



2" Globe Valve: GS200H

INTRODUCTION

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

APPLICATIONS

Typical uses include the following:

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

Steel pipe portions of R12, R22, R502 commercial, industrial, and air conditioning systems, using seal cap models.

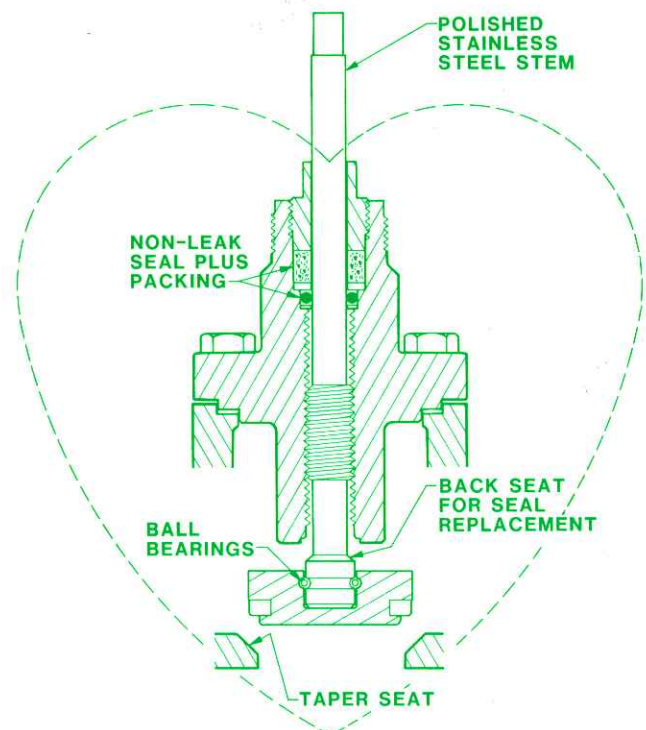
Compressor suction and discharge connections and condenser and evaporator inlet and outlet connections for ammonia, R12, R22, R502.

Specifications, Applications, Service Instructions and Parts

SOCKET WELDING SHUT-OFF VALVES

$\frac{1}{2}$ " thru $2\frac{1}{2}$ "
Globe and Angle
for Refrigerants

KEY FEATURES



ADDITIONAL FEATURES

Suitable for ammonia and R12, R22, and R502
Globe and angle available
Also available as expansion valve
Handwheel or seal cap, interchangeable
400 PSIG safe working pressure
Temperature range: -60F to 240F
Temperature below -60F at lower pressures
Non-asbestos gaskets
Make entirely in the U.S.A.

MATERIAL SPECIFICATIONS

Body: $\frac{1}{2}$ " and $\frac{3}{4}$ ", ASTM A-108
(Connections, ASTM A-513)
1" thru $2\frac{1}{2}$ ", Cast Steel, ASTM A-352,
Grade LCB
Stem: Stainless Steel
Disc Holder: Steel
Seat Disc: $\frac{1}{2}$ " thru $1\frac{1}{4}$ ", Compound PbSb
 $1\frac{1}{2}$ " thru $2\frac{1}{2}$ ", PTFE Teflon, Retained
Ball Bearings: Stainless Steel
Packing Nut: Steel, Zinc Plated
Stem Packing: Graphite Composite Plus Neoprene
O-Ring
Handwheel: $\frac{1}{2}$ " thru $1\frac{1}{4}$ ", Zamak Alloy, Zinc Plated
 $1\frac{1}{2}$ " thru $2\frac{1}{2}$ ", Iron Alloy, Zinc Plated
Bonnet: $\frac{1}{2}$ " thru $1\frac{1}{4}$ ", Steel, Zinc Chromate Plated
 $1\frac{1}{2}$ " thru $2\frac{1}{2}$ ", ASTM A-536

ADVANTAGES

Compared to threaded valves, Hansen Socket Welding Valves eliminate the chance of future leaks at pipe threads. In addition, a socket welded pipe-to-valve 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 and interior weld joint cleanliness.

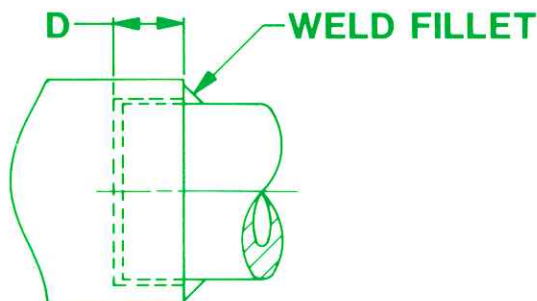
Compared to flanged valves, Hansen Socket Welding Valves eliminate the gasket joint leakage potential at the flange joint due to pipe and bolt-nut movement as the result of temperature expansion and pressure surges. Pressure drop is lower than conventional flanged cast valve bodies. In addition, nearly all refrigeration flanged valves are made of cast iron or "semi-steel," which is merely a type of cast iron. Steel has much greater tensile strength, ductility, and impact resistance than cast iron.

Compared to pressed sheet steel welding valves, Hansen valves have heavier cast steel wall thickness for greater rigidity and corrosion resistance.

All Hansen socket weld valves have rising stems so the operator knows at a glance whether the valve is open or closed.

CONNECTION DIMENSIONS

Sockets in bodies accommodate U.S.A. Standard Pipe Schedule 40 or Extra Heavy Pipe Schedule 80.



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

INSTALLATION

All Hansen welding valves may be installed in horizontal or vertical pipe lines. Stems may be horizontal or vertical or angled upward. Globe valves in horizontal suction lines or liquid overfeed return lines, condenser drain lines, purge lines, oil pot drain lines and level control column isolation valves should preferably have stems horizontal rather than upward to avoid liquid or gas trapping at valve seat orifices. Inlet pressure for all valve sizes should normally be under valve seat disc.

The valve stem should be open during welding. Normally it is not necessary to disassemble these socket weld valves for welding. However, if welding is prolonged enough to overheat the body, a wet rag should be wrapped around the valve bonnet and upper body during welding. The codes applicable to the welding of socket weld fittings or valves require that the pipe be inserted into the socket until bottomed against the stop. The pipe is then to be backed out approximately $\frac{1}{16}$ of an inch before welding.

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 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.

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 indicated on pages 6, 8, and 10 represents the width of the reinforcement web.

