

FLOWSERVE

Vogt Valves

*Catalog
and Application
Manual*

Vogt Valves

VVACT0000-01
(Replaces VV200)

Forged Steel Valves and Fittings

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Gate Valve Index

Press. Class	Material	Bonnet Joint	End Connection	Bonnet Type	SERIES
150	A105	Bolted	Flanged	OS&Y	353
			Butt Weld	OS&Y	BW353
			Thd/SW	OS&Y	See Class 800
	A182 F316/F316 L	Bolted	Flanged	OS&Y	358
	A350 LF2	Bolted	Flanged	OS&Y	32353
300	A105	Bolted	Flanged	OS&Y	363
			Butt Weld	OS&Y	BW363
			Thd/SW	OS&Y	See Class 800
	A182 F316/F316 L	Bolted	Flanged	OS&Y	368
	A350 LF2	Bolted	Flanged	OS&Y	32363
600	A105	Bolted	Flanged	OS&Y	373, 13373, 11403
			Butt Weld	OS&Y	BW373
			Thd/SW	OS&Y	See Class 800
	A182 F316/F316 L	Bolted	Flanged	OS&Y	378
	A350 LF2	Bolted	Flanged	OS&Y	32373
800	A105	Bolted	Threaded	OS&Y	12111, 13111, 11103
				ISS	12161
			Socket Weld	OS&Y	SW12111, SW13111, SW11103
				ISS	SW12161
			Male Thd x Fem Thd	OS&Y	TT12111
			Male Soc x Fem Thd	OS&Y	ST 12111
		Male Cpt x Fem Thd	OS&Y	CT12111	
		Weld	Threaded	OS&Y	2801, 2801B
				ISS	2811
			Socket Weld	OS&Y	SW2801, SW2801B
				ISS	SW2811
			Male Thd x Fem Thd	OS&Y	TT2801
				ISS	TT2811
			Male Soc x Fem Thd	OS&Y	ST2801
			Male Cpt x Fem Thd	OS&Y	CT 2801, CT 2901
	Union		Threaded	ISS	59851
		Socket Weld	ISS	SW59851	
	A350 LF2	Bolted	Threaded	OS&Y	32111
			Socket Weld	OS&Y	SW32111
	A182 F3/F316L	Bolted	Threaded	OS&Y	12401, 13401
			Socket Weld	OS&Y	SW12401, SW13401
		Weld	Threaded	OS&Y	2831
			Socket Weld	OS&Y	SW2831
			Male Thd x Fem Thd	OS&Y	TT2831
			Male Soc x Fem Thd	OS&Y	ST2831
			Male Cpt x Fem Thd	OS&Y	CT2831
Union		Threaded	ISS	59951	
		Socket Weld	ISS	SW59951	
A182 F316H	Bolted	Threaded	OS&Y	82401	
		Socket Weld	OS&Y	SW82401	
A182 F5	Bolted	Threaded	OS&Y	12421	
		Socket Weld	OS&Y	SW12421	
A182 F9	Bolted	Threaded	OS&Y	12921	
		Socket Weld	OS&Y	SW12921	

Gate Valve Index *(cont.)*

Press. Class	Material	Bonnet Joint	End Connection	Bonnet Type	SERIES
800 (cont.)	A182 F11, CL2	Bolted	Threaded	OS&Y	12321
			Socket Weld	OS&Y	SW12321
	A182 F22 CL 3	Bolted	Threaded	OS&Y	12521
			Socket Weld	OS&Y	SW12521
1500	A105	Bolted	Threaded	OS&Y	15111, 16111, 1033, 1043
			Socket Weld	OS&Y	SW15111, SW16111, SW1043, SW1033
			Flanged	OS&Y	15373, 11603, 11683
		Weld	Threaded	OS&Y	15801
			Socket Weld	OS&Y	SW15801
			Male Cpt x Fem Thd	OS&Y	ST15801
	A350 LF2	Bolted	Threaded	OS&Y	35111
			Socket Weld	OS&Y	SW35111
	A182 F316/F316L	Bolted	Threaded	OS&Y	15401
			Socket Weld	OS&Y	SW15401
		Weld	Threaded	OS&Y	15831
			Socket Weld	OS&Y	SW15831
	A182 F11, CL.2	Bolted	Threaded	OS&Y	15321
			Socket Weld	OS&Y	SW15321
2500	A105	Welded	Threaded	OS&Y	66703
			Socket Weld	OS&Y	SW66703
	A182 F11, CL2	Welded	Threaded	OS&Y	66713
			Socket Weld	OS&Y	SW66713
	A182 F22, CL.3	Welded	Socket Weld	OS&Y	SW66773

Globe Valve Index

Press. Class	Material	Bonnet Joint	End Connection	Bonnet Type	SERIES
150	A105	Bolted	Flanged	OS&Y	473, 473B
		Bolted	Thd/SW	OS&Y	See Class 800
	A350 LF2	Bolted	Flanged	OS&Y	32473
300	A105	Bolted	Flanged	OS&Y	483, 483B, 22483CL
		Bolted	Thd/SW	OS&Y	See Class 800
	A350 LF2	Bolted	Flanged	OS&Y	32483
600	A105	Bolted	Flanged	OS&Y	493, 493B, 22493CL, 22493MT, 10403
		Bolted	Thd/SW	OS&Y	See Class 800
	A350 LF2	Bolted	Flanged	OS&Y	32493
800	A105	Bolted	Threaded	OS&Y	12141, 12141B, 13141, 22141 12443, 22461, 10103, 1971
				ISS	12181
			Socket Weld	OS&Y	SW12141, 12141B, SW13141 SW22141, SW12443, SW22461 SW10103, SW1971
				ISS	SW12181
				OS&Y	TT12141
			Weld	OS&Y	ST 12141
		OS&Y		CT12141	
		OS&Y		2821, 810	
		OS&Y		SW2821, SW810	

Globe Valve Index *(cont.)*

Press. Class	Material	Bonnet Joint	End Connection	Bonnet Type	SERIES	
800 (cont.)		Union	Threaded	OS&Y	801	
				ISS	851	
		Socket Weld		OS&Y	SW801	
				ISS	SW851	
	A182 F316/F316L	Bolted	Threaded	OS&Y	12501	
			Socket Weld	OS&Y	SW12501	
	A182 F316H	Bolted	Threaded	OS&Y	82501	
			Socket Weld	OS&Y	SW82501	
	A182 F11, CL. 2	Bolted	Socket Weld	OS&Y	SW12351	
		Weld	Threaded	OS&Y	811	
	A182 F22, CL. 3	Bolted	Socket Weld	OS&Y	SW811	
			Threaded	OS&Y	12551	
	A350 LF2	Bolted	Socket Weld	OS&Y	822	
			Threaded	OS&Y	SW822	
1500	A105	Bolted	Threaded	OS&Y	15141, 15443, 1003, 1023	
			Socket Weld	OS&Y	SW15141, SW15443, SW1003, SW1023	
		Weld	Flanged	OS&Y	15493, 10603, 10683	
			Threaded	OS&Y	15821	
	A182 F316/F316L	Bolted	Socket Weld	OS&Y	SW15821	
			Threaded	OS&Y	15501	
	A182 F11, CL2	Bolted	Socket Weld	OS&Y	SW15501	
			Threaded	OS&Y	15351	
	1690	A105	Weld	Socket Weld	OS&Y	SW15351
				Threaded	OS&Y	1510
		A182 F11, CL2	Weld	Socket Weld	OS&Y	SW1510
				Threaded	OS&Y	1511
	A182 F22, CL. 3	Weld	Socket Weld	OS&Y	SW1511,	
			Threaded	OS&Y	1522	
2500	A105	Weld	Socket Weld	OS&Y	SW1522	
			Threaded	OS&Y	66723	
	A182 F11, CL2	Weld	Socket Weld	OS&Y	SW66723	
			Threaded	OS&Y	66733	
	A182 F22, CL. 3	Weld	Socket Weld	OS&Y	SW66733	
			Threaded	OS&Y	66793	
2680	A105	Weld	Socket Weld	OS&Y	SW66793	
			Threaded	OS&Y	2510	
	A182 F11, CL2	Weld	Socket Weld	OS&Y	SW2510	
			Threaded	OS&Y	2511	
	A182 F22, CL. 3	Weld	Socket Weld	OS&Y	SW2511	
			Threaded	OS&Y	2522	
			Socket Weld	OS&Y	SW2522	

Check Valve Index

Press. Class	Material	Bonnet Joint	End Connection	Type	SERIES
150	A105	Bolted	Flanged	Piston	573
		Bolted	Thd/SW	Piston	See Class 800
		Bolted	Flanged	Swing	S 673
	A350 LF2	Bolted	Flanged	Piston	32573
300	A105	Bolted	Flanged	Piston	583
		Bolted	Thd/Sw	Piston	See Class 800
		Bolted	Flanged	Swing	S 683
	A350 LF2	Bolted	Flanged	Piston	32583
600	A105	Bolted	Flanged	Piston	593
		Bolted	Thd/SW	Piston	See Class 800
		Bolted	Flanged	Swing	S 693
	A350 LF2	Bolted	Flanged	Piston	32593
800	A105		Threaded	Piston	701,701ZL,710,13701
				Ball	B701,B710
				Swing	4835, S701
			Socket Weld	Piston	SW701,SW710,SW13701
				Ball	SWB701, SWB710
				Swing	SW4835, SWS701
		No	Threaded	Swing	S74
			Socket Weld	Swing	SWS74
		Union	Threaded	Piston	9091
				Ball	B9091, 54853
	Socket Weld		Piston	SW9091	
			Ball	SWB9091, SW5483	
	A182 F316/F316L	Bolted	Threaded	Piston	718
				Socket Weld	SW718
				Swing	S718
			Socket Weld	Swing	SWS718
				Ball	B718
				Ball	SWB718
		Union	Threaded	Ball	54863
		A182 F316H	Bolted	Threaded	piston
Socket Weld	Piston			SW82718	
A350 LF2	Bolted	Threaded	Piston	32701	
		Socket Weld	Piston	SW32701	
1500	A105	Bolted	Threaded	Piston	15701
				Ball	B15701
			Socket Weld	Piston	SW15701
				Ball	SWB15701
1690	A105	Weld	Threaded	Piston	1610
			Socket Weld	Piston	SW1610
	A182 F22, CL. 3	Weld	Threaded	Piston	1622
			Socket Weld	Piston	SW1622
2680	A105	Weld	Threaded	Piston	2610
			Socket Weld	Piston	SW2610
	A182 F11, CL. 2	Weld	Threaded	Piston	2611
			Socket Weld	Piston	SW2611
	A182 F22, CL. 3	Weld	Threaded	Piston	2622
			Socket Weld	Piston	SW2622

Meter Globe Valve Index

Press. Class	Material	Bonnet Joint	End Connection	Bonnet Type	SERIES
3000	A105	Screw	Threaded	ISS	1331T, 1881T, 2891T
			Socket Weld	ISS	SW1871T, SW1331T, SW2891T
4000	A105	Union	Threaded	ISS	54831T
			Socket Weld	ISS	SW54381T
5000	A105	Screw	Threaded	ISS	9871T, 9841T
			Socket Weld	ISS	SW9871T, SW9841T
	A182 F316/F316L	Screw	Threaded	ISS	98717T, 9841T
			Socket Weld	ISS	SW9871T, SW9841T
	A182 F316/F316L	Screw	Threaded	ISS	9871T, 9841T
			Socket Weld	ISS	SW9871T, SW9841T
	A182 F316/F316L	Screw	Threaded	ISS	9821T
			Socket Weld	ISS	SW9821T
6000	A105	Screw	Threaded	ISS	3991T
			Socket Weld	ISS	SW3991T

Hydraulic Check Valve Index

Press. Class	Material	Bonnet Joint	End Connection	Bonnet Type	SERIES
3000	A105	Screw	Threaded	Piston	1551, 2191
			Socket Weld	Piston	SW1551, SW2191
			Threaded	Ball	B1551
			Socket Weld	Ball	SWB1551
6000	A105	Screw	Threaded	Piston	4881
			Socket Weld	Piston	SW4881

Vogt Valves – A History in the Making



Vogt Valves, Sulphur Springs, TX

In the late 1890s, Vogt pioneered the early development of ammonia absorption refrigeration systems that made artificial ice. This business, plus Vogt's fledgling boiler business created an internal need for quality valves that initiated Vogt's early entry into the valve manufacturing business. The early reputation of Vogt's quality valves and the rapidly growing petroleum processing industry created an outside demand that would firmly establish Vogt in the mass production of high quality forged steel valves.

For more than 100 years, Vogt's leadership has been evident in the production of forged steel fittings, gate, globe, angle and check valves in most popular materials, trims and bonnet configurations.

Today, Vogt Valves supports a worldwide network of distributors with access to the world's largest capability for the manufacturing of forged steel valves and fittings.

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Service Application

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* Globe, Angle and Check Valves can be provided with appropriate trim materials for sour service. Valve series with MB6, MB8 and MBS suffixes meet NACE. See pages 4 and 45 for explanation.

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	353MM	6	S 683	95B	1189	126-128	SW 2110	126,127,130	TSW	2801	24	B	9091	104	
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	363FHF	7	SW 701F8M	100	1299	126,127		2271	125	ST	2801F8M	26	SW	9841T	86
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	373FHF	8	B 701	97	SWR 1510	80	SW 2450	126,127,130	TSW	2811	31	SW	11103	33	
	373MB8	8	SWB 701	97	1511	78			TT	2811	26		11403	10	
	373MM	8	SWB 701HF6	97	R 1511	80	SW 2510	81	2821	67		11603	35		
BW	373MM	8	SWB 701HF7	97	SW 1511	78	R 2510	82	SW	2821	67		11683	35	
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SW 12111T	14	SW 12521FHF	16	15321	37	SW 15821MBS	77	SW 32701	99	SW 82401	15
		12551	56	SW 15321	37	15821MM	77	32701MB8	99	82401FHF	15
12141	55	SW 12551	56	SW 15351	75	SW 15821MM	77	SW 32701MB8	99		
SW 12141	55	SW 12551FHF	16	15373	34	15831	40			82501	56
12141B	52			SW 15373	34	SW 15831	40	35111	38, 43	SW 82501	56
SW 12141B	52	12921	16	RJ 15373	34			SW 35111	38, 43		
12141F8M	55	SW 12921	16	15373FHF	34	16111	39	35111F8M	38, 43	82718	99
SW 12141F8M	55	12921FHF	16	RJ 15373FHF	34	SW 16111	39	SW 35111F8M	38, 43	82718	99
12141FHF	55	SW 12921FHF	16					35111MB8	38, 43		
SW 12141HF6	55	13111	21	SW 15401	37	22141CL	61	SW 35111MB8	38, 43		
SW 12141HF7	55	13111BB	21	SW 15401	37	22141CL	61				
12141MB8	55	13111FHF	21	15443	76	22141F8M	60	41000 04	19		
SW 12141MB8	55	13111F8M	21	SW 15443	76	SW 22141F8M	60	41000 06	19		
12141T	55	SW 13111	21	15493	74	22141MM	60	41000 08	19		
		SW 13111F8M	21	15493F8M	74	SW 22141MM	60	41000 09	19		
CT 12141	62	SW 13111FHF	21	15493FHF	74	SW 22141MM	60				
TT 12141	62	SW 13111MB8	21	15493MB8	74	22141MT	61	42211MTG	11		
SW 12141FHF	55	SW 13111MM	21	15493MBS	74	SW 22141MT	61	SW 42211MTG	11		
12141MM	55	SW 13111HF4	21	15493MM	74			SW 42241HF2	54		
SW 12141MM	55	SW 13111HF5	21			22461	64	SW 42241MTG	54		
SW 12141T	55	13111R	22	15501	75	SW 22461	64	SW 42241MTG	54		
		SW 13111R	22	13141	58	SW 22461FHF	64	43111MMP	12		
12161	23	13141	58	SW 13141	58	SW 22461FHF	64	SW 43211HF2	11		
SW 12161	23	13141FHF	58	15501FHF	75	22483CL	50	SW 43241MMP	53		
12161F8M	23	SW 13141FHF	58	SW 15501FHF	75	22493CL	50	43241MTP	53		
SW 12161F8M	23	13141FHF	58	15593	105	22493MT	50	SWB 43721HF2	93		
12161MM	23	13363MMP	7	SW 15593	105			SWB 43721HF4	93		
SW 12161MM	23	13373	9	15593FHF	105	SW 23141HF4	59	SWB 43721HF5	93		
12181	66	13373MMP	7	SW 15593FHF	105	SW 23141HF5	59				
SW 12181	66	13401	21					54853	103		
12321	16	SW 13401	21	15701	106	32111	18, 43	SW 54853	103		
SW 12321	16	13701	102	B 15701	106	32111F8M	18, 43	54863	103		
12321FHF	16	SW 13701	102	SW 15701	106	32111MB8	18, 43	58431T	85		
SW 12321FHF	16			SWB 15701	106	32111MM	18	SW 58431T	85		
12351	56	15111	37	15701FHF	106	SW 32111	18, 43				
SW 12351	56	SW 15111	37	SW 15701FHF	106	TSW 32111	18	59851	32		
		15111F8M	37			SW 32111F8M	18, 43	SW 59851	32		
12401	15	SW 15111F8M	37	15801	40	TSW 32111F8M	18	SW 59851F8M	32		
SW 12401	15	15111FHF	37	ST 15801	41	SW 32111MB8	18, 43	SW 59851F8M	32		
12401C	17	SW 15111FHF	37	SW 15801	40	SW 32111MM	18	59851MBS	32		
SW 12401C	17	15111MB6	37	ST 15801F8M	41	32141	55	SW 59851MBS	32		
12401FHF	15	SW 15111MB6	37	15801FHF	40	SW 32141	55	59851MM	32		
SW 12401FHF	15	15111MB8	37	SW 15801FHF	40	32141F8M	55	SW 59851MM	32		
12401T	15	SW 15111MB8	37	15801MB8	40	SW 32141F8M	55	59951	32		
SW 12401T	15	15111MBS	37	SW 15801MB8	40	32141MB8	55	59951T	32		
12421	16	SW 15111MBS	37	15801MBS	40	SW 32141MB8	55				

Description of Series Number System for Vogt Valves

(Order Vogt Valves & Fittings by size—series number)

Prefix:

This maximum 3 alphanumeric letter beginning the Vogt Valve series number is normally indicative of the valve connection. Historically, a few design features have also been used as part of the prefix including **S**, **B** and **R**. A fully female threaded valve as the traditional Vogt standard does not have a prefix number (see below for prefix descriptions).

Prefix Description:

(Blank) - Female NPT (both ends)
B - Ball Check (female NPT)
BS - Female SW by Male Butt Weld
BT - Female Thd by Male Butt Weld
BW - Butt Weld
CS - Female SW by Male Couplet
CT - Female Thd by Male Couplet
R - In-Line Repair (female NPT)
RJ - Ring Joint Flanges
S - Swing Check (female NPT)
SS - Female SW by Male SW
ST - Female Thd by Male SW
SW - Socket Weld
SWB - Ball Check (SW)
SWR - In-line Repairable (SW)
SWS - Swing Check (SW)
TS - Female SW by Male Thd
TSW - Female Thd by Female SW
TT - Female Thd by Male Thd

Legend:

The prefixes and suffixes based on design are limited to **S**, **B**, **R** and **ER** (as listed above) **ONLY**.

Expansion of new valve designs are added as new SERIES NUMBERS.

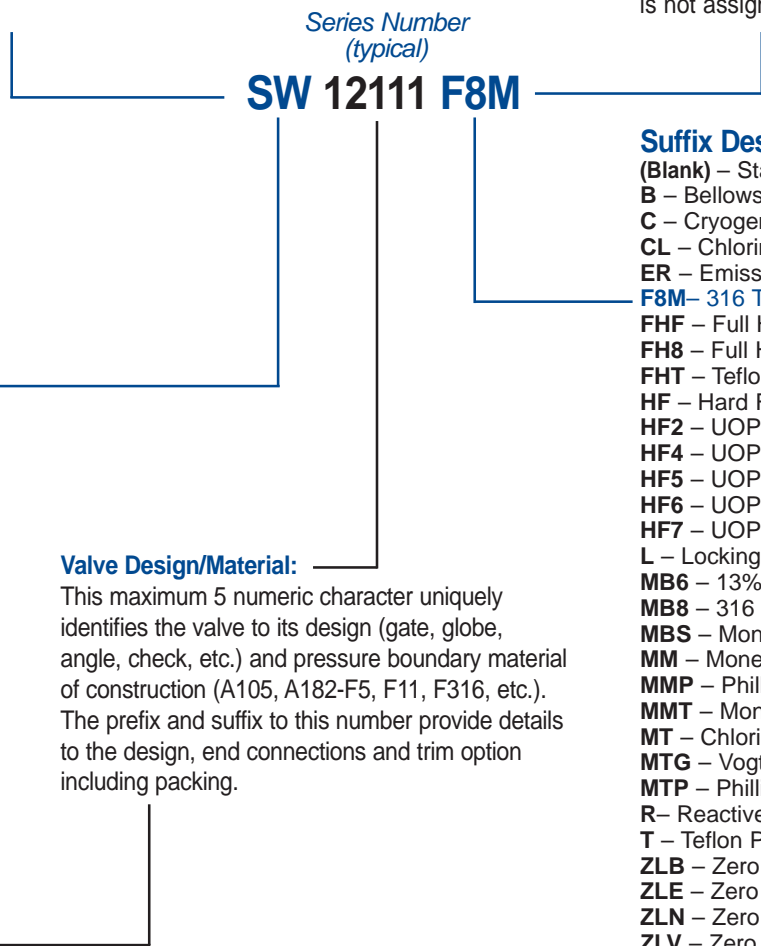
(See the VV 200 individual pages for standard series available.)

Suffix:

This maximum 3 alphanumeric character ending of the Vogt Valve series number is normally indicative of the valve internal trim package. Historically, packing and a few design features have also been used as part of the suffix number including **T**, **B** and **ER**. A valve with the traditional Vogt standard trim package and packing is not assigned a suffix number (see below for suffix descriptions).

Suffix Description:

(Blank) – Standard Trim
B – Bellows Valve
C – Cryogenic Valve
CL – Chlorine Valve Trim – Monel/Hastelloy
ER – Emissions Reduction – Double Packed with Lantern Ring
F8M– 316 Trim
FHF – Full Hard Face (unless standard)
FH8 – Full Hard Faced F8M Trim
FHT – Teflon Packing and Full Hard Face
HF – Hard Faced Disc (F316 Globes and Checks Only)
HF2 – UOP Alkylation
HF4 – UOP Alkylation
HF5 – UOP Alkylation
HF6 – UOP Alkylation
HF7 – UOP Alkylation
L – Locking Device
MB6 – 13% Chrome Trim – NACE
MB8 – 316 Trim Hard Faced Seats and Disc/Wedge – NACE
MBS – Monel Trim – NACE
MM – Monel Trim – Grafoil Packing and Gasket
MMP – Phillips Alkylation
MMT – Monel Trim – Teflon Packing and Gasket
MT – Chlorine Valve Trim – Monel/Teflon Disc/Hastelloy
MTG – Vogt Alkylation
MTP – Phillips Alkylation
R– Reactive Seal
T – Teflon Packing and Gasket
ZLB – Zero Leakage Check Valve – Buna N
ZLE – Zero Leakage Check Valve – Ethylene Propylene
ZLN – Zero Leakage Check Valve – Neoprene
ZLV – Zero Leakage Check Valve – Viton 14



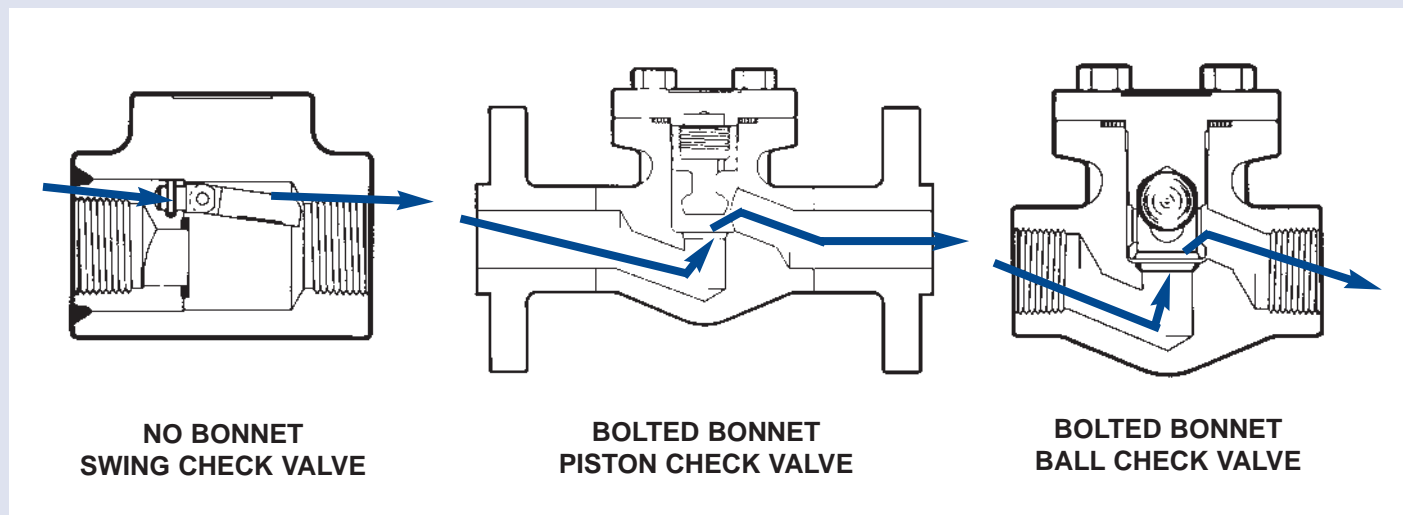
Check Valve Section – Pages 89-111

Vogt check valves are forged from fine grain steel and are available with threaded, socket weld or flanged ends. Most bonnet designs, including bolted, seal weld, union, and bonnetless type check valves are manufactured to meet a wide variety of service applications.

Piston, ball, swing and spring controlled check valve designs for horizontal or vertical (upward) flow applications for the most often specified pressure classes are available. A spring can be added to piston check valves not currently equipped with that option if specified on the order.

Vogt's "Y" pattern check valves complement our "Y" pattern and In-Line repairable globe valve lines used in refineries, chemicals, power and related industries.

Piston and ball check valves should not be used in applications where rusting or rust particles are present or anticipated. Swing check valves are more tolerant for applications of this nature.



Vogt check valves (non spring loaded) should be sized to provide a minimum of 2 psi pressure drop for ball and piston type valves and 1/2 psi for swing check type valves. This will assure that the valves will not be subject to noisy operation and premature wear of parts.

Spring loaded piston check valves are the Vogt preference for reciprocating compressor service in which a history of noisy check valve operation has been experienced.

Check valves are designed to prevent reverse flow. Leakage rate for Vogt check valves with metal-to-metal seats are dependent on the amount of back pressure and the viscosity of the flowing medium. Check valves should not be used in gas or low back pressure liquid applications if zero leakage is desired. See Page 100 for Vogt zero leakage check valves.

**Dimensions are in inches and millimeters.
Dimensions are subject to change without notice.
Order by Size and Series Number.**

Forged Check Valves

Class 150 (PN 20)

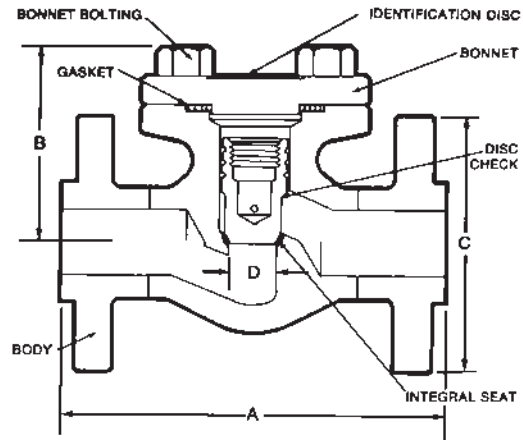
Conventional Port

285 PSI @ 100°F (19.7 BAR @ 38°C)

For other ratings see pgs. 112-115

Body/Bonnet	SERIES NUMBER	Trim:	Seat:
A105	573	13% Cr.	HF
	573MB8	316 SS	HF
	573MBS	Monel	HF
	573MM	Monel	HF
	573F8M	316	HF
A350 LF2	32573	13% Cr.	HF

MATERIALS MEET REQUIREMENTS OF NACE STANDARD MR-01-75 FOR SOUR SERVICE



- Round Bolted Bonnet
- Spiral Wound Gasket
- Horizontal Type
- Piston Check
- Integral Hard Faced Seat
- ASME B16.34

Dimensions

Bold face numerals are in inches and pounds.
Blue numerals are in millimeters and kilograms.

Size	NPS	1/2	3/4	1	1-1/2	2
	DN	15	20	25	40	50
A-End-to-End		4.25 108	4.62 117	5.00 127	6.50 165	8.00 203
B		2.56 65	2.56 65	3.12 79	4.50 114	4.94 125
C		3.50 89	3.88 99	4.25 108	5.00 127	6.00 152
D-Seat Diameter		.50 12.7	.50 12.5	.75 19.1	1.28 32.5	1.53 38.9
Weight		5.3 2.4	6.5 3.0	10.1 4.6	20.7 9.4	33.1 15.0

Meets API-602 required wall thicknesses.

Valve flanges conform to ASME Standard B16.5 and end-to-end dimensions conform to ASME Standard B16.10.

For Cv factors see page 123, Valve Matrix FF.
 Refer to pages 116-120 for full materials description.

CHECK CLASS 150 (PN 20) 573, 32573

Forged Check Valves

Class 300 (PN 50)

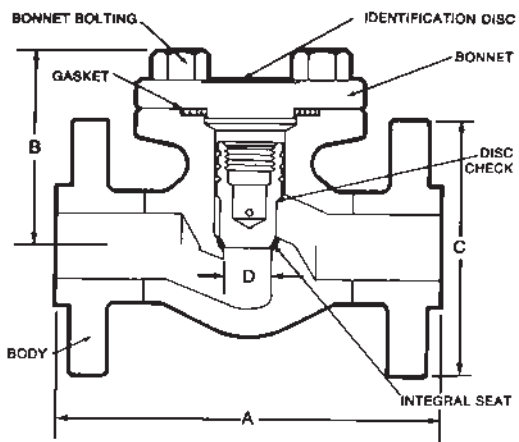
Conventional Port

740 PSI @ 100°F (51.0 BAR @ 38°C)

For other ratings see pgs. 112-115

Body/Bonnet	SERIES NUMBER	Trim	Seat
A105	583	Trim: 13% Cr.	Seat: HF
	583MB8	Trim: 316 SS	Disc/Seat: HF
	583MBS	Trim: Monel	Seat: HF
	583MM	Trim: Monel	Seat: HF
	583F8M	Trim: 316	Seat: HF

MATERIALS MEET REQUIREMENTS OF NACE STANDARD MR-01-75 FOR SOUR SERVICE



Flanged Ends 1/16" R.F.

- Round Bolted Bonnet
- Spiral Wound Gasket
- Horizontal Type
- Piston Check
- Integral Hard Faced Seat
- ASME B16.34

A350 LF2 32583 Trim: 13% Cr. Seat: HF

Meets API-602 required wall thicknesses.

Dimensions

Bold face numerals are in inches and pounds.
Blue numerals are in millimeters and kilograms.

Size	NPS DN	1/2 15	3/4 20	1 25	1-1/2 40	2 50
A-End-to-End		6.00 152	7.00 178	8.00 203	9.00 229	10.50 267
B		2.56 65	2.56 65	3.12 79	4.50 114	4.94 125
C		3.75 95	4.62 117	4.88 124	6.12 155	6.50 165
D-Seat Diameter		.50 12.7	.50 12.7	.75 19.1	1.28 32.5	1.53 38.9
Weight		6.6 3.0	10.0 4.5	13.7 6.2	27.9 12.7	38.0 17.3

Valve flanges conform to ASME Standard B16.5 and end-to-end dimensions conform to ASME Standard B16.10.

For Cv factors see page 123, Valve Matrix FF.
Refer to pages 116-120 for full materials description.

Forged Check Valves

Class 600 (PN 110)

Conventional Port

1480 PSI @ 100°F (102.1 BAR @ 38°C)

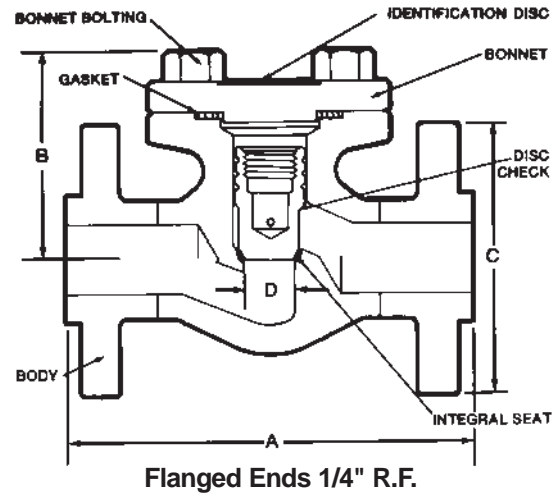
For other ratings see pgs. 112-115

Body/Bonnet

SERIES NUMBER

A105	593	Trim: 13% Cr. Seat: HF
	593MB8	Trim: 316 SS Disc/Seat: HF
	593MBS	Trim: Monel Seat: HF
	593MM	Trim: Monel Seat: HF
	593F8M	Trim: 316 Seat: HF
A350 LF2	32593	Trim: 13% Cr. Seat: HF

MATERIALS MEET REQUIREMENTS OF NACE STANDARD MR-01-75 FOR SOUR SERVICE



- Round Bolted Bonnet
- Spiral Wound Gasket
- Horizontal Type
- Piston Check
- Integral Hard Faced Seat
- ASME B16.34

Meets API-602 required wall thicknesses.

Dimensions

Bold face numerals are in inches and pounds.
Blue numerals are in millimeters and kilograms.

Size	NPS DN	1/2 15	3/4 20	1 25	1-1/2 40	2 50
A-End-to-End		6.50	7.50	8.50	9.50	11.50
		165	190	216	241	292
B		2.56	2.56	3.12	4.50	4.94
		65	65	79	114	125
C		3.75	4.62	4.88	6.12	6.50
		95	117	124	155	165
D-Seat Diameter		.50	.50	.75	1.28	1.53
		12.7	12.7	19.1	32.5	38.9
Weight		6.9	9.8	15.2	31.2	41.8
		3.1	4.4	6.9	14.2	19.0

Valve flanges conform to ASME Standard B16.5 and end-to-end dimensions conform to ASME Standard B16.10.

For Cv factors see page 123, Valve Matrix FF.
Refer to pages 116-120 for full materials description.

Forged Check Valves – For HF Alkylation Service

Class 800 (PN 130)

1975 PSI @ 100°F (136.2 BAR @ 38°C)

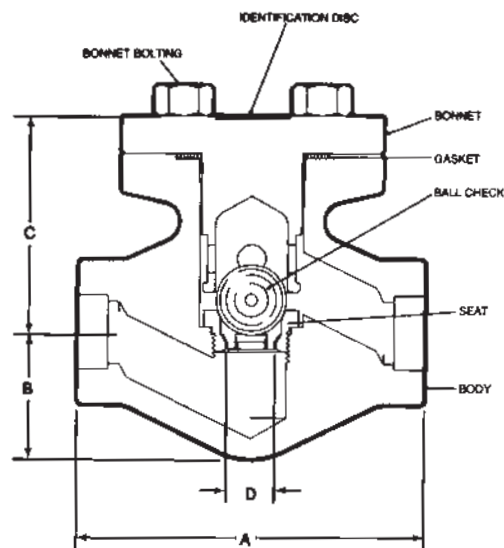
For other ratings see pgs. 112-115

A105 Body/Bonnet

SERIES NUMBER

Threaded	Socket Weld	
-	SWB43721HF2 Sizes 1/2-1"	
	Trim: Monel	
-	SWB43721HF4	
	Trim: Monel	
-	SWB43721HF5	
	Trim: Monel	

HYDROFLURIC
ACID (HF)
ALKYLATION VALVES.
UOP APPROVED.



- Round Bolted Bonnet
- Spiral Wound Gasket
- Horizontal Type
- Ball Check
- Removable Seat
- ASME B16.34

Dimensions

Bold face numerals are in inches and pounds.
Blue numerals are in millimeters and kilograms.

Size	NPS	1/2	3/4	1	1-1/2	2
	DN	15	20	25	40	50
A-End-to-End		4.00 102	4.62 117	6.25 159	7.75 197	9.00 229
B		1.12 28	1.56 40	2.25 57	2.69 68	3.50 89
C		2.56 65	3.06 78	4.50 114	4.88 124	5.94 151
D-Seat Diameter		.39 9.9	.59 15.0	.97 24.6	1.44 36.6	1.88 47.8
Weight		3.5 1.6	6.5 3.0	17.5 8.0	25.8 11.7	47.4 21.5

Refer to pages 116-120 for full materials description.

For Cv factors see page 123, Valve Matrix HH.

Forged Check Valves

Class 800 (PN 130)

Conventional Port

1975 PSI @ 100°F (136.2 BAR @ 38°C)

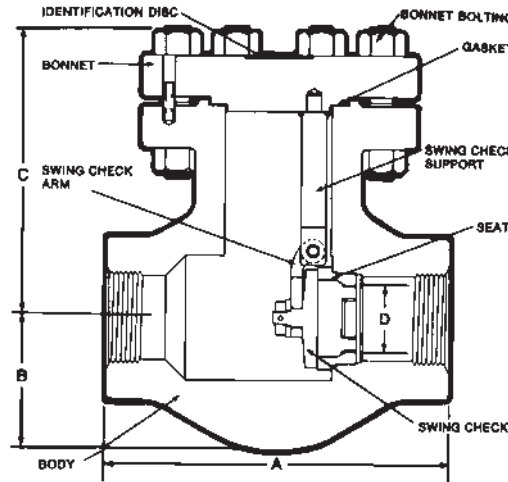
For other ratings see pgs. 112-115

A105 Body/Bonnet

SERIES NUMBER

Threaded Socket Weld
4835 **SW4835**
 Trim: 13% Cr.

Meets API-600 required wall thicknesses.



- Round Bolted Bonnet
- Flat Gasket Joint
- Horizontal or Vertical Upward Flow
- Swing Check
- Renewable Seat
- ASME B16.34

Dimensions

Bold face numerals are in inches and pounds.
Blue numerals are in millimeters and kilograms.

Size	NPS DN	1/2 15	3/4 20	1 25	1-1/4 32	1-1/2 40	2 50
A-End-to-End		4.00 102	4.00 102	5.00 127	6.50 165	6.50 165	7.25 184
B		1.31 33	1.31 33	1.75 44	2.19 56	2.19 56	2.62 66
C		4.62 117	4.62 117	5.50 140	6.38 162	6.38 162	6.94 176
D-Seat Diameter		.39 9.9	.39 9.9	.69 17.5	.97 24.6	1.19 30.2	1.44 36.6
Weight		13.2 6.0	13.0 6.0	22.1 10.0	29.1 13.2	30.2 13.7	39.9 18.1

Refer to pages 116-120 for full materials description.

For Cv factors see page 123, Valve Matrix JJ.

Forged Check Valves

Class 800 (PN 130)

Conventional Port

1975 PSI @ 100°F (136.2 BAR @ 38°C)

For other ratings see pgs. 112-115

A105 Body/Bonnet

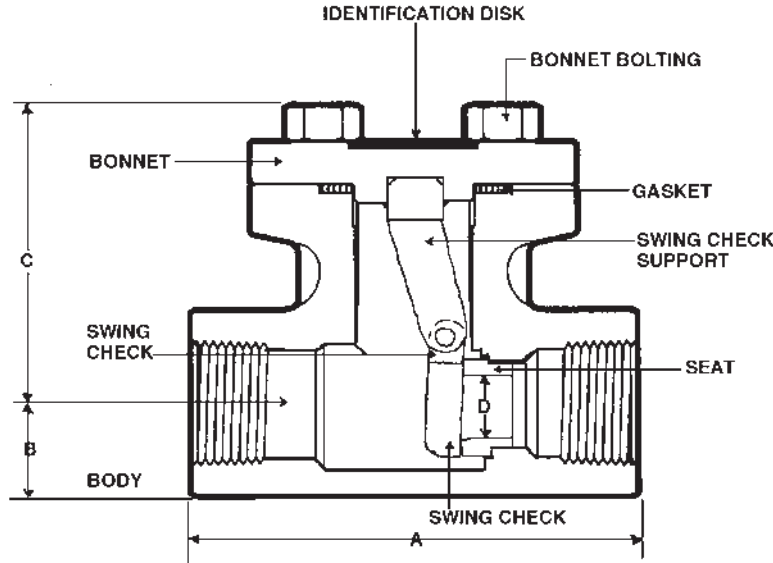
SERIES NUMBER

Threaded Socket Weld
S701 **SWS701**
 Trim: 13% Cr.
 Seat: HF

F316, F316L Body/Bonnet

1920 PSI @ 100°F (132.4 BAR @ 38°C)

S718 **SWS718**
 Trim: 316
 Seat: HF



- Round Bolted Bonnet
- Spiral Wound Gasket
- Horizontal or Vertical Upward Flow
- Swing Check
- Hard Faced Seat
- ASME B16.34

Dimensions

Bold face numerals are in inches and pounds.
Blue numerals are in millimeters and kilograms.

Size	NPS DN	1/2 15	3/4 20	1 25	1-1/2 40	2 50
A-End-to-End		3.38 86	3.38 86	4.19 106	5.44 138	5.94 151
B		.78 20	.78 20	.97 25	1.28 33	1.56 40
C		2.33 59	2.33 59	3.06 78	4.46 113	4.92 125
D-Seat Diameter		.50 12.7	.50 12.7	.75 19.1	1.25 31.8	1.50 38.1
Weight		3.9 1.8	3.8 1.7	6.1 2.7	16.5 7.5	25.3 11.5

Refer to pages 116-120 for full materials description.

For Cv factors see page 123, Valve Matrix MM.

Forged Check Valves

Class 150 (PN 20)

Conventional Port

285 PSI @ 100°F (19.7 BAR @ 38°C)

For other ratings see pgs. 112-115

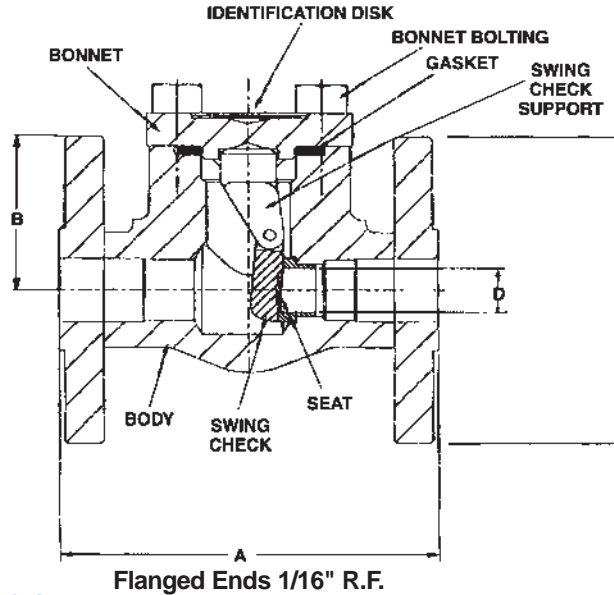
A105 Body/Bonnet

SERIES NUMBER

S673

Trim: 13% Cr.

Seat: HF



- Round Bolted Bonnet
- Spiral Wound Gasket
- Horizontal or Vertical Upward Flow
- Swing Check
- Hard Faced Seat
- ASME B16.34

Dimensions

Bold face numerals are in inches and pounds.
Blue numerals are in millimeters and kilograms.

Size	NPS	1/2	3/4	1	1-1/2	2
	DN	15	20	25	40	50
A-End-to-End		4.25	4.62	5.00	6.50	8.00
		108	117	127	165	203
B		2.33	2.33	3.06	4.43	4.89
		59	59	78	112	124
C		3.50	3.88	4.25	5.00	6.00
		89	99	108	127	152
D-Seat Diameter		.50	.50	.75	1.25	1.50
		12.7	12.7	19.1	31.8	38.1
Weight		4.8	6.2	9.1	18.8	33.2
		2.2	2.8	4.1	8.5	15.1

Refer to pages 116-120 for full materials description.

For Cv factors see page 123, Valve Matrix MM.

Forged Check Valves

Class 300 (PN 50)

Conventional Port

740 PSI @ 100°F (51.0 BAR @ 38°C)

For other ratings see pgs. 112-115

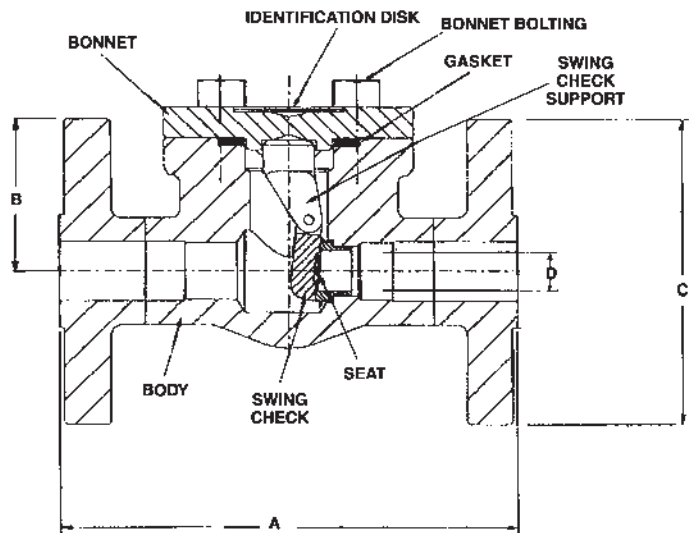
A105 Body/Bonnet

SERIES NUMBER

S683

Trim: 13% Cr.

Seat: HF



Flanged Ends 1/16" R.F.

- Round Bolted Bonnet
- Spiral Wound Gasket
- Horizontal or Vertical Upward Flow
- Swing Check
- Hard Faced Seat
- ASME B16.34

Dimensions

Bold face numerals are in inches and pounds.
Blue numerals are in millimeters and kilograms.

Size	NPS	1/2	3/4	1	1-1/2	2
	DN	15	20	25	40	50
A-End-to-End		5.50 140	6.00 152	8.50 216	9.50 241	10.50 267
B		2.33 59	2.33 59	3.06 78	4.43 112	4.89 124
C		3.75 95	4.75 121	5.00 127	6.12 155	6.50 165
D-Seat Diameter		.50 12.7	.50 12.7	.75 19.1	1.25 31.8	1.50 38.1
Weight		6.3 2.9	9.3 4.2	13.9 6.3	2.60 11.8	39.4 17.9

Refer to pages 116-120 for full materials description.

For Cv factors see page 123, Valve Matrix MM.

Forged Check Valves

Class 600 (PN 110)

Conventional Port

1480 PSI @ 100°F (102.1 BAR @ 38°C)

For other ratings see pgs. 112-115

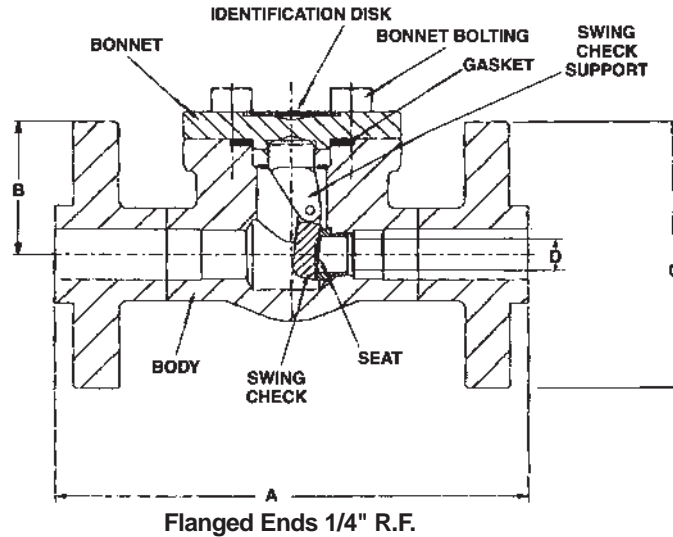
A105 Body/Bonnet

SERIES NUMBER

S693

Trim: 13% Cr.

Seat: HF



- Round Bolted Bonnet
- Spiral Wound Gasket
- Horizontal or Vertical Upward Flow
- Swing Check
- Hard Faced Seat
- ASME B16.34

Dimensions

Bold face numerals are in inches and pounds.
Blue numerals are in millimeters and kilograms.

Size	NPS	1/2	3/4	1	1-1/2	2
	DN					
A-End-to-End		6.50	7.50	8.50	9.50	11.50
		165	190	216	241	292
B		2.33	2.33	3.06	4.43	4.89
		59	59	78	112	124
C		3.75	4.62	5.00	6.12	6.50
		95	117	127	155	165
D-Seat Diameter		.50	.50	.75	1.25	1.50
		12.7	12.7	19.1	31.8	38.1
Weight		6.9	10.2	14.4	27.8	43.2
		3.1	4.6	6.5	12.6	19.6

Refer to pages 116-120 for full materials description.

For Cv factors see page 123, Valve Matrix MM.

Forged Check Valves

Class 800 (PN 130)

Conventional Port

1975 PSI @ 100°F (136.2 BAR @ 38°C)

For other ratings see pgs. 112-115

A105 Body/Bonnet

SERIES NUMBER

Threaded

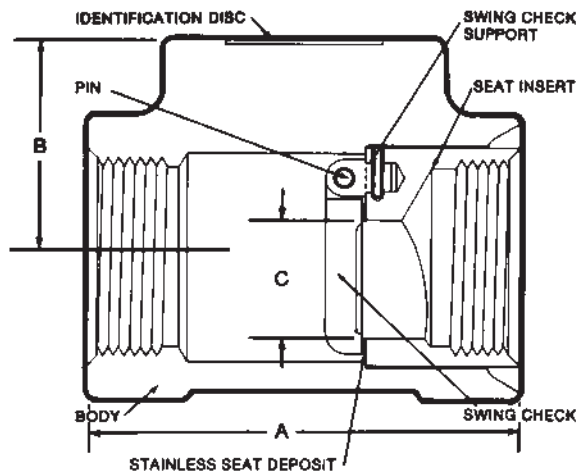
S74

Socket Weld

SWS74

Trim: 13% Cr. with Type 309

Integral Seat



- No Bonnet
- Horizontal or Vertical Upward Flow
- Swing Type Check
- Welded Seat Insert with Integral Stainless Seat Deposit
- ASME B16.34

Dimensions

Bold face numerals are in inches and pounds.
Blue numerals are in millimeters and kilograms.

Size	NPS	1/2	3/4	1	1-1/2	2
	DN	15	20	25	40	50
A-End-to-End		3.50 89	3.50 89	4.00 102	5.00 127	6.75 171
B		1.75 44	1.75 44	2.00 51	2.50 64	3.38 86
C-Seat Diameter		.50 12.7	.50 12.7	.75 19.1	1.25 31.8	1.50 38.1
Weight		3.7 1.5	3.6 1.6	5.1 2.3	10.7 4.9	23.7 10.8

Refer to pages 116-120 for full materials description.

For Cv factors see page 123, Valve Matrix MM.

Forged Check Valves

Class 800 (PN 130)

Conventional Port

1975 PSI @ 100°F (136.2 BAR @ 38°C)

For other ratings see pgs. 112-115

A105 Body/Bonnet

SERIES NUMBER

Threaded
B701

Socket Weld
SWB701
Trim: 18% Cr.
Seat: HF

HYDROFLUORIC
ACID (HF)
ALKYLATION VALVES.
UOP APPROVED.

SWB701HF6 Sizes 1/2-2 (No 1-1/4)

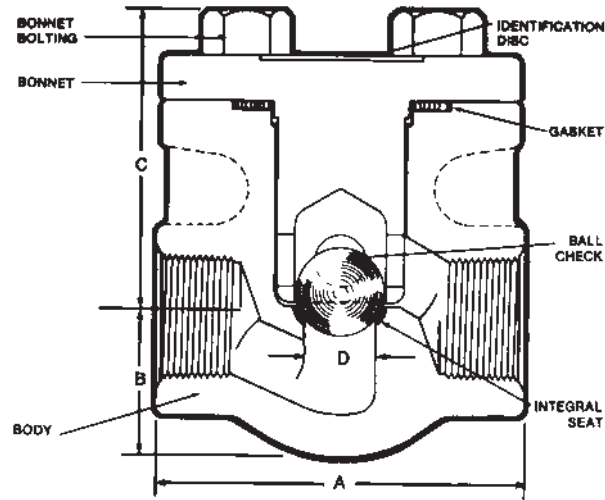
SWB701HF7 Sizes 1/2-2 (No 1-1/4)

Trim: 18% Cr.
Seat: HF

316/316L Body/Bonnet

1920 PSI @ 100°F (132.4 BAR @ 38°C)

B718
SWB718
Trim: 316



- Round Bolted Bonnet
- Spiral Wound Gasket
- Horizontal Type
- Ball Check
- Integral Seat
- ASME B16.34

Dimensions

Bold face numerals are in inches and pounds.
Blue numerals are in millimeters and kilograms.

Size	NPS	1/2	3/4	1	1-1/4	1-1/2	2
	DN	15	20	25	32	40	50
A-End-to-End		3.75 95	4.00 102	4.62 117	6.25 159	6.25 159	7.75 197
B		1.00 25	1.12 28	1.56 40	2.25 57	2.25 57	2.69 68
C		2.56 65	2.56 65	3.06 78	4.50 114	4.50 114	4.94 125
D-Seat Diameter		.50 12.7	.50 12.7	.75 19.1	1.28 32.5	1.28 32.5	1.53 38.9
Weight		3.4 1.5	3.5 1.5	6.2 2.8	17.6 8.0	17.0 7.7	26.1 11.8

Refer to pages 116-120 for full materials description.

For Cv factors see page 123, Valve Matrix FF.

CHECK CLASS 800 (PN 130) B 701, B 718

Forged Check Valves – Spring Control

Class 800 (PN 130) Conventional Port

1975 PSI @ 100°F
(136.2 BAR @ 38°C)

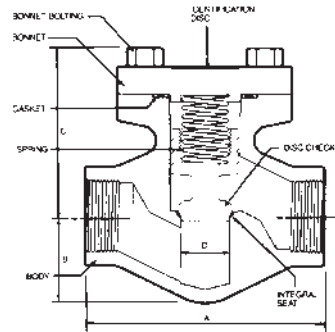
For other ratings see pgs. 112-115

A105 Body/Bonnet

SERIES NUMBER

Threaded 710 Socket Weld SW 710
Trim: 13% Cr. (302 Spring)
Seat: HF

710FHF SW710FHF
Trim: 13% Cr. (302 Spring)
Disc/Seat: HF



- Round Bolted Bonnet
- Spiral Wound Gasket
- Horizontal or Vertical Upward Flow
- Spring Control
- Piston Check or Ball Check
- Integral Hard Faced Seat
- ASME B16.34

Dimensions

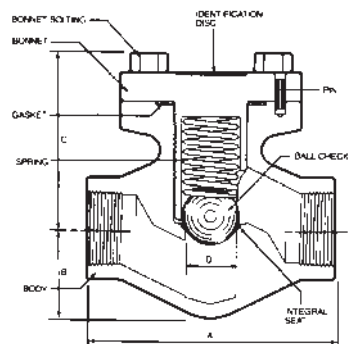
Bold face numerals are in inches and pounds.
Blue numerals are in millimeters and kilograms.

Size	NPS DN	1/4 8	3/8 10	1/2 15	3/4 20	1 25	1-1/4 32	1-1/2 40	2 50
A-End-to-End		3.75 95	3.75 95	3.75 95	4.00 102	4.62 117	6.25 159	6.25 159	7.75 197
B-Center-to-Bottom		1.00 25	1.00 25	1.00 25	1.12 28	1.56 40	2.25 57	2.25 57	2.69 68
C-Center-to-Top		2.56 65	2.56 65	2.56 65	2.56 65	3.06 78	4.50 114	4.50 114	4.94 126
D-Seat Diameter		.50 12.7	.50 12.7	.50 12.7	.50 12.7	.75 19.1	1.28 32.5	1.28 32.5	1.53 38.9
Weight		3.4 1.5	3.4 1.5	3.2 1.5	3.4 1.5	6.1 2.8	17.0 7.7	16.5 7.5	25.0 11.4

A105 Body/Bonnet

SERIES NUMBER

Threaded B 710 Socket Weld SWB 710
Trim: 18% Cr. (302 Spring)
Seat: HF



Dimensions

Bold face numerals are in inches and pounds.
Blue numerals are in millimeters and kilograms.

Size	NPS DN	1/2 15	3/4 20	1 25	1-1/2 40	2 50
A-End-to-End		3.75 95	4.00 102	4.62 117	6.25 159	7.75 197
B-Center-to-Bottom		1.00 25	1.12 28	1.56 40	2.25 57	2.69 68
C-Center-to-Top		2.56 65	2.56 65	3.06 78	4.50 114	4.94 126
D-Seat Diameter		.50 12.7	.50 12.7	.75 19.1	1.28 32.5	1.53 38.9
Weight		3.2 1.5	3.4 1.5	6.1 2.8	16.5 7.5	25.0 11.4

Refer to pages 116-120 for full materials description.

Forged Check Valves

Class 800 (PN 130)

Conventional Port

For other ratings see pgs. 112-115

A350 LF2 Body/Bonnet

1975 PSI @ 100°F (136.2 BAR @ 38°C)

SERIES NUMBER

Threaded
32701

Socket Weld
SW32701
Trim: 13% Cr.
Seat: HF

32701MB8 ← **SW32701MB8**
Trim: 316SS
Disc/Seat: HF

MATERIALS MEET
REQUIREMENTS OF
NACE STANDARD
MR-01-75 FOR
SOUR SERVICE

F316/F316L Body/Bonnet

1920 PSI @ 100°F (132.4 BAR @ 38°C)

Threaded
718
718T⁺

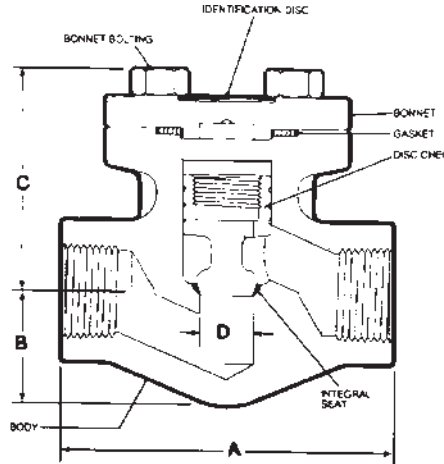
Socket Weld
SW718 Sizes 1/2-2 (no 1 1/4)
SW718T⁺
Trim: 316

F316H Body/Bonnet

1920 PSI @ 100°F (132.4 BAR @ 38°C)

Threaded
82718

Socket Weld
SW82718
Trim: 316H



- Round Bolted Bonnet
- Spiral Wound Gasket
- Horizontal Type
- Piston Check
- Integral Hard Faced Seat
- ASME B16.34

Dimensions

Bold face numerals are in inches and pounds.
Blue numerals are in millimeters and kilograms.

Size	NPS DN	1/4 8	3/8 10	1/2 15	3/4 20	1 25	1-1/4 32	1-1/2 40	2 50
A-End-to-End		3.75 95	3.75 95	3.75 95	4.00 102	4.62 117	6.25 159	6.25 159	7.75 197
B		1.00 25	1.00 25	1.00 25	1.12 28	1.56 40	2.25 57	2.25 57	2.69 68
C		2.56 65	2.56 65	2.56 65	2.56 65	3.06 78	4.50 114	4.50 114	4.94 125
D-Seat Diameter		.50 12.7	.50 12.7	.50 12.7	.50 12.7	.75 19.1	1.28 32.5	1.28 32.5	1.53 38.9
Weight		3.4 1.5	3.4 1.5	3.2 1.5	3.4 1.5	6.1 2.8	17.0 7.7	16.5 7.5	25.0 11.4

See next page for assistance in selecting the type of "ZL" Ring to use.
[†]Valves contain TEFLON — maximum temperature 500°F.
 Refer to pages 116-120 for full materials description.

For Cv factors see page 123, Valve Matrix FF.

CHECK
CLASS 800 (PN 130)
32701, 718, 82718

Forged Check Valves

Class 800 (PN 130) Conventional Port

For other ratings see pgs. 112-115

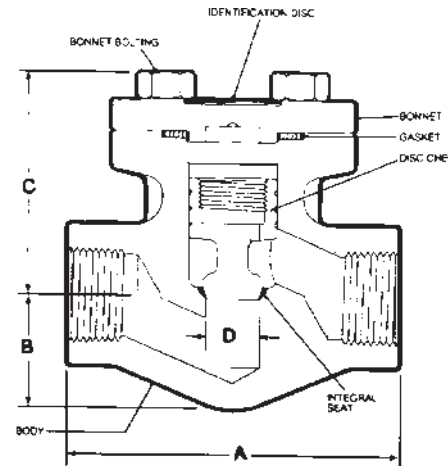
A105 Body/Bonnet

1975 PSI @ 100°F (136.2 BAR @ 38°C)

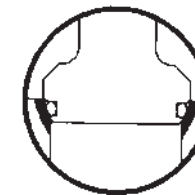
SERIES NUMBER

Threaded 701	Socket Weld SW701 Trim: 13% Cr. Seat: HF
701F8M	SW701F8M 1/2-2 (no 1 1/4) Trim: 316 Seat: HF
701MM	SW701MM 1/2-2 (no 1 1/4) Trim: Monel Seat: HF
701MB8	SW701MB8 Trim: 316 Disc/Seat: HF
701MBS	SW701MBS Trim: Monel Seat: HF

MATERIALS MEET
REQUIREMENTS OF
NACE STANDARD
MR-01-75 FOR
SOUR SERVICE



- Round Bolted Bonnet
- Spiral Wound Gasket
- Horizontal Type
- Piston Check
- Integral Hard Faced Seat
- ASME B16.34



Soft Insert "ZL" Ring
Zero Leakage

Dimensions

Bold face numerals are in inches and pounds.
Blue numerals are in millimeters and kilograms.

Size	NPS DN	1/4 8	3/8 10	1/2 15	3/4 20	1 25	1-1/4 32	1-1/2 40	2 50
A-End-to-End		3.75 95	3.75 95	3.75 95	4.00 102	4.62 117	6.25 159	6.25 159	7.75 197
B		1.00 25	1.00 25	1.00 25	1.12 28	1.56 40	2.25 57	2.25 57	2.69 68
C		2.56 65	2.56 65	2.56 65	2.56 65	3.06 78	4.50 114	4.50 114	4.94 125
D-Seat Diameter		.50 12.7	.50 12.7	.50 12.7	.50 12.7	.75 19.1	1.28 32.5	1.28 32.5	1.53 38.9
Weight		3.4 1.5	3.4 1.5	3.2 1.5	3.4 1.5	6.1 2.8	17.0 7.7	16.5 7.5	25.0 11.4

ZERO LEAKAGE "ZL" (RING)

701ZLB -20°F to 250°F	Buna N	} Trim: 13% Cr Seat: HF
701ZLE -20°F to 300°F	Ethylene Propylene	
701ZLN -20°F to 240°F	Neoprene	
701ZLV -20°F to 400°F	Viton	

See preceding page for assistance in selecting the type of "ZL" Ring to use.
Refer to pages 116-120 for full materials description.

For Cv factors see page 123, Valve Matrix FF.

CHECK CLASS 800 (PN 130) 701

Compound Selection Guide*

for Service Fluids Commonly Used in Vogt "ZL" Check Valves

FLUID					FLUID					FLUID					FLUID				
	BUNA N	VITON	ETHYLENE PROPYLENE (EPR)	NEOPRENE		BUNA N	VITON	ETHYLENE PROPYLENE (EPR)	NEOPRENE		BUNA N	VITON	ETHYLENE PROPYLENE (EPR)	NEOPRENE		BUNA N	VITON	ETHYLENE PROPYLENE (EPR)	NEOPRENE
Acetone			●		Fuel Oil	●	●			Methyl Alcohol	●		●	●	Pyrogallic Acid		●		
Acetylene	●	●	●		Furfural			●		Mineral Oil	●	●			Shellac (Bleached)	●			
Air	●	●	●	●	Gas, Manufactured	●				Mustard	●				Shellac (Orange)	●			
Alcohols	●	●			Gas, Natural	●	●		●	Naphtha		●			Soap Solutions (Stearates)	●	●	●	
Amines—Mixed			●	●	Gasoline, Leaded	●	●			Naphthalene		●			Sodium Carbonate	●	●	●	●
Ammonia (Anhydrous)			●	●	Gasoline, Refined	●	●			Natural Gas	●	●		●	Sodium Chromate	●	●		
Ammonia (Aqueous)	●	●			Gasoline, Sour	●	●			Nitrogen	●	●	●	●	Sodium Cyanide	●		●	●
Ammonium Phosphate	●		●	●	Gasoline, Unleaded			●	●	Oils, Animal	●	●			Sodium Hydroxide	●	●	●	●
Asphalt		●			Glucose	●	●	●	●	Oils, Fuel	●	●			Sodium Metaphosphate	●	●	●	
Barium Carbonate	●	●		●	Glue	●	●		●	Oils, Mineral	●	●			Sodium Nitrate			●	
Beet Sugar Liquors	●	●	●		Glycerin	●	●	●	●	Oils, Petroleum (Refined)	●	●			Sodium Perborate		●	●	
Benzene (Beneol)		●			Hydraulic Oil	●	●			Oils, Petroleum (Sour)	●	●			Sodium Silicate	●	●	●	●
Butane	●	●		●	Hydrocarbons	●	●			Oxygen (Cold)		●	●	●	Sodium Sulfate	●	●	●	●
Cane Sugar Liquors	●	●	●	●	Hydrogen Gas (Cold)	●	●	●	●	Palmitic Acid	●	●			Sodium Sulfide	●	●	●	●
Carbon Bisulfide		●			Hydrogen Sulfide (Dry)			●		Pentane	●	●			Sodium Sulfite	●	●	●	●
Castor Oil	●	●		●	Jet Fuel	●	●			Potassium Carbonate	●	●		●	Sodium Thiosulfate (Hypo)	●	●	●	●
Caustic Soda	●	●	●	●	Kerosene	●	●			Potassium Cyanide	●	●	●	●	Steam (212° F)			●	
Crude Oil	●	●			Linseed Oil	●	●			Potassium Hydroxide		●	●		Sulfur Dioxide (Dry)			●	
Diesel Oils	●	●			Lubricating Oil	●	●			Potassium Nitrate	●	●	●	●	Tar & Tar Oil		●		
Dowtherms		●			Magnesium Hydroxide	●	●	●	●	Potassium Permanganate	●	●			Toluene		●		
Ethyl Alcohol	●		●	●	Magnesium Hydrox. (Hot)	●	●	●	●	Potassium Phosphate	●	●		●	Vegetable Oils	●	●		
Ethyl Chloride (Dry)	●	●			Magnesium Sulfate	●	●	●	●	Potassium Sulfate	●	●	●	●	Xylene		●		
Ethylene Glycol	●	●	●	●	Maleic Acid		●			Potassium Sulfide	●	●		●	Zinc Hydrosulfite	●	●	●	●
Fish Oils	●				Mercury	●	●	●	●	Potassium Sulfite	●	●	●	●					
Freon 12, 13, 22				●	Methane	●	●			Propane	●	●							

See Valves on Page No. 100

● Indicates the ZL Ring material suggested for use in a given fluid or service application.

*Because of the influence of contaminants in corrosive chemical solutions, this table is intended only as a general guide and does not constitute a recommendation or guarantee.

Forged Check Valves

Class 800 (PN 130)

Full Port

1975 PSI @ 100°F (136.2 BAR @ 38°C)

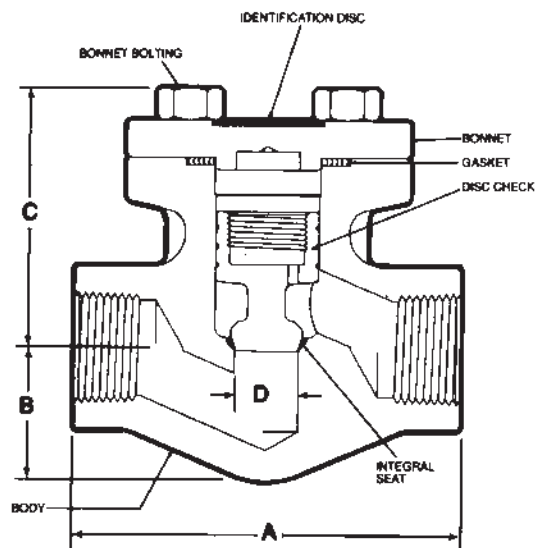
For other ratings see pgs. 112-115

A105 Body/Bonnet

SERIES NUMBER

Threaded
13701

Socket Weld
SW13701
Trim: 13% Cr.
Seat: HF



- Round Bolted Bonnet
- Spiral Wound Gasket
- Horizontal Type
- Piston Check
- Integral Hard Faced Seat
- ASME B16.34

Dimensions

Bold face numerals are in inches and pounds.
Blue numerals are in millimeters and kilograms.

Size	NPS DN	1/2 15	3/4 20	1 25	1-1/4 32	1-1/2 40	2 50
A-End-to-End		4.00 102	4.62 117	6.25 159	6.25 159	7.75 197	9.00 229
B		1.12 28	1.56 40	2.25 57	2.25 57	2.69 68	3.50 89
C		2.56 65	3.06 78	4.50 114	4.50 114	4.94 125	5.94 151
D-Seat Diameter		.50 12.7	.75 19.1	1.28 32.5	1.28 32.5	1.53 38.9	2.00 50.8
Weight		3.5 1.6	6.5 3.0	17.5 7.9	16.6 7.5	25.8 11.7	47.4 21.5

Refer to pages 116-120 for full materials description.

For Cv factors see page 123, Valve Matrix KK.

Forged Check Valves

Class 800 (PN 130)

Full Port

1975 PSI @ 100°F (136.2 BAR @ 38°C)

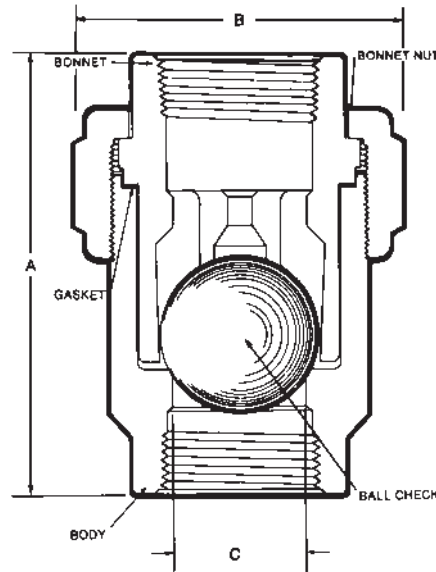
For other ratings see pgs. 112-115

SERIES NUMBER

Body/Bonnet	Threaded	Socket Weld
A105	54853	SW54853
		Trim: 18% Cr.

1920 PSI @ 100°F (132.4 BAR @ 38°C)

F316/F316L	54863	-
		Trim: 316



- Union Bonnet
- Flat Gasket Joint
- Horizontal or Vertical
- Upward Flow
- Ball Check
- Integral Seat
- ASME B16.34

H & V CHECK
CLASS 800 (PN 130)
54853, 54863

Dimensions

Bold face numerals are in inches and pounds.
Blue numerals are in millimeters and kilograms.

Size	NPS	1/2	3/4	1	1-1/4	1-1/2	2
	DN	15	20	25	32	40	50
A-End-to-End		3.38	3.88	5.31	5.50	5.62	6.75
		86	99	135	140	143	171
B-Nut-Across-Corners		2.74	3.18	3.46	3.79	4.46	4.94
		70	81	88	96	113	125
C-Seat Diameter		.55	.81	1.06	1.28	1.53	2.00
		14.0	20.6	26.9	32.5	38.9	50.8
Weight		2.3	3.8	5.9	7.7	10.6	16.7
		1.0	1.7	2.7	3.5	4.8	7.6

Refer to pages 116-120 for full materials description.

For Cv factors see page 123, Valve Matrix LL.

Forged Check Valves

Class 800 (PN 130)

1975 PSI @ 100°F (136.2 BAR @ 38°C)

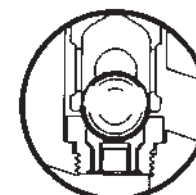
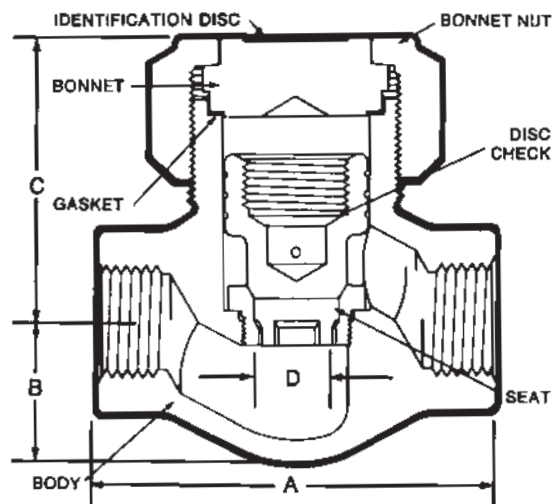
For other ratings see pgs. 112-115

A105 Body/Bonnet

SERIES NUMBER

Threaded	Socket Weld
9091	SW9091
	Trim: 13% Cr.
B9091	SWB9091
	Trim: 13% Cr. Seat
	18% Cr. Ball

- Union Bonnet
- Flat Gasket Joint
- Horizontal Type
- Piston Check/Ball Check
- Renewable Seat
- ASME B16.34



Ball Check

Dimensions

Bold face numerals are in inches and pounds.
Blue numerals are in millimeters and kilograms.

Size	NPS	1/4	3/8	1/2	3/4	1	1-1/4	1-1/2	2
	DN	8	10	15	20	25	32	40	50
A-End-to-End		3.12 79	3.12 79	3.38 86	4.00 102	5.00 127	6.25 159	6.75 171	8.25 210
B		.94 24	.94 24	1.12 28	1.50 38	1.75 44	2.38 60	2.69 68	3.12 79
C		2.50 64	2.50 64	2.88 73	3.12 79	3.56 90	3.88 99	4.56 116	4.88 124
D-Seat Diameter		.39 9.9	.39 9.9	.50 12.7	.72 18.3	.97 24.6	1.19 30.2	1.44 36.6	1.88 47.8
Weight		2.7 1.2	2.8 1.3	4.2 1.9	6.4 2.9	9.2 4.2	14.5 6.6	23.0 10.4	35.4 16.1

Refer to pages 116-120 for full materials description.

For Cv factors see page 123, Valve Matrix GG.

Forged Check Valves

Class 1500 (PN 260)

Conventional Port

3705 PSI @ 100°F (255.5 BAR @ 38°C)

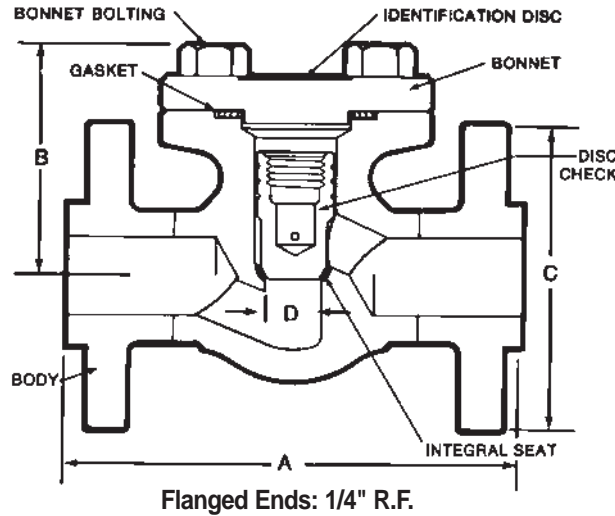
For other ratings see pgs. 112-115

A105 Body/Bonnet

SERIES NUMBER

15593 Trim: 13% Cr.
Seat: HF

15593FHF Trim: 13% Cr.
Disc/Seat: HF



- Round Bolted Bonnet
- Spiral Wound Gasket
- Horizontal Type
- Piston Check
- Integral Hard Faced Seat
- ASME B16.34

Dimensions

Bold face numerals are in inches and pounds.
Blue numerals are in millimeters and kilograms.

Size	NPS DN	1/2 15	3/4 20	1 25	1-1/2 40	2 50
A-End-to-End		8.50 216	9.00 229	10.00 254	12.00 305	14.50 368
B		3.06 78	3.06 78	4.41 112	5.03 128	6.12 155
C		4.75 114	5.12 130	5.88 149	7.00 178	8.50 216
D-Seat Diameter		.50 12.7	.50 12.7	.75 19.1	1.12 28.4	1.38 35.1
Weight		17.0 7.7	21.0 9.5	36.0 16.3	37.5 17.0	81.4 37.0

Valve flanges conform to ASME Standard B16.5 and end-to-end dimensions conform to ASME Standard B16.10. Refer to pages 116-120 for full materials description.

For Cv factors see page 123, Valve Matrix NN.

Forged Check Valves

Class 1500 (PN 260)

Conventional Port

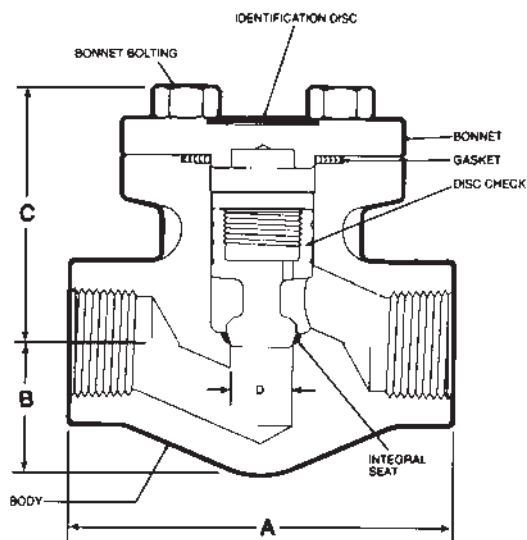
3705 PSI @ 100°F (255.5 BAR @ 38°C)

For other ratings see pgs. 112-115

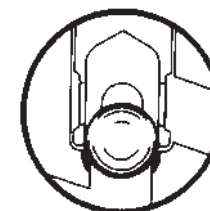
A105 Body/Bonnet

SERIES NUMBER

Threaded	Socket Weld
15701	SW15701
	Trim: 13% Cr.
	Seat: HF
15701FHF	SW15701FHF
	Trim: 13% Cr.
	Disc/Seat: HF
B15701	SWB15701
	Trim: 18% Cr. Ball
	Seat: HF



- Round Bolted Bonnet
- Spiral Wound Gasket
- Horizontal Type
- Piston Check/Ball Check
- Integral Hard Faced Seat
- ASME B16.34



Ball Check

Dimensions

Bold face numerals are in inches and pounds.
Blue numerals are in millimeters and kilograms.

Size	NPS	1/2	3/4	1	1-1/4	1-1/2	2
	DN	15	20	25	32	40	50
A-End-to-End		4.50	4.50	6.25	7.75	7.75	9.00
		114	114	159	197	197	229
B		1.56	1.56	2.25	2.69	2.69	3.50
		40	40	57	68	68	89
C		3.06	3.06	4.41	5.03	5.03	6.12
		78	78	112	128	128	155
D-Seat Diameter		.50	.50	.75	1.12	1.12	1.38
		12.7	12.7	19.1	28.4	28.4	35.1
Weight		7.1	6.9	18.5	29.9	29.5	54.4
		3.2	3.1	8.4	13.6	13.4	24.7

Refer to pages 116-120 for full materials description.

For Cv factors see page 123, Valve Matrix NN.

Forged Check Valves – For Oil Hydraulic Service

Class 1690 (PN 290)

Conventional Port

4225 PSI @ 100°F (291.4 BAR @ 38°C)

For other ratings see pgs. 112-115

A105 Body/Bonnet

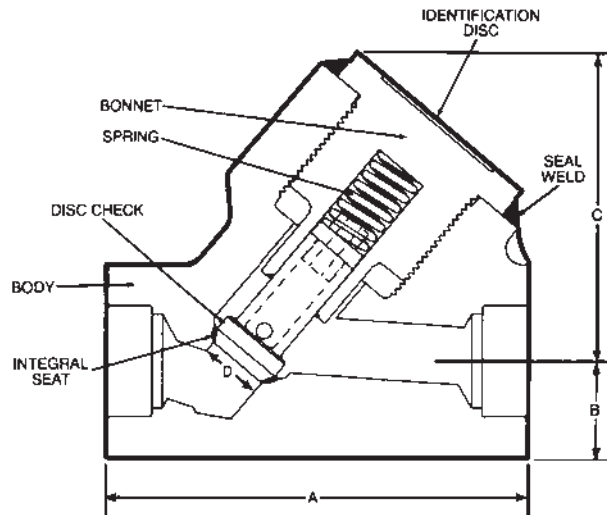
SERIES NUMBER

Threaded Socket Weld
1610 **SW1610**
 Trim: 13% Cr. (302 SS Spring)
 Disc/Seat: HF

F22 CI 3 (2 1/4% Cr.) Body/Bonnet

SERIES NUMBER

Threaded Socket Weld
1622 **SW1622**
 Trim: 13% Cr. (302 SS Spring)
 Disc/Seat: HF



- Welded Bonnet
- “Y” Pattern
- Horizontal or Vertical Upward Flow
- Spring Control
- Hard Faced Piston Check
- Integral Hard Faced Seat
- ASME B16.34 LTD Pressure Class

Dimensions

Bold face numerals are in inches and pounds.
Blue numerals are in millimeters and kilograms.

Size	NPS DN	1/2 15	3/4 20	1 25	1-1/2 40	2 50
A-End-to-End		4.00 102	4.00 102	5.12 130	7.50 190	7.50 190
B		.81 21	.81 21	1.16 30	1.69 43	1.69 43
C		2.75 70	2.75 70	3.72 94	5.03 128	5.03 128
D-Seat Diameter		.50 12.7	.50 12.7	.75 19.1	1.53 38.9	1.53 38.9
Weight		4.1 1.9	4.0 1.8	9.1 4.1	23.2 10.4	23.0 10.4

Refer to pages 116-120 for full materials description.

Y PATTERN CHECK
LTD CLASS 1690 (PN 290)
 1610, 1622

Forged Check Valves – For Air, Water & Oil Service

Class 2680 (PN 460)

Full Port

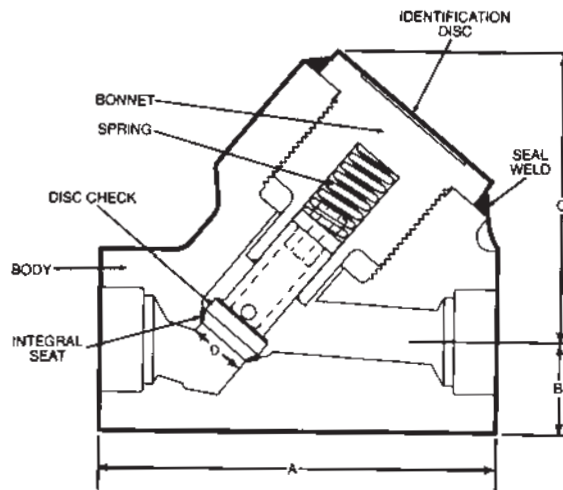
SW: 6700 PSI @ 100°F (462.1 BAR @ 38°C)

THD: 6250 PSI @ 100°F (431.0 BAR @ 38°C)*

For other ratings see pgs. 112-115

SERIES NUMBER

Body/Bonnet	Threaded*	Socket Weld
A105	2610	SW2610 Trim: 13% Cr. (302 SS Spring) Disc/Seats: HF
F11, Cl. 2 (1-1/4% Cr.)	2611	SW2611 Trim: 13% Cr. (302 SS Spring) Disc/Seats: HF
F22, Cl. 3 (2-1/4% Cr.)	2622	SW2622 Trim: 13% Cr. (302 SS Spring) Disc/Seats: HF



- Welded Bonnet
- "Y" Pattern
- Horizontal or Vertical Upward Flow
- Spring Control
- Hard Faced Piston Check
- Integral Hard Faced Seat
- ASME B16.34 LTD Pressure Class

*Threaded valves limited to Class 2500 Applications under ASME B16.34. See 2500 LTD Class Press/Temp tables, pages 112-115.

Dimensions

Bold face numerals are in inches and pounds.
Blue numerals are in millimeters and kilograms.

Size	NPS	1/2	3/4	1	1-1/2	2
	DN	15	20	25	40	50
A-End-to-End		4.00	5.12	5.12	8.25	8.25
		102	130	130	210	210
B		.81	1.16	1.16	1.94	1.94
		21	29	29	49	49
C		2.75	3.75	3.75	5.38	5.38
		70	95	95	137	137
D-Seat Diameter		.50	.75	.75	1.53	1.53
		12.7	19.1	19.1	38.9	38.9
Weight		4.0	9.1	9.1	36.0	33.2
		1.8	4.1	4.1	16.3	15.1

Refer to pages 116-120 for full materials description.

Forged Check Valves – For Oil Hydraulic Service

Type 3000

3000 PSI @ 100°F (206.9 BAR @ 38°C)

NON-SHOCK PRESSURE

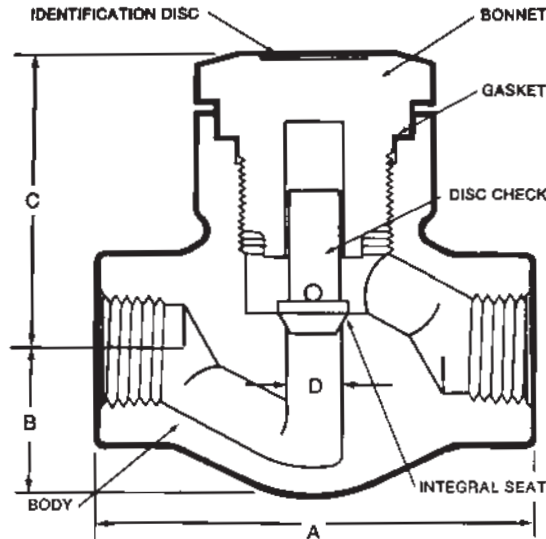
Temperature not to exceed 450°F.

Not recommended for steam or dry gas service.

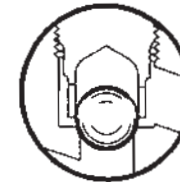
A105 Body/Bonnet

SERIES NUMBER

Threaded	Socket Weld
1551	SW1551
	Trim: 13% Cr.
B1551	SWB1551
(1/4 - 3/4 Only)	Trim: 18% Cr. Ball



- Screw Bonnet
- Flat Gasket Joint
- Horizontal Type
- Piston Check
- Integral Seat



Ball Check

Dimensions

Bold face numerals are in inches and pounds.
Blue numerals are in millimeters and kilograms.

Size	NPS	1/4	3/8	1/2	3/4	1	1-1/4	1-1/2	2
	DN	8	10	15	20	25	32	40	50
A-End-to-End		3.12 79	3.12 79	3.38 86	4.00 102	5.00 127	6.25 159	6.75 170	8.25 210
B		.94 24	.94 24	1.12 28	1.50 38	1.75 44	2.38 60	2.69 68	3.12 79
C		2.69 68	2.69 68	2.81 71	3.50 89	3.81 97	3.88 99	4.25 108	4.75 121
D-Seat Diameter		.50 12.7	.50 12.7	.50 12.7	.56 14.2	.81 20.6	1.06 27.0	1.28 32.5	1.53 38.9
Weight		2.4 1.1	2.4 1.1	3.7 1.7	6.0 2.7	8.7 3.9	13.7 6.2	21.7 9.8	34.5 15.7

Refer to pages 116-120 for full materials description.

For Cv factors see page 123, Valve Matrix SS.

CHECK TYPE 3000 1551

Forged Check Valves – For Air, Water & Oil Service

Type 3000

3000 PSI @ 100°F (206.9 BAR @ 38°C)

NON-SHOCK PRESSURE

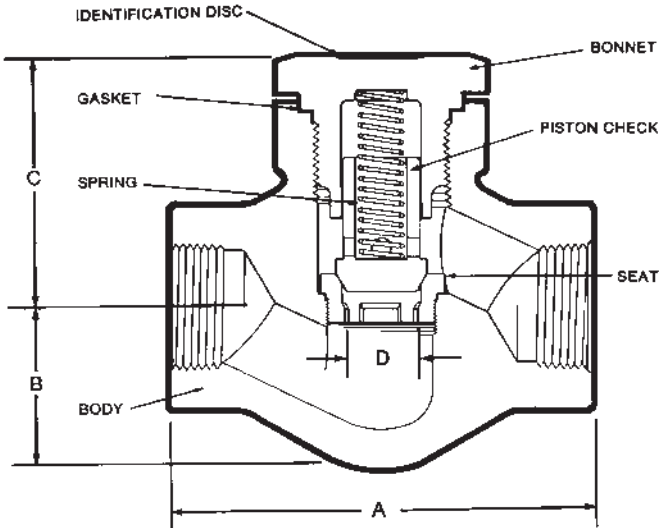
Temperature not to exceed 450°F.

Not recommended for steam service.

A105 Body/Bonnet

SERIES NUMBER

Threaded Socket Weld
2191 **SW2191**
 Trim: 13% Cr.



- Screw Bonnet
- Flat Gasket Joint
- Horizontal or Vertical
- Upward Flow
- Spring Control
- Piston Check
- Renewable Seat

Dimensions

*Bold face numerals are in inches and pounds.
 Blue numerals are in millimeters and kilograms.*

Size	NPS	1/4	3/8	1/2	3/4	1	1-1/4	1-1/2	2
	DN	8	10	15	20	25	32	40	50
A-End-to-End		3.12	3.12	3.38	4.00	5.00	6.25	6.75	8.25
		79	79	86	102	127	159	170	210
B		.94	.94	1.12	1.50	1.75	2.38	2.69	3.12
		24	24	28	38	44	60	68	79
C		2.75	2.75	3.00	3.50	3.81	3.81	4.25	4.94
		70	70	76	89	97	97	108	125
D-Seat Diameter		.39	.39	.39	.50	.72	.97	1.19	1.44
		9.9	9.9	9.9	12.7	18.3	24.6	30.2	36.6
Weight		2.5	2.4	3.5	5.8	8.7	13.5	20.8	34.5
		1.1	1.1	1.6	2.6	3.9	6.1	9.4	15.7

Refer to pages 116-120 for full materials description.

CHECK
TYPE 3000
2191

Forged Check Valves – For Air, Water & Oil Service

Type 6000

NON-SHOCK PRESSURE

6000 PSI @ 100°F (413.8 BAR @ 38°C)

Full Port

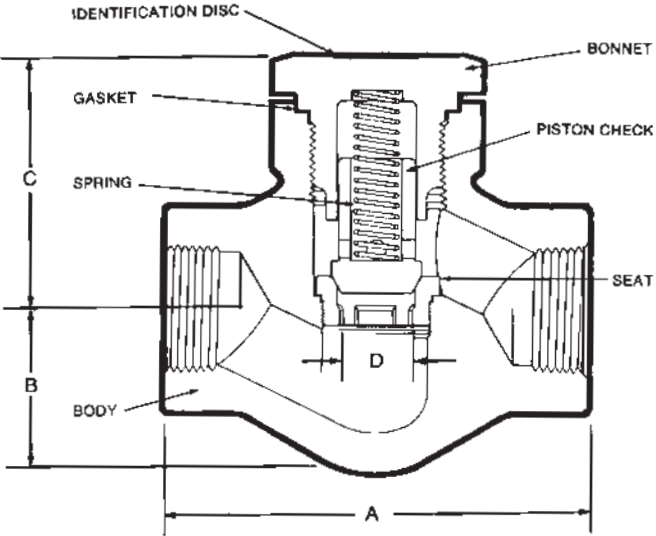
Temperature not to exceed 450°F.

Not recommended for steam service.

A105 Body/Bonnet

SERIES NUMBER

Threaded	Socket Weld
4881	SW4881
	Trim: 13% Cr.



- Screw Bonnet
- Flat Gasket Joint
- Horizontal or Vertical Upward Flow
- Spring Control
- Piston Check
- Renewable Seat

Dimensions

Bold face numerals are in inches and pounds.
Blue numerals are in millimeters and kilograms.

Size	NPS DN	1/2 15	3/4 20	1 25	1-1/4 32	1-1/2 40	2 50
A-End-to-End		4.00 102	5.00 127	6.25 159	6.75 170	8.25 210	8.50 216
B		1.50 38	1.75 44	2.38 60	2.69 68	3.12 79	3.38 86
C		3.12 79	3.62 92	3.88 99	4.44 113	4.75 121	5.88 149
D-Seat Diameter		.39 9.9	.50 12.7	.72 18.3	.97 24.6	1.19 30.2	1.44 36.6
Weight		5.7 2.6	7.2 3.3	14.5 6.6	23.4 10.6	36.9 16.8	51.9 23.6

Refer to pages 116-120 for full materials description.

CHECK TYPE 6000 4881

Pressure-temperature Ratings for Vogt products

Service Temp (°F)	Class 800 (PN 130) (Standard) PRESSURE (PSIG)								Class 1500 (PN 260) (Standard) PRESSURE (PSIG)							
	(1) (4) (9) A105	(1) A182-F5	(1) (2) A182-F316	(1) A182-F316H	(1) (4) (7) A350-LF2	(1) A182-F9	(1) (5) & (6) A182-F11 C12	(1) (5) A182-F22 C13	(1) (4) (9) A105	(1) A182-F5	(1) (2) A182-F316	(1) A182-F316H	(1) (4) (7) A350-LF2	(1) A182-F9	(1) (5) & (6) A182-F11 C12	(1) (5) A182-F22 C13
-20 to 100	1975	2000	1920	1920	1975	2000	2000	2000	3705	3750	3600	3600	3705	3750	3750	3750
200	1800	1985	1655	1655	1800	2000	2000	2000	3375	3725	3095	3095	3375	3750	3750	3750
300	1750	1910	1495	1495	1750	1940	1925	1940	3280	3580	2795	2795	3280	3640	3610	3640
400	1690	1880	1370	1370	1690	1880	1850	1880	3170	3530	2570	2570	3170	3530	3465	3530
500	1595	1775	1275	1275	1595	1775	1775	1775	2995	3325	2390	2390	2995	3325	3325	3325
600	1460	1615	1205	1205	1460	1615	1615	1615	2735	3025	2255	2255	2735	3025	3025	3025
650	1430	1570	1185	1185	1430	1570	1570	1570	2685	2940	2220	2220	2685	2940	2940	2940
700	1420	1515	1160	1160	1420	1515	1515	1515	2665	2840	2170	2170	2665	2840	2840	2840
750	1345	1410	1140	1140	1345	1420	1420	1420	2520	2640	2135	2135	2520	2660	2660	2660
800	1100	1355	1125	1125	1100	1355	1355	1355	2060	2540	2110	2110	2060	2540	2540	2540
850	715	1290	1115	1115	715	1300	1300	1300	1340	2415	2090	2090	1340	2435	2435	2435
900	460	985	1105	1105	460	1200	1200	1200	860	1850	2075	2075	860	2245	2245	2245
950	275	735	1030	1030	275	1005	850	1005	515	1370	1930	1930	515	1885	1595	1885
1000	140	530	935	935	140	675	575	695	260	995	1750	1750	260	1270	1080	1305
1050	–	385	–	915	–	460	385	465	–	720	–	1720	–	855	720	875
1100	–	265	–	815	–	300	255	295	–	495	–	1525	–	565	480	550
1150	–	165	–	630	–	200	165	180	–	310	–	1185	–	375	310	345
1200	–	95	–	495	–	140	100	110	–	170	–	925	–	255	190	205
1250	–	–	–	390	–	–	–	–	–	–	–	735	–	–	–	–
1300	–	–	–	310	–	–	–	–	–	–	–	585	–	–	–	–
1350	–	–	–	255	–	–	–	–	–	–	–	480	–	–	–	–
1400	–	–	–	200	–	–	–	–	–	–	–	380	–	–	–	–
1450	–	–	–	155	–	–	–	–	–	–	–	290	–	–	–	–
1500	–	–	–	110	–	–	–	–	–	–	–	205	–	–	–	–

1 bar = 100kPa = 14.504 psi

SEE NOTE ON PAGE 113 FOR RATING RESTRICTIONS.

Pressure-temperature Ratings for Vogt products

PRESSURE (PSIG)															
	Class 800 (PN 130) (Limited)			Class 1500 (PN 260) (Limited)			Class 1690 (PN 290) (Limited)			Class 2500 (PN 420) (Limited)			Class 2680 (PN 460) (Limited)		
Service Temp (°F)	(3) (4) (9)	(3) (5) (6) A182- F11 Cl2	(3) (5) A182- F22 Cl3	(3) (4) (9)	(3) (5) & (6) A182- F11 Cl2	(3) (5) A182- F22 Cl3	(3) (4) (9)	(3) (5) & (6) A182- F11 Cl2	(3) (5) A182- F22 Cl3	(3) (4) (9)	(3) (5) (6) A182- F11 Cl2	(3) (5) A182- F22 Cl3	(3) (4) (9)	(3) (5) (6) A182- F11 Cl2	(3) A11 F22 Cl3
	-20 to 100	2000	2000	2000	3750	3750	3750	4225	4225	4225	6250	6250	6250	6700	6700
200	2000	2000	2000	3750	3750	3750	4225	4225	4225	6250	6250	6250	6700	6700	6700
300	2000	2000	1980	3750	3750	3705	4225	4225	4175	6250	6250	6180	6700	6700	6625
400	2000	2000	1935	3750	3750	3620	4225	4225	4080	6250	6250	6035	6700	6700	6470
500	2000	2000	1920	3750	3750	3600	4225	4225	4055	6250	6250	6000	6700	6700	6430
600	1900	2000	1920	3565	3750	3600	4015	4225	4055	5940	6250	6000	6370	6700	6430
650	1865	2000	1905	3495	3750	3580	3940	4225	4035	5825	6250	5965	6245	6700	6395
700	1850	1955	1900	3470	3665	3555	3910	4130	4005	5780	6110	5930	6195	6550	6355
750	1680	1945	1840	3150	3645	3450	3550	4105	3885	5250	6070	5750	5630	6505	6165
800	1375	1920	1795	2570	3600	3365	2895	4055	3790	4285	6000	5605	4595	6430	6010
850	895	1805	1715	1670	3385	3215	1880	3815	3620	2785	5645	5355	2985	6050	5740
900	575	1565	1600	1070	2935	3000	1205	3305	3380	1785	4895	5000	1915	5245	5360
950	350	1070	1275	660	2040	2405	745	2300	2720	1110	3445	4075	1190	3700	4385
1000	180	745	895	340	1445	1740	390	1640	1980	600	2520	3040	650	2725	3290
1050	–	495	600	–	960	1170	–	1095	1330	–	1680	2040	–	1820	2205
1100	–	330	380	–	640	730	–	730	830	–	1120	1280	–	1210	1385
1150	–	210	235	–	410	460	–	470	525	–	720	800	–	780	865
1200	–	130	145	–	250	275	–	285	315	–	440	480	–	480	520

PRESSURE (PSIG)								
Service Temp (°F)	Threaded, Socket Weld, Flanged and Butt Weld End Valves				Threaded, Socket Weld End Unions			
	150 (PN20) (1)(4)(9) A105	300 (PN50) (1)(4)(9) A105	600 (PN110) (1)(4)(9) A105	1500 (PN260) (1)(4)(9) A105	Service Temp (°F)	3000 (8) A105	6000 (8) A105	
100	285	740	1480	3705	100	3000	6000	
200	260	675	1350	3375	200	2735	5470	
300	230	655	1315	3280	300	2655	5310	
400	200	635	1270	3170	400	2565	5130	
500	170	600	1200	2995	500	2425	4850	
600	140	550	1095	2735	600	2220	4440	
650	125	535	1075	2685	650	2180	4360	
700	110	535	1065	2665	700	2155	4310	
750	95	505	1010	2520	750	–	–	
800	80	410	825	2060	800	–	–	
850	65	270	535	1340	850	–	–	
900	50	170	345	860	900	–	–	
950	35	105	205	515	950	–	–	
1000	20	50	105	260	1000	–	–	

NOTE: THE FOLLOWING RESTRICTIONS CORRESPOND TO THE CHARTS ON PAGES 112 AND 113.

- (1) Ratings are in accordance with ASME B16.34-96, Standard Class.
- (2) F316 Stainless Steel containing Max. Carbon of .035.
Do not use above 1000°F.
- (3) Ratings are in accordance with ASME B16.34-96, Limited Class.
- (4) Permissible but not recommended for prolonged use above 800°F.
- (5) Permissible but not recommended for prolonged use above 1100°F.
- (6) Use Normalized and Tempered material only.
- (7) A350 LF2 is suitable to -50°F at the -20°F to 100°F Pressure Rating.
- (8) Ratings are in accordance with MSS-SP-83-1995.
- (9) Only killed steel shall be used above 850°F.

1 bar = 100kPa = 14.504 psi

Pressure-temperature Ratings (metric) for Vogt products

Service Temp (°C)	PN 130 (Class 800) (Standard) PRESSURE (BAR)								PN 260 (Class 1500) (Standard) PRESSURE (BAR)							
	(1) (4) (9) A105	(1) A182- F5	(1) (2) A182- F316	(1) A182- F316H	(1) (4) (7) A350- LF2	(1) A182- F9	(1) (5) & (6) A182- F11 C12	(1) (5) A182- F22 C13	(1) (4) (9) A105	(1) A182- F5	(1) (2) A182- F316	(1) A182- F316H	(1) (4) (7) A350- LF2	(1) A182- F9	(1) (5) & (6) A182- F11 C12	(1) (5) A182- F22 C13
-29 to 38	136.2	137.9	132.4	132.4	136.2	137.9	137.9	137.9	255.5	258.6	248.3	248.3	255.5	258.6	258.6	258.6
50	133.6	137.7	128.4	128.4	133.6	137.9	137.9	137.9	250.5	258.2	240.6	240.6	250.5	258.6	258.5	258.6
100	123.7	136.3	112.8	112.8	123.7	137.4	137.3	137.4	232.0	255.7	211.0	211.0	232.0	257.7	257.5	257.7
150	120.6	131.7	102.9	102.9	120.6	133.7	132.7	133.7	226.1	246.8	192.4	192.4	226.1	250.9	248.8	250.9
200	116.9	129.8	95.2	95.2	116.9	130.0	128.0	130.0	219.2	243.7	178.5	178.5	219.2	244.1	239.8	244.1
250	111.2	123.7	89.1	89.1	111.2	123.7	123.3	123.7	208.7	231.9	167.1	167.1	208.7	231.9	231.0	231.9
300	103.3	114.5	84.5	84.5	103.3	114.5	114.5	114.5	193.6	214.4	158.1	158.1	193.6	214.4	214.4	214.4
350	98.5	107.4	81.3	81.3	98.5	107.4	107.4	107.4	184.8	201.1	152.3	152.3	184.8	201.1	201.1	201.1
375	97.2	103.5	79.8	79.8	97.2	103.6	103.6	103.6	182.4	193.9	149.3	149.3	182.4	194.1	194.1	194.1
400	92.1	97.1	78.6	78.6	92.1	97.8	97.8	97.8	172.5	181.8	147.2	147.2	172.5	183.1	183.1	183.1
425	76.9	93.7	77.6	77.6	76.9	93.7	93.7	93.7	144.0	175.6	145.6	145.6	144.0	175.7	175.7	175.7
450	53.6	89.7	77.0	77.0	53.6	90.3	90.3	90.3	100.4	167.9	144.4	144.4	100.4	169.1	169.1	169.1
475	36.3	73.4	76.4	76.4	36.3	84.6	84.6	84.6	67.9	137.7	143.4	143.4	67.9	158.2	158.2	158.2
500	23.6	56.9	72.9	72.9	23.6	74.2	67.3	74.2	44.1	106.4	136.7	136.7	44.1	138.9	126.1	138.9
525	13.9	43.1	67.5	67.5	13.9	57.0	48.4	57.8	26.0	80.5	126.4	126.4	26.0	107.1	90.8	108.4
538	9.7	36.5	64.5	64.5	9.7	46.4	39.7	47.8	17.9	68.5	120.7	120.7	17.9	87.4	74.3	89.8
550	-	32.2	-	63.9	-	40.0	33.9	41.0	-	60.3	-	119.8	-	75.0	63.6	77.0
575	-	23.7	-	60.8	-	28.0	23.5	28.1	-	44.4	-	114.0	-	52.2	44.0	52.7
600	-	16.6	-	53.1	-	19.0	16.1	18.4	-	31.1	-	99.5	-	35.8	30.3	34.5
625	-	10.7	-	42.1	-	13.2	10.8	11.7	-	20.0	-	79.2	-	24.7	20.2	22.4
650	-	6.6	-	33.8	-	9.7	6.9	7.6	-	11.7	-	63.3	-	17.6	13.1	14.1
675	-	-	-	27.3	-	-	-	-	-	-	-	51.5	-	-	-	-
700	-	-	-	22.3	-	-	-	-	-	-	-	42.0	-	-	-	-
725	-	-	-	18.6	-	-	-	-	-	-	-	35.0	-	-	-	-
750	-	-	-	15.2	-	-	-	-	-	-	-	28.7	-	-	-	-
775	-	-	-	12.1	-	-	-	-	-	-	-	22.9	-	-	-	-
800	-	-	-	9.3	-	-	-	-	-	-	-	17.4	-	-	-	-
816	-	-	-	7.6	-	-	-	-	-	-	-	14.1	-	-	-	-

1 bar = 100kPa = 14.504 psi

Pressure-temperature Ratings (metric) for Vogt products

PRESSURE (PSIG)															
	PN 130 (Class 800) (Limited)			PN 260 (Class 1500) (Limited)			PN 290 (Class 1690) (Limited)			PN 420 (Class 2500) (Limited)			PN 460 (Class 2680) (Limited)		
Service Temp (°C)	(3) (4) (9)	(3) (5) (6) A182- F11 Cl2	(3) (5) A182- F22 Cl3	(3) (4) (9)	(3) (5) (6) & (6) A182- F11 Cl2	(3) (5) A182- F22 Cl3	(3) (4) (9)	(3) (5) (6) & (6) A182- F11 Cl2	(3) (5) A182- F22 Cl3	(3) (4) (9)	(3) (5) (6) A182- F11 Cl2	(3) (5) A182- F22 Cl3	(3) (4) (9)	(3) (5) (6) A182- F11 Cl2	(3) A11 F22 Cl3
	A105	F11 Cl2	F22 Cl3	A105	F11 Cl2	F22 Cl3	A105	F11 Cl2	F22 Cl3	A105	F11 Cl2	F22 Cl3	A105	F11 Cl2	F22 Cl3
-29 to 38	137.9	137.9	137.9	258.6	258.6	258.6	291.4	291.4	291.4	431.0	431.0	431.0	462.1	462.1	462.1
50	137.9	137.9	137.9	258.6	258.6	258.6	291.4	291.4	291.4	431.0	431.0	431.0	462.1	462.1	462.1
100	137.9	137.9	137.8	258.6	258.6	258.2	291.4	291.4	291.0	431.0	431.0	430.5	462.1	462.1	461.4
150	137.9	137.9	136.5	258.6	258.6	255.4	291.4	291.4	287.8	431.0	431.0	426.0	462.1	462.1	456.7
200	137.9	137.9	133.7	258.6	258.6	250.1	291.4	291.4	281.9	431.0	431.0	417.0	462.1	462.1	447.1
250	137.9	137.9	132.6	258.6	258.6	248.5	291.4	291.4	280.0	431.0	431.0	414.2	462.1	462.1	443.9
300	133.0	137.9	132.4	249.4	258.6	248.3	281.0	291.4	279.7	415.6	431.0	413.8	445.7	462.1	443.4
350	128.4	137.2	131.3	240.6	257.2	246.5	271.2	289.8	277.8	401.0	428.7	410.8	429.9	459.6	440.4
375	125.9	134.7	130.5	236.2	252.6	244.2	266.2	284.6	275.0	393.5	421.0	407.2	421.8	451.3	436.4
400	115.0	134.1	126.8	215.6	251.3	237.7	243.0	283.0	267.7	359.4	418.4	396.2	385.4	448.4	424.7
425	96.1	132.5	124.0	179.6	248.5	232.4	202.4	279.9	261.8	299.5	414.1	387.2	321.2	443.8	415.1
450	67.0	125.8	119.2	125.1	235.8	223.4	140.9	265.8	251.5	208.6	393.2	372.1	223.6	421.4	398.8
475	45.4	112.2	112.4	84.6	210.5	210.8	95.2	237.1	237.4	141.0	351.0	351.2	151.3	376.2	376.5
500	29.7	86.1	96.0	55.7	162.9	180.6	62.8	183.6	204.0	93.3	273.6	304.0	100.1	293.5	326.6
525	17.8	61.7	73.8	33.6	118.5	141.1	38.2	134.0	160.0	57.6	203.1	242.5	62.0	218.9	261.6
538	12.4	51.2	61.6	23.4	99.4	119.7	26.9	112.8	136.2	41.4	173.3	209.1	44.8	187.4	226.3
550	-	43.8	52.8	-	84.9	102.7	-	96.6	116.8	-	148.3	179.3	-	160.5	194.0
575	-	30.3	36.2	-	58.7	70.4	-	67.0	80.0	-	102.7	122.9	-	111.2	132.8
600	-	20.8	23.8	-	40.3	45.9	-	46.0	52.2	-	70.6	80.3	-	76.3	86.9
625	-	13.7	15.3	-	26.7	29.9	-	30.6	34.2	-	47.0	52.1	-	50.9	56.3
649	-	9.0	10.0	-	17.2	19.0	-	19.7	21.7	-	30.3	33.1	-	33.1	35.9

PRESSURE (PSIG)								
	Threaded, Socket Weld, Flanged and Butt Weld End Valves				Threaded, Socket Weld End Unions			
Service Temp (°C)	PN20 (CL150) (1)(4)(9) A105	PN 50 (CL300) (1)(4)(9) A105	PN 110 (CL600) (1)(4)(9) A105	PN260 (CL1500) (1)(4)(9) A105	Service Temp (°C)	3000 (8) A105	6000 (8) A105	
	A105	A105	A105	A105		A105	A105	
-29 to 38	19.7	51.0	102.1	255.5	-29 to 38	206.9	413.8	
50	19.3	50.0	100.1	250.5	50	202.9	405.7	
100	17.7	46.4	92.8	232.0	100	187.9	375.9	
150	15.8	45.1	90.6	226.1	150	183.0	366.0	
200	14.0	43.9	87.8	219.2	200	177.4	354.8	
250	12.1	41.8	83.6	208.7	250	168.9	338.0	
300	10.2	38.9	77.5	193.6	300	157.0	314.1	
350	8.4	36.9	74.0	184.8	350	149.9	299.9	
375	7.4	36.6	72.9	182.4	371	148.6	297.2	
400	6.5	34.6	69.1	172.5	-	-	-	
425	5.6	28.7	57.7	144.0	-	-	-	
450	4.6	20.2	40.1	100.4	-	-	-	
475	3.7	13.5	27.2	67.9	-	-	-	
500	2.8	8.9	17.6	44.1	-	-	-	
525	1.9	5.2	10.4	26.0	-	-	-	
538	1.4	3.4	7.2	17.9	-	-	-	

1 bar = 100kPa = 14.504 psi

NOTE: THE FOLLOWING RESTRICTIONS CORRESPOND TO THE CHARTS ON PAGES 114 AND 115.

- (1) Ratings are in accordance with ASME B16.34-96, Standard Class.
- (2) F316 Stainless Steel containing Max. Carbon of .035.
Do not use above 1000°F.
- (3) Ratings are in accordance with ASME B16.34 -96, Limited Class.
- (4) Permissible but not recommended for prolonged use above 800°F.
- (5) Permissible but not recommended for prolonged use above 1100°F.
- (6) Use Normalized and Tempered material only.
- (7) A350 LF2 is suitable to -50°F at the -20°F to 100°F Pressure Rating.
- (8) Ratings are in accordance with MSS-SP-83-1995.
- (9) Only killed steel shall be used above 850°F.

Meeting the Demands of Today

Asbestos-Free Valves

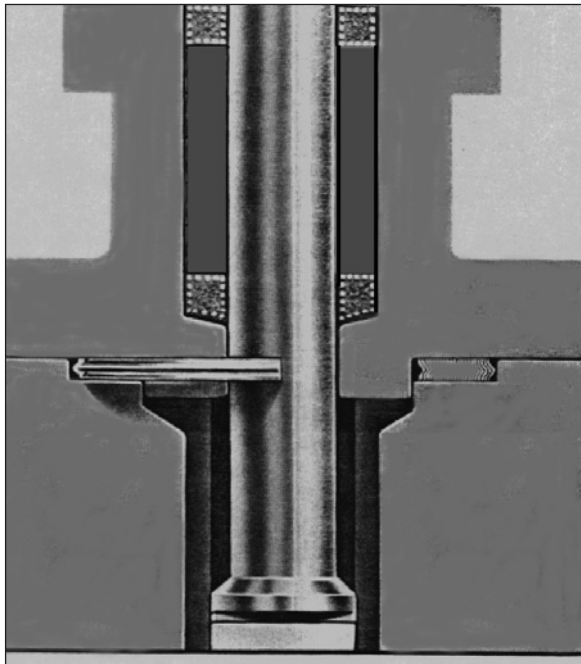
Asbestos-Free Packing

Asbestos-Free Gasket

SAFE—EFFICIENT in retaining high and low temperature media

ADVANCED TECHNOLOGY PROVIDES:

- Environmental acceptance
- Elimination of media contamination
- Leak-proof integrity
- High thermal conductivity
- Self-lubricating operation
- Shrinkage resistance
- Corrosion resistant inhibitor
- Less frequent maintenance
- Longer service life



STANDARD PACKING

Vogt standard valves are packed with one of the following asbestos-free packing sets:

FLEXIBLE GRAPHITE PACKING

A 95% by weight minimum carbon packing set that consists of a cylindrical ring of flexible graphite packing supported on the top and bottom with braided graphite filament packing rings. The packing set contains a dispersed and embedded active corrosion inhibitor to protect against stem pitting. It may be used in fluids having a pH range of 0-14. The packing has minimal residues as follows:

Leachable Chlorides: 100PPM Maximum

Total Chlorides: 500PPM Maximum

Total Sulfur: 1000PPM Maximum

PTFE: None

MOLDED TFE TEFLON SHAPED PACKING

Vogt valves that have a series number suffixed with the letter “T” are packed with a molded shaped TFE packing. This virgin TFE material needs no corrosion inhibitor in its composition and its self-energizing shape assures superior service with low gland bolting loads in high pressure liquid and dry gas applications. It may also be used in fluids having a pH range of 0-14. Temperature range: -120°F to 500°F (-84° to 260°C).

Since this packing has directional sealing, it can be reoriented for valves used in vacuum and/or combination vacuum/pressure service.

OTHER PACKING

Other packing sets can be placed in Vogt valves at the user’s option.

Cross-Reference of ASTM Material Specifications

Covering Cast and Forged Valves, Fittings, Flanges and Unions

Material	Forgings	Castings	Wrought Fittings
Carbon Steel Cold Temperature Service	A105 A350-LF2	A216-WCB	A234-WPB A420-WPL6
Carbon-1/2 Moly Alloy Steel High Temperature Service	A182-F1	A217-WC1 A352-LC1	A234-WP1
3-1/2 Nickel Alloy Steel Low Temperature Service	A350-LF3	A352-LC3	A420-WPL3
1/2 Cr-1/2 Mo Alloy Steel 1/2 Cr-1/2 Mo-1 Ni Alloy Steel 3/4 Cr-1 Mo-3/4 Ni Alloy Steel 1 Cr-1/2 Mo Alloy Steel	A182-F2 A182-F12 CL2	A217-WC4 A217-WC5	A234-WP12 CL2
1-1/4 Cr-1/2 Mo Alloy Steel 2-1/4 Cr-1 Mo Alloy Steel 5 Cr-1/2 Mo Alloy Steel 5 Cr-1/2 Mo Alloy Steel 9 Cr-1 Mo Alloy Steel 13 Cr Alloy Steel	A182-F11 CL2 A182-F22 CL3 A182-F5 A182-F5a A182-F9 A182-F6	A217-WC6 A217-WC9 A217-C5 A217-C12 A743-CA15	A234-WP11 CL2 A234-WP22 CL3 A234-WP5 A234-WP9
Type 304 Stainless Steel (18 Cr-8 Ni) Standard Low Carbon High Temperature Service	A182-F304 A182-F304L A182-F304H	A351-CF3 A351-CF8	A403-WP304 A403-WP304L A403-WP304H
Type 310 Stainless Steel (25 Cr-20 Ni) Type 316 Stainless Steel (16 Cr-12 Ni-2 Mo) Standard Low Carbon High Temperature	A182-F310H A182-F316 A182-F316L A182-F316H	A351-CK20 A351-CF3M A351-CF8M	A403-WP310 A403-WP316 A403-WP316L A403-WP316H
Type 317 Stainless Steel (18 Cr-13 Ni-3 Mo) Type 321 Stainless Steel (18 Cr-10 Ni-Ti) Standard High Temperature Service	A182-F321 A182-F321H		A403-WP317 A403-WP321 A403-WP321H
Type 347 Stainless Steel (18 Cr-10 Ni-Cb) Standard High Temperature Service	A182-F347 A182-F321H	A351-CF8C	A403-WP347 A403-WP347H
Type 348 Stainless Steel (18 Cr-10 Ni-Cb) Standard High Temperature Service	A182-F348 A182-F348H		A403-WP348 A403-WP348H

Forging Materials

Chemistry Element – % Composition	Mechanical Properties	Chemistry Element – % Composition	Mechanical Properties
ASTM A105 Carbon Steel Where temperatures are moderate and corrosion resistance is not critical.		ASTM A182, Grade 5 – 4-6% Chromium 1/2% Molybdenum With moderately corrosive fluids and in oil refineries where high temperature stability and oxidation resistance of the lower alloy steels are inadequate.	
C 0.20 - 0.24	TS Min. psi(MPa) 70,000(485)	C 0.15 Max.	TS Min. psi(MPa) 70,000(485)
Mn 1.00 - 1.35	YS Min. psi(MPa) 36,000(250)	Mn 0.30 - 0.60	YS Min. psi(MPa) 40,000(275)
Si 0.15 - 0.30	EL (2" Min.) 22%	P .030 Max.	EL (2" Min.) 20%
P .030 Max.	RA Min. 30%	S 0.015 - 0.035	RA Min. 35%
S 0.015 - 0.040	Hardness, Bhn Max. 187	Si 0.50 Max	Hardness, Bhn 143-217
Cr 0.20		Ni 0.50 Max	
Ni 0.20		Cr 4.00 - 6.00	
Mo 0.06		Mo 0.44 - 0.65	
V 0.02			
Cb 0.02			
Cu 0.20			
Pb 0.02			
Total Residuals = 0.50			
ASTM A350, LF2 Where cold temperature (-50°F) impact strength is essential.		ASTM A182, Grade F9 – 9% Chromium For services where the higher chrome alloys are preferred and where high temperature stability and oxidation resistance of the lower alloy steels are inadequate.	
C 0.20 - 0.24	TS Min. psi(MPa) 70,000(485)	C 0.15 Max.	TS Min. psi(MPa) 85,000(585)
Mn 1.00 - 1.35	YS Min. psi(MPa) 36,000(250)	Mn 0.30 - 0.60	YS Min. psi(MPa) 55,000(380)
Si 0.15 - 0.30	EL (2" Min.) 22%	P .030 Max.	EL (2" Min.) 20%
P .030 Max.	RA Min. 30%	S 0.030 Max	RA Min. 40%
S 0.015 - 0.040	Hardness, Bhn Max. 197	Si 0.50 - 1.00	Hardness, Bhn 179-217
Cr 0.20	-50°F Charpy Min. Impact	Cr 8.00 - 10.00	
Ni 0.20	Energy (Ft./Lb.) (J)	Mo 0.90 - 1.10	
Mo 0.06	Average of Each		
V 0.02	Set of 3 Specimen		
Cb 0.02	For One Specimen		
Cu 0.20			
Pb 0.02			
Total Residuals = 0.50			
ASTM A182, Grade F11, Class 2 – 1 1/4% Chromium 1/2% Molybdenum To minimize graphitization encountered with carbon and carbon moly steels at high temperatures.		ASTM A182, Grade F316. Grade F316L – 18% Chromium 8% Nickel 2-3% Molybdenum For corrosion resistance applications where high temperature strength is required. Has restricted carbon level to minimize sensitization. Do not use for service temperatures above 1000°F.	
C 0.10 - 0.15	TS Min. psi(MPa) 70,000(485)	C 0.035 Max.	TS Min. psi(MPa) 75,000(515)
Mn 0.30 - 0.80	YS Min. psi(MPa) 40,000(275)	Mn 2.00 Max.	YS Min. psi(MPa) 30,000(205)
P .040 Max.	EL (2" Min.) 20%	P .040 Max.	EL (2" Min.) 30%
S 0.015 - 0.035	RA Min. 30%	S 0.020 - 0.030	RA Min. 30%
Si 0.50 - 1.00	Hardness, Bhn 143-207	Si 1.00 Max	
Cr 1.00 - 1.50		Ni 10.00 - 14.00	
Mo 0.44 - 0.65		Cr 16.00 - 18.00	
		Mo 2.00 - 3.00	
ASTM A182, Grade F22, Class 3 – 2 1/4% Chromium 1% Molybdenum Where elevated temperature, surface stability, and greater strength than F11 are needed.		ASTM A182, Grade F316H – 18% Chromium 8% Nickel 2-3% Molybdenum For corrosion resistance applications where extreme high temperature service is expected. Has a restricted carbon range for high temperature strength above 1000°F.	
C 0.15 Max.	TS Min. psi(MPa) 75,000(515)	C 0.04 - 0.10	TS Min. psi(MPa) 75,000(515)
Mn 0.30 - 0.60	YS Min. psi(MPa) 40,000(310)	Mn 2.00 Max.	YS Min. psi(MPa) 30,000(205)
P .040 Max.	EL (2" Min.) 20%	P .040 Max.	EL (2" Min.) 30%
S 0.015 - 0.035	RA Min. 30%	S 0.020 - 0.030	RA Min. 30%
Si 0.50 Max	Hardness, Bhn 156-207	Si 1.00 Max	
Cr 2.00 - 2.50		Ni 10.00 - 14.00	
Mo 0.87 - 1.13		Cr 16.00 - 18.00	
		Mo 2.00 - 3.00	

