



AW300H Butt Weld Angle Valve

Specifications, Applications, Service Instructions & Parts

BUTT WELD SHUT-OFF VALVES

**1/2" through 18"
(13mm through 450mm)
Globe & Angle
for Refrigerants**

CRN CE
Canadian Registration

INTRODUCTION

These low pressure drop refrigerant shut-off valves are designed to be butt-welded directly to steel piping, thereby eliminating potential leaky flanges or threaded joints and simplifying installation. Forged and cast steel bodies are lightweight, yet have substantial wall thickness to help overcome corrosion loss. The cast steel body is rigid, reducing the potential for seat leakage due to flexing of the valve body under abnormal conditions. The "heart" of Hansen shut-off valves is the patented non-leak seal plus packing design. This seal design is used exclusively on Hansen shut-off valves and virtually eliminates stem seal leakage.

APPLICATIONS

Typical uses include:

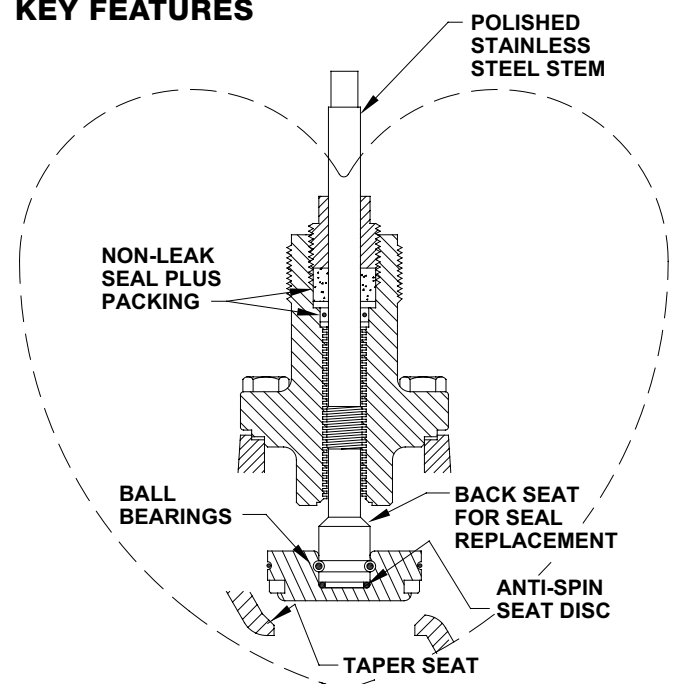
Ammonia refrigeration system suction, liquid, discharge, recirculating liquid, hot gas, thermosyphon, and oil lines, using handwheel or seal cap models.

Steel pipe portions of halocarbon, commercial, industrial, and air conditioning systems, using seal cap models.

Valves are also available for other fluids such as propane, propylene, and glycol with compatible seals. Contact factory with specific fluid and application details for written approval.

The low friction, no leak stem seal design permits the use of chain actuation for crossover applications without the need to retighten the packing.

KEY FEATURES



ADDITIONAL FEATURES

Globe and angle valves available.

Low pressure drop design

Interchangeable handwheel or seal cap.

Teflon seat disc.

Also available as Hand Expansion Valve.

Chain actuators available (1/2" or 40mm and larger).

Suitable for R717 (ammonia), R22, R134a, R507a, R404a, R744 (CO₂) and other Hansen approved refrigerants.

600 psig (41 bar g) SWP valves are available.

Extended neck available up through 4" (100mm) for additional insulation clearance.

MATERIAL SPECIFICATIONS

Body: ½" to 1¼" (13mm–32mm), forged steel, ASTM A105; 1½" to 18" (40mm–450mm), cast steel, ASTM A-352, Grade LCB

Bonnet: Ductile iron, ½" to 8" (13mm–200mm) ASTM A-536; 10" to 18" (250mm–450mm) ASME SA-395

Stem: Polished stainless steel

Disc Holder: Plated steel

Seat Disc: Retained PTFE Teflon

Ball Bearings: Stainless steel

Packing Nut: Zinc plated steel

Stem Packing: Graphite composite plus neoprene O-ring in series

Handwheel: ½" to 1¼" (13mm–32mm) Zinc plated alloy; 1½" to 6" (40mm–150mm) Zinc plated iron alloy; 8" to 18" (200mm–450mm) cast aluminum

Seal Cap: ½" to 1¼" (13mm–32mm) Glass-filled polymer, safety vented; 1½" to 4" (40mm–100mm) Zinc plated steel; 5" to 18" (125mm–450mm) cast aluminum

Operating Temperature:

Standard, –60°F to 240°F (–51°C to 115°C), temperatures below –60°F (–51°C) to –76°F (–60°C) at coincident pressures

Optional, –20°F to 300°F (–29°C to 149°C) contact factory

Safe Working Pressure: 400 psig (28 bar g) standard, 600 psig (41 bar g) upon request

Connection Dimensions: ½" to 1 ½" Match Schedule 80 pipe, 2" to 10" Match Schedule 40 pipe, 12" & Up Match Standard Weight Pipe

ADVANTAGES

Compared to conventional stem seal designs, Hansen's patented no leak seal-plus-stem-packing virtually eliminates stem seal leakage. In addition, the stem is polished to avoid packing wear. The precision stem threads avoid stem wobble and the packing nut is close fitting to remove dirt particles and frost from the stem. This results in infrequent maintenance or tightening and almost no refrigerant loss.

Hansen valves are designed with anti-spin seat discs. High velocity gas can sometimes cause ordinary seat discs to fail over time. Hansen adds a snubber to prevent the seat disc from freely rotating when valve is in the open position.

Compared to threaded valves, Hansen welding valves eliminate the chance of future leaks at pipe threads. In addition, a butt weld pipe-to-valve body joint eliminates the inherent weakness and corrosion vulnerability of the threaded portion of pipe immediately adjacent to a screwed valve body or flange.

Compared to ball valves, Hansen welding valves have no threaded or flanged-gasket pipe joints. Hansen valves also will not open or close so rapidly as to cause severe pipe shock due to sudden change in liquid velocity. In addition, ball valve stem packing typically cannot be replaced while the valve is in a pressurized line. The stem packing on these Hansen valves can be replaced while the valve is in a pressurized line. Also, dirt or damage to ball valve Teflon seats cannot be overcome by greater stem closing forces, an advantage of Hansen valves.

INSTALLATION

All Hansen welded valves can be installed in horizontal or vertical pipe lines. Stems are normally installed horizontally, but, depending on the application, stems may be installed vertically. Inlet pressure or direction of flow for all valve sizes should normally be under valve seat disc. However, to avoid installing an angle valve with the stem down, it is better to install the valve with the normal flow opposite the direction of the arrow. For pressure differences exceeding approximately 125 psi (9 bar), valves 8" (200mm) and larger should have inlet pressure above valve disc, using a small bypass valve for preopening equalization.

Care must be taken when handling and installing large valves. Proper lifting devices and safety precautions must be observed.

A valve should have its bonnet assembly removed before welding. This reduces weight during welding, protects the Teflon seat disc from welding sparks, and facilitates cleaning of welding debris from the body interior prior to valve operation. The valve stem should be several turns open when removing and replacing the bonnet assembly. The Teflon seat disc should be protected when outside of the valve. Do not allow the Teflon seat to bump the valve body when removing it or stand the bonnet on the seat disc.

Where it is necessary or standard practice to weld a valve into the line without bonnet removal, the stem should be opened several turns to prevent heat damage to the seat disc. Extra care should be taken when welding angle valves without disassembly to avoid welding sparks striking the seat from the outlet weld connection.

Use of welding rings is recommended. They help alignment, control the gap for full penetration welding, and reduce the potential of welding debris entering the system. Welds should be annealed as necessary in accordance with good practice. Painting of valves and welds is recommended for corrosion protection. Pipe covering, where applied, should have a proper moisture barrier.

Before putting valves into service, all pipe weld connections, valve seats, bonnet seals, and stem seals should be tested for leaks at pressure levels called for in appropriate codes.

Shut-off valves leading to the atmosphere must not be left unsupervised and must be plugged or capped to prevent corrosion inside the valve as well as leakage due to seat expansion, vibration, pressure shock, or improper opening. Where hand wheel valves are subject to excessive vibration or liquid shock loads, the packing nut should be tightened to prevent handwheel vibration from potentially rotating valve stem. The valve seat should be cracked open to prevent hydrostatic expansion between the valve and the cap. A bleed valve and gauge should be installed to provide a means of monitoring and pump-out. Valves should never directly feed a water tank because of potential internal corrosion or seat opening caused by vibration.

INSULATION

Conventional valve-shaped block insulation can occasionally be used for both angle and globe valves. However, fabricated insulation shapes are recommended. If not available locally, Hansen can recommend a source of high quality, economical valve insulation. For exterior valve insulation dimensions refer to Sales Drawing 5002-28.

EXTENDED NECK VALVES

Hansen bonnets with extended necks, 1/2" thru 4" (13mm–100mm), meet or exceed the recommended low temperature insulation thickness dimensions of the IIAR Piping Handbook. In addition, the stem and packing nut trim are upgraded to 316 stainless steel materials. Stainless steel trim is recommended for environments where severe corrosive conditions exist. (Add an "E" suffix to the model number, for example AWE200C or GWE150H.)

SIZING GUIDE

These flow capacity recommendations are not affected by the length of the pipe line. These are approximate optimum sizes based on power costs versus the investment costs of piping and its total installed cost. Piping sized to this capacity will have a 1°F (0.6°C) pressure drop for the following equivalent lengths:

- suction lines 700 diameters
- discharge lines 1400 diameters
- liquid lines 2400 diameters

Example: 275 feet (84m) of 3" (80mm) pipe and equivalent fittings amount to 1100 diameters, pressure drop for a suction line handling 81.5 tons (287 kW) at 20°F (–7°C) is 1100/700 times 1°F (0.6°C) drop, equals 1.6°F (1°C) or 1.8 psi (0.12 bar).

Example: Hansen valves have about 145 diameters of equivalent flow resistance, or 145/700 = 0.2°F (0.12°C) of equivalent pressure drop at the suction line capacities shown for a valve in a suction line.

The rationale for the vapor line sizing was developed by William V. Richards in two papers: "Refrigerant Vapor Line Sizing Not Dependent of Length," 16th International Congress of Refrigeration, IIR, Paris, 1983; and "Practical Pipe Sizing for Refrigerant Vapor Lines," Sixth Annual Meetings, IIAR, San Francisco, 1984.