SERVICE AND MAINTENANCE

Hansen Socket Welding Steel Shut-Off Valves require practically no service or maintenance. The common ailment of shut-off valves, stem leakage, is almost entirely eliminated by the combination of polished stainless steel stems and reliable, conventional, adjustable packing supplementing fluidtight O-ring stem seals. For optimum maintenance, occasional cleaning of the valve stem with a soft rag containing refrigerant oil is helpful. The patented O-ring stem seal design permits low torque operation to open and close the valve because the packing nut does not require much tightening.

FLOW CAPACITIES

PIPING AND VALVE SIZING GUIDE FOR AMMONIA

Service	CONDITIONS		CAPACITIES SHOWN IN TONS						
	°F Temp.	PSIG Pres.	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"
Suction Lines	+ 20	33.5	—	—	8.6	15.8	21.3	35.7	51.1
Single Stage Compressor	0	15.7	—	—	5.7	10.4	13.9	22.7	34.0
Suction Lines	- 20	3.6	—	—	4.2	7.4	10.3	16.8	24.8
Booster	- 40	8.7"	—	—	—	4.4	6.3	9.9	14.4
Liquid	+ 20	33.5	—	—	5.0	9.1	12.3	20.6	29.4
Overfeed	0	15.7	—	—	3.4	6.3	8.5	13.6	20.5
Return	- 20	3.6	—	—	2.2	4.0	5.5	8.9	13.1
Lines (4 x)	- 40	8.7"	—	—	—	2.4	3.4	5.4	7.9
Hot Gas Feed	+ 70	114.1	2.2	4.3	7.3	14.1	19.6	36.5	53.0
Hot Gas Main	+ 70	114.1	4.4	8.6	14.7	28.1	39.2	73.0	106
Compressor Discharge	+ 86	154.5	—	—	12.6	24.1	33.6	62.6	90.3
Condenser Drains	+ 86	—	6.0	14.5	24.0	50.0	77.0	140	220
Liquid Mains	+ 86	—	28.3	53.1	90.8	143	202	454	657
Liquid Feed Branch	+ 86	—	54.9	103	176	277	392	881	1273
Liquid Overfeed Supply (4 x)	+ 10	—	9.0	17.0	29.0	46.0	65.0	144	208

SIZING GUIDE

These capacity recommendations are not affected by the length of the pipe line. These are approximate optimum sizes based upon power costs versus the investment cost of piping and its total installed cost. Piping sized to these capacities will have 1 degree F pressure drop for the following equivalent lengths:

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

Example: Hansen angle socket welding valves have about 145 diameters of equivalent flow resistance, or 145/700 =

0.2 degrees of equivalent pressure drop at the suction line capacities shown for a valve in a suction line. Globe valves equal about 225 diameters.

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

FLOW COEFFICIENTS

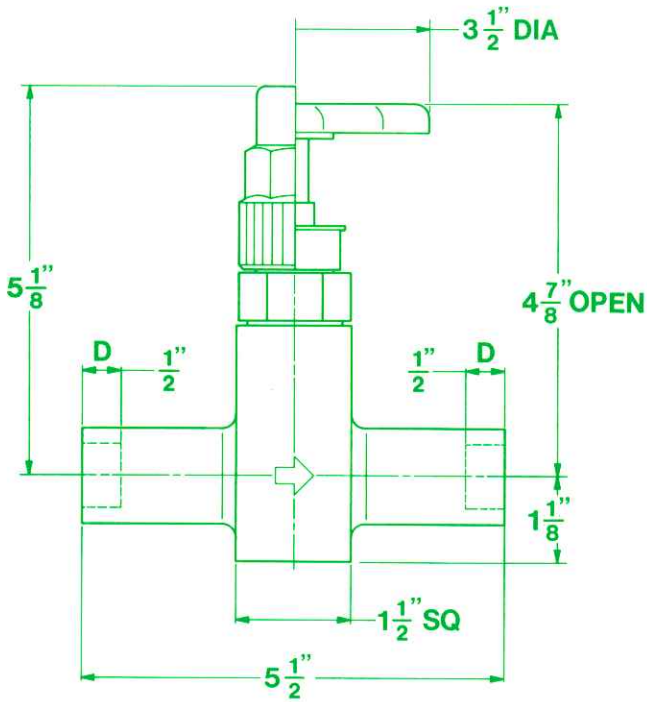
SIZE	ANGLE		GLOBE	
	Cv	*Equiv. Length Ft.	Cv	*Equiv. Length Ft.
1/2"	6	5	4	9
3/4"	9	8	8	8
1"	26	5	18	8
1 1/4"	30	14	21	21
1 1/2"	53	11	41	14
2"	80	27	67	34
2 1/2"	173	18	163	20

The Cv Factor is in units of U.S. GPM and PSI.

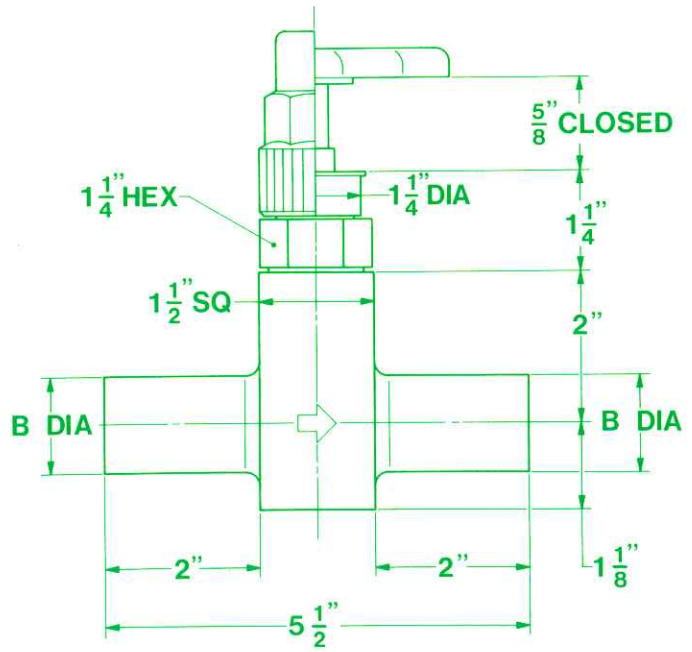
*Schedule 80 pipe under 2" size.

1/2" AND 3/4" SOCKET WELD VALVE

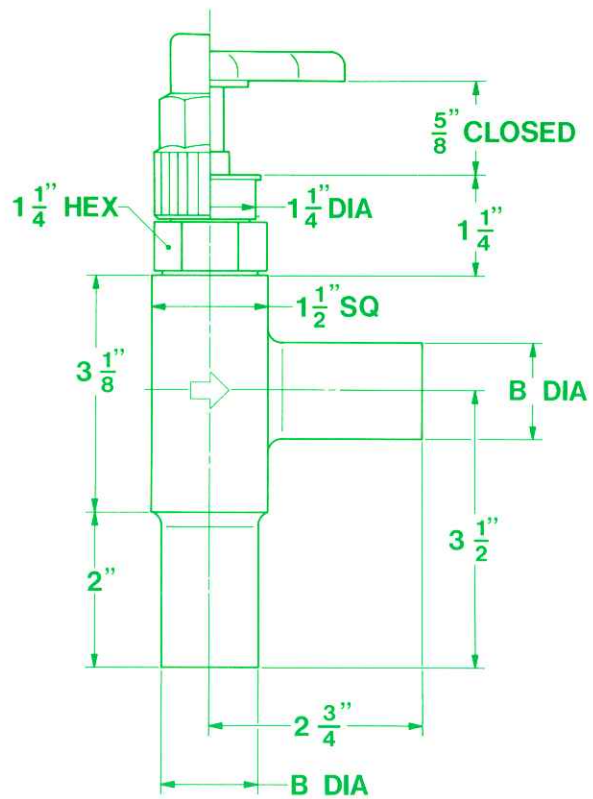
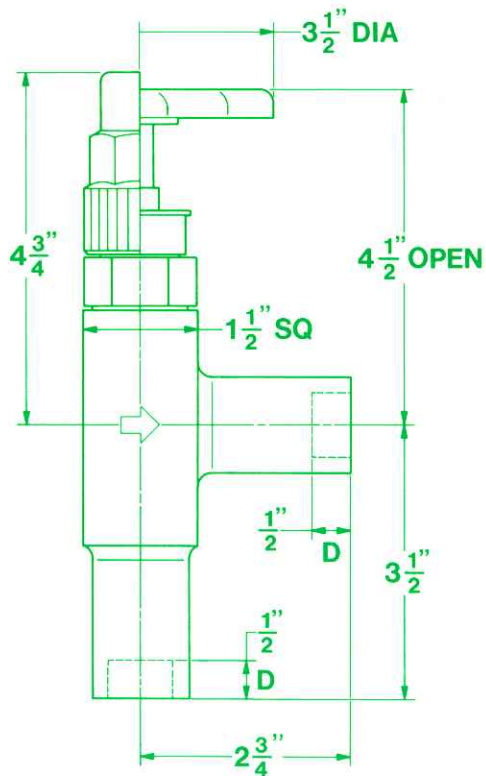
INSTALLATION DIMENSIONS



INSULATION DIMENSIONS

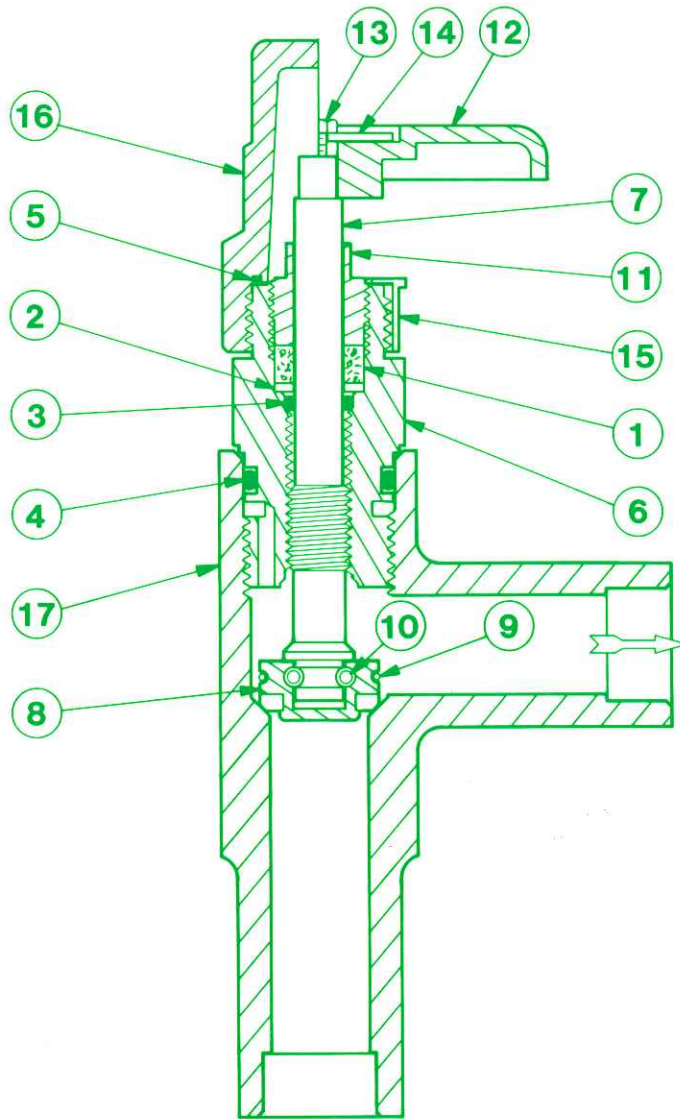


	B
1/2"	1 1/4"
3/4"	1 1/2"



	B
1/2"	1 1/4"
3/4"	1 1/2"

1/2" AND 3/4" SOCKET WELD VALVE



PARTS LIST

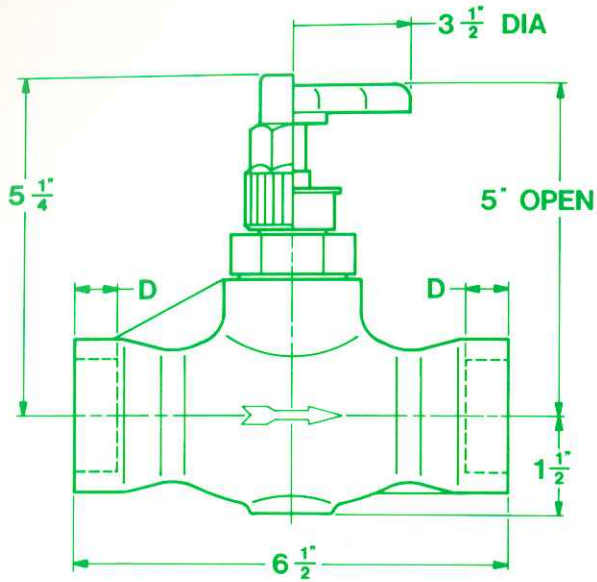
ITEM	DESCRIPTION	QTY	PART NO.*
	Gasket Kit consists of:		50-1040
1	Stem Packing	1	50-0045
2	Stem Washer	1	50-0046
3	Stem O-Ring	1	50-0179
4	Bonnet O-Ring	1	50-0453
5	Seal Cap O-Ring	1	50-0432
11	Packing Nut	1	50-0013
	Bonnet Assembly Kit 1/2", 3/4"		50-1041
	Above kit consists of:		
6	Bonnet	1	50-0422
7	Stem	1	50-0012
8	Disc Assembly	1	50-0041
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	50-0041
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	50-0027
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 1/2" S.W.	1	50-0449
17b	Body, Globe 3/4" S.W.	1	50-0451
17c	Body, Angle 1/2" S.W.	1	50-0450
17d	Body, Angle 3/4" S.W.	1	50-0452

* Prior to 1989, 1/2" and 3/4" Socket Weld valves were cast steel bodied. Replacement parts and numbers for these valves are the same as the 1" and 1 1/4" valves listed on page 7.

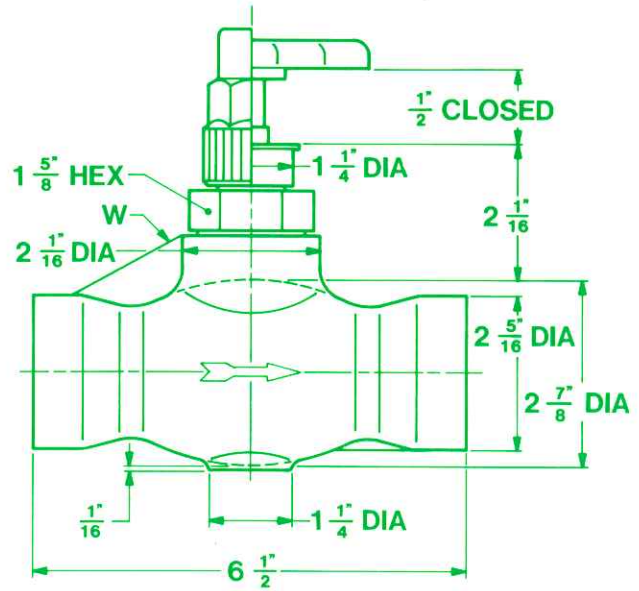
1" AND 1 1/4" SOCKET WELD VALVE

INSTALLATION DIMENSIONS

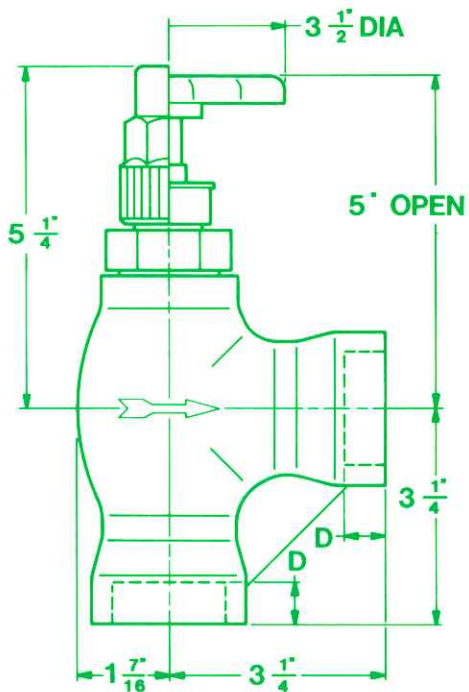


	D
1"	1/2"
1 1/4"	5/8"

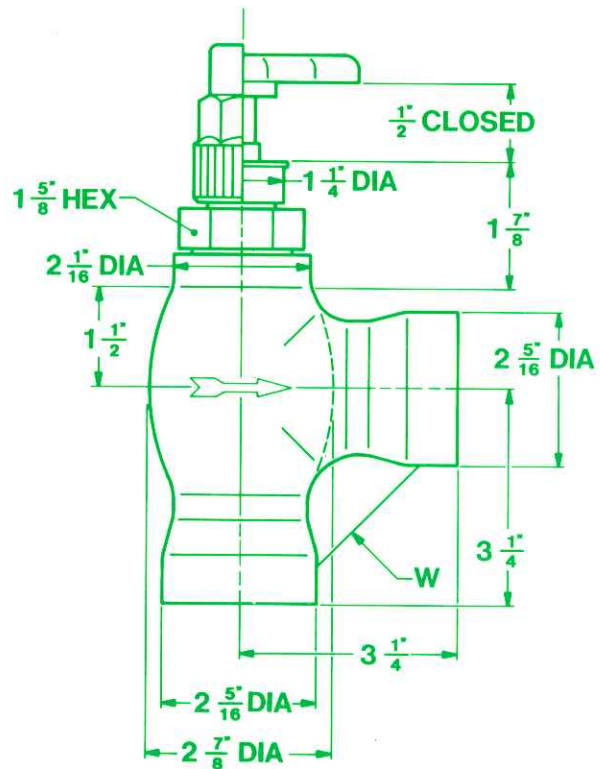
INSULATION DIMENSIONS



W = 1" (WEB THICKNESS)