Valve Trim Materials

Description & General Use	Chemistry Element % Composition	Description & General Use	Chemistry Element % Composition
13% Chromium Stainless Steel Type 410 ASTM A479 This stainless steel material lends itself readily to hardening by heat treatment and is excellent for contacting parts such as stems, gates, and discs.	C 0.10- 0.15 Mn .60 Max. P .040 Max. S .030 Max. Si 1.00 Max Cr 12 - 13.5	Cobalt Base and Nickel Base Hard Facing Materials ASME SFA 5.13 Hard facing materials, when used on seating surfaces of Gate, Globe, and Check Valves, give extended service life and troublefree operation.	– Cobalt, Chromium and Tungsten Alloy – Nickel, Chromium and Boron Alloy
13% Chromium Stainless Steel Type 416 ASTM A582 High quality stainless steel yoke nut material having excellent anti-galling characteristic for better operating threads.	C 0.11- 0.14 Mn .60 Max. P .060 Max. S 0.25 - 0.35 Si 1.00 Max Cr 12.00 - 14.00 Ni .60 Max.	Nickel-Moly-Chromium ASTM B574, Grade N 10276 Hastelloy C-276 A high nickel alloy with exceptional resistance to corrosive attack by chlorine gas.	C .02 Max. Fe 4.00 - 7.00 Ni Balance Si 0.08 Max Co 2.5 Max. Mn 1.00 Max. Cr 14.50 - 16.50 V .35 Max. Mo 15.00 - 17.00 P .04 Max. W 3.00 - 4.50 S .03 Max.
18% Chromium 8% Nickel, 2% Molybdenum Stainless Steel Type 316 Type 316L ASTM A182 Provides excellent resistance to corrosive media at high temperatures and toughness for service at low temperatures.	C .035 Max. Mn 2.00 Max. P .040 Max. S 0.020 - .030 Si 1.00 Max Cr 16.00 - 18.00 Ni 10.00 - 14.00 Mo 2.00 - 3.00	Precipitation Hardened Stainless Steel A564, Gr. 630 17-4 PH Provides corrosion resistance and high strength for stems in NACE applications.	C 0.07 Max. Cr 15.00 - 17.50 Mn 1.00 Max. Ni 3.00 - 5.00 P .04 Max. Cu 3.00 - 5.00 S .03 Max. Cb Si 1.00 Max +Ta 0.15 - 0.45
		S-Monel ASTM A-494, Grade M-25S Material used for Monel castings.	C .25 Max. S .03 Mn 1.50 Ni Balance Si 3.5 - 4.5 Fe 3.5 P .03 Cu 27.00 - 33.00
Nickel-Copper Monel Alloy K500 FED-SPEC QQ-N-286F Class A This wrought material is precipitation hardened and possesses excellent corrosion resistance, high strength properties and hardness for internal valve components.	C .25 Max. Mn 1.50 Max. S 0.010 Max. Ni 63.00 - 70.00 Si .50 Max Fe 2.00 Max Al 2.3 - 3.15 Ti .35 - .85 Cu 27.0 - 33.0 P 0.020 Zn 0.020 Pb 0.006 Sn 0.006	ASTM A-743, Grade CA-15 Material used for 13 CR castings, the cast equivalent to type 410 Stainless Steel.	C .15 Max. S .040 Max. Mn 1.00 Cr 11.50 - 14.00 Si 1.50 Max. Ni 1.0 Max. P .040 Mo .50 Max.
		Cast Cobalt ASME-SFA-5.13 RCoCr-A Material used for Cobalt castings, the cast equivalent to Stellite #6.	C 0.9-1.4 Mo 1.0 Mn 1.0 W 3.5 - 5.5 Si 1.5 Fe 3.0 Ni 3.0 Others .50 Cr 27.0 - 31.0 Co Balance
Monel Alloy 400 ASTM B164 (N0400) Non hardened alloy, except by work hardened, that has high strength and toughness over a wide temperature range. Has excellent corrosion resistance in chlorine and alkylation service.	C .030 Max. Mn 2.00 Max. S .024 Max. Si 0.50 Max Ni 63.00 - 70.00 Fe 2.50 Max Cu 27.0 - 33.0	ASTM A351 Grade CF8M Material used for 18-8 castings, the cast equivalent to type 316 stainless steel.	C .08 Max Cr 18.0-21.0 Mn 1.50 Max P .040 Max Ni 9.0-12.0 S .040 Max Si 1.50 Max Mo 2.0-3.0

Flow Data Utilizing Cv Factors

FORMULAS		
TYPE FLOW	FLOW RATE	PRESSURE DROP
LIQUID	$Q = C_v \sqrt{\frac{\Delta P}{S}}$	$\Delta P = S \left(\frac{Q}{C_v} \right)^2$
GAS WHEN $\Delta P < .5P_1$	$q'_m = 22.6 C_v \sqrt{\frac{\Delta P \times P_1}{T_1 S_g}}$	$\Delta P = \frac{.00195 T_1 S_g}{P_1} \left(\frac{q'_m}{C_v} \right)^2$
WHEN $\Delta P \geq .5P_1$	$q'_m = \frac{13.9 P_1 C_v}{\sqrt{S_g T_1}}$	
DRY SATURATED STEAM		
WHEN $\Delta P < .5P_1$	$W = 2.97 C_v \sqrt{\Delta P \times P_1}$	$\Delta P = \frac{.113}{P_1} \left(\frac{W}{C_v} \right)^2$
WHEN $\Delta P \geq .5P_1$	$W = 1.82 C_v P_1$	
SUPERHEATED STEAM		
WHEN $\Delta P < .5P_1$	$W = \frac{2.97 C_v \sqrt{\Delta P \times P_1}}{(1 + .0007s)}$	$\Delta P = \frac{.113}{P_1} \left(\frac{W(1 + .0007s)}{C_v} \right)^2$
WHEN $\Delta P \geq .5P_1$	$W = \frac{1.82 C_v P_1}{(1 + .0007s)}$	

Fluid Flow Nomenclature

- C_v – Flow coefficient for valves and fittings.
- P_1 – Absolute inlet pressure. (PSIA)
- P_2 – Absolute outlet pressure. (PSIA)
- ΔP – Pressure drop in pounds per square inch. (PSI)
- Q – Liquid flow in gallons per minute. (GPM)
- q'_m – Rate of gas flow in cubic feet per minute at standard conditions, 14.7 psia and 60°F. (SCFM)
- S – Specific gravity of flowing liquid relative to water at 60°F.
- S_g – Specific gravity of gas relative to air.
- s – Number of degrees of superheat for steam in °F.
- T_1 – Absolute inlet temperature in degrees Rankine. (°R)
- W – Steam or vapor flow rate in pounds per hour. (LBS./HR.)

Flow Data Utilizing Cv Factors (Metric Version)

FORMULAS		
TYPE FLOW	FLOW RATE	PRESSURE DROP
LIQUID	$Q = .865Cv \sqrt{\frac{\Delta P}{S}}$	$\Delta P = 1.34S \left(\frac{Q}{Cv}\right)^2$
GAS WHEN $\Delta P < .5P_1$	$q'_H = 414.97 Cv \sqrt{\frac{\Delta P \times P_1}{T_1 S_g}}$	$\Delta P = \frac{5.81 \times 10^{-6} T_1 S_g}{P_1} \left(\frac{q'_H}{Cv}\right)^2$
WHEN $\Delta P \geq .5P_1$	$q'_m = \frac{255.2 P_1 Cv}{\sqrt{S_g T_1}}$	
DRY SATURATED STEAM		
WHEN $\Delta P < .5P_1$	$W = 19.53 Cv \sqrt{\Delta P \times P_1}$	$\Delta P = \frac{.00262}{P_1} \left(\frac{W}{Cv}\right)^2$
WHEN $\Delta P \geq .5P_1$	$W = 11.97 Cv P_1$	
SUPERHEATED STEAM		
WHEN $\Delta P < .5P_1$	$W = \frac{19.1 Cv \sqrt{\Delta P \times P_1}}{(1 + 0.00123s)}$	$\Delta P = \frac{0.00274}{P_1} \left(\frac{W(1 + 0.00123s)}{Cv}\right)^2$
WHEN $\Delta P \geq .5P_1$	$W = \frac{11.71 Cv \times P_1}{(1 + 0.00123s)}$	

Fluid Flow Nomenclature

- Cv – Flow coefficient for valves and fittings.
- P₁ – Absolute inlet pressure. (BAR)
- P₂ – Absolute outlet pressure. (BAR)
- Δ P – Pressure drop in bars.
- Q – Liquid flow in cubic meters per hour.
- q'_H – Rate of gas flow in cubic meters per hour at standard conditions, 1.01 BAR @ 15.6°C.
- S – Specific gravity of flowing liquid relative to water at 16°C.
- S_g – Specific gravity of gas relative to air.
- s – Number of degrees of superheat for steam in °C.
- T₁ – Absolute inlet temperature in degrees Kelvin. (°K)
- W – Steam or vapor flow rate in kilograms per hour. (KGS./HR.)

Cv Factor Matrix

Valve Matrix	Typical Series Number (See Notes)	Valve Matrix	Typical Series Number (See Notes)
A	353, 363, 373, 353R, 363R, 373R, 12401C, 2801, 2811, 2831, 12111, 12111R, 12161, 12321, 12401, 12421, 12521, 15111, 15373, 15801, ST15801, 32111, 35111, 42211MTG, 59851, 59951	U	15141, 15493, 15821
B	13111, 13373, 16111, 43111MMP, SW-43211HF2, 13111R	V	1003, 1023, 10603, 10683
C	11103, 11403	W	15443
D	2801B	X	1510, 1511, 1522
E	CT-2801, ST-2801, TT-2801, CT-2831, ST-2831, TT-2831	Y	66723, 66733, 66793
F	CT-2901, CT, BT, TT, ST-12111	Z	2510, 2511, 2522
G	1033, 1043, 11603, 11683	Z-R	R2510, R2511, R2522
H	66703, 66713	AA	1331T, 1871T, 3991T
J	473, 483, 493, 801, 851, 2821, 12141, 12181, 12501, 12501C	BB	2891T, 9841T
K	473B, 483B, 493B, 12141B	CC	9821T, 9871T, 58431T
L	22141CL, 22141F8M, 22141MT, 22493CL, 22493MT, 42241HF2	FF	573, 583, 593, 701, 701ZL, B701, 718, B718, 32701, 82718
M	10103, 10403	GG	9091, B9091
N	SW-23141HF4, 43241MMP, 43241MTP	HH	SWB-43721HF2
P	13141	JJ	4835
Q	CT-12141, ST-12141, TT-12141	KK	13701
R	12443	LL	54853, 54863
S	1971	MM	S74, S701
T	22461	NN	15593, 15701, B15701
		SS	1551, B1551
		TT	810, 811, 822

- NOTE: (1) For SW or TSW Series, use CV factor for corresponding threaded series listed above.
 (2) For different trim configurations, use CV factor for corresponding 13 Cr. trimmed series listed above.
 (3) A valve of same dimensional design but made from different pressure boundary material (body & bonnet) will have the same Cv factor as its A105 equivalent above.

Cv Factors

Size NPS	1/4 8	3/8 10	1/2 15	3/4 20	1 25	1 1/4 32	1 1/2 40	2 50	2 1/2 65	3 80	4 100	Size NPS	1/4 8	3/8 10	1/2 15	3/4 20	1 25	1 1/4 32	1 1/2 40	2 50	2 1/2 65	3 80	4 100
A	2.6	3.9	9.6	9.7	20.3	80.5	91.6	117.6	174	203.9	230.0	V	–	–	3.6	6.0	10.2	15.1	24.2	39.8	–	–	–
B	–	–	9.6	28.7	46.5	80.5	109.6	181.0	–	–	–	W	–	–	1.46	2.38	4.54	–	11.5	13.0	–	–	–
C	–	–	9.6	28.7	46.5	80.5	109.6	181.0	242.3	322.7	–	X**	–	–	6.0	4.0	9.3	–	57.8	48.9	–	–	–
D	–	–	9.6	9.7	20.3	–	109.6	117.6	–	–	–	Y***	–	–	1.2	4.3	5.8	–	17.6	19.3	–	–	–
E	–	–	6.5	9.0	27.7	–	78.0	–	–	–	–	Z***	–	–	1.8	4.3	9.4	–	32.7	49.4	–	–	–
F	–	–	9.6	9.7	20.3	–	78.0	–	–	–	–	Z-R***	–	–	1.5	3.9	7.9	–	29.3	39.8	–	–	–
G	–	–	11.8	28.7	32.0	83.2	109.6	181.0	–	–	–	AA	1.4	1.3	2.9	3.8	8.1	15.3	18.4	25.5	–	–	–
H	–	–	5.0	17.5	16.1	–	109.6	100.2	–	–	–	BB	1.1	1.7	2.6	4.5	11.9	19.0	25.0	49.0	–	–	–
J	1.3	2.0	2.4	4.3	7.3	14.2	20.4	23.1	–	–	–	CC	.64	1.4	1.8	3.5	5.8	7.6	11.7	17.7	–	–	–
K	–	–	2.2	5.7	5.2	–	21.1	20.5	–	–	–	FF	.9	1.5	2.1	3.2	5.8	13.3	18.3	25.3	–	–	–
L	.7	1.7	1.7	3.1	5.9	13.7	18.4	22.5	–	–	–	GG	1.5	2.0	3.6	6.7	11.8	20.2	26.1	43.3	–	–	–
M	–	–	3.4	7.3	11.9	15.6	28.2	46.9	–	85.1	–	HH	–	–	.7	5.9	11.8	–	22.6	32.6	–	–	–
N	–	–	.7	5.9	13.7	–	21.0	34.0	–	–	–	JJ	–	–	3.3	4.4	17.0	28.2	43.0	63.0	–	–	–
P	.9	2.5	3.0	6.8	14.5	17.2	24.4	37.6	–	–	–	KK	.9	1.5	3.2	6.9	16.0	18.3	25.5	36.9	–	–	–
Q	–	–	2.4	4.3	7.3	–	20.4	–	–	–	–	LL	–	–	8.7	15.1	30.5	29.1	37.7	45.3	–	–	–
R	–	–	1.46	2.38	4.54	–	9.65	14.6	–	–	–	MM	–	–	9.2	6.8	22.0	–	54.6	81.9	–	–	–
S	1.1	2.1	2.6	4.5	11.9	21.0	31.4	52.0	–	–	–	NN	–	–	3.2	3.3	6.3	13.3	11.0	19.6	–	–	–
T	.56	.55	.68	.99	1.5	–	–	–	–	–	–	SS	1.2	1.3	2.1	4.1	7.3	10.5	17.6	23.3	–	–	–
U**	–	–	3.1	3.3	5.9	–	13.8	21.4	–	–	–	TT	–	–	4.5	9.1	21.3	–	70.0	79.1	–	–	–

These Cv factors have been established by testing valves using Schedule 40 pipe except as noted.

** Sch. 160 used for testing valve.

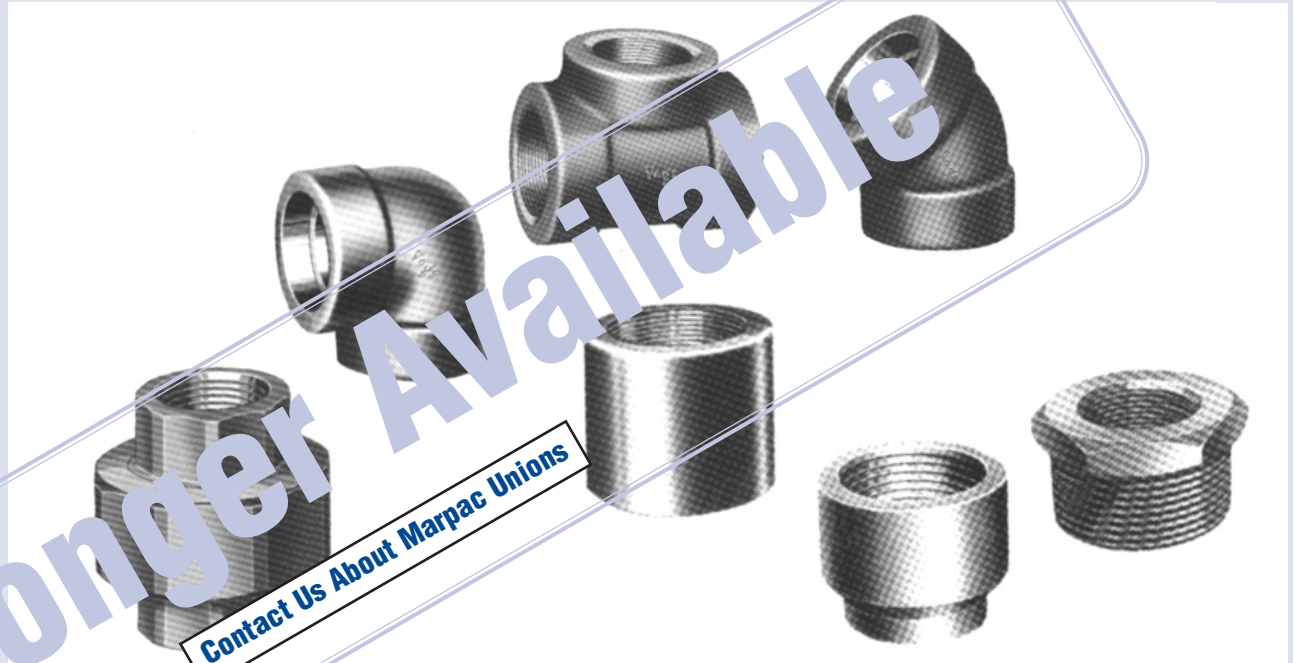
***Sch. XXH used for testing valve.

Fitting and Union Section – Pages 124-132

VOGT'S ASME B16.11 A105 FITTINGS do not have a Pressure/Temperature Table. Consistent with the ASME B16.11-1996 method of pressure/temperature application of fittings, Vogt A105 fittings have a pressure/temperature retaining capability equal to A106B or A106C connecting pipe schedules (see chart).

Plugs and bushings are not identified by class designation. They may be used for ratings Class 6000 and lower.

Fittings are manufactured under a **traceability system** in order that material certification can be provided when required.



Class Designation
2000, 3000, 6000
Threaded or Socket-Weld

Class Designation of Fitting	Type of Fitting	Pipe(1) Used for Rating Basis	
		Schedule No.	Wall Designation
2000	Threaded	80	XS
3000	Threaded	160	–
6000	Threaded	–	XXS
3000	Socket-Welding	80	XS
6000	Socket-Welding	160	–
9000	Socket-Welding	–	XXS

(1) This table is not intended to restrict the use of pipe of thinner or thicker wall with fittings. Pipe actually used may be thinner or thicker in nominal wall than that shown. When thinner pipe is used, its strength may govern the rating. When thicker pipe is used (e.g., for mechanical strength), the strength of the fitting governs the rating.

Dimensions are in inches and millimeters.
Dimensions are subject to change without notice.
Order by Size and Series Number.

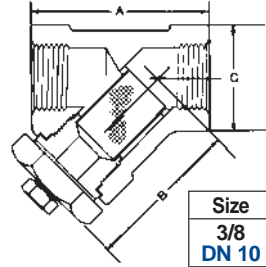
Forged Steel Strainer & Union Ells

Style 3000 "Y" Type Strainer

HORIZONTAL & VERTICAL
SCREW BONNET/SCREEN

A105 Body/Bonnet
3000 PSI @ 100°F
(206.9 BAR @ 38°C)

SERIES NUMBER
Threaded 2271 Socket Weld SW2271
Screen: 316*



Size	Cv Factor
3/8 DN 10	-
1/2 DN 15	6
3/4 DN 20	14
1 DN 25	14
1-1/2 DN 40	40
2 DN 50	40

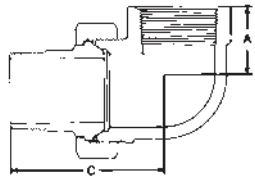
Dimensions

Bold face numerals are in inches and pounds.
Blue numerals are in millimeters and kilograms.

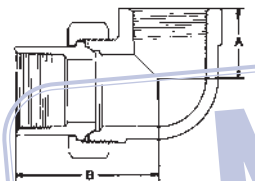
Size	NPS DN	3/8 10	1/2 15	3/4 20	1 25	1-1/4 32	1-1/2 40	2 50
A-End-to-End		2.50 64	3.00 76	3.50 89	4.00 102	4.50 114	6.0 152	7.50 191
B-Center-to-Bonnet End		2.31 59	2.75 70	3.19 81	3.56 90	4.00 102	5.25 133	6.19 157
C-Bead Diameter		1.50 38	1.75 44	2.00 51	2.38 60	2.69 68	3.56 90	4.31 109
Weight		3.78 1.7	2.24 1.0	3.80 1.7	5.10 2.3	6.88 3.1	16.2 7.4	28.4 12.9
Cv Factor		-	6	14	14	-	40	40

* Strainers are furnished with 40 mesh, 31 gauge stainless steel screen.

STRAINERS & UNION ELLS
STYLE 3000 - 2271



THREADED MALE & FEMALE



THREADED FEMALE TO FEMALE



Dimensions

Bold face numerals are in inches and pounds.
Blue numerals are in millimeters and kilograms.

Size	NPS DN	1/4 8	3/8 10	1/2 15	3/4 20	1 25	1-1/4 32	1-1/2 40	2 50
A		1.12 28	1.1 28	1.1 28	1.5 38	1.75 44	2.00 51	2.38 60	2.50 64
B		2.25 57	2.25 57	2.81 71	3.06 78	3.50 89	3.81 97	4.38 111	4.69 119
C		2.75 70	2.75 70	3.00 76	3.44 87	4.00 102	4.25 108	4.88 124	5.06 129
Weight-Series 5061		.94 .43	.84 .38	1.30 .59	1.90 .86	3.00 1.36	3.88 1.76	6.63 3.01	8.13 3.69
Weight-Series 6281		.91 .41	.78 .35	1.63 .74	1.90 .86	2.94 1.3	3.88 1.8	6.50 3.0	7.94 3.6

Refer to pages 116-120 for full materials description.

Style 2000















A105 Material
2000 PSI @ 100°F (137.9 BAR @ 38°C)

SERIES NUMBER
Threaded Male & Female Union Ells
5061

SERIES NUMBER
Threaded Female & Female Union Ells
6281

ReadyPAK Fittings

Number Of Fittings Per Carton

		Series	Pressure	1/8	1/4	3/8	1/2	3/4	1	1-1/4	1-1/2	2			Series	Pressure	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2											
	90° ELLS	259	2000	—	25	15	15	25	20	20	15	10		HALF COUPLINGS	2090	3000	50	40	25	25	30	20	10	20	15											
		229	3000	25	25	15	25	20	20	15	5	5			2110	6000	—	20	15	25	20	10	15	10	10											
		1299	6000	25	15	25	20	15	10	5	5	*			SW 2090	3000	20	15	25	25	20	15	20	10												
		SW 229	3000	25	25	15	15	25	20	20	15	10			SW 2110	3000	—	—	10	15	15	10	10	5												
		SW 1299	6000	—	—	—	25	20	20	10	5	*			1299	3000	15	25	30	25	25	15	10	10												
	TEES	273	2000	—	15	10	25	25	20	15	10	10		WELL COUPLINGS	SW 1299	6000	—	—	—	25	20	20	10	5	*	SW 1299	3000	—	15	25	30	25	25	15	10	10
		243	3000	15	20	10	25	20	10	10	5	5			SW 2110	3000	—	—	—	—	*	*	*	*	—											
		1399	6000	20	10	10	20	10	10	5	5	*			SW 1399	6000	*	15	10	10	20	20	5	5	5											
		SW 243	3000	15	15	10	25	25	20	15	10	10			SW 1399	6000	—	—	—	25	20	10	10	5	*											
		SW 1399	6000	—	—	—	25	20	10	10	5	*			SW 1399	6000	—	—	—	*	*	*	*	—												
	45° ELLS	1280	2000	—	25	15	20	10	15	10	15	10		CAPS	4200	3000	50	25	20	20	25	25	15	20	10											
		2001	3000	25	15	10	25	15	10	10	10	10			4001	6000	20	10	10	10	10	5	10	15	10											
		2024	6000	10	10	10	15	10	10	5	5	*			SW 4200	3000	*	25	20	20	25	20	10	15	5											
		SW 2001	3000	25	25	15	20	10	20	10	5	10			SW 4001	6000	—	—	—	10	10	10	15	5	5											
		SW 2024	6000	—	—	—	25	15	10	5	10	*			2400	Hex.Head	—	50	50	50	50	30	20	30	15											
	CROSSES	1189	2000	—	15	15	20	15	10	5	5	5		BUSHINGS	2370	Flush	—	100	50	45	50	25	15	25	15											
		1899	3000	15	15	10	15	10	5	5	5	5			2560	Square Hd.	100	50	50	25	25	40	10	15	15											
		2199	6000	15	10	10	15	10	5	5	*	2580			Hex. Head	100	50	50	25	25	40	15	15	15												
		SW 1899	3000	*	—	10	20	15	10	5	5	5			2130	Round Hd.	50	50	20	50	20	20	10	15	5											
		SW 2199	6000	—	—	—	10	10	5	5	5	*			SW 503	3000	—	—	20	20	10	10	5	15	15											
	STREET ELLS	1800	3000	20	20	15	20	25	10	5	10		PLUGS	SW 623	6000	—	—	—	10	10	10	10	15	10												
		1260	3000	20	15	20	20	10	5	5	—			1931	3000	10	20	25	25	20	15	10	15	5												
	45° LATERALS	423	3000	—	—	—	10	10	10	5	5	*		UNIONS	1951	3000	—	20	25	25	20	15	10	15	5											
		2133	3000	—	—	—	10	10	10	5	5	*			1961	6000	—	*	*	20	15	10	15	5	*											
	COUPLINGS	2324	3000	25	20	25	25	20	25	10	15	10		INSERTS	SW 1961	6000	—	—	—	20	15	10	15	5	*											
		2350	3000	—	—	—	25	25	15	10	10	5			1931	3000	10	20	25	25	20	15	10	15	5											
		2450	3000	—	*	25	25	20	25	10	10	5			1951	3000	—	20	25	25	20	15	10	15	5											
		SW 2450	3000	—	*	10	25	25	25	25	10	10			SW 1961	6000	—	—	—	20	15	10	15	5	*											
		2450	3000	—	*	10	25	25	25	25	10	10																								

*Not Prepackaged —Not Manufactured

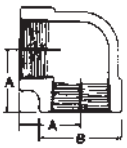

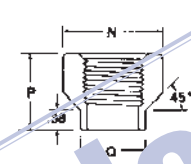
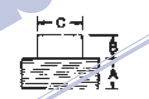

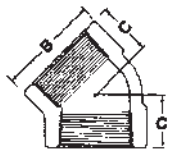
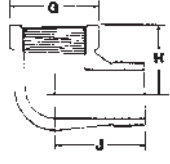


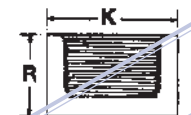

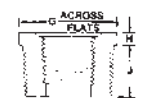
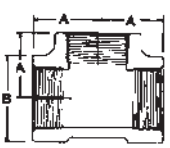

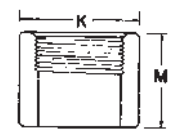
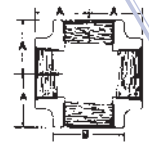
Forged Carbon Steel Fitting and Union Weights

Series Number	1/8 6	1/4 8	3/8 10	1/2 15	3/4 20	1 25	1 1/4 32	1 1/2 40	2 50	2 1/2 65	3 80	4 100	Series Number	1/8 6	1/4 8	3/8 10	1/2 15	3/4 20	1 25	1 1/4 32	1 1/2 40	2 50	2 1/2 65	3 80	4 100
229	.25	.31	.60	.86	1.37	2.08	2.71	5.43	6.10	15.2	19.6	36.2	2024	.30	.59	.85	1.40	2.23	2.65	4.90	6.25	6.81	15.5	38.7	—
SW 229	.11	.14	.27	.39	.62	.94	1.23	2.46	2.77	6.9	8.9	16.4	SW 2024	.14	.27	.39	.64	1.0	1.20	2.2	2.8	3.1	7.0	17.6	—
243	.28	.44	.77	1.12	1.88	3.03	3.98	7.23	7.70	18.4	24.6	43.2	2090	.03	.05	.06	.14	.21	.41	.75	1.05	1.43	2.27	3.29	6.13
SW 243	.13	.20	.35	.51	.85	1.4	1.8	3.3	3.5	8.4	11.2	19.6	SW 2090	.01	.02	.03	.06	.10	.19	.34	.48	.65	1.0	1.5	2.8
259	.27	.22	.33	.65	.90	1.28	2.05	2.88	4.33	8.33	11.0	28.2	2110	.10	.12	.16	.31	.48	.66	1.16	1.40	2.19	3.43	4.50	6.00
SW 259	.12	.10	.15	.30	.41	.58	.93	1.3	2.0	3.8	5.0	12.8	SW 2110	.04	.05	.07	.14	.22	.30	.53	.64	.99	1.6	2.0	2.7
273	—	.18	.25	.50	.70	.92	1.47	2.05	3.73	7.05	10.1	24.2	2130	.10	.12	.20	.34	.47	.94	1.13	1.99	2.99	4.31	6.50	10.8
SW 273	—	.08	.11	.23	.32	.42	.67	.93	1.7	3.2	4.6	1.1	SW 2130	.04	.05	.09	.15	.21	.42	.51	.90	1.4	2.0	3.0	4.9
1160	—	.24	.34	.64	.90	1.36	2.03	3.08	4.55	8.90	12.5	28.3	2199	—	—	—	.55	.79	1.55	1.50	2.88	5.06	—	—	—
SW 1160	.12	.15	.20	.33	.41	.90	1.15	1.86	2.89	4.40	6.40	—	SW 2199	—	—	—	.25	.36	.70	.68	1.3	2.3	—	—	—
1189	.05	.07	.09	.15	.19	.41	.52	.84	1.3	2.0	2.9	—	2324	.05	.11	.16	.24	.41	.72	1.20	1.56	3.01	4.85	7.36	13.1
SW 1189	.18	.16	.22	.35	.43	.92	1.24	1.91	3.07	4.83	6.83	—	SW 2324	.02	.05	.07	.11	.19	.33	.54	.71	1.4	2.2	3.3	5.9
1211	—	.30	.46	.79	1.10	1.74	2.52	3.38	4.81	10.7	14.2	—	2350	1.10	1.16	1.68	2.78	4.25	5.63	9.53	11.4	25.9	—	—	—
SW 1211	—	.14	.21	.36	.50	.79	1.1	1.5	2.2	4.9	6.4	—	SW 2350	.50	.53	.76	1.3	1.9	2.6	4.3	5.1	11.8	—	—	—
1260	—	.13	.15	.25	.29	.51	.81	1.15	1.91	2.63	4.11	—	2370*	—	—	—	.82	1.1	1.7	2.4	3.8	7.1	—	—	—
SW 1260	—	.06	.07	.12	.14	.26	.39	.54	.94	1.3	1.8	—	2400*	—	.02	.03	.05	.10	.12	.27	.40	.57	.86	1.75	2.28
1280	.19	.38	.58	1.06	1.51	2.71	3.63	6.61	—	—	—	—	2450*	—	.04	.05	.07	.14	.26	.51	.70	1.24	1.94	3.11	3.88
SW 1280	.09	.17	.26	.48	.68	1.2	1.6	3.0	—	—	—	—	SW 2450*	—	.02	.02	.03	.06	.12	.23	.32	.56	.88	1.4	1.8
1299	—	.17	.23	.45	.57	.85	1.31	1.58	2.60	4.73	7.50	—	2560	—	.11	.20	.33	.52	1.06	2.00	2.73	3.90	5.56	9.03	15.68
SW 1299	.34	.63	.98	1.55	2.60	3.63	6.45	8.38	18.9	25.7	37.2	—	SW 2560	—	.05	.09	.15	.24	.48	.91	1.2	1.8	2.5	4.1	7.1
1399	.15	.29	.44	.70	1.2	1.6	2.9	3.8	8.6	11.7	16.9	—	2580	.02	.13	.14	.32	.52	.77	1.39	1.60	2.93	4.11	5.30	9.56
SW 1399	—	—	—	.89	1.40	2.23	2.90	5.86	10.5	17.3	21.2	39.7	2670*	—	.06	.06	.15	.24	.35	.63	.73	1.33	1.9	2.4	4.3
1800	.48	.90	1.39	2.18	3.49	4.89	8.30	10.5	21.6	33.0	45.9	—	SW 2670*	—	—	—	—	.79	1.42	1.80	2.89	5.10	10.0	14.0	23.5
SW 1800	.22	.41	.63	.99	1.6	2.2	3.8	4.8	9.8	15.0	20.8	—	4001	.10	.19	.30	.50	.77	1.20	1.78	2.85	4.45	7.50	12.0	21.8
1899	—	—	—	1.17	1.89	3.13	4.05	7.68	8.26	20.7	27.6	50.1	SW 4001	.04	.09	.14	.23	.35	.54	.81	1.3	2.0	3.4	5.4	9.9
SW 1899	.13	.18	.40	.49	.87	1.32	1.86	3.04	5.06	—	—	—	4200	—	—	—	.45	.60	1.20	1.40	2.20	4.45	—	—	—
1931	.38	.53	.94	1.42	2.45	3.60	4.33	7.97	8.94	23.6	30.0	—	SW 4200	.05	.08	.11	.22	.34	.68	1.20	1.53	2.19	4.13	6.01	10.6
SW 1931	.17	.24	.43	.64	1.1	1.6	2.0	3.6	4.1	10.7	13.6	—	4823	.02	.04	.05	.10	.15	.31	.54	.69	.99	1.9	2.7	4.8
1951	.34	.26	.97	.78	1.00	1.62	2.23	3.08	4.86	9.50	14.6	39.0	SW 4823	.05	.08	.12	.21	.35	.47	.90	1.12	1.86	2.79	4.27	7.47
SW 1951	.15	.12	.44	.35	.45	.73	1.0	1.4	2.2	.43	6.6	17.7	SW 4823	.02	.04	.05	.09	.16	.21	.41	.51	.84	1.3	1.9	3.4
1961	.39	.34	.53	.70	1.27	1.63	2.54	3.30	4.73	7.59	10.9	—	—	—	—	—	1.04	1.72	2.31	3.44	4.65	11.6	21.2	—	
SW 1961	.18	.15	.24	.32	.58	.74	1.2	1.5	2.1	3.4	4.9	—	—	—	—	—	.47	.78	1.0	1.6	2.1	5.3	9.6	—	
1991	.39	.34	.53	.70	1.27	1.63	2.54	3.30	4.73	7.59	10.9	—	—	—	—	—	—	—	—	—	—	—	—	—	
SW 1991	.18	.15	.24	.32	.58	.74	1.2	1.5	2.1	3.4	4.9	—	—	—	—	—	—	—	—	—	—	—	—	—	
2001	—	.53	.70	1.27	1.63	3.36	3.30	4.73	7.59	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
SW 2001	—	.24	.32	.58	.74	1.5	1.5	2.1	3.4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
2001	.19	.27	.52	.74	1.20	1.85	2.10	4.25	4.55	12.5	13.6	28.0	—	—	—	—	—	—	—	—	—	—	—	—	
SW 2001	.09	.12	.24	.34	.54	.84	.95	1.9	2.1	5.7	6.2	12.7	—	—	—	—	—	—	—	—	—	—	—	—	
2001	.19	.16	.20	.43	.55	.82	1.24	1.54	2.82	4.33	7.66	26.5	—	—	—	—	—	—	—	—	—	—	—	—	
SW 2001	.09	.07	.09	.20	.25	.37	.56	.70	3.0	2.0	3.5	12.0	—	—	—	—	—	—	—	—	—	—	—	—	

Bold face numerals are in inches and pounds. Blue numerals are in millimeters and kilograms.

*Bushing and Reducing Coupling Weights vary according to reduction. Weights listed are an approximated average.

Forged Carbon Steel Fittings

DESCRIPTION	CLASS DESIGNATION	SERIES NUMBER	SIZE RANGE	DESCRIPTION	CLASS DESIGNATION	SERIES NUMBER	SIZE RANGE	DESCRIPTION	CLASS DESIGNATION	SERIES NUMBER	SIZE RANGE
 <p>90° ELLS ASME B16.11</p>	2000	259	1/4 - 4 DN 8 - 100	 <p>45° LATERALS</p>	3000	4823	1/2 - 2-1/2 DN 15 - 65	 <p>WELD COUPLETS ASME B31.1 FIG. 127.4.8(F)</p>	3000	1211 SWT 1211	1/4 - 3 DN 8 - 80 1/2 - 2 DN 15 - 50
	3000	229	1/8 - 4 DN 6 - 100		6000	1800	1/8 - 2 DN 6 - 50		6000	1160 SWT 1160	1/8 - 3 DN 6 - 80 1/2 - 2 DN 15 - 50
	6000	1299	1/8 - 3 DN 6 - 80		6000	1260	1/8 - 1-1/2 DN 6 - 40		 <p>SQ. HEAD PLUGS Series No. 2560 Sizes 1/8 - 4 DN 6 - 100 ASME B16.11</p>	 <p>ROUND HEAD PLUGS Series No. 2130 Sizes 1/8 - 4 DN 6 - 100 ASME B16.11</p>	
 <p>45° ELLS ASME B16.11</p>	2000	1280	1/4 - 3 DN 8 - 80	 <p>STREET ELLS</p>	3000	4200	1/8 - 4 DN 6 - 100	 <p>HEX. HEAD PLUGS Series No. 2580 Sizes 1/8 - 4 DN 6 - 100 ASME B16.11</p>			 <p>FLUSH BLUSHINGS Series No. 2370 Sizes 1/4 - 4 DN 8 - 100 ASME B16.11</p>
	3000	2001	1/8 - 4 DN 6 - 100		6000	4001	1/8 - 4 DN 6 - 100				
	6000	2024	1/8 - 3 DN 6 - 80		 <p>PIPE CAPS ASME B16.11</p>	 <p>COUPLINGS ASME B16.11</p>	 <p>HEX. HEAD BUSHINGS Series No. 2400 Sizes 1/4 - 4 DN 8 - 100 ASME B16.11</p>				
 <p>TEES ASME B16.11</p>	2000	273	1/4 - 4 DN 8 - 100	3000				2324	1/8 - 4 DN 6 - 100	 <p>REDUCING COUPLINGS ASME B16.11</p>	 <p>HALF COUPLINGS ASME B16.11</p>
	3000	243	1/8 - 3 DN 6 - 100	6000				2350	1/8 - 4 DN 6 - 100		
	6000	1399	1/8 - 3 DN 6 - 80	 <p>CROSSES ASME B16.11</p>	2000	1189	1/4 - 3 DN 8 - 80	<p>Notes concerning Pressure-Temperature Ratings For Fittings The ratings for forged steel fittings correspond to the pressure retaining capabilities of the connecting pipe. Pressure temperature ratings are dependent on the pipe schedule, service conditions, and the pressure piping code covering the particular installation. Rating guidance is provided in ASME B16.11 which establishes procedures and tabulates a correlation of fitting pressure class designations with pipe schedule or wall designations. See page 124 for extract.</p>			
3000	1899	1/8 - 3 DN 6 - 80	6000		2670	1/4 - 4 DN 8 - 100					
6000	2199	1/8 - 2 DN 6 - 50	3000		2090	1/8 - 4 DN 6 - 100					
				6000	2110	1/8 - 4 DN 6 - 100					

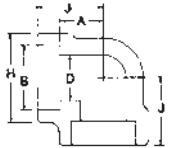

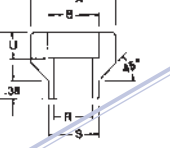
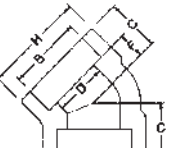
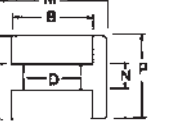
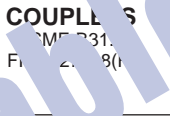
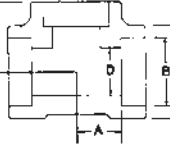
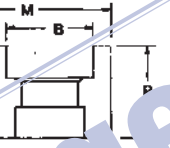

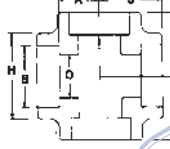
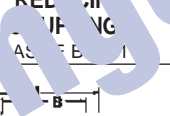
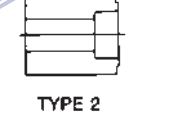
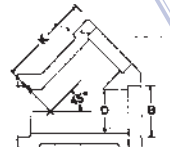
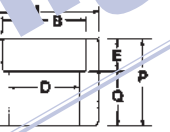
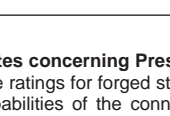
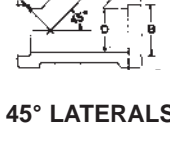
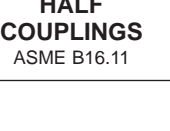
Threaded Fitting Dimensions

Fitting Class Designation	NPS DN	1/8 6	1/4 8	3/8 10	1/2 15	3/4 20	1 25	1 1/4 32	1 1/2 40	2 50	2 1/2 65	3 80	3 1/2 90	4 100	
CLASS 2000	A	-.88 22	.97 25	.97 25	1.12 28	1.31 33	1.50 38	1.75 44	2.00 51	2.38 60	3.00 76	3.38 86	-	4.19 106	
	B	-.91 23	1.06 27	1.31 33	1.50 33	1.84 47	2.22 56	2.50 64	3.03 77	3.69 94	4.38 111	-	-	5.75 146	
	C	-.75 19	.75 19	.88 22	1.00 25	1.12 28	1.31 33	1.38 35	1.69 43	2.06 52	2.50 64	-	-	-	-
CLASS 3000	A	.88 22	.97 25	1.12 28	1.31 33	1.50 38	1.75 44	2.00 51	2.38 60	2.50 64	3.38 86	3.75 95	4.19 106	4.50 114	
	B	.91 23	1.06 27	1.31 33	1.50 33	1.84 47	2.22 56	2.50 64	3.03 77	3.34 85	4.38 111	4.88 124	5.75 146	6.25 159	
	C	.75 19	.75 19	.88 22	1.00 25	1.12 28	1.31 33	1.38 35	1.69 43	2.06 52	2.50 64	3.12 79	3.12 79	-	-
	D	-	-	-	1.75 44	2.12 54	2.50 64	2.81 71	3.19 81	4.38 111	5.31 135	-	-	-	-
	E	-	-	-	1.50 38	1.75 44	2.00 51	2.38 60	2.69 68	3.56 90	4.31 109	-	-	-	-
	F	-	-	-	2.50 64	3.00 76	3.50 89	4.00 102	4.50 114	6.00 152	7.50 190	-	-	-	-
	G	.75 19	1.00 25	1.31 33	1.50 38	1.75 44	2.00 51	2.38 60	2.69 68	3.25 82	-	-	-	-	-
	H	.75 19	.88 22	1.12 28	1.25 32	1.50 38	1.75 44	2.00 51	2.25 57	2.50 64	-	-	-	-	-
	J	1.00 25	1.25 32	1.50 38	1.62 41	1.88 48	2.25 57	2.62 66	2.81 71	3.31 84	-	-	-	-	-
	K	.62 16	.75 19	.88 22	1.12 28	1.38 35	1.75 44	2.25 57	2.50 64	3.00 76	3.62 92	4.25 108	4.75 121	5.50 140	-
	L	1.25 32	1.38 35	1.50 38	1.88 48	2.00 51	2.38 60	2.62 66	3.12 79	3.38 86	3.62 92	4.25 108	4.50 114	4.75 121	-
	M	.62 16	.69 18	.75 19	.94 24	1.00 25	1.19 30	1.31 33	1.56 40	1.69 43	1.81 46	2.12 54	2.25 57	2.38 60	-
	N	-	.94 24	1.06 27	1.31 33	1.50 38	1.81 46	2.19 56	2.50 64	3.12 79	3.62 92	4.38 111	-	5.56 141	-
	P	-	1.19 30	1.19 30	1.31 33	1.38 35	1.69 43	1.88 48	2.00 51	2.25 57	2.50 64	2.75 70	-	3.00 76	-
	Q	-	.69 18	.81 21	.94 24	1.06 27	1.31 33	1.69 43	1.94 49	2.44 62	2.88 73	3.50 89	-	4.50 114	-
	R	.75 19	1.00 25	1.00 25	1.25 32	1.44 37	1.62 41	1.75 44	1.75 44	1.88 48	2.38 60	2.56 65	2.62 67	2.69 68	-

Fitting Class Designation	NPS DN	1/8 6	1/4 8	3/8 10	1/2 15	3/4 20	1 25	1 1/4 32	1 1/2 40	2 50	2 1/2 65	3 80	3 1/2 90	4 100	
CLASS 6000	A	.97 25	1.12 28	1.31 33	1.50 38	1.75 44	2.00 51	2.38 60	2.50 64	3.38 86	3.75 95	4.19 106	4.50 114	-	
	B	1.06 22	1.31 33	1.50 38	1.84 47	2.22 56	2.50 64	3.03 77	3.34 85	4.38 111	4.88 124	5.75 146	6.25 159	-	
	C	.75 19	.88 22	1.00 25	1.12 28	1.31 33	1.38 35	1.69 43	2.06 52	2.50 64	3.12 79	3.12 79	-	-	
	D	-	-	-	-	-	-	-	-	-	-	-	-	-	
	E	-	-	-	-	-	-	-	-	-	-	-	-	-	
	F	-	-	-	-	-	-	-	-	-	-	-	-	-	
	G	1.00 25	1.31 33	1.50 38	1.75 44	2.00 51	2.38 60	2.69 68	3.25 83	-	-	-	-	-	-
	H	.88 22	1.12 28	1.25 32	1.50 38	1.75 44	2.00 51	2.25 57	2.50 64	-	-	-	-	-	-
	J	1.25 32	1.50 38	1.62 41	1.88 48	2.25 57	2.62 67	2.81 71	3.31 84	-	-	-	-	-	-
	K	.88 22	1.00 25	1.25 32	1.50 38	1.75 44	2.00 51	2.25 57	2.50 64	3.00 76	3.62 92	4.25 108	5.00 127	5.75 146	6.25 159
	L	1.25 32	1.38 35	1.50 38	1.88 48	2.00 51	2.38 60	2.62 67	3.12 79	3.38 86	3.62 92	4.25 108	4.50 114	4.75 121	-
	M	.62 16	.69 18	.75 19	.94 24	1.00 25	1.19 30	1.31 33	1.56 40	1.69 43	1.81 46	2.12 54	2.25 57	2.38 60	-
	N	.88 22	1.00 25	1.25 32	1.50 38	1.75 44	2.00 51	2.25 57	2.50 64	3.00 76	3.62 92	4.25 108	5.00 127	6.25 159	-
	P	1.19 30	1.19 30	1.19 30	1.31 33	1.38 35	1.69 43	1.88 48	2.00 51	2.25 57	2.50 64	2.75 70	-	3.00 76	-
	Q	.56 14	.69 18	.81 21	.94 24	1.06 27	1.31 33	1.69 43	1.94 49	2.44 62	2.88 73	3.50 89	-	4.50 114	-
	R	.81 21	1.06 27	1.06 27	1.31 33	1.50 38	1.69 43	1.81 46	1.88 43	2.00 51	2.50 64	2.69 63	2.81 71	2.94 75	-
	PLUGS* AND BUSHINGS	A	.38 10	.44 11	.50 13	.56 14	.62 16	.75 19	.81 21	.81 21	.88 22	1.06 27	1.12 28	1.19 30	1.25 32
B		.25 6	.25 6	.31 8	.38 10	.44 11	.50 13	.56 14	.62 16	.69 18	.75 19	.81 21	.88 22	1.00 25	
C		.28 7	.38 10	.44 11	.56 14	.62 16	.81 21	.94 24	1.12 28	1.31 33	1.50 38	1.69 43	1.88 48	2.50 64	
D		.38 10	.50 13	.60 16	.62 16	.62 16	.81 21	.81 21	.84 21	.88 22	1.69 43	1.75 44	1.81 46	1.88 48	
E		.25 6	.25 6	.31 8	.31 8	.38 10	.38 10	.56 14	.62 16	.69 18	.75 19	.81 21	.88 22	1.00 25	
F		1.38 35	1.62 41	1.62 41	1.75 44	1.75 44	2.00 51	2.00 51	2.00 51	2.50 64	2.75 70	2.75 70	3.00 76	3.00 76	
G		-	.62 16	.69 18	.88 22	1.06 27	1.38 35	1.75 44	2.00 51	2.50 64	3.00 76	3.53 90	4.12 105	4.62 117	
H		-	.19 5	.19 5	.19 5	.25 6	.25 6	.38 10	.31 8	.44 11	.50 13	.62 16	.62 16	.62 16	
J		-	.50 13	.50 13	.62 16	.62 16	.81 21	.81 21	.84 21	.88 22	1.19 30	1.25 32	1.38 35	1.50 38	
K		-	.44 11	.50 13	.56 14	.62 16	.75 19	.81 21	.81 21	.88 22	1.06 27	1.12 28	1.19 30	1.25 32	

ASME B16.11 plugs and bushings are not identified by pressure class. They may be used for ratings up through pressure class 6000.
 ASME B16.11 hex. head bushings of one-size reduction should not be used in services wherein they might be subject to harmful loads and forces other than internal pressures.

Forged Carbon Steel Fittings

DESCRIPTION	CLASS DESIGNATION	SERIES NUMBER	SIZE RANGE	DESCRIPTION	CLASS DESIGNATION	SERIES NUMBER	SIZE RANGE	DESCRIPTION	CLASS DESIGNATION	SERIES NUMBER	SIZE RANGE
 <p>90° ELLS ASME B16.11</p>	3000	SW 229	1/8 - 4 DN 6 - 100	 <p>PIPE CAPS ASME B16.11</p>	3000	SW 4200	1/8 - 4 DN 6 - 100	 <p>WELD NECK COUPLINGS ASME B31.1 F1.2.1.8(f)</p>	3000	SW 1211 SWT 1211	1/4 - 3 DN 8 - 80 1/2 - 2 DN 15 - 50
 <p>45° ELLS ASME B16.11</p>	6000	SW 1299	1/2 - 4 DN 15 - 100	 <p>COUPLINGS ASME B16.11</p>	6000	SW 4001	1/2 - 2 DN 6 - 50	 <p>WELD NECK COUPLINGS ASME B31.1 F1.2.1.8(f)</p>	6000	SW 1160 SWT 1160	1/8 - 3 DN 6 - 80 1/2 - 2 DN 15 - 50
 <p>TEES ASME B16.11</p>	3000	SW 2001	1/8 - 4 DN 6 - 100	 <p>REDUCER INSERTS ASME B16.11</p>	3000	SW 2324	1/8 - 4 DN 6 - 100	 <p>TYPE 1</p>	3000	SW 503*	3/8 X 1/4 DN 10 x 8 Thru 4 X 3 DN 100 x 80
 <p>CROSSES ASME B16.11</p>	6000	SW 2024	1/2 - 4 DN 15 - 100	 <p>TYPE 2</p>	6000	SW 2350	1/2 - 4 DN 15 - 100	 <p>REDUCER INSERTS MSS SP-79</p>	6000	SW 623*	1/2 X 1/4 DN 15 x 8 Thru 2 1/2 X 2 DN 65 x 50
 <p>HALF COUPLINGS ASME B16.11</p>	3000	SW 243	1/8 - 4 DN 6 - 100	 <p>HALF COUPLINGS ASME B16.11</p>	3000	SW 150	1/4 - 4 DN 8 - 100		3000	SW 2090	1/8 - 4 DN 6 - 100
 <p>45° LATERALS</p>	6000	SW 1899	1/2 - 2 DN 15 - 100		6000	SW 2110	1/2 - 2 DN 15 - 50				

Notes concerning Pressure-Temperature Ratings For Fittings
The ratings for forged steel fittings correspond to the pressure retaining capabilities of the connecting pipe. Pressure temperature ratings are dependent on the pipe schedule, service conditions, and the pressure piping code covering the particular installation. Rating guidance is provided in ASME B16.11 which establishes procedures and tabulates a correlation of fitting pressure class designations with pipe schedule or wall designations. See page 124 for extract.

Carbon Steel material conforms to ASTM A105.
*Dimensions for Reducer Inserts furnished on request.
Refer to Pages 116-120 for full materials description.

Socket Weld Fitting Dimensions

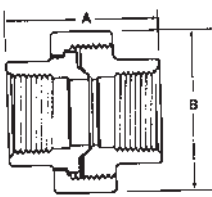
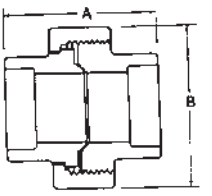
Fitting Class Designation	NPS	1/8	1/4	3/8	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3	4
	DN	6	8	10	15	20	25	32	40	50	65	80	100
CLASS 3000	A	.44 11.0	.44 11.0	.53 13.5	.62 15.7	.75 19.1	.88 22.5	1.06 27.0	1.25 32.0	1.50 38.0	1.62 41.1	2.25 57.0	2.62 66.5
	B	.420 10.8	.555 14.2	.690 17.6	.855 21.8	1.065 27.2	1.330 33.9	1.675 42.7	1.915 48.8	2.406 61.2	2.906 73.9	3.535 89.9	4.545 115.2
	C	.75 19.1	.75 19.1	.75 19.1	.88 22.5	1.00 25.4	1.12 28	1.31 33	1.38 35.1	1.69 43	2.06 52	2.47 63	3.12 79
	D	.25 6.4	.38 9.7	.50 12.7	.62 15.7	.81 20.6	1.06 26.9	1.38 35.1	1.62 41.1	2.06 52.3	2.50 63.5	3.06 77.7	4.00 101.6
	E	.38 9.5	.38 9.5	.44 11.0	.50 12.7	.56 14.0	.62 15.5	.69 17.5	.75 19.1	.88 22.5	.88 22.5	1.00 25.4	1.12 28.5
	F	.31 8.0	.31 8.0	.31 8.0	.44 11.0	.50 12.7	.56 14.0	.69 17.5	.81 20.5	1.00 25.4	1.12 28.4	1.25 32	1.62 41.0
	G	-	-	-	.44 11.0	.56 14.0	.56 14.0	.56 14.0	.56 14.0	.69 17.5	.69 17.5	-	-
	H	.91 23	.91 23	1.06 27	1.31 33	1.50 38	1.84 47	2.22 56	2.50 64	3.03 77	3.69 94	4.38 111	5.75 146
	J	.86 22	.86 22	.97 25	1.09 28	1.28 33	1.47 37	1.72 44	1.97 50	2.35 60	2.97 75	3.35 85	4.16 106
	K	-	-	-	1.75 44	2.12 54	2.50 64	2.81 71	3.19 81	4.38 111	5.31 135	-	-
	L	-	-	-	2.50 64	3.00 76	3.50 89	4.00 102	4.50 114	6.00 152	7.50 190	-	-
	M	.75 19	.88 22	1.06 27	1.25 32	1.50 38	1.81 46	2.25 57	2.50 64	3.00 76	3.62 92	4.31 109	5.50 140
	N	.25 6.5	.25 6.5	.25 6.5	.38 9.5	.38 9.5	.50 12.7	.50 12.7	.50 12.7	.75 19.1	.75 19.1	.75 19.1	.75 19.1
	P	1.06 27	1.06 27	1.12 28	1.38 35	1.50 38	1.75 44	1.88 48	2.00 51	2.50 64	2.50 64	2.75 70	3.00 76
	Q	.62 15.7	.62 15.7	.69 17.5	.88 22.5	.94 24.0	1.12 28.5	1.19 30.0	1.25 32.0	1.62 41.1	1.62 41.1	1.75 44.5	1.88 48.0
	R	-	.36 9.1	.49 12.4	.62 15.7	.82 20.8	1.05 26.7	1.38 35.1	1.61 40.9	2.07 52.6	2.47 62.7	3.07 78	4.03 102.4
	S	-	.69 17.5	.81 20.6	.94 23.9	1.06 26.9	1.31 33.3	1.69 42.9	1.94 49.3	2.44 62.0	2.88 73.2	3.50 88.9	4.50 114.3
	T	-	1.19 30	1.19 30	1.31 33	1.38 35	1.69 43	1.88 48	2.00 51	2.25 57	2.50 63.5	2.75 70	3.00 76
	U	-	.38 9.5	.38 9.5	.38 9.5	.50 12.7	.50 12.7	.50 12.7	.50 12.7	.62 15.7	.62 15.7	.62 15.7	1.00 25.4
	V	.44 11.0	.44 11.0	.44 11.0	.50 12.7	.56 14.0	.62 15.7	.69 17.5	.75 19.0	.88 22.5	.88 22.5	1.00 25.4	1.12 28.5
W	.69 18	.69 18	.75 19.1	.88 22	1.00 25.4	1.06 27	1.19 30	1.25 32	1.50 38	1.50 38	1.75 44	1.88 48	
X	-	.94 24	1.06 27	1.31 33	1.50 38	1.81 46	2.19 56	2.50 64	3.12 79	3.62 92	4.38 111	5.56 141	

Fitting Class Designation	NPS	1/8	1/4	3/8	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3	4
	DN	6	8	10	15	20	25	32	40	50	65	80	100
CLASS 6000	A	-	-	-	.75 19.1	.88 22.5	1.06 27.0	1.25 32.0	1.50 38.0	1.62 41.0	2.25 57.0	2.50 63.5	2.75 70.0
	B	.420 10.8	.555 14.2	.690 17.6	.855 21.8	1.065 27.2	1.330 33.9	1.675 42.7	1.915 48.8	2.406 61.2	2.906 73.9	3.535 89.8	4.545 115.2
	C	-	-	-	1.00 25.4	1.12 28	1.31 33	1.38 35	1.69 43	1.75 44	2.50 64	2.50 64	3.12 79
	D	-	-	-	.47 11.9	.62 15.7	.81 20.6	1.16 29.5	1.34 34.0	1.69 42.9	2.12 53.8	2.62 66.5	3.44 87.4
	E	-	-	-	.50 12.7	.56 14.0	.62 15.7	.69 17.5	.75 19.1	.88 22.5	.88 22.5	1.00 25.4	1.12 28.5
	F	-	-	-	.50 12.7	.56 14.0	.69 17.5	.81 20.5	1.00 25.4	1.12 28.5	1.25 32.0	1.38 35.0	1.62 41.0
	G	-	-	-	-	-	-	-	-	-	-	-	-
	H	-	-	-	1.50 38	1.84 47	2.22 56	2.50 64	3.03 77	3.34 85	4.38 111	4.88 124	6.25 159
	J	-	-	-	1.28 33	1.47 37	1.72 44	1.97 50	2.35 60	2.47 63	3.35 85	3.72 94	4.47 114
	K	-	-	-	-	-	-	-	-	-	-	-	-
	L	-	-	-	-	-	-	-	-	-	-	-	-
	M	-	-	-	1.50 38	1.75 44	2.25 57	2.50 64	3.00 76	3.62 92	4.25 108	5.00 127	6.25 159
	N	-	-	-	.38 9.5	.38 9.5	.50 12.7	.50 12.7	.50 12.7	.75 19.1	.75 19.1	.75 19.1	.75 19.1
	P	-	-	-	1.38 35	1.50 38	1.75 44	1.88 48	2.00 51	2.50 64	2.50 64	2.75 70	3.00 76
	Q	-	-	-	.88 22.5	.94 24.0	1.12 28.5	1.19 30.0	1.25 32.0	1.62 41.0	1.62 41.0	1.75 44.5	1.88 48.0
	R	.27 6.9	.36 9.1	.49 12.4	.62 15.7	.82 20.8	1.05 26.7	1.38 35.1	1.61 40.9	2.07 52.6	2.47 62.7	3.07 78.0	4.03 102
	S	.56 14.2	.69 17.5	.81 20.6	.94 23.9	1.06 26.9	1.31 33.3	1.69 42.9	1.94 49.3	2.44 62.0	2.88 73.2	3.50 88.9	4.50 114
	T	1.19 30	1.19 30	1.19 30	1.31 33	1.38 35	1.69 43	1.88 48	2.00 51	2.25 57	2.50 63.5	2.75 70	3.00 76
	U	.38 9.5	.38 9.5	.38 9.5	.50 12.7	.50 12.7	.50 12.7	.50 12.7	.62 15.7	.62 15.7	.62 15.7	1.00 25.4	
	V	-	-	-	.50 12.7	.56 14.0	.62 15.5	.69 17.5	.75 19.0	.88 22.5	.88 22.5	1.00 25.4	1.12 28.5
W	-	-	-	1.00 25.4	1.06 27	1.25 32	1.31 33	1.38 35	1.62 41	1.62 41	1.88 48	2.12 54	
X	.88 22	1.00 25.4	1.25 32	1.50 38	1.75 44	2.25 57	2.50 64	3.00 76	3.62 92	4.25 108	5.00 127	6.25 159	

Bold face numerals are in inches and pounds.

Blue numerals are in millimeters and kilograms.

Forged Steel Unions

DESCRIPTION	SERVICE DESIGNATION	SERIES NO. SIZE RANGE	UNION DIMENSIONS											
			PNS DN	1/8 6	1/4 8	3/8 10	1/2 15	3/4 20	1 25	1-1/4 32	1-1/2 40	2 50	2-1/2 65	3 80
 THREADED ENDS	CLASS 3000 MSS SP-83	1931 1/8 - 3 DN 6 - 80	A	1.63 41	1.63 41	1.81 46	1.93 49	2.24 57	2.44 62	2.81 71	3.01 76	3.39 86	4.03 102	4.29 109
		1951 1/4 - 2 8 - 50	B	1.59 40	1.59 40	1.88 48	1.91 49	2.41 61	2.75 70	3.25 83	3.62 92	4.28 109	5.22 133	6.15 156
	CLASS 6000*	1961 1/4 - 2 DN 8 - 50	A	—	1.81 46	1.97 50	2.22 56	2.47 63	2.81 71	3.06 78	3.38 86	4.09 104	—	—
		B	—	1.88 48	1.91 48	2.41 61	2.75 70	3.25 83	3.62 92	4.28 109	5.20 132	—	—	
 SOCKET WELD ENDS	CLASS 3000 MSS SP-83	SW 1931 1/8 - 3 DN 6 - 80	A	1.63 41	1.63 41	1.81 46	1.93 49	2.24 57	2.44 62	2.81 71	3.01 76	3.39 86	4.03 102	4.29 109
		SW 1951 1/4 - 2 DN 8 - 50	B	1.59 40	1.59 40	1.88 48	1.91 49	2.41 61	2.75 70	3.25 83	3.62 92	4.28 109	5.22 133	6.15 156
	CLASS 6000*	SW 1961 1/4 - 2 DN 8 - 50	A	—	—	—	2.22 56	2.47 63	2.81 71	3.06 78	3.38 86	4.09 104	—	—
		B	—	—	—	2.41 61	2.75 70	3.25 83	3.62 92	4.28 109	5.20 132	—	—	

Contact Us About Marpac Unions

*"B" dimension is across corners of nut.

PRESSURE-TEMPERATURE RATINGS FOR THREADED AND SOCKET WELD UNIONS					
PRESSURE IN PSIG			METRIC: PRESSURE IN BARS		
SERVICE TEMP. (°F)	CLASS 3000	CLASS 6000	SERVICE TEMP. (°C)	CLASS 3000	CLASS 6000
-20 to 100	3000	6000	-29 to 38	206.9	413.8
200	2735	5470	50	202.9	405.7
300	2655	5310	100	187.9	375.9
400	2565	5130	150	183.0	366.0
500	2425	4850	200	177.4	354.8
600	2220	4440	250	168.9	338.0
650	2180	4360	300	157.0	314.1
700	2155	4310	350	149.9	299.9
750	—	—	371	148.6	297.2

Bold face numerals are in inches.
Blue numerals are in millimeters.

***Note:**
There are no current industry standards applicable to Class 6000 unions. Class 6000 unions are designed **proportionately** to Class 3000 unions which meet the provisions of MSS SP-83.

Limited Warranty

Seller warrants that the Goods shall be free from defects in materials manufactured by Seller and in Seller's workmanship for a period of one (1) year following shipment (the "Warranty Period"). This limited warranty shall apply only in favor of Buyer, shall expire on the last day of such one (1) year period, and shall be subject to the following:

- (a) This warranty shall not apply to Goods which have been (i) repaired or altered by any Person other than the Seller, (ii) subjected to unreasonable or improper use or use beyond rated conditions, improper storage, negligence or accident, (iii) damaged because of use of the Goods or the incorporation of the Goods into use of any Goods with other materials or equipment, after Buyer (or any other Person using the Goods) has, or reasonably should have, knowledge of any defect; (iv) manufactured, fabricated or assembled by any Person other than Seller (Seller shall assign to Buyer, to the extent same is assignable, any warranty Seller has received from the manufacture of such Goods); or (v) improperly installed by any Person (including Buyer) other than Seller.
- (b) This warranty shall not be effective unless Seller receives a written claim within thirty (30) days after discovery of any defect with respect to which a claim is made.
- (c) Seller shall have the right (but not the obligation) to verify, with its own representatives, the nature and extent of any claimed defect prior to return of the Goods to Seller. Upon request by Seller, Buyer shall, at its own risk and expense, promptly return the Goods in question to Seller's Plant.
- (d) Buyer covenants to inform all subsequent buyers to the Goods of the limitations on and exclusion of the warranties provided for herein. Buyer hereby indemnifies and agrees to hold Seller harmless from and against all losses costs and expenses, including reasonable attorney's fees, incurred by Seller as a result of any third party claim relating to the purchase, sale or use of, otherwise relating to, the Goods covered by this Agreement.
- (e) Seller's liability for any breach of warranty shall be limited either to (i) repair or replacement (whichever Seller shall elect) at Seller's Plant of any Goods determined by Seller to be defective, or (ii) payment of an amount equal to the invoiced cost to Buyer of the part or material which is defective, as Seller may elect. In no event shall Seller be required to repair, replace or reimburse Buyer for more than the part or material that is found to be defective and Seller's liability shall in no event be greater than the invoiced price of the item and shall not include labor, shipping or other costs incurred in connection with the reshipment of defective Goods to Seller or the reinstallation of such Goods after any repair or replacement. The Goods, as a whole, shall not be construed to be a "part" or "material" for the purpose of the immediately preceding sentence. Any Goods that are repaired or replaced by Seller shall be re-delivered to Buyer F.O.B. Seller's Plant and shall be warranted for the remaining term of the original Warranty Period for such Goods. **THE REMEDY SET FORTH IN THIS LIMITED WARRANTY IS EXPRESSLY AGREED TO BE THE SOLE AND EXCLUSIVE REMEDY FOR ANY BREACH OF WARRANTY.**
- (f) **THIS LIMITED WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES (EXCEPT OF TITLE), EXPRESS, IMPLIED OR STATUTORY, INCLUDING WITHOUT LIMITATION ANY IMPLIED OR EXPRESS WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND CONFORMITY TO MODELS OR SAMPLES. ALL OTHER LIABILITY WHETHER IN CONTRACT OR TORT, STRICT LIABILITY, NEGLIGENCE OR OTHERWISE, IS HEREBY EXCLUDED.**

Glossary of Abbreviations & Terms Used in the Valve and Fitting Industry

AARH – Arithmetic Average Roughness Height
AISI – American Iron and Steel Institute
API – American Petroleum Institute
ANSI – American National Standards Institute, Inc.
ASME – American Society of Mechanical Engineers
ASTM – American Society for Testing and Materials
AWS – American Welding Society

BB – Bolted Bonnet
BHN – Brinell Hardness Number
Blind Flange – A Flange with no flow way bore, used to provide a pressure-tight closure of a flanged opening.
Btu – British Thermal Unit
BWE – Butt Weld Ends

C or Cel – Celsius degrees
CI – Cast Iron
CI – Chlorine Institute
CR 13 – 13% Chromium Stainless Steel
CRES – Corrosion Resistant Steel
C_v – The number of U.S. gallons per minute of water at 70°F which will flow through a valve at a pressure drop of one psi.
CWP – Cold Working Pressure

DN – Diameter Nominal (Metric)

ELL – Elbow

FAS – Free Alongside Steamer
F or Fahr – Fahrenheit degrees
F & D – Faced and Drilled
FF – Flat Face
FHF – Full Hard Faced
FLG – Flanged
FOB – Free on Board
FTTG – Fitting

G – Gas
gpm – Gallon per Minute

HF – Hard Faced
HW – Handwheel

IBBM – Iron Body Bronze Mounted
ID – Inside Diameter
INT – Integral
IPS – Iron Pipe Size
ISRS – Inside Screw Rising Stem
ISNRS – Inside Screw Non. Rising Stem

Kg – Kilograms km – Kilometers

LH – Left Hand

MAV – Motor Actuated Valve
mm – Millimeter
MOV – See MAV
MSS – Manufacturers Standardization Society of the Valve & Fitting Industry

NACE – National Association of Corrosion Engineers (Formerly NACE International)
NPS – Nominal Pipe Size
NPT – National Standard Pipe Thread Taper
NRS – Non Rising Stem

OD – Outside Diameter
One-Piece Stem – An inseparable Stem and Disc made from one piece of metal.
OS&Y – Outside Screw and Yoke
OWG – Oil, Water & Gas (See CWP)

PN – Pressure Nominal (Metric)
Psi – Pounds per square inch
Psia – Pounds per square inch absolute
Psig – Pounds per square inch gage
P-T – Pressure-Temperature

Rc – Rockwell “C”
RF – Raised Face
RH – Right Hand
RMS – Root Mean Square Roughness Height
RS – Rising Stem
RTJ – Ring-Type Joint

S – Steam
SAE – Society of Automotive Engineers
SC – Swing Check Valve
Sch. or Sched. – Schedule (Pipe Wall Thickness)
SCFM – Standard Cubic Feet per Minute
Screw Bonnet – Body and Bonnet Threaded Together
SE – Screwed Ends
Seal Weld – Threaded Joint Back Welded for Seal
SS – Stainless Steel
Stem Nut – Operating Nut
Stuffing Box – Packing Chamber
STD – Standard Wall Thickness
Stop Check – A Check valve in which the closure member can be mechanically closed.
SWE – Socket Weld End
SWP – Steam Working Pressure

T – Tee
Thd. – Threaded
TIR – Total Indicator Reading

UB – Union Bonnet

W – Water
Wedge – Gate
WOG – Water, Oil and Gas (See CWP)
WSP – Working Steam Pressure
WWP – Working Water Pressure

XS – Extra Strong Wall Thickness
XXS – Double Extra Strong Wall Thickness

Y – Wye Valve, Fitting or Strainer
Yoke Bushing – Operating Stem Nut
Yoke Nut – Stem Nut

Refer to MSS-SP-96 for additional Abbreviations and Terms used in the Valve and Fitting Industry. (Manufacturers Standardization Society, 127 Park Street N.E., Vienna, VA 22180)

Standards in the Valve and Fitting Industry

Codes and standards play an important role in the design and production of forged steel valves, fittings, and unions. These codes and standards cover material, product dimension, design, examination, inspection, testing procedure, pressure/temperature ratings, and safety.

Material standards are developed by such organizations as the American Society for Testing and Materials (ASTM), the American Iron & Steel Institute (AISI), the Society of Automotive Engineers (SAE), and the National Association of Corrosion Engineers (NACE) .

The American National Standards Institute, Inc. (ANSI), whose membership is composed of both user and producer groups, serves as the national coordinator for the majority of code and **product** standards related to the Valve and Fittings Industry. **Product** standards are also developed and issued by individual user and/or manufacturing agencies such as the American Society of Mechanical Engineers (ASME), American Petroleum Institute (API) and the Manufacturers' Standardization Society (MSS).

Procedural and **safety** standards are issued by ANSI, MSS and the American Society of Mechanical Engineers (ASME).

Following is a partial list of codes and standards that have a direct bearing on the design and production of Vogt's forged steel valves, fittings, and unions. The codes and standards are interrelated as the following descriptions project:

ASME Boiler & Vessel Code

Section I – Power Boilers

Section II – Material Specifications

Section III – Nuclear Power Plant Components

Section V – Nondestructive Examination

Section VIII – Pressure Vessels

Section IX – Welding and Brazing Qualifications

The above Codes (Sections I, III & VIII) cover construction requirements for Boilers, Pressure Vessels, and Nuclear Components that require Authorized Inspection Agency involvement. Section I and VIII Codes relate to the boiler and pressure vessel proper and not to external piping. Section III Code includes rules for nuclear components including piping. Section II, V and IX Codes cover material, nondestructive examination and welding requirements, respectively, for ASME construction.

ASME Codes for Pressure Piping

ASME B31.1-95 – Power Piping

ASME B31.3-96 – Process Piping

ASME B31.4 – Liquid Transportation Systems for Hydrocarbons, Liquid Petroleum Gas, Anhydrous Ammonia and Alcohols.

ASME B31.5-92 – Refrigeration Piping

ASME B31.8-95 – Gas Transmission and Distribution Piping Systems

ASME B31.9 – Building Services Piping Systems

ASME B31.11 – Slurry Transportation Piping Systems

The above are piping construction codes that include requirements for design, materials, fabrication, examination, testing, inspection and components. Valve, fitting, union and flange requirements used in these piping systems are normally referenced standards, as follows:

Valve Standards

ASME B16.34 – Valves - Flanged, Threaded and Welding Ends

API-600 – Steel Gate Valves, Flanged, and Butt-welding Ends

API-602 – Compact Steel Gate Valves

MSS-SP-99 – Instrument Valves

MSS-SP-118 – Compact Steel Globe and Check Valves*

The above are component (valve) standards used for construction of Vogt valves as noted in this catalog.

Flanges, Fittings and Unions

ASME B16.5 – Pipe Flanges and Flanged Fittings

ASME B16.11 – Forged Steel Fittings, Socket Weld and Threaded

MSS-SP-83 – Steel Pipe Unions, Socket Welding and Threaded Ends

MSS-SP-79 – Socket Welding Reducer Inserts

The above standards are recognized for the construction of flanges, fittings and Unions.

(* This standard practice (SP) is not currently referenced in Vogt's VV-200 catalog but Vogt class 150, 300, 600, 800 and 1500 globe and check valves would normally meet the SP but they also meet the wall thickness requirements of API 602. Vogt Class 150, 300 & 600 globe and check valves meet the applicable requirements of a class 800 API602 valve, including the heavier wall thicknesses of API602.)

Standards in the Valve and Fitting Industry

Valve, Fitting, Flange and Union Details

ASME B1.20.1 – Pipe Threads, General Purpose

ASME B16.10 – Face-to-Face and End-to-End Dimensions of Ferrous Valves

ASME B16.20 – Ring Joint Gaskets and Grooves for Steel Pipe Flanges

ASME B16.25 – Buttwelding Ends

MSS-SP-6 – Standard Finishes for Contact Faces of Pipe Flanges and Connecting End Flanges of Valves

MSS-SP-25 – Standard Marking System for Valves, Fittings, Flanges and Unions

MSS-SP-45 – Bypass and Drain Connection Standard

The above standards are detailed dimensional, marking, finish and bypass valve and fittings instructions for use in the manufacture of valves, flanges and fittings. The product standards normally refer to these standards for detailed instructions.

Inspection and Testing

MSS-SP-61 – Pressure Testing of Valves

API-598 – Valve Inspection and Test

The above highly recognized standards provide detailed instructions for inspection and testing of valves.

NACE Standard

MR-01-75 – Sulfide Stress Cracking Resistant Metallic Material for Oil Field Equipment

This standard is a recognized practice for selection of materials for construction of valves to be used in a sour environment. Such materials are recommended when sulfide stress cracking (SSC) is anticipated.

Chlorine Institute

PAMPHLET #6 – Piping Systems For Dry Chlorine

This publication is intended to provide useful information concerning the construction of chlorine piping systems including valves.

For detailed Material Standards used by Vogt valves, see page 118 and 119.

ADDRESSES:

American Iron & Steel Institute (AISI)
1133 15th Street, N.W.
Washington, D.C. 20005-2701

American National Standards Institute (ANSI)
11 West 42nd Street
New York, N.Y. 10036

American Petroleum Institute (API)
1220 L Street Northwest
Washington, D.C. 20005

American Society of Mechanical Engineers (ASME) United Engineering Center
345 E. 47th Street
New York, N.Y. 10017

American Society of Testing Materials (ASTM)
100 Barr Harbor Dr.
West Conshohocken, PA 19428-2959

Manufacturers Standardization Society of the Valve & Fitting Industry, Inc. (MSS)
127 Park Street, N.E.
Vienna, VA 22180

NACE International
P.O. Box 218340
Houston, TX 77218-8340

Society of Automotive Engineers (SAE)
400 Commonwealth Drive
Warrendale, PA 15096

The Chlorine Institute, Inc.
2001 L Street, NW
Washington, D.C. 20036

Care and Maintenance of Vogt Forged Steel Valves

VALVE CARE BEFORE INSTALLATION

Vogt valves are carefully made from selected materials to give long, trouble-free service when properly installed in applications for which they were designed. Proper care and maintenance in the field can contribute significantly to maximum performance.

The care the valve receives between the time it is shipped by the manufacturer and installed in the piping system is important. During this period, the valve can be handled many times and can be kept in storage for long periods. Industrial valves are not delicate, but they are mechanical devices which should be treated as such and handled with care.

Vogt always provides valves with appropriate end covers to protect the end connections and to prevent foreign material from entering the valve. In addition, small valves are shipped in sealed cartons while larger valves are usually palletized. If at all practical, keep the valves in the cartons or on the pallets with end covers in place until ready to be installed. Storing the valves off the ground and indoors is always preferable. When stored outside, valves should be off the ground and protected by a weatherproof cover.

Prior to installation, the valves and nameplates should be checked for proper identification to be sure the valve is the proper type and of a suitable pressure class. Actuate the valve to check for possible damage from shipping and handling. Also, it is extremely important to inspect the interior of both the valve and the adjoining pipe for cleanliness. By far the major

cause of seat leakage and seat damage is foreign material in the line. Also, inspect end connections to be sure that pipe threads and flange faces are free from scratches, nicks, or dents.

ROUTINE INSPECTION AND MAINTENANCE

Once the right valve is properly installed, field maintenance is of a generally routine nature and can be readily performed by the user. The critical areas of a valve include the stem threads and those locations where leakage will most likely occur—the stem packing, the bonnet joint, the seat and the end connections. It is desirable that a maintenance program be established which will include periodic inspection of the noted critical areas. Stem threads should be lubricated prior to installation and periodically as part of the regular inspection. A high pressure and temperature lubricant such as Dow Corning *Molykote*[™] G-n Paste should be used .

The most common location of a noticeable leak is at the stem seal. Leakage at the stem can usually be stopped by adjusting the packing. If leakage cannot be stopped by packing adjustment, repacking is indicated. However, backseating the valve and attempting to repack under pressure is hazardous and is not recommended. Rather than attempting to repack under pressure, it is preferable to use the backseat to control the stem leakage until a shutdown provides safe repacking conditions.

MAJOR FIELD REPAIR

Maintenance involving rework or replacement of parts is considered major repair. When circumstances dictate field repair of Vogt valves, the following information is offered as an aid. It must be pointed out, however, that Vogt valves repaired in the field are no longer under "Product Warranty," and in no event is Vogt liable for any incidental or consequential damages resulting from any cause whatsoever. There are no warranties of any kind whatsoever, express or implied, other than those stated in Vogt's current Terms and Conditions.

Preliminary Considerations for Valve Repair:

1. Use experienced, trained personnel.
2. Observe all standard safety precautions.
3. If possible, remove valve from line so that work can be done in a clean, well lighted area.
4. Use genuine Vogt replacement parts.
5. Use proper tools.
6. Pressure test valve before reinstalling. This is particularly essential on valves intended for critical service.
7. Remember that improper repairs can be hazardous.

Care and Maintenance of Vogt Forged Steel Valves

REPLACEMENT PARTS...HOW TO ORDER

Genuine replacement parts are available for Vogt current standard valves and can usually be shipped from stock. All parts are made with the same careful inspection and laboratory control given original valves and parts. Orders for replacement parts should clearly identify the items required and should specify the correct name of the part, valve size and series number, drawing and revision number, material, etc. The drawing and revision number which appears on the identification disc attached to the handwheel is of particular value.

In the absence of an identification disc, series numbers may be found on the side of the valve body or drawing numbers may be found on the bonnet flange. The purchase date and/or purchase order number will further identify the parts and materials originally ordered, especially valves with custom designed features.

The embossed number on each handwheel, having a prefix letter "V", is the pattern number of the handwheel and has no relation to the ordering of other valve parts. Prices for valve parts will be furnished on application.

TOOLS FOR INSTALLING REPLACEMENT PARTS

Wrenches are available (price on application) for the removal and replacement of renewable seats for globe, angle, and check valves. The wrenches are machined to an accurate finish to fit the spline broach on the inside diameter of the seat and are properly heat treated for strength and toughness.

DISASSEMBLY

Small valves of the union bonnet type or of the screw bonnet type are readily disassembled by unscrewing the union nut or the bonnet. In bolted bonnet valves, the nut should be removed from the bonnet stud bolts or hexagon head cap screws removed from the body. Tight bolt threads may be loosened by applying penetrating oil to the threads or by selectively heating the bolt at the point of thread engagement. On bonnet joints of the through bolt type, the bolts may be cut between the body and bonnet flanges for removal.

STEMS

Tight stems in valves of the O.S. & Y. type are caused by either dry, worn packing, or nonlubrication of yoke nut threads. Applying a few drops of oil to the stem threads and packing, and opening and closing the valve a few times, may loosen the stem. At the same time, make sure the packing gland bolting is pulled down evenly so the gland will not bind against the stem; however, care should be taken not to overcompress the packing.

A tight stem in an inside screw valve may also result from worn or overcompressed packing, or the stem bonnet threads may "freeze" from excessive service temperatures or from corrosive fluids in the valve. If the stem turns freely after all packing is removed, and if the surface of the stem in contact with the packing is in good condition, new packing is the remedy. If stem is still tight, turn valve to upright position, fill the stuffing box with penetrating oil, and let soak. If stem remains tight, a new bonnet and stem are required, or, if practical, an O.S. & Y. type valve could be substituted.

BONNET JOINTS

On valves of the union bonnet type, repairs can be made without removing the valve from the line provided there is enough wrench room for loosening and tightening the bonnet nut. Before loosening the bonnet nut, be sure valve is relieved of all pressure. A few hammer taps to the side of the bonnet nut or around the body neck of screw bonnet type valves will loosen nut or bonnet. Gasketed joints require smooth, clean surfaces on both the body and the bonnet gasket faces, and a new gasket is recommended for reassembly. On bolted bonnet valves in high temperature service, and particularly where severe thermal cycling is involved, it is recommended that bolt torque be checked periodically. This recommendation applies to gland bolting as well.

PACKING

Vogt valves have well proportioned stuffing boxes filled with the best grade of packing available. Before repacking, be sure to have the right grade, type, and size of packing.

Repacking under pressure is hazardous and is not recommended. The backseat should be used as a temporary measure to control the stem leakage until a shutdown provides safe repacking conditions.

Wipe all parts of the stuffing box, inside and out, before installing new packing. Vogt uses a split ring type packing. If this type is used for replacement, take care to stagger the ring slits so that they are not in line. After putting in a few rings, tamp them well into place, using the packing gland as a tamping tool. Then add enough packing to fill the

Care and Maintenance of Vogt Forged Steel Valves (cont.)

stuffing box. Pressure on the packing is applied by the packing nut or gland flange bolting, depending on valve design, which bears on a gland in the stuffing box. Gland bolting should be tightened evenly to obtain the proper packing compression for leak free service. Upon reassembling the valve, a few turns of the handwheel and a few drops of oil applied on the stem just above the packing will help work in the packing to the stem.

DISC AND SEAT

Leakage through seat and disc is not always easy to detect, but when definitely known to exist, immediate repair is recommended since delay may permanently damage the disc or seat or both.

The internal repair of gate valves 2" and smaller is usually found to be uneconomical. However, if a gate valve is disassembled for inspection or cleaning, care should be taken when removing the wedge to note and mark its orientation with respect to the valve body so that when the wedge is reinserted in the valve, it will have precisely the same relationship to the seats that it had in the original assembly.

The seat threads in angle, globe, and check valve bodies should be carefully inspected to make sure they are in useable condition. When installing new seats by using proper seat tools, the seats should be screwed tightly into the valve body, then unscrewed and examined to make sure they are making continuous contact for tight seal.

If seating surfaces show galling, slight pitting, grooving, or indentations not deeper than 0.010", lapping will usually restore the surfaces

sufficiently to permit tight closure. Defects deeper than 0.010" can seldom be corrected by lapping, but seating surfaces can be remachined or new parts installed. For relapping the seat and disc of Vogt globe, angle, or check valves, use a fine and a coarse grade emery base compound such as Clover Compound A and D. Apply a light coat of fine, or A, compound to the seating surface of disc or one-piece stem, insert disc or one-piece stem into seat, and lap using an oscillating motion. Lap a few minutes and then wipe seating surfaces clean. This will clearly show the extent of damage. If severe damage is noted, use the coarse, or D, compound and lap until all defects are removed. Then finish with the fine, or A, compound. It is recommended that the face of the disc be "blued" to check for contact between seating surfaces after final lapping.

Globe and angle valves require a lapping guide fixture to maintain alignment during the lapping operation.

A fixture as shown in Figure 1 may be made or, for O.S. & Y valves, a valve bonnet with yoke nut removed may be used. For relapping loose disc globe valves, place a washer between the disc and head of the stem and retighten the disc nut, as shown in Figure 1.

Vogt piston check valves require an adapter to screw into the piston for lapping the piston seating surface to the seat. The bore of the valve body serves as a guide for lapping, see Figure 2. Ball check valves are primarily used for fluids of high viscosity and the rolling action of the ball maintains seating surfaces in good condition until ball size or ball guide is worn and replacement parts are needed.

FIGURE 1

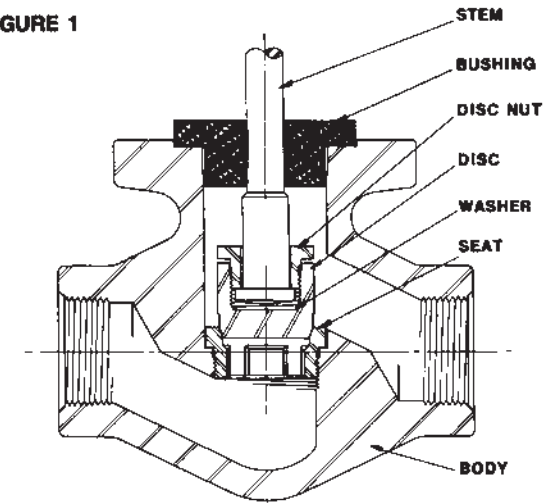
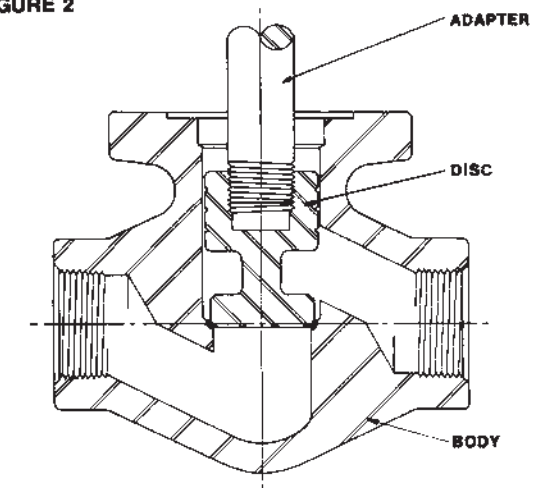


FIGURE 2



Recommended Spare Parts for Vogt Valves

A high degree of standardization of Vogt valves permits a small stock of replacement packing and gaskets to service your Vogt valves. The following matrix and part number tables provide the details for the purchasing of replacement gaskets for your Vogt bolted bonnet valves and packing for our popular class 150, 300, 600, 800 and 1500 gate, globe and angle valves.*

Packing Matrix

Pressure Class	NPS DN	1/2 15	3/4 20	1 25	1-1/4 32	1-1/2 40	2 50	2-1/2 65	3 80	4 100
150 Conventional Port		B	B	C	D	D	E	F	F	G
300 Conventional Port		B	B	C	D	D	E	F	F	G
600 Conventional Port		B	B	C	D	D	E	F	F	G
800 Conventional Port		B**	B	C	D	D	E	F	F	—
1500 Conventional Port		J	J	D	E	E	F	—	—	—
600 & 800 Full Port		B	C	D	—	E	F	—	—	—
1500 Full Port		B	D	E	E	F	—	—	—	—

**Also 1/4 & 3/8 sizes

Packing Set Part Numbers

Matrix	Flexible Graphite		Teflon	
	Packing Set	PN	Packing Set	PN
B	36323R	DC00065	36451T4	DC00065
C	36323R	DU00065	36451T6	DU00065
D	36323R	EG00065	36451T6	EG00065
E	36323R	EU00065	36451T6	EU00065
F	36323R	FI00065	36451T6	FI00065
G	36323R	FU00065	36451T5	FU00065
J	36323R	DT00065	36451T9	DT00065

*API 602/ASME B16.34 type valves—see valve description. For other valves consult your Vogt sales or engineering staff.

Recommended Spare Parts for Vogt Valves

Gasket Matrix (Spiral Wound Type)

Pressure Class	NPS DN	1/2 15	3/4 20	1 25	1-1/4 32	1-1/2 40	2 50	2-1/2 65	3 80	4 100
150 Conventional Port		A	A	B	C	C	D	E	E	F
300 Conventional Port		A	A	B	C	C	D	E	E	F
600 Conventional Port		A	A	B	C	C	D	E	E	F
800 Conventional Port		A**	A	B	C	C	D	E	E	-
1500 Conventional Port		A	A	B	C	C	D	-	-	-
600 & 800 Full Port		A	B	G	-	D	E	-	-	-
1500 Full Port		A	B	C	C	D	-	-	-	-

**Also 1/4 & 3/8 sizes

Gasket Matrix	Part Number (Including Suffix)		Spiral Wound Gasket Description*
A	31102S2 31102S2 31102S2 31102S2 31102S2	G18029 G33029 G51029 T33029 T51029	304/Graphite Filled 316/Graphite Filled Monel/Graphite Filled 316/Teflon Filled Monel/Teflon Filled
B	31103S3	(Same as above)	(Same as above)
C	31107S7	(Same as above)	(Same as above)
D	31105S5	(Same as above)	(Same as above)
E	31114S8	(Same as above)	(Same as above)
F	31119S	(Same as above)	(Same as above)
G	31104S4	(Same as above)	(Same as above)

*USAGE TABLE

Gasket	Where Used
304/Graphite	A105, A182-F5, F9, F11 Cl. 2 & F22 Cl.3 Valves
316/Graphite	A182, F316 Valves
Monel/Graphite	MM & HF Acid Trimmed Valves
316/Teflon	"T" Suffix Trimmed Valves
Monel/Teflon	Chlorine Valves

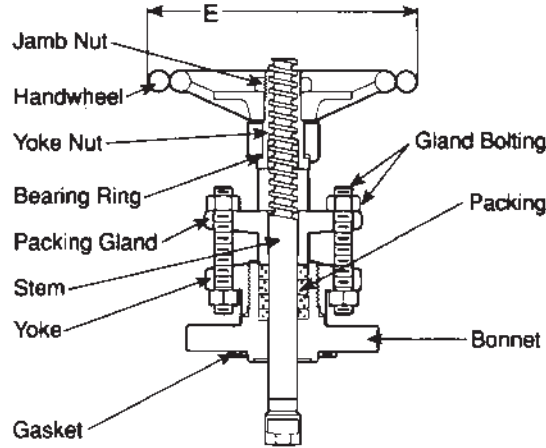
Bonnet Replacement Assemblies

Series 21000-Vogt Valve Replacement Bonnet Subassemblies

Some valve end users find it more expedient to replace the bonnet subassembly, complete with new packing, when repacking small bore valves. To support this maintenance philosophy, Vogt valve users may purchase A105 bonnet subassemblies for replacement on their Vogt valves by specifying the parts numbers noted below. The removed bonnet assemblies, if not damaged and are serviceable, can be repacked in a valve repair shop environment and be used during a later valve repacking cycle.

- Repacking made easy
- Promotes quick change
- Completely packed and ready to install
- Supports valve repacking in valve shop environment
- High degree of standardization permits retrofitting of popular Vogt Class 150, 300, 600, and 800, 13 Cr. trimmed, bolted bonnet valves.

The Replacement Bonnet Assembly Packages can be easily installed on most existing in-line Compact Design Gate Valves in Classes 150, 300, 600, and 800, of A105 bolted bonnet design with 13 Cr. trim. Specify the desired replacement Bonnet Assembly Package for the valve size and series you intend to repack by replacing the bonnet subassembly.



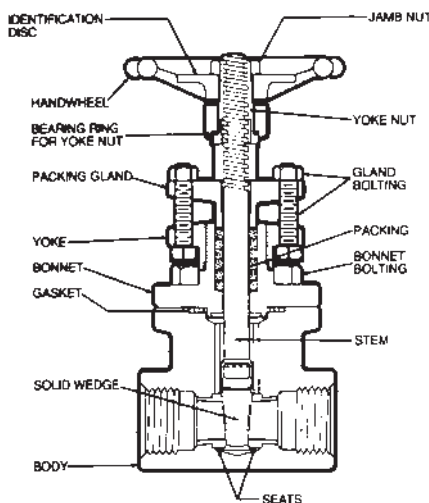
**Series 21000
A105/13 Cr. Trim**

Order by this number:

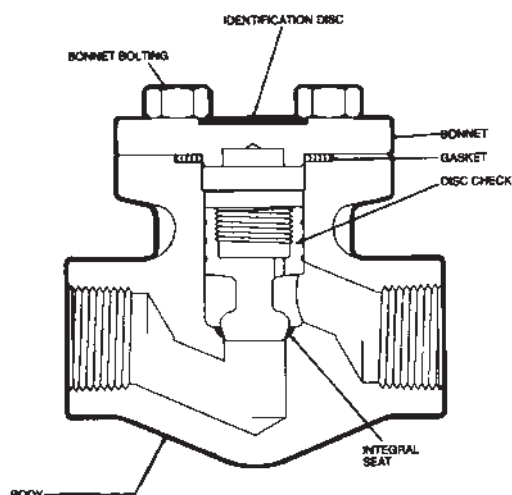
Valve Size	For Valve Series No.	Retrofit Bonnet Assembly Package No.	E
1/2, 3/4	353,363,373,12111, SW12111, 12161, SW12161	21000 04	4.00
1	353,363,373,12111, SW12111, 12161, SW12161	21000 06	4.75
1-1/4, 1-1/2	353,363,373,12111, SW12111, 12161, SW12161	21000 08	5.75
2	353,363,373,12111, SW12111, 12161, SW12161	21000 09	7.00

Write for Vogt's installation procedure covering instructions for proper field replacement of the series 21000 replacement bonnet subassemblies.

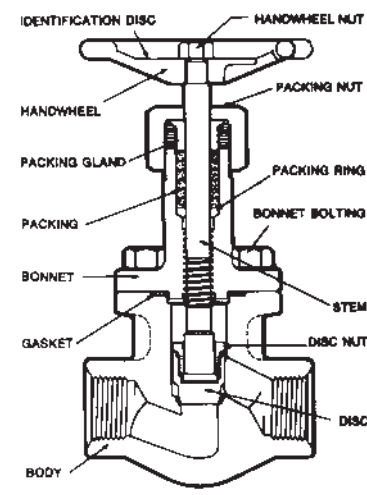
Typical Nomenclatures for Valves



GATE VALVE



CHECK VALVE



GLOBE VALVE

REPLACEMENT PARTS FOR VOGT VALVES

Vogt valves are carefully made from selected materials to give longer, more trouble-free service when properly installed in recommended applications. But proper care and maintenance in the field can contribute significantly to good performance. Much of the field maintenance is of a routine nature and can be readily performed by the user; however, major repairs are discouraged, and it is recommended that valves be returned to the factory for inspection and rework when major repairs are indicated.

The following information is offered as an aid to field maintenance of Vogt valves; however, Vogt valves repaired in the field do not carry the "Product Warranty" of valves repaired in our own facilities.

Preliminary Considerations

1. Use experienced, trained personnel.
2. Observe all standard safety precautions.
3. If possible, remove valve from line so that work can be done in a clean, well lighted area.
4. Have proper replacement parts.
5. Use proper tools.
6. Pressure test valve before reinstalling. This is particularly essential on valves intended for critical service.

In no event are we liable for any special, direct, indirect, or consequential damages however resulting from any cause whatsoever. There are no warranties of any kind other than those stated herein.

Replacement Parts—How To Order

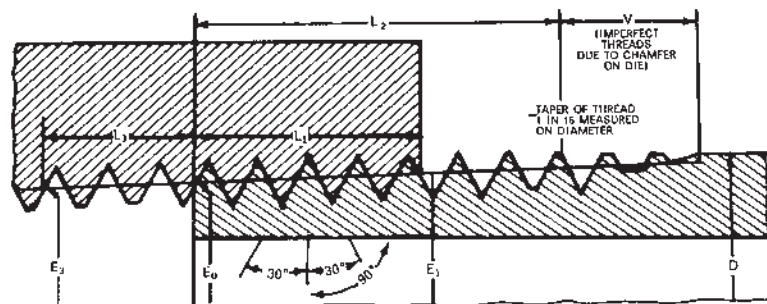
Genuine replacement parts are available for all Vogt valves and can usually be shipped from stock for all standard valves. All parts are made to gauge with the same careful inspection and laboratory control given original valves.

Orders for replacement parts should clearly identify the items required, and should specify the correct name of part, valve size and series number, drawing and revision number, material, etc. This information is shown on the identification disc which is attached to the handwheel. The date of purchase and/or the order number will further identify the parts, especially those for special valves.

(See pages 140-142 for recommended spare parts and replacement bonnet assemblies.)

Thread & Socket Weld Standards

Basic Dimensions,
ASME Standard Taper
Pipe Thread¹



Nominal Pipe Size	Outside Diameter of Pipe D	Number of Threads Per Inch	Pitch Diameter at Beginning of External Thread E_0	Length ² of Effective Thread, External L_2	Vanish Threads V	Handtight Engagement		Wrench Make-up Length for Internal Thread		Total Normal Engagement ⁵ $L_1 + L_3$
						Diam. ³ , E_1	Length ⁴ , L_1	Diam., E_3	Length, L_3	
1/8	.405	27	.36351	.2639	.1285	.37360	.1615	.35656	.1111	.2726
1/4	.540	18	.47739	.4018	.1928	.49163	.2278	.46697	.1667	.3945
3/8	.675	18	.61201	.4078	.1928	.62701	.240	.60160	.1667	.4067
1/2	.840	14	.75843	.5337	.2478	.77843	.320	.74504	.2143	.5343
3/4	1.050	14	.96768	.5457	.2478	.98887	.339	.95429	.2143	.5533
1	1.315	11 1/2	1.21363	.6828	.3017	1.23863	.400	1.19733	.2609	.6609
1 1/4	1.660	11 1/2	1.55713	.7068	.3017	1.58338	.420	1.54083	.2609	.6809
1 1/2	1.900	11 1/2	1.79609	.7235	.3017	1.82234	.420	1.77978	.2609	.6809
2	2.375	11 1/2	2.26902	.7565	.3017	2.29627	.436	2.25272	.2609	.6969
2 1/2	2.875	8	2.71953	1.1375	.4337	2.76216	.682	2.70391	.2500	.9320
3	3.500	8	3.34062	1.2000	.4337	3.38850	.766	3.32500	.2500	1.016
3 1/2	4.000	8	3.83750	1.2500	.4337	3.88881	.821	3.82188	.2500	1.071
4	4.500	8	4.33438	1.3000	.4337	4.38712	.844	4.31875	.2500	1.094
5	5.563	8	5.39073	1.4063	.4337	5.44929	.937	5.37511	.2500	1.187
6	6.625	8	6.44609	1.5125	.4337	6.50597	.958	6.43047	.2500	1.208
8	8.625	8	8.43359	1.7125	.4337	8.50003	1.063	8.41797	.2500	1.313

Dimensions are in inches
(metric not provided).

¹The basic dimensions of the ASME Taper Pipe Thread are given in inches to four or five decimal places. While this implies a greater degree of precision than is ordinarily attained, these dimensions are the basis of gauge dimensions and are so expressed for the purpose of eliminating errors in computations.

²Also length of plug gauge.

³Also pitch diameter at gauging notch (handtight plane).

⁴Also length of thin ring gauge and length from gauging notch to small end of plug gauge.

⁵Dimensions given do not allow for variations in tapping or threading. Standard gauging tolerance equals plus or minus one thread on both male and female threads.

The above information taken from the American National Standards Institute, Inc. for pipe threads, ASME B1.20.1. Metric version not available.

Socket Weld Dimensions For Valves & Fittings

Bold face numerals are in inches.

Blue numerals are in millimeters.

Valve Size	NPS DN	1/4 15	3/8 10	1/2 15	3/4 20	1 25	1-1/4 32	1-1/2 40	2 50	2-1/2 65	3 80	4 100
A-Socket Dia.		.555 14.2	.690 17.6	.855 21.8	1.065 27.8	1.330 33.9	1.675 42.7	1.915 48.8	2.406 61.2	2.906 73.9	3.535 89.8	4.545 115.2
B-Socket Depth (Min. ASME B16.11-96)		.38 9.5	.38 9.5	.38 9.5	.50 12.5	.50 12.5	.50 12.5	.50 12.5	.62 16.0	.62 16.0	.62 16.0	.75 19.0

Tolerances

Column A Dimensions +.020/-.000 thru Size 2" (+.4/-.00mm thru 1-1/2").

For sizes above 2" Dimensions +.025/-.000 (+.5/-.00mm above 1-1/2").

Dimensional Data for Standard & Schedule Pipe – Carbon Steel Pipe

PIPE	NPS DN	1/8 6	1/4 8	3/8 10	1/2 15	3/4 20	1 25	1-1/4 32	1-1/2 40	2 50	2-1/2 65	3 80	3-1/2 95	4 100	5 125	6 150	8 200	10 250	12 300
	Outside Dia.	.405 10.3	.540 13.7	.675 17.1	.840 21.3	1.050 26.7	1.315 33.4	1.660 42.2	1.900 48.3	2.375 60.3	2.875 73.0	3.500 88.9	4.000 101.6	4.500 114.3	5.563 141.3	6.625 168.3	8.625 219.1	10.750 273.0	12.750 323.8
Standard	Inside Dia.	.269 6.8	.364 9.2	.493 12.5	.622 15.8	.824 20.9	1.049 26.6	1.380 35.1	1.610 40.9	2.067 52.5	2.469 62.7	3.068 77.9	3.548 90.1	4.026 102	5.047 128	6.065 154	7.981 203	10.020 255	12.000 305
	Wall Thick.	.068 1.73	.088 2.24	.091 2.31	.109 2.77	.113 2.87	.133 3.38	.140 3.56	.145 3.68	.154 3.91	.203 5.16	.216 5.49	.226 5.74	.237 6.02	.258 6.55	.280 7.11	.322 8.18	.365 9.27	.375 9.53
	Wt. Per Ft.	.24 .37	.42 .63	.57 .84	.85 1.27	1.13 1.69	1.68 2.50	2.27 3.39	2.72 4.05	3.65 5.44	5.79 8.63	7.58 11.29	9.11 13.57	10.79 16.07	14.62 21.77	18.97 28.26	28.55 42.55	40.48 60.31	49.56 73.88
Extra Heavy	Inside Dia.	.215 5.4	.302 7.7	.423 10.7	.546 13.9	.742 18.8	.957 24.3	1.278 32.5	1.50 38.1	1.939 49.2	2.323 59.0	2.900 73.7	3.364 85.4	3.826 97.2	4.813 122	5.761 146	7.625 194	9.750 248	11.750 298
	Wall Thick.	.095 2.41	.119 3.02	.126 3.20	.147 3.73	.154 3.91	.179 4.55	.191 4.85	.200 5.08	.218 5.54	.276 7.01	.300 7.62	.318 8.08	.337 8.56	.375 9.53	.432 10.97	.500 12.70	.500 12.70	.500 12.70
	Wt. Per Ft.	.31 .47	.54 .80	.74 1.10	1.09 1.62	1.47 2.20	2.17 3.24	3.00 4.47	3.63 5.41	5.02 7.48	7.66 11.41	10.25 15.27	12.50 18.63	14.98 22.32	20.78 30.97	28.57 42.56	43.39 64.64	54.74 81.55	65.42 97.46
Double Extra Heavy	Inside Dia.				.252 6.4	.434 11.0	.599 15.2	.896 22.8	1.100 27.9	1.503 38.2	1.771 45.0	2.300 58.4	2.900 73.7	3.364 85.4	3.826 97.2	4.813 122	5.761 146	7.625 194	9.750 248
	Wall Thick.				.294 7.47	.308 7.82	.358 9.09	.382 9.70	.400 10.15	.436 11.07	.552 13.69	.600 15.24	.674 17.12	.750 19.05	.864 22.23	.875 22.23	.864 22.23	.875 22.23	.864 22.23
	Wt. Per Ft.				1.71 2.55	2.44 3.64	3.66 5.45	5.21 7.77	6.41 9.56	9.03 13.44	11.07 20.39	13.69 27.68	15.24 27.68	17.12 41.03	19.05 57.43	22.23 79.22	22.23 107.92	22.23 107.92	22.23 107.92
Schedule 10	Inside Dia.																		
Schedule 20	Wall Thick.																		
	Wt. Per Ft.																		
	Inside Dia.																		
Schedule 30	Wall Thick.																		
	Wt. Per Ft.																		
	Inside Dia.																		
Schedule 40	Wall Thick.																		
	Wt. Per Ft.																		
	Inside Dia.																		
Schedule 60	Wall Thick.																		
	Wt. Per Ft.																		
	Inside Dia.																		
Schedule 80	Wall Thick.																		
	Wt. Per Ft.																		
	Inside Dia.																		
Schedule 100	Wall Thick.																		
	Wt. Per Ft.																		
	Inside Dia.																		
Schedule 120	Wall Thick.																		
	Wt. Per Ft.																		
	Inside Dia.																		
Schedule 140	Wall Thick.																		
	Wt. Per Ft.																		
	Inside Dia.																		
Schedule 160	Wall Thick.																		
	Wt. Per Ft.																		
	Inside Dia.																		

Bold face numerals are in inches and pounds. Blue numerals are in millimeters and kilograms.

Dimensional Data for Standard & Schedule Pipe

Stainless Steel Pipe

*Bold face numerals are in inches & lb/ft.
Blue numerals are in millimeters & kg/meter.*

PIPE	NPS DN	1/8 6	1/4 8	3/8 10	1/2 15	3/4 20	1 25	1-1/4 32	1-1/2 40	2 50	2-1/2 65	3 80	3-1/2 95	4 100	5 125	6 150	8 200	10 250	12 300
	Outside Dia.	.405 10.3	.540 13.7	.675 17.1	.840 21.3	1.050 26.7	1.315 33.4	1.660 42.2	1.900 48.3	2.375 60.3	2.875 73.0	3.500 88.9	4.000 101.6	4.500 114.3	5.563 141.3	6.625 168.3	8.625 219.1	10.750 273.0	12.750 323.8
Schedule 5S (a)	Inside Dia.				.710 18.0	.920 23.3	1.185 30.1	1.530 38.9	1.770 44.9	2.245 57.0	2.709 68.8	3.334 84.7	3.834 97.4	4.334 110	5.345 136	6.407 163	8.407 213	10.482 266	12.438 316
	Wall Thick.				.065 1.65	.065 1.65	.065 1.65	.065 1.65	.065 1.65	.065 1.65	.083 2.11	.083 2.11	.083 2.11	.083 2.11	.109 2.77	.109 2.77	.109 2.77	.134 3.40	.156 3.96
	Wt. Per Ft.				.54 .80	.69 1.03	.87 1.30	1.11 1.65	1.28 1.91	1.61 2.40	2.48 3.69	3.03 4.51	3.48 5.18	3.92 5.84	6.36 9.47	7.60 11.32	9.93 14.79	15.19 22.63	20.98 31.25
Schedule 10S (a)	Inside Dia.	.307 7.8	.410 10.4	.545 13.8	.674 17.1	.884 22.4	1.097 27.9	1.442 36.6	1.682 42.7	2.157 54.8	2.635 66.9	3.260 82.8	3.760 95.5	4.260 108	5.295 135	6.357 161	8.329 212	10.420 265	12.390 315
	Wall Thick.	.049 1.24	.065 1.65	.065 1.65	.083 2.11	.083 2.11	.109 2.77	.109 2.77	.109 2.77	1.09 2.77	.120 3.05	.120 3.05	.120 3.05	.120 3.05	.134 3.40	.134 3.40	.148 3.76	.165 4.19	.180 4.57
	Wt. Per Ft.	.19 .28	.33 .49	.42 .63	.67 1.00	.86 1.28	1.40 2.09	1.81 2.70	2.09 3.11	2.64 3.93	3.53 5.26	4.33 6.45	4.97 7.40	5.61 8.36	7.77 11.57	9.29 13.84	13.40 19.96	18.65 27.78	24.17 36.0
Schedule 40S	Inside Dial	.269 6.8	.364 9.2	.493 12.5	.622 15.8	.824 20.9	1.049 26.6	1.380 35.1	1.610 40.9	2.067 52.5	2.469 62.7	3.068 77.9	3.548 90.1	4.026 102	5.047 128	6.065 154	7.981 203	10.020 255	11.938 303
	Wall Thick.	.068 1.73	.088 2.24	.091 2.31	.109 2.77	.113 2.87	.133 3.38	.140 3.56	.145 3.68	.154 3.91	.203 5.16	.216 5.49	.226 5.74	.237 6.02	.258 6.55	.280 7.11	.322 8.18	.365 9.27	.375 9.53
	Wt.PerFt.	.24 .37	.42 .63	.57 .84	.85 1.27	1.13 1.69	1.68 2.50	2.27 3.39	2.72 4.05	3.65 5.44	5.79 8.63	7.58 11.29	9.11 13.57	10.79 16.07	14.62 21.77	18.97 28.26	28.55 42.55	40.48 60.31	49.56 73.88
Schedule 80S	Inside Dia.	.215 5.5	.302 7.7	.423 10.7	.546 13.9	.742 18.8	.957 24.3	1.278 32.5	1.50 38.1	1.939 49.3	2.323 59.0	2.900 73.7	3.364 85.4	3.826 97.2	4.813 122	5.761 146	7.625 194	9.750 248	11.750 298
	Wall Thick.	.095 2.41	.119 3.02	.126 3.20	.147 3.73	.154 3.91	.179 4.55	.191 4.85	.200 5.08	.218 5.54	.276 7.01	.300 7.62	.318 8.08	.337 8.56	.375 9.53	.432 10.92	.500 12.70	.500 12.70	.500 12.70
	Wt.PerFt.	.31 .47	.54 .80	.74 1.10	1.09 1.62	1.47 2.20	2.17 3.24	3.00 4.47	3.63 5.41	5.02 7.48	7.66 11.41	1025 15.27	12.51 18.63	14.98 22.32	20.78 30.97	28.57 42.56	43.39 64.64	54.74 96.01	65.42 132.08

(a) Wall thickness of schedule 5S & 10S does not permit threading in accordance with USA Standard for pipe threads (ASME B1.20.1).

NOTE: □ These do not conform to ASME Standard B36.10.

CARBON STEEL PIPE DATA – Extracted from ASME B36.10M-1985 Standard (except inside diameter and DN size notation).
 STAINLESS STEEL PIPE DATA – Extracted from ASME B36.19M-1985 Standard (except inside diameter and DN size notation).

Engineering Information (English Units Only)

Check Valve Cracking/ Opening Pressures (701,15701, 573, 583, 593, etc.)

1/2"-.61 psi
 3/4"-.61 psi
 1" - .52 psi
 1 1/4" -.57 psi
 1 1/2" - .57 psi
 2" - .58 psi

All spring loaded Check valves have cracking pressures of 10-12 psi.

Handwheel Max. Closing Torques (Typical in Ft-lbs)

Class 800 Reduced Port Gate

1/4", 3/8" - 8 ft-lbs
 1/2", 3/4" - 15 ft-lbs
 1" - 20 ft-lbs
 1 1/4", 1 1/2" - 50 ft-lbs
 2" - 70 ft-lbs

Class 800 Full Port Gate

1/2" -15 ft-lbs
 3/4" - 20 ft-lbs
 1" - 40 ft-lbs
 1 1/4" - 50 ft-lbs
 1 1/2" - 70 ft-lbs
 2" - 100 ft-lbs

Handwheel Max. Closing Torques (Typical in Ft-lbs)

Class 800 Reduced Port Globe

1/2" - 15 ft-lbs
 3/4" - 15 ft-lbs
 1" - 30 ft-lbs
 1 1/2" - 40 ft-lbs
 2" - 75 ft-lbs

Class 800 Full Port Globe

1/2" - 15 ft-lbs
 3/4" - 30 ft-lbs
 1" - 40 ft-lbs
 1 1/2" - 75 ft-lbs
 2" - 125 ft-lbs

Maximum Packing Gland Bolting Torque

Size	300, 600 & 800 Conv. Port	Class 600 & 800 Full Port	Class 1500	Class 1500 Full Port
1/2	1.8 ft-lbs	1.8 ft-lbs	4.2 ft-lbs	4.2 ft-lbs
3/4	1.8 ft-lbs	3.7 ft-lbs	4.2 ft-lbs	7.5 ft-lbs
1	3.7 ft-lbs	4.0 ft-lbs	7.5 ft-lbs	13.9 ft-lbs
1 1/4	4.0 ft-lbs		13.9 ft-lbs	13.9 ft-lbs
1 1/2	4.0 ft-lbs	7.5 ft-lbs	13.9 ft-lbs	15.9 ft-lbs
2	7.5 ft-lbs	8.5 ft-lbs	15.9 ft-lbs	
2 1/2	8.5 ft-lbs			
3	8.5 ft-lbs			
4	12.0 ft-lbs			

Recommended Maximum Bonnet Bolt Torques (Dry, Unlubricated Values)

Bolt Diameter	Torque (ft-lbs) B7 & B16	B8M
5/16"	25	22
3/8"	40	36
7/16"	50	45
1/2"	85	75
9/16"	144	130
5/8"	125	115
3/4"	175	156
7/8"	530	480
1"	795	710

Note: Reduce above values by 25% to 30% if any type lubrication is used on bolting.

Weight Conversion

Pounds to Kilograms (1 pound = 0.4536 kilogram)										
Pounds	0	1	2	3	4	5	6	7	8	9
0	0.00	0.45	0.91	1.36	1.81	2.27	2.72	3.18	3.63	4.08
10	4.54	4.99	5.44	5.90	6.35	6.80	7.26	7.71	8.16	8.62
20	9.07	9.53	9.98	10.43	10.89	11.34	11.79	12.25	12.70	13.15
30	13.61	14.06	14.52	14.97	15.42	15.88	16.33	16.78	17.24	17.69
40	18.14	18.60	19.05	19.50	19.96	20.41	20.87	21.32	21.77	22.23
50	22.68	23.13	23.59	24.04	24.49	24.95	25.40	25.86	26.31	26.76
60	27.22	27.67	28.12	28.58	29.03	29.48	29.94	30.39	30.84	31.30
70	31.75	32.21	32.66	33.11	33.57	34.02	34.47	34.93	35.38	35.83
80	36.29	36.74	37.20	37.65	38.10	38.56	39.01	39.46	39.92	40.37
90	40.82	41.28	41.73	42.18	42.64	43.09	43.55	44.00	44.45	44.91

Kilograms to Pounds (1 kilogram = 2.2046 pounds)										
Kilograms	0	1	2	3	4	5	6	7	8	9
0	0.00	2.20	4.41	6.61	8.82	11.02	13.23	15.43	17.64	19.84
10	22.05	24.25	26.46	28.66	30.86	33.07	35.27	37.48	39.68	41.89
20	44.09	46.30	48.50	50.71	52.91	55.12	57.32	59.52	61.73	63.93
30	66.14	68.34	70.55	72.75	74.96	77.16	79.37	81.57	83.77	85.98
40	88.18	90.39	92.59	94.80	97.00	99.21	101.41	103.62	105.82	108.03
50	110.23	112.43	114.64	116.84	119.05	121.25	123.46	125.66	127.87	130.07
60	132.28	134.48	136.69	138.89	141.09	143.30	145.50	147.71	149.91	152.12
70	154.32	156.53	158.73	160.94	163.14	165.35	167.55	169.75	171.96	174.16
80	176.37	178.57	180.77	182.98	185.19	187.39	189.60	191.80	194.00	196.21
90	198.41	200.62	202.82	205.03	207.23	209.44	211.64	213.85	216.05	218.26

Pressure Conversion

Bar to Pounds per Square Inch
(1 Bar = 10⁵ Pa = 14.5 pounds per square inch)

1 to 20		21 to 40		41 to 60		61 to 80		81 to 100	
Bar	Lbs. per Sq. Inch	Bar	Lbs. per Sq. Inch	Bar	Lbs. per Sq. Inch	Bar	Lbs. per Sq. Inch	Bar	Lbs. per Sq. Inch
1	14.5	21	304.5	41	594.5	61	884.5	81	1174.5
2	29.0	22	319.0	42	609.0	62	899.0	82	1189.0
3	43.5	23	333.5	43	623.5	63	913.5	83	1203.5
4	58.0	24	348.0	44	638.0	64	928.0	84	1218.0
5	72.5	25	362.5	45	652.5	65	942.5	85	1232.5
6	87.0	26	377.0	46	667.0	66	957.0	86	1247.0
7	101.5	27	391.5	47	681.5	67	971.5	87	1261.5
8	116.0	28	406.0	48	696.0	68	986.0	88	1276.0
9	130.5	29	420.5	49	710.5	69	1000.5	89	1290.5
10	145.0	30	435.0	50	725.0	70	1015.0	90	1305.0
11	159.5	31	449.5	51	739.5	71	1029.5	91	1319.5
12	174.0	32	464.0	52	754.0	72	1044.0	92	1334.0
13	188.5	33	478.5	53	768.5	73	1058.5	93	1348.5
14	203.0	34	493.0	54	783.0	74	1073.0	94	1363.0
15	217.5	35	507.5	55	797.5	75	1087.5	95	1377.5
16	232.0	36	522.0	56	812.0	76	1102.0	96	1392.0
17	246.5	37	536.5	57	826.5	77	1116.5	97	1406.5
18	261.0	38	551.0	58	841.0	78	1131.0	98	1421.0
19	275.5	39	565.5	59	855.5	79	1145.5	99	1435.5
20	290.0	40	580.0	60	870.0	80	1160.0	100	1450.0

Temperature Conversion

Celsius (C) To Fahrenheit (F) — Fahrenheit (F) To Celsius

-459.4° to 0°			1° to 60°			61° to 290°			300° to 890°			900° to 3000°		
C	CEL. OR FAH.	F	C	CEL. OR FAH.	F	C	CEL. OR FAH.	F	C	CEL. OR FAH.	F	C	CEL. OR FAH.	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	215	420	788	560	1040	1904
-201	-330		-10.0	14	57.2	23.3	74	165.2	221	430	806	571	1070	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	-0.6	31	87.8	32.8	91	195.8	316	600	1112	843	1550	2822
-107	-160	-256	0.0	32	79.6	33.3	92	197.6	321	610	1130	871	1600	2912
-101	-150	-238	0.6	33	91.4	33.9	93	199.4	327	620	1148	899	1650	3002
-96	-140	-220	1.1	34	93.2	34.4	94	201.2	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	982	1800	3272
-79	-110	-166	2.8	37	98.6	36.1	97	206.6	349	660	1220	1010	1850	3362
-73	-100	-148	3.3	38	100.4	36.7	98	208.4	354	670	1238	1038	1900	3452
-68	-90	-130	3.9	39	102.2	37.2	99	210.2	360	680	1256	1066	1950	3542
-62	-80	-112	4.4	40	104.0	37.8	100	212.0	366	690	1274	1093	2000	3632
-57	-70	-94	5.0	41	105.8	43	110	230	371	700	1292	1121	2050	3722
-51	-60	-76	5.6	42	107.6	49	120	248	377	710	1310	1149	2100	3812
-46	-50	-58	6.1	43	109.4	54	130	266	382	720	1328	1177	2150	3902
-40	-40	-40	6.7	44	111.2	60	140	284	388	730	1346	1204	2200	3992
-34	-30	-22	7.2	45	113.0	66	150	302	393	740	1364	1232	2250	4082
-29	-20	-4	7.8	46	114.8	71	160	320	399	750	1382	1260	2300	4172
-23	-10	14	8.3	47	116.6	77	170	338	404	760	1400	1288	2350	4262
-17.8	0	32	8.9	48	118.4	82	180	356	410	770	1418	1316	2400	4352
			9.4	49	120.2	88	190	374	416	780	1436	1343	2450	4442
			10.0	50	122.0	93	200	392	421	790	1454	1371	2500	4532
			10.6	51	123.8	99	210	410	427	800	1472	1399	2550	4622
			11.1	52	125.6	100	212	413.6	432	810	1490	1427	2600	4712
			11.7	53	127.4	104	220	428	438	820	1508	1454	2650	4802
			12.2	54	129.2	110	230	446	443	830	1526	1482	2700	4892
			12.8	55	131.0	116	240	464	449	840	1544	1510	2750	4982
			13.3	56	132.8	121	250	482	454	850	1562	1538	2800	5072
			13.9	57	134.6	127	260	500	460	860	1580	1566	2850	5162
			14.4	58	136.4	132	270	518	466	870	1598	1593	2900	5252
			15.0	59	138.2	138	280	536	471	880	1616	1621	2950	5342
			15.6	60	140.0	143	290	554	477	890	1634	1649	3000	5432

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

Locate temperature in middle column. If in degrees Celsius, read Fahrenheit equivalent in right-hand column; if in degrees Fahrenheit, read Celsius equivalent in left-hand column.



Vogt Valves

1511 Jefferson Street
Sulphur Springs, TX 75482

US Sales Offices

Phone: 903-885-3151
Fax: 903-439-3386

Toll-Free Telephone Service

1-800-225-6989

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FLOWSERVE CORPORATION

Vogt Valves

1511 Jefferson Street
Sulphur Springs, TX 75482
Phone: 903-885-3151
Fax: 903-439-3386