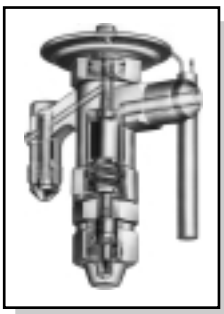
January 1998 / **BULLETIN 10-10**

Thermostatic Expansion Valves

SPORLAN

featuring
Selective Thermostatic Charges

THERMOSTATIC EXPANSION VALVES



10 Outstanding Features & Benefits of Sporlan Thermostatic Expansion Valves

- **SELECTIVE THERMOSTATIC CHARGES** Designed to provide optimum performance for all applications — air conditioning and heat pump, medium and low temperature refrigeration.
- **THERMOSTATIC ELEMENT DESIGN** Long lasting and field proven stainless steel diaphragm and welded element construction.
- **DIAPHRAGM DESIGN** Large flat diaphragm permits precise valve control.
- **REPLACEABLE THERMOSTATIC ELEMENTS** Field replaceable elements on all standard valves.
- **BALANCED PORT DESIGN** Provides perfect pin and port alignment, and prevents changes in pressure drop across the valve from influencing valve operation. Provides excellent control on applications with widely varying operating conditions.
- **PIN CARRIER DESIGN (CONVENTIONAL VALVES)** Provides precise pin and port alignment, and tighter seating.
- **ACCESSIBLE INTERNAL PARTS** Durable, leakproof body joint construction allows the valve to be disassembled, and the internal parts cleaned and inspected.
- **MATERIALS OF CONSTRUCTION** Pin and port materials offer maximum protection against corrosion and erosion.
- **SILVER SOLDERED CONNECTIONS** For leakproof, high strength connection-to-body joints.
- **ADJUSTABLE SUPERHEAT DESIGN** All standard valves are externally adjustable except the Type NI, which is internally adjustable through its outlet connection.

TABLE OF CONTENTS

Refer to Bulletin 10-9 for a complete discussion on ***The Theory of Operation and Application of Thermostatic Expansion Valves.***
Refer to Bulletin 10-11 for a complete discussion on ***Installing and Servicing Thermostatic Expansion Valves.***

SPORLAN THERMOSTATIC EXPANSION VALVES

The thermostatic expansion valve (TEV) controls the flow of liquid refrigerant entering the direct expansion (DX) evaporator by maintaining a constant **superheat** of the refrigerant vapor at the outlet of the evaporator. The TEV controls the difference between the actual temperature and the saturation temperature of the refrigerant corresponding to the suction pressure at the sensing bulb location; this is superheat. By controlling superheat, the TEV keeps nearly the entire evaporator surface active, while preventing liquid refrigerant from returning to the compressor. The ability of the TEV to match refrigerant flow to the rate at which refrigerant can be vaporized in the evaporator makes the TEV the ideal expansion device for most air conditioning and refrigeration applications.

FOR USE ON REFRIGERATION and/or AIR CONDITIONING SYSTEMS ONLY

Bulletin 10-10, January 1998 supersedes Bulletin 10-10, December 1995; Bulletin 10-15, February 1994 and all prior publications.

SELECTION PROCEDURE

The following procedure should be used when selecting a Sporlan TEV:

1. Determine the liquid temperature of the refrigerant entering the valve — The TEV capacity tables on pages 5 to 9 are based on a liquid temperature of 100°F for R-12, R-22, R-134a, R401A, R-402A, R-404A, R-407A, R-407C, R-408A, R-409A, R-502, R-507; R-717 (ammonia) capacities are based on 86°F. For other liquid temperatures, apply the correction factor given in the tables for each refrigerant. For example see Table B.

2. Determine pressure drop across valve — The pressure drop correction factors are based on standard liquid temperature and pressure drop. The standard pressure drop is dependent on the evaporator temperature. To determine the pressure drop, subtract the saturated pressure equivalent to evaporator outlet temperature from the condensing pressure. The condensing pressure used in this calculation should be the minimum operating condensing pressure of the system. From this value, subtract all other pressure losses to obtain the net pressure drop across the valve. Use this value to determine the pressure drop correction factor. For example see Table C. Be sure to consider all of the following possible sources of pressure drop:

1. Friction losses through refrigeration lines including the evaporator and condenser.
2. Pressure drop across liquid line accessories such as a solenoid valve and filter-drier.
3. Static pressure loss (gain) due to the vertical lift (drop) of the liquid line.
4. Pressure drop across a refrigerant distributor if used.

Refer to Bulletin 20-10 for information on refrigerant distributors.

3. Select valve from the capacity tables — Select a valve based on the design evaporating temperature. If possible the valve capacity should be equal or slightly exceed the design rating of the system. Be sure to apply the appropriate correction factors for liquid temperature and pressure drop. Once the desired valve capacity has been located, determine the nominal capacity of the valve from the tables' second column. On multiple evaporator systems, select each valve on the basis of individual evaporator capacity. For example see Table A.

4. Determine if an external equalizer is required — The amount of pressure drop between the valve outlet and bulb location will determine if an external equalizer is required. Refer to Bulletin 10-9 for further information on this subject.

5. Select body type — Select the body type according to the style connections desired. For complete specifications on each TEV type including nominal ratings, refer to pages 9 to 11.

6. Select the Sporlan Selective Thermostatic Charge — Select the charge according to the design evaporating temperature from the Table on Page 4. Refer to Bulletin 10-9 for a complete discussion of the available Sporlan Selective Thermostatic Charges.

Selection Example – Refrigerant 22

Application: medium temperature refrigeration

Design evaporator temperature	20°F
Design condenser temperature	95°F
Refrigerant liquid temperature	70°F
Design system capacity	1 ton
Available pressure drop across TEV:	
Condensing pressure (psig)	182
Evaporating pressure (psig)	43
	139
Liquid line and accessories loss (psi)	– 4
Distributor and tubes loss (psi) ①	– 35
	100
Refrigerant liquid correction factor	1.17
Pressure drop correction factor	0.89

Use the following formula to calculate TEV capacity:
TEV Capacity = TEV rating x CF liquid temperature x CF pressure drop

EGVE-1 Has valve capacity of: 1.09 x 1.17 x 0.89 = 1.13 Tons at 20°F evaporating temperature, 100 psi pressure drop and 70° liquid temperature.

Thermostatic charge (from Table on Page 4): VC ②

Selection:

EGVE-1-C 3/8" x 1/2" x 1/4" ODF x 5'

① An externally equalized valve must be used on evaporators employing a refrigerant distributor due to the pressure drop created by the distributor. In addition, an externally equalized valve should always be used with air conditioning thermostatic charges to reduce the possibility of thermostatic charge migration.

② Please note that the refrigerant charge designation in the thermostatic charge ("V" in this case) is dropped when it is incorporated into the valve model designation.

THERMOSTATIC EXPANSION VALVE CAPACITIES for REFRIGERANTS
TONS OF REFRIGERATION

AIR CONDITIONING, HEAT PUMP and

VALVE TYPES	NOMINAL CAPACITY	REFRIGERANT 22				
		RECOMMENDED THERMOST				
		VC, VCP100, VGA	VZ, VZP4			
		EVAPORATOR TEMPERATUR				
		40°	20°	0°	-10°	-20
F-EF-G-EG	1/5	0.20	0.22	0.19	0.17	0.1
NI	1/4	0.25	0.27	0.25	0.22	0.1
F-EF-G-EG	1/3	0.35	0.38	0.33	0.27	0.2
NI-F-EF-G-EG	1/2	0.45	0.49	0.43	0.35	0.3
G-EG	3/4	0.75	0.82	0.71	0.68	0.6
NI-F-EF-G-EG	1	1.00	1.09	0.95	0.86	0.7

Table A

The valve capacity should equal or slightly exceed the tonnage rating of the system. (For complete R-22 capacity tables, see page 6)

Design Evaporating Temperature

Liquid Temperature

REFRIGERANT	LIQUID TEMPERATURE EN								
	0°	10°	20°	30°	40°	50°	60°	70°	80
	CORRECTION FACTOF								
22	1.56	1.51	1.45	1.40	1.34	1.29	1.23	1.17	1.1
407A	1.75	1.68	1.61	1.53	1.46	1.39	1.31	1.24	1.1
407C	1.69	1.62	1.55	1.49	1.42	1.35	1.28	1.21	1.1

Table B

TEV Pressure Drop

EVAPORATOR TEMPERATURE (°F)	PRESSURE DROP ACROSS TEV (PSI)						
	30	50	75	100	125	150	175
	CORRECTION FACTOR, CF PRESSURE D						
40°	0.55	0.71	0.87	1.00	1.12	1.22	1.32
20° & 0°	0.49	0.63	0.77	0.89	1.00	1.10	1.18
– 10° & – 20°	0.45	0.58	0.71	0.82	0.91	1.00	1.08
– 40°	0.41	0.53	0.65	0.76	0.85	0.93	1.00

Table C

7. Valve Nomenclature / Ordering Instructions — Combine the letters and numbers in the following manner to obtain the complete valve designation. Also include all connection sizes and the capillary tube length.

EXAMPLE

EG	V	E	- 1 -	C	3/8" ODF Solder	X	1/2" ODF Solder	X	1/4" ODF Solder	X	5'
Body Type	Sporlan Code – REFRIGERANT – Element Label Color Code **F** - R-12 - Yellow **E** - R-13 - Blue **V** - R-22 - Green **G** - R-23 - Blue **M** - R-124 - Blue **J** - R-134a - Blue **X** - R-401A - Pink **L** - R-402A - Sand **S** - R-404A - Orange **V** - R-407A - Green **N** - R-407C - Lt. Brown **R** - R-408A - Purple **F** - R-409A - Yellow **R** - R-502 - Purple **W** - R-503 - Blue **P** - R-507 - Teal **W** - R-508B - Blue **A** - R-717 - White	"E" specifies external equalizer. Omission of letter "E" indicates valve with internal equalizer. eg. EGV-1-C	Nominal Capacity in Tons	Thermostatic Charge	Inlet Connection Size and Style		Outlet Connection Size and Style		External Equalizer Connection Size and Style		Capillary Tubing Length (Inches or Feet)

SPORLAN SELECTIVE CHARGES ENGINEERED for PEAK PERFORMANCE for EACH SPECIFIC APPLICATION

*** RECOMMENDED THERMOSTATIC CHARGES**

APPLICATION	REFRIGERANT										ACTUAL THERMOSTATIC CHARGES
	12 409A	22 407A	134a	401A	402A	404A	407C	502 408A	507	717	
AIR CONDITIONING	FCP60	–	JCP60	XCP60	–	–	–	–	–	–	FCP60
	–	VCP100	–	–	–	–	NCP100	–	–	–	VCP100
	–	VGA	–	–	–	–	NGA	–	–	–	VGA
	–	–	–	–	–	SCP115	–	RCP115	–	–	RCP115
COMMERCIAL REFRIGERATION 50°F to – 10°F	FC	–	JC	XC	–	–	–	–	–	–	FC
	–	VC	–	–	–	–	NC	–	–	–	VC
	–	–	–	–	–	SC	–	RC	–	–	RC
	–	–	–	–	LC	–	–	–	PC	–	PC
	–	–	–	–	–	–	–	–	–	AC, AL	AC, AL
LOW TEMPERATURE REFRIGERATION 0°F to – 40°F	FZ	–	–	–	–	–	–	–	–	–	FZ
	FZP	–	–	–	–	–	–	–	–	–	FZP
	–	VZ	–	–	–	–	–	–	–	–	VZ
	–	VZP40	–	–	–	–	–	–	–	–	VZP40
	–	–	–	–	LZ	SZ	–	RZ	PZ	–	RZ
	–	–	–	–	LZP	SZP	–	RZP	PZP	–	RZP
	–	–	–	–	–	–	–	–	–	AZ, AL	AZ, AL
EXTREME LOW TEMP. REFRIGERATION – 40°F to – 100°F	–	VX	–	–	–	–	–	–	–	–	VX
	–	–	–	–	LX	SX	–	RX	PX	–	RX

*** APPLICATION FACTORS:**

1. The Type ZP charges have essentially the same characteristics as the Type Z charge with one exception: they produce a pressure limit Maximum Operating Pressure (MOP). ZP charges are not intended as replacements for Z charges. Each should be selected for its own unique purpose. Refer to Bulletin 10-9 for additional application discussion.
2. All air conditioning and heat pump charges are intended for use with externally equalized valves. Refer to Bulletin 10-9 for complete discussion on when to use an external equalizer.
3. Type L Liquid charges are also available for most commonly used refrigerants in most element sizes.
4. Refer to Bulletin 10-9 for information regarding the differences between the VGA and VCP100 charges.
5. If in doubt as to which charge to use, review the section on thermostatic charges in Bulletin 10-9 or contact Sporlan Valve Company, Washington, Missouri with complete system data.

TEV CAPACITY RATINGS FOR REFRIGERANTS: 12, 22, 134a, 401A, 402A, 404A, 407A, 407C, 408A, 409A, 502, 507, 717

TEV capacity ratings for R-12, R-22, R-134a, R-401A, R-402A, R-404A, R-407A, R-407C, R-408A, R-409A, R-502, R-507 are based on vapor free 100°F liquid refrigerant entering the expansion valve, a maximum opening superheat of 7°F, and a standard factory air test superheat setting. A discussion of the relationship between valve capacities and superheat settings can be found in Bulletin 10-9.

The ratings for evaporator temperatures 40°F, 20°F, -10°F, -40°F in the capacity tables are in accordance with ANSI/ARI Standard Number 750. TEVs are tested in accordance with ANSI/ASHRAE 17.

TEV models featuring the mechanical pressure limit style thermostatic elements, i.e., the Types G(PL) and C(PL) TEVs, are now obsolete. Consult Bulletin 210-10-17 for additional information on this subject and replacement valves.

R-717 (ammonia) capacities for Types D and A TEVs are shown on Page 9. These ratings are based on vapor free 86°F liquid refrigerant entering the TEV, a maximum opening superheat of 7°F, and a standard factory air test setting.

For TEV capacity ratings at operating conditions not shown in the following tables, contact Sporlan Valve Company.

THERMOSTATIC EXPANSION VALVE CAPACITIES for REFRIGERANTS
TONS OF REFRIGERATION

12, 134a, 401A, 409A

AIR CONDITIONING, HEAT PUMP and COMMERCIAL REFRIGERATION APPLICATIONS

VALVE TYPES	NOMINAL CAPACITY	REFRIGERANT											
		12			134a			401A			409A		
		RECOMMENDED THERMOSTATIC CHARGES											
		FC, FCP60			JC, JCP60			XC, XCP60			FC, FCP60		
		EVAPORATOR TEMPERATURE (°F)											
		40°	20°	0°	40°	20°	0°	40°	20°	0°	40°	20°	0°
NI-F-EF-G-EG	1/8	0.13	0.12	0.11	0.15	0.15	0.14	0.16	0.16	0.15	0.15	0.15	0.14
F-EF-G-EG	1/6	0.21	0.23	0.22	0.25	0.28	0.26	0.27	0.30	0.29	0.25	0.28	0.27
NI-F-EF-G-EG	1/4	0.26	0.29	0.27	0.31	0.35	0.33	0.34	0.37	0.36	0.32	0.35	0.33
NI-F-EF-G-EG	1/2	0.50	0.50	0.46	0.60	0.60	0.55	0.65	0.65	0.60	0.61	0.60	0.56
NI-F-EF-G-EG	1	1.00	1.00	0.92	1.21	1.20	1.10	1.29	1.29	1.20	1.21	1.21	1.12
F-EF-G-EG	1-1/2	1.60	1.59	1.47	1.93	1.91	1.76	2.07	2.07	1.92	1.94	1.93	1.79
F&EF(Ext)-G&EG(Ext)-C(Int)-S	2	2.00	1.99	1.84	2.41	2.39	2.20	2.59	2.59	2.40	2.42	2.42	2.23
C-S	2-1/2	2.50	2.49	2.30	3.01	2.99	2.75	3.23	3.24	3.00	3.03	3.02	2.79
C-S	3	3.00	2.99	2.76	3.62	3.59	3.30	3.88	3.88	3.60	3.63	3.62	3.35
C&S(Ext)	5	5.00	4.15	3.49	6.03	4.98	4.17	6.47	5.39	4.56	6.05	5.03	4.24
S(Ext)	6	6.00	4.98	4.18	7.23	5.98	5.01	7.76	6.47	5.47	7.26	6.04	5.09
H	1-1/2	1.60	1.59	1.47	1.93	1.91	1.76	2.07	2.07	1.92	1.94	1.93	1.79
H	3	3.00	2.99	2.55	3.62	3.59	3.04	3.88	3.88	3.31	3.63	3.62	3.08
H	4	4.00	3.98	3.38	4.82	4.79	4.05	5.18	5.18	4.42	4.84	4.83	4.11
H	5	5.00	4.98	4.23	6.03	5.98	5.06	6.47	6.47	5.52	6.05	6.04	5.14
H	8	7.50	7.47	6.34	9.04	8.97	7.59	9.70	9.71	8.29	9.08	9.06	7.71
H	12	11.7	11.7	9.89	14.1	14.0	11.8	15.1	15.1	12.9	14.2	14.1	12.0
M	15	15.5	15.4	12.6	18.7	18.5	15.1	20.1	20.1	16.5	18.8	18.7	15.3
M	20	20.0	19.9	16.3	24.1	23.9	19.5	25.9	25.9	21.3	24.2	24.2	19.8
M	25	25.0	24.9	20.3	30.1	29.9	24.3	32.3	32.4	26.6	30.3	30.2	24.7
BALANCED PORT THERMOSTATIC EXPANSION VALVES													
BF-EBF-SBF	AAA	0.21	0.23	0.22	0.25	0.28	0.26	0.27	0.30	0.29	0.25	0.28	0.27
BF-EBF-SBF	AA	0.45	0.45	0.41	0.54	0.54	0.50	0.58	0.58	0.54	0.55	0.54	0.50
BF-EBF-SBF	A	1.00	1.00	0.92	1.21	1.20	1.10	1.29	1.29	1.20	1.21	1.21	1.12
BF-EBF-SBF	B	1.70	1.69	1.56	2.05	2.03	1.87	2.20	2.20	2.04	2.06	2.05	1.90
BF-EBF-SBF	C	3.00	2.99	2.76	3.62	3.59	3.30	3.88	3.88	3.60	3.63	3.62	3.35
EBS	5	5.10	4.68	4.04	6.12	5.60	4.82	6.57	6.06	5.26	6.15	5.66	4.89
EBS	7	7.00	6.43	5.55	8.44	7.72	6.64	9.06	8.36	7.25	8.47	7.80	6.74
O	9	9.00	8.96	7.80	10.8	10.8	9.33	11.6	11.7	10.2	10.9	10.9	9.48
O	12	11.7	11.7	10.1	14.1	14.0	12.1	15.1	15.1	13.2	14.2	14.1	12.3
O	16	15.5	15.4	13.4	18.7	18.5	16.1	20.1	20.1	17.6	18.8	18.7	16.3
O	23	23.0	24.9	20.7	27.7	30.0	24.7	29.8	32.4	27.0	27.8	30.2	25.1
O	32	32.0	34.7	28.7	38.6	41.7	34.4	41.4	45.1	37.6	38.7	42.1	34.9
O	40	40.0	43.4	35.9	48.2	52.1	43.0	51.8	56.4	47.0	48.4	52.6	43.7
V	35	35.0	34.9	27.7	42.2	41.9	33.2	45.3	45.3	36.3	42.4	42.3	33.7
V	45	45.0	44.8	35.7	54.2	53.8	42.7	58.2	58.3	46.6	54.5	54.3	43.3
V	55	55.0	54.8	43.6	66.3	65.8	52.2	71.2	71.2	57.0	66.6	66.4	53.0
W	80	85.0	84.6	62.9	102	102	75.3	110	110	82.2	103	103	76.4
W	110	114	–	–	137	–	–	148	–	–	138	–	–
VALVE TYPE	CARTRIDGE NO.	REPLACEABLE CARTRIDGE THERMOSTATIC EXPANSION VALVES											
Q-EQ-SQ	0	1/6	0.20	0.20	0.19	0.24	0.24	0.22	0.26	0.26	0.24	0.24	0.24	0.22
Q-EQ-SQ	1	1/4	0.45	0.45	0.42	0.54	0.54	0.50	0.58	0.58	0.54	0.55	0.54	0.50
Q-EQ-SQ	2	1/2	0.65	0.65	0.60	0.78	0.78	0.72	0.84	0.84	0.78	0.79	0.79	0.73
Q-EQ-SQ	3	1	1.00	1.00	0.92	1.21	1.20	1.10	1.29	1.29	1.20	1.21	1.21	1.12
Q-EQ-SQ	4	1-1/2	1.41	1.40	1.29	1.69	1.67	1.54	1.81	1.81	1.68	1.69	1.69	1.56
Q-EQ-SQ	5	2	2.01	2.00	1.85	2.41	2.39	2.20	2.59	2.59	2.40	2.42	2.42	2.23
Q-EQ-SQ	6	2-1/2	2.71	2.70	2.49	3.25	3.23	2.97	3.49	3.50	3.24	3.27	3.26	3.02

REFRIGERANT	LIQUID TEMPERATURE ENTERING TEV (°F)														
	0°	10°	20°	30°	40°	50°	60°	70°	80°	90°	100°	110°	120°	130°	140°
	CORRECTION FACTOR, CF LIQUID TEMPERATURE														
12	1.60	1.54	1.48	1.42	1.36	1.30	1.24	1.18	1.12	1.06	1.00	0.94	0.88	0.82	0.75
134a	1.70	1.63	1.56	1.49	1.42	1.36	1.29	1.21	1.14	1.07	1.00	0.93	0.85	0.78	0.71
401A	1.60	1.54	1.48	1.43	1.36	1.31	1.25	1.19	1.13	1.06	1.00	0.94	0.87	0.80	0.74
409A	1.55	1.50	1.45	1.39	1.34	1.28	1.23	1.17	1.12	1.06	1.00	0.94	0.88	0.82	0.76

These factors include corrections for liquid refrigerant density and net refrigerating effect and are based on an evaporator temperature of 0°F. However, they may be used for any evaporator temperature from 0°F to 40°F since the variation in the actual factors across this range is insignificant.

EVAPORATOR TEMPERATURE (°F)	PRESSURE DROP ACROSS TEV (PSI)							
	20	40	60	80	100	120	140	160
	CORRECTION FACTOR, CF PRESSURE DROP							
40°	0.58	0.82	1.00	1.15	1.29	1.41	1.53	1.63
20° & 0°	0.50	0.71	0.87	1.00	1.12	1.22	1.32	1.41

TEV capacity = TEV rating x CF liquid temperature x CF pressure drop — Example: Actual capacity of a nominal 1-1/2 ton R-134a Type EG valve at 20°F evaporator, 100 psi pressure drop across the TEV, and 60°F liquid temperature entering the TEV = 1.91 (from rating chart) x 1.29 (CF liquid temperature) x 1.12 (CF pressure drop) = 2.76 tons.

22, 407A, 407C

THERMOSTATIC EXPANSION VALVE CAPACITIES for REFRIGERANTS
TONS OF REFRIGERATION

AIR CONDITIONING, HEAT PUMP and COMMERCIAL REFRIGERATION APPLICATIONS

VALVE TYPES	NOMINAL CAPACITY	REFRIGERANT														
		22						407A						407C		
		RECOMMENDED THERMOSTATIC CHARGES														
		VC, VCP100, VGA			VZ, VZP40			VC, VCP100, VGA			VZ, VZP40			NC, NCP100, NGA		
		EVAPORATOR TEMPERATURE (°F)														
		40°	20°	0°	-10°	-20°	-40°	40°	20°	0°	-10°	-20°	-40°	40°	20°	0°
F-EF-G-EG	1/5	0.20	0.22	0.19	0.17	0.15	0.11	0.19	0.20	0.17	0.15	0.13	0.10	0.18	0.20	0.17
NI	1/4	0.25	0.27	0.25	0.22	0.19	0.14	0.23	0.25	0.23	0.24	0.22	0.16	0.23	0.25	0.23
F-EF-G-EG	1/3	0.35	0.38	0.33	0.27	0.24	0.18	0.33	0.35	0.30	0.24	0.21	0.15	0.32	0.35	0.30
NI-F-EF-G-EG	1/2	0.45	0.49	0.43	0.35	0.31	0.23	0.42	0.45	0.39	0.31	0.27	0.17	0.41	0.44	0.38
G-EG	3/4	0.75	0.82	0.71	0.68	0.61	0.45	0.70	0.75	0.64	0.60	0.53	0.39	0.69	0.74	0.64
NI-F-EF-G-EG	1	1.00	1.09	0.95	0.86	0.77	0.57	0.94	1.00	0.85	0.76	0.68	0.49	0.92	0.99	0.85
F-EF-G-EG	1-1/2	1.60	1.74	1.52	1.22	1.09	0.81	1.50	1.60	1.37	1.08	0.96	0.70	1.47	1.58	1.36
F&EF(Ext)-G&EG(Ext)-S	2	2.00	2.18	1.91	1.96	1.75	1.31	1.87	2.00	1.71	1.74	1.54	1.12	1.84	1.97	1.70
F&EF(Int)-G&EG(Int)	2-1/2	2.50	2.72	2.38	2.20	1.97	1.47	2.34	2.50	2.14	1.95	1.73	1.26	2.30	2.46	2.12
F&EF(Ext)-G&EG(Ext)-C(Int)-S	3	3.20	3.49	3.05	2.33	2.09	1.56	2.99	3.19	2.73	2.07	1.83	1.33	2.94	3.16	2.71
C-S	4	4.50	4.90	4.29	3.43	3.07	2.29	4.21	4.49	3.85	3.04	2.69	1.96	4.14	4.44	3.81
C-S	5	5.20	5.67	4.96	4.04	3.62	2.70	4.86	5.19	4.44	3.58	3.17	2.31	4.78	5.13	4.41
C&S(Ext)	8	8.00	8.72	7.04	5.82	4.87	3.59	7.48	7.99	6.30	5.16	4.27	3.07	7.35	7.89	6.25
S(Ext)	10	10.0	10.9	8.80	7.27	6.08	4.48	9.35	9.98	7.88	6.45	5.33	3.84	9.19	9.86	7.82
H	2-1/2	2.50	2.67	2.38	2.10	1.55	1.25	2.50	2.67	2.38	1.86	1.36	1.07	2.30	2.42	2.12
H	5-1/2	5.60	5.98	5.34	4.59	3.39	2.73	5.61	5.99	5.34	4.07	2.97	2.34	5.15	5.41	4.75
H	7	7.00	7.48	6.67	5.14	3.79	3.06	7.01	7.48	6.68	4.56	3.33	2.62	6.43	6.76	5.93
H	11	10.5	11.2	10.0	7.00	5.17	4.17	10.5	11.2	10.0	6.21	4.53	3.60	9.65	10.1	8.90
H	16	15.2	16.2	14.5	10.0	7.38	5.96	15.2	16.2	14.5	8.87	6.47	5.10	14.0	14.7	12.9
H	20	22.2	23.7	21.2	16.3	12.0	9.71	22.2	23.7	21.2	14.5	10.5	8.32	20.4	21.5	18.8
M	21	21.5	23.4	22.5	18.4	16.3	13.2	20.1	21.5	20.2	16.3	14.3	11.3	19.8	21.2	20.0
M	26	26.5	28.9	27.8	26.0	23.0	18.7	24.8	26.5	24.9	23.1	20.2	16.0	24.4	26.1	24.7
M	34	34.0	37.1	35.6	30.6	27.1	22.0	31.8	33.9	32.0	27.1	23.8	18.9	31.3	33.5	31.7
M	42	42.0	45.8	44.0	39.6	32.7	25.2	39.3	41.9	39.5	35.1	28.7	21.6	38.6	41.4	39.2
BALANCED PORT THERMOSTATIC EXPANSION VALVES																
BF-EBF-SBF	AAA	0.35	0.38	0.33	0.27	0.24	0.18	0.33	0.35	0.30	0.24	0.21	0.15	0.32	0.34	0.30
BF-EBF-SBF	AA	0.75	0.82	0.71	0.68	0.61	0.45	0.70	0.75	0.64	0.60	0.53	0.39	0.69	0.74	0.64
BF-EBF-SBF	A	1.60	1.74	1.52	1.22	1.09	0.81	1.50	1.60	1.37	1.08	0.96	0.70	1.47	1.58	1.36
BF-EBF-SBF	B	2.80	3.05	2.67	2.25	2.01	1.50	2.62	2.79	2.39	2.00	1.77	1.29	2.57	2.76	2.37
BF-EBF-SBF	C	5.20	5.67	4.96	4.04	3.62	2.70	4.86	5.19	4.44	3.58	3.17	2.31	4.78	5.13	4.41
EBS	8	8.51	8.81	7.30	6.15	5.15	3.79	7.95	8.06	6.54	5.45	4.51	3.25	7.81	7.96	6.48
EBS	11	11.5	11.9	9.86	8.32	6.96	5.13	10.8	10.9	8.84	7.38	6.10	4.39	10.6	10.8	8.77
O	15	15.0	15.5	13.0	9.20	8.15	6.14	14.0	14.2	11.7	8.20	7.14	5.26	13.8	14.1	11.6
O	20	22.2	23.0	19.3	16.3	12.0	9.71	20.8	21.1	17.3	14.5	10.5	8.32	20.4	20.8	17.1
O	30	30.5	31.6	26.5	19.4	17.1	14.4	28.5	28.9	23.7	17.2	15.0	12.3	28.0	28.6	23.6
O	40	40.3	43.5	32.0	29.5	26.1	21.8	37.7	39.8	28.7	26.2	22.9	18.7	37.0	39.3	28.5
O	55	55.0	59.3	43.7	39.4	29.9	24.3	51.4	54.4	39.2	34.9	26.2	20.8	50.6	53.7	38.9
O	70	73.0	78.8	58.0	51.5	34.0	26.4	68.3	72.1	52.0	45.7	29.8	22.7	67.1	71.3	51.6
V	52	52.0	56.1	54.0	52.2	37.0	29.5	48.6	51.4	48.4	46.3	32.4	25.3	47.8	50.8	48.0
V	70	73.0	78.8	75.8	71.6	50.7	40.4	68.3	72.1	67.9	63.5	44.5	34.7	67.1	71.3	67.4
V	100	100	108	104	92.2	65.3	52.1	93.5	98.8	93.0	81.8	57.3	44.6	91.9	97.6	92.3
W	135	143	154	148	132	93.5	74.5	134	141	133	117	82.0	63.9	131	140	132
W	180	180	–	–	–	–	–	168	–	–	–	–	–	165	–	–
VALVE TYPE / CARTRIDGE NO.		REPLACEABLE CARTRIDGE THERMOSTATIC EXPANSION VALVES														
Q-EQ-SQ	0	1/3	0.35	0.38	0.33	0.27	0.24	0.18	0.33	0.35	0.30	0.24	0.21	0.15	0.32	0.35	0.30
Q-EQ-SQ	1	3/4	0.75	0.82	0.72	0.68	0.61	0.45	0.70	0.75	0.64	0.60	0.53	0.39	0.69	0.74	0.64
Q-EQ-SQ	2	1	1.00	1.09	0.95	0.86	0.77	0.57	0.94	1.00	0.85	0.76	0.68	0.49	0.92	0.99	0.85
Q-EQ-SQ	3	1-1/2	1.50	1.64	1.43	1.10	0.99	0.73	1.40	1.50	1.28	0.98	0.86	0.63	1.38	1.48	1.27
Q-EQ-SQ	4	2-1/2	2.50	2.73	2.38	2.20	1.97	1.47	2.34	2.50	2.14	1.95	1.73	1.26	2.30	2.46	2.12
Q-EQ-SQ	5	3-1/2	3.50	3.82	3.34	3.00	2.69	2.00	3.27	3.49	2.99	2.66	2.36	1.72	3.22	3.45	2.97
Q-EQ-SQ	6	5	4.80	5.24	4.58	3.65	3.27	2.44	4.49	4.79	4.10	3.24	2.87	2.09	4.41	4.73	4.07
-- VGA and NGA Thermostatic Charges Only --																
RIVE	2	2.14	2.33	2.09	–	–	–	2.00	2.14	1.87	–	–	–	1.97	2.11	1.85
RIVE	3	3.40	3.71	3.31	–	–	–	3.18	3.39	2.97	–	–	–	3.13	3.35	2.95
RIVE	4	4.18	4.56	4.08	–	–	–	3.91	4.17	3.65	–	–	–	3.84	4.12	3.62
RIVE	5	4.52	4.93	4.41	–	–	–	4.23	4.51	3.95	–	–	–	4.15	4.46	3.92

REFRIGERANT	LIQUID TEMPERATURE ENTERING TEV (°F)														
	0°	10°	20°	30°	40°	50°	60°	70°	80°	90°	100°	110°	120°	130°	140°
	CORRECTION FACTOR, CF LIQUID TEMPERATURE														
22	1.56	1.51	1.45	1.40	1.34	1.29	1.23	1.17	1.12	1.06	1.00	0.94	0.88	0.82	0.76
407A	1.75	1.68	1.61	1.53	1.46	1.39	1.31	1.24	1.16	1.08	1.00	0.92	0.83	0.74	0.64
407C	1.69	1.62	1.55	1.49	1.42	1.35	1.28	1.21	1.14	1.07	1.00	0.93	0.85	0.77	0.69

These factors include corrections for liquid refrigerant density and net refrigerating effect and are based on an evaporator temperature of 0°F. However, they may be used for any evaporator temperature from -40°F to 40°F since the variation in the actual factors across this range is insignificant.

EVAPORATOR TEMPERATURE (°F)	PRESSURE DROP ACROSS TEV (PSI)										
	30	50	75	100	125	150	175	200	225	250	275
	CORRECTION FACTOR, CF PRESSURE DROP										
40°	0.55	0.71	0.87	1.00	1.12	1.22	1.32	1.41	1.50	1.58	1.66
20° & 0°	0.49	0.63	0.77	0.89	1.00	1.10	1.18	1.26	1.34	1.41	1.48
– 10° & – 20°	0.45	0.58	0.71	0.82	0.91	1.00	1.08	1.15	1.22	1.29	1.35
– 40°	0.41	0.53	0.65	0.76	0.85	0.93	1.00	1.07	1.13	1.20	1.25

TEV capacity = TEV rating x CF liquid temperature x CF pressure drop — Example: Actual capacity of a nominal 2 ton R-22 Type S valve at 20°F evaporator, 100 psi pressure drop across the TEV, and 90°F liquid temperature entering the TEV = 2.18 (from rating chart) x 1.06 (CF liquid temperature) x 0.89 (CF pressure drop) = 2.06 tons.

THERMOSTATIC EXPANSION VALVE CAPACITIES for REFRIGERANTS
TONS OF REFRIGERATION

404A, 408A, 502

AIR CONDITIONING, HEAT PUMP and COMMERCIAL REFRIGERATION APPLICATIONS

VALVE TYPES	NOMINAL CAPACITY	REFRIGERANT																	
		404A						408A						502					
		RECOMMENDED THERMOSTATIC CHARGE																	
		SC, SCP115			SZ, SZP			RC, RCP115			RZ, RZP			RC, RCP115			RZ, RZP		
		EVAPORATOR TEMPERATURE (°F)																	
		40°	20°	0°	-10°	-20°	-40°	40°	20°	0°	-10°	-20°	-40°	40°	20°	0°	-10°	-20°	-40°
NI-F-EF-G-EG	1/8	0.15	0.16	0.15	0.15	0.13	0.11	0.20	0.21	0.20	0.22	0.19	0.16	0.14	0.15	0.15	0.16	0.13	0.11
F-EF-G-EG	1/6	0.23	0.24	0.23	0.24	0.21	0.17	0.31	0.33	0.32	0.34	0.30	0.25	0.23	0.24	0.23	0.24	0.21	0.18
NI-F-EF-G-EG	1/4	0.29	0.31	0.29	0.31	0.27	0.22	0.39	0.42	0.41	0.43	0.38	0.32	0.29	0.31	0.29	0.31	0.27	0.23
NI-F-EF-G-EG	1/2	0.56	0.59	0.56	0.59	0.51	0.42	0.75	0.81	0.77	0.83	0.72	0.61	0.55	0.58	0.55	0.59	0.51	0.43
NI-F-EF-G-EG	1	1.02	1.10	1.04	1.10	0.94	0.79	1.37	1.50	1.44	1.54	1.34	1.14	1.00	1.09	1.03	1.10	0.95	0.80
F-EF-G-EG	1-1/2	1.53	1.60	1.39	1.47	1.26	1.05	2.05	2.19	1.92	2.06	1.79	1.53	1.50	1.58	1.38	1.47	1.27	1.07
F&EF(Ext)-G&EG(Ext)-C(Int)-S	2	2.04	2.14	1.83	1.96	1.68	1.40	2.74	2.92	2.54	2.74	2.38	2.04	2.00	2.11	1.82	1.96	1.69	1.43
C-S	3	2.86	3.00	2.50	2.45	2.10	1.75	3.83	4.08	3.48	3.43	2.98	2.54	2.80	2.96	2.50	2.45	2.12	1.78
C-S	4	4.08	4.28	3.58	3.42	2.94	2.45	5.48	5.83	4.97	4.80	4.17	3.56	4.00	4.23	3.57	3.43	2.96	2.50
C&S(Ext)	6	5.61	5.11	4.25	4.52	3.84	2.97	7.53	6.97	5.90	6.34	5.45	4.32	5.50	5.05	4.23	4.53	3.87	3.03
S(Ext)	7	7.14	6.51	5.41	5.76	4.90	3.79	9.58	8.87	7.50	8.08	6.94	5.51	7.00	6.42	5.39	5.77	4.93	3.86
H	1-1/2	1.53	1.46	1.39	1.47	1.25	0.99	2.05	1.99	1.92	2.06	1.77	1.44	1.50	1.44	1.38	1.47	1.26	1.01
H	3	2.85	2.72	2.31	2.45	2.08	1.65	3.83	3.71	3.20	3.43	2.95	2.41	2.80	2.69	2.30	2.45	2.09	1.69
H	4	4.08	3.89	3.13	3.42	2.91	2.32	5.48	5.30	4.34	4.80	4.13	3.37	4.00	3.84	3.12	3.43	2.93	2.36
H	6-1/2	6.63	6.32	5.09	5.32	4.52	3.60	8.90	8.61	7.06	7.46	6.41	5.24	6.50	6.24	5.07	5.33	4.55	3.67
H	9	9.69	9.24	7.44	6.11	5.19	4.13	13.0	12.6	10.3	8.57	7.36	6.01	9.50	9.12	7.41	6.12	5.23	4.22
H	12	13.3	12.6	10.2	9.79	8.31	6.62	17.8	17.2	14.1	13.7	11.8	9.60	13.0	12.5	10.1	9.80	8.37	6.75
M	15	16.1	17.1	13.0	13.8	12.4	10.0	21.6	23.3	18.0	19.3	17.5	14.5	15.8	16.9	13.0	13.8	12.5	10.2
M	20	21.0	22.3	16.3	17.3	15.5	12.5	28.2	30.3	22.7	24.2	22.0	18.2	20.6	22.0	16.3	17.3	15.6	12.8
M	25	26.2	27.8	20.4	20.3	18.2	14.7	35.2	37.8	28.3	28.4	25.8	21.4	25.7	27.4	20.3	20.3	18.3	15.0
M	30	31.6	33.5	24.6	23.5	21.1	17.0	42.4	45.7	34.1	32.9	29.9	24.7	31.0	33.1	24.5	23.5	21.2	17.3
BALANCED PORT THERMOSTATIC EXPANSION VALVES																			
BF-EBF-SBF	AAA	0.23	0.24	0.23	0.24	0.21	0.17	0.31	0.33	0.32	0.34	0.30	0.25	0.23	0.24	0.23	0.24	0.21	0.18
BF-EBF-SBF	AA	0.46	0.49	0.46	0.45	0.39	0.32	0.62	0.66	0.64	0.63	0.55	0.47	0.45	0.48	0.46	0.45	0.39	0.33
BF-EBF-SBF	A	1.02	1.10	1.04	1.10	0.94	0.79	1.37	1.50	1.44	1.54	1.34	1.14	1.00	1.09	1.03	1.10	0.95	0.80
BF-EBF-SBF	B	1.89	1.98	1.66	1.60	1.37	1.14	2.53	2.70	2.30	2.24	1.95	1.66	1.85	1.95	1.65	1.60	1.38	1.17
BF-EBF-SBF	C	2.86	3.00	2.50	2.45	2.10	1.75	3.83	4.08	3.48	3.43	2.98	2.54	2.80	2.96	2.50	2.45	2.12	1.78
EBS	6	5.71	5.63	4.61	4.15	3.28	2.97	7.67	7.66	6.40	5.82	4.66	4.32	5.60	5.56	4.59	4.15	3.31	3.02
EBS	7-1/2	7.75	7.64	6.26	5.28	4.18	3.78	10.4	10.4	8.68	7.41	5.93	5.49	7.60	7.54	6.24	5.29	4.21	3.85
O	9	9.69	9.24	7.24	6.11	5.31	4.43	13.0	12.6	10.1	8.57	7.53	6.44	9.50	9.12	7.22	6.12	5.35	4.52
O	12	13.3	12.6	9.91	9.74	8.46	7.06	17.8	17.2	13.8	13.6	12.0	10.3	13.0	12.5	9.88	9.75	8.52	7.20
O	21	21.4	20.4	14.3	11.7	10.1	8.46	28.8	27.8	19.8	16.4	14.4	12.3	21.0	20.2	14.3	11.7	10.2	8.62
O	30	30.8	32.3	23.0	17.5	15.2	12.7	41.4	44.0	32.0	24.5	21.5	18.4	30.2	31.9	22.9	17.5	15.3	12.9
O	35	35.7	37.4	26.7	19.0	16.5	13.8	47.9	51.0	37.0	26.6	23.4	20.0	35.0	37.0	26.6	19.0	16.6	14.0
O	45	45.9	48.1	34.3	21.9	19.0	15.9	61.6	65.6	47.6	30.7	26.9	23.1	45.0	47.5	34.2	21.9	19.1	16.2
V	38	38.7	39.4	33.6	33.2	30.5	24.1	52.0	53.7	46.6	46.6	43.2	35.1	38.0	38.9	33.5	33.3	30.7	24.6
V	50	52.0	52.9	45.1	47.4	43.5	34.4	69.8	72.1	62.6	66.5	61.7	50.0	51.0	52.2	44.9	47.5	43.8	35.1
V	70	71.4	72.6	62.7	66.4	60.9	48.1	95.8	99.0	87.0	93.1	86.4	70.0	70.0	71.7	62.4	66.5	61.3	49.1
VALVE TYPE	CARTRIDGE NO.	REPLACEABLE CARTRIDGE THERMOSTATIC EXPANSION VALVES																	
Q-EQ-SQ	0	1/6	0.20	0.22	0.20	0.20	0.17	0.14	0.27	0.30	0.28	0.28	0.24	0.21	0.20	0.21	0.20	0.20	0.17	0.15
Q-EQ-SQ	1	1/4	0.46	0.49	0.46	0.45	0.39	0.32	0.62	0.66	0.64	0.63	0.55	0.47	0.45	0.48	0.46	0.45	0.39	0.33
Q-EQ-SQ	2	1/2	0.66	0.72	0.67	0.59	0.51	0.42	0.89	0.98	0.94	0.83	0.72	0.61	0.65	0.71	0.67	0.59	0.51	0.43
Q-EQ-SQ	3	1	1.02	1.07	0.89	0.85	0.73	0.61	1.37	1.46	1.24	1.19	1.03	0.88	1.00	1.06	0.89	0.85	0.73	0.62
Q-EQ-SQ	4	1-1/2	1.63	1.71	1.44	1.47	1.26	1.05	2.19	2.33	1.99	2.06	1.79	1.53	1.60	1.69	1.43	1.47	1.27	1.07
Q-EQ-SQ	5	2	2.14	2.25	1.88	1.96	1.68	1.40	2.88	3.06	2.61	2.74	2.38	2.04	2.10	2.22	1.87	1.96	1.69	1.43
Q-EQ-SQ	6	3	2.86	3.00	2.51	2.45	2.11	1.75	3.83	4.08	3.48	3.43	2.98	2.54	2.80	2.96	2.50	2.45	2.12	1.78

REFRIGERANT	LIQUID TEMPERATURE ENTERING TEV (°F)														
	0°	10°	20°	30°	40°	50°	60°	70°	80°	90°	100°	110°	120°	130°	140°
	CORRECTION FACTOR, CF LIQUID TEMPERATURE														
404A	2.04	1.94	1.84	1.74	1.64	1.54	1.43	1.33	1.22	1.11	1.00	0.89	0.77	0.65	0.53
408A	1.66	1.60	1.54	1.47	1.40	1.34	1.27	1.21	1.14	1.07	1.00	0.93	0.86	0.79	0.71
502	1.86	1.78	1.69	1.61	1.52	1.44	1.35	1.26	1.18	1.09	1.00	0.91	0.82	0.73	0.64

These factors include corrections for liquid refrigerant density and net refrigerating effect and are based on an evaporator temperature of 0°F. However, they may be used for any evaporator temperature from -40°F to 40°F since the variation in the actual factors across this range is insignificant.

EVAPORATOR TEMPERATURE (°F)	PRESSURE DROP ACROSS TEV (PSI)										
	30	50	75	100	125	150	175	200	225	250	275
	CORRECTION FACTOR, CF PRESSURE DROP										
40°	0.55	0.71	0.87	1.00	1.12	1.22	1.32	1.41	1.50	1.58	1.66
20° & 0°	0.49	0.63	0.77	0.89	1.00	1.10	1.18	1.26	1.34	1.41	1.48
– 10° & – 20°	0.45	0.58	0.71	0.82	0.91	1.00	1.08	1.15	1.22	1.29	1.35
– 40°	0.41	0.53	0.65	0.76	0.85	0.93	1.00	1.07	1.13	1.20	1.25

TEV capacity = TEV rating x CF liquid temperature x CF pressure drop — Example: Actual capacity of a nominal 1-1/2 ton R-404A Type EG valve at -20°F evaporator, 125 psi pressure drop across the TEV, and 60°F liquid temperature entering the TEV = 1.26 (from rating chart) x 1.43 (CF liquid temperature) x 0.91 (CF pressure drop) = 1.64 tons.

THERMOSTATIC EXPANSION VALVE CAPACITIES for REFRIGERANTS
TONS OF REFRIGERATION

402A & 507

COMMERCIAL and LOW TEMPERATURE REFRIGERATION APPLICATIONS

VALVE TYPES	NOMINAL CAPACITY	REFRIGERANT											
		402A						507					
		RECOMMENDED THERMOSTATIC CHARGE											
		LC			LZ, LZP			PC			PZ, PZP		
		EVAPORATOR TEMPERATURE (°F)											
		40°	20°	0°	-10°	-20°	-40°	40°	20°	0°	-10°	-20°	-40°
NI-F-EF-G-EG	1/8	0.15	0.16	0.15	0.16	0.13	0.11	0.14	0.15	0.14	0.15	0.13	0.11
F-EF-G-EG	1/6	0.23	0.24	0.23	0.24	0.21	0.18	0.22	0.24	0.22	0.24	0.20	0.17
NI-F-EF-G-EG	1/4	0.29	0.31	0.29	0.31	0.27	0.23	0.29	0.30	0.29	0.30	0.26	0.22
NI-F-EF-G-EG	1/2	0.56	0.59	0.56	0.59	0.51	0.43	0.55	0.58	0.54	0.58	0.50	0.41
NI-F-EF-G-EG	1	1.02	1.10	1.04	1.11	0.95	0.80	1.00	1.08	1.01	1.08	0.93	0.77
F-EF-G-EG	1-1/2	1.52	1.61	1.39	1.48	1.27	1.07	1.50	1.57	1.36	1.44	1.24	1.03
F&EF(Ext)-G&EG(Ext)-C(Int)-S	2	2.03	2.14	1.84	1.97	1.70	1.42	2.00	2.09	1.79	1.92	1.65	1.38
C-S	3	2.85	3.00	2.52	2.47	2.12	1.78	2.79	2.93	2.45	2.40	2.06	1.72
C-S	4	4.07	4.28	3.60	3.45	2.97	2.49	3.99	4.19	3.50	3.36	2.89	2.41
C&S(Ext)	6	5.59	5.12	4.27	4.56	3.88	3.02	5.49	5.00	4.16	4.43	3.77	2.93
S(Ext)	7	7.12	6.51	5.44	5.81	4.95	3.85	6.99	6.36	5.30	5.65	4.80	3.73
H	1-1/2	1.52	1.46	1.39	1.48	1.26	1.01	1.50	1.43	1.36	1.44	1.22	0.98
H	3	2.85	2.72	2.32	2.46	2.10	1.68	2.79	2.66	2.26	2.40	2.04	1.63
H	4	4.07	3.89	3.15	3.45	2.94	2.36	3.99	3.81	3.07	3.36	2.86	2.28
H	6-1/2	6.61	6.33	5.12	5.36	4.57	3.66	6.49	6.18	4.98	5.22	4.44	3.54
H	9	9.66	9.25	7.48	6.16	5.25	4.20	9.48	9.04	7.28	5.99	5.09	4.07
H	12	13.2	12.7	10.2	9.86	8.40	6.73	13.0	12.4	10.0	9.59	8.16	6.52
M	15	16.1	17.1	13.1	13.9	12.5	10.2	15.8	16.7	12.7	13.5	12.1	9.83
M	20	20.9	22.3	16.4	17.4	15.7	12.7	20.6	21.8	16.0	16.9	15.2	12.3
M	25	26.1	27.8	20.5	20.4	18.4	14.9	25.6	27.2	20.0	19.9	17.9	14.5
M	30	31.5	33.5	24.7	23.6	21.3	17.3	30.9	32.8	24.1	23.0	20.7	16.7
BALANCED PORT THERMOSTATIC EXPANSION VALVES													
BF-EBF-SBF	AAA	0.23	0.24	0.23	0.24	0.21	0.18	0.23	0.24	0.22	0.24	0.21	0.17
BF-EBF-SBF	AA	0.46	0.49	0.46	0.45	0.39	0.33	0.45	0.48	0.45	0.44	0.38	0.32
BF-EBF-SBF	A	1.02	1.10	1.04	1.11	0.95	0.80	1.00	1.08	1.01	1.08	0.93	0.77
BF-EBF-SBF	B	1.88	1.98	1.66	1.61	1.39	1.16	1.85	1.94	1.62	1.57	1.35	1.12
BF-EBF-SBF	C	2.85	3.00	2.52	2.47	2.12	1.78	2.79	2.93	2.45	2.40	2.06	1.72
EBS	6	5.69	5.63	4.63	4.18	3.32	3.01	5.59	5.50	4.52	4.06	3.22	2.92
EBS	7-1/2	7.73	7.64	6.29	5.32	4.23	3.84	7.59	7.47	6.13	5.18	4.10	3.72
O	9	9.66	9.25	7.28	6.16	5.37	4.50	9.48	9.04	7.09	5.99	5.21	4.36
O	12	13.2	12.7	9.96	9.81	8.55	7.17	13.0	12.4	9.71	9.54	8.30	6.95
O	21	21.3	20.4	14.4	11.8	10.2	8.60	21.0	20.0	14.0	11.4	9.95	8.32
O	30	30.7	32.3	23.1	17.6	15.3	12.9	30.1	31.6	22.5	17.1	14.9	12.5
O	35	35.6	37.5	26.8	19.1	16.7	14.0	34.9	36.6	26.1	18.6	16.2	13.5
O	45	45.7	48.2	34.5	22.0	19.2	16.1	44.9	47.1	33.6	21.4	18.6	15.6
V	38	38.6	39.5	33.8	33.5	30.8	24.5	37.9	38.6	32.9	32.6	29.9	23.7
V	50	51.8	52.9	45.3	47.8	44.0	34.9	50.9	51.8	44.2	46.5	42.7	33.8
V	70	71.2	72.7	63.0	66.9	61.5	48.9	69.9	71.0	61.4	65.1	59.8	47.4
VALVE TYPE	CARTRIDGE NO.	REPLACEABLE CARTRIDGE THERMOSTATIC EXPANSION VALVES											
Q-SQ-EQ	0	1/6	0.20	0.22	0.20	0.20	0.17	0.15	0.20	0.21	0.20	0.20	0.17	0.14
Q-SQ-EQ	1	1/4	0.46	0.49	0.46	0.45	0.39	0.33	0.45	0.48	0.45	0.44	0.38	0.32
Q-SQ-EQ	2	1/2	0.66	0.72	0.67	0.59	0.51	0.43	0.65	0.70	0.66	0.58	0.50	0.42
Q-SQ-EQ	3	1	1.02	1.07	0.89	0.86	0.74	0.62	1.00	1.05	0.88	0.83	0.72	0.60
Q-SQ-EQ	4	1-1/2	1.63	1.71	1.44	1.48	1.27	1.07	1.60	1.67	1.41	1.44	1.24	1.03
Q-SQ-EQ	5	2	2.13	2.25	1.88	1.97	1.70	1.43	2.10	2.20	1.84	1.92	1.65	1.38
Q-SQ-EQ	6	3	2.85	3.00	2.51	2.47	2.13	1.77	2.79	2.93	2.46	2.40	2.07	1.72

REFRIGERANT	LIQUID TEMPERATURE ENTERING TEV (°F)														
	0°	10°	20°	30°	40°	50°	60°	70°	80°	90°	100°	110°	120°	130°	140°
	CORRECTION FACTOR, CF LIQUID TEMPERATURE														
402A	2.01	1.91	1.82	1.72	1.62	1.52	1.42	1.32	1.22	1.11	1.00	0.89	0.77	0.65	0.53
507	1.99	1.89	1.79	1.69	1.59	1.50	1.40	1.30	1.20	1.10	1.00	0.89	0.78	0.66	0.51

These factors include corrections for liquid refrigerant density and net refrigerating effect and are based on an evaporator temperature of 0°F. However, they may be used for any evaporator temperature from -40°F to 40°F since the variation in the actual factors across this range is insignificant.

EVAPORATOR TEMPERATURE (°F)	PRESSURE DROP ACROSS TEV (PSI)											
	30	50	75	100	125	150	175	200	225	250	275	300
	CORRECTION FACTOR, CF PRESSURE DROP											
40°	0.55	0.71	0.87	1.00	1.12	1.22	1.32	1.41	1.50	1.58	1.66	1.73
20° & 0°	0.49	0.63	0.77	0.89	1.00	1.10	1.18	1.26	1.34	1.41	1.48	1.55
– 10° & – 20°	0.45	0.58	0.71	0.82	0.91	1.00	1.08	1.15	1.22	1.29	1.35	1.41
– 40°	0.41	0.53	0.65	0.76	0.85	0.93	1.00	1.07	1.13	1.20	1.25	1.31

TEV capacity = TEV rating x CF liquid temperature x CF pressure drop — Example: Actual capacity of a nominal 1-1/2 ton R-402A Type EG valve at -20°F evaporator, 125 psi pressure drop across the TEV, and 60°F liquid temperature entering the TEV = 1.27 (from rating chart) x 1.42 (CF liquid temperature) x 0.91 (CF pressure drop) = 1.64 tons.

THERMOSTATIC EXPANSION VALVE CAPACITIES for REFRIGERANTS
TONS OF REFRIGERATION

717 (Ammonia)

COMMERCIAL REFRIGERATION APPLICATIONS

VALVE TYPE	NOMINAL CAPACITY	REFRIGERANT 717 RECOMMENDED THERMOSTATIC CHARGE AC, AL			AZ, AL	AZ
		EVAPORATOR TEMPERATURE (°F) 40°	20°	5°	-10°	-20°
D	1	1.21	1.12	1.00	0.66	0.60
	2	2.41	2.24	2.00	1.14	1.03
	5	6.03	5.61	5.00	2.68	2.42
	10	12.1	11.2	10.0	5.66	5.11
	15	18.1	16.8	15.0	7.85	7.08

VALVE TYPE	NOMINAL CAPACITY	REFRIGERANT 717 RECOMMENDED THERMOSTATIC CHARGE AL			
		EVAPORATOR TEMPERATURE (°F) 40°	20°	5°	-10°
A	20	21.6	20.6	20.0	17.2
	30	32.3	30.8	30.0	25.8
	50	53.9	51.4	50.0	43.1
	75	80.8	77.1	75.0	64.6
	100	108	103	100	86.1

REFRIGERANT	LIQUID TEMPERATURE ENTERING TEV (°F) 0°	10°	20°	30°	40°	50°	60°	70°	80°	86°	90°	100°
	CORRECTION FACTOR, CF LIQUID TEMPERATURE											
717	1.27	1.24	1.20	1.17	1.14	1.11	1.08	1.05	1.02	1.00	0.99	0.96

These factors include corrections for liquid refrigerant density and net refrigerating effect and are based on an average evaporator temperature of 0°F. However, they may be used for any evaporator temperature from -20°F to 40°F since the variation in the actual factors across this range is insignificant.

EVAPORATOR TEMPERATURE (°F)	PRESSURE DROP ACROSS TEV (PSI) 40	60	80	100	120	140	160	180	200
	CORRECTION FACTOR, CF PRESSURE DROP								
40°	0.63	0.77	0.89	1.00	1.10	1.18	1.26	1.34	1.41
20°	0.58	0.71	0.82	0.91	1.00	1.08	1.15	1.22	1.29
5° & – 10°	0.53	0.65	0.76	0.85	0.93	1.00	1.07	1.13	1.20
– 20°	0.50	0.61	0.71	0.79	0.87	0.94	1.00	1.06	1.12

TEV capacity = TEV rating x CF liquid temperature x CF pressure drop — Example: Actual capacity of a nominal 2 ton R-717 Type D valve at 5°F evaporator, 100 psi pressure drop across the TEV, and 70°F liquid temperature entering the TEV = 2.00 (from rating chart) x 1.05 (CF liquid temperature) x 0.85 (CF pressure drop) = 1.79 tons.

TEV Quick Reference Guide

VALVE TYPE	NOMINAL CAPACITY RANGE (tons) R-22	R-134a	R-404A & R-507	CONNECTION TYPES	VALVE DESCRIPTION AND APPLICATION
NI  Specs on Page 12	1/4 thru 1	1/8 thru 1	1/8 thru 1	SAE Flare	Small brass body, angle style valve which is adjustable through its outlet fitting. Inlet connection has a removable 100 mesh strainer. Suitable for small capacity refrigeration applications in which an external adjustment is not required. Typical application: Drink dispensers, ice cubers.
RI  Specs on Page 13	2 thru 5	–	–	SAE Flare or ODF Solder	Small brass body, externally adjustable valve available only for R-22 air conditioning or heat pump applications. This valve is available with the Rapid Pressure Balancer (RPB) feature for off-cycle pressure equalization if desired. Suitable for replacing OEM type TEVs used on these applications.
F  Specs on Page 14 & 15	1/5 thru 3	1/8 thru 2	1/8 thru 2	SAE Flare	Small brass bar body, externally adjustable valve for small capacity refrigeration systems. SAE flare inlet connection has a removable 100 mesh strainer. Typical applications: Refrigerated cases, coolers, freezers.
EF  Specs on Page 14 & 15	1/5 thru 3	1/8 thru 2	1/8 thru 2	ODF Solder	Same as the Type F valve except it features ODF solder connections. The inlet connection has a 100 mesh insert type strainer. Typical applications: Refrigerated cases, coolers, freezers.

FOR OEM TYPE VALVES, REFER TO PAGE 37.

TEV Quick Reference Guide

VALVE TYPE	NOMINAL CAPACITY RANGE (tons)			CONNECTION TYPES	VALVE DESCRIPTION AND APPLICATION
	R-22	R-134a	R-404A & R-507		
Q  **Specs on Page 16-19**	1/3 thru 5	1/6 thru 2-1/2	1/6 thru 3	SAE Flare	The brass body Q valve is externally adjustable. The valve body has a removable cartridge or orifice. The valve body, cartridge and thermostatic element can be supplied as independent components. This allows body, cartridge and element to be assembled and matched to specific system requirements. Inlet connection has a 100 mesh removable strainer screen. Typical applications: Refrigeration applications and external equalized versions may be used on air conditioning.
EQ  **Specs on Page 16-19**	1/3 thru 5	1/6 thru 2-1/2	1/6 thru 3	Extended ODF Solder	Same as the Type Q valve except it features extended ODF connections. A 100 mesh insert strainer is provided with the valve.
SQ  **Specs on Page 16-19**	1/3 thru 5	1/6 thru 2-1/2	1/6 thru 3	Extended ODF Solder	Same as the Type Q valve except it features ODF solder connections and a forged brass inlet fitting with a removable 100 mesh strainer screen which can be cleaned and/or replaced without removing the valve from the line.
G  **Specs on Page 20**	1/5 thru 3	1/8 thru 2	1/8 thru 2	SAE Flare	Forged brass body, externally adjustable valve for small capacity refrigeration systems. Inlet connection has a removable 100 mesh strainer. Typical applications: Refrigerated cases, coolers, freezers, small capacity air conditioners.
EG  **Specs on Page 21**	1/5 thru 3	1/8 thru 2	1/8 thru 2	ODF Solder	Same as the Type G valve except it features ODF solder connections and a forged brass inlet fitting with a removable 100 mesh strainer which can be cleaned and/or replaced without removing the valve from the line.
C  **Specs on Page 22**	3 thru 8	2 thru 5	2 thru 6	SAE Flare	Forged brass body, externally adjustable valve. Inlet connection has a removable 80 mesh strainer. This valve is a larger capacity version of the Type G valve. Typical applications: Refrigerated cases, coolers, freezers, air conditioners.
BF  **Specs on Page 23**	AAA thru C	AAA thru C	AAA thru C	SAE Flare	Same physical size as the Type F valve with SAE flare connections except it features a balanced port construction. Inlet connection has a removable 100 mesh strainer. Typical applications: Small capacity refrigeration that operates over widely varying operating conditions.
SBF  **Specs on Page 24 & 25**	AAA thru C	AAA thru C	AAA thru C	Extended ODF Solder	Same as the Type BF valve except it features ODF solder connections and a forged brass inlet fitting with a removable 100 mesh strainer which can be cleaned and/or replaced without removing the valve from the line.
EBF  **Specs on Page 24 & 25**	AAA thru C	AAA thru C	AAA thru C	Extended ODF Solder	Same as the Type BF valve except it features extended ODF connections. A 100 mesh insert strainer is provided with the valve.

FOR OEM TYPE VALVES, REFER TO PAGE 37.

TEV Quick Reference Guide

VALVE TYPE	NOMINAL CAPACITY RANGE (tons)			CONNECTION TYPES	VALVE DESCRIPTION AND APPLICATION
	R-22	R-134a	R-404A & R-507		
S  **Specs on Page 26**	2 thru 10	2 thru 6	2 thru 7	ODF Solder	Brass bar body, externally adjustable valve. Inlet has a permanent 12 mesh strainer. General purpose valve for air conditioning and refrigeration applications.
EBS  **Specs on Page 27**	8 & 11	5 & 7	6 & 7-1/2	Extended ODF Solder	Same physical size as the Type S valve except it features extended ODF connections and a balanced port construction.
O  **Specs on Page 28 & 29**	15 thru 70	9 thru 40	9 thru 45	ODF Solder	Brass bar body, externally adjustable valve. Inlet has a permanent 12 mesh strainer. This valve features a balanced port construction, and it is suitable for both air conditioning and refrigeration applications.
H  **Specs on Page 30**	2-1/2 thru 20	1-1/2 thru 12	1-1/2 thru 12	ODF Solder or FPT Flange	Brass bar body, externally adjustable valve with flange connections. Inlet flange bushing has a permanent 16 mesh strainer. The FPT flange connection requires the K-1178 adapter kit. This valve provides the smallest capacity TEVs with flange connections and it is suitable for both air conditioning and refrigeration applications.
M  **Specs on Page 31**	21 thru 42	15 thru 25	15 thru 30	ODF Solder or FPT Flange	Cast bronze body, externally adjustable valve with flange connections. Inlet has a 12 mesh strainer. This valve type provides valve capacities greater than the Type H and it is suitable for air conditioning and refrigeration applications. Flanges for the Type M valve are interchangeable with the Type V valve.
V  **Specs on Page 32**	52 thru 100	35 thru 55	38 thru 70	ODF Solder or FPT Flange	Cast bronze body, externally adjustable valve with flange connections. Inlet has a 12 mesh strainer. This valve type features a dual port semi-balanced design. This valve type provides valve capacities greater than the Type M, and is suitable for air conditioning and refrigeration applications. Flanges for the Type V are interchangeable with the Type M.
W  **Specs on Page 33**	135 & 180	80 & 110	–	ODF Solder Flange	Cast bronze body, externally adjustable valve with flange connections. Inlet has a 12 mesh strainer. This valve type features a dual port semi-balanced design and it is primarily for large capacity chillers. This valve type provides the largest valve capacities available for flange connection TEVs.
D  **Specs on Page 34**	R-717 1 thru 15			FPT or Socket Weld Flange	Gray cast iron body, externally adjustable valve for small capacity ammonia service. Optional XD-074 100 mesh external strainer may be ordered with this valve.
A  **Specs on Page 35**	R-717 20 thru 100			FPT or Socket Weld Flange	Gray cast iron body, externally adjustable valve for large capacity ammonia service. Optional 8004 (1/2 FPT) or 8006 (3/4 FPT) 80 mesh external strainer may be ordered with this valve.

FOR OEM TYPE VALVES, REFER TO PAGE 37.

TYPE NI

for Refrigerants 22-134a-404A-507 — SAE Flare Connections

Sporlan Type NI valve is a small brass bar body, angle style (bottom outlet) valve with SAE flare connections. The thermostatic element is replaceable, and the inlet connection has a removable 100 mesh strainer. An internal adjustment is provided in the outlet fitting, and adjustments can be made with a 7/32" hex wrench when the outlet is not connected. This valve is designed for small refrigeration systems such as drink dispensers and ice cubers where space is limited and an external superheat adjustment is not necessary.

for complete details of construction, see page 36

SPECIFICATIONS — **ELEMENT SIZE NO. 43, KNIFE EDGE JOINT**

REFRIGERANT (Sporlan Code)	TYPE Internal Equalizer Only	NOMINAL CAPACITY Tons of Refrigeration	Thermostatic Charges Available	Standard Tubing Length-Inches	CONNECTIONS – Inches SAE Flare. Blue figures are standard and will be furnished unless otherwise specified. INLET	CONNECTIONS – Inches SAE Flare. Blue figures are standard and will be furnished unless otherwise specified. OUTLET	Net Weight-Lbs.	Shipping Weight-Lbs.
22 (V) 407C (N) 407A (V)	NIV-1/4	1/4	C Z ZP40	30	1/4 or 3/8 ①	3/8 or 1/2 ②	1	1-1/2
	NIV-1/2	1/2						
	NIV-1	1						
134a (J) 12 (F) 401A (X) 409A (F)	NIJ-1/8	1/8	C		1/4 or 3/8 ①			
	NIJ-1/4	1/4						
	NIJ-1/2	1/2						
	NIJ-1	1			1/4 or 3/8 ①			
404A (S) 502 (R) 408A (R)	NIS-1/8	1/8	C Z ZP		1/4 or 3/8 ①			
	NIS-1/4	1/4						
	NIS-1/2	1/2						
	NIS-1	1			1/4 or 3/8 ①			
507 (P) 402A (L)	NIP-1/8	1/8	C Z ZP		1/4 or 3/8 ①			
	NIP-1/4	1/4						
	NIP-1/2	1/2						
	NIP-1	1			1/4 or 3/8 ①			

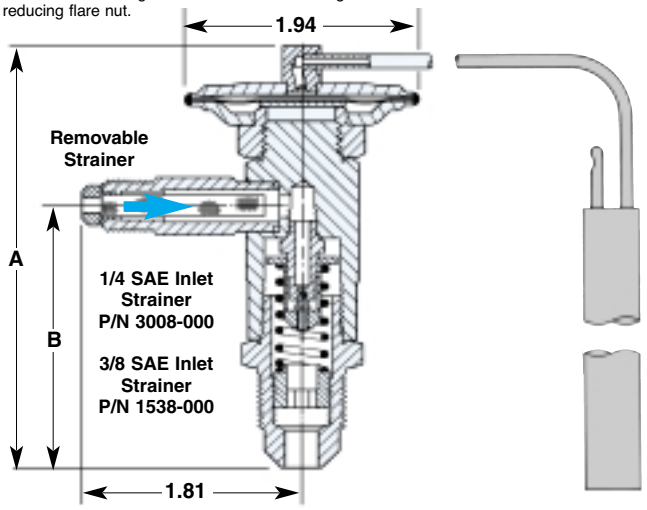
① The 3/8" SAE inlet fitting has a long taper on the flare surface. A 3/8" x 1/4" reducing flare nut will allow 1/4" OD tubing to be attached to this fitting.
② The 1/2" SAE outlet fitting has a long taper. 3/8" OD tubing can be connected by using 1/2" x 3/8" reducing flare nut.

DIMENSIONS – Inches Connections - SAE Flare

OUTLET FITTING SIZE	A	B
3/8	4.07	2.72
1/2	3.63	2.29

BULB SIZES – Inches

STANDARD CHARGES	REFRIGERANT 22	134a	404	507
C	0.50 OD x 3.00			
Z & ZP Series	0.50 OD x 3.00	–	0.50 OD x 3.00	



NOTE: The cross-sectional views on the following valve specification pages illustrate the internal construction differently depending on whether one or two pushrod construction is used. Types NI, RIVE, F, EF, Q, EQ, SQ, G, EG, C, S, H, M, D, and A utilize two pushrods to operate the valve. The pushrods are not shown to avoid confusing details in the cross-sectional view.

The element diaphragm assembly deflects in response to temperature changes at the sensing bulb. This moves the pin carrier which opens the valve port. The pushrods transmit the diaphragm motion to the pin carrier. Valve types BF, EBF, SBF, EBS, O, V, and W utilize only one pushrod. The pushrods are shown in the proper position.

for Refrigerant 22 — SAE Flare & ODF Solder Connections

TYPE RIVE

for complete details of construction, see page 36

Sporlan Type RI valve is a small brass bar body, externally adjustable valve available with either SAE flare or ODF solder connections. This valve has a replaceable thermostatic element, and it is designed for small R-22 air conditioning and heat pump units where space is limited. This valve is also ideal for replacement of OEM type Sporlan TEVs such as the Type I and BI when used on the above applications.

This valve is available with the Rapid Pressure Balancer (RPB) feature for off-cycle pressure equalization if desired. Refer to Sporlan Bulletin 10-9 for additional information on this subject.

Refrigerant distributors that will mate directly to this valve are listed below. Refer to Sporlan Bulletin 20-10 for additional application information on this subject.

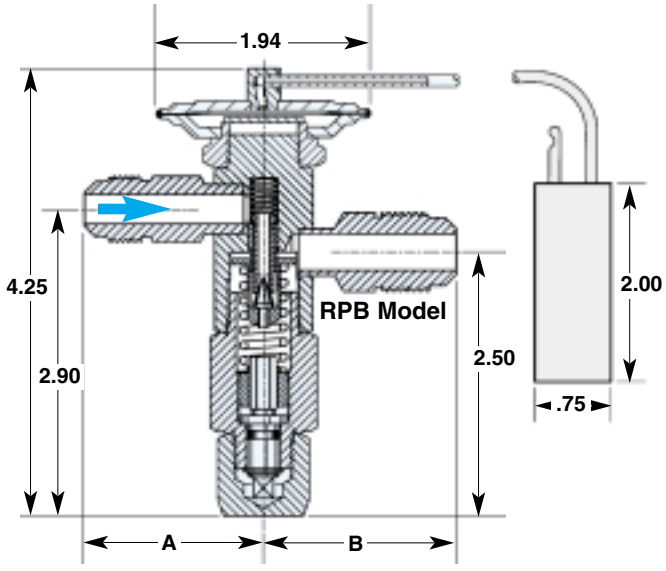
Outlet Connections	*Distributors*
1/2" SAE	1603, 1605, 1606, 1608, 1650(R)
1/2" ODF	1613, 1616
5/8" ODF	1620, 1622, 1651(R)

SPECIFICATIONS — ELEMENT SIZE NO. 43, KNIFE EDGE JOINT

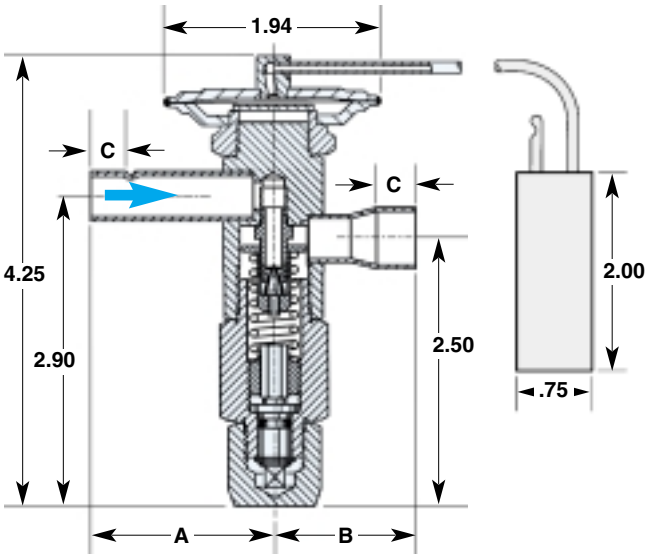
REFRIGERANT (Sporlan Code)	TYPE External Equalizer Only	④ NOMINAL CAPACITY Tons of Refrigeration	Thermostatic Charges Available	Standard Tubing Length-Inches	CONNECTIONS – Inches Blue figures are standard and will be furnished unless otherwise specified.				Net Weight-Lbs.	Shipping Weight-Lbs.
					SAE Flare		③ ODF Solder			
					INLET	OUTLET	INLET	OUTLET		
22 (V) 407C (N) 407A (V)	RIVE-2	2	GA only	30	3/8	1/2	3/8	1/2	1	1-1/2
	RIVE-3	3								
	RIVE-4	4			1/2	1/2	1/2	1/2, 5/8		
	RIVE-5	5								

③ ODF Solder indicates a female connection on the valve of proper diameter to receive copper tubing of corresponding OD size. Thus 1/2" ODF will receive 1/2" OD tubing.
④ The Nominal Capacity of the valve is increased by 15% when the Rapid Pressure Balancer (RPB) feature is used. A cross drilling is part of the internal construction of the RPB feature and this drilling provides the additional refrigerant flow.

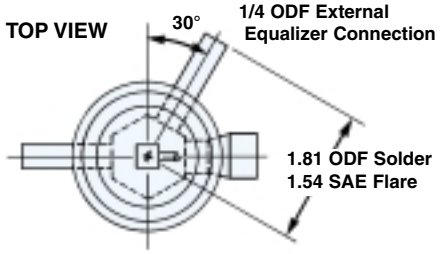
SAE Flare



ODF Solder



DIMENSIONS – Inches			
FITTING SIZE	A	B	C
3/8 SAE	1.69	–	–
1/2 SAE	1.66	1.80	–
3/8 ODF	1.69	–	.37
1/2 ODF	1.75	1.33	.44
5/8 ODF	–	1.41	.50



TYPE F & EF

for Refrigerants 22-134a-404A-507 — SAE Flare & ODF Solder Connections

Sporlan Type F with SAE flare connections or Type EF with ODF solder connections are small brass bar body valves with identical internal construction and replaceable thermostatic elements. The Type F valve has a removable 100 mesh strainer as a standard feature. The Type EF has a 60x50 mesh insert strainer. These valves are designed for small refrigeration systems such as refrigerated cases, coolers, and freezers where space is limited and an external adjustment is desired.

Refrigerant distributors that will mate directly to this valve are listed below. Refer to Sporlan Bulletin 20-10 for additional application information on this subject.

Outlet Connections
1/2" SAE
1/2" ODF

Distributors
1603, 1605, 1606, 1608, 1650(R)
1613, 1616

F

EF

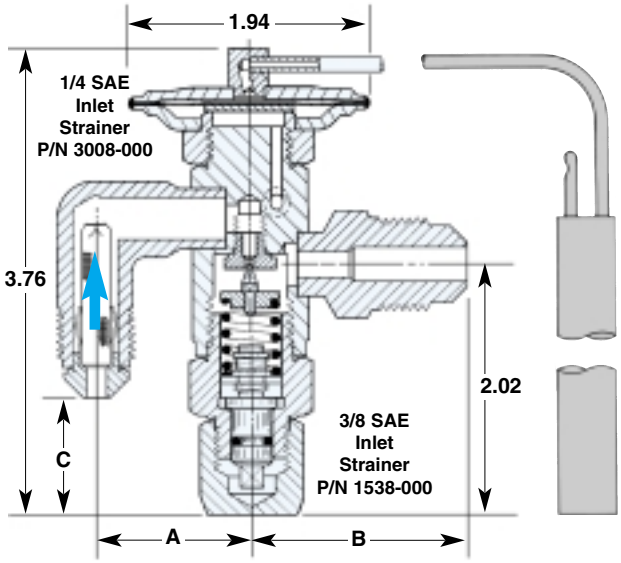
for complete details of construction, see page 36

SPECIFICATIONS — ELEMENT SIZE NO. 43, KNIFE EDGE JOINT

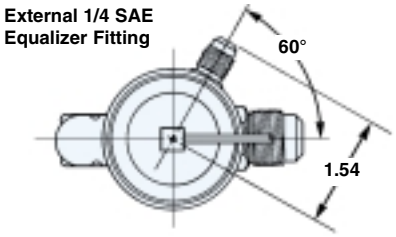
REFRIGERANT (Sporlan Code)	TYPE F SAE Flare		TYPE EF ODF Solder		NOMINAL CAPACITY Tons of Refrigeration	Thermostatic Charges Available	Standard Tubing Length-Inches	CONNECTIONS – Inches SAE Flare / ③ ODF Solder. Blue figures are standard and will be furnished unless otherwise specified.		Net Weight-Lbs.	Shipping Weight-Lbs.
	Internal Equalizer	External Equalizer	Internal Equalizer	External Equalizer				INLET	OUTLET		
22 (V) 407C (N) 407A (V)	FV-1/5	FVE-1/5	EFV-1/5	EFVE-1/5	1/5	C Z ZP40	30	1/4 or 3/8 ①	3/8 or 1/2	1	1-1/2
	FV-1/3	FVE-1/3	EFV-1/3	EFVE-1/3	1/3						
	FV-1/2	FVE-1/2	EFV-1/2	EFVE-1/2	1/2						
	FV-1	FVE-1	EFV-1	EFVE-1	1						
	FV-1-1/2	FVE-1-1/2	EFV-1-1/2	EFVE-1-1/2	1-1/2			3/8 ⑮	1/2		
	–	FVE-2	–	EFVE-2	2						
	FV-2-1/2	–	EFV-2-1/2	–	2-1/2						
	–	FVE-3	–	EFVE-3	3						
134a (J) 12 (F) 401A (X) 409A (F)	FJ-1/8	FJE-1/8	EFJ-1/8	EFJE-1/8	1/8	C		1/4 or 3/8 ①	3/8 or 1/2		
	FJ-1/6	FJE-1/6	EFJ-1/6	EFJE-1/6	1/6						
	FJ-1/4	FJE-1/4	EFJ-1/4	EFJE-1/4	1/4						
	FJ-1/2	FJE-1/2	EFJ-1/2	EFJE-1/2	1/2						
	FJ-1	FJE-1	EFJ-1	EFJE-1	1			3/8 ⑮	1/2		
	FJ-1-1/2	FJE-1-1/2	EFJ-1-1/2	EFJE-1-1/2	1-1/2						
	–	FJE-2	–	EFJE-2	2						
404A (S) 502 (R) 408A (R)	FS-1/8	FSE-1/8	EFS-1/8	EFSE-1/8	1/8	C Z ZP		1/4 or 3/8 ①	3/8 or 1/2		
	FS-1/6	FSE-1/6	EFS-1/6	EFSE-1/6	1/6						
	FS-1/4	FSE-1/4	EFS-1/4	EFSE-1/4	1/4						
	FS-1/2	FSE-1/2	EFS-1/2	EFSE-1/2	1/2						
	FS-1	FSE-1	EFS-1	EFSE-1	1			3/8 ⑮	1/2		
	FS-1-1/2	FSE-1-1/2	EFS-1-1/2	EFSE-1-1/2	1-1/2						
	–	FSE-2	–	EFSE-2	2						
507 (P) 402A (L)	FP-1/8	FPE-1/8	EFP-1/8	EFPE-1/8	1/8	C Z ZP		1/4 or 3/8 ①	3/8 or 1/2		
	FP-1/6	FPE-1/6	EFP-1/6	EFPE-1/6	1/6						
	FP-1/4	FPE-1/4	EFP-1/4	EFPE-1/4	1/4						
	FP-1/2	FPE-1/2	EFP-1/2	EFPE-1/2	1/2						
	FP-1	FPE-1	EFP-1	EFPE-1	1			3/8 ⑮	1/2		
	FP-1-1/2	FPE-1-1/2	EFP-1-1/2	EFPE-1-1/2	1-1/2						
	–	FPE-2	–	EFPE-2	2						

① The 3/8" SAE inlet fitting has a long taper on the flare surface. A 3/8" x 1/4" reducing flare nut will allow 1/4" OD tubing to be attached to this fitting.
③ ODF Solder on Type EF valves indicates a female connection on the valve of proper diameter to receive copper tubing of corresponding OD size. Thus 1/2" ODF will receive 1/2" OD tubing.
⑮ Nominal 1 ton and larger F valves for R-134a, R-404A and R-507 type refrigerants, and nominal 1-1/2 ton and larger for R-22 refrigerant require 3/8" SAE Flare or 3/8" ODF inlet, minimum.

SAE Flare



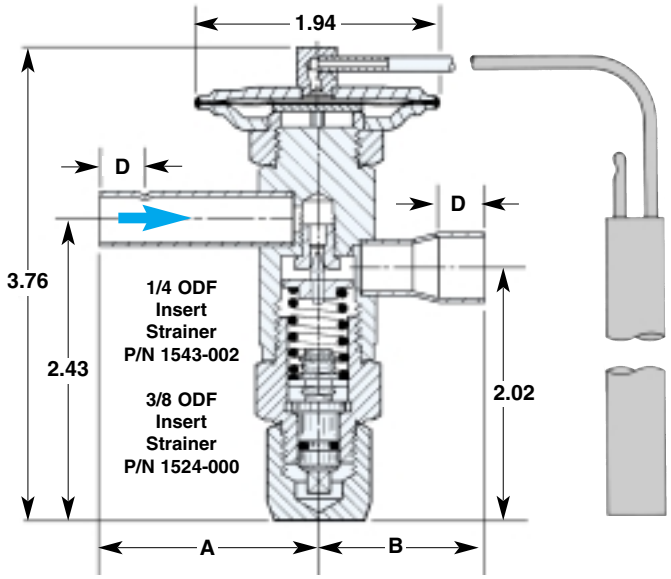
TOP VIEW



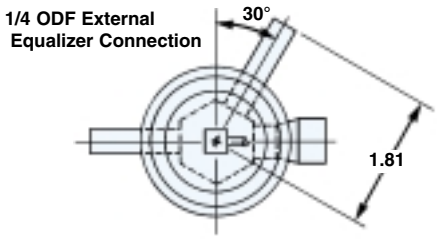
BULB SIZES – Inches				
STANDARD CHARGES	22	134a	404	507
C	0.50 OD x 3.00			
Z & ZP Series	0.50 OD x 3.00	–	0.50 OD x 3.00	

DIMENSIONS – Inches SAE			
FITTING SIZE	A	B	C
1/4 Elbow	1.05	–	1.34
3/8 Elbow	1.27	–	.98
3/8 SAE	–	1.61	–
1/2 SAE	–	1.80	–

ODF Solder



TOP VIEW



BULB SIZES – Inches				
STANDARD CHARGES	22	134a	404	507
C	0.50 OD x 3.00			
Z & ZP Series	0.50 OD x 3.00	–	0.50 OD x 3.00	

DIMENSIONS – Inches ODF			
FITTING SIZE	A	B	D
1/4 ODF	1.69	–	.31
3/8 ODF	1.69	1.33	.31
1/2 ODF	–	1.33	.38

TYPE Q EQ SQ

for Refrigerants 22-134a-404A-507 — SAE Flare & Extended ODF Solder Connections

for complete details of construction, see page 36

The brass body type Q, EQ, and SQ are replaceable cartridge style valves, whereby a cartridge can be selected to match the system capacity and installed in the valve body. All share identical internal construction with external adjustments. The identification of the three valve body styles available is now unique. The Q body is supplied with the traditional SAE flare connections. The EQ body is supplied with extended ODF solder connections and the "877" series strainer. The SQ body features ODF solder connections with the forged inlet and replaceable strainer. These valves are all designed for small refrigeration systems, such as refrigerated cases, coolers, and freezers. The externally equalized version of these valves may be used on air conditioning and heat pump systems, the EQ body is specifically targeted for this application. This is the first cartridge type valve to be designed and marketed by Sporlan Valve Company, and it can be supplied as a complete valve or as three component parts: the thermostatic element, the valve body, and the replaceable cartridge or orifice. The thermostatic element to valve body joint is the Sporlan traditional knife edge, metal-to-metal, joint which insures leak-proof construction.

SELECTIVE THERMOSTATIC CHARGES — Since the valve body and thermostatic elements can be supplied as independent components, the installer can select the best possible thermostatic charge for the application. Sporlan selective thermostatic charges are specifically designed for low temperature, medium temperature and air conditioning applications. The element is manufactured with a large flat diaphragm to yield maximum power for best control performance.

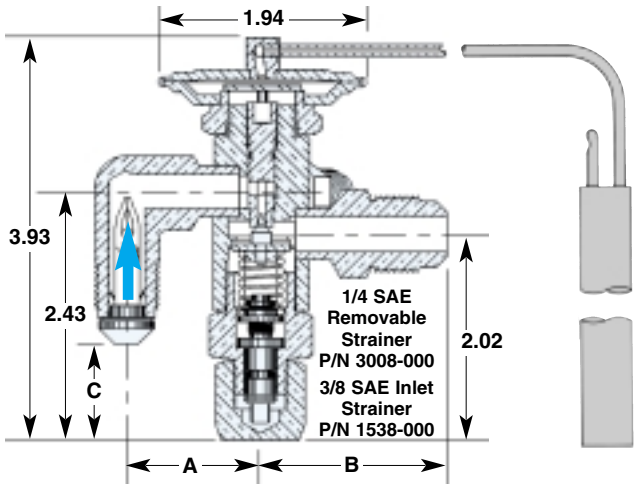
INTERNAL PORT DESIGN — The flow of refrigerant through the valve port opposes the pin movement in all type Q, EQ and SQ valves. This design concept improves valve control stability when light loads occur and the pin modulates to a position close to the port. This design also reduces or eliminates the risk of charge migration in the thermostatic element which is inherent with other cartridge style valves. By design, the Sporlan thermostatic element is warmed by the entering liquid which flows through the top of the valve body.

SPECIFICATIONS — ELEMENT SIZE NO. 43, KNIFE EDGE JOINT

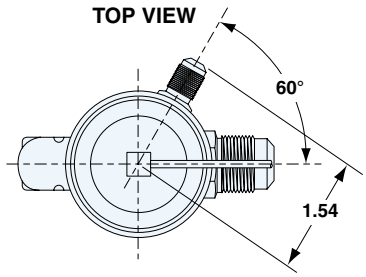
REFRIGERANT (Sporlan Code)	BODY TYPE-CARTRIDGE						CARTRIDGE	NOMINAL CAPACITY-Tons	Thermostatic Charges Available	Standard Tubing Length-Feet	CONNECTIONS Inches **BOLD** figures are standard and will be funished unless otherwise specified	Net Weight-Lbs.	Shipping Weight-Lbs.
	SAE Flare		Extended ODF Solder										
	Internal Equalizer ⑥	External Equalizer ⑯	Internal Equalizer ⑥	External Equalizer ⑯	Internal Equalizer ⑥	External Equalizer ⑯					Inlet x Outlet		
22 (V) 407C (N) 407A (V)	Q-0	QE-0	EQ-0	EQE-0	SQ-0	SQE-0	0	1/3	Refer to Recommended Thermostatic Elements on Page 18	5	*Q & QE Only* 1/4 x 3/8 SAE 90° Angle Inlet or 1/4 x 1/2 SAE 90° Angle Inlet or **3/8 x 1/2 SAE 90° Angle Inlet** *EQ Only* **3/8 x 1/2 ODF Straight Thru** *EQE Only* **3/8 x 1/2 ODF Straight Thru** or 3/8 x 5/8 ODF Straight Thru or 1/2 x 5/8 ODF Straight Thru or 1/2 x 7/8 ODF Straight Thru *SQ & SQE Only* **3/8 x 1/2 ODF 90° Angle Inlet**	1	1-1/2
	Q-1	QE-1	EQ-1	EQE-1	SQ-1	SQE-1	1	3/4					
	Q-2	QE-2	EQ-2	EQE-2	SQ-2	SQE-2	2	1					
	Q-3	QE-3	EQ-3	EQE-3	SQ-3	SQE-3	3	1-1/2					
	Q-4	QE-4	EQ-4	EQE-4	SQ-4	SQE-4	4	2-1/2					
	Q-5	QE-5	EQ-5	EQE-5	SQ-5	SQE-5	5	3-1/2					
	Q-6	QE-6	EQ-6	EQE-6	SQ-6	SQE-6	6	5					
134a (J) 12 (F) 401A (X) 409A (F)	Q-0	QE-0	EQ-0	EQE-0	SQ-0	SQE-0	0	1/6					
	Q-1	QE-1	EQ-1	EQE-1	SQ-1	SQE-1	1	1/4					
	Q-2	QE-2	EQ-2	EQE-2	SQ-2	SQE-2	2	1/2					
	Q-3	QE-3	EQ-3	EQE-3	SQ-3	SQE-3	3	1					
	Q-4	QE-4	EQ-4	EQE-4	SQ-4	SQE-4	4	1-1/2					
	Q-5	QE-5	EQ-5	EQE-5	SQ-5	SQE-5	5	2					
	Q-6	QE-6	EQ-6	EQE-6	SQ-6	SQE-6	6	2-1/2					
404A (S) 502 (R) 408A (R)	Q-0	QE-0	EQ-0	EQE-0	SQ-0	SQE-0	0	1/6					
	Q-1	QE-1	EQ-1	EQE-1	SQ-1	SQE-1	1	1/4					
	Q-2	QE-2	EQ-2	EQE-2	SQ-2	SQE-2	2	1/2					
	Q-3	QE-3	EQ-3	EQE-3	SQ-3	SQE-3	3	1					
	Q-4	QE-4	EQ-4	EQE-4	SQ-4	SQE-4	4	1-1/2					
	Q-5	QE-5	EQ-5	EQE-5	SQ-5	SQE-5	5	2					
	Q-6	QE-6	EQ-6	EQE-6	SQ-6	SQE-6	6	3					
507 (P) 402A (L)	Q-0	QE-0	EQ-0	EQE-0	SQ-0	SQE-0	0	1/6					
	Q-1	QE-1	EQ-1	EQE-1	SQ-1	SQE-1	1	1/4					
	Q-2	QE-2	EQ-2	EQE-2	SQ-2	SQE-2	2	1/2					
	Q-3	QE-3	EQ-3	EQE-3	SQ-3	SQE-3	3	1					
	Q-4	QE-4	EQ-4	EQE-4	SQ-4	SQE-4	4	1-1/2					
	Q-5	QE-5	EQ-5	EQE-5	SQ-5	SQE-5	5	2					
	Q-6	QE-6	EQ-6	EQE-6	SQ-6	SQE-6	6	3					

⑥ Valves listed in this column NOT AVAILABLE with MOP Type air conditioning charges.
⑯ Standard External Equalizer 1/4" SAE (Q Body), 1/4" ODF (SQ and EQ Body).

TYPE QE

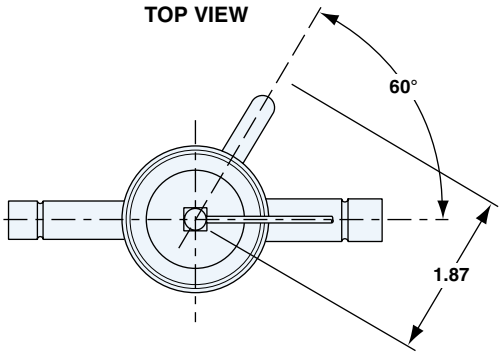


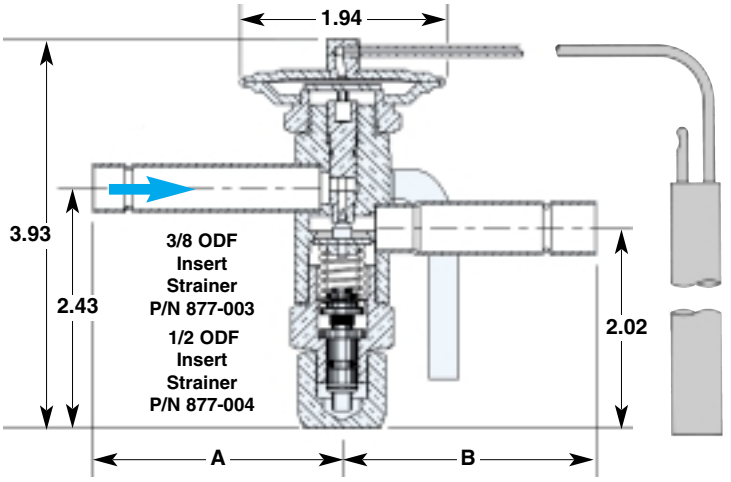
QE DIMENSIONS – Inches			
FITTING SIZE	A	B	C
1/4 SAE, 90° Angle	1.19	–	1.34
3/8 SAE, 90° Angle	1.35	–	0.98
3/8 SAE	–	1.61	–
1/2 SAE	–	1.80	–



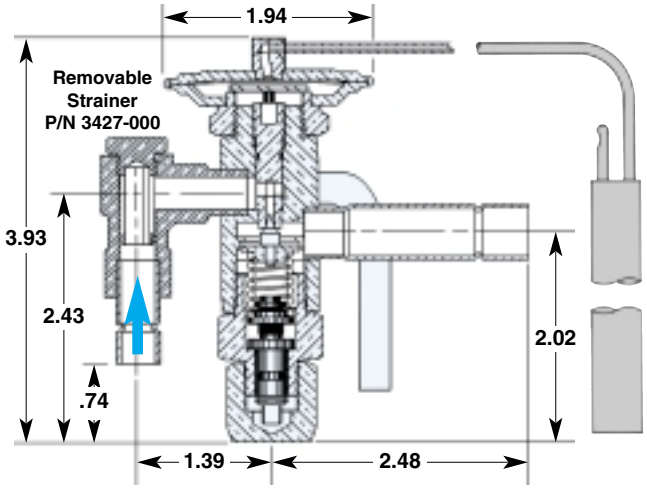
TYPE EQE

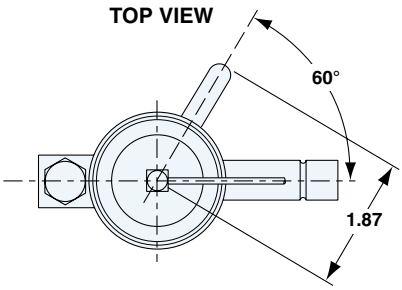
EQE DIMENSIONS – Inches		
FITTING SIZE	A	B
3/8	2.50	–
1/2	2.42	2.48
5/8	–	2.48
7/8	–	2.39





TYPE SQE





QE, EQE, SQE BULB SIZES – Inches				
STANDARD CHARGES	REFRIGERANT			
	22	134a	404A	507
C	0.50 OD x 3.00			
Z & ZP Series	0.50 OD x 3.00	–	0.50 OD x 3.00	
CP Series	0.50 OD x 3.00			–
VGA	0.75 OD x 2.00	–		

TYPE Q EQ SQ

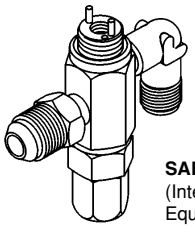
ORDERING INSTRUCTIONS

QE – 0 (1/3T) – VC – 5' – 3/8 x 1/2 x 1/4 SAE

- QE: Valve Type — Q, EQ, SQ = Internally Equalized; QE, EQE, SQE = Externally Equalized
- 0 (1/3T): Cartridge Size
- Nominal Capacity (tons)
- VC: Refrigerant Code (See page 4)
- Thermostatic Charge
- 5': Capillary Tube Length
- 3/8 x 1/2 x 1/4 SAE: Connection Size and Style: in x out x ext. eq.

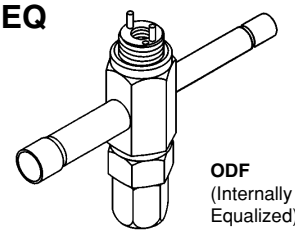
SELECTING BODY TYPE

Q



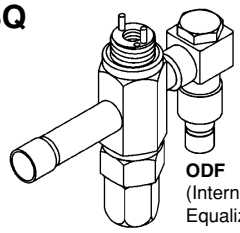
SAE (Internally Equalized)

EQ



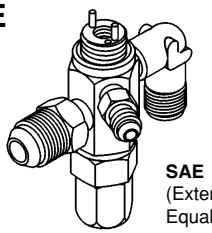
ODF (Internally Equalized)

SQ



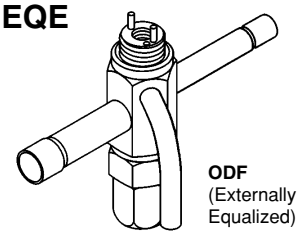
ODF (Internally Equalized)

QE



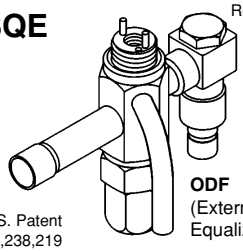
SAE (Externally Equalized)

EQE



ODF (Externally Equalized)

SQE

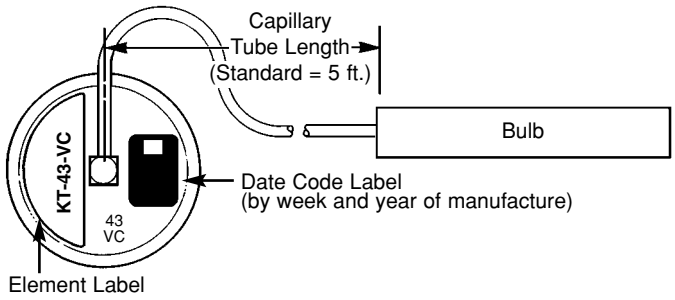


Replaceable Strainer
- U.S. Patent No. 5,232,015
- P/N 3427-000

U.S. Patent No. 5,238,219

ODF (Externally Equalized)

SELECTING THE ELEMENT



KT	-	43	-	V	C
Abbreviation for "Kit"		Element Size Number		*Refrigerant Code See Page 4	Thermostatic Charge

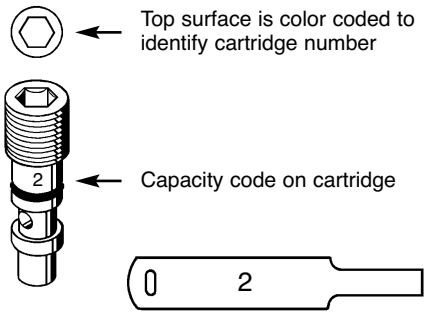
* While many new refrigerants and refrigerant blends have a unique letter code, many use the same thermostatic element as the traditional refrigerant they replace. Refer to the table below to select the correct thermostatic element.

RECOMMENDED THERMOSTATIC ELEMENTS

APPLICATION	REFRIGERANT												THERMOSTATIC ELEMENT	SYSTEM MOP psig
	12	22	134a	401A	402A	404A	407A	407C	408A	409A	502	507		
AIR CONDITIONING	X	–	X	X	–	–	–	–	–	X	–	–	KT-43-FCP60	50
	–	X	–	–	–	–	X	X	–	–	–	–		90
	–	X	–	–	–	–	X	X	–	–	–	–	KT-43-VGA	–
	–	–	–	–	–	X	–	–	X	–	X	–		105
COMMERCIAL REFRIGERATION 50°F to – 10°F	X	–	X	X	–	–	–	–	–	X	–	–		–
	–	X	–	–	–	–	X	X	–	–	–	–		–
	–	–	–	–	–	X	–	–	X	–	X	–		–
	–	–	–	–	X	–	–	–	–	–	–	X		–
LOW TEMPERATURE REFRIGERATION 0°F to – 40°F	X	–	–	–	–	–	–	–	–	–	–	–	KT-43-FZ	–
	X	–	–	–	–	–	–	–	–	–	–	–	KT-43-FZP	12
	–	X	–	–	–	–	X	–	–	–	–	–	KT-43-VZ	–
	–	X	–	–	–	–	X	–	–	–	–	–		30
	–	–	–	–	X	X	–	–	X	–	X	X		–
	–	–	–	–	X	X	–	–	X	–	X	X		35

The Sporlan type ZP thermostatic charges have essentially the same characteristics as the conventional Z cross charges with one exception: they produce a pressure limit or MOP. The ZP charges are not intended as replacements for the Z charges - they should only be used where a definite pressure limit is required to prevent motor overloading.

SELECTING THE CARTRIDGE

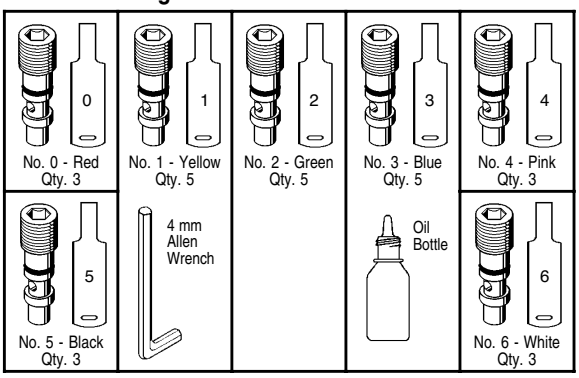


Identification tag with cartridge number (bends around capillary tubing)

INDIVIDUAL REPLACEMENT PARTS		
PART NUMBER	**SIZE**	**COLOR CODE**
CARTRIDGE AND I.D. TAG		
QC-0	0	RED
QC-1	1	YELLOW
QC-2	2	GREEN
QC-3	3	BLUE
QC-4	4	PINK
QC-5	5	BLACK
QC-6	6	WHITE
MISCELLANEOUS PARTS		
OB-1	Oil Bottle (With Oil)	
AW-1	4 mm Allen Wrench	
CSK-1	Cartridge Service Kit (Empty)	
184000	Cartridge Service Kit (Complete as noted below)	

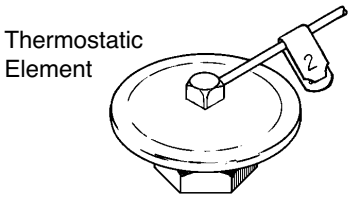
TYPE Q EQ SQ

Cartridge Service Kit – Part No. 184000

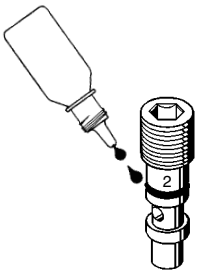


NOMINAL CAPACITY (tons) of SPORLAN VALVE to be REPLACED								Q VALVE CARTRIDGE	
R-12	**R-22**	**R-134a**	**R-401A**	**R-402A**	**R-404A**	**R-502**	**R-507**	**SIZE**	**COLOR CODE**
1/8	1/4	1/8	1/8	1/8	1/8	1/8	1/8	0	RED
1/6	1/3	1/6	1/6	1/6	1/6	1/6	1/6		
1/4	1/2	1/4	1/4	1/4	1/4	1/4	1/4	1	YELLOW
	3/4								
1/2	1	1/2	1/2	1/2	1/2	1/2	1/2	2	GREEN
1	1-1/2	1	1	1	1	1	1	3	BLUE
1-1/2	2	1-1/2	1-1/2	1-1/2	1-1/2	1-1/2	1-1/2	4	PINK
	2-1/2								
2	3	2	2	2	2	2	2	5	BLACK
2-1/2	4	2-1/2	2-1/2	3	3	3	3	6	WHITE
3	5	3	3						

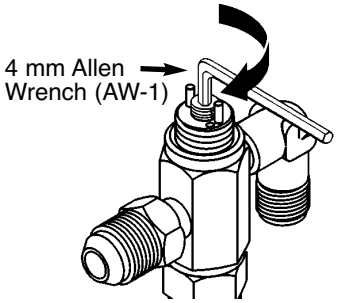
COMPONENT ASSEMBLY



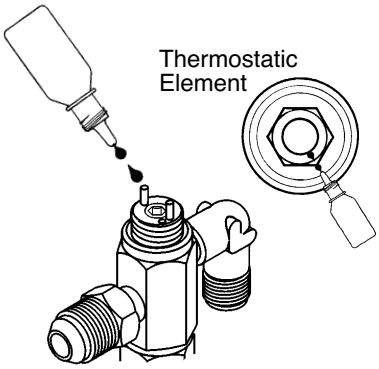
1 Attach cartridge identification tag to element capillary tube.



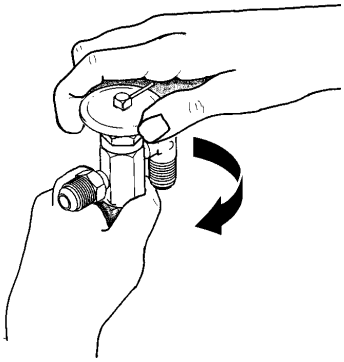
2 (Oil) Lubricate O-ring.



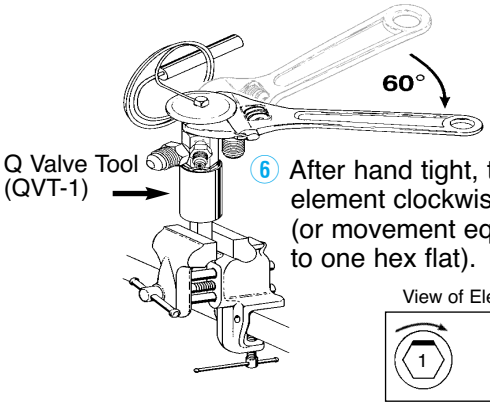
3 Turn clockwise until seated (do not over tighten).



4 (Oil) Lubricate lock ring surface and top of push rods.

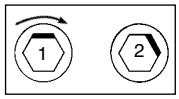


5 Hand tighten element.



6 After hand tight, turn element clockwise 60° (or movement equal to one hex flat).

View of Element



TYPE G

for Refrigerants 22-134a-404A-507 — SAE Flare Connections

Sporlan Type G valve is a forged brass body, externally adjustable valve with SAE flare connections. The thermostatic element is replaceable, and the inlet connection has a removable 100 mesh strainer. This valve is designed for small refrigeration systems such as refrigerated cases, coolers and freezers. In addition to refrigeration applications, the externally equalized Type G valve may be used for small capacity air conditioning and heat pump units.

Refrigerant distributors that will mate directly to this valve are listed below. Refer to Sporlan Bulletin 20-10 for additional application information on this subject.

for complete details of construction, see page 36

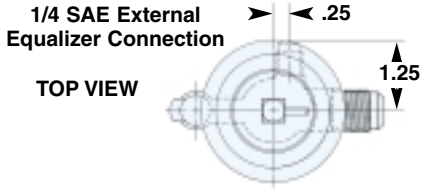
Outlet Connections
1/2" SAE

Distributors
1603, 1605, 1606, 1608, 1650(R)

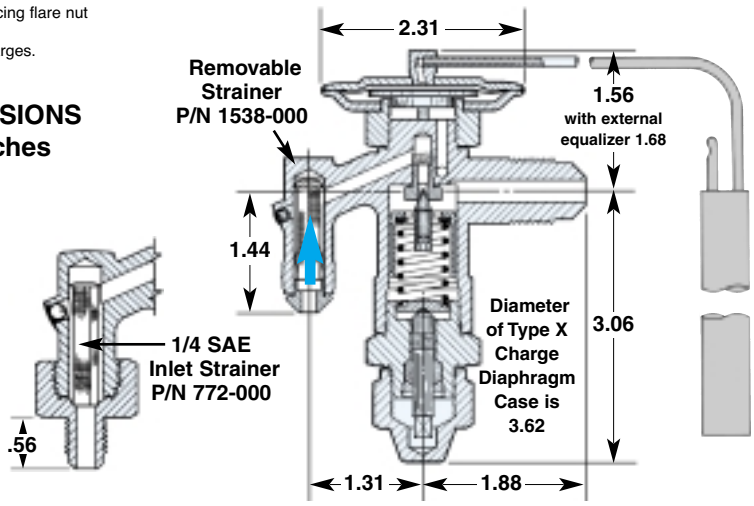
SPECIFICATIONS — ELEMENT SIZE NO. 53, KNIFE EDGE JOINT

REFRIGERANT (Sporlan Code)	TYPE: Internal Equalizer ⑥	TYPE: External Equalizer 1/4" SAE Flare	NOMINAL CAPACITY Tons of Refrigeration	Thermostatic Charges Available	Standard Tubing Length-Feet	CONNECTIONS – Inches SAE Flare. Blue figures are standard and will be furnished unless otherwise specified. INLET	CONNECTIONS OUTLET	Net Weight-Lbs.	Shipping Weight-Lbs.
22 (V) 407C (N) 407A (V)	GV-1/5	GVE-1/5	1/5	Refer to Recommended Thermostatic Charges on Page 4	5	1/4 or 3/8 ①	1/2	2	3
	GV-1/3	GVE-1/3	1/3						
	GV-1/2	GVE-1/2	1/2			1/4 or 3/8 ①			
	GV-3/4	GVE-3/4	3/4						
	GV-1	GVE-1	1						
	GV-1-1/2	GVE-1-1/2	1-1/2			3/8 ①			
	–	GVE-2	2						
	GV-2-1/2	–	2-1/2						
	–	GVE-3	3						
134a (J) 12 (F) 401A (X) 409A (F)	GJ-1/8	GJE-1/8	1/8			1/4 or 3/8 ①			
	GJ-1/6	GJE-1/6	1/6						
	GJ-1/4	GJE-1/4	1/4			1/4 or 3/8 ①			
	GJ-1/2	GJE-1/2	1/2						
	GJ-1	GJE-1	1			3/8 ①			
	GJ-1-1/2	GJE-1-1/2	1-1/2						
	–	GJE-2	2						
404A (S) 502 (R) 408A (R)	GS-1/8	GSE-1/8	1/8			1/4 or 3/8 ①			
	GS-1/6	GSE-1/6	1/6						
	GS-1/4	GSE-1/4	1/4			1/4 or 3/8 ①			
	GS-1/2	GSE-1/2	1/2						
	GS-1	GSE-1	1			3/8 ①			
	GS-1-1/2	GSE-1-1/2	1-1/2						
	–	GSE-2	2						
507 (P) 402A (L)	GP-1/8	GPE-1/8	1/8			1/4 or 3/8 ①			
	GP-1/6	GPE-1/6	1/6						
	GP-1/4	GPE-1/4	1/4			1/4 or 3/8 ①			
	GP-1/2	GPE-1/2	1/2						
	GP-1	GPE-1	1			3/8 ①			
	GP-1-1/2	GPE-1-1/2	1-1/2						
	–	GPE-2	2						

① The 3/8" SAE inlet fitting has a long taper on the flare surface. A 3/8" x 1/4" reducing flare nut will allow 1/4" OD tubing to be attached to this fitting.
⑥ Valves listed in this column NOT AVAILABLE with MOP Type air conditioning charges.



DIMENSIONS – Inches



BULB SIZES – Inches				
STANDARD CHARGES	REFRIGERANT 22	134a	404A	507
C	0.50 OD x 3.50			
Z & ZP Series	0.50 OD x 3.50	–	0.50 OD x 3.50	
X	0.75 OD x 4.00	–	0.75 OD x 4.00	
CP Series	0.50 OD x 3.50			–
VGA	0.75 OD x 2.00	–		

for Refrigerants 22-134a-404A-507 — SAE Flare & ODF Solder Connections

for complete details of construction, see page 36

Sporlan Type EG valve is a forged brass body, externally adjustable valve with ODF solder connections. The thermostatic element is replaceable, and the inlet connection has a removable 100 mesh strainer which can be cleaned and/or replaced without removing the valve from the line. This valve is designed for small refrigeration systems such as refrigerated cases, coolers and freezers. In addition to refrigeration applications, the externally equalized Type EG valve may be used for small capacity air conditioning and heat pump units.

Refrigerant distributors that will mate directly to this valve are listed below. Refer to Sporlan Bulletin 20-10 for additional application information on this subject.

Outlet Connections
1/2" ODF

Distributors
1613, 1616

TYPE EG

Replaceable Strainer
U.S. Patent
No. 5,232,015

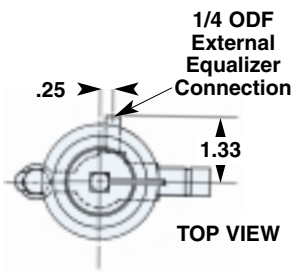
SPECIFICATIONS — ELEMENT SIZE NO. 53, KNIFE EDGE JOINT

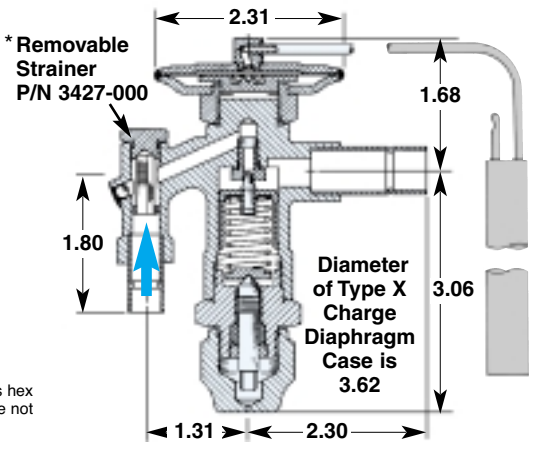
REFRIGERANT (Sporlan Code)	TYPE: Internal Equalizer ⑥	TYPE: External Equalizer 1/4" ODF Solder	NOMINAL CAPACITY Tons of Refrigeration	Thermostatic Charges Available	Standard Tubing Length-Feet	CONNECTIONS – Inches ③ ODF Solder. Blue figures are standard and will be furnished unless otherwise specified. INLET	CONNECTIONS – Inches ③ ODF Solder. Blue figures are standard and will be furnished unless otherwise specified. OUTLET	Net Weight-Lbs.	Shipping Weight-Lbs.
22 (V) 407C (N) 407A (V)	EGV-1/5	EGVE-1/5	**1/5**	Refer to Recommended Thermostatic Charges on Page 4	5	3/8	1/2	2	3
	EGV-1/3	EGVE-1/3	**1/3**						
	EGV-1/2	EGVE-1/2	**1/2**						
	EGV-3/4	EGVE-3/4	**3/4**						
	EGV-1	EGVE-1	**1**						
	EGV-1-1/2	EGVE-1-1/2	**1-1/2**						
	–	EGVE-2	**2**						
	EGV-2-1/2	–	**2-1/2**						
	–	EGVE-3	**3**						
134a (J) 12 (F) 401A (X) 409A (F)	EGJ-1/8	EGJE-1/8	**1/8**						
	EGJ-1/6	EGJE-1/6	**1/6**						
	EGJ-1/4	EGJE-1/4	**1/4**						
	EGJ-1/2	EGJE-1/2	**1/2**						
	EGJ-1	EGJE-1	**1**						
	EGJ-1-1/2	EGJE-1-1/2	**1-1/2**						
	–	EGJE-2	**2**						
404A (S) 502 (R) 408A (R)	EGS-1/8	EGSE-1/8	**1/8**						
	EGS-1/6	EGSE-1/6	**1/6**						
	EGS-1/4	EGSE-1/4	**1/4**						
	EGS-1/2	EGSE-1/2	**1/2**						
	EGS-1	EGSE-1	**1**						
	EGS-1-1/2	EGSE-1-1/2	**1-1/2**						
	–	EGSE-2	**2**						
507 (P) 402 (L)	EGP-1/8	EGPE-1/8	**1/8**						
	EGP-1/6	EGPE-1/6	**1/6**						
	EGP-1/4	EGPE-1/4	**1/4**						
	EGP-1/2	EGPE-1/2	**1/2**						
	EGP-1	EGPE-1	**1**						
	EGP-1-1/2	EGPE-1-1/2	**1-1/2**						
	–	EGPE-2	**2**						

③ ODF Solder indicates a female connection on the valve of proper diameter to receive copper tubing of corresponding OD size. Thus 1/2" ODF will receive 1/2" OD tubing.
⑥ Valves listed in this column NOT AVAILABLE with MOP Type air conditioning charges.

DIMENSIONS – Inches

BULB SIZES – Inches				
STANDARD CHARGES	REFRIGERANT 22	134a	404A	507
C	0.50 OD x 3.50			
Z & ZP Series	0.50 OD x 3.50	–	0.50 OD x 3.50	
X	0.75 OD x 4.00	–	0.75 OD x 4.00	
CP Series	0.50 OD x 3.50			–
VGA	0.75 OD x 2.00	–		





* Type EG valves manufactured prior to June 1994 use a smaller inlet strainer, P/N 1935-000, which has a 1/2" brass hex head. Current Type EG valves use inlet strainer P/N 3247-000 which has a 5/8" brass hex head. These strainers are not interchangeable, but both are available as replacement parts.

TYPE C

for Refrigerants 22-134a-404A-507 — SAE Flare Connections

Sporlan Type C valve is a forged brass body, externally adjustable valve with SAE flare connections. The thermostatic element is replaceable, and the inlet connection has a removable 80 mesh strainer. This valve is designed for refrigerated cases, coolers and freezers. In addition to refrigeration applications, the externally equalized Type C valve may be used for small capacity air conditioning and heat pump units.

Refrigerant distributors that will mate directly to this valve are listed below. Refer to Sporlan Bulletin 20-10 for additional application information on this subject.

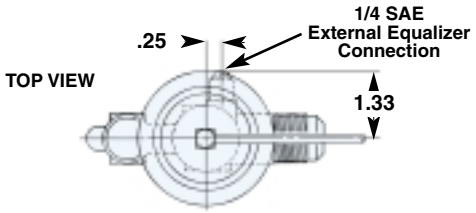
Outlet Connections	*Distributors*
1/2" SAE	1603, 1605, 1606, 1608, 1650(R)
5/8" SAE	1104, 1147, 1652(R), 1654(R), 1656(R)

for complete details of construction, see page 36

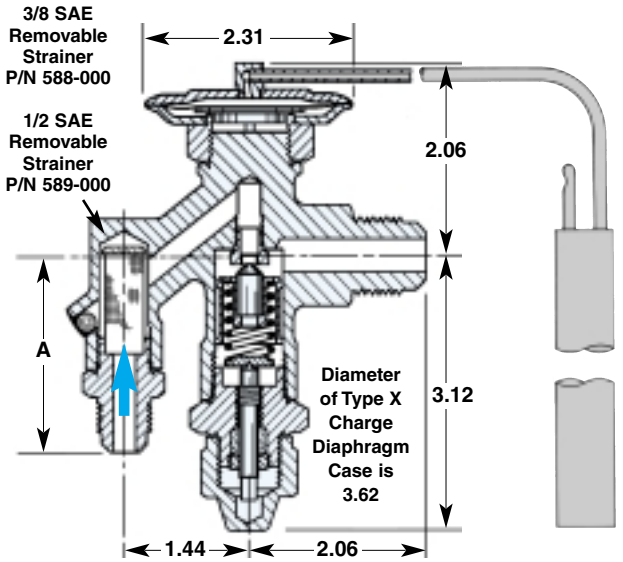
SPECIFICATIONS — ELEMENT SIZE NO. 83, KNIFE EDGE JOINT

REFRIGERANT (Sporlan Code)	TYPE: Internal Equalizer ⑥	TYPE: External Equalizer 1/4" SAE Flare Only	NOMINAL CAPACITY Tons of Refrigeration	Thermostatic Charges Available	Standard Tubing Length-Feet	CONNECTIONS – Inches SAE Flare. Blue figures are standard and will be furnished unless otherwise specified. INLET	CONNECTIONS – Inches SAE Flare. Blue figures are standard and will be furnished unless otherwise specified. OUTLET	Net Weight-Lbs.	Shipping Weight-Lbs.
22 (V) 407C (N) 407A (V)	CV-3	–	3	Refer to Recommended Thermostatic Charges on Page 4	5	3/8 ① or 1/2	1/2 or 5/8	2	3
	CV-4	CVE-4	4						
	CV-5	CVE-5	5						
	–	CVE-8	8			1/2	5/8		
134a (J) 12 (F) 401A (X) 409A (F)	CJ-2	–	2			3/8 ① or 1/2	1/2 or 5/8		
	CJ-2-1/2	CJE-2-1/2	2-1/2						
	CJ-3	CJE-3	3						
	–	CJE-5	5			1/2	5/8		
404A (S) 502 (R) 408A (R)	CS-2	–	2			3/8 ① or 1/2	1/2 or 5/8		
	CS-3	CSE-3	3						
	CS-4	CSE-4	4						
	–	CSE-6	6			1/2	5/8		
507 (P) 402A (L)	CP-2	–	2			3/8 ① or 1/2	1/2 or 5/8		
	CP-3	CPE-3	3						
	CP-4	CPE-4	4						
	–	CPE-6	6			1/2	5/8		

① The 3/8" SAE inlet fitting has a long taper on the flare surface. A 3/8" x 1/4" reducing flare nut will allow 1/4" OD tubing to be attached to this fitting.
⑥ Valves listed in this column NOT AVAILABLE with MOP Type air conditioning charges.



DIMENSIONS – Inches Connections - SAE Flare	
FITTING SIZE	A
3/8	2.25
1/2	2.38



BULB SIZES – Inches				
STANDARD CHARGES	REFRIGERANT			
	22	134a	404A	507
C	0.50 OD x 3.50			
Z & ZP Series	0.50 OD x 3.50	–	0.50 OD x 3.50	
X	0.75 OD x 4.00	–	0.75 OD x 4.00	
CP Series	0.50 OD x 3.50			–
VGA	0.75 OD x 2.00	–		

for Refrigerants 22-134a-404A-507 — SAE Flare Connections

for complete details of construction, see page 36

Sporlan Type BF valve is a small brass bar body valve with SAE flare connections and balanced port construction. This valve has the same exterior dimensions as the Type F valve. The thermostatic element is replaceable, and the inlet connection has a removable 100 mesh strainer. The balanced port construction makes this valve ideally suited for small capacity refrigeration applications which operate over widely varying operating conditions.

Refrigerant distributors that will mate directly to this valve are listed below. Refer to Sporlan Bulletin 20-10 for additional application information on this subject.

Outlet Connections
1/2" SAE

Distributors
1603, 1605, 1606, 1608, 1650(R)

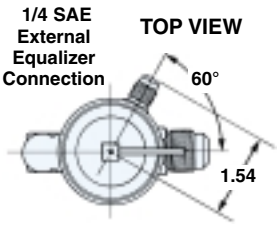
SPECIFICATIONS — ELEMENT SIZE NO. 43, KNIFE EDGE JOINT

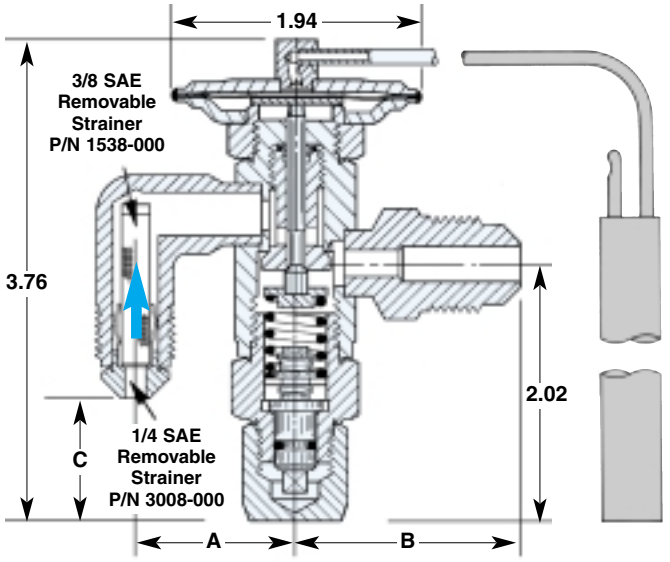
REFRIGERANT (Sporlan Code)	TYPE SAE Flare: Internal Equalizer	TYPE SAE Flare: External Equalizer	Port Size	NOMINAL CAPACITY Tons of Refrigeration	Thermostatic Charges Available	Standard Tubing Length-Inches	CONNECTIONS – Inches (Blue figures are standard and will be furnished unless otherwise specified.) SAE Flare: INLET	SAE Flare: OUTLET	SAE Flare: External Equalizer	Net Weight-Lbs.	Shipping Weight-Lbs.
22 (V) 407C (N) 407A (V)	BFV-AAA	BFVE-AAA	AAA	1/8 thru 1/3	C Z ZP40	30	1/4 or 3/8 Elbow ①	3/8 or 1/2	1/4	1	1-1/2
	BFV-AA	BFVE-AA	AA	1/2 thru 2/3			1/4 or 3/8 Elbow ①				
	BFV-A	BFVE-A	A	3/4 thru 1-1/2			3/8 Elbow				
	BFV-B	BFVE-B	B	1-3/4 thru 3							
	BFV-C	BFVE-C	C	3-1/4 thru 5-1/2							
134a (J) 12 (F) 401A (X) 409A (F)	BFJ-AAA	BFJE-AAA	AAA	1/8 thru 1/5	C		1/4 or 3/8 Elbow ①				
	BFJ-AA	BFJE-AA	AA	1/4 thru 1/3			1/4 or 3/8 Elbow ①				
	BFJ-A	BFJE-A	A	1/2 thru 1			3/8 Elbow				
	BFJ-B	BFJE-B	B	1-1/4 thru 1-3/4							
	BFJ-C	BFJE-C	C	2 thru 3							
404A (S) 502 (R) 408A (R)	BFS-AAA	BFSE-AAA	AAA	1/8 thru 1/5	C Z ZP		1/4 or 3/8 Elbow ①				
	BFS-AA	BFSE-AA	AA	1/4 thru 1/3			1/4 or 3/8 Elbow ①				
	BFS-A	BFSE-A	A	1/2 thru 1			3/8 Elbow				
	BFS-B	BFSE-B	B	1-1/4 thru 2							
	BFS-C	BFSE-C	C	2-1/4 thru 3							
507 (P) 402A (L)	BFP-AAA	BFPE-AAA	AAA	1/8 thru 1/5	C Z ZP		1/4 or 3/8 Elbow ①				
	BFP-AA	BFPE-AA	AA	1/4 thru 1/3			1/4 or 3/8 Elbow ①				
	BFP-A	BFPE-A	A	1/2 thru 1			3/8 Elbow				
	BFP-B	BFPE-B	B	1-1/4 thru 2							
	BFP-C	BFPE-C	C	2-1/4 thru 3							

① The 3/8" SAE inlet fitting has a long taper on the flare surface. A 3/8" x 1/4" reducing flare nut will allow 1/4" OD tubing to be attached to this fitting.

DIMENSIONS – Inches Connections - SAE Flare

FITTINGS SIZE	A	B	C
1/4 Elbow	1.19	–	1.34
3/8 Elbow	1.35	–	.98
3/8 SAE	–	1.61	–
1/2 SAE	–	1.80	–





BULB SIZES – Inches

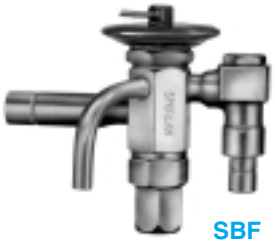
STANDARD CHARGES	REFRIGERANT 22	134a	404A	507
C	0.50 OD x 3.00			
Z & ZP Series	0.50 OD x 3.00	–	0.50 OD x 3.00	

TYPE SBF & EBF

for Refrigerants 22-134a-404A-507 — Extended Solder Connections

Sporlan Types SBF & EBF are small brass bar body valves with Extended ODF solder connections and the same balanced port construction as the Type BF valve. Both valves have replaceable thermostatic elements. The Type EBF has a 100 mesh insert strainer. The Type SBF has a 100 mesh removable strainer that can be cleaned and/or replaced while the valve is still soldered to the system tubing. The balanced port construction makes these valves ideally suited for small capacity refrigeration applications which operate over widely varying conditions.

Refrigerant distributors that will mate directly to these valves are listed below. Refer to Sporlan Bulletin 20-10 for additional application information on this subject.



SBF

EBF

Replaceable Strainer
U.S. Patent
No. 5,232,015

Outlet Connections
1/2" ODF
5/8" ODF

Distributors
1613, 1616
1620, 1622, 1651(R)

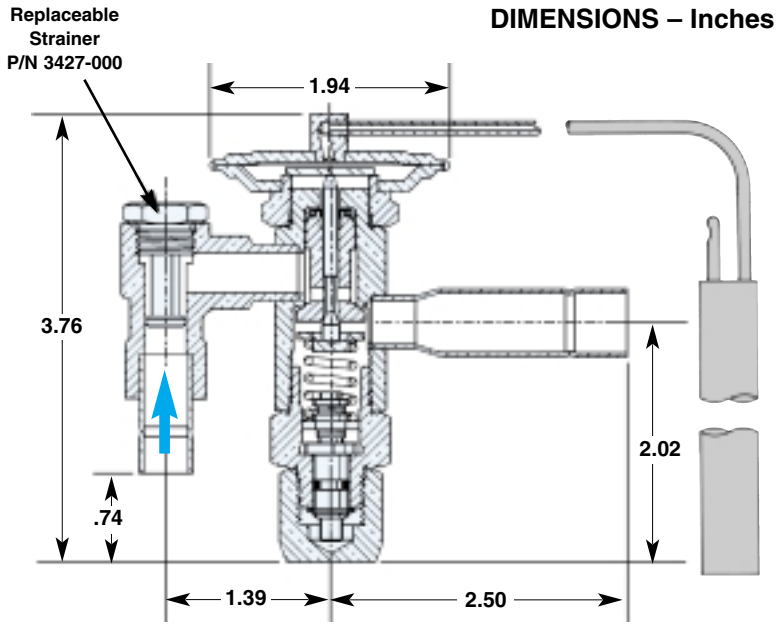
for complete details of construction, see page 36

SPECIFICATIONS — ELEMENT SIZE NO. 43, KNIFE EDGE JOINT

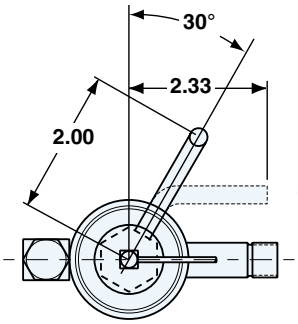
REFRIGERANT (Sporlan Code)	TYPE SBF Extended ODF Solder (with replaceable strainer)		TYPE EBF Extended ODF Solder		Port Size	NOMINAL CAPACITY RANGE Tons of Refrigeration	Thermostatic Charges Available	Standard Tubing Length-Inches	CONNECTIONS – Inches Blue figures are standard and will be furnished unless otherwise specified.			Net Weight-Lbs.	Shipping Weight-Lbs.
									Extended ODF Solder				
	Internal Equalizer	External Equalizer	Internal Equalizer	External Equalizer					INLET	OUTLET	External Equalizer		
22 (V) 407C (N) 407A (V)	SBFV-AAA	SBFVE-AAA	EBFV-AAA	EBFVE-AAA	AAA	1/8 thru 1/3	C Z ZP40	30	3/8	1/2 or 5/8	1/4 Pointed Toward Bottom Cap or Parallel to Outlet Connection	1	1-1/2
	SBFV-AA	SBFVE-AA	EBFV-AA	EBFVE-AA	AA	1/2 thru 2/3							
	SBFV-A	SBFVE-A	EBFV-A	EBFVE-A	A	3/4 thru 1-1/2							
	SBFV-B	SBFVE-B	EBFV-B	EBFVE-B	B	1-3/4 thru 3							
	SBFV-C	SBFVE-C	EBFV-C	EBFVE-C	C	3-1/4 thru 5-1/2							
134a (J) 12 (F) 401A (X) 409A (F)	SBFJ-AAA	SBFJE-AAA	EBFJ-AAA	EBFJE-AAA	AAA	1/8 thru 1/5	C						
	SBFJ-AA	SBFJE-AA	EBFJ-AA	EBFJE-AA	AA	1/4 thru 1/3							
	SBFJ-A	SBFJE-A	EBFJ-A	EBFJE-A	A	1/2 thru 1							
	SBFJ-B	SBFJE-B	EBFJ-B	EBFJE-B	B	1-1/4 thru 1-3/4							
	SBFJ-C	SBFJE-C	EBFJ-C	EBFJE-C	C	2 thru 3							
404A (S) 502 (R) 408A (R)	SBFS-AAA	SBFSE-AAA	EBFS-AAA	EBFSE-AAA	AAA	1/8 thru 1/5	C Z ZP						
	SBFS-AA	SBFSE-AA	EBFS-AA	EBFSE-AA	AA	1/4 thru 1/3							
	SBFS-A	SBFSE-A	EBFS-A	EBFSE-A	A	1/2 thru 1							
	SBFS-B	SBFSE-B	EBFS-B	EBFSE-B	B	1-1/4 thru 2							
	SBFS-C	SBFSE-C	EBFS-C	EBFSE-C	C	2-1/4 thru 3							
507 (P) 402A (L)	SBFP-AAA	SBFPE-AAA	EBFP-AAA	EBFPE-AAA	AAA	1/8 thru 1/5	C Z ZP						
	SBFP-AA	SBFPE-AA	EBFP-AA	EBFPE-AA	AA	1/4 thru 1/3							
	SBFP-A	SBFPE-A	EBFP-A	EBFPE-A	A	1/2 thru 1							
	SBFP-B	SBFPE-B	EBFP-B	EBFPE-B	B	1-1/4 thru 2							
	SBFP-C	SBFPE-C	EBFP-C	EBFPE-C	C	2-1/4 thru 3							

SBF

DIMENSIONS – Inches



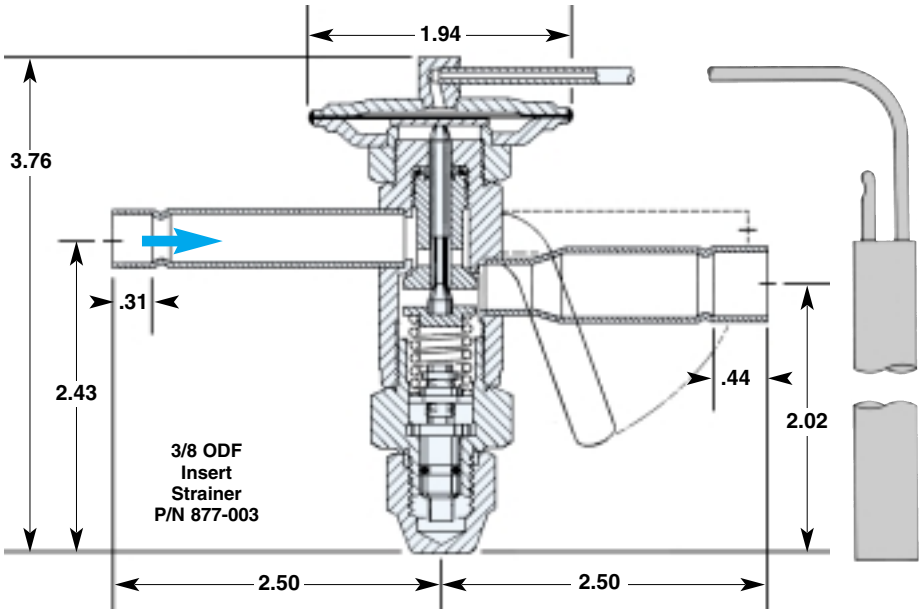
TOP VIEW



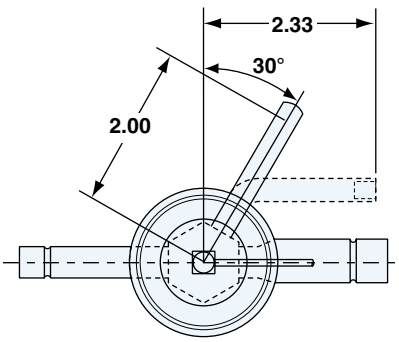
BULB SIZES – Inches				
STANDARD CHARGES	REFRIGERANT			
	22	134a	404A	507
C	0.50 OD x 3.00			
Z & ZP Series	0.50 OD x 3.00	–	0.50 OD x 3.00	

EBF

DIMENSIONS – Inches



TOP VIEW



BULB SIZES – Inches				
STANDARD CHARGES	REFRIGERANT			
	22	134a	404A	507
C	0.50 OD x 3.00			
Z & ZP Series	0.50 OD x 3.00	–	0.50 OD x 3.00	

TYPE S

for Refrigerants 22-134a-404A-507 — ODF Solder Connections

Sporlan Type S valve is a brass bar body, externally adjustable valve with ODF solder connections. The thermostatic element is replaceable, and the inlet connection has a permanent 12 mesh strainer. This valve is designed for both air conditioning and refrigeration applications.

Refrigerant distributors that will mate directly to this valve are listed below. Refer to Sporlan Bulletin 20-10 for additional application information on this subject.

for complete details of construction, see page 36

Outlet Connections	*Distributors*
5/8" ODF	1620, 1622, 1651(R)
7/8" ODF	1112, 1113, 1653(R)
1-1/8" ODF	1115, 1116, 1655(R)

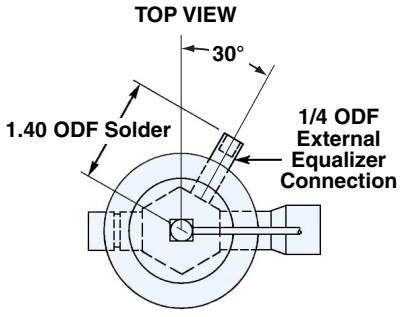
SPECIFICATIONS — ELEMENT SIZE NO. 83, KNIFE EDGE JOINT

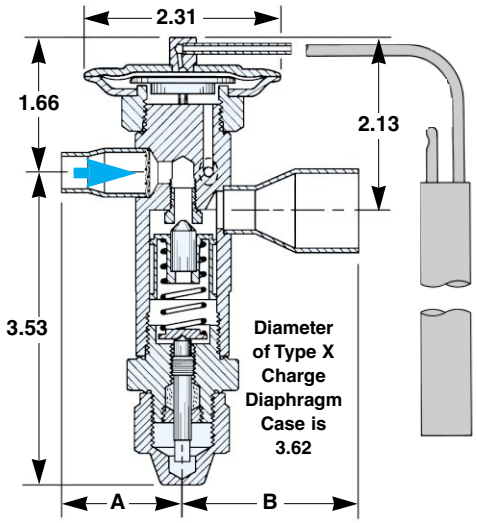
REFRIGERANT (Sporlan Code)	TYPE: Internal Equalizer ⑥	TYPE: External Equalizer ⑦	NOMINAL CAPACITY Tons of Refrigeration	Thermostatic Charges Available	Standard Tubing Length-Feet	CONNECTIONS – Inches ⑧ ODF Solder. Blue figures are standard and will be furnished unless otherwise specified. INLET	CONNECTIONS – Inches ⑧ ODF Solder. Blue figures are standard and will be furnished unless otherwise specified. OUTLET	Net Weight-Lbs.	Shipping Weight-Lbs.
22 (V) 407C (N) 407A (V)	SV-2	SVE-2	2	Refer to Recommended Thermostatic Charges on Page 4	5	3/8 or 1/2	5/8, 7/8 or 1-1/8	2	3
	SV-3	SVE-3	3			1/2	5/8, 7/8 or 1-1/8		
	SV-4	SVE-4	4			5/8	7/8 or 1-1/8		
	SV-5	SVE-5	5						
	–	SVE-8	8						
	–	SVE-10	10						
134a (J) 12 (F) 401A (X) 409A (F)	SJ-2	SJE-2	2			3/8 or 1/2	5/8, 7/8 or 1-1/8		
	SJ-2-1/2	SJE-2-1/2	2-1/2			1/2	5/8, 7/8 or 1-1/8		
	SJ-3	SJE-3	3			5/8	7/8 or 1-1/8		
	–	SJE-5	5						
	–	SJE-6	6						
404A (S) 502 (R) 408A (R)	SS-2	SSE-2	2			3/8 or 1/2	5/8, 7/8 or 1-1/8		
	SS-3	SSE-3	3			1/2	5/8, 7/8 or 1-1/8		
	SS-4	SSE-4	4			5/8	7/8 or 1-1/8		
	–	SSE-6	6						
	–	SSE-7	7						
507 (P) 402A (L)	SP-2	SPE-2	2			3/8 or 1/2	5/8, 7/8 or 1-1/8		
	SP-3	SPE-3	3			1/2	5/8, 7/8 or 1-1/8		
	SP-4	SPE-4	4			5/8	7/8 or 1-1/8		
	–	SPE-6	6						
	–	SPE-7	7						

⑥ Valves listed in this column NOT AVAILABLE with MOP Type air conditioning charges.
⑦ Standard External Equalizer Connection 1/4" ODF Solder, 1/4" SAE flare connection available on request.
⑧ ODF Solder indicates a female connection on the valve of proper diameter to receive copper tubing of corresponding OD size. Thus 5/8" ODF will receive 5/8" OD tubing.

DIMENSIONS – Inches

FITTING SIZE	A	B
3/8	1.34	–
1/2	1.29	1.36
5/8	1.50	1.57
7/8	–	2.13
1-1/8	–	2.19





BULB SIZES – Inches

STANDARD CHARGES	REFRIGERANT 22	134a	404A	507
C	0.50 OD x 3.50			
Z & ZP Series	0.50 OD x 3.50	–	0.50 OD x 3.50	
X	0.75 OD x 4.00	–	0.75 OD x 4.00	
CP Series	0.50 OD x 3.50			–
VGA	0.75 OD x 2.00	–		

for complete details of construction, see page 36

for Refrigerants 22-134a-404A-507 — Extended ODF Solder Connections

Sporlan Type EBS valve is a brass bar body valve having the same physical size as the Type S valve except the Type EBS features a balanced port construction and extended ODF connections. The thermostatic element is replaceable. The balanced port construction makes this valve ideally suited for refrigeration and air conditioning applications which operate over widely varying conditions.

Refrigerant distributors that will mate directly to this valve are listed below. Refer to Sporlan Bulletin 20-10 for additional application information on this subject.

Outlet Connections	*Distributors*
7/8" ODF	1112, 1113, 1653(R)
1-1/8" ODF	1115, 1116, 1655(R)
1-3/8" ODF	1117, 1126, 1128, 1657(R)

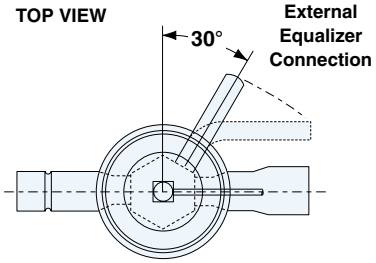
SPECIFICATIONS — ELEMENT SIZE NO. 83, KNIFE EDGE JOINT

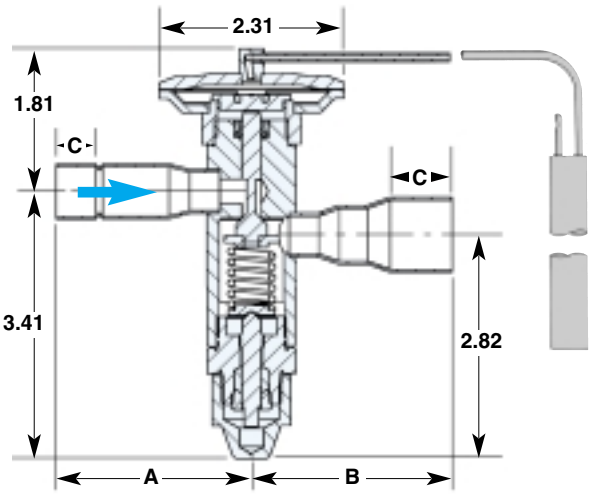
REFRIGERANT (Sporlan Code)	TYPE External Equalizer	NOMINAL CAPACITY Tons of Refrigeration	Thermostatic Charges Available	Standard Tubing Length-Feet	CONNECTIONS – Inches Blue figures are standard and will be furnished unless otherwise specified. ⑧ Extended ODF Solder INLET	OUTLET	External Equalizer	Net Weight-Lbs.	Shipping Weight-Lbs.
22 (V) 407C (N) 407A (V)	EBSVE-8	8	* Refer to Recommended Thermostatic Charges on Page 4	5	1/2 or 5/8	7/8 or 1-1/8	1/4 Pointed Toward Bottom Cap or Parallel to Connection	2	3
	EBSVE-11	11			1/2, 5/8 or 7/8	7/8, 1-1/8 or 1-3/8			
134a (J) 12 (F) 401A (X) 409A (F)	EBSJE-5	5			1/2 or 5/8	7/8 or 1-1/8			
	EBSJE-7	7			1/2, 5/8 or 7/8	7/8, 1-1/8 or 1-3/8			
404A (S) 502 (R) 408A (R)	EBSSE-6	6			1/2 or 5/8	7/8 or 1-1/8			
	EBSSE-7-1/2	7-1/2			1/2, 5/8 or 7/8	7/8, 1-1/8 or 1-3/8			
507 (P) 402A (L)	EBSPE-6	6			1/2 or 5/8	7/8 or 1-1/8			
	EBSPE-7-/12	7-1/2			1/2, 5/8 or 7/8	7/8, 1-1/8 or 1-3/8			

⑧ ODF Solder indicates a female connection on the valve of proper diameter to receive copper tubing of corresponding OD size. Thus 5/8" ODF will receive 5/8" OD tubing.

* X - Charge Not Available

DIMENSIONS – Inches			
FITTING SIZE	A	B	C
1/2	2.49	–	.37
5/8	2.46	–	.50
7/8	2.46	2.53	.75
1-1/8	–	2.53	.81
1-3/8	–	3.04	.97





BULB SIZES – Inches				
STANDARD CHARGES	REFRIGERANT 22	134a	404A	507
C	0.50 OD x 3.50			
Z & ZP Series	0.50 OD x 3.50	–	0.50 OD x 3.50	
CP Series	0.50 OD x 3.50			–
VGA	0.75 OD x 2.00	–		

TYPE O

for Refrigerants 22-134a-404A-507 — ODF Solder Connections

U.S. Patent Number 3,742,722

Sporlan Type O valve is a brass bar body, externally adjustable valve with ODF solder connections. The thermostatic element is replaceable, and the inlet connection has a permanent 12 mesh strainer. This valve type features a balanced port construction, and it is designed for both air conditioning and refrigeration applications. A synthetic seating surface provides tight shut-off during system off periods.

This valve type has two body styles: a small body which provides capacities up to 30 tons R-22, and a large body which extends capacities to 70 tons R-22.

Refrigerant distributors that will mate directly to this valve are listed below. Refer to Sporlan Bulletin 20-10 for additional application information on this subject.

Outlet Connections
1-1/8" ODF
1-3/8" ODF
1-5/8" ODF

Distributors
1115, 1116, 1655(R)
1117, 1126, 1128, 1657(R)
1125, 1127, 1143, 1659(R)

for complete details of construction, see page 36

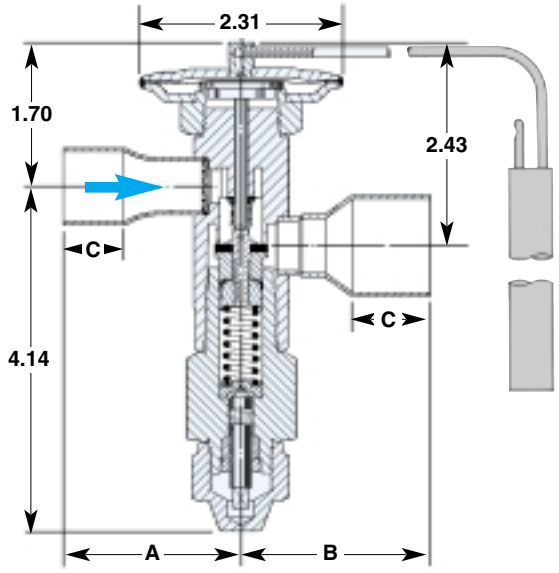
SPECIFICATIONS — ELEMENT SIZE NO.'s 83 and 33, KNIFE EDGE JOINT

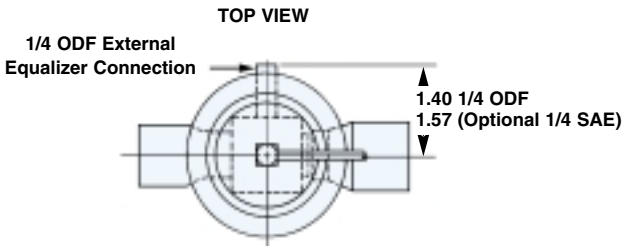
REFRIGERANT (Sporlan Code)	TYPE External Equalizer ⑦	NOMINAL CAPACITY Tons of Refrigeration	Element Size No.	Thermostatic Charges Available	Standard Tubing Length-Feet	CONNECTIONS – Inches ⑧ ODF Solder. Blue figures are standard and will be furnished unless otherwise specified. INLET	CONNECTIONS – Inches ⑧ ODF Solder. Blue figures are standard and will be furnished unless otherwise specified. OUTLET	Net Weight-Lbs.	Shipping Weight-Lbs.
22 (V) 407C (N) 407A (V)	OVE-15	15	83	* Refer to Recommended Thermostatic Charges on Page 4	5	7/8	1-1/8	2	3
	OVE-20	20					1-3/8		
	OVE-30	30				1-1/8			
	OVE-40	40	33				1-3/8 or 1-5/8	4	5
	OVE-55	55							
	OVE-70	70							
134a (J) 12 (F) 401A (X) 409A (F)	OJE-9	9	83			7/8	1-1/8	2	3
	OJE-12	12					1-3/8		
	OJE-16	16				1-1/8			
	OJE-23	23	33				1-3/8 or 1-5/8	4	5
	OJE-32	32							
	OJE-40	40							
404A (S) 502 (R) 408A (R)	OSE-9	9	83			7/8	1-1/8	2	3
	OSE-12	12					1-3/8		
	OSE-21	21				1-1/8			
	OSE-30	30	33				1-3/8 or 1-5/8	4	5
	OSE-35	35							
	OSE-45	45							
507 (P) 402A (L)	OPE-9	9	83			7/8	1-1/8	2	3
	OPE-12	12					1-3/8		
	OPE-21	21				1-1/8			
	OPE-30	30	33				1-3/8 or 1-5/8	4	5
	OPE-35	35							
	OPE-45	45							

⑦ Standard External Equalizer Connection 1/4" ODF Solder, 1/4" SAE flare connection available on request.
⑧ ODF Solder indicates a female connection on the valve of proper diameter to receive copper tubing of corresponding OD size. Thus 5/8" ODF will receive 5/8" OD tubing.

* X - Charge Not Available

TYPE O WITH NUMBER 83 ELEMENT

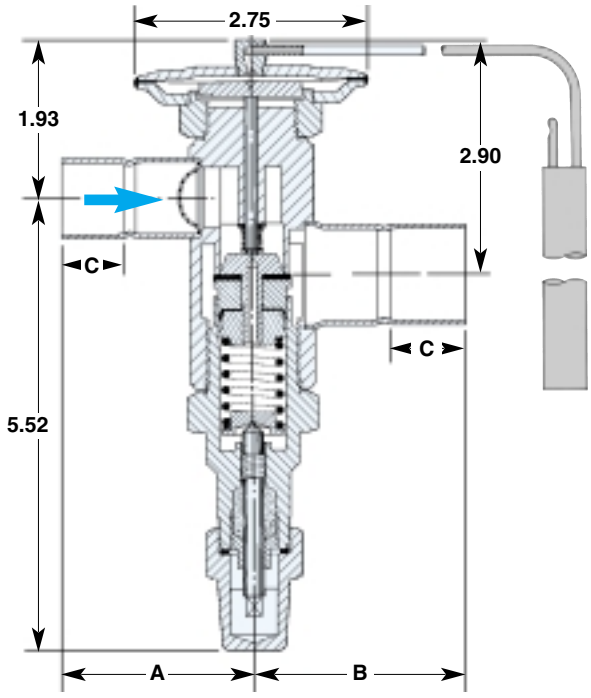


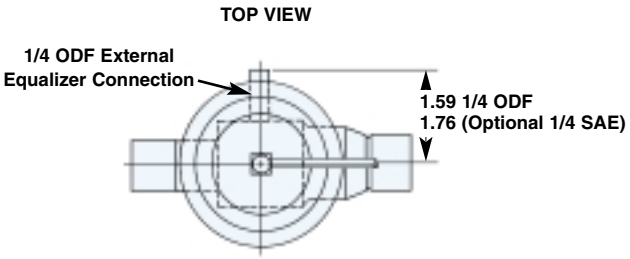


DIMENSIONS – Inches			
STRAIGHT THRU ODF SOLDER	A	B	C
7/8	2.09	2.08	0.75
1-1/8	2.21	2.23	0.91
1-3/8	–	2.39	0.97

BULB SIZES – Inches				
STANDARD CHARGES	REFRIGERANT			
	22	134a	404A	507
C	0.50 OD x 3.50			
Z & ZP Series	0.50 OD x 3.50	–	0.50 OD x 3.50	
CP Series	0.50 OD x 3.50			–
VGA	0.75 OD x 2.00	–		

TYPE O WITH NUMBER 33 ELEMENT





DIMENSIONS – Inches			
STRAIGHT THRU ODF SOLDER	A	B	C
1-1/8	2.69	–	0.91
1-3/8	–	2.84	0.97
1-5/8	–	3.12	1.09

BULB SIZES – Inches				
STANDARD CHARGES	REFRIGERANT			
	22	134a	404A	507
C	0.75 OD x 4.00	0.50 OD x 5.00	0.75 OD x 4.00	
Z & ZP Series	0.75 OD x 4.00	–	0.75 OD x 4.00	
CP Series	0.75 OD x 4.00			–
VGA	0.75 OD x 4.00	–		

TYPE H

for Refrigerants 22-134a-404A-507 — ODF Solder-Flange Connections

Sporlan Type H valve is a brass bar body, externally adjustable valve available with either ODF solder or FPT flange connections. The thermostatic element is replaceable, and the inlet connection has a permanent 16 mesh strainer. The FPT flange connection requires the Sporlan K-1178 adapter kit. This valve type provides the smallest capacity TEVs with flange connections, and it is designed for both air conditioning and refrigeration applications.

Refrigerant distributors that will mate directly to this valve are listed below. Refer to Sporlan Bulletin 20-10 for additional application information on this subject.

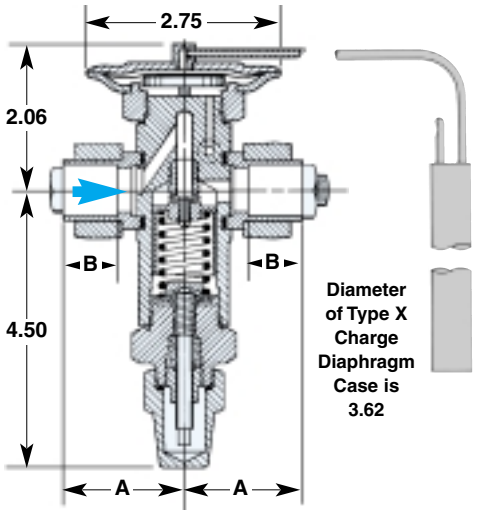
Outlet Connections	***Distributors***
5/8" ODF	1620, 1622, 1651(R)
7/8" ODF	1112, 1113, 1653(R)
1-1/8" ODF	1115, 1116, 1655(R)
"H" flange type	1109, 1110, 1124, 1192 (aluminum)

for complete details of construction, see page 36

SPECIFICATIONS — ELEMENT SIZE NO. 33, KNIFE EDGE JOINT

REFRIGERANT (Sporlan Code)	TYPE: Internal Equalizer ⑥	TYPE: External Equalizer ⑦	NOMINAL CAPACITY Tons of Refrigeration	Thermostatic Charges Available	Standard Tubing Length-Feet	CONNECTIONS – Inches ⑧ ODF Solder Flange. Blue figures are standard and will be furnished unless otherwise specified. INLET	CONNECTIONS – Inches ⑧ ODF Solder Flange. Blue figures are standard and will be furnished unless otherwise specified. OUTLET	Flange Ring Size OD x ID Inches ⑨	Net Weight-Lbs.	Shipping Weight-Lbs.
22 (V) 407C (N) 407A (V)	HV-2-1/2	HVE-2-1/2	**2-1/2**	Refer to Recommended Thermostatic Charges on Page 4	5	1/2 or 5/8	5/8 or 7/8	1.25 x 1.00	5	6
	HV-5-1/2	HVE-5-1/2	**5-1/2**			5/8 or 7/8	7/8 or 1-1/8			
	–	HVE-7	**7**							
	–	HVE-11	**11**							
	–	HVE-16	**16**			7/8	7/8 or 1-1/8			
	–	HVE-20	**20**							
134a (J) 12 (F) 401A (X) 409A (F)	HJ-1-1/2	HJE-1-1/2	**1-1/2**			1/2 or 5/8	5/8 or 7/8			
	HJ-3	HJE-3	**3**			5/8 or 7/8	7/8 or 1-1/8			
	HJ-4	HJE-4	**4**							
	HJ-5	HJE-5	**5**							
	–	HJE-8	**8**							
	–	HJE-12	**12**			7/8	7/8 or 1-1/8			
404A (S) 502 (R) 408A (R)	HS-1-1/2	HSE-1-1/2	**1-1/2**			1/2 or 5/8	5/8 or 7/8			
	HS-3	HSE-3	**3**			5/8 or 7/8	7/8 or 1-1/8			
	HS-4	HSE-4	**4**							
	–	HSE-6-1/2	**6-1/2**							
	–	HSE-9	**9**							
	–	HSE-12	**12**			7/8	7/8 or 1-1/8			
507 (P) 402A (L)	HP-1-1/2	HPE-1-1/2	**1-1/2**			1/2 or 5/8	5/8 or 7/8			
	HP-3	HPE-3	**3**			5/8 or 7/8	7/8 or 1-1/8			
	HP-4	HPE-4	**4**							
	–	HPE-6-1/2	**6-1/2**							
	–	HPE-9	**9**							
	–	HPE-12	**12**			7/8	7/8 or 1-1/8			

⑥ Valves listed in this column NOT AVAILABLE with MOP Type air conditioning charges.
⑦ Standard External Equalizer Connection 1/4" SAE Flare, 1/4" ODF Solder connection available on request.
⑧ ODF Solder indicates a female connection on the valve of proper diameter to receive copper tubing of corresponding OD size. Thus, 5/8" ODF will receive 5/8" OD tubing.
⑨ Kit K-1178 with two brass bushings is available for two purposes: 1) To allow the current Type H valve to replace obsolete Types T and H with 1.125" x 0.75" flange rings by mating with the smaller flange ring bushings and/or distributors. 2) To allow the Type H to use 1/2" FPT connections — Part number 225-002 and 1/2" socket weld connections — Part number 580-000. Order the appropriate 1/2" connections and one K-1178 per valve.



DIMENSIONS – Inches		
SOLDER BUSHING	A	B
1/2, 5/8, 7/8	2.00	0.88
1-1/8	2.06	0.94

BULB SIZES – Inches				
STANDARD CHARGES	REFRIGERANT			
	22	134a	404A	507
C	0.75 OD x 4.00	0.50 OD x 5.00	0.75 OD x 4.00	
Z & ZP Series	0.75 OD x 4.00	–	0.75 OD x 4.00	
X	0.75 OD x 4.00	–	0.75 OD x 4.00	
CP Series	0.75 OD x 4.00			–
VGA	0.75 OD x 4.00	–		

for Refrigerants 22-134a-404A-507 — ODF Solder-Flange Connections

for complete details of construction, see page 36

Sporlan Type M valve is a cast bronze body, externally adjustable valve with either ODF solder or FPT flange connections. The thermostatic element is replaceable, and the inlet connection has a permanent 12 mesh strainer. This valve type provides capacities greater than the Type H, and it is designed for both air conditioning and refrigeration applications. Flanges for the Type M valve are interchangeable with the Type V.

Refrigerant distributors that will mate directly to this valve are listed below. Refer to Sporlan Bulletin 20-10 for additional application information on this subject.

Outlet Connections	*Distributors*
1-1/8" ODF	1115, 1116, 1655(R)
1-3/8" ODF	1117, 1126, 1128, 1657(R)
1-5/8" ODF	1125, 1127, 1143, 1659(R)
"M/V" flange	1119, 1121, 1193 (aluminum)

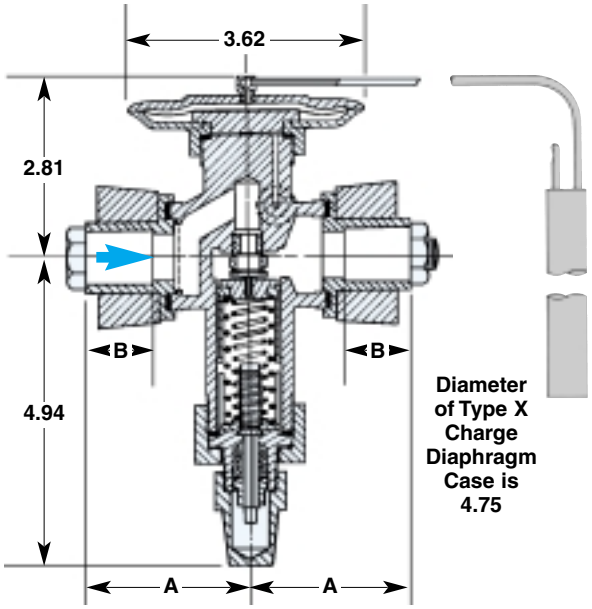
SPECIFICATIONS — ELEMENT SIZE NO. 63, GASKET JOINT

REFRIGERANT (Sporlan Code)	TYPE External Equalizer ⑦	NOMINAL CAPACITY Tons of Refrigeration	Thermostatic Charges Available	Blue figures are standard and will be furnished unless otherwise specified. Standard Tubing Length-Feet	⑩ CONNECTIONS – INCHES ⑪ ODF Solder Flange INLET	⑩ CONNECTIONS – INCHES ⑪ ODF Solder Flange OUTLET	Flange Ring Size OD x ID Inches	Net Weight-Lbs.	Shipping Weight-Lbs.
22 (V) 407C (N) 407A (V)	MVE-21	21	Refer to Recommended Thermostatic Charges on Page 4	5 10	7/8 or 1-1/8	1-1/8 1-3/8 or 1-5/8	1.75 x 1.25	8	9
	MVE-26	26							
	MVE-34	34							
	MVE-42	42			7/8 or 1-1/8				
134a (J) 12 (F) 401A (X) 409A (F)	MJE-15	15			7/8 or 1-1/8				
	MJE-20	20							
	MJE-25	25			7/8 or 1-1/8				
404A (S) 502 (R) 408A (R)	MSE-15	15			7/8 or 1-1/8				
	MSE-20	20							
	MSE-25	25							
	MSE-30	30			7/8 or 1-1/8				
507 (P) 402A (L)	MPE-15	15			7/8 or 1-1/8				
	MPE-20	20							
	MPE-25	25							
	MPE-30	30			7/8 or 1-1/8				

⑦ Standard External Equalizer Connection 1/4" SAE Flare. 1/4" ODF Solder connection available on request.
⑩ FPT connections also available on request; 1/2" FPT - Part Number 360-000, 3/4" FPT - Part Number 360-001, 1" FPT - Part Number 362-000.
⑪ ODF Solder indicates a female connection on the valve of proper diameter to receive copper tubing of corresponding OD size. Thus, 7/8" ODF will receive 7/8" OD tubing.

DIMENSIONS – Inches		
SOLDER BUSHING	A	B
7/8	2.38	0.88
1-1/8, 1-3/8	2.75	0.94
1-5/8	3.22	1.22

BULB SIZES – Inches				
STANDARD CHARGES	REFRIGERANT			
	22	134a	404A	507
C	0.88 OD x 6.00			
Z & ZP Series	0.88 OD x 6.00	–	0.88 OD x 6.00	
X	0.88 OD x 6.00	–	0.88 OD x 6.00	
CP Series	0.75 OD x 4.00			–
VGA	0.75 OD x 4.00	–		



TYPE V

for Refrigerants 22-134a-404A-507 — ODF Solder-Flange Connections

Sporlan Type V valve is a cast bronze body, externally adjustable valve available with either ODF solder or FPT flange connections. The thermostatic element is replaceable, and the inlet connection has a permanent 12 mesh strainer. This valve features a dual port semi-balanced design, and it is designed for both air conditioning and refrigeration applications. A synthetic seating surface provides tight shut-off during system off periods. This valve provides greater capacities than the Type M. Flanges for the Type V valve are interchangeable with the Type M.

Refrigerant distributors that will mate directly to this valve are listed below. Refer to Sporlan Bulletin 20-10 for additional application information on this subject.

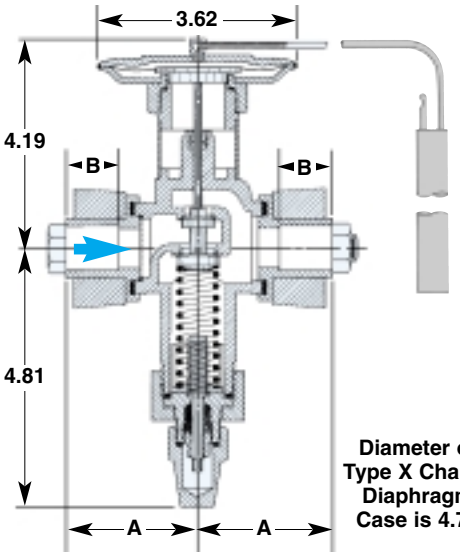
Outlet Connections	*Distributors*
1-3/8" ODF	1117, 1126, 1128, 1657(R)
1-5/8" ODF	1125, 1127, 1143, 1659(R)
"M/V" flange	1119, 1121, 1193 (aluminum)

for complete details of construction, see page 36

SPECIFICATIONS — ELEMENT SIZE NO. 63, GASKET JOINT

REFRIGