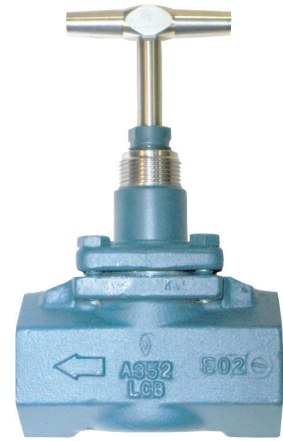


Hand Expansion Valves

for Standard and Extended Bonnets

Product Bulletin 82-00 C

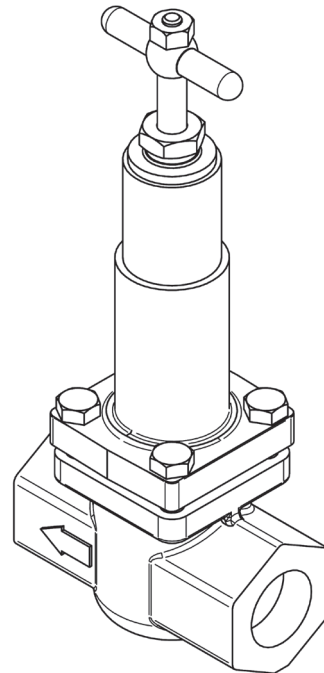
Type: Angle, Globe "T" & Globe "Y"



Purpose:

Refrigerating Specialties Division offers a complete line of hand expansion or regulating flow valves that work as shut off valves in the closed position. Designed and built to maintain reliability both in their seating/plug and back seating functions. Maintenance costs are reduced and simplified with bolt-on bonnets, cast steel body, stainless steel plug and stem.

Hand expansion valves are ideal for liquid make-up, recirculated overfeed systems or liquid feed with high, intermediate or low pressure; hot gas feed, defrost relief, for equalization in suction lines and other typical applications.



Contact Information: Product Features:

Parker Hannifin Corporation
**Sporlan Division –
Refrigeration Business Unit**
2445 South 25th. Avenue
Broadview, IL 60155-3891

phone (708) 681-6300
fax (708) 681-6306

www.parker.com/rs
rsd_orders@parker.com

- Suitable for Ammonia, R-22, R-507, R-134a, Nitrogen and other Common Refrigerants.
- Type 303 Stainless Steel Stem and Packing Nut; 304 Stainless Steel Bolts.
- Reliable Back Seating.
- Complete Line of Bolted Bonnets.
- Extended Bonnets for Insulation.
- Available in Threaded (FPT), Socket Weld (SW) and Weld Neck (WN) connections with options in Globe "T", Angle, and Globe "Y" body style.
- 25% Carbon Filled PTFE Seat.
- High Capacities Plug/Bodies from 6 to 100 mm (¼ to 4").
- Tee Handle and Seal Cap Interchangeable on Same Valve.



ENGINEERING YOUR SUCCESS.

Table of Contents

Technical Data.....	2
Description	2
Weights	3
Installation	3
Torque Recommendations.....	3
Capacities.....	4
Selection.....	6

HEV Material List, Part Kits and Dimensions

FPT Standard Bonnet.....	7
FPT Extended Bonnet.....	9
SW Standard Bonnet.....	11
SW Extended Bonnet.....	14
WN Standard Bonnet.....	17
WN Extended Bonnet.....	20
Bonnet Hole Dimensions	22

Hand Expansion Valves Technical Data

Material:

Body	Cast Steel (A-352 GR, LCB)
Standard Bonnet:	
6 to 100mm (¼ to 4")	A350 Forged Steel
Extended Bonnet:	
6 to 100mm (¼ to 4")	LCB Cast Steel
Stem	304 Stainless Steel
Packing	25% Carbon Filled PTFE

Temperature Range:

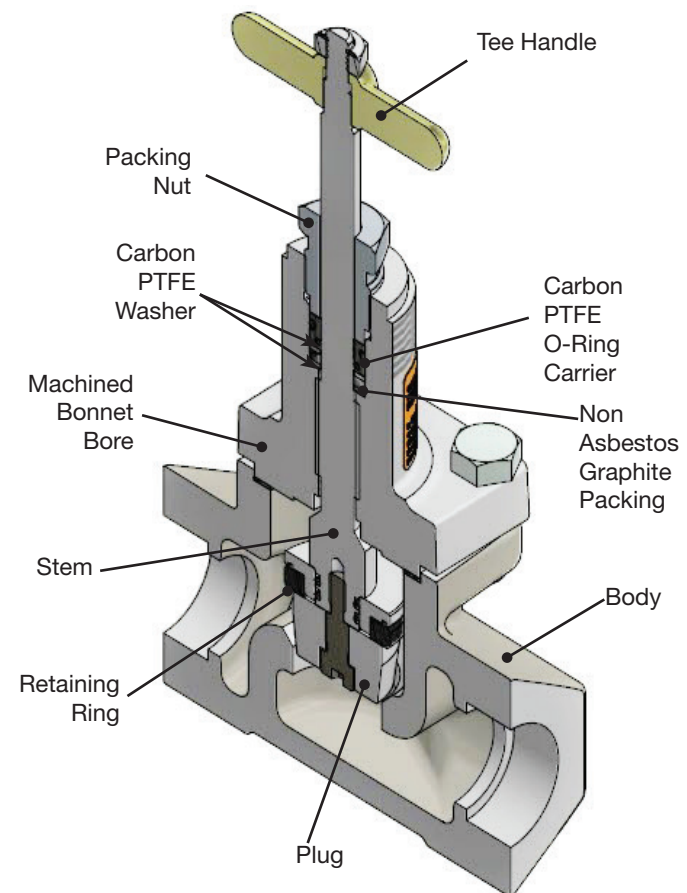
6 to 100mm (¼ to 4").....-51 to 204°C (-60 to 400°F)

Maximum Rated Pressure (MRP) 27.6 bar (400 psig)

Hand Expansion Valve Options			
Connection Type	Body Type	Port Size	
		mm	Inch
Threaded (FPT)	Globe "T"	6 - 25	¼ - 1
	Angle	6 - 25	¼ - 1
	Globe "T" Extended Bonnet	13 - 25	½ - 1
Socket Weld (SW)	Globe "T"	6 - 65	¼ - 2½
	Angle	6 - 100	¼ - 4
	Globe "Y"	32 - 100	1¼ - 4
	Globe "T" Extended Bonnet	13 - 65	½ - 2½
	Angle Extended Bonnet	20 - 75	¾ - 3
	Globe "Y" Extended Bonnet	32 - 50	1¼ - 2
Weld Neck (WN)	Globe "T"	75 - 100	3 - 4
	Angle	32 - 100	1¼ - 4
	Globe "Y"	40 - 100	1½ - 4
	Angle Extended Bonnet	65 - 100	2½ - 4
	Globe "Y" Extended Bonnet	40, 65 - 75	1½, 2½ - 3

Description

This complete line of all steel bodied valves with bolt-on bonnets is designed and built to maintain reliability both in their seating and back seating functions. This entire line is supplied with stainless steel stems for maximum corrosion resistance and back seating capability. A unique carbon filled PTFE seat is standard throughout the line, lending durability to the seating surface. In addition, a dual O-ring stem packing design along with a stem packing seal is standard on all valves 6 thru 100 mm (¼ thru 4"). This innovative design seals both the valve stem and bonnet bore with independent O-rings, which are captured in a carbon PTFE carrier. The addition of the packing provides for backup sealing capability in the unlikely event of an O-ring failure.



Cross-Section: Hand Expansion Valve Part Descriptions

A packing nut design with either (¼") or (⅝") flats provides a generous wrench engagement area, with little likelihood of "rounding" the flats. With the O-ring cartridge used in all valve bonnets, there will typically be no need to loosen the packing nut when opening or closing a valve. In most cases, stem resistance will be negligible, allowing the valve to be easily repositioned.

Extended Bonnet

The extended bonnet is available for globe style valves in the Tee body configuration and in angle style bodies. Valves are available with either tee handle or seal cap. These caps are exclusive to this series to this series of valves and should not be exchanged with seal caps from R/S service valves.

Note: The new hand expansion valve plugs and bonnet assemblies will not retrofit to either a prior design hand expansion valve body or to prior design expansion valve.

Hand Expansion Valve - Weights													
Port Size		Standard Bonnet						Extendend Bonnet					
		Globe "T"		Globe "Y"		Angle		Globe "T"		Globe "Y"		Angle	
mm	Inch	kg	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg	lb
6	¼	1.2	2.6	—	—	1.1	2.4	—	—	—	—	—	—
10	⅜	1.2	2.6	—	—	1.1	2.4	—	—	—	—	—	—
13	½	2.0	4.5	—	—	2.0	4.5	2.1	4.6	—	—	—	—
20	¾	2.0	4.5	—	—	2.0	4.5	2.1	4.6	—	—	2.1	4.6
25	1	2.0	4.5	—	—	2.0	4.5	2.1	4.6	—	—	2.1	4.6
32	1¼	5.4	11.8	4.1	9.1	5.0	11.0	5.4	11.9	4.2	9.2	5.0	11.1
40	1½	8.3	18.4	4.3	9.5	5.0	11.0	8.4	18.5	4.4	9.6	5.0	11.1
50	2	8.6	18.9	5.3	11.7	6.8	15.0	8.6	19.0	5.4	11.8	6.9	15.1
65	2½	14.7	32.3	8.9	19.6	10.0	22.0	14.7	32.3	9.0	19.7	10.0	22.1
75	3	20.6	45.5	15.3	33.8	15.0	33.0	—	—	15.4	33.9	15.0	33.1
100	4	34.0	75.0	22.2	49.0	18.1	40.0	—	—	—	—	18.2	40.1

Installation

Screwed End

The most important factor other than the valve itself in achieving a leak-tight and secure threaded valve installation is selection and preparation of mating piping. Pipe 40 mm (1½") and smaller should be Schedule 80 Steel ASTM A-106 Grade B or equal, properly cut to correct length and cleanly and properly threaded with U.S. National Tapered Male Pipe Threads. The male thread sealant is recommended. Sealant should be applied evenly to act as a lubricant between the threads to avoid any chance of metal-to-metal galling. Valve and piping should be adequately tightened with two wrenches positioned as close together as possible, but not touching the pipe threads. In horizontal piping of suction, overfeed gas return, or condenser drain lines, globe valve or angle valve stems should be horizontal to avoid liquid trapping of gas flow at the valve body casting seat orifice.

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

Socket Weld (SW) and Weld Neck (WN)

Welding valves may be installed in horizontal or vertical pipelines. Stems may be horizontal, 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 seat valve disc, although not required.

The valve stem should be open during welding. Normally, it is not necessary to disassemble 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 valves require that the pipe be inserted into the socket until bottomed against the stop. The pipe is then to be backed out approximately 1/16 of an inch before welding.

Use of welding rings is optional but recommended for Weld Neck valves. They help alignment, control gap for full penetration welding, and reduce welding debris entry. 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.

Expansion valves leading to atmosphere, even if it is temporary, must be plugged or capped to prevent corrosion inside of the valve as well as leakage due to 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.

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

Hand Expansion Valve - Bolt Torque Recommendations							
Port Size		Bolt Size	Qty	Torque			
				Bonnet Screws		Packing Nut	
				N m	ft lb	N m	ft lb
6 - 25	¼ - 1	⅝" - 18 x 1"	4	25.8	19.0	3.4	2.5
32	1¼	⅝" - 16 x 1"	4	42.0	31.0	3.4	2.5
40 - 50	1½ - 2	⅞" - 14 x 1¼"	4	61.0	45.0	3.4	2.5
65	2½	1½" - 13 x 1½"	4	81.3	60.0	3.4	2.5
75	3	1½" - 13 x 1½"	4	101.7	75.0	3.4	2.5
100	4	⅝" - 11 x 1½"	4	101.7	75.0	3.4	2.5

Number of Turns	Hand Expansion Valves Globe "T" Body Capacities																					
	6 mm		10 mm		13 mm		20 mm		25 mm		32 mm		40 mm		50 mm		65 mm		75 mm		100 mm	
	1/4"		3/8"		1/2"		3/4"		1"		1 1/4"		1 1/2"		2"		2 1/2"		3"		4"	
	Kv	Cv	Kv	Cv	Kv	Cv	Kv	Cv	Kv	Cv	Kv	Cv	Kv	Cv	Kv	Cv	Kv	Cv	Kv	Cv	Kv	Cv
1	0.3	0.4	0.4	0.5	0.5	0.6	0.3	0.3	0.2	0.2	0.5	0.6	9.5	11	9.5	11	16.1	19	21.5	25	34.4	40
2	1.0	1.1	1.1	1.3	1.1	1.3	0.4	0.5	0.4	0.5	2.5	2.9	11.2	13	12.1	14	22.8	26	37.2	43	45.6	53
3	1.1	1.3	1.6	1.8	1.6	1.9	1.4	1.6	1.4	1.6	7.9	9.1	13.8	16	13.8	16	26.2	30	41.6	48	50.6	59
4	1.2	1.4	1.9	2.2	2.0	2.3	2.3	2.7	2.2	2.6	11.2	13.0	15.6	18	13.8	19	30.7	36	45.9	53	57.8	67
5	1.3	1.5	2.2	2.5	2.3	2.7	2.9	3.4	3.0	3.5	12.1	14.0	17.3	20	16.4	21	35.3	41	51.2	59	64.2	74
6	—	—	—	—	—	—	3.5	4.1	3.5	4.1	13.8	16.0	19.0	22	19.9	23	39.6	46	56.0	65	71.1	82
7	—	—	—	—	—	—	—	—	—	—	14.7	17.0	19.9	23	22.5	26	43.9	51	62.7	73	77.4	90
8	—	—	—	—	—	—	—	—	—	—	14.7	17.0	21.6	25	23.3	27	46.7	54	66.7	77	82.9	96
9	—	—	—	—	—	—	—	—	—	—	15.6	18.0	22.5	26	25.9	30	49.0	57	69.0	80	88.7	103
10	—	—	—	—	—	—	—	—	—	—	16.4	19.0	23.3	27	26.8	31	50.6	59	70.3	81	95.0	110
11	—	—	—	—	—	—	—	—	—	—	—	—	25.1	29	27.6	32	51.5	60	72.9	84	97.6	113
12	—	—	—	—	—	—	—	—	—	—	—	—	25.1	29	27.6	32	53.2	62	74.1	86	103.9	120
13	—	—	—	—	—	—	—	—	—	—	—	—	25.9	30	29.4	34	54.1	63	75.6	88	107.5	124
14	—	—	—	—	—	—	—	—	—	—	—	—	26.8	31	29.4	34	55.2	64	77.3	79	110.8	128
15	—	—	—	—	—	—	—	—	—	—	—	—	26.8	31	30.2	35	—	—	78.5	91	113.2	131
16	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	81.0	94	115.5	134
17	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	81.9	95	117.1	135
18	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	83.8	97	123.8	143
19	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	86.2	100	128.3	149
20	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	87.8	102	132.8	154

[illegible]

Hand Expansion Selection

Liquid Make-Up

Below is a table of Tons per Cv or Kv at various liquid make-up conditions, including high to intermediate and intermediate to low temperature.

Suction Temperature	Liquid Make-Up Tons/Cv				Liquid Make-Up Tons/Kv			
	Condensing Temperature				Condensing Temperature			
	35°C (95°F)	23.9°C (75°F)	-6.7°C (20°F)	-17.8°C (0°F)	35°C (95°F)	23.9°C (75°F)	-6.7°C (20°F)	-17.8°C (0°F)
-6.7°C (+20°F)	92	77	xx	xx	106	89	xx	xx
-17.8°C (0°F)	96	82	40	xx	111	95	46	xx
-28.9°C (-20°F)	98	85	50	33	113	98	58	38

To select a valve for liquid make-up, simply pick the factor from the above table and divide that into the refrigeration load required. The result is the required Cv or Kv for the valve.

For example, to select a valve for a 500 Tons of refrigeration load at -17.8°C (0°F) at 23.9°C (75°F) condensing, using Cv capacity; pick 82 from the table and divide into 500, the result is a Cv of 6.1 [= 500/82 = 6.1]. A valve with Cv in mid-range should be selected (use the capacity tables of the previous pages according to body type). In this case, 32mm (1-1/4") globe T, globe Y or angle valve. Slight differences in conditions from those above are not of any great significance in the final selection.

Liquid Recirculation

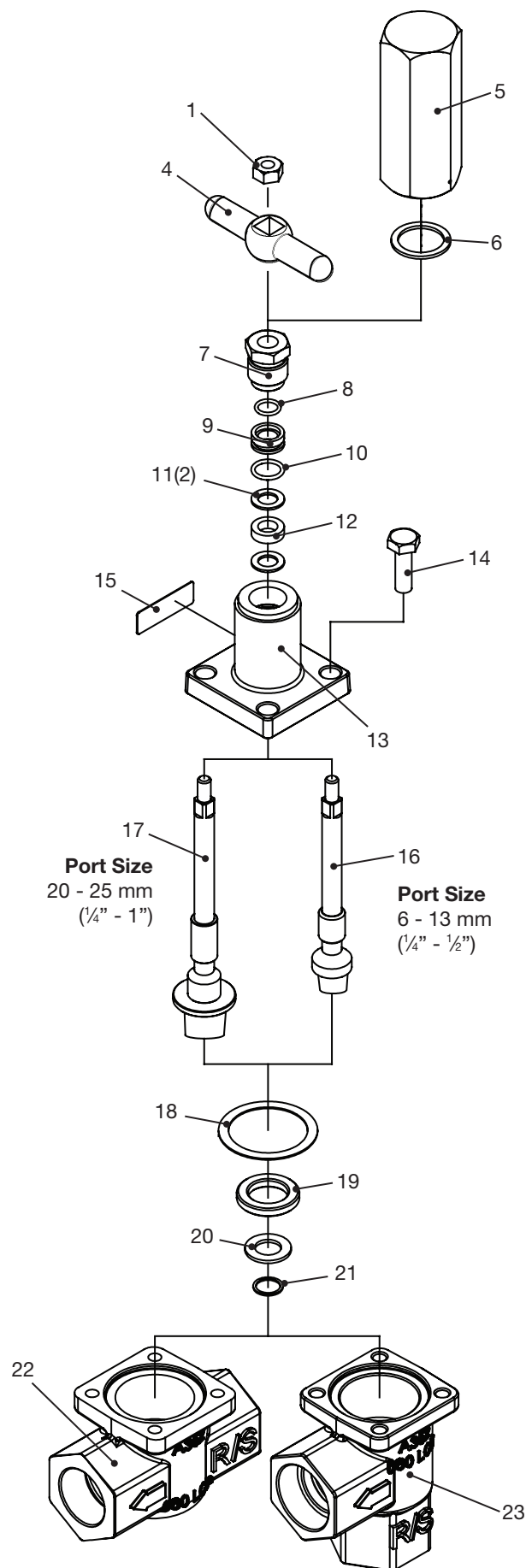
Below is the table of factors to be used when selecting a hand expansion valve in a liquid recirculation system.

Pressure Difference	Liquid Recirculated Tons/Cv				Liquid Recirculated Tons/Kv			
	Recirculation Rate				Recirculation Rate			
	2:1	3:1	4:1	5:1	2:1	3:1	4:1	5:1
0.35 bar (5 psi)	17.9	14.3	10.7	7.1	20.7	16.5	12.4	8.2
0.69 bar (10 psi)	24.9	19.9	14.9	9.9	28.8	23.0	17.2	11.4
1.03 bar (15 psi)	30.1	24.1	18.1	12.1	34.8	27.9	20.9	14.0
1.38 bar (20 psi)	34.6	27.7	20.8	13.9	40.0	32.0	24.0	16.1
2.07 bar (30 psi)	41.4	33.2	25.0	16.8	47.9	38.4	28.9	19.4

To select a valve to serve as a flow regulator for an evaporator supplied with recirculated liquid, go to the table above and select a factor at the anticipated pressure drop and recirculation rate. Divide that factor into the evaporator load and the result is the required mid-range Cv or Kv for the valve. Select a valve size from the table of Cv or Kv values.

For example, to select a valve for a 100 Tons evaporator with a 1.38 bar (20 psi) pressure drop and a recirculation rate of 3:1, a factor of 27.7 would be selected from the table above for Tons/Cv. Divide that into the evaporator load for a valve mid-range Cv of 3.6. A valve with size 25 mm (1") or 32 mm (1 1/4") globe T, globe Y or angle type would be selected (use the capacity tables of the previous pages according to body type).

Hand Expansion Valve FPT Standard Bonnet Parts List			
No.	Description	Material	Qty
1	$\frac{1}{4}$ "-20 Hex Jam Nut	Nylon, S.S.	1
4	Tee Handle	Zinc-Aluminum	1
5	Seal Cap	Aluminum 2011-T3	1
6	Gasket, Seal Cap	Nylon	1
7	Nut, Packing	303 S.S.	1
8	O-ring	Neoprene	1
9	Gland, O-ring	Carbon, PTFE	1
10	O-ring	Neoprene	1
11	Washer, Packing	Teflon, Carbon	2
12	Packing, Stem	Crane Foil	1
13	Bonnet	ASTM A350	1
14	Bolts, $\frac{5}{16}$ "-18 x1"	304 S.S.	4
15	Sticker, Name & Warning	—	1
16	Stem & Plug: 6 - 13mm ($\frac{1}{4}$ " - $\frac{1}{2}$ ")	303 S.S.	1
17	Stem & Plug: 20 - 25mm ($\frac{3}{4}$ " - 1")	303 S.S.	1
18	Gasket	Garlock 2930	1
19	Seat Disc	Ebolon 48, Carbon	1
20	Washer, Flat	Zinc	1
21	Ring, Retaining	Carbon	1
22	Globe-T Body	LCB ASTM A-352	1
23	Angle Body	LCB ASTM A-352	1

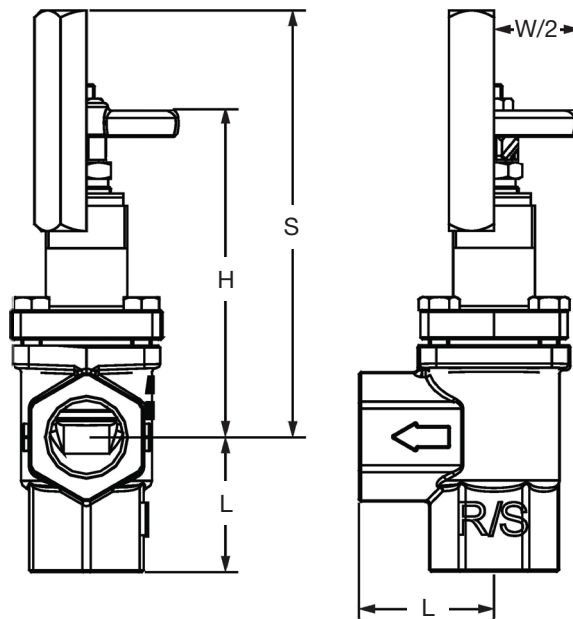
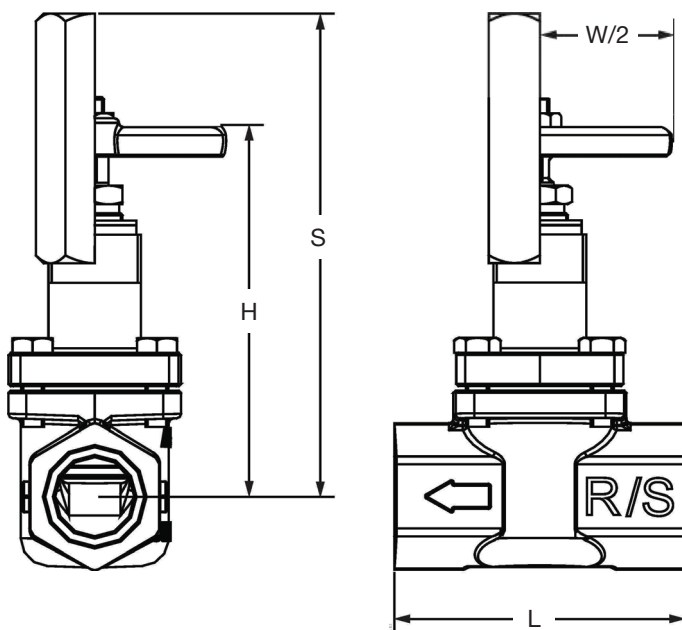


Explosion View: FPT Globe "T" and Angle Standard Bonnet Hand Expansion Valves.

**Hand Expansion Valve
FPT Standard Bonnet Replacement Part Kits**

Item	Kit Description	Port Size				
		6 mm ($\frac{1}{4}$ ")	10 mm ($\frac{3}{8}$ ")	13 mm ($\frac{1}{2}$ ")	20 mm ($\frac{3}{4}$ ")	25 mm (1")
1, 4	Tee Handle	204265	204265	204265	204265	204265
5, 6	Yellow Seal Cap	208351	208351	208351	208351	208351
7 - 12	Packing	204471	204471	204471	204471	204471
7 - 12, 16, 18 - 21	Plug/Stem	205675	205675	205675	—	—
7 - 12, 17 - 21	Plug/Stem	—	—	—	205679	205679
7 - 16, 18 - 21	Bonnet Assembly	205697	205697	205697	—	—
7 - 15, 17 - 21	Bonnet Assembly	—	—	—	204551	204551
18(6)	Gasket Pkg, Bonnet	204281	204281	204281	204282	204282
6(6)	Gasket Pkg, Seal Cap	204292	204292	204292	204292	204292

Note: The New Hand Expansion Valve Plugs and Bonnet Assemblies will not retrofit to a prior design body (2007).



Port Size	L	H**	S	W
6 mm ($\frac{1}{4}$ ")	93.7 mm (3.69")	127.0 mm (5.00")	146.1 mm (5.75")	63.5 mm (2.50")
10 mm ($\frac{3}{8}$ ")	93.7 mm (3.69")	127.0 mm (5.00")	146.1 mm (5.75")	63.5 mm (2.50")
13 mm ($\frac{1}{2}$ ")	93.7 mm (3.69")	127.0 mm (5.00")	146.1 mm (5.75")	63.5 mm (2.50")
20 mm ($\frac{3}{4}$ ")	99.6 mm (3.92")	152.4 mm (6.00")	165.1 mm (6.50")	108.0 mm (4.25")
25 mm (1")	99.6 mm (3.92")	152.4 mm (6.00")	165.1 mm (6.50")	108.0 mm (4.25")

** Valve completely open.

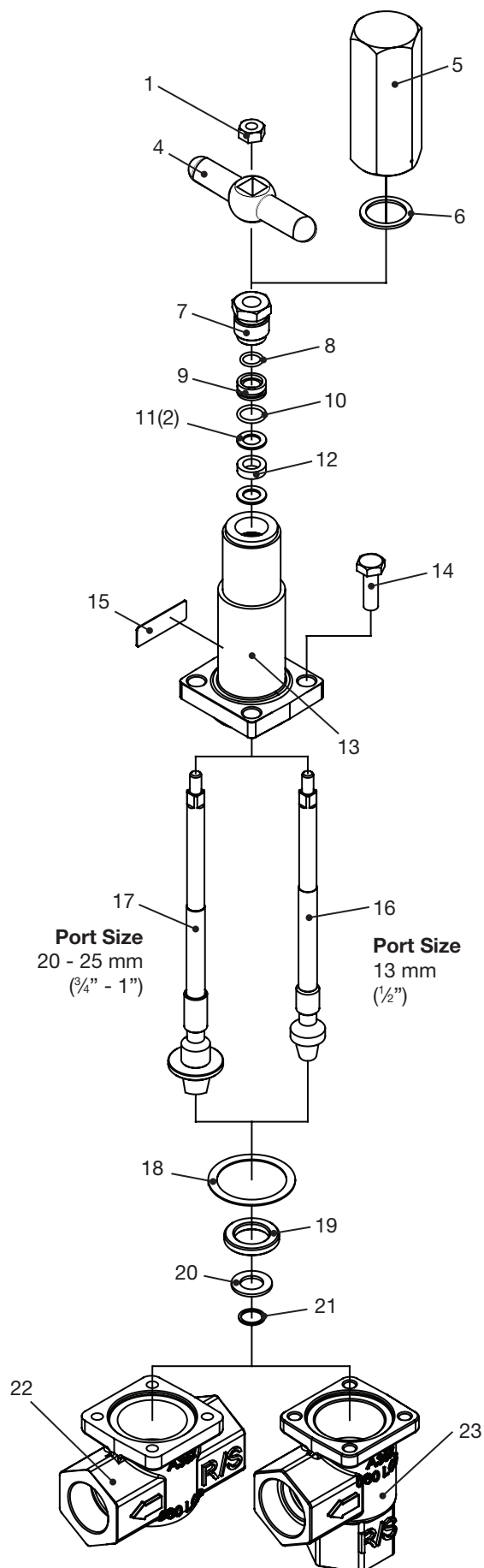
Dimensional Data: FPT Globe "T" Standard Bonnet Hand Expansion Valves.

Port Size	L	H**	S	W
6 mm ($\frac{1}{4}$ ")	44.5 mm (1.75")	127.0 mm (5.00")	146.1 mm (5.75")	63.5 mm (2.50")
10 mm ($\frac{3}{8}$ ")	44.5 mm (1.75")	127.0 mm (5.00")	146.1 mm (5.75")	63.5 mm (2.50")
13 mm ($\frac{1}{2}$ ")	44.5 mm (1.75")	127.0 mm (5.00")	146.1 mm (5.75")	63.5 mm (2.50")
20 mm ($\frac{3}{4}$ ")	52.4 mm (2.06")	152.4 mm (6.00")	165.1 mm (6.50")	108.0 mm (4.25")
25 mm (1")	52.4 mm (2.06")	152.4 mm (6.00")	165.1 mm (6.50")	108.0 mm (4.25")

** Valve completely open.

Dimensional Data: FPT Angle Standard Bonnet Hand Expansion Valves.

Hand Expansion Valve FPT Extended Bonnet Parts List			
No.	Description	Material	Qty
1	1/4"-20 Hex Jam Nut	Nylon, S.S.	1
4	Tee Handle	Zinc-Aluminum	1
5	Seal Cap	Aluminum 2011-T3	1
6	Gasket, Seal Cap	Nylon	1
7	Nut, Packing	303 S.S.	1
8	O-ring	Neoprene	1
9	Gland, O-ring	Carbon, PTFE	1
10	O-ring	Neoprene	1
11	Washer, Packing	Teflon, Carbon	2
12	Packing, Stem	Crane Foil	1
13	Bonnet	ASTM A350	1
14	Bolts, 5/16"-18 x1"	304 S.S.	4
15	Sticker, Name & Warning	—	1
16	Stem & Plug: 13mm (1/2")	303 S.S.	1
17	Stem & Plug: 20 - 25mm (3/4" - 1")	303 S.S.	1
18	Gasket	Garlock 2930	1
19	Seat Disc	Ebolon 48, Carbon	1
20	Washer, Flat	Zinc	1
21	Ring, Retaining	Carbon	1
22	Globe-T Body	LCB ASTM A-352	1
23	Angle Body	LCB ASTM A-352	1

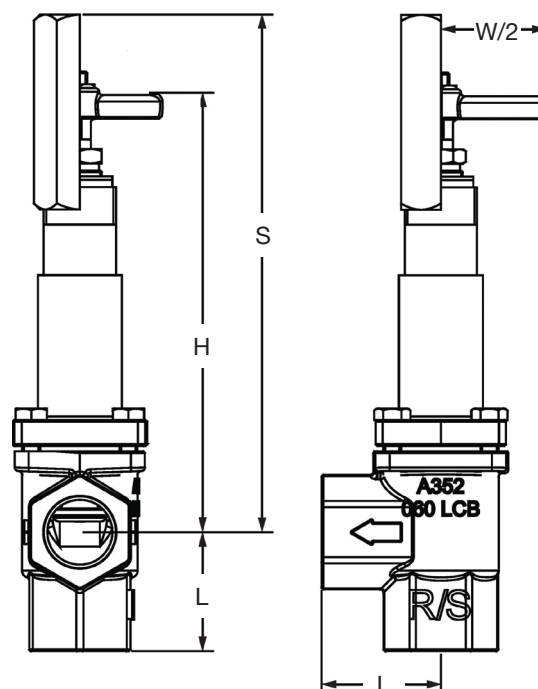
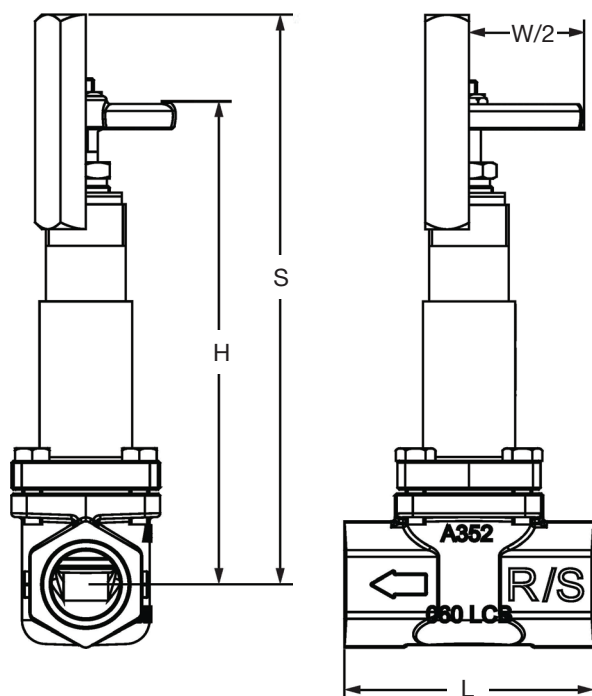


Explosion View: FPT Globe "T" and Angle Extended Bonnet Hand Expansion Valves.