FLOW COEFFICIENTS

NOMINAL SIZE		ANGLE				GLOBE			
INCH	MM	FLOW COEFFICIENT		EQUIVALENT LENGTH		FLOW COEFFICIENT		EQUIVALENT LENGTH	
		Cv	Kv	FEET	METERS	Cv	Kv	FEET	METERS
1/2"	13	6.0	5.2	3.7	1.1	4.0	3.5	8.4	2.6
3/4"	20	9.0	7.8	8.4	2.6	8.0	6.9	11	3.2
1"	25	19	16	7.2	2.2	15	13	12	3.5
1¼"	32	21	18	27	8.2	16	14	46	14
1½"	40	53	46	10	3.0	41	35	16	5.0
2"	50	80	69	23	7.0	67	58	33	10
2½"	65	173	150	13	3.8	163	141	14	4.3
3"	80	205	177	28	8.5	195	169	31	9.3
4"	100	320	277	47	14.3	290	251	57	17
5"	125	600	519	44	13.3	575	497	47	14
6"	150	820	709	61	18.5	790	683	66	20
8"	200	1440	1240	82	25.1	1380	1190	90	27
10"	250	2450	2120	93	28.4	2350	2030	101	31
12"	300	3400	2940	119	36.2	3270	2830	128	39
14"	350	4600	3980	113	34.4	4350	3770	126	38
16"	400	5640	4880	155	47.3	-	-	-	-
18"	450	6500	5620	222	67.6	-	-	-	-

**FLOW CAPACITIES
PIPING AND VALVE SIZING GUIDE FOR AMMONIA**

SERVICE	CONDITIONS				CAPACITIES (MM)									
	TEMPERATURE °F (°C)		PRESSURE PSIG (BAR)		1/2" (13) TONS (kW)		3/4" (20) TONS (kW)		1" (25) TONS (kW)		1 1/4" (32) TONS (kW)		1 1/2" (40) TONS (kW)	
Suction Lines Single Stage Compressor	+20	(-6.7)	33.5	(2.3)	-	-	-	-	8.6	(30)	15.8	(56)	21.3	(75.0)
	0	(-17.8)	15.7	(1.1)	-	-	-	-	5.7	(20)	10.4	(37)	13.9	(49.0)
Suction Lines Booster	-20	(-28.9)	3.6	(0.25)	-	-	-	-	4.2	(15)	7.4	(26)	10.3	(36.0)
	-40	(-40)	8.7"	(0.7)	-	-	-	-	-	-	4.4	(15)	6.3	(22.0)
Liquid Overfeed Return Lines (4X)	+20	(-6.7)	33.5	(2.3)	-	-	-	-	5.0	(18)	9.1	(32)	12.3	(43.0)
	0	(-17.8)	15.7	(1.1)	-	-	-	-	3.4	(12)	6.3	(22)	8.5	(30.0)
	-20	(-28.9)	3.6	(0.25)	-	-	-	-	2.2	(8.0)	4.0	(14)	5.5	(19.0)
	-40	(-40)	8.7"	(0.7)	-	-	-	-	-	-	2.4	(8.0)	3.4	(12.0)
Hot Gas Feed	+70	(+21.1)	114	(7.9)	2.2	(8)	4.3	(15)	7.3	(26)	14.1	(50)	19.6	(69.0)
Hot Gas Main	+70	(+21.1)	114	(7.9)	4.4	(15)	8.6	(30)	14.7	(52)	28.1	(99)	39.2	(138)
Compressor Discharge	+86	(+30)	155	(10.7)	-	-	-	-	12.6	(44)	24.1	(85)	33.6	(118)
Condenser Drains	+86	(+30)	-	-	6.0	(21)	14.5	(51)	24.0	(84)	50.0	(176)	77.0	(271)
Liquid Mains	+86	(+30)	-	-	28.3	(100)	53.1	(187)	90.8	(320)	143	(503)	202	(711)
Liquid Feed Branch	+86	(+30)	-	-	54.9	(193)	103	(363)	176	(620)	277	(975)	392	(1380)
Liquid Overfeed Supply (4X)	+10	(-12.2)	-	-	9.0	(32)	17.0	(60)	29.0	(102)	46.0	(162)	65.0	(229)

SERVICE	CONDITIONS				CAPACITIES (MM)									
	TEMPERATURE °F (°C)		PRESSURE PSIG (BAR)		2" (50) TONS (kW)		2 1/2" (65) TONS (kW)		3" (80) TONS (kW)		4" (100) TONS (kW)		5" (125) TONS (kW)	
Suction Lines Single Stage Compressor	+20	(-6.7)	33.5	(2.3)	35.7	(126)	51.1	(180)	81.5	(287)	146	(513)	235	(826)
	0	(-17.8)	15.7	(1.1)	22.7	(80.0)	34.0	(120)	53.9	(190)	94.6	(333)	156	(549)
Suction Lines Booster	-20	(-28.9)	3.6	(0.25)	16.8	(59.0)	24.8	(87.0)	39.7	(140)	68.9	(242)	114	(401)
	-40	(-40)	8.7"	(0.7)	9.9	(35.0)	14.4	(51.0)	23.4	(82.3)	40.8	(143)	66.8	(235)
Liquid Overfeed Return Lines (4X)	+20	(-6.7)	33.5	(2.3)	20.6	(72.4)	29.4	(103)	47.0	(165)	84.3	(296)	135	(475)
	0	(-17.8)	15.7	(1.1)	13.6	(48.0)	20.5	(72.0)	32.4	(114)	56.8	(200)	93.8	(330)
	-20	(-28.9)	3.6	(0.25)	8.9	(31.3)	13.1	(46.0)	21.0	(74.0)	36.4	(128)	60.5	(213)
	-40	(-40)	8.7"	(0.7)	5.4	(19.0)	7.90	(28.0)	12.8	(45.0)	22.4	(79.0)	36.7	(129)
Hot Gas Feed	+70	(+21.1)	114	(7.9)	36.5	(128)	53.0	(186)	82.5	(290)	145	(510)	231	(812)
Hot Gas Main	+70	(+21.1)	114	(7.9)	73.0	(257)	106	(373)	165	(580)	290	(1020)	463	(1628)
Compressor Discharge	+86	(+30)	155	(10.7)	62.6	(220)	90.3	(318)	142	(499)	249	(876)	397	(1396)
Condenser Drains	+86	(+30)	-	-	140	(492)	220	(774)	375	(1319)	740	(2602)	1320	(4642)
Liquid Mains	+86	(+30)	-	-	454	(1597)	657	(2311)	1031	(3626)	1808	(6358)	2886	(10150)
Liquid Feed Branch	+86	(+30)	-	-	881	(3098)	1273	(4477)	1999	(7030)	3506	(12330)	5596	(19680)
Liquid Overfeed Supply (4X)	+10	(-12.2)	-	-	144	(506)	208	(732)	327	(1150)	573	(2015)	915	(3218)

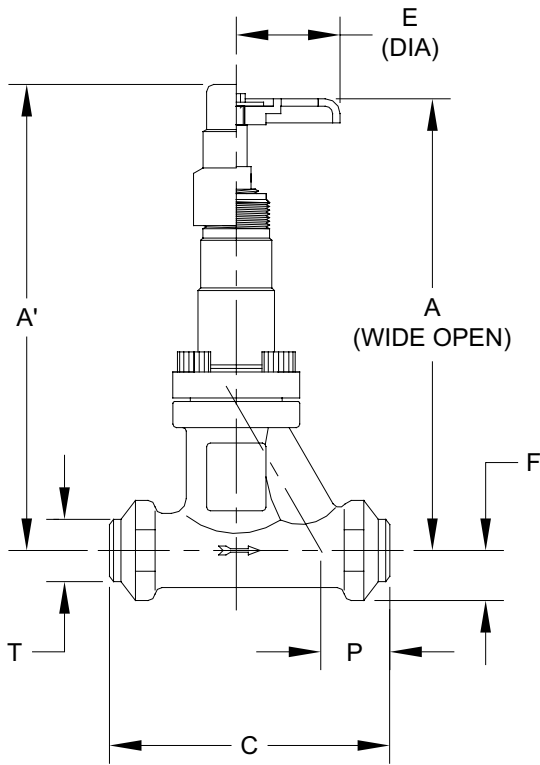
**FLOW CAPACITIES
PIPING AND VALVE SIZING GUIDE FOR AMMONIA**

SERVICE	CONDITIONS				CAPACITIES (MM)									
	TEMPERATURE °F (°C)		PRESSURE PSIG (BAR)		6" (150) TONS (kW)		8" (200) TONS (kW)		10" (250) TONS (kW)		12" (300) TONS (kW)		14" (350) TONS (kW)	
Suction Lines Single Stage Compressor	+20	(-6.7)	33.5	(2.3)	343	(1206)	628	(2209)	1020	(3387)	1490	(5240)	1821	(6404)
	0	(-17.8)	15.7	(1.1)	225	(791.0)	414	(1456)	662	(2328)	946	(3327)	1156	(4065)
Suction Lines Booster	-20	(-28.9)	3.6	(0.25)	165	(580.0)	306	(1076)	486	(1709)	709	(2494)	867	(3049)
	-40	(-40)	8.7"	(0.7)	97.8	(344.0)	181	(637.0)	288	(1013)	419	(1474)	512	(1801)
Liquid Overfeed Return Lines (4X)	+20	(-6.7)	33.5	(2.3)	198	(696.0)	362	(1273)	587	(2064)	856	(3010)	1046	(3679)
	0	(-17.8)	15.7	(1.1)	135	(475.0)	249	(876.0)	398	(1400)	568	(1998)	694	(2441)
	-20	(-28.9)	3.6	(0.25)	87.5	(308.0)	162	(570.0)	256	(900)	375	(1319)	458	(1611)
	-40	(-40)	8.7"	(0.7)	53.7	(189.0)	100	(352.0)	158	(556)	232	(816)	284	(999)
Hot Gas Feed Hot Gas Main	+70	(+21.1)	114	(7.9)	338	(1189)	595	(2093)	949	(3338)	1377	(4843)	1683	(5919)
	+70	(+21.1)	114	(7.9)	673	(2367)	1190	(4185)	1898	(6675)	2754	(9685)	3366	(11838)
Compressor Discharge	+86	(+30)	155	(10.7)	580	(2040)	1021	(3591)	1629	(5729)	2363	(8310)	2888	(10157)
Condenser Drains	+86	(+30)	-	-	2030	(7139)	4200	(14771)	-	-	-	-	-	-
Liquid Mains	+86	(+30)	-	-	4218	(14834)	-	-	-	-	-	-	-	-
Liquid Feed Branch	+86	(+30)	-	-	8179	(28764)	-	-	-	-	-	-	-	-
Liquid Overfeed Supply (4X)	+10	(-12.2)	-	-	1337	(4702)	-	-	-	-	-	-	-	-

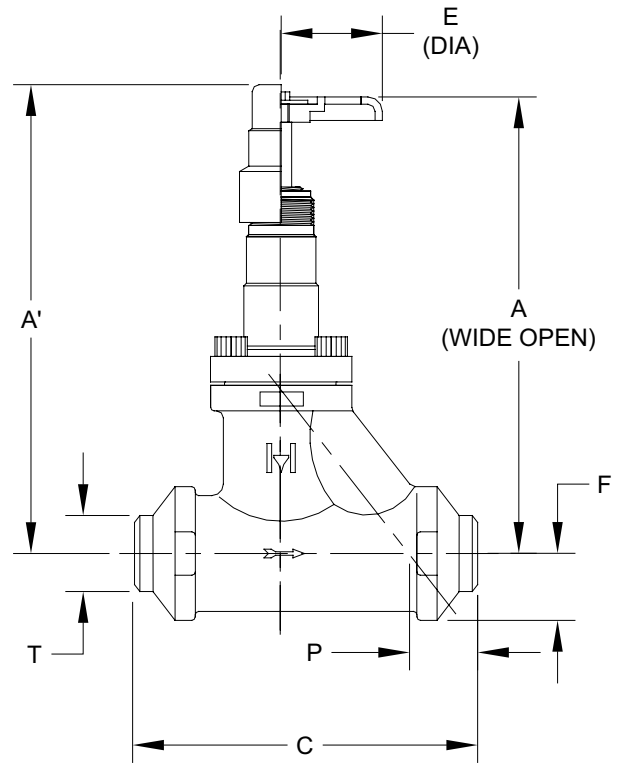
**FLOW CAPACITIES
PIPING AND VALVE SIZING GUIDE FOR AMMONIA**

SERVICE	CONDITIONS				CAPACITIES (MM)			
	TEMPERATURE °F (°C)		PRESSURE PSIG (BAR)		16" (400) TONS (kW)		18" (450) TONS (kW)	
Suction Lines Single Stage Compressor	+20	(-6.7)	33.5	(2.3)	2310	(8124)	2663	(9365)
	0	(-17.8)	15.7	(1.1)	1684	(5922)	1941	(6826)
Suction Lines Booster	-20	(-28.9)	3.6	(0.25)	1162	(4087)	1339	(4709)
	-40	(-40)	8.7"	(0.7)	692	(2434)	798	(2806)
Liquid Overfeed Return Lines (4X)	+20	(-6.7)	33.5	(2.3)	1258	(4424)	1450	(5099)
	0	(-17.8)	15.7	(1.1)	944	(3320)	1088	(3826)
	-20	(-29)	3.6	(0.25)	614	(2159)	708	(2490)
	-40	(-40)	8.7"	(0.7)	381	(1340)	439	(1544)
Hot Gas Feed Hot Gas Main	+70	(+21)	114	(7.9)	-	-	-	-
	+70	(+21)	114	(7.9)	-	-	-	-
Compressor Discharge	+86	(+30)	155	(10.7)	3883	-	-	-

GLOBE INSTALLATION DIMENSIONS
1/2" THROUGH 1 1/4" (13MM THROUGH 32MM)



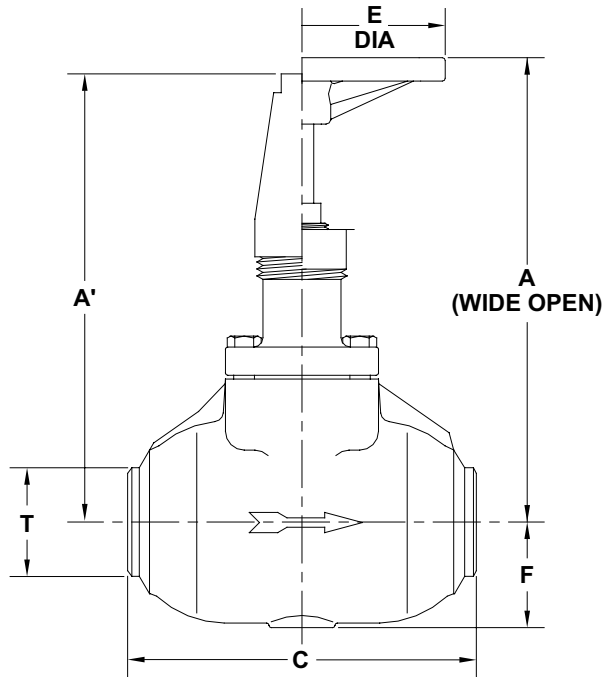
1/2" AND 3/4"
(13MM AND 20MM)



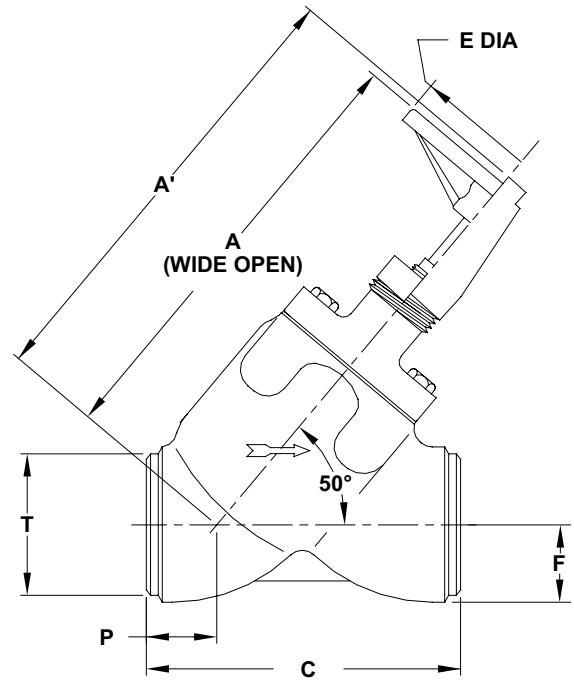
1" AND 1 1/4"
(25MM AND 32MM)

SIZE (MM)	A	A'	C	E	F	P	T	ADD TO A, A' EXT NECK
1/2" (13)	7.62" (194)	7.86" (200)	4.73" (120)	3.5" (89)	0.84" (21)	1.17" (30)	0.84" (21)	1.8" (45)
3/4" (20)	7.62" (194)	7.86" (200)	4.73" (120)	3.5" (89)	0.84" (21)	1.17" (30)	1.05" (27)	1.8" (45)
1" (25)	7.88" (200)	8.09" (206)	5.93" (150)	3.50" (89)	1.15" (29)	1.17" (30)	1.31" (33)	1.8" (45)
1 1/4" (32)	7.88" (200)	8.09" (206)	5.93" (150)	3.50" (89)	1.15" (29)	1.17" (30)	1.66" (42)	1.8" (45)

GLOBE INSTALLATION DIMENSIONS
1½" THROUGH 14" (40MM THROUGH 350MM)



1½" - 3", 4" EXT NECK
(40MM - 80MM), (100MM)

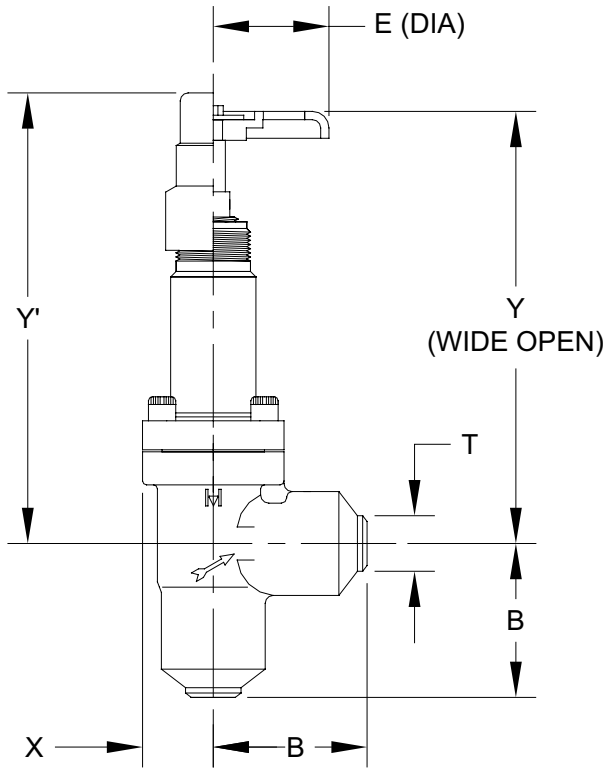


4" - 14"
(100MM - 350MM)

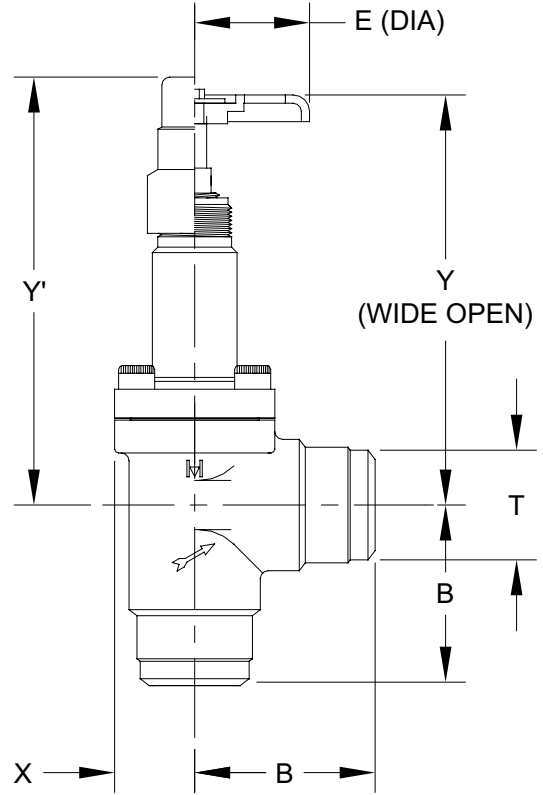
SIZE (MM)	A	A'	C	E	F	P	T	ADD TO A, A' EXT NECK
1½" (40)	8.88" (225)	9.13" (232)	7.25" (184)	4.25" (108)	2.12" (54)	-	1.90" (48)	2.85" (72)
2" (50)	8.88" (225)	9.13" (232)	7.25" (184)	4.25" (108)	2.13" (54)	-	2.38" (60)	2.85" (72)
2½" (65)	12.13" (308)	11.75" (298)	9.25" (235)	7.63" (194)	2.75" (70)	-	2.88" (73)	3.64" (92)
3" (80)	12.13" (308)	11.75" (298)	9.25" (235)	7.63" (194)	2.75" (70)	-	3.50" (89)	3.64" (92)
4" (100)	13.75" (349)	14.25" (362)	10.00" (254)	7.63" (194)	2.50" (64)	2.50" (64)	4.50" (114)	-
4" EXT NECK* (100)	13.12" (333)	12.12" (308)	12.50" (318)	7.63" (194)	3.75" (95)	-	4.50" (114)	-
5" (125)	21.38" (543)	21.63" (549)	11.65" (396)	10.00" (254)	3.00" (76)	2.65" (67)	5.56" (141)	-
6" (150)	22.10" (561)	22.15" (563)	13.26" (337)	10.00" (254)	3.50" (89)	2.73" (69)	6.63" (168)	-
8" (200)	29.10" (739)	29.51" (750)	18.10" (459)	16.00" (406)	4.61" (117)	3.98" (101)	8.63" (219)	-
10" (250)	35.29" (896)	36.16" (918)	23.38" (594)	16.00" (406)	5.81" (148)	5.19" (132)	10.75" (273)	-
12" (300)	42.16" (1071)	46.39" (1178)	29.20" (742)	20.00" (508)	7.00" (178)	6.27" (159)	12.75" (324)	-
14" (350)	47.55" (1208)	49.66" (1261)	32.86" (835)	20.00" (508)	7.63" (194)	7.23" (184)	14.00" (356)	-

* 4" (100mm) Extended Neck is "T" style body only.

ANGLE INSTALLATION DIMENSIONS
1/2" THROUGH 1 1/4" (13MM THROUGH 32MM)



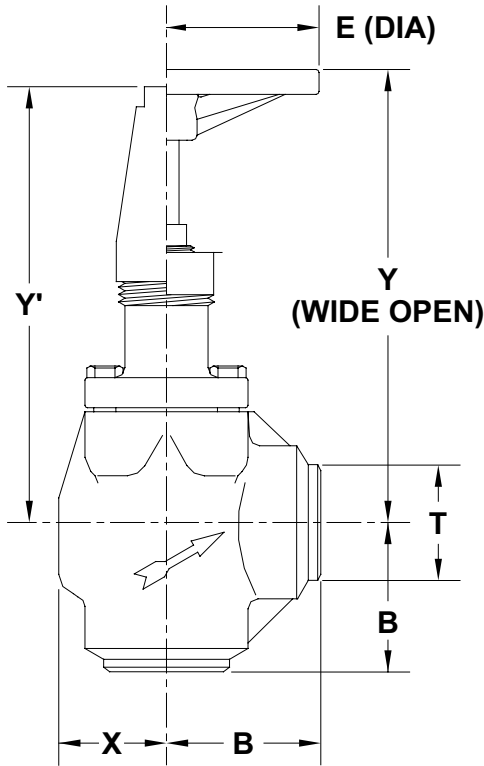
1/2" AND 3/4"
(13MM AND 20MM)



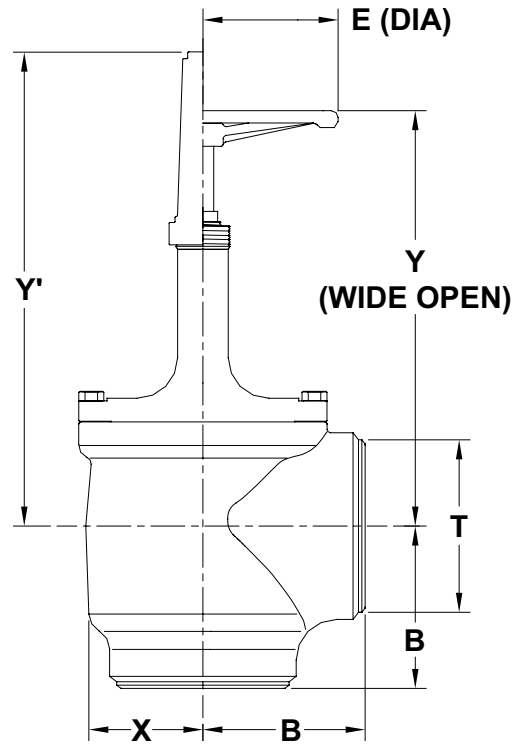
1" AND 1 1/4"
(25MM AND 32MM)

SIZE (MM)	B	E	T	X	Y	Y'	ADD TO Y, Y' EXT NECK
1/2" (13)	2.33" (59)	3.50" (89)	0.84" (21)	1.07" (27)	6.46" (164)	6.70" (170)	1.80" (45)
3/4" (20)	2.33" (59)	3.50" (89)	1.05" (27)	1.07" (27)	6.46" (164)	6.70" (170)	1.80" (45)
1" (25)	2.75" (70)	3.50" (89)	1.31" (33)	1.22" (31)	6.24" (158)	6.52" (166)	1.80" (45)
1 1/4" (32)	2.75" (70)	3.50" (89)	1.66" (42)	1.22" (31)	6.24" (158)	6.52" (166)	1.80" (45)

ANGLE INSTALLATION DIMENSIONS
1½" THROUGH 18" (40MM THROUGH 450MM)



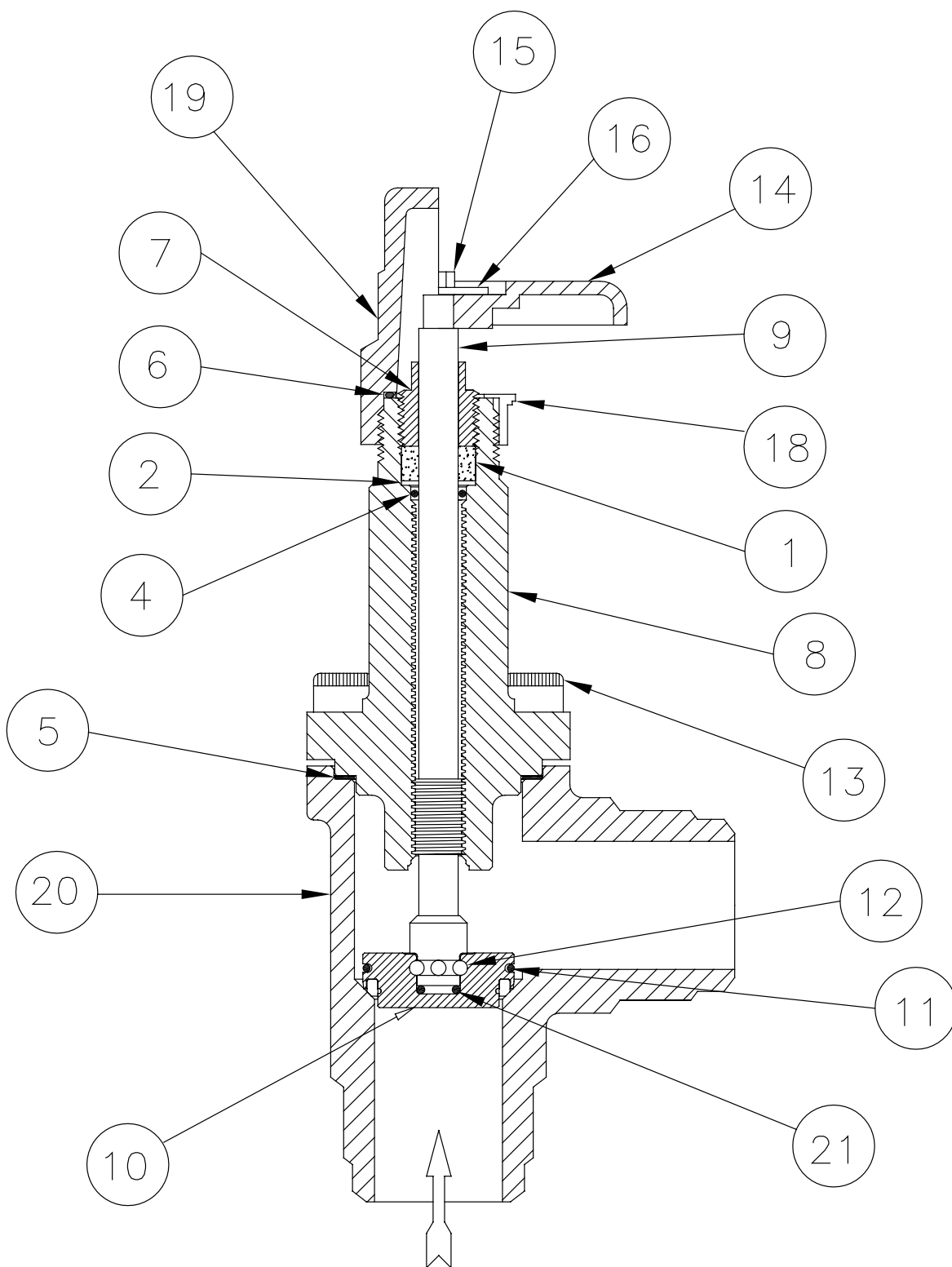
1½" – 8"
(40MM – 200MM)



10" – 18"
(250MM – 450MM)

SIZE (MM)	B	E	T	X	Y	Y'	ADD TO Y, Y' EXT NECK
1½" (40)	3.38" (86)	4.25" (108)	1.90" (48)	1.88" (48)	7.75" (197)	8.00" (203)	2.85" (72)
2" (50)	3.38" (86)	4.25" (108)	2.38" (60)	1.88" (48)	7.75" (197)	8.00" (203)	2.85" (72)
2½" (65)	3.38" (86)	7.63" (194)	2.88" (73)	2.38" (60)	11.00" (280)	10.63" (270)	3.64" (92)
3" (80)	3.38" (86)	7.63" (194)	3.50" (89)	2.38" (60)	11.00" (280)	10.63" (270)	3.64" (92)
4" (100)	3.88" (98)	7.63" (194)	4.50" (114)	3.00" (76)	11.00" (280)	10.63" (270)	3.65" (93)
5" (125)	4.47" (131)	10.00" (254)	5.56" (141)	3.47" (88)	16.42" (417)	16.62" (422)	-
6" (150)	5.15" (131)	10.00" (254)	6.63" (168)	3.85" (98)	16.55" (420)	16.78" (426)	-
8" (200)	6.90" (175)	16.00" (406)	8.63" (219)	6.11" (155)	22.12" (562)	22.52" (572)	-
10" (250)	9.44" (240)	16.00" (406)	10.75" (273)	6.63" (168)	26.47" (672)	27.34" (694)	-
12" (300)	12.00" (305)	20.00" (508)	12.75" (324)	8.66" (220)	30.34" (783)	33.86" (860)	-
14" (350)	12.97" (329)	20.00" (508)	14.00" (356)	9.20" (234)	34.92" (887)	36.91" (938)	-
16" (400)	13.16" (334)	30.00" (752)	16.00" (406)	10.25" (260)	59.45" (1510)	45.60" (1158)	-
18" (450)	14.42" (366)	30.00" (752)	18.00" (457)	11.55" (293)	62.40" (1585)	44.50" (1130)	-

1/2" THROUGH 1 1/4" (13 MM THROUGH 32 MM) BUTT WELD SHUT-OFF VALVES



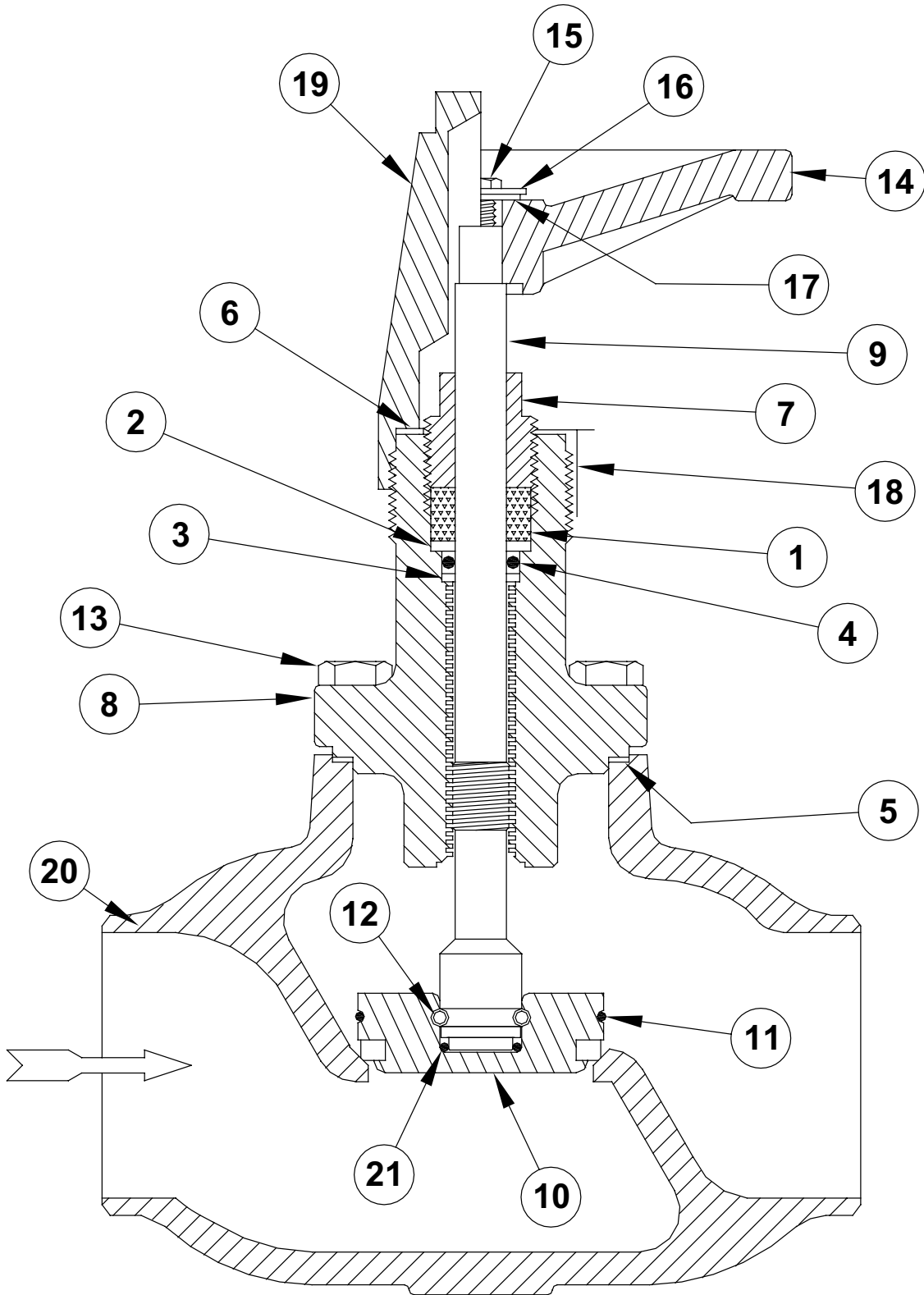
NOTE: Angle valve shown; kits are the same for globe valves.

