2" Globe Valve: GS200H

Specifications, Applications, Service Instructions & Parts

SOCKET WELD SHUT-OFF VALVES

½" through 2½"* (13 mm through 65 mm) Globe and Angle for Refrigerants

*2" (50 mm) to 16" (400 mm) available as butt weld

INTRODUCTION

The advanced design and materials of the Hansen Steel Body Socket Weld Refrigerant Valves make them stronger and far superior to other commonly available products. This is especially true in regard to leakage from seats, stems, bonnets, and piping connections. Socket weld steel bodies permit these valves to be quickly and easily welded directly into piping without the inconvenience of pipe threading or using bulkier iron-flanged valves with socket weld steel flanges requiring bolts, nuts, and gaskets. Compared to butt weld valves, the Hansen socket weld bodies allow quicker welding, easier pipe alignment, and cleaner pipe and valve interiors.

APPLICATIONS

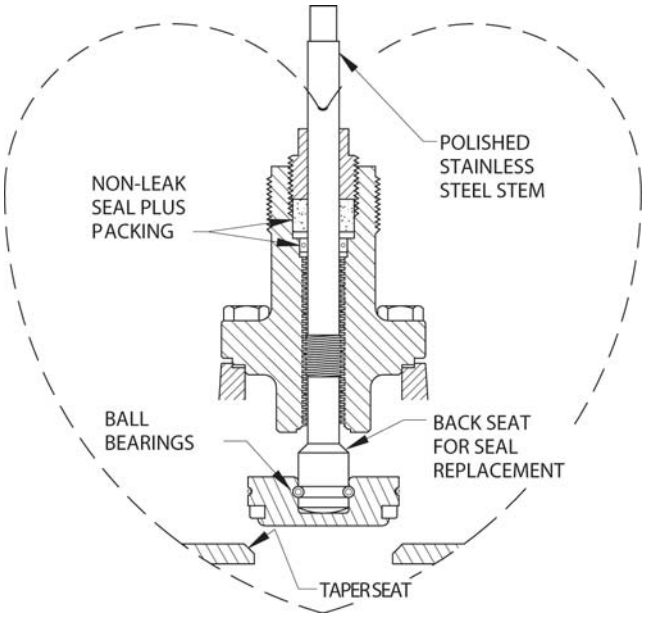
Typical uses include:

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

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

Compressor suction and discharge connections and condenser and evaporator inlet and outlet connections for ammonia, R22, R134a, and other Hansen-approved refrigerants.

KEY FEATURES



ADDITIONAL FEATURES

Suitable for ammonia, R22, R134a, and other Hansen-approved refrigerants
Globe and angle available
Teflon seat disc (no lead)
Available also as an expansion valve
Handwheels or seal caps are interchangeable
400 psig (27 bar) safe working pressure
Temperature range: –60°F to +240°F (–50°C to +115°C)
Below –60°F (–50°C) at lower pressures
Nonasbestos gaskets
Made entirely in the USA

MATERIAL SPECIFICATION

Body: ½" and ¾", ASTM A108 (connections ASTM A513)
1" through 2½", cast steel, ASTM A352, grade LCB
Stem: stainless steel
Disc Holder: steel
Seat Disc: PTFE Teflon, retained
Ball Bearings: stainless steel
Packing Nut: ½" through 1¼", corrosion resistant coated steel
1½" through 2½", electroless nickel plated steel
Stem Packing: graphite composite plus neoprene o-ring
Handwheel: ½" through 1¼", zinc-plated Zamak alloy
1½" through 2½", zinc-plated iron alloy
Bonnet: ½" through 1¼", zinc-chromate plated steel
1½" through 2½", ductile iron ASTM A536
Seal Cap: ½" through 1¼", glass-filled polymer, safety vented
1½" through 2½", zinc-plated steel

ADVANTAGES

Compared to threaded valves, Hansen Socket Weld Valves eliminate the chance of future leaks at pipe threads. In addition, a socket welded pipe-to-body joint eliminates the inherent weakness and vulnerability of the threaded portion of pipe immediately adjacent to a screwed valve body or flange.

Socket welding is easier than butt welding for alignment. It also provides cleaner interior weld joints.

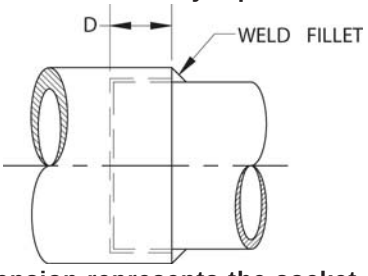
Compared to flanged valves, Hansen Socket Weld Valves eliminate the leak potential at the gasket joint. In addition, nearly all refrigeration flanged valves are made of cast iron or "semi-steel," a type of cast iron. Hansen's steel valves have much greater tensile strength, ductility, and impact resistance than cast iron.

Compared to pressed-sheet-steel weld valves, Hansen valves have heavier cast steel wall thickness for greater rigidity and a corrosion safety margin.

All Hansen socket weld valves have rising stems. This allows the operator to know at a glance whether the valve is open or closed.

CONNECTION DIMENSIONS

The body sockets accommodate US Standard Pipe Schedule 40 or Extra Heavy Pipe Schedule 80.



The D dimension represents the socket depth. See pages 4, 6, 8, and 10.

INSTALLATION

All Hansen weld 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. Globe valves in horizontal suction lines, liquid overfeed return lines, condenser drain lines, purge lines, oil pot drain lines, or level control column isolation valves should have stems horizontal to avoid liquid or vapor being trapped at the valve seat orifice. 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.

The valve stem should be opened several turns during welding to prevent heat damage to the seat disc. Normally, it is not necessary to disassemble these socket weld valves for installation welding. However, if welding is prolonged enough to overheat the valve body, a wet rag should be wrapped around the valve bonnet and upper body while welding. Socket weld fitting and valve codes require that the pipe be inserted until bottomed against the stop, then backed out approximately $^{1}/_{16}$" (1.5 mm) before welding.

Welds should be annealed as necessary in accordance with good practice. Painting 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. If necessary, retighten at 75 ft-lbs (100 Nm) the threaded bonnet on ½" (13 mm) through 1¼" (32 mm) valves. These may have a loosened secondary knife-edge seal after installation due to excessive heating of valve body.

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. The valve seat should be cracked open to prevent hydrostatic expansion between the valve and the cap. Valves should never directly feed a water tank because of potential internal corrosion or seat opening caused by vibration.

INSULATION

Readily available, valve shaped block insulation can be used for both angle and globe valves. Exterior valve dimensions for insulation are shown on pages 4, 6, 8, and 10. The W dimension on pages 6, 8, and 10 represents the width of the reinforcement web.

SERVICE AND MAINTENANCE

Hansen Steel Body Socket Weld Shut-Off Valves require practically no service or maintenance. Stem leakage, a common problem of shut-off valves, is almost entirely eliminated by the combination of polished stainless steel stems and reliable, conventional, adjustable packing supplementing fluid-tight o-ring stem seals. For optimum maintenance, occasional cleaning of the valve stem with a soft rag and refrigerant oil is helpful. The patented o-ring stem seal design permits low torque operation to open and close the valve.