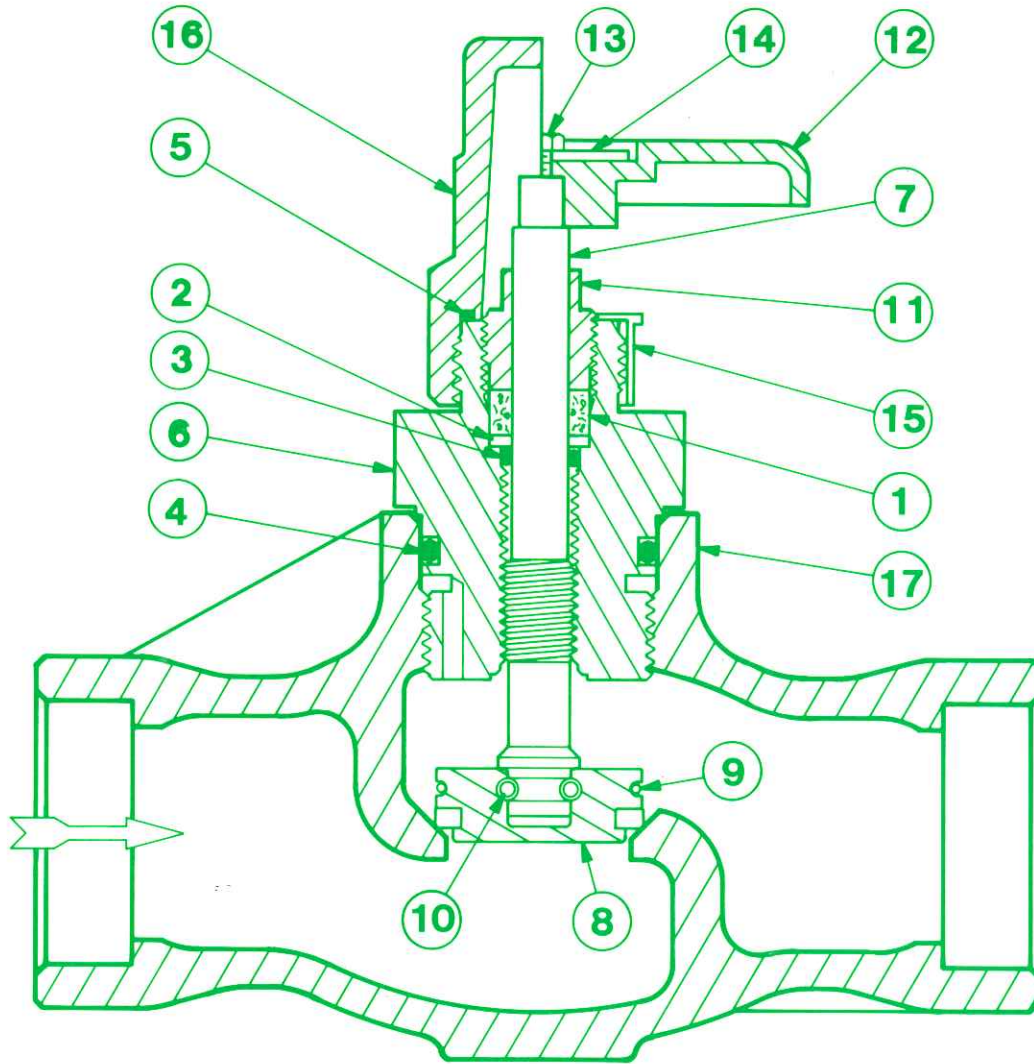


	D
1"	1/2"
1 1/4"	5/8"



W = 1" (WEB THICKNESS)

1" AND 1 1/4" SOCKET WELD VALVE



PARTS LIST

ITEM	DESCRIPTION	QTY	PART NO.
	Gasket Kit consists of:		50-1020
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	50-0013
	Bonnet Assembly Kit 1", 1 1/4"		50-1021
	Above kit consists of:		
6	Bonnet	1	50-0429
7	Stem	1	50-0012
8	Disc Assembly	1	50-0042
9	Ball Retainer	1	50-0026
10	Balls	10	50-0016
	Gasket Kit	1	50-1020
	Disc Assembly Kit consists of:		50-1004
8	Disc Assembly	1	50-0042
9	Ball Retainer	1	50-0026
10	Balls	10	50-0016
4	Bonnet O-Ring	1	50-0017

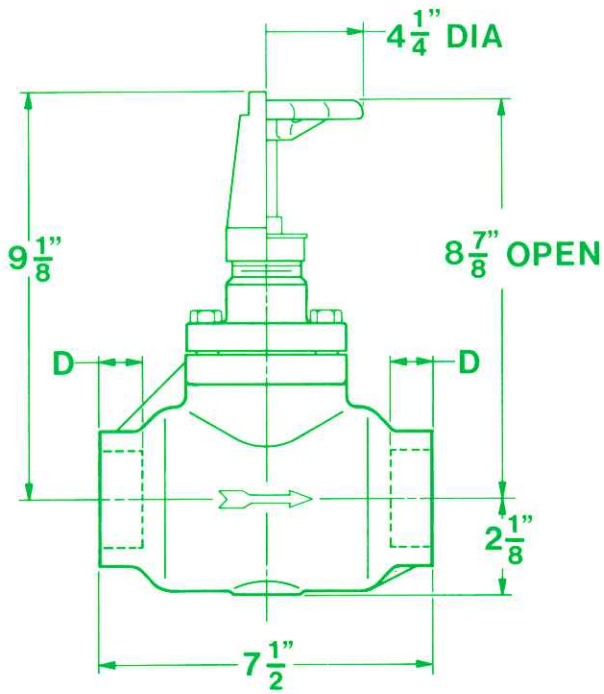
ITEM	DESCRIPTION	QTY	PART NO.
	Handwheel Kit consists of:		50-1005
12	Handwheel	1	50-0027
13	Screw	1	50-0479
14	Name Plate	1	50-0094
15	Bonnet Thread Cap	1	50-0434
	Seal Cap Kit consists of:		50-1036*
16	Seal Cap	1	50-0423
5	Seal Cap O-Ring	1	50-0432
17a	Body, Globe 1" S.W.	1	50-0386
17b	Body, Globe 1 1/4" S.W.	1	50-0387
17c	Body, Angle 1" S.W.	1	50-0389
17d	Body, Angle 1 1/4" S.W.	1	50-0390

* Prior to 1989, a larger, aluminum seal cap was used: (old) Seal Cap Kit catalog number 50-1000.

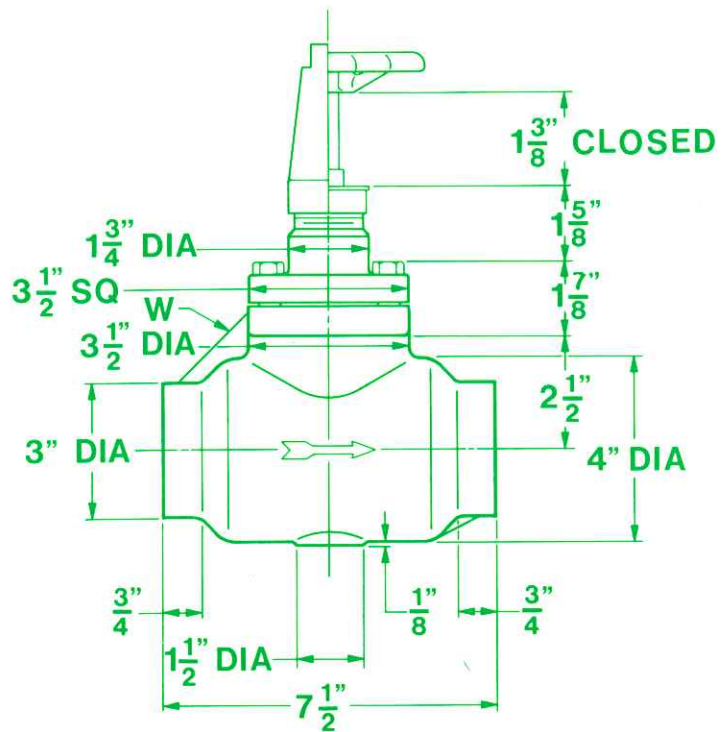
1½" AND 2" SOCKET WELD VALVE

INSTALLATION DIMENSIONS

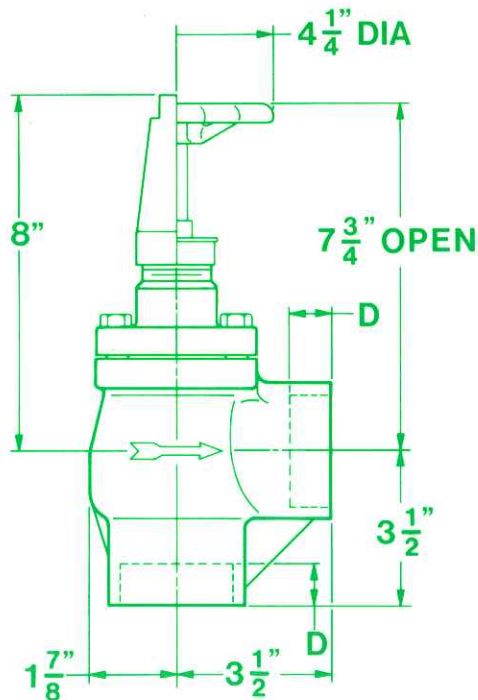
INSULATION DIMENSIONS



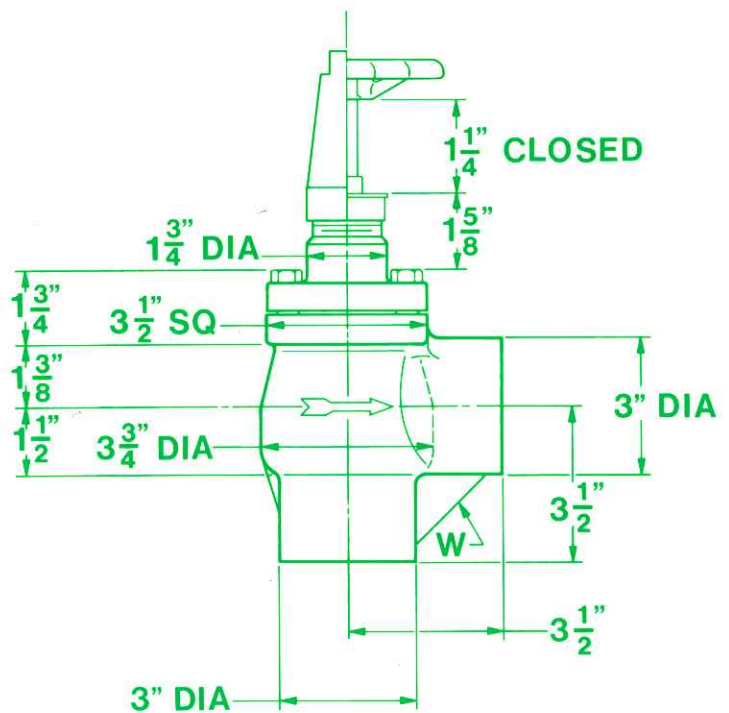
	D
1½"	5/8"
2"	7/8"



W = 1" (WEB THICKNESS)

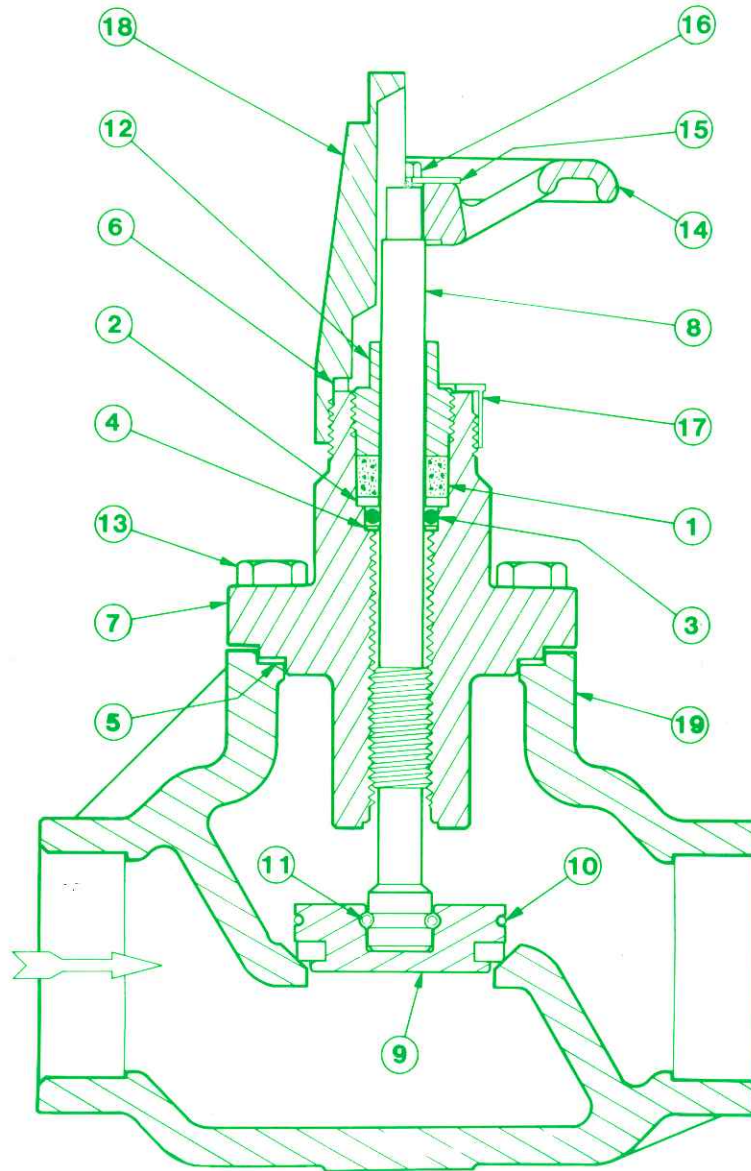


	D
1½"	5/8"
2"	7/8"



W = 1" (WEB THICKNESS)

1½" AND 2" SOCKET WELD VALVE



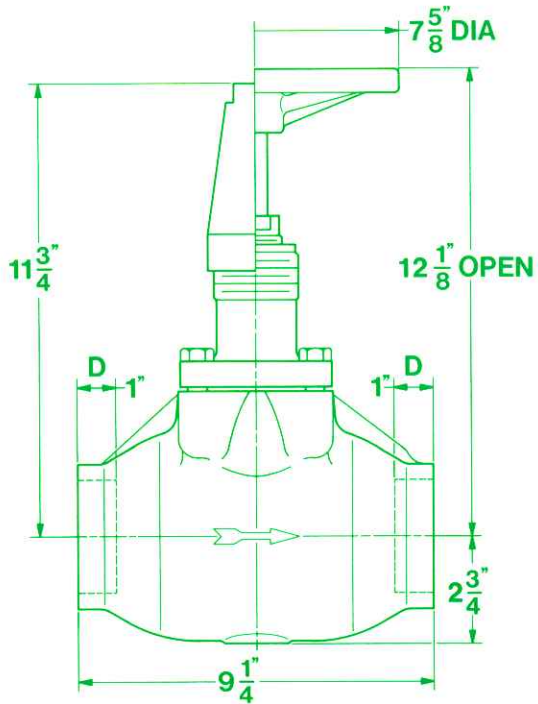
PARTS LIST

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 1½", 2"		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

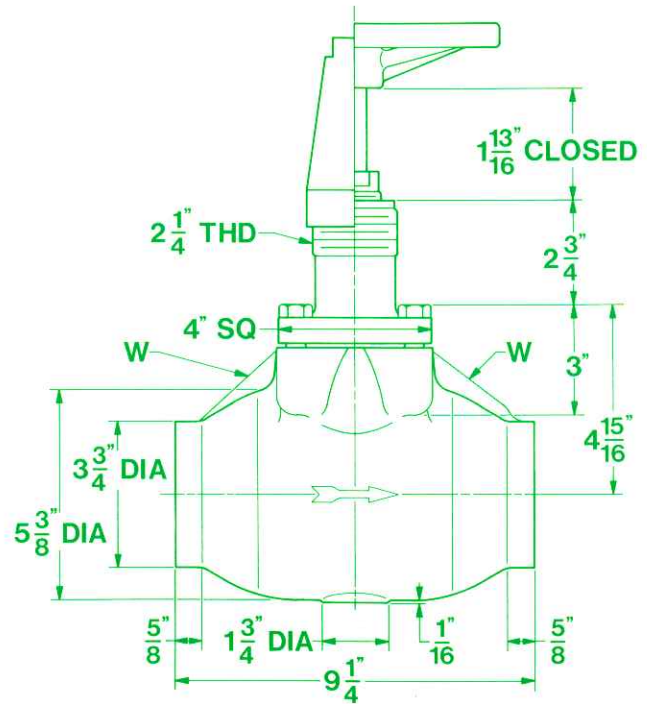
ITEM	DESCRIPTION	QTY	PART NO.
	Disc Assembly Kit consists of:		50-1025
9	Disc Assembly	1	50-0363
10	Ball Retainer	1	50-0257
11	Balls	16	50-0016
5	Bonnet Gasket	1	50-0259
	Handwheel Kit consists of:		50-1026
14	Handwheel	1	50-0321
15	Name Plate	1	50-0094
16	Screw	1	50-0254
17	Bonnet Thread Cap	1	50-0263
	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

2 1/2" SOCKET WELD VALVE

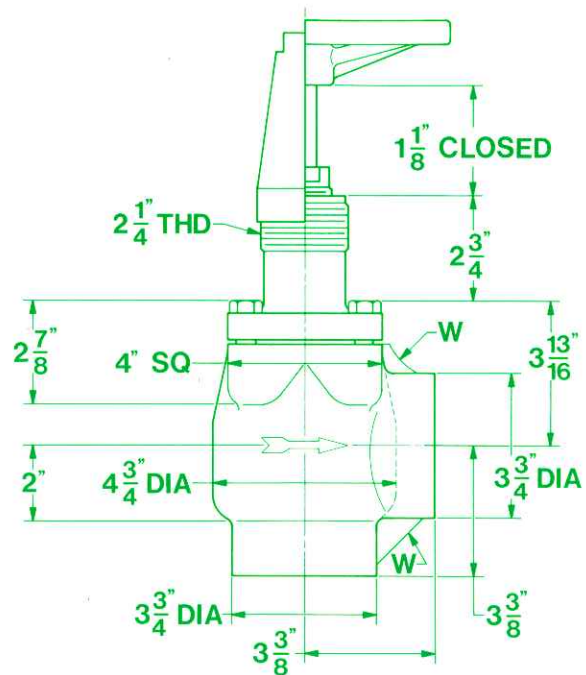
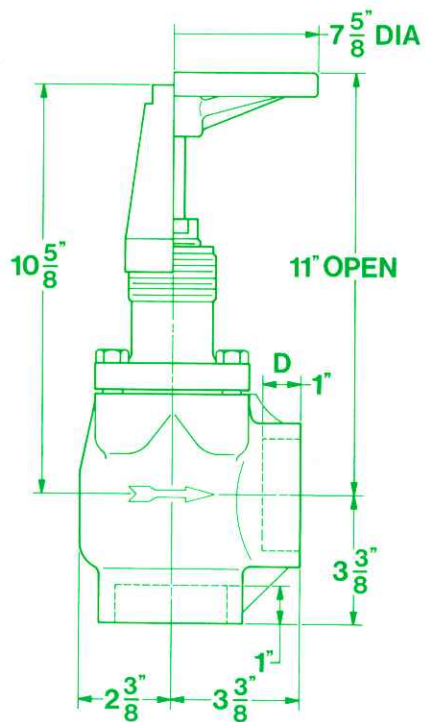
INSTALLATION DIMENSIONS



INSULATION DIMENSIONS

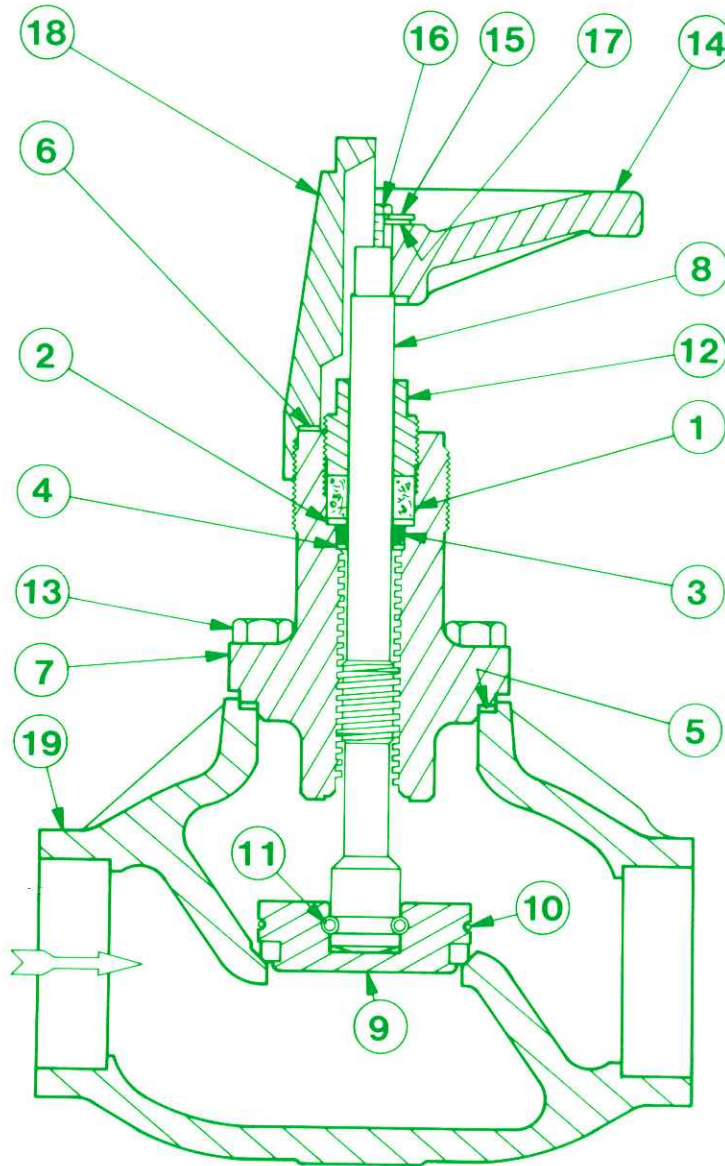


W = 1/4" (WEB THICKNESS)



W = 1/4" (WEB THICKNESS)

2 1/2" 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 2 1/2"		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 2 1/2" S.W.	1	50-0456
19b	Body, Angle 2 1/2" S.W.	1	50-0457

STEM PACKING

Tightening of the packing nut is seldom necessary because the O-ring portion of stem sealing is continuous. However, if tightening is ever needed, 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 back-seat position (this separates the O-ring and packing from the system refrigerant). Remove the packing nut carefully and then use a wirehook 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 new lubricated stem O-ring, stem washers and stem packing; tighten the packing nut only enough to give handwheel slight turning friction.

VALVE SEAT

To inspect or replace the valve seat disc, isolate the valve from the system and safely pump out refrigerant; with stem open at least one turn, remove bonnet assembly carefully. A 12" wrench is adequate for 1/2" and 3/4" screwed bonnet valves and bonnet cap screws for 1 1/2" thru 2 1/2" valves. An 18" wrench is required for 1" and 1 1/4" screwed bonnet valves. Proceed slowly and cautiously because refrigerant may still remain inside the valve body.

If conical seat surface in body is marred, remove marks with emery paper by hand or power drill. If seat disc is damaged, replace entire disc assembly by first removing ball retainer ring and ball bearings. Install new disc assembly including new balls and retainer ring. Install new stem packing, stem O-ring, stem washers, and bonnet O-ring or gasket if necessary. Reassemble bonnet into valve body with stem still open at least several turns and tighten screwed bonnet to minimum torque of 75 foot pounds. Flange bonnet cap screws on the 1 1/2" and 2" valves require a torque of 50 ft. lbs.; 60 ft. lbs. on the 2 1/2" valves.

CAUTION

Hansen valves are only for refrigeration systems. Read these instructions completely before selecting, using, or servicing these valves. Only knowledgeable, trained refrigeration mechanics should install, operate, or service these valves. 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 current List Price Bulletin and Safety Precautions Sheet supplied with product.

WARRANTY

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

ORDERING INFORMATION, SOCKET WELDING SHUT-OFF VALVES

SIZES	DESCRIPTION	CAT. NO.
1/2"	Globe, Handwheel	GS051H
	Angle, Handwheel	AS051H
	Globe, Seal Cap	GS051C
	Angle, Seal Cap	AS051C
3/4"	Globe, Handwheel	GS076H
	Angle, Handwheel	AS076H
	Globe, Seal Cap	GS076C
	Angle, Seal Cap	AS076C
1"	Globe, Handwheel	GS100H
	Angle, Handwheel	AS100H
	Globe, Seal Cap	GS100C
	Angle, Seal Cap	AS100C
1 1/4"	Globe, Handwheel	GS125H
	Angle, Handwheel	AS125H
	Globe, Seal Cap	GS125C
	Angle, Seal Cap	AS125C
1 1/2"	Globe, Handwheel	GS150H
	Angle, Handwheel	AS150H
	Globe, Seal Cap	GS150C
	Angle, Seal Cap	AS150C
2"	Globe, Handwheel	GS200H
	Angle, Handwheel	AS200H
	Globe, Seal Cap	GS200C
	Angle, Seal Cap	AS200C
2 1/2"	Globe, Handwheel	GS251H
	Angle, Handwheel	AS251H
	Globe, Seal Cap	GS251C
	Angle, Seal Cap	AS251C

Above also available as Expansion Valves except 2 1/2".

TYPICAL SPECIFICATIONS

"Refrigerant shut-off valves from 1/2" through 2 1/2" sizes shall have steel bodies machined for socket weld connections, stainless steel stems, backseating design for packing replacement, bonnet threads for installation of stem seal caps, and suitability for working pressure of 400 PSIG, as manufactured by Hansen Technologies Corporation or approved equal."

HANSEN TECHNOLOGIES CORPORATION

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