REPLACEMENT PARTS – BUTT WELD SHUT-OFF VALVES
1/2" THROUGH 1 1/4" (13MM THROUGH 32MM)

ITEM	DESCRIPTION	QTY	PART NO
	Gasket Kit 1/2", 3/4", 1", 1-1/4" (13mm, 20mm, 25mm, 32mm)		50-1040
	Gasket Kit, Extended Neck 1/2", 3/4", 1", 1-1/4" (13mm, 20mm, 25mm, 32mm)		50-1171
	<i>Above kits consist of:</i>		
1	Stem Packing	1	50-0045
2	Stem Washer	1	50-0046
4	Stem O-Ring	1	50-0179
5a	Bonnet Gasket 1/2", 3/4" (13mm, 20mm)	1	50-0805
5b	Bonnet Gasket 1", 1-1/4" (25mm, 32mm)	1	50-0806
6	Seal Cap O-Ring	1	50-0432
7a	Packing Nut	1	50-0933
7b	Packing Nut, Extended Neck	1	50-2483
21	O-Ring, Anti-Spin	1	50-2697
	Bonnet Assembly Kit 1/2", 3/4" (13mm, 20mm)		50-1094
	Bonnet Assembly Ext Neck Kit 1/2", 3/4" (13mm, 20mm)		50-1172
	Bonnet Assembly Kit 1", 1-1/4" (25mm, 32mm)		50-1095
	Bonnet Assembly Ext Neck Kit 1", 1-1/4" (25mm, 32mm)		50-1174
	<i>Above kits consist of:</i>		
8a	Bonnet 1/2", 3/4" (13mm, 20mm)	1	50-0743
8b	Bonnet 1", 1-1/4" (25mm, 32mm)	1	50-0774
8c	Bonnet, Ext Neck 1/2", 3/4" (13mm, 20mm)	1	50-2636
8d	Bonnet, Ext Neck 1", 1-1/4" (25mm, 32mm)	1	50-2637
9a	Stem	1	50-0765
9b	Stem, Extended Neck	1	50-2478
10a	Disc Assembly 1/2", 3/4" (13mm, 20mm)	1	50-0803
10b	Disc Assembly 1", 1-1/4" (25mm, 32mm)	1	50-0804
11a	Ball Retainer 1/2", 3/4" (13mm, 20mm)	1	50-0439
11b	Ball Retainer 1", 1-1/4" (25mm, 32mm)	1	50-0026
12	Balls	10	50-0016
13	Bonnet Cap Screw	4	50-0813
	Gasket Kit 1/2" to 1-1/4" (13mm - 32mm)	1	50-1040
	Disc Assembly Kit 1/2", 3/4" (13mm, 20mm)		50-1042
	Disc Assembly Kit 1", 1-1/4" (25mm, 32mm)		50-1004
	<i>Above kits consist of:</i>		
5a	Bonnet Gasket 1/2", 3/4" (13mm, 20mm)	1	50-0805
5b	Bonnet Gasket 1", 1-1/4" (25mm, 32mm)	1	50-0806
10a	Disc Assembly 1/2", 3/4" (13mm, 20mm)	1	50-0803
10b	Disc Assembly 1", 1-1/4" (25mm, 32mm)	1	50-0804
11a	Ball Retainer 1/2", 3/4" (13mm, 20mm)	1	50-0439
11b	Ball Retainer 1", 1-1/4" (25mm, 32mm)	1	50-0026
12	Balls	10	50-0016
21	O-Ring, Anti-Spin	1	50-2697
	Handwheel Kit		50-1005
	<i>Above kits consist of:</i>		
14	Handwheel	1	50-2691
15	Screw	1	50-0479
16	Nameplate	1	50-0094
18	Bonnet Thread Cap	1	50-0434
	Seal Cap Kit		50-1036
	<i>Above kits consist of:</i>		
6	Seal Cap O-Ring	1	50-0432
19	Seal Cap	1	50-0423
20a	Body, Globe 1/2" BW (13mm)	1	50-2339
20b	Body, Globe 3/4" BW (20mm)	1	50-2342
20c	Body, Globe 1" BW (25mm)	1	50-2344
20d	Body, Globe 1-1/4" BW (32mm)	1	50-2346
20e	Body, Angle 1/2" BW (13mm)	1	50-0768
20f	Body, Angle 3/4" BW (20mm)	1	50-0771
20g	Body, Angle 1" BW (25mm)	1	50-0779
20h	Body, Angle 1-1/4" BW (32mm)	1	50-0782

NOTE: A plate steel cap is available to order, specify part number 50-1064.

1½" THROUGH 4" (40MM THROUGH 100MM) - BUTT WELD SHUT-OFF VALVES



NOTE: Globe valve shown; kits are the same for angle valves.

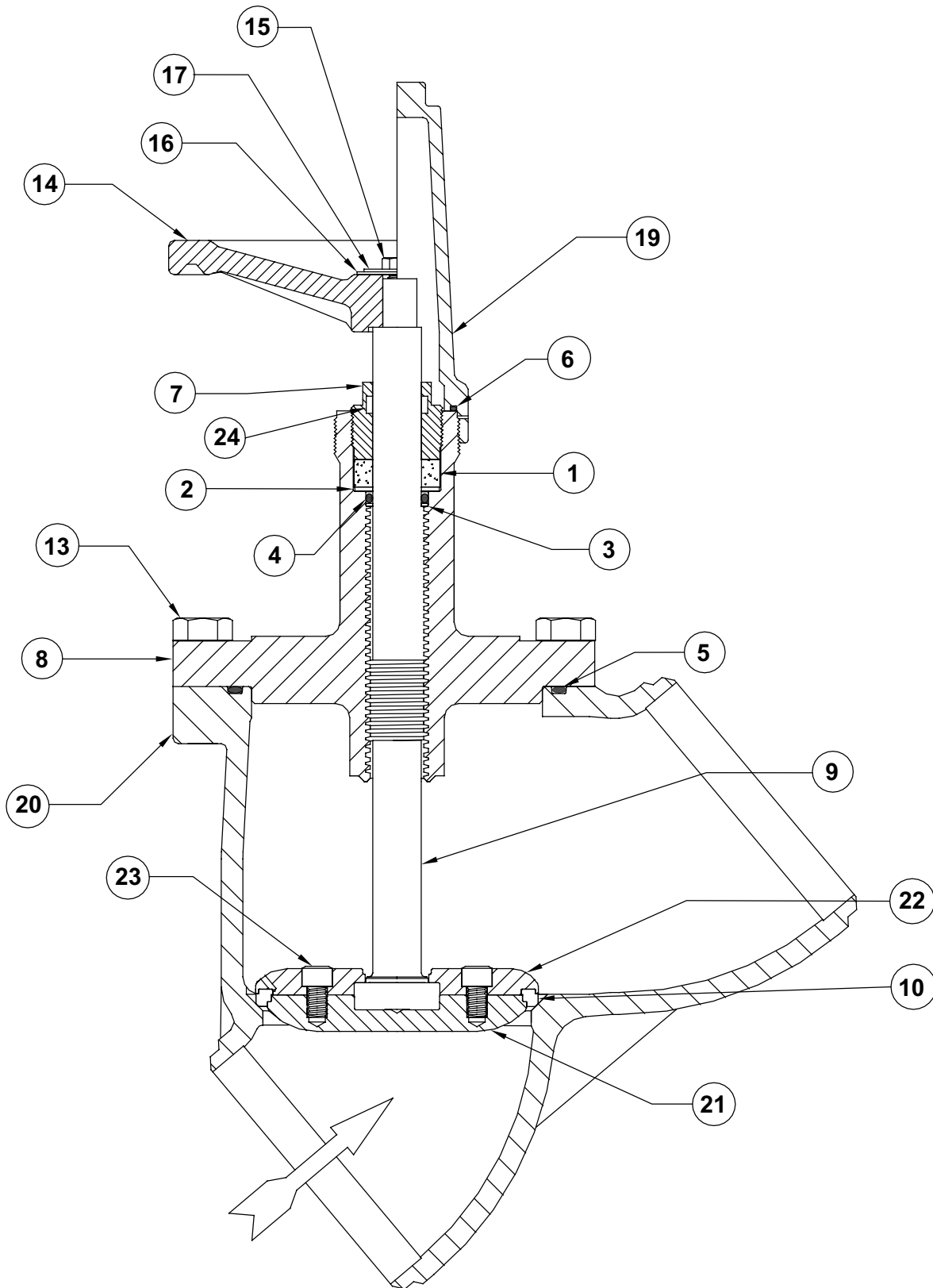
REPLACEMENT PARTS - BUTT WELD SHUT-OFF VALVES

1½" THROUGH 4" (40MM THROUGH 100MM)

ITEM	DESCRIPTION	QTY	PART NO
	Gasket Kit 1-1/2", 2" (40mm, 50mm)		50-1023
	Gasket Kit Ext Neck 1-1/2", 2" (40mm, 50mm)		50-1164
	Gasket Kit 2-1/2", 3" (65mm, 80mm)		50-1043
	Gasket Kit Ext Neck 2-1/2", 3" (65mm, 80mm)		50-1166
	Gasket Kit 4" (100mm)		50-1065
	Gasket Kit Ext Neck 4" (100mm)		50-1203
	<i>Above kits consist of:</i>		
1a	Stem Packing 1-1/2", 2" (40mm, 50mm)	1	50-0248
1b	Stem Packing 2-1/2", 3", 4" (65mm, 80mm, 100mm)	1	50-0290
2a	Stem Washer 1-1/2", 2" (40mm, 50mm)	1	50-0247
2b	Stem Washer 2-1/2", 3", 4" (65mm, 80mm, 100mm)	1	50-0299
3a	Back-up Washer 1-1/2", 2" (40mm, 50mm)	1	50-0351
3b	Back-up Washer 2-1/2", 3", 4" (65mm, 80mm, 100mm)	1	50-0324
4a	Stem O-Ring 1-1/2", 2" (40mm, 50mm)	1	50-0253
4b	Stem O-Ring 2-1/2", 3", 4" (65mm, 80mm, 100mm)	1	50-0293
5a	Bonnet Gasket 1-1/2", 2" (40mm, 50mm)	1	50-0259
5b	Bonnet Gasket 2-1/2", 3" (65mm, 80mm)	1	50-0310
5c	Bonnet Gasket 4" (100mm)	1	50-0537
6a	Seal Cap Gasket 1-1/2", 2" (40mm, 50mm)	1	50-0270
6b	Seal Cap Gasket 2-1/2", 3", 4" (65mm, 80mm, 100mm)	1	50-0315
7a	Packing Nut 1-1/2", 2" (40mm, 50mm)	1	50-0251
7b	Packing Nut Ext Neck 1-1/2", 2" (40mm, 50mm)	1	50-2484
7c	Packing Nut 2-1/2", 3", 4" (65mm, 80mm, 100mm)	1	50-0292
7d	Packing Nut Ext Neck 2-1/2", 3", 4" (65mm, 80mm, 100mm)	1	50-2485
21a	O-Ring, Anti-Spin 1-1/2", 2" (40mm, 50mm)	1	50-0637
21b	O-Ring, Anti-Spin 2-1/2", 3", 4" (65mm, 80mm, 100mm)	1	50-2700
	Bonnet Assembly Kit 1-1/2", 2" (40mm, 50mm)		50-1024
	Bonnet Assembly Ext Neck Kit 1-1/2", 2" (40mm, 50mm)		50-1165
	Bonnet Assembly Kit 2-1/2", 3" (65mm, 80mm)		50-1044
	Bonnet Assembly Ext Neck Kit 2-1/2", 3" (65mm, 80mm)		50-1167
	Bonnet Assembly Kit 4" (100mm)		50-1066
	Bonnet Assembly Ext Neck Kit 4" (100mm)		50-1184
	<i>Above kits consist of:</i>		
8a	Bonnet 1-1/2", 2" (40mm, 50mm)	1	50-0239
8b	Bonnet Ext Neck 1-1/2", 2" (40mm, 50mm)	1	50-2505
8c	Bonnet 2-1/2", 3" (65mm, 80mm)	1	50-0286
8d	Bonnet Ext Neck 2-1/2", 3" (65mm, 80mm)	1	50-2506
8e	Bonnet 4" (100mm)	1	50-0515
8f	Bonnet Ext Neck 4" (100mm)	1	50-2507
9a	Stem 1-1/2", 2" (40mm, 50mm)	1	50-0242
9b	Stem Ext Neck 1-1/2", 2" (40mm, 50mm)	1	50-2476
9c	Stem 2-1/2", 3", 4" (65mm, 80mm, 100mm)	1	50-0287
9d	Stem Ext Neck 2-1/2", 3", 4" (65mm, 80mm, 100mm)	1	50-2474
13a	Bonnet Cap Screw 1-1/2", 2" (40mm, 50mm)	4	50-0473
13b	Bonnet Cap Screw 2-1/2", 3" (65mm, 80mm)	4	50-0294
13c	Bonnet Cap Screw 4" (100mm)	4	50-0521
	Gasket Kit 1-1/2", 2" (40mm, 50mm)	1	50-1023
	Gasket Kit 2-1/2", 3" (65mm, 80mm)	1	50-1043
	Gasket Kit 4" (100mm)	1	50-1065
	Disc Assembly Kit 1-1/2", 2" (40mm, 50mm)		50-1025
	Disc Assembly Kit 2-1/2", 3" (65mm, 80mm)		50-1045
	Disc Assembly Kit 4" (100mm)		50-1067

	Disc Assembly Kit 1-1/2", 2" (40mm, 50mm)		50-1025
	Disc Assembly Kit 2-1/2", 3" (65mm, 80mm)		50-1045
	Disc Assembly Kit 4" (100mm)		50-1067
	<i>Above kits consist of:</i>		
5a	Bonnet Gasket 1-1/2", 2" (40mm, 50mm)	1	50-0259
5b	Bonnet Gasket 2-1/2", 3" (65mm, 80mm)	1	50-0310
5c	Bonnet Gasket 4" (100mm)	1	50-0537
10a	Disc Assembly 1-1/2", 2" (40mm, 50mm)	1	50-0363
10b	Disc Assembly 2-1/2", 3" (65mm, 80mm)	1	50-0374
10c	Disc Assembly 4" (100mm)	1	50-0524
11a	Ball Retainer 1-1/2", 2" (40mm, 50mm)	1	50-0257
11b	Ball Retainer 2-1/2", 3", 4" (65mm, 80mm, 100mm)	1	50-0297
12a	Balls 1-1/2", 2" (40mm, 50mm)	16	50-0016
12b	Balls 2-1/2", 3", 4" (65mm, 80mm, 100mm)	15	50-0305
21a	O-Ring, Anti-Spin 1-1/2", 2" (40mm, 50mm)	1	50-0637
21b	O-Ring, Anti-Spin 2-1/2", 3", 4" (65mm, 80mm, 100mm)	1	50-2700
	Handwheel Kit 1-1/2", 2" (40mm, 50mm)		50-1026
	Handwheel Kit 2-1/2", 3", 4" (65mm, 80mm, 100mm)		50-1037
	<i>Above kits consist of:</i>		
14a	Handwheel 1-1/2", 2" (40mm, 50mm)	1	50-0321
14b	Handwheel 2-1/2", 3", 4" (65mm, 80mm, 100mm)	1	50-0319
15a	Screw 1-1/2", 2" (40mm, 50mm)	1	50-0254
15b	Screw 2-1/2", 3", 4" (65mm, 80mm, 100mm)	1	50-0295
16a	Nameplate 1-1/2", 2" (40mm, 50mm)	1	50-0094
16b	Nameplate 2-1/2", 3", 4" (65mm, 80mm, 100mm)	1	50-0318
17	Support Washer 2-1/2", 3", 4" (65mm, 80mm, 100mm)	1	50-0480
18	Bonnet Thread Cap 1-1/2", 2" (40mm, 50mm)	1	50-0263
	Seal Cap Kit 1-1/2", 2" (40mm, 50mm)		50-1027
	Seal Cap Kit 2-1/2", 3", 4" (65mm, 80mm, 100mm)		50-1038
	<i>Above kits consist of:</i>		
6a	Seal Cap Gasket 1-1/2", 2" (40mm, 50mm)	1	50-0270
6b	Seal Cap Gasket 2-1/2", 3", 4" (65mm, 80mm, 100mm)	1	50-0315
19a	Seal Cap 1-1/2", 2" (40mm, 50mm)	1	50-0260
19b	Seal Cap 2-1/2", 3", 4" (65mm, 80mm, 100mm)	1	50-0304
20a	Body, Globe 1-1/2" BW (40mm)	1	50-2686P
20b	Body, Globe 2" BW (50mm)	1	50-0391
20c	Body, Globe 2-1/2" BW (65mm)	1	50-0454
20d	Body, Globe 3" BW (80mm)	1	50-0455
20e	Body, Globe 4" BW (100mm), (Standard Y-Style)	1	50-0671
20f	Body, Globe 4", (Ext. Neck T-Style)	1	50-0550
20g	Body, Angle 1-1/2" BW (40mm)	1	50-2687P
20h	Body, Angle 2" BW (50mm)	1	50-0354
20i	Body, Angle 2-1/2" BW (65mm)	1	50-0285
20j	Body, Angle 3" BW (80mm)	1	50-0289
20k	Body, Angle 4" BW (100mm)	1	50-0516

5" THROUGH 8" (125MM THROUGH 200MM - BUTT WELD SHUT-OFF VALVES



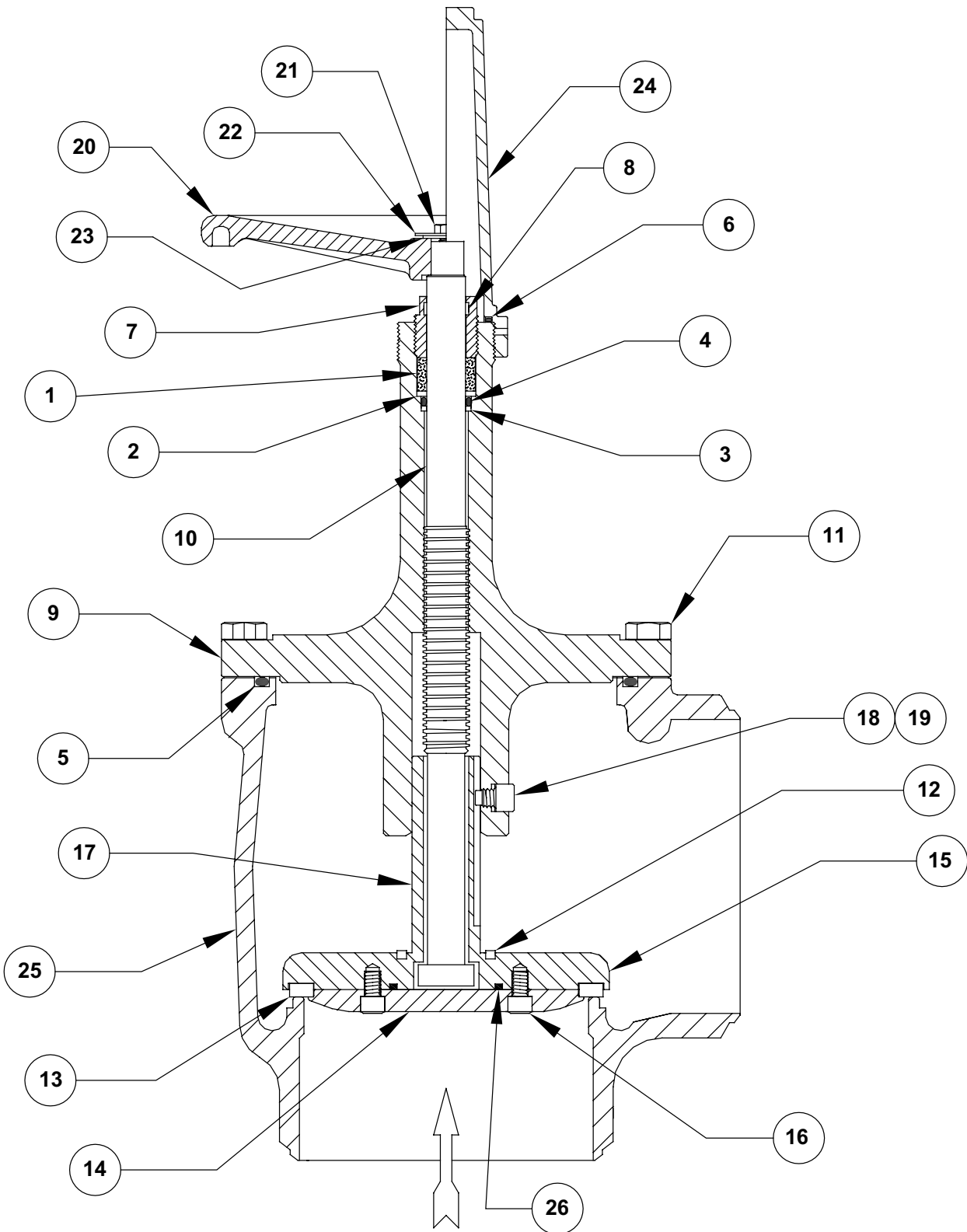
NOTE: Globe valve shown; kits are the same for angle valves.

REPLACEMENT PARTS - BUTT WELD SHUT-OFF VALVES
5" THROUGH 8" (125MM THROUGH 200MM)

ITEM	DESCRIPTION	QTY	PART NO
	Gasket Kit 5" (125mm)		50-1082
	Gasket Kit 6" (150mm)		50-1083
	Gasket Kit 8" (200mm)		50-1084
	<i>Above kits consist of:</i>		
1a	Stem Packing 5", 6" (125mm, 150mm)	1	50-0703
1b	Stem Packing 8" (200mm)	1	50-0745
2a	Stem Washer 5", 6" (125mm, 150mm)	1	50-0705
2b	Stem Washer 8" (200mm)	1	50-0747
3a	Back-up Washer 5", 6" (125mm, 150mm)	1	50-0706
3b	Back-up Washer 8" (200mm)	1	50-0748
4a	Stem O-Ring 5", 6" (125mm, 150mm)	1	50-0707
4b	Stem O-Ring 8" (200mm)	1	50-0749
5a	Bonnet O-Ring 5" (125mm)	1	50-0708
5b	Bonnet O-Ring 6" (150mm)	1	50-0709
5c	Bonnet O-Ring 8" (200mm)	1	50-0750
6a	Seal Cap O-Ring 5", 6" (125mm, 150mm)	1	50-0730
6b	Seal Cap O-Ring 8" (200mm)	1	50-0761
7a	Packing Nut 5", 6" (125mm, 150mm)	1	50-0704
7b	Packing Nut 8" (200mm)	1	50-0746
	Bonnet Assembly Kit 5" (125mm)		50-1080
	Bonnet Assembly Kit 6" (150mm)		50-1081
	Bonnet Assembly Kit 8" (200mm)		50-1085
	<i>Above kits consist of:</i>		
8a	Bonnet 5" (125mm)	1	50-0675
8b	Bonnet 6" (150mm)	1	50-0682
8c	Bonnet 8" (200mm)	1	50-0699
9a	Stem Assembly 5", 6" (125mm, 150mm)	1	50-0734
9b	Stem Assembly 8" (200mm)	1	50-1093
13a	Bonnet Cap Screw 5" (125mm)	4	50-0521
13b	Bonnet Cap Screw 6" (150mm)	6	50-0521
13c	Bonnet Cap Screw 8" (200mm)	8	50-0959
21a	Lower Disc Holder 5" (125mm)	1	50-0713
21b	Lower Disc Holder 6" (150mm)	1	50-0711
21c	Lower Disc Holder 8" (200mm)	1	50-0752
22a	Upper Disc Holder 5" (125mm)	1	50-0712
22b	Upper Disc Holder 6" (150mm)	1	50-0710
22c	Upper Disc Holder 8" (200mm)	1	50-0751
23a	Disc Holder Screw 5", 6" (125mm, 150mm)	4	50-0729
23b	Disc Holder Screw 8" (200mm)	6	50-0760
24	Bushing, Stem Guide, 8"	1	50-0958
	Gasket Kit 5" (125mm)	1	50-1082
	Gasket Kit 6" (150mm)	1	50-1083
	Gasket Kit 8" (200mm)	1	50-1084
	Disc Kit 5" (125mm)	1	50-1086
	Disc Kit 6" (150mm)	1	50-1087
	Disc Kit 8" (200mm)	1	50-1088
	Disc Kit 5" (125mm)		50-1086
	Disc Kit 6" (150mm)		50-1087
	Disc Kit 8" (200mm)		50-1088
	<i>Above kits consist of:</i>		
5a	Bonnet O-Ring 5" (125mm)	1	50-0708
5b	Bonnet O-Ring 6" (150mm)	1	50-0709
5c	Bonnet O-Ring 8" (200mm)	1	50-0750
10a	Seat Disc 5", Teflon (125mm)	1	50-0717
10b	Seat Disc 6", Teflon (150mm)	1	50-0716
10c	Seat Disc 8", Teflon (200mm)	1	50-0755