FLOW CAPACITIES
PIPING AND VALVE SIZING GUIDE FOR AMMONIA

SERVICE	CONDITIONS				CAPACITIES													
	Temp.		PRESSURE		½" (13 mm)		¾" (20 mm)		1" (25 mm)		1¼" (32 mm)		1½" (40 mm)		2" (50 mm)		2½" (65 mm)	
	°F	(°C)	PSIG	(BAR)	TONS	(kW)	TONS	(kW)	TONS	(kW)	TONS	(kW)	TONS	(kW)	TONS	(kW)	TONS	(kW)
Suction Lines Single Stage Compressor	+20	(–6.7)	33.5	(2.3)	—	—	—	—	8.6	(30)	15.8	(56)	21.3	(75)	35.7	(126)	51.1	(180)
	0	(–17.8)	15.7	(1.1)	—	—	—	—	5.7	(20)	10.4	(37)	13.9	(49)	22.7	(80)	34.0	(120)
Suction Lines Booster	–20	(–28.9)	3.6	(0.2)	—	—	—	—	4.2	(15)	7.4	(26)	10.3	(36)	16.8	(59)	24.8	(87)
	–40	(–40)	8.7"	(–0.3)	—	—	—	—	—	—	4.4	(15)	6.3	(22)	9.9	(35)	14.4	(51)
Liquid Overfeed Return Lines (4X)	+20	(–6.7)	33.5	(2.3)	—	—	—	—	5.0	(18)	9.1	(32)	12.3	(43)	20.6	(73)	29.4	(103)
	0	(–17.8)	15.7	(1.1)	—	—	—	—	3.4	(12)	6.3	(22)	8.5	(30)	13.6	(48)	20.5	(72)
	–20	(–28.9)	3.6	(0.2)	—	—	—	—	2.2	(8)	4.0	(14)	5.5	(19)	8.9	(31)	13.1	(46)
	–40	(–40)	8.7"	(–0.3)	—	—	—	—	—	—	2.4	(8)	3.4	(12)	5.4	(19)	7.9	(28)
Hot Gas Feed	+70	(+21.1)	114.1	(7.9)	2.2	(8)	4.3	(15)	7.3	(26)	14.1	(50)	19.6	(69)	36.5	(128)	53	(187)
Hot Gas Main	+70	(+21.1)	114.1	(7.9)	4.4	(15)	8.6	(30)	14.7	(52)	28.1	(99)	39.2	(138)	73.0	(257)	106	(373)
Compressor Discharge	+86	(+30)	154.5	(10.7)	—	—	—	—	12.6	(44)	24.1	(85)	33.6	(118)	62.6	(220)	90.3	(318)
Condenser Drains	+86	(+30)	—	—	6.0	(21)	14.5	(51)	24.0	(84)	50.0	(176)	77.0	(271)	140	(493)	220	(774)
Liquid Mains	+86	(+30)	—	—	28.3	(100)	53.1	(187)	90.8	(320)	143	(503)	202	(711)	454	(1598)	657	(2313)
Liquid Feed Branch	+86	(+30)	—	—	54.9	(193)	103	(363)	176	(620)	277	(975)	392	(1380)	881	(3101)	1273	(4481)
Liquid Overfeed Supply (4X)	+10	(–12.2)	—	—	9.0	(32)	17.0	(60)	29.0	(102)	46.0	(162)	65.0	(229)	144	(507)	208	(732)

SIZING GUIDE

These capacity recommendations are not affected by the length of the pipe line. These are approximate optimum sizes based on power costs versus the investment cost of piping and its total installed cost. Piping sized to these capacities will have 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: Hansen angle socket weld valves have about 145 diameters of equivalent flow resistance, or 145/700 = 0.2°F (0.1°C) of equivalent pressure drop at the suction line capacities shown for a valve in a suction line. Globe valves equal about 225 diameters.

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

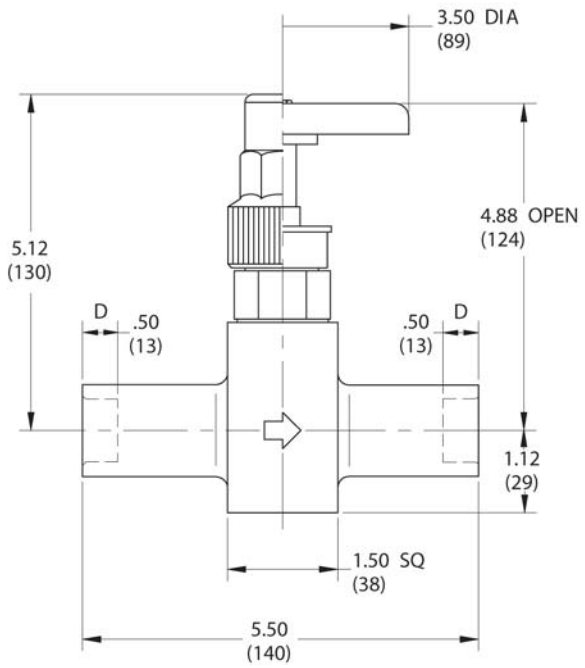
FLOW COEFFICIENTS

NOMINAL SIZE INCH	(MM)	ANGLE				GLOBE			
		FLOW COEFFICIENT Cv	(Kv)	EQUIVALENT LENGTH* FEET	(METERS)	FLOW COEFFICIENT Cv	(Kv)	EQUIVALENT LENGTH* FEET	(METERS)
1/2	(13)	6	(5.2)	5	(1.5)	4	(3.5)	9	(2.7)
3/4	(20)	9	(7.8)	8	(2.4)	8	(6.9)	8	(2.4)
1	(25)	26	(22)	5	(1.5)	18	(16)	8	(2.4)
1 1/4	(32)	30	(26)	14	(4.3)	21	(18)	21	(6.4)
1 1/2	(40)	53	(46)	11	(3.4)	41	(35)	14	(4.3)
2	(50)	80	(69)	27	(8.2)	67	(58)	34	(10.4)
2 1/2	(65)	173	(150)	18	(5.5)	163	(141)	20	(6.1)

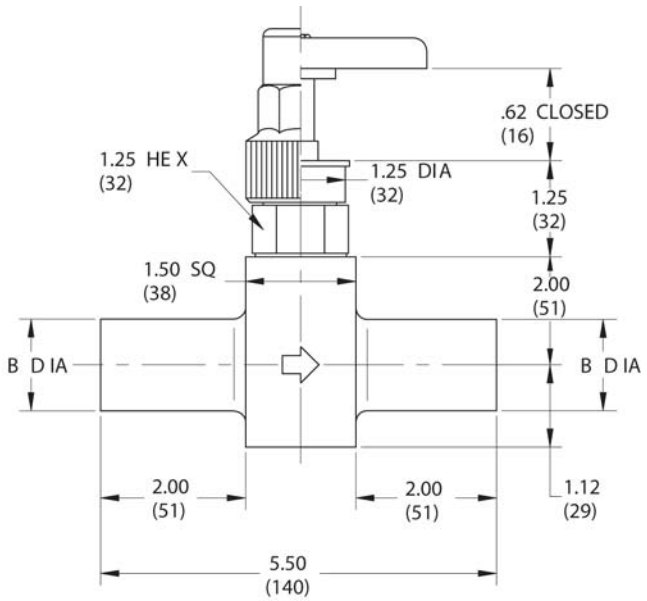
*Schedule 80 pipe under 2" size

½" (13 MM) AND ¾" (20 MM) SOCKET WELD VALVE

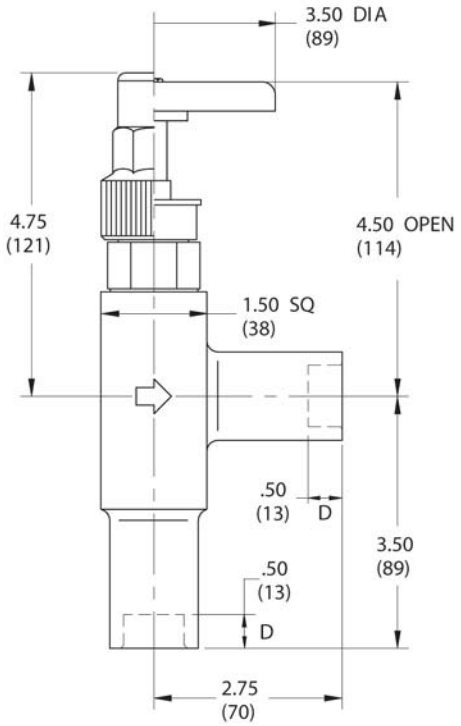
INSTALLATION DIMENSIONS INCHES (MM)

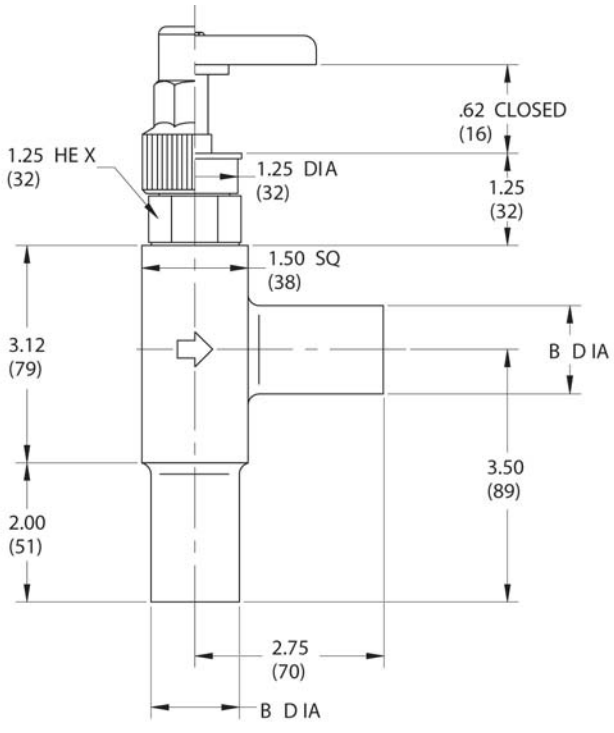


INSULATION DIMENSIONS INCHES (MM)



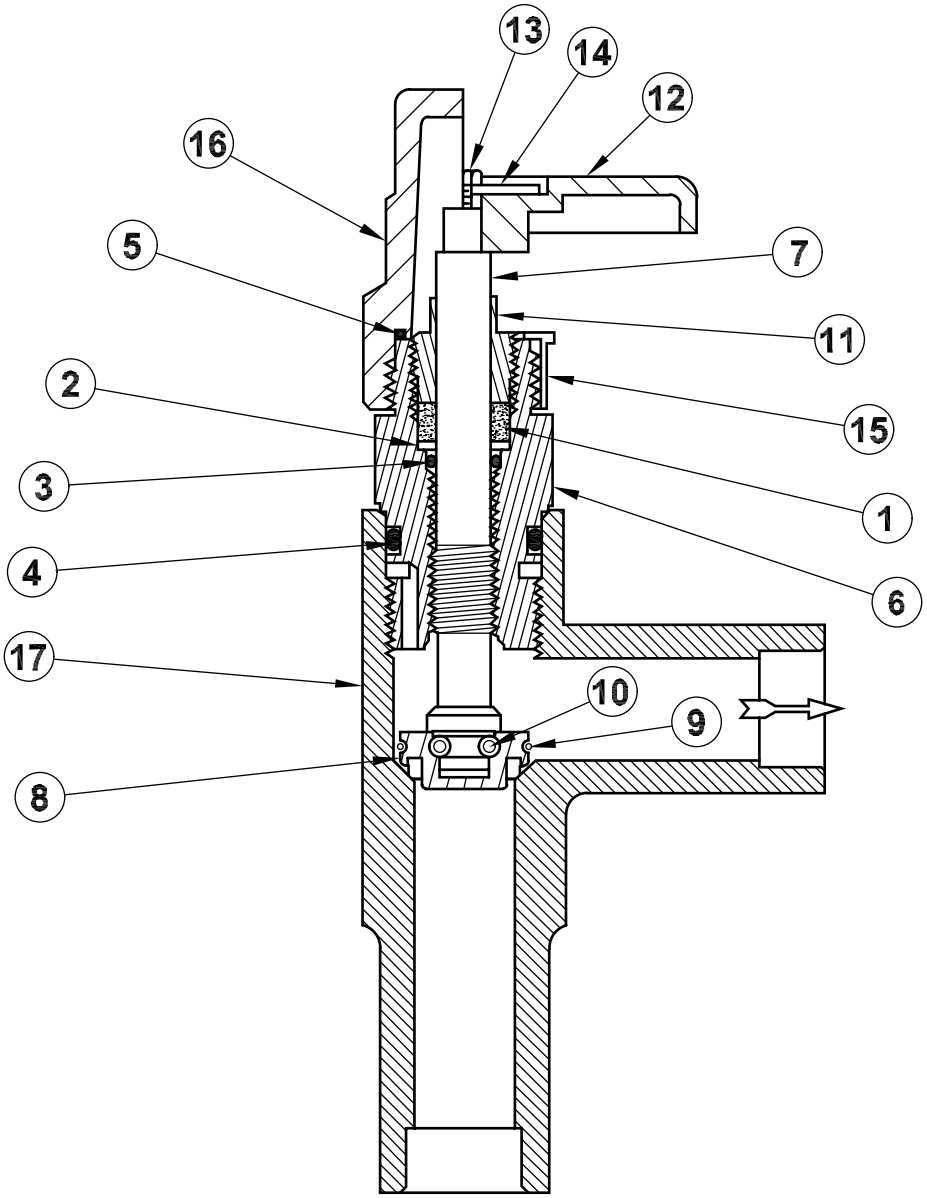
SIZE	B
1/2 (13)	1.25 (32)
3/4 (20)	1.50 (51)





SIZE	B
1/2 (13)	1.25 (32)
3/4 (20)	1.50 (51)

½" (13 MM) AND ¾" (20 MM) SOCKET WELD VALVE



PARTS LIST

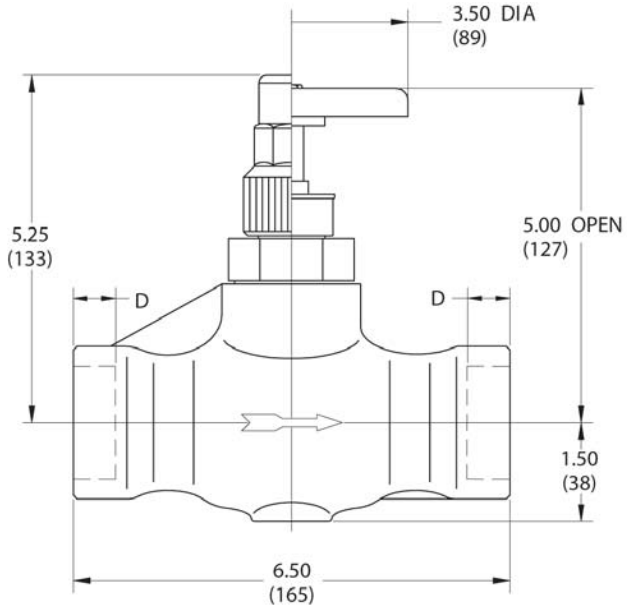
ITEM	DESCRIPTION	QTY	PART NO*
	Gasket Kit consist of:		**50-1040**
1	Stem Packing	1	50-0045
2	Stem Washer	1	50-0046
3	Stem O-ring	1	50-0179
4	Bonnet O-ring	1	50-0453
5	Seal Cap O-ring	1	50-0432
11	Packing nut	1	50-0933
	Bonnet Assembly Kit		**50-1041**
	Above Kit consists of:		
6	Bonnet	1	50-0422
7	Stem	1	50-0012
8	Disc Assembly	1	50-0803
9	Ball Retainer	1	50-0439
10	Balls	10	50-0016
	Gasket Kit	1	50-1040
	Disc Assembly Kit consists of:		**50-1042**
8	Disc Assembly	1	50-0803
9	Ball Retainer	1	50-0439
10	Balls	10	50-0016
4	Bonnet O-ring	1	50-0453