Hand Expansion Valve FPT Extended Bonnet Replacement Part Kits

Item	Kit Description	13 mm ($\frac{1}{2}$ ")	20 mm ($\frac{3}{4}$ ")	25 mm (1")
1, 4	Tee Handle	204265	204265	204265
5, 6	Yellow Seal Cap	208351	208351	208351
7 - 12	Packing	204471	204471	204471
7 - 15, 16, 18 - 21	Bonnet Assembly	205968	—	—
7 - 15, 17 - 21	Bonnet Assembly	—	205972	205972
18(6)	Gasket Pkg, Bonnet	204281	204282	204282
6(6)	Gasket Pkg, Seal Cap	204292	204292	204292

Note: The New Hand Expansion Valve Plugs and Bonnet Assemblies will not retrofit to a prior design body (2007).



Port Size	L	H**	S	W
13 mm ($\frac{1}{2}$ ")	93.7 mm (3.69")	190.5 mm (7.50")	209.6 mm (8.25")	63.5 mm (2.50")
20 mm ($\frac{3}{4}$ ")	99.6 mm (3.92")	215.9 mm (8.50")	228.6 mm (9.00")	108.0 mm (4.25")
25 mm (1")	99.6 mm (3.92")	215.9 mm (8.50")	228.6 mm (9.00")	108.0 mm (4.25")

** Valve completely open.

Allowance for low temperature insulation: 75mm (3") minimum.

Dimensional Data: FPT Globe "T" Extended Bonnet Hand Expansion Valves.

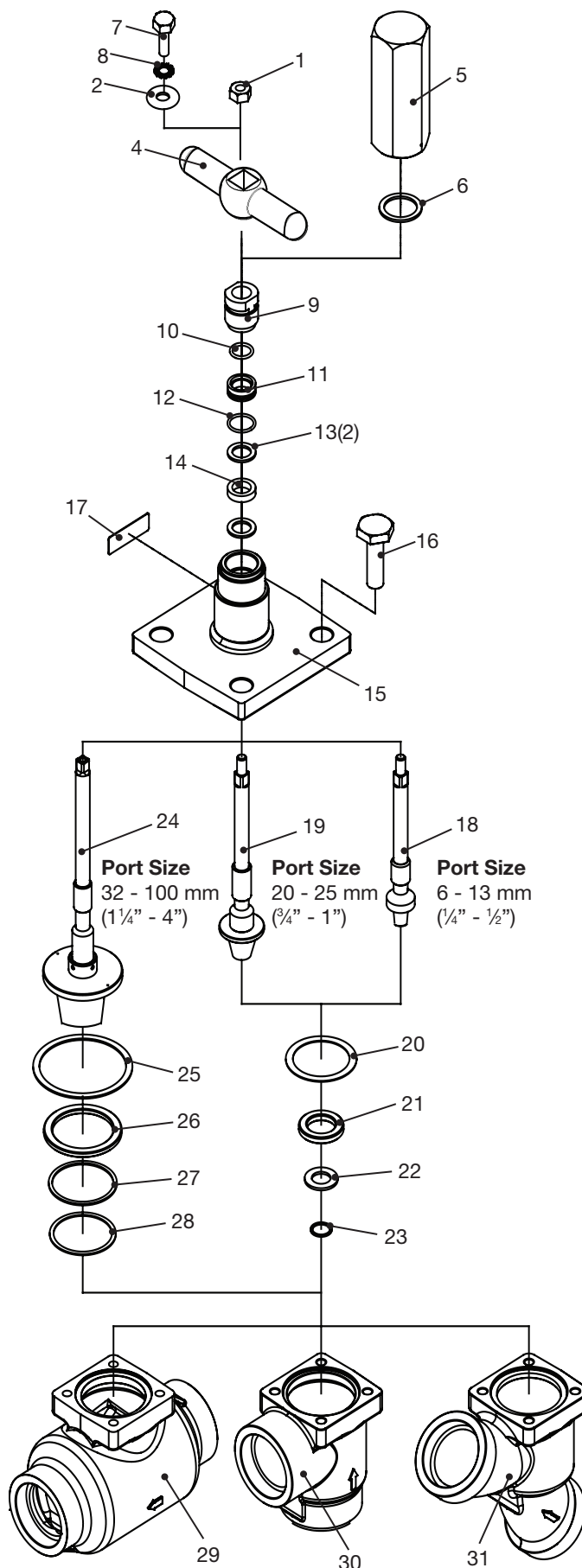
Port Size	L	H**	S	W
13 mm ($\frac{1}{2}$ ")	44.5 mm (1.75")	190.5 mm (7.50")	215.9 mm (8.50")	63.5 mm (2.50")
20 mm ($\frac{3}{4}$ ")	52.4 mm (2.06")	215.9 mm (8.50")	228.6 mm (9.00")	108.0 mm (4.25")
25 mm (1")	52.4 mm (2.06")	215.9 mm (8.50")	228.6 mm (9.00")	108.0 mm (4.25")

** Valve completely open.

Allowance for low temperature insulation: 75mm (3") minimum.

Dimensional Data: FPT Angle Extended Bonnet Hand Expansion Valves.

Hand Expansion Valve Socket Weld (SW) Standard Bonnet Parts List			
No.	Description	Material	Qty
1	1/4"-20 Hex Jam Nut	Nylon, S.S.	1
2	Washer, Flat	S.S.	1
4	Tee Handle	Zinc-Aluminum	1
5	Seal Cap	Aluminum	1
6	Gasket, Seal Cap	Nylon	1
7	Screw, Hex 1/4" - 20	S.S.	1
8	Washer, Ext - Star 1/4" ID	S.S.	1
9	Nut, Packing	303 S.S.	1
10	O-ring	Neoprene	1
11	Gland, O-ring	Carbon, PTFE	1
12	O-ring	Neoprene	1
13	Washer, Packing	Teflon, Carbon	2
14	Packing, Stem	Crane Foil	1
15	Bonnet	ASTM A350	1
Bolts:			
6 - 25 mm (1/4" - 3/4")			
5/16" - 18 x 1"			
32 mm (1 1/4")			
3/8" - 16 x 1"			
16	40 - 50 mm (1 1/2" - 2")	304 S.S.	4
7/8" - 14 x 1 1/4"			
65 - 75 mm (2 1/2" - 3")			
1/2" - 13 x 1 1/2"			
100 mm (4")			
5/8" - 11 x 1 1/2"			
17	Sticker, Name & Warning	—	1
18	Stem & Plug: 6 - 13mm (1/4" - 1/2")	303 S.S.	1
19	Stem & Plug: 20 - 25mm (3/4" - 1")	303 S.S.	1
20	Gasket	Garlock 2930	1
21	Seat Disc	Ebolon, Carbon	1
22	Washer, Flat	Zinc	1
23	Ring, Retaining	Carbon	1
24	Stem & Plug: 32 - 100 mm (1 1/4" - 4")	303 S.S.	1
25	Gasket	Garlock 2930	1
26	Seat Disc	Ebolon, Carbon	1
27	Washer, Retaining	Zinc - Chromate	1
28	Ring, Retaining	Carbon - Temper Steel	1
29	Globe-T Body	LCB ASTM A-352	1
30	Angle Body	LCB ASTM A-352	1
31	Globe-Y Body	LCB ASTM A-352	1

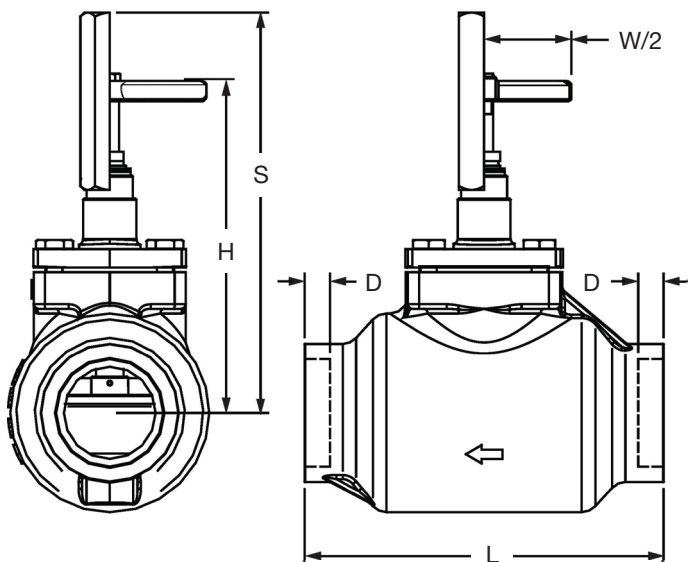


Explosion View: Socket Weld (SW) Standard Bonnet Hand Expansion Valves.

Hand Expansion Valve Socket Weld (SW) Standard Bonnet Replacement Part Kits												
Item	Kit Description	Port Size										
		6 mm (¼")	10 mm (⅜")	13 mm (½")	20 mm (¾")	25 mm (1")	32 mm (1¼")	40 mm (1½")	50 mm (2")	65 mm (2½")	75 mm (3")	100 mm (4")
1, 4	Tee Handle	204265	204265	204265	204265	204265	—	—	—	—	—	—
2, 4, 7, 8	Tee Handle	—	—	—	—	—	205713	205713	205713	205713	205714	205714
5, 6	Yellow Seal Cap	208351	208351	208351	208351	208351	208352	208352	208352	208352	208353	208353
9 - 14	Packing	204471	204471	204471	204471	204471	204472	204472	204472	204472	204473	204473
9 - 14, 18, 20 - 23	Plug/Stem	205675	205675	205675	—	—	—	—	—	—	—	—
9 - 14, 19 - 23	Plug/Stem	—	—	—	205679	205679	—	—	—	—	—	—
9 - 14, 24 - 28	Plug/Stem	—	—	—	—	—	205680	205680 *204316	204316	—	—	—
9 - 18, 20 - 23	Bonnet Assembly	205697	205697	205697	—	—	—	—	—	—	—	—
9 - 17, 19 - 23	Bonnet Assembly	—	—	—	204551	204551	—	—	—	—	—	—
9 - 17, 24 - 28	Bonnet Assembly	—	—	—	—	—	205703	205703	205704	207895	207896	207897
20(6)	Gasket Pkg, Bonnet	204281	204281	204281	204282	204282	—	—	—	—	—	—
25(6)	Gasket Pkg, Bonnet	—	—	—	—	—	204283	204283	204284	204285	204286	204287
6(6)	Gasket Pkg, Seal Cap	204292	204292	204292	204292	204292	204292	204292	204292	204292	—	—
6(2)	Gasket Pkg, Seal Cap	—	—	—	—	—	—	—	—	—	204293	204293

* 1½" Globe "T" valve body only.

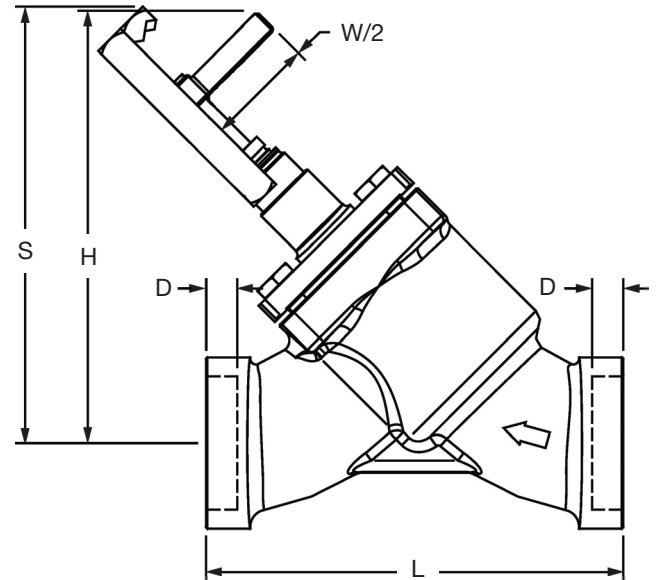
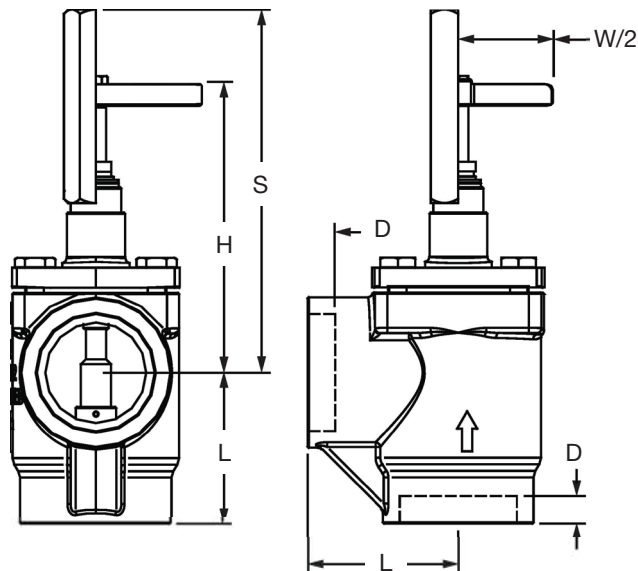
Note: The New Hand Expansion Valve Plugs and Bonnet Assemblies will not retrofit to a prior design body (2007).



Port Size	L	D	H**	S	W
6 mm (¼")	93.7 mm (3.69")	10.4 mm (0.41")	127.0 mm (5.00")	146.1 mm (5.75")	63.5 mm (2.50")
10 mm (⅜")	93.7 mm (3.69")	10.4 mm (0.41")	127.0 mm (5.00")	146.1 mm (5.75")	63.5 mm (2.50")
13 mm (½")	93.7 mm (3.69")	10.4 mm (0.41")	127.0 mm (5.00")	146.1 mm (5.75")	63.5 mm (2.50")
20 mm (¾")	99.5 mm (3.92")	12.7 mm (0.50")	152.4 mm (6.00")	165.1 mm (6.50")	108.0 mm (4.25")
25 mm (1")	99.5 mm (3.92")	12.7 mm (0.50")	152.4 mm (6.00")	165.1 mm (6.50")	108.0 mm (4.25")
32 mm (1¼")	174.8 mm (6.88")	14.3 mm (0.56")	228.6 mm (9.00")	241.3 mm (9.50")	136.5 mm (5.38")
40 mm (1½")	207.8 mm (8.18")	14.3 mm (0.56")	254.0 mm (10.00")	266.7 mm (10.50")	136.5 mm (5.38")
50 mm (2")	207.8 mm (8.18")	17.3 mm (0.68")	254.0 mm (10.00")	254.0 mm (10.0")	136.5 mm (5.38")
65 mm (2½")	241.3 mm (9.50")	17.3 mm (0.68")	279.4 mm (11.00")	285.8 mm (11.25")	136.5 mm (5.38")

** Valve completely open.

Dimensional Data: SW Globe "T" Standard Bonnet Hand Expansion Valves.



Port Size	L	D	H**	S	W
6 mm (1/4")	44.5 mm (1.75")	10.4 mm (0.41")	127.0 mm (5.00")	146.1 mm (5.75")	63.5 mm (2.50")
10 mm (3/8")	44.5 mm (1.75")	10.4 mm (0.41")	127.0 mm (5.00")	146.1 mm (5.75")	63.5 mm (2.50")
13 mm (1/2")	44.5 mm (1.75")	10.4 mm (0.41")	127.0 mm (5.00")	146.1 mm (5.75")	63.5 mm (2.50")
20 mm (3/4")	52.4 mm (2.06")	13.6 mm (0.53")	152.4 mm (6.00")	165.1 mm (6.50")	108.0 mm (4.25")
25 mm (1")	52.4 mm (2.06")	12.7 mm (0.50")	152.4 mm (6.00")	165.1 mm (6.50")	108.0 mm (4.25")
32 mm (1 1/4")	67.6 mm (2.66")	14.3 mm (0.56")	184.1 mm (7.25")	203.2 mm (8.00")	136.5 mm (5.38")
40 mm (1 1/2")	66.3 mm (2.61")	14.3 mm (0.56")	184.1 mm (7.25")	203.2 mm (8.00")	136.5 mm (5.38")
50 mm (2")	78.1 mm (3.08")	17.3 mm (0.68")	215.9 mm (8.50")	222.3 mm (8.75")	136.5 mm (5.38")
65 mm (2 1/2")	92.1 mm (3.63")	17.3 mm (0.68")	235.0 mm (9.25")	241.3 mm (9.50")	136.5 mm (5.38")
75 mm (3")	92.7 mm (3.65")	17.3 mm (0.68")	279.4 mm (11.00")	298.5 mm (11.75")	158.8 mm (6.25")
100 mm (4")	112.0 mm (4.41")	20.8 mm (0.82")	298.5 mm (11.75")	311.2 mm (12.25")	158.8 mm (6.25")

Port Size	L	D	H**	S	W
32 mm (1 1/4")	158.8 mm (6.25")	14.3 mm (0.56")	222.3 mm (8.75")	203.2 mm (8.00")	136.5 mm (5.38")
40 mm (1 1/2")	158.8 mm (6.25")	14.3 mm (0.56")	222.3 mm (8.75")	203.2 mm (8.00")	136.5 mm (5.38")
50 mm (2")	202.4 mm (7.97")	17.3 mm (0.68")	254.0 mm (10.00")	228.6 mm (9.00")	136.5 mm (5.38")
65 mm (2 1/2")	228.6 mm (9.00")	17.3 mm (0.68")	279.4 mm (11.00")	254.0 mm (10.00")	136.5 mm (5.38")
75 mm (3")	285.8 mm (11.25")	17.3 mm (0.68")	317.5 mm (12.50")	304.8 mm (12.00")	158.8 mm (6.25")
100 mm (4")	339.7 mm (13.38")	20.8 mm (0.82")	355.6 mm (14.00")	330.2 mm (13.00")	158.8 mm (6.25")

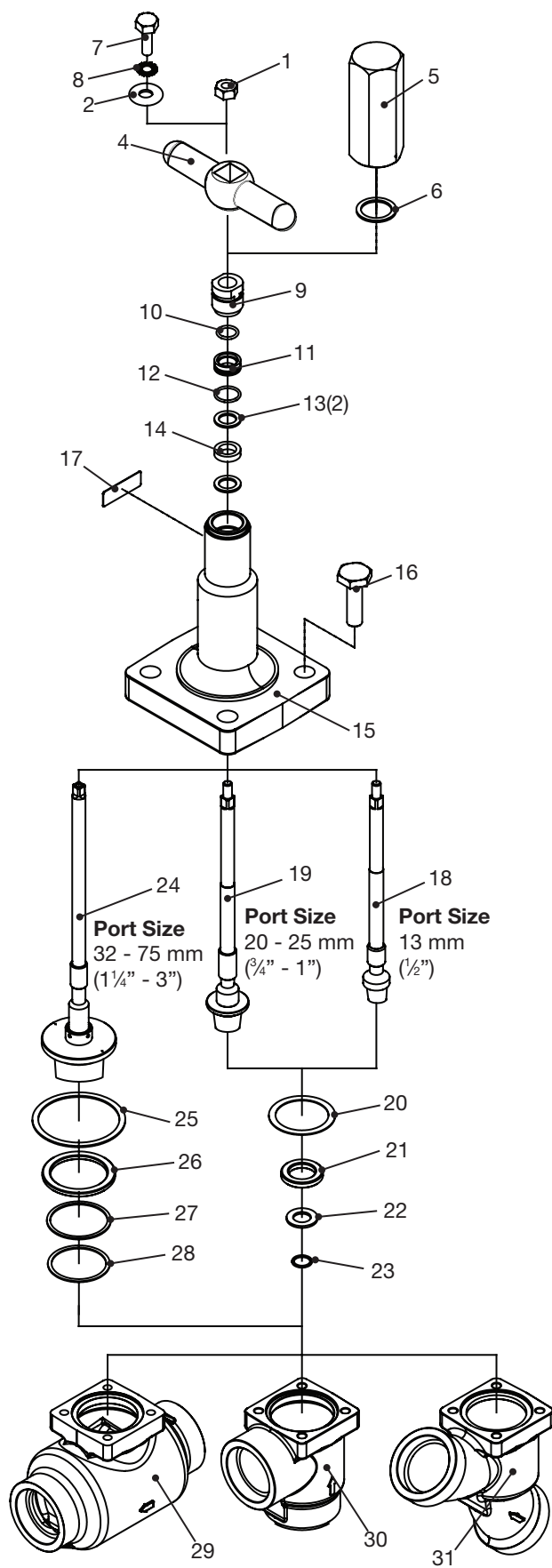
** Valve completely open.

Dimensional Data: SW Globe "Y" Standard Bonnet Hand Expansion Valves.

** Valve completely open.

Dimensional Data: SW Angle Standard Bonnet Hand Expansion Valves.

Hand Expansion Valve Socket Weld (SW) Extended Bonnet Parts List			
No.	Description	Material	Qty
1	1/4"-20 Hex Jam Nut	Nylon, S.S.	1
2	Washer, Flat	S.S.	1
4	Tee Handle	Zinc-Aluminum	1
5	Seal Cap	Aluminum	1
6	Gasket, Seal Cap	Nylon	1
7	Screw, Hex 1/4" - 20	S.S.	1
8	Washer, Ext - Star 1/4" ID	S.S.	1
9	Nut, Packing	303 S.S.	1
10	O-ring	Neoprene	1
11	Gland, O-ring	Carbon, PTFE	1
12	O-ring	Neoprene	1
13	Washer, Packing	Teflon, Carbon	2
14	Packing, Stem	Crane Foil	1
15	Bonnet	ASTM A350	1
Bolts:			
13 - 25mm (1/2" - 1")			
5/16" - 18 x 1"			
32mm (1 1/4")			
3/8" - 16 x 1"			
40 - 50mm (1 1/2" - 2")			
7/8" - 14 x 1 1/4"			
65 - 75mm (2 1/2" - 3")			
1/2" - 13 x 1 1/2"			
16		304 S.S.	4
17	Sticker, Name & Warning	—	1
18	Stem & Plug: 6 - 13mm (1/4" - 1/2")	303 S.S.	1
19	Stem & Plug: 20 - 25mm (3/4" - 1")	303 S.S.	1
20	Gasket	Garlock 2930	1
21	Seat Disc	Ebolon, Carbon	1
22	Washer, Flat	Zinc	1
23	Ring, Retaining	Carbon	1
24	Stem & Plug: 32 - 100 mm (1 1/4" - 4")	303 S.S.	1
25	Gasket	Garlock 2930	1
26	Seat Disc	Carbon - Ebolon 48	1
27	Washer, Retaining	Zinc - Chromate	1
28	Ring, Retaining	Carbon - Temper Steel	1
29	Globe-T Body	LCB ASTM A-352	1
30	Angle Body	LCB ASTM A-352	1
31	Globe-Y Body	LCB ASTM A-352	1

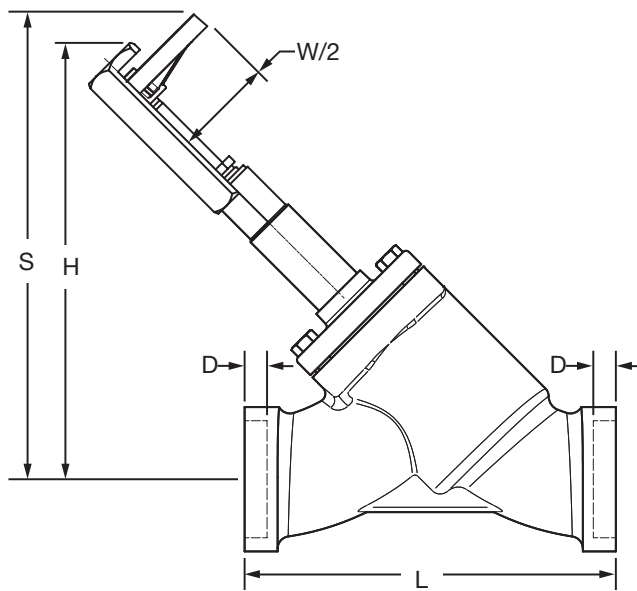


Explosion View: Socket Weld (SW) Extended Bonnet Hand Expansion Valves.

Hand Expansion Valve Socket Weld (SW) Extended Bonnet Replacement Part Kits									
Item	Kit Description	Port Size							
		13 mm ($\frac{1}{2}$ ")	20 mm ($\frac{3}{4}$ ")	25 mm (1")	32 mm ($1\frac{1}{4}$ ")	40 mm ($1\frac{1}{2}$ ")	50 mm (2")	65 mm ($2\frac{1}{2}$ ")	75 mm (3")
1, 4	Tee Handle	204265	204265	204265	—	—	—	—	—
2, 4, 7, 8	Tee Handle	—	—	—	205713	205713	205713	205713	205714
5, 6	Yellow Seal Cap	208351	208351	208351	208352	208352	208352	208352	208353
9 - 14	Packing	204471	204471	204471	204472	204472	204472	204472	204473
9 - 18, 20 - 23	Bonnet Assembly	205968	—	—	—	—	—	—	—
9 - 17, 19 - 23	Bonnet Assembly	—	205972	205972	—	—	—	—	—
9 - 17, 24 - 28	Bonnet Assembly	—	—	—	205973	205973 *205974	205974	207636	251345
20(6)	Gasket Pkg, Bonnet	204281	204282	204282	—	—	—	—	—
25(6)	Gasket Pkg, Bonnet	—	—	—	204283	204283	204284	204285	204286
6(6)	Gasket Pkg, Seal Cap	204292	204292	204292	204292	204292	204292	204292	—
6(2)	Gasket Pkg, Seal Cap	—	—	—	—	—	—	—	204293

* $1\frac{1}{2}$ " Globe "T" valve body only.

Note: The New Hand Expansion Valve Plugs and Bonnet Assemblies will not retrofit to a prior design body (2007).

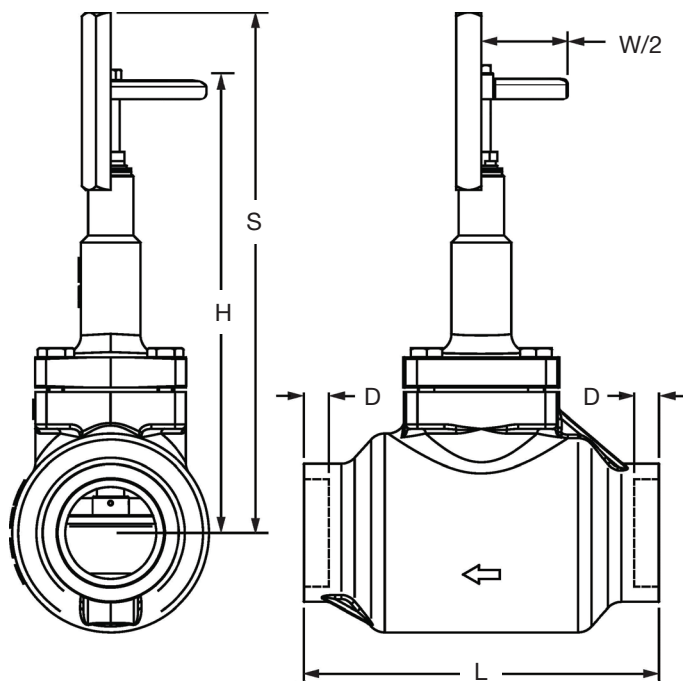


Port Size	L	D	H**	S	W
32 mm ($1\frac{1}{4}$ ")	158.8 mm (6.25")	14.3 mm (0.56")	247.7 mm (9.75")	266.7 mm (10.50")	136.5 mm (5.38")
40 mm ($1\frac{1}{2}$ ")	158.8 mm (6.25")	14.3 mm (0.56")	247.7 mm (9.75")	266.7 mm (10.50")	136.5 mm (5.38")
50 mm (2")	202.4 mm (7.97")	17.3 mm (0.68")	279.4 mm (12.50")	279.4 mm (11.00")	136.5 mm (5.38")

** Valve completely open.

Allowance for low temperature insulation: 75mm (3") minimum.

Dimensional Data: SW Globe "Y" Extended Bonnet Hand Expansion Valves.

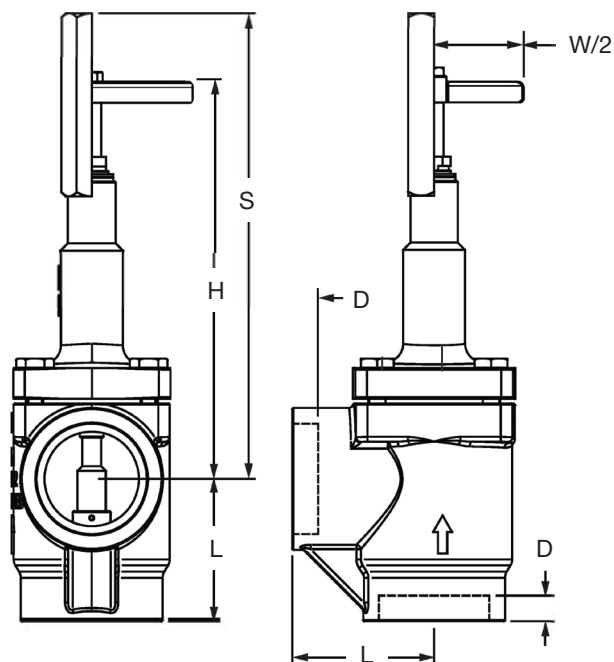


Port Size	L	D	H**	S	W
13 mm (½")	93.7 mm (3.69")	10.4 mm (0.41")	190.5 mm (7.50")	209.6 mm (8.25")	63.5 mm (2.50")
20 mm (¾")	99.5 mm (3.92")	12.7 mm (0.50")	215.9 mm (8.50")	228.6 mm (9.00")	108.0 mm (4.25")
25 mm (1")	99.5 mm (3.92")	12.7 mm (0.50")	215.9 mm (8.50")	228.6 mm (9.00")	108.0 mm (4.25")
32 mm (1¼")	174.8 mm (6.88")	14.3 mm (0.56")	292.1 mm (11.50")	304.8 mm (12.00")	136.5 mm (5.38")
40 mm (1½")	207.8 mm (8.18")	14.3 mm (0.56")	317.5 mm (12.50")	330.2 mm (13.00")	136.5 mm (5.38")
50 mm (2")	207.8 mm (8.18")	17.3 mm (0.68")	317.5 mm (12.50")	330.2 mm (13.00")	136.5 mm (5.38")
65 mm (2½")	241.3 mm (9.50")	17.3 mm (0.68")	362.0 mm (14.25")	368.3 mm (14.50")	136.5 mm (5.38")

** Valve completely open.

Allowance for low temperature insulation: 75mm (3") minimum.

Dimensional Data: SW Globe "T" Extended Bonnet Hand Expansion Valves.

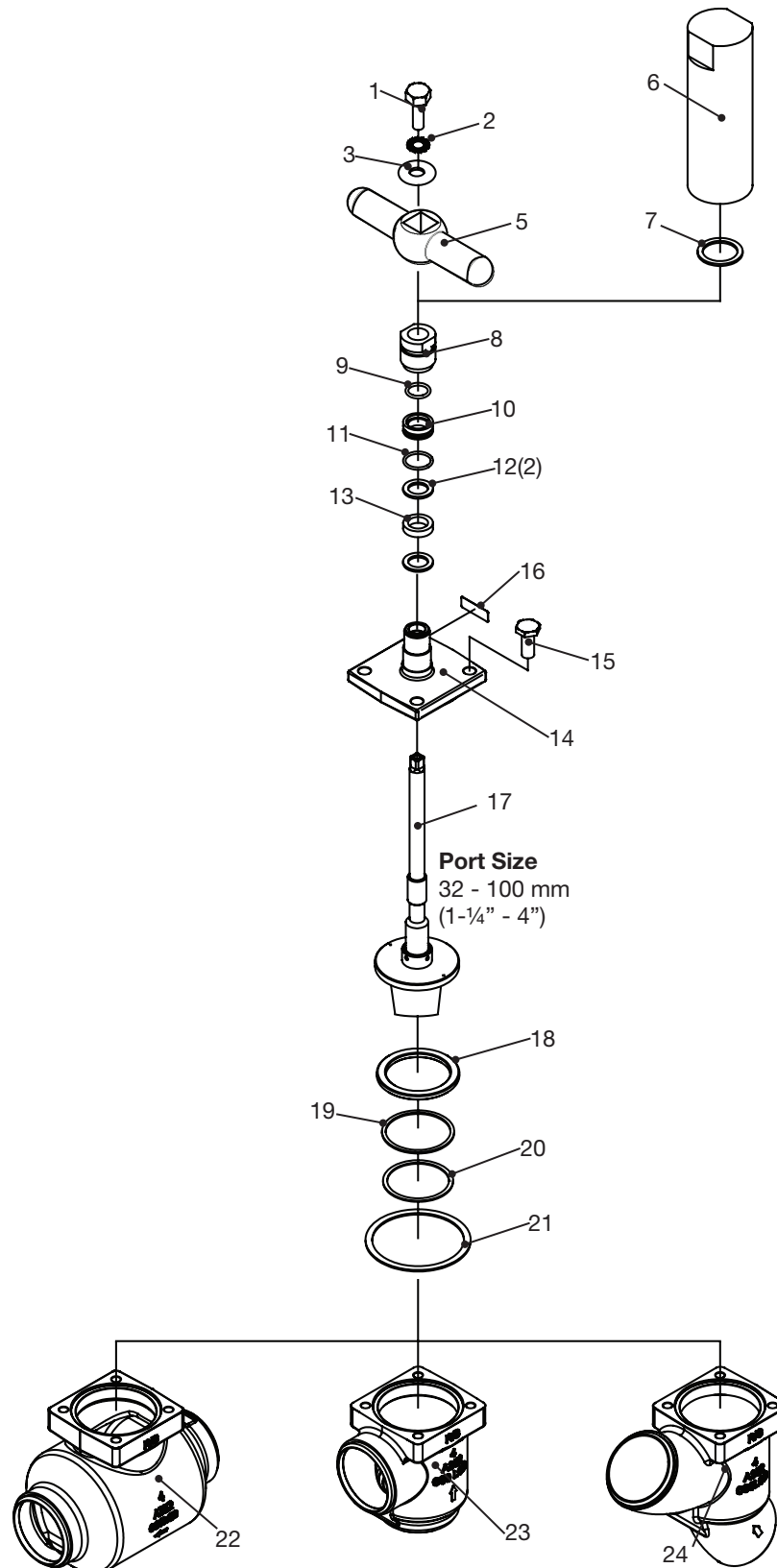


Port Size	L	D	H**	S	W
20 mm (¾")	52.4 mm (2.06")	52.4 mm (2.06")	215.9 mm (8.50")	228.6 mm (9.00")	108.0 mm (4.25")
25 mm (1")	52.4 mm (2.06")	52.4 mm (2.06")	215.9 mm (8.50")	228.6 mm (9.00")	108.0 mm (4.25")
32 mm (1¼")	67.6 mm (2.66")	67.6 mm (2.66")	247.7 mm (9.75")	266.7 mm (10.50")	136.5 mm (5.38")
40 mm (1½")	66.3 mm (2.61")	66.3 mm (2.61")	247.7 mm (9.75")	266.7 mm (10.50")	136.5 mm (5.38")
50 mm (2")	78.1 mm (3.08")	78.1 mm (3.08")	279.4 mm (12.50")	279.4 mm (11.00")	136.5 mm (5.38")
65 mm (2½")	92.1 mm (3.63")	92.1 mm (3.63")	311.2 mm (12.25")	311.2 mm (12.25")	136.5 mm (5.38")
75 mm (3")	92.7 mm (3.65")	92.7 mm (3.65")	323.9 mm (12.75")	349.3 mm (13.75")	158.8 mm (6.25")

** Valve completely open.

Allowance for low temperature insulation: 75mm (3") minimum.

Dimensional Data: SW Angle Extended Bonnet Hand Expansion Valves.

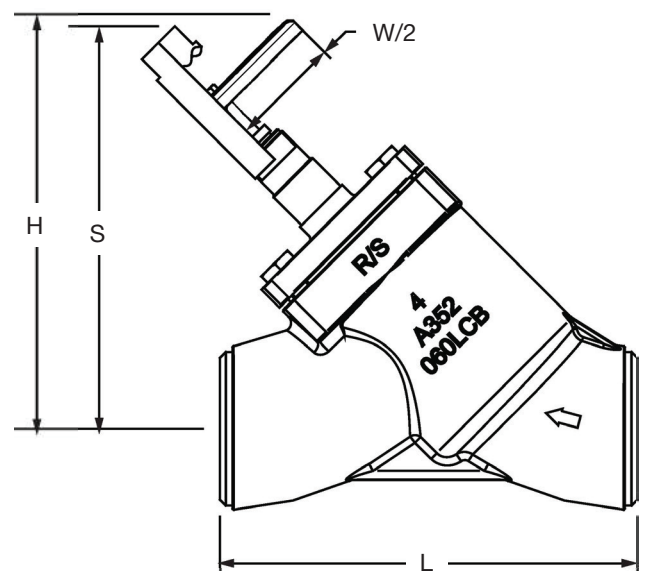
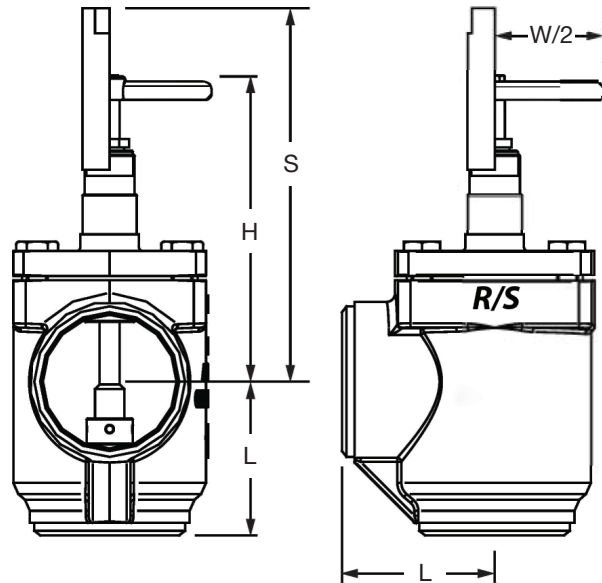


Explosion View: Weld Neck (WN) Standard Bonnet Hand Expansion Valves.

Hand Expansion Valve Weld Neck (WN) Standard Bonnet Parts List			
No.	Description	Material	Qty
1	Screw, Hex 1/4" - 20	S.S.	1
2	Washer, Ext - Star 1/4" ID	S.S.	1
3	Washer, Flat	S.S.	1
5	Tee Handle	Zinc-Aluminum	1
6	Seal Cap	Aluminum 2011-T3	1
7	Gasket, Seal Cap	Nylon	1
8	Nut, Packing	303 S.S.	1
9	O-ring	Neoprene	1
10	Gland, O-ring	Carbon, PTFE	1
11	O-ring	Neoprene	1
12	Washer, Packing	Teflon, Carbon	2
13	Packing, Stem	Crane Foil	1
14	Bonnet: 32 - 100 mm (1 1/4" - 4")	ASTM A350	1
15	Bolts: 32 mm (1 1/4") 3/8" - 16 x 1"	304 S.S.	4
	40 - 50 mm (1 1/2" - 2") 7/8" - 14 x 1 1/4"		
	65 - 75 mm (2 1/2" - 3") 1/2" - 13 x 1 1/2"		
	100 mm (4") 5/8" - 11 x 1 1/2"		
16	Sticker, Name & Warning	—	1
17	Stem & Plug: 32 - 100 mm (1 1/4" - 4")	303 S.S.	1
18	Seat Disc	Ebolon 48, Carbon	1
19	Washer, Retaining	Zinc - Chromate	1
20	Ring, Retaining	Carbon - Steel	1
21	Gasket	Garlock 2930	1
22	Globe-T Body	LCB ASTM A-352	1
23	Angle Body	LCB ASTM A-352	1
24	Globe-Y Body	LCB ASTM A-352	1

Hand Expansion Valve Weld Neck (WN) Standard Bonnet Replacement Part Kits							
Item	Kit Description	Port Size					
		32 mm (1 1/4")	40 mm (1 1/2")	50 mm (2")	65 mm (2 1/2")	75 mm (3")	100 mm (4")
1, 2, 3, 5	Tee Handle	205713	205713	205713	205713	205714	205714
6, 7	Yellow Seal Cap	208352	208352	208352	208352	208353	208353
8 - 12	Packing	204472	204472	204472	204472	204473	204473
8 - 13, 17 - 21	Plug/Stem	205680	205680	204316	—	—	—
8 - 17	Bonnet Assembly	205703	205703	205704	207895	207896	207897
21(6)	Gasket, Bonnet	204283	204283	204284	204285	204286	204287
7(6)	Gasket, Seal Cap	204292	204292	204292	204292	—	—
7(2)	Gasket, Seal Cap	—	—	—	—	204293	204293

Note: The New Hand Expansion Valve Plugs and Bonnet Assemblies will not retrofit to a prior design body (2007).



Port Size	L	H**	S	W
32 mm (1¼")	67.6 mm (2.66")	184.2 mm (7.25")	203.2 mm (8.00")	136.5 mm (5.38")
40 mm (1½")	66.3 mm (2.61")	184.2 mm (7.25")	203.2 mm (8.00")	136.5 mm (5.38")
50 mm (2")	77.1 mm (3.04")	215.9 mm (8.50")	222.3 mm (8.75")	136.5 mm (5.38")
65 mm (2½")	92.1 mm (3.63")	235.0 mm (9.25")	241.3 mm (9.5")	136.5 mm (5.38")
75 mm (3")	91.4 mm (3.60")	279.4 mm (11.00")	298.5 mm (11.75")	158.8 mm (6.25")
100 mm (4")	112.0 mm (4.41")	298.5 mm (11.75")	311.2 mm (12.25")	158.8 mm (6.25")

** Valve completely open.

Dimensional Data: Weld Neck (WN) Angle Standard Bonnet Hand Expansion Valves.

Port Size	L	H**	S	W
40 mm (1½")	193.8 mm (7.63")	222.3 mm (8.75")	203.2 mm (8.00")	136.5 mm (5.38")
50 mm (2")	206.2 mm (8.12")	254.0 mm (10.00")	228.6 mm (9.00")	136.5 mm (5.38")
65 mm (2½")	247.7 mm (9.75")	279.4 mm (11.00")	254.0 mm (10.00")	136.5 mm (5.38")
75 mm (3")	285.8 mm (11.25")	317.5 mm (12.50")	304.8 mm (12.00")	158.8 mm (6.25")
100 mm (4")	300.1 mm (11.82")	355.6 mm (14.00")	330.2 mm (13.00")	158.8 mm (6.25")

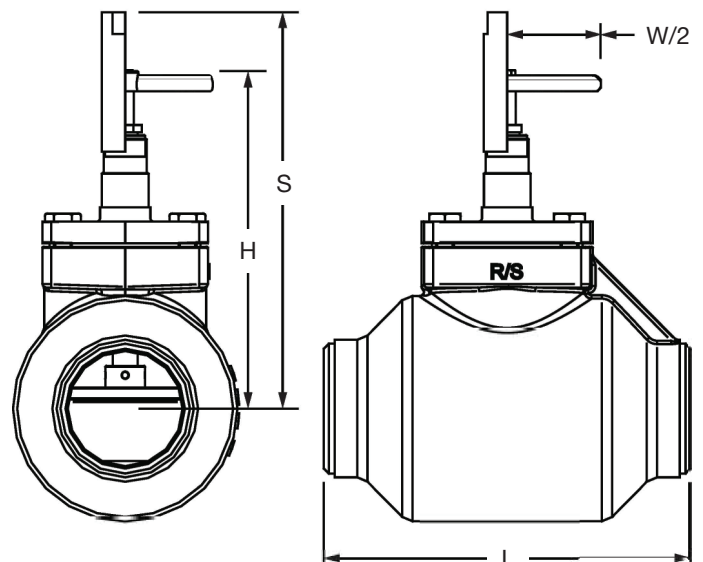
** Valve completely open.

Dimensional Data: Weld Neck (WN) Globe "Y" Standard Bonnet Hand Expansion Valves.

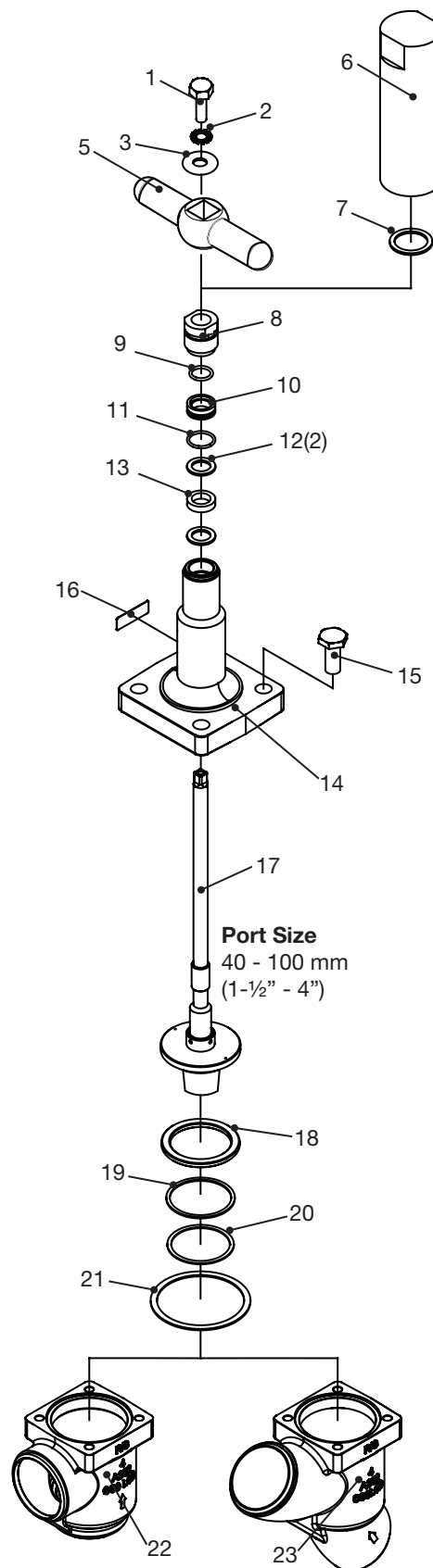
Port Size	L	H**	S	W
75 mm (3")	282.6 mm (11.13")	342.9 mm (13.50")	362.0 mm (14.25")	158.8 mm (6.25")
100 mm (4")	304.8 mm (12.00")	368.3 mm (14.50")	393.7 mm (15.50")	158.8 mm (6.25")

** Valve completely open.

Dimensional Data: Weld Neck (WN) Globe "T" Standard Bonnet Hand Expansion Valves.



Hand Expansion Valve Weld Neck (WN) Extended Bonnet Parts List			
No.	Description	Material	Qty
1	Screw, Hex 1/4" - 20	S.S.	1
2	Washer, Ext - Star 1/4" ID	S.S.	1
3	Washer, Flat	S.S.	1
5	Tee Handle	Zinc-Aluminum	1
6	Seal Cap	Aluminum 2011-T3	1
7	Gasket, Seal Cap	Nylon	1
8	Nut, Packing	303 S.S.	1
9	O-ring	Neoprene	1
10	Gland, O-ring	Carbon, PTFE	1
11	O-ring	Neoprene	1
12	Washer, Packing	Teflon, Carbon	2
13	Packing, Stem	Crane Foil	1
14	Bonnet: 40 - 100 mm (1 1/2" - 4")	ASTM A350	1
	40 mm (1 1/2") 7/8" - 14 x 1 1/4"		
15	65 - 75 mm (2-1/2" - 3") 1/2" - 13 x 1 1/2"	304 S.S.	4
	100 mm (4") 5/8" - 11 x 1 1/2"		
16	Sticker, Name & Warning	—	1
17	Stem & Plug: 40 - 100 mm (1 1/2" - 4")	303 S.S.	1
18	Seat Disc	Ebolon 48, Carbon	1
19	Washer, Retaining	Zinc - Chromate	1
20	Ring, Retaining	Carbon - Steel	1
21	Gasket	Garlock 2930	1
22	Angle Body	LCB ASTM A-352	1
23	Glove-Y Body	LCB ASTM A-352	1

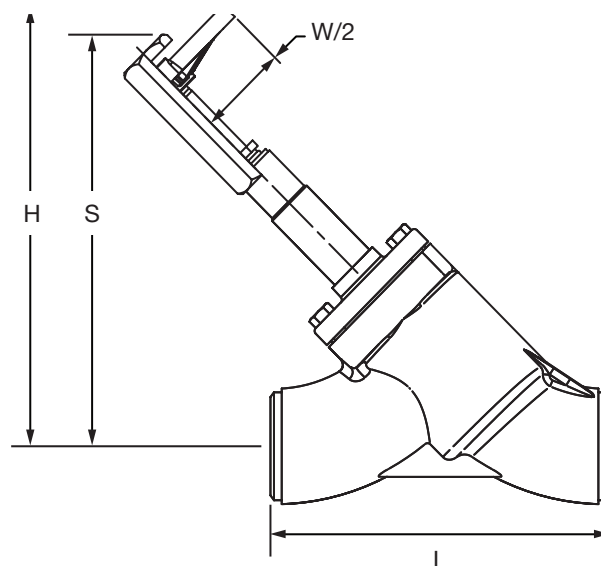
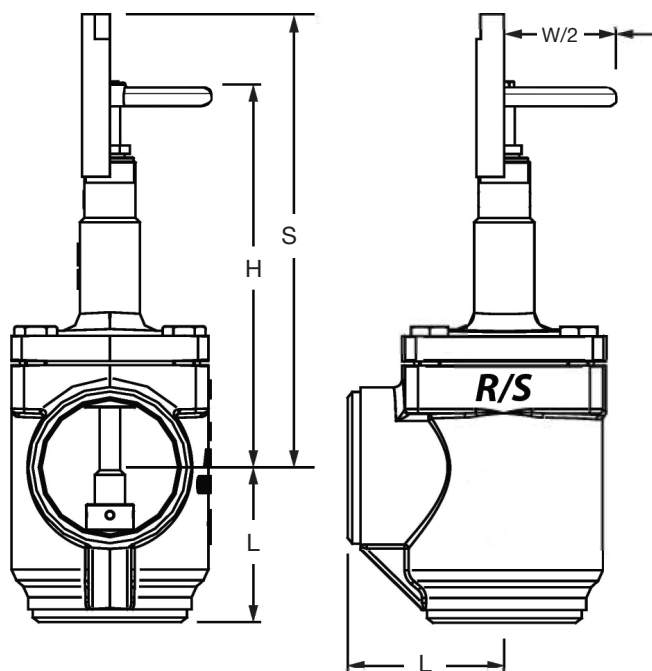


Explosion View: Weld Neck (WN) Extended Bonnet Hand Expansion Valves.

Hand Expansion Valve Weld Neck (WN) Extended Bonnet Replacement Part Kits

Item	Kit Description	40 mm (1½")	50 mm (2")	65 mm (2½")	75 mm (3")	100 mm (4")
1, 2, 3, 5	Tee Handle	205713	205713	205713	205714	205714
6, 7	Yellow Seal Cap	208352	208352	208352	208353	208353
8 - 13	Packing	204472	204472	204472	204473	204473
8 - 21	Bonnet Assembly	205974	205974	207636	251345	205988
21(6)	Gasket Pkg, Bonnet	204283	204284	204285	204286	204287
7(6)	Gasket Pkg, Seal Cap	204292	204292	204292	—	—
7(2)	Gasket Pkg, Seal Cap	—	—	—	204293	204293

Note: The New Hand Expansion Valve Plugs and Bonnet Assemblies will not retrofit to a prior design body (2007).



Port Size	L	H**	S	W
65 mm (2½")	92.1 mm (3.63")	311.2 mm (12.25")	311.2 mm (12.25")	136.5 mm (5.38")
75 mm (3")	92.7 mm (3.65")	323.9 mm (12.75")	349.3 mm (13.75")	158.8 mm (6.25")
100 mm (4")	112.0 mm (4.41")	349.3 mm (13.75")	368.3 mm (14.50")	158.8 mm (6.25")

** Valve completely open.

Allowance for low temperature insulation: 75mm (3") minimum.

Dimensional Data: Weld Neck (WN) Angle Extended Bonnet Hand Expansion Valves.

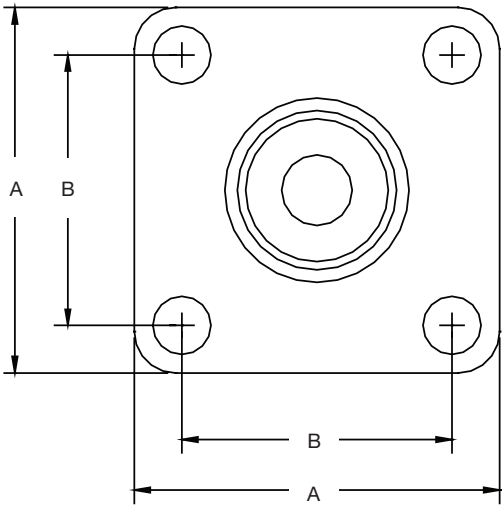
Port Size	L	H**	S	W
40 mm (1½")	193.8 mm (7.63")	247.7 mm (9.75")	266.7 mm (10.50")	136.5 mm (5.38")
65 mm (2½")	247.7 mm (9.75")	311.2 mm (12.25")	311.2 mm (12.25")	136.5 mm (5.38")
75 mm (3")	285.8 mm (11.25")	323.9 mm (12.75")	349.3 mm (13.75")	158.8 mm (6.25")

** Valve completely open.

Allowance for low temperature insulation: 75mm (3") minimum.

Dimensional Data: Weld Neck (WN) Globe "Y" Extended Bonnet Hand Expansion Valves.

Hand Expansion Bonnet Hole Dimensions		
Port Size	A	B
6 mm (¼")		
10 mm (⅜")	44.5 mm (1.75")	31.5 mm (1.24")
13 mm (½")		
20 mm (¾")	56.9 mm (2.24")	42.7 mm (1.68")
25 mm (1")		
32 mm (1¼")	69.9 mm (2.75")	51.6 mm (2.03")
40 mm (1½")		
50 mm (2")	88.9 mm (3.50")	65.0 mm (2.56")
65 mm (2½")	104.9 mm (4.13")	76.2 mm (3.00")
75 mm (3")	120.7 mm (4.75")	91.9 mm (3.62")
100 mm (4")	146.1 mm (5.75")	110.0 mm (4.33")



[illegible]

Safe Operation (See Bulletin RSBHV)

People doing any work on a refrigeration system must be qualified and completely familiar with the system and the Refrigerating Specialties Division valves involved, or all other precautions will be meaningless. This includes reading and understanding pertinent Refrigerating Specialties Division Product Bulletins and Safety Bulletin RSB prior to installation or servicing work.

Where cold refrigerant liquid lines are used, it is necessary that certain precautions be taken to avoid damage which could result from liquid expansion. Temperature increases in a piping section full of solid liquid will cause high pressure due to the expanding liquid which can possibly rupture a gasket, pipe or valve. All hand valves isolating such sections should be marked, warning against accidental closing, and must not be closed until the liquid is removed. Check valves must never be installed upstream of solenoid valves, or regulators with electric shut-off, nor should hand valves upstream of solenoid valves or downstream of check valves be closed until the liquid has been removed.

It is advisable to properly install relief devices in any section where liquid expansion could take place. Avoid all piping or control arrangements which might produce thermal or pressure shock.

For the protection of people and products, all refrigerant must be removed from the section to be worked on before a valve, strainer, or other device is opened or removed. Flanges with ODS connections are not suitable for ammonia service.

Warranty

All Refrigerating Specialties products are under warranty against defects in workmanship and materials for a period of one year from date of shipment from factory. This warranty is in force only when products are properly installed, field assembled, maintained, and operated in use and service as specifically stated in Refrigerating Specialties Catalogs or Bulletins for normal refrigeration applications, unless otherwise approved in writing by the Refrigerating Specialties Division. Defective products, or parts thereof returned to the

factory with transportation charges prepaid and found to be defective by factory inspection, will be replaced or repaired at Refrigerating Specialties option, free of charge, F.O.B. factory. Warranty does not cover products which have been altered, or repaired in the field, damaged in transit, or have suffered accidents, misuse, or abuse. Products disabled by dirt or other foreign substances will not be considered defective.

The express warranty set forth above constitutes the only warranty applicable to Refrigerating Specialties products, and is in lieu of all other warranties, expressed or implied, written including any warranty of merchantability, or fitness for a particular purpose. In no event is Refrigerating Specialties responsible for any consequential damages of any nature whatsoever. No employee, agent, dealer or other person is authorized to give any warranties on behalf of Refrigerating Specialties, nor to assume, for Refrigerating Specialties, any other liability in connection with any of its products.