	Handwheel Kit 5", 6" (125mm, 150mm)		50-1089
	Handwheel Kit 8" (200mm)		50-1090
	<i>Above kits consist of:</i>		
14a	Handwheel 5", 6" (125mm, 150mm)	1	50-0727
14b	Handwheel 8" (200mm)	1	50-2229
15a	Screw 5", 6" (125mm, 150mm)	1	50-0732
15b	Screw 8" (200mm)	1	50-0763
16	Back-Up Washer (8" Only)	1	50-0764
17a	Nameplate 5", 6" (125mm, 150mm)	1	50-0728
17b	Nameplate 8" (200mm)	1	50-0759
	Seal Cap Kit 5", 6" (125mm, 150mm)		50-1091
	Seal Cap Kit 8" (200mm)		50-1092
	<i>Above kits consist of:</i>		
6a	Seal Cap O-Ring 5", 6" (125mm, 150mm)	1	50-0730
6b	Seal Cap O-Ring 8" (200mm)	1	50-0761
19a	Seal Cap 5", 6" (125mm, 150mm)	1	50-0715
19b	Seal Cap 8" (200mm)	1	50-0754
20a	Body, Globe 5" BW (125mm)	1	50-0677
20b	Body, Globe 6" BW (150mm)	1	50-0693
20c	Body, Globe 8" BW (200mm)	1	50-0812
20d	Body, Angle 5" BW (125mm)	1	50-0673
20e	Body, Angle 6" BW (150mm)	1	50-0680
20f	Body, Angle 8" BW (200mm)	1	50-0695

10" THROUGH 18" (250MM THROUGH 450MM) - BUTT WELD SHUT-OFF VALVES



NOTE: Angle valve shown; kits are the same for globe valves.

REPLACEMENT PARTS - BUTT WELD SHUT-OFF VALVES
10" THROUGH 18" (250MM THROUGH 450MM)

ITEM	DESCRIPTION	QTY	PART NO				
	Gasket Kit 10" (250mm)		50-1122				
	Gasket Kit 12" (300mm)		50-1123				
	Gasket Kit 14" (350mm)		50-1124				
	Gasket Kit 16" (400mm)		50-1196				
	Gasket Kit 18" (450mm)		50-1197				
	<i>Above kits consist of:</i>						
1a	Stem Packing 10" (250mm)	1	50-2289	15d	Upper Disc Holder 16" (400mm)	1	50-2535
1b	Stem Packing 12" (300mm)	1	50-2292	15e	Upper Disc Holder 18" (450mm)	1	50-2532
1c	Stem Packing 14" (350mm)	1	50-2295	16a	Disc Screw 10" (250mm)	8	50-2236
1d	Stem Packing 16", 18" (400mm, 450mm)	1	50-2517	16b	Disc Screw 12" (300mm)	8	50-2404
2a	Packing Washer 10" (250mm)	1	50-2278	16c	Disc Screw 14" (350mm)	8	50-2468
2b	Packing Washer 12" (300mm)	1	50-2215	16d	Disc Screw 16" (400mm)	10	50-2588
2c	Packing Washer 14" (350mm)	1	50-2254	16e	Disc Screw 18" (450mm)	10	50-2587
2d	Packing Washer 16", 18" (400mm, 450mm)	1	50-2515	17a	Guide Tube 10" (250mm)	1	50-2155
3a	Back-up Washer 10" (250mm)	1	50-2217	17b	Guide Tube 12" (300mm)	1	50-2209
3b	Back-up Washer 12" (300mm)	1	50-2216	17c	Guide Tube 14" (350mm)	1	50-2143
3c	Back-up Washer 14" (350mm)	1	50-2253	17d	Guide Tube 16", 18" (400mm, 450mm)	1	50-2524
3d	Back-up Washer 16", 18" (400mm, 450mm)	1	50-2514	18	Screw Guide 10" to 18" (250mm to 450mm)	1	50-2237
4a	Stem O-Ring 10" (250mm)	1	50-2224	19	Washer, Screw Guide 10" to 18" (250mm to 450mm)	1	50-2238
4b	Stem O-Ring 12" (300mm)	1	50-2264		Disc Kit 10" (250mm)	1	50-1128
4c	Stem O-Ring 14" (350mm)	1	50-2245		Disc Kit 12" (300mm)	1	50-1129
4d	Stem O-Ring 16", 18" (400mm, 450mm)	1	50-2583		Disc Kit 14" (350mm)	1	50-1130
5a	Bonnet O-Ring 10" (250mm)	1	50-2223		Disc Kit 16" (400mm)	1	50-1200
5b	Bonnet O-Ring 12" (300mm)	1	50-2260		Disc Kit 18" (450mm)	1	50-1201
5c	Bonnet O-Ring 14" (350mm)	1	50-2243		Gasket Kit 10" (250mm)	1	50-1122
5d	Bonnet O-Ring 16" (400mm)	1	50-2582		Gasket Kit 12" (300mm)	1	50-1123
5e	Bonnet O-Ring 18" (450mm)	1	50-2584		Gasket Kit 14" (350mm)	1	50-1124
6a	Seal Cap O-Ring 10" (250mm)	1	50-0761		Gasket Kit 16" (400mm)	1	50-1196
6b	Seal Cap O-Ring 12", 14" (300mm, 350mm)	1	50-2259		Gasket Kit 18" (450mm)	1	50-1197
6c	Seal Cap O-Ring 16", 18" (400mm, 450mm)	1	50-2623		Disc Kit 10" (250mm)		50-1128
7a	Packing Nut 10" (250mm)	1	50-2149		Disc Kit 12" (300mm)		50-1129
7b	Packing Nut 12" (300mm)	1	50-2218		Disc Kit 14" (350mm)		50-1130
7c	Packing Nut 14" (350mm)	1	50-2144		Disc Kit 16" (400mm)		50-1200
7d	Packing Nut 16", 18" (400mm, 450mm)	1	50-2518		Disc Kit 18" (450mm)		50-1201
8a	Bushing, Stem Guide 10" (250mm)	1	50-2179		<i>Above kits consist of:</i>		
8b	Bushing, Stem Guide 12" (300mm)	1	50-2274	5a	Bonnet O-Ring 10" (250mm)	1	50-2223
8c	Bushing, Stem Guide 14" (350mm)	1	50-2161	5b	Bonnet O-Ring 12" (300mm)	1	50-2260
8d	Bushing, Stem Guide 16", 18" (400mm, 450mm)	1	50-2534	5c	Bonnet O-Ring 14" (350mm)	1	50-2243
				5d	Bonnet O-Ring 16" (400mm)	1	50-2582
				5e	Bonnet O-Ring 18" (450mm)	1	50-2584
				13a	Ring, Teflon Main Seat 10" (250mm)	1	50-2234
				13b	Ring, Teflon Main Seat 12" (300mm)	1	50-2212
				13c	Ring, Teflon Main Seat 14" (350mm)	1	50-2249
				13d	Ring, Teflon Main Seat 16" (400mm)	1	50-2519
				13e	Ring, Teflon Main Seat 18" (450mm)	1	50-2537
				26	O-Ring, Upper Disc 10", 12", 14", 16", 18"	1	50-2259
	Bonnet Assembly Kit 10" (250mm)		50-1125		Handwheel Kit 10" (250mm)		50-1131
	Bonnet Assembly Kit 12" (300mm)		50-1126		Handwheel Kit 12", 14" (300mm, 350mm)		50-1132
	Bonnet Assembly Kit 14" (350mm)		50-1127		Handwheel Kit 16", 18" (400mm, 450mm)		50-1193
	Bonnet Assembly Kit 16" (400mm)		50-1198		<i>Above kits consist of:</i>		
	Bonnet Assembly Kit 18" (450mm)		50-1199	20a	Handwheel 10" (250mm)	1	50-2229
	<i>Above kits consist of:</i>			20b	Handwheel 12", 14" (300mm, 350mm)	1	50-2242
9a	Bonnet 10" (250mm)	1	50-2180P	20c	Handwheel 16", 18" (400mm, 450mm)	1	50-2651
9b	Bonnet 12" (300mm)	1	50-2184P	21a	Screw 10", 12", 14" (250mm to 350mm)	1	50-0763
9c	Bonnet 14" (350mm)	1	50-2142P	21b	Screw 16", 18" (400mm, 450mm)	1	50-2681
9d	Bonnet 16" (400mm)	1	50-2539P	22a	Nameplate 10", 12", 14" (250mm to 350mm)	1	50-0759
9e	Bonnet 18" (450mm)	1	50-2540P	22b	Nameplate 16", 18" (400mm, 450mm)	1	50-2682
10a	Stem Assembly 10" (250mm)	1	50-2350	23a	Support Washer 10", 12", 14" (250mm to 350mm)	1	50-0764
10b	Stem Assembly 12" (300mm)	1	50-2352	23b	Support Washer 16", 18" (400mm, 450mm)	1	50-2680
10c	Stem Assembly 14" (350mm)	1	50-2354		Seal Cap Kit 10" (250mm)		50-1133
10d	Stem Assembly 16" (400mm)	1	50-2624		Seal Cap Kit 12", 14" (300mm, 350mm)		50-1134
10e	Stem Assembly 18" (450mm)	1	50-2626		Seal Cap Kit 16", 18" (400mm, 450mm)		50-1194
11a	Bonnet Cap Screw 10" (250mm)	8	75-0604		<i>Above kits consist of:</i>		
11b	Bonnet Cap Screw 12" (300mm)	12	75-0604	6a	Seal Cap O-Ring 10" (250mm)	1	50-0761
11c	Bonnet Cap Screw 14" (350mm)	16	50-2250	6b	Seal Cap O-Ring 12", 14" (300mm, 350mm)	1	50-2259
11d	Bonnet Cap Screw 16" (400mm)	20	50-2589	6c	Seal Cap O-Ring 16", 18" (400mm, 450mm)	1	50-2623
11e	Bonnet Cap Screw 18" (450mm)	24	50-2590	24a	Seal Cap 10" (250mm)	1	50-0754
12a	Ring, Teflon Back Seat 10" (250mm)	1	50-2233	24b	Seal Cap 12", 14" (300mm, 350mm)	1	50-2258
12b	Ring, Teflon Back Seat 12" (300mm)	1	50-2213	24c	Seal Cap 16", 18" (400mm, 450mm)	1	50-2527
12c	Ring, Teflon Back Seat 14" (350mm)	1	50-2248	25a	Body, Globe 10" BW (250mm)	1	50-2197
12d	Ring, Teflon Back Seat 16", 18" (400mm, 450mm)	1	50-2516	25b	Body, Globe 12" BW (300mm)	1	50-2199
14a	Lower Disc Holder 10" (250mm)	1	50-2153	25c	Body, Globe 14" BW (350mm)	1	50-2195
14b	Lower Disc Holder 12" (300mm)	1	50-2211	25d	Body, Angle 10" BW (250mm)	1	50-2177
14c	Lower Disc Holder 14" (350mm)	1	50-2145	25e	Body, Angle 12" BW (300mm)	1	50-2186
14d	Lower Disc Holder 16" (400mm)	1	50-2536	25f	Body, Angle 14" BW (350mm)	1	50-2148
14e	Lower Disc Holder 18" (450mm)	1	50-2533	25g	Body, Angle 16" BW (400mm)	1	50-2542
15a	Upper Disc Holder 10" (250mm)	1	50-2154	25h	Body, Angle 18" BW (450mm)	1	50-2541
15b	Upper Disc Holder 12" (300mm)	1	50-2210				
15c	Upper Disc Holder 14" (350mm)	1	50-2146				

SERVICE AND MAINTENANCE

Hansen steel butt welding shut-off valves require practically no service or maintenance due to the combination of polished stainless steel stems and reliable O-ring stem seals plus graphite composite packing. This almost entirely eliminates stem leakage, the common ailment of shut-off valves.

To help ensure safety, verify the tightness of the packing nut whenever the position (open or closed) is changed on isolation shut-off valves before opening the system. Ensuring that the packing nut is tight helps reduce the possibility that any line or system vibration may cause a slight unseating of a closed valve.

STEM PACKING

When verifying the tightness of the packing nut, use an adjustable wrench. Extrusion of some black graphite packing material along the stem is normal. If the O-ring or the adjustable packing ever needs replacement as evidenced by refrigerant or oil leakage at the stem, open the valve stem firmly to the back-seat position. This separates the O-ring and packing from the system refrigerant. Remove the packing nut carefully and then use a wire hook or a small blade screwdriver to remove the packing and O-ring. Take care not to scratch the stem or bonnet sealing surfaces. Carefully install the backup washer (1½"-18" or 13mm-450mm only), new lubricated stem O-ring, stem washer, and stem packing. Tighten the packing nut only enough to give the handwheel slight turning friction.

VALVE SEAT

To inspect or replace the valve seat disc, isolate the valve from the system and safely pump out all refrigerant to zero pressure with the stem open at least one turn. Evenly loosen all bolts one to two turns. Using a screwdriver, break the seal between the bonnet and valve body, proceeding cautiously to avoid any refrigerant which may still remain inside the valve body. Remove the bonnet bolts and bonnet assembly, being careful not to damage the Teflon seat disc surface. If the seat surface in the body is marred, it may be possible to repair the seat by polishing with emery paper.

If the Teflon seat disc is damaged, replace the entire disc assembly ½" (13mm) thru 4" (100mm) by first removing the ball retainer spring, ball bearings and anti-spin O-ring. Install a new disc assembly including anti-spin O-ring. Alternately, use a lathe to take a ⅙₄" (0.4 mm) by 45° surface cut on the Teflon seat. The 5" (125mm) thru 18" (450mm) Teflon seats can be replaced by disassembling the disc holder by loosening and removing the disc screws. Replace the Teflon ring, the upper disc O-ring in 10" (250mm) and above, and reassemble the disc.

Replace body gasket or O-ring and reassemble bonnet into body using care not to damage Teflon seat surface. Be careful not to pinch the O-ring. If necessary, retain O-ring in O-ring groove by using a suitable O-ring grease. Ensure the stem is opened at least several turns.

Hansen assembles valves with bonnet cap screws factory tightened as follows: ½" to 1¼" (13mm to 32mm)–30 ft-lb (41 Nm); 1½" (40mm) and 2" (50mm)–40 ft-lb (54 Nm); 2½" (65mm) and 3" (80mm)–60 ft-lb (81 Nm); 4" (100mm)–180 ft-lb (244 Nm); and 5" to 18" (125mm to 450mm)–200 ft-lb (271Nm). Test the valve for leaks before returning it to service.

TROUBLESHOOTING VALVE LEAKS

On the rare occasion when a small valve leak is discovered, the following procedures may help:

Stem seal leaks – The possibility of this occurrence is based on many factors, such as frequency of use, exercising, debris or rust on stem, etc. First, simply tighten the packing nut to see if this eliminates the leak. If not, back seat the valve or isolate it entirely from the refrigeration system. See Stem Packing section of this bulletin.

Bonnet gasket leaks – If a gasket leak is discovered at the bonnet-to-body interface, first bring the pressure in the valve to zero pressure and check the bonnet bolt tightness. If the leak persists, isolate the valve from the refrigeration system and disassemble the valve. Check the gasket sealing surfaces on the bonnet and valve body for scratches or gouges. These scratches can sometimes be polished smooth. Install a new gasket and reassemble the valve. Evenly tighten all bolts to properly seat the bonnet. Repeat the pressure test.

Bonnet O-ring leaks – Valves 5" (125mm) and larger use bonnet O-rings. If a leak is discovered at the bonnet-to-body interface, first bring the pressure in the valve to zero pressure and check the bonnet bolt torque. The torque recommendations are provided below. If the leak persists, isolate the valve from the refrigeration system and disassemble the valve. Check for debris on the surfaces of the bonnet and O-ring groove in the valve body. Check for scratches and polish the surfaces. Clean and check the O-ring for cuts, cracks and embedded debris. Check the bonnet and valve surface for flatness. Occasionally, the edge of the bonnet on the valve body is struck or dropped which could damage or raise the sealing surface of the bonnet. This prevents the two sealing surfaces from being completely engaged. Remove the raised edge. Also, if not carefully re-assembled, the bonnet may have been slightly askew, preventing proper sealing. Before reassembling the valve, clean the sealing surfaces and O-ring apply suitable grease to the O-ring. Install the bonnet, making sure the stem is open several turns. Evenly tighten, then torque the bonnet bolts to the specified value below. Pressure test the valve to check for leaks.

ORDERING INFORMATION, EXTENDED NECK BUTT WELD SHUT-OFF VALVES

SIZE	DESCRIPTION	CAT NO
1/2" (13mm)	Globe, Handwheel Angle, Handwheel Globe, Seal Cap Angle, Seal Cap	GWE051H AWE050H GWE051C AWE050C
3/4" (20mm)	Globe, Handwheel Angle, Handwheel Globe, Seal Cap Angle, Seal Cap	GWE076H AWE075H GWE076C AWE075C
1" (25mm)	Globe, Handwheel Angle, Handwheel Globe, Seal Cap Angle, Seal Cap	GWE101H AWE100H GWE101C AWE100C
1¼" (32mm)	Globe, Handwheel Angle, Handwheel Globe, Seal Cap Angle, Seal Cap	GWE126H AWE125H GWE126C AWE125C
1½" (40mm)	Globe, Handwheel Angle Handwheel Globe, Seal Cap Angle, Seal Cap	GWE150H AWE150H GWE150C AWE150C
2" (50mm)	Globe, Handwheel Angle, Handwheel Globe, Seal Cap Angle, Seal Cap	GWE200H AWE200H GWE200C AWE200C
2½" (65mm)	Globe, Handwheel Angle, Handwheel Globe, Seal Cap Angle, Seal Cap	GWE251H AWE251H GWE251C AWE251C
3" (80mm)	Globe, Handwheel Angle, Handwheel Globe, Seal Cap Angle, Seal Cap	GWE301H AWE301H GWE301C AWE301C
4"* (100mm)	Globe, Handwheel Angle, Handwheel Globe, Seal Cap Angle, Seal Cap	GWE400H AWE402H GWE400C AWE402C

*Note: 4" Extended Neck Globe is a "T" style valve.

**ORDERING INFORMATION,
BUTT WELD SHUT-OFF VALVES**

SIZE	DESCRIPTION	CAT NO
1/2" (13mm)	Globe, Handwheel Angle, Handwheel Globe, Seal Cap Angle, Seal Cap	GWB051H AWB050H GWB051C AWB050C
3/4" (20mm)	Globe, Handwheel Angle, Handwheel Globe, Seal Cap Angle, Seal Cap	GWB076H AWB075H GWB076C AWB075C
1" (25mm)	Globe, Handwheel Angle, Handwheel Globe, Seal Cap Angle, Seal Cap	GWB101H AWB100H GWB101C AWB100C
1 1/4" (32mm)	Globe, Handwheel Angle, Handwheel Globe, Seal Cap Angle, Seal Cap	GWB126H AWB125H GWB126C AWB125C
1 1/2" (40mm)	Globe, Handwheel Angle Handwheel Globe, Seal Cap Angle, Seal Cap	GW150H AW150H GW150C AW150C
2" (50mm)	Globe, Handwheel Angle, Handwheel Globe, Seal Cap Angle, Seal Cap	GW200H AW200H GW200C AW200C
2 1/2" (65mm)	Globe, Handwheel Angle, Handwheel Globe, Seal Cap Angle, Seal Cap	GW251H AW251H GW251C AW251C
3" (80mm)	Globe, Handwheel Angle, Handwheel Globe, Seal Cap Angle, Seal Cap	GW301H AW301H GW301C AW301C
4" (100mm)	Globe, Handwheel Angle, Handwheel Globe, Seal Cap Angle, Seal Cap	GW402H AW402H GW402C AW402C
5" (125mm)	Globe, Handwheel Angle, Handwheel Globe, Seal Cap Angle, Seal Cap	GW500H AW500H GW500C AW500C
6" (150mm)	Globe, Handwheel Angle, Handwheel Globe, Seal Cap Angle, Seal Cap	GW600H AW600H GW600C AW600C
8" (200mm)	Globe, Handwheel Angle, Handwheel Globe, Seal Cap Angle, Seal Cap	GW800H AW800H GW800C AW800C
10" (250mm)	Globe, Handwheel Angle Handwheel Globe, Seal Cap Angle, Seal Cap	GW1000H AW1000H GW1000C AW1000C
12" (300mm)	Globe, Handwheel Angle, Handwheel Globe, Seal Cap Angle, Seal Cap	GW1200H AW1200H GW1200C AW1200C
14" (350mm)	Globe, Handwheel Angle, Handwheel Globe, Seal Cap Angle, Seal Cap	GW1400H AW1400H GW1400C AW1400C
16" (400mm)	Angle, Handwheel Angle, Seal Cap	AW1600H AW1600C
18" (450mm)	Angle, Handwheel Angle, Seal Cap	AW1800H AW1800C

TO ORDER

Specify catalog number. To order valves for 600 psig (41 bar g) SWP, add the letter "C" prefix to catalog number (Example: CGW200H). CE marked valves are available for 1 1/4" through 14" (32mm to 350mm), add the letter "E" suffix (Example: AW150HE).

CAUTION

Hansen valves are for refrigeration only. These instructions must be completely read and understood before selecting, using or servicing Hansen valves and electronics. Only knowledgeable, trained refrigeration mechanics should install, operate, or service. Stated temperature and pressure limits should not be exceeded. Bonnets should not be removed from valves unless system has been evacuated to zero pressure. See also Safety Precautions in the current List Price Schedule and the Safety Precautions Sheet supplied with product.

WARRANTY

All Hansen products, except electronics, are guaranteed against defective materials or workmanship for one year F.O.B. factory. Electronics are guaranteed against defective materials or workmanship for 90 days F.O.B. factory. No consequential damages or field labor is included.

TYPICAL SPECIFICATIONS

"Weldable refrigerant shut-off valves shall have stainless steel stems with dual seals, forged or cast steel bodies, back-seating design for packing replacement, bonnet threads for installation of stem seal caps, butt weld ends machined dimensionally correct for schedule 80 pipe (sizes 1/2"-1 1/2"), schedule 40 pipe (sizes 2"-10") and gauge or standard weight pipe (sizes 12" and above), and suitable for a safe working pressure of 400 psig (28 bar g) or 600 psig (41 bar g) as manufactured by Hansen Technologies Corporation, or approved equal."

H HANSEN

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