ITEM	DESCRIPTION	QTY	PART NO.*
	Handwheel Kit consists of:		50-1005
12	Handwheel	1	50-0953
13	Screw	1	50-0479
14	Name Plate	1	50-0094
15	Bonnet Thread Cap	1	50-0434
	Seal Cap Kit consists of:		50-1036
16	Seal Cap	1	50-0423
5	Seal Cap O-ring	1	50-0432
17	Body, Globe 1/2" SW	1	50-0449
	Body, Globe 3/4" SW	1	50-0451
	Body, Angle 1/2" SW	1	50-0450
	Body, Angle 3/4" SW	1	50-0452

***Prior to 1989, ½" and ¾" socket weld valves had cast steel bodies. Replacement parts and numbers for these valves are the same as the 1" and 1¼" valves listed on page 7. A plated steel seal cap is available. To order specify part number 50-1064.**

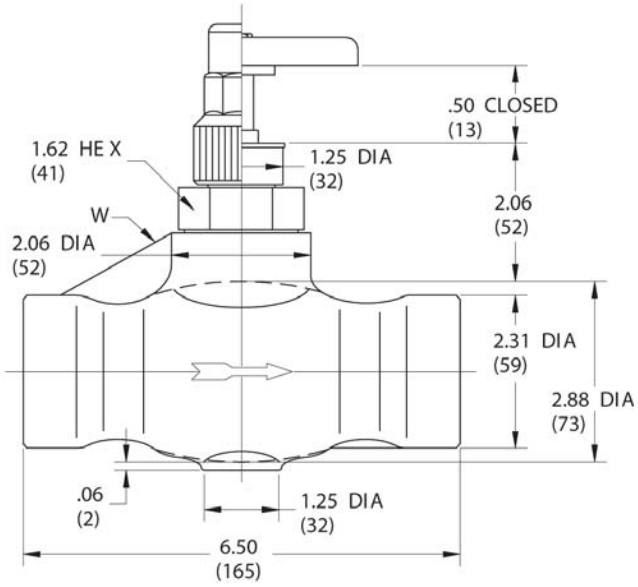
1" (25 MM) AND 1¼" (32 MM) SOCKET WELD VALVE

INSTALLATION DIMENSIONS INCHES (MM)

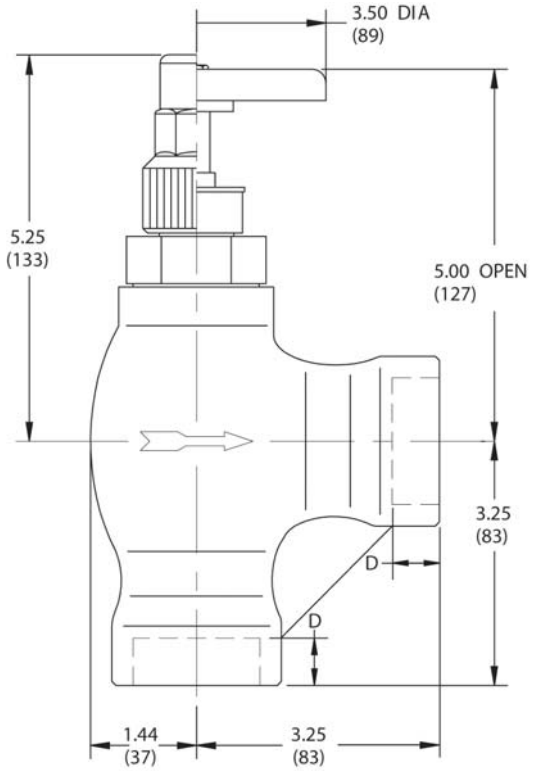


SIZE	D
1 (25)	0.50 (13)
1¼ (32)	0.62 (16)

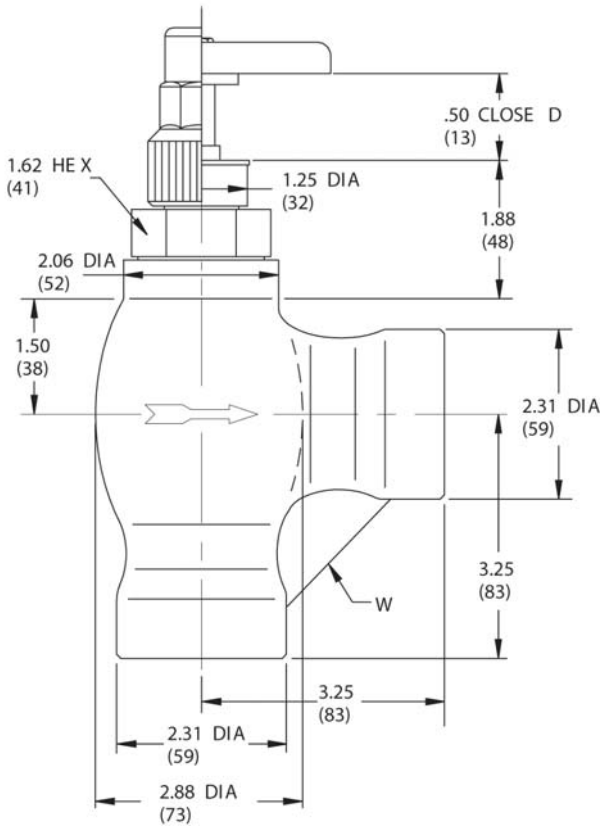
INSULATION DIMENSIONS INCHES (MM)



W=1.00 (25), WEB THICKNESS

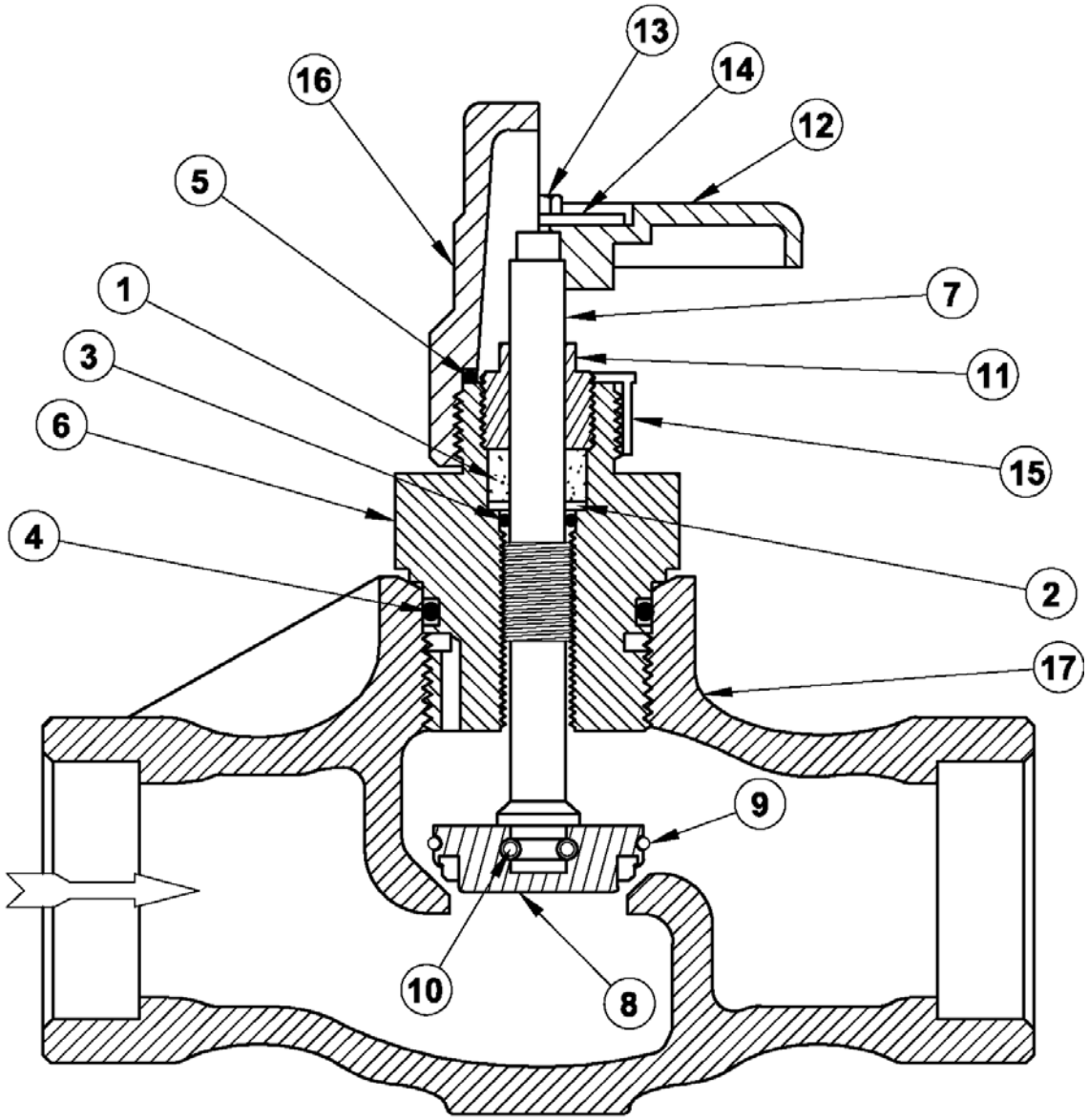


SIZE	D
1 (25)	0.50 (13)
1¼ (32)	0.62 (16)



W=1.00 (25), WEB THICKNESS

1" (25 MM) AND 1¼" (32 MM) SOCKET WELD VALVE



PARTS LIST

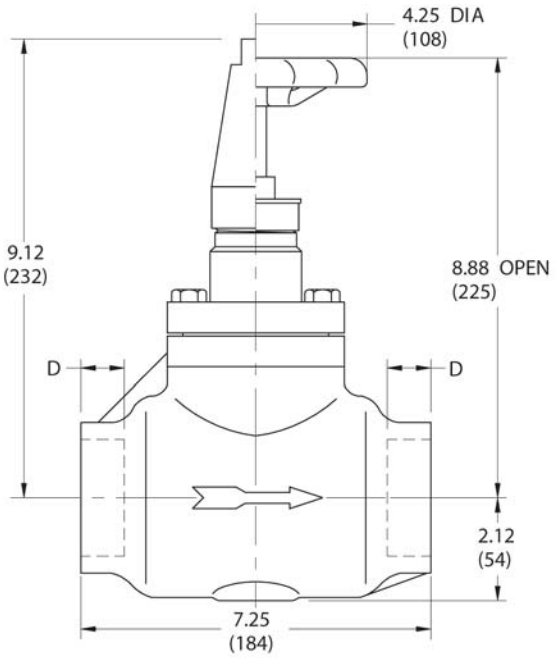
ITEM	DESCRIPTION	QTY	PART NO.
	Gasket Kit consists of:		**50-1040**
1	Stem Packing	1	50-0045
2	Stem Washer	1	50-0046
3	Stem O-ring	1	50-0179
4	Bonnet O-ring	1	50-0017
5	Seal Cap O-ring	1	50-0432
11	Packing nut	1	50-0933
	Bonnet Assembly Kit		**50-1021**
	Above kit consists of:		
6	Bonnet	1	50-0429
7	Stem	1	50-0012
8	Disc Assembly	1	50-0804
9	Ball Retainer	1	50-0026
10	Balls	10	50-0016
	Gasket Kit	1	50-1040
	Disc Assembly Kit consists of:		**50-1004**
8	Disc Assembly	1	50-0804
9	Ball Retainer	1	50-0026
10	Balls	10	50-0016
4	Bonnet O-ring	1	50-0017

ITEM	DESCRIPTION	QTY	PART NO.
	Handwheel Kit consists of:		**50-1005**
12	Handwheel	1	50-0953
13	Screw	1	50-0479
14	Name Plate	1	50-0094
15	Bonnet Thread Cap	1	50-0434
	Seal Cap Kit consists of:		**50-1036**
16	Seal Cap	1	50-0423
5	Seal Cap O-ring	1	50-0432
17a	Body, Globe 1" S.W.	1	50-0386
17b	Body, Globe 1¼" S.W.	1	50-0387
17c	Body, Angle 1" S.W.	1	50-0389
17d	Body, Angle 1¼" S.W.	1	50-0390

*Plated steel seal cap kits are available (p/n 50-1064).

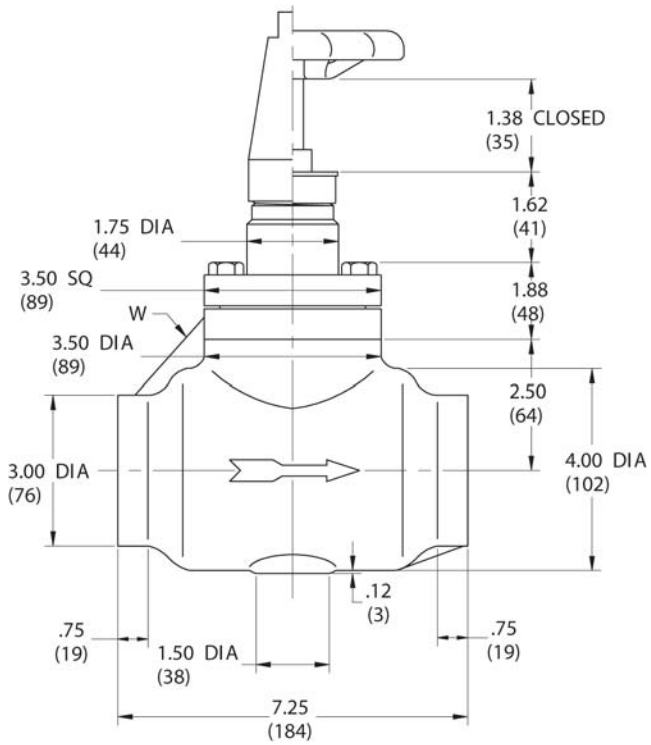
1½" (40 MM) AND 2" (50 MM) SOCKET WELD VALVE

INSTALLATION DIMENSIONS INCHES (MM)

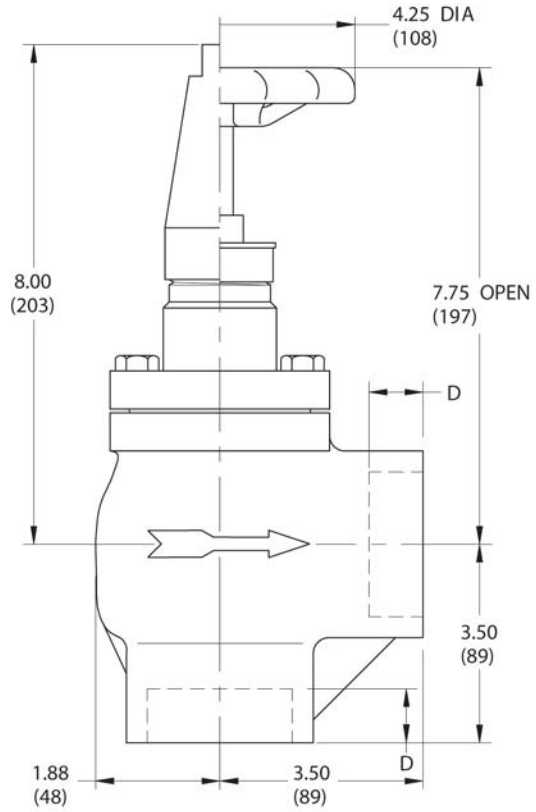


SIZE	D
1½ (40)	.62 (16)
2 (50)	.88 (22)

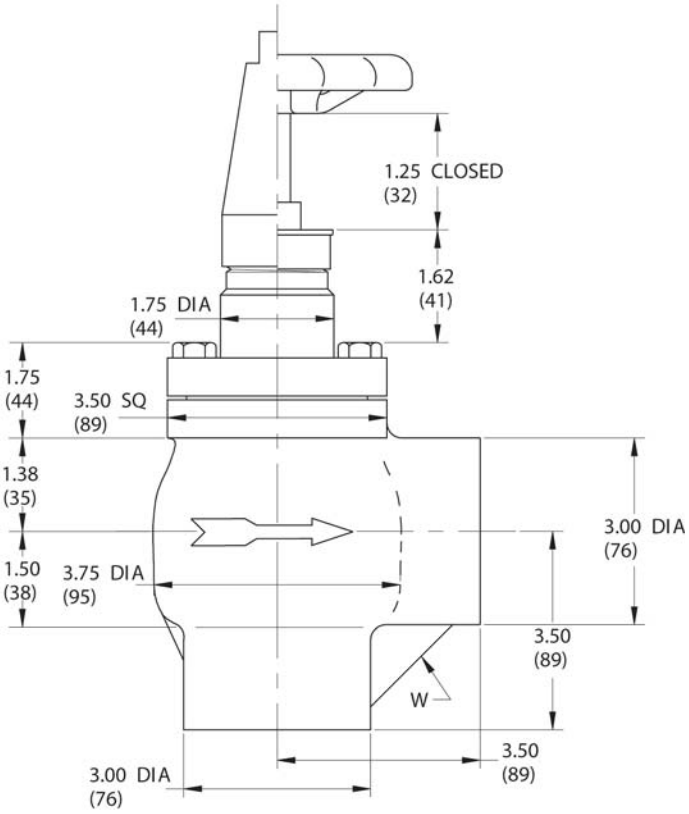
INSULATION DIMENSIONS INCHES (MM)



W=1.00 (25), WEB THICKNESS

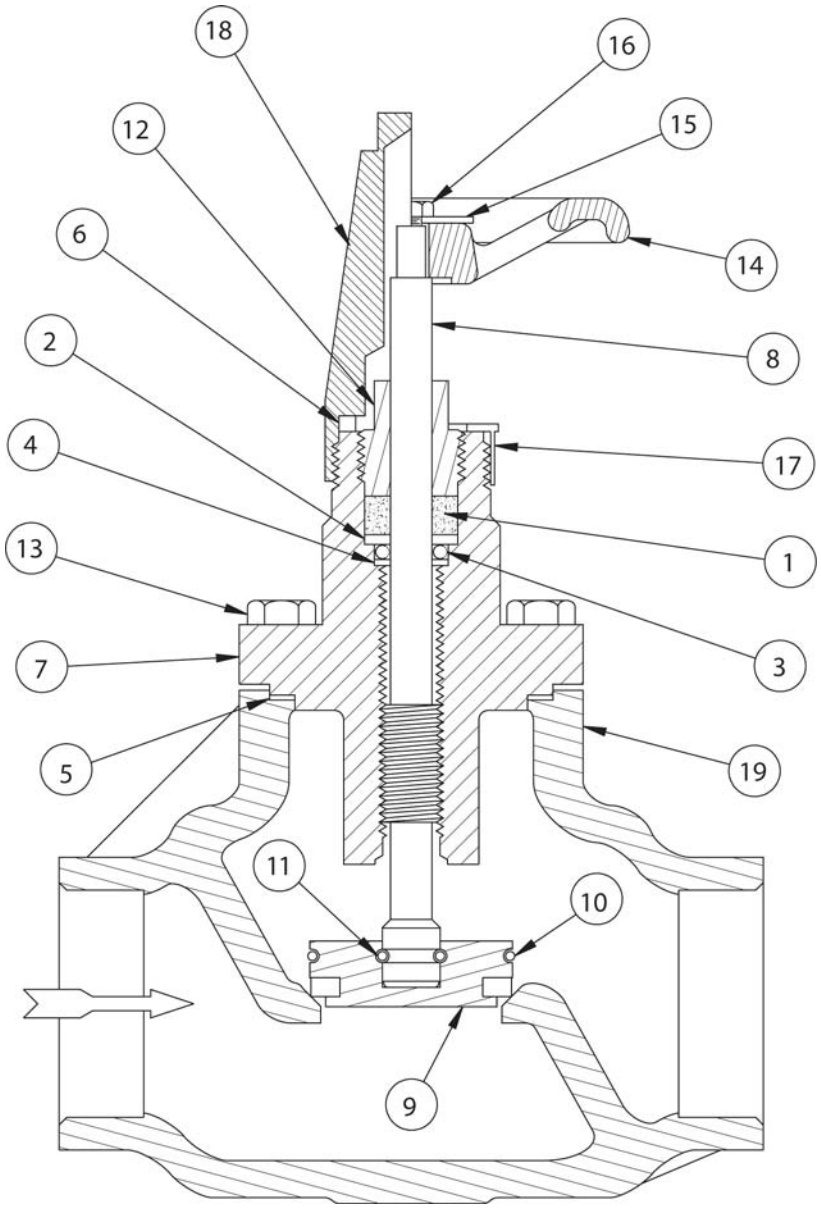


SIZE	D
1½ (40)	.62 (16)
2 (50)	.88 (22)



W=1.00 (25), WEB THICKNESS

1½" (40 MM) AND 2" (50 MM) SOCKET WELD VALVE



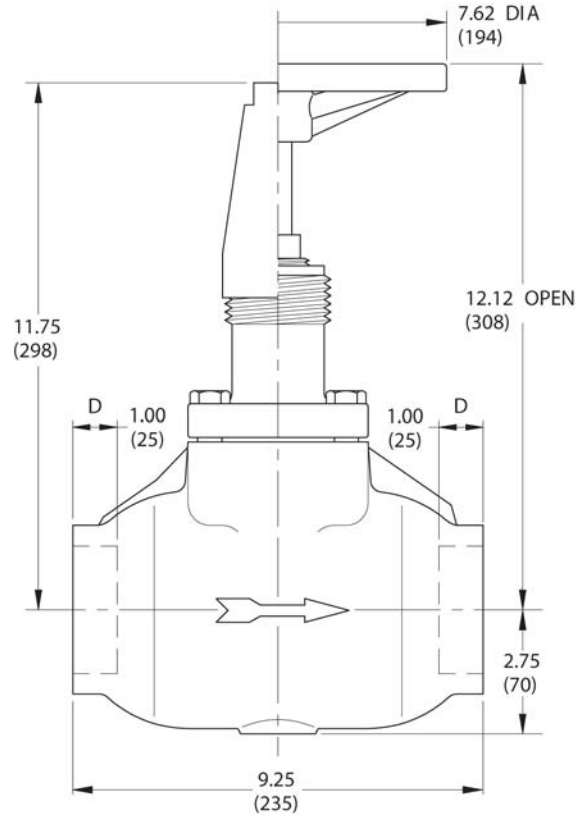
PARTS LIST

ITEM	DESCRIPTION	QTY	PART NO.
	Gasket Kit consists of:		**50-1023**
1	Stem Packing	1	50-0248
2	Stem Washer	1	50-0247
3	Stem O-ring	1	50-0253
4	Back-Up Washer	1	50-0351
5	Bonnet Gasket	1	50-0259
6	Seal Cap Gasket	1	50-0270
12	Packing nut	1	50-0251
	Bonnet Assembly Kit		**50-1024**
	Above kit consists of:		
7	Bonnet	1	50-0239
8	Stem	1	50-0242
9	Disc Assembly	1	50-0363
10	Ball Retainer	1	50-0257
11	Balls	16	50-0016
13	Bonnet Bolts	4	50-0473
	Gasket Kit	1	50-1023

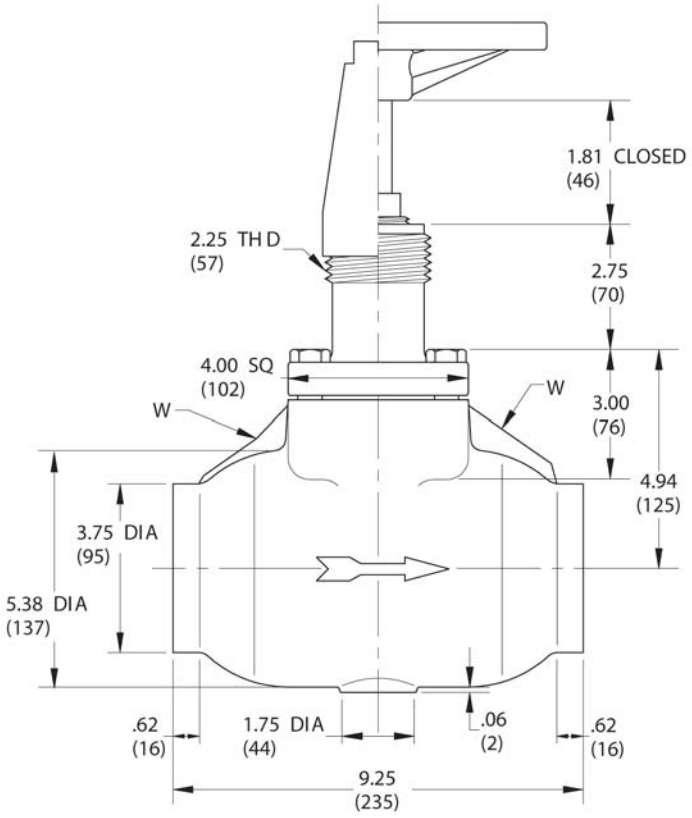
ITEM	DESCRIPTION	QTY	PART NO.
	Disc Assembly Kit consists of:		**50-1025**
9	Disc Assembly	1	50-0363
10	Ball Retainer	1	50-0257
11	Balls	16	50-0016
5	Bonnet Gasket	1	50-0259
	Handwheel Kit consists of:		**50-1026**
14	Handwheel	1	50-0321
15	Name Plate	1	50-0094
16	Screw	1	50-0254
17	Bonnet Thread Cap	1	50-0263
	Seal Cap Kit consists of:		**50-1027**
18	Seal Cap	1	50-0260
6	Seal Cap Gasket	1	50-0270
19a	Body, Globe 1½" S.W.	1	50-0232
19b	Body, Globe 2" S.W.	1	50-0233
19c	Body, Angle 1½" S.W.	1	50-0268
19d	Body, Angle 2" S.W.	1	50-0269

2½" (65 MM) SOCKET WELD VALVE

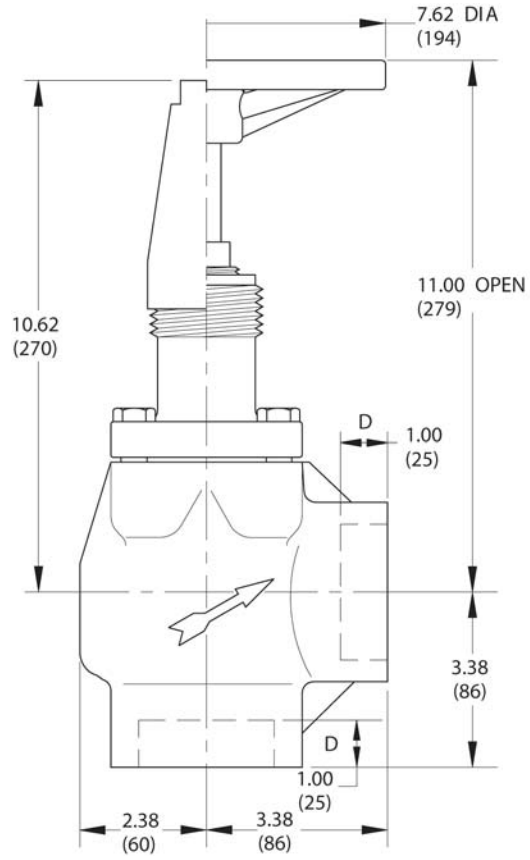
INSTALLATION DIMENSIONS INCHES (MM)

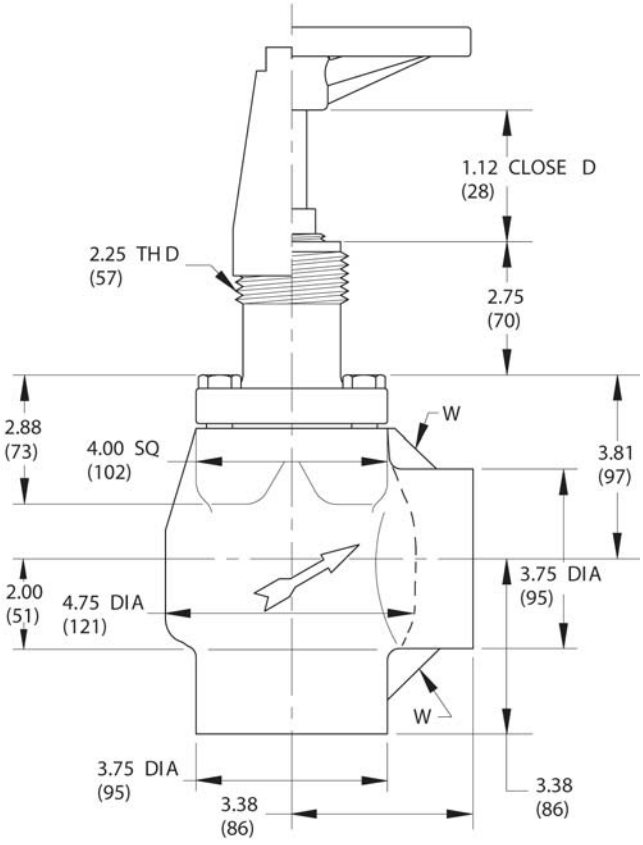


INSULATION DIMENSIONS INCHES (MM)



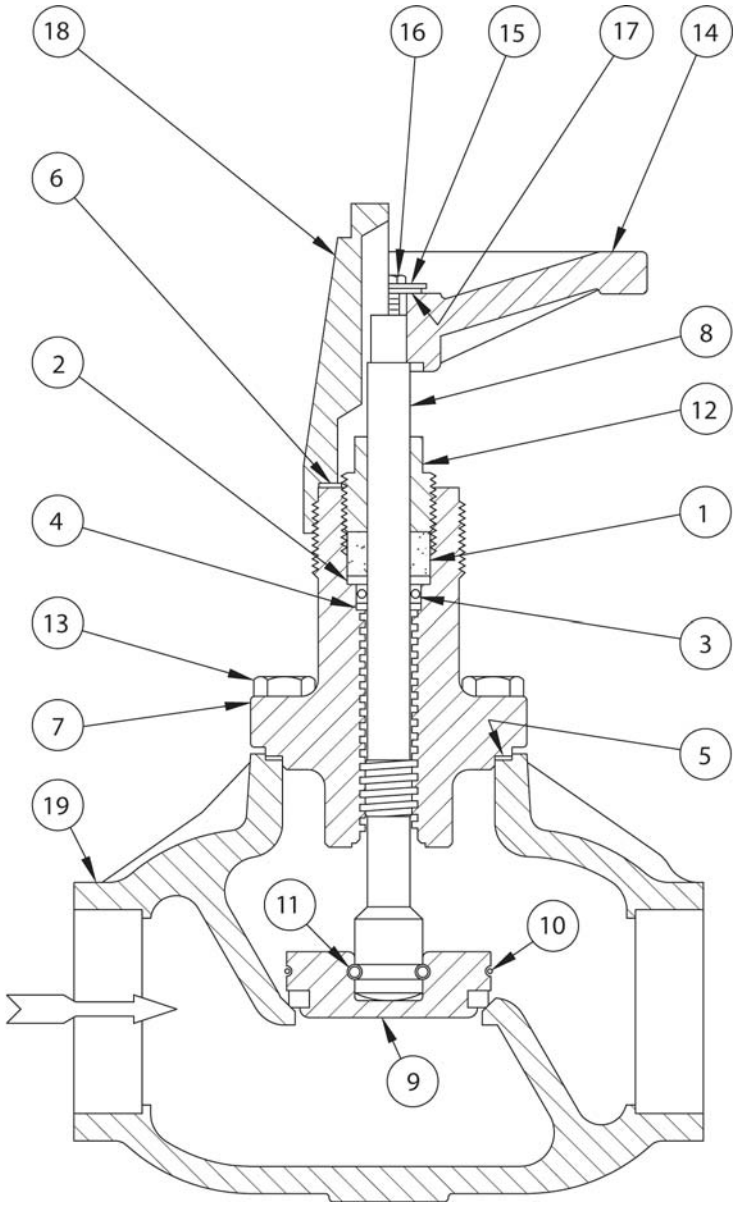
W=1.75 (44), WEB THICKNESS





W=1.75 (44), WEB THICKNESS

2½" (65 MM) SOCKET WELD VALVE



PARTS LIST

ITEM	DESCRIPTION	QTY	PART NO.
	Gasket Kit consists of:		**50-1043**
1	Stem Packing	1	50-0290
2	Stem Washer	1	50-0299
3	Stem O-ring	1	50-0293
4	Back-Up Washer	1	50-0324
5	Bonnet Gasket	1	50-0310
6	Seal Cap Gasket	1	50-0315
12	Packing nut	1	50-0292
	Bonnet Assembly Kit		**50-1044**
	Above kit consists of:		
7	Bonnet	1	50-0286
8	Stem	1	50-0287
9	Disc Assembly	1	50-0374
10	Ball Retainer	1	50-0297
11	Balls	15	50-0305
13	Bonnet Bolts	4	50-0294
	Gasket Kit	1	50-1043

ITEM	DESCRIPTION	QTY	PART NO.
	Disc Assembly Kit consists of:		**50-1045**
9	Disc Assembly	1	50-0374
10	Ball Retainer	1	50-0297
11	Balls	15	50-0305
5	Bonnet Gasket	1	50-0310
	Handwheel Kit consists of:		**50-1037**
14	Handwheel	1	50-0319
15	Name Plate	1	50-0318
16	Screw	1	50-0295
17	Support Washer	1	50-0480
	Seal Cap Kit consists of:		**50-1038**
18	Seal Cap	1	50-0304
6	Seal Cap Gasket	1	50-0315
19a	Body, Globe 2½" S.W.	1	50-0456
19b	Body, Angle 2½" S.W.	1	50-0457

STEM PACKING

When verifying the tightness of the packing nut, use an 8" 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. See the CAUTION section. 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 a backup washer, 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 several turns, carefully remove the bonnet assembly. Proceed slowly and cautiously since some refrigerant may still be inside the valve body. The ½" (13 mm) through 1¼" (32 mm) valves have a unique safety vent to warn of internal pressure when removing the threaded bonnet. The 1½" (40 mm) and larger valves have bolted bonnets. 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 conical seat surface in the body is marred, remove the marks with emery paper by hand or with a power drill. If the seat disc is damaged, replace the entire disc assembly by first removing the ball retainer ring and ball bearings. Install a new disc assembly, including new bearings and retainer ring. Prior to 1998, seat discs in ½" (13 mm) to 1¼" (32 mm) socket weld shut-off valves were made with lead. All seat discs are now made with Teflon. The new seat disc assemblies and replacement kits are interchangeable with the old. Install new stem packing, stem o-ring, stem washers, and bonnet o-ring or gasket, if necessary. Reassemble the bonnet into the valve body with the stem still open several turns. Tighten the threaded bonnet to a minimum torque of 75 ft-lbs (100 Nm). Bonnet bolts for the 1½" (40 mm) and 2" (50 mm) valves require a torque of 40 ft-lbs (55 Nm), and 2½" (65 mm) valves require 60 ft-lbs (80 Nm).

CAUTION

Hansen valves are for refrigeration systems only. Read these instructions completely before selecting, using, or servicing these valves. Only knowledgeable, trained refrigeration technicians should install, operate, or service these valves. Stated temperature and pressure limits should never be exceeded. Bonnets should not be removed from the valves unless the system has been evacuated to zero pressure. See also Safety Precautions in the current List Price Bulletin and the Safety Precautions Sheet supplied with the product. Escaping refrigerant may cause injury, particularly to the eyes and lungs.

ORDERING INFORMATION, SOCKET WELD SHUT-OFF VALVES

NOMINAL SIZE	DESCRIPTION	CAT. NO.
½" (13 mm)	Globe, Handwheel	GS051H
	Angle, Handwheel	AS051H
	Globe, Seal Cap	GS051C
	Angle, Seal Cap	AS051C
¾" (20 mm)	Globe, Handwheel	GS076H
	Angle, Handwheel	AS076H
	Globe, Seal Cap	GS076C
	Angle, Seal Cap	AS076C
1" (25 mm)	Globe, Handwheel	GS100H
	Angle, Handwheel	AS100H
	Globe, Seal Cap	GS100C
	Angle, Seal Cap	AS100C
1¼" (32 mm)	Globe, Handwheel	GS125H
	Angle, Handwheel	AS125H
	Globe, Seal Cap	GS125C
	Angle, Seal Cap	AS125C
1½" (40 mm)	Globe, Handwheel	GS150H
	Angle, Handwheel	AS150H
	Globe, Seal Cap	GS150C
	Angle, Seal Cap	AS150C
2" (50 mm)	Globe, Handwheel	GS200H
	Angle, Handwheel	AS200H
	Globe, Seal Cap	GS200C
	Angle, Seal Cap	AS200C
2½" (65 mm)	Globe, Handwheel	GS251H
	Angle, Handwheel	AS251H
	Globe, Seal Cap	GS251C
	Angle, Seal Cap	AS251C

All of the above valves are also available as expansion valves except the 2½".

WARRANTY

Hansen valves are guaranteed against defective materials and workmanship for one year F.O.B. our plant. No consequential damages or field labor is included.

TYPICAL SPECIFICATIONS

"Refrigerant shut-off valves from ½" (13 mm) through 2½" (65 mm) sizes shall have steel bodies machined for socket weld connections, stainless steel stems, back-seating design for packing replacement, bonnet threads for installation of stem seal caps, and suitability for a safe working pressure of 400 psig (27 bar), as manufactured by Hansen Technologies Corporation or approved equal."

HANSEN TECHNOLOGIES CORPORATION
6827 High Grove Boulevard
Burr Ridge, Illinois 60527 USA
Tel: (630) 325-1565 Fax: (630) 325-1572
Toll: (800) 426-7368 http://www.hantech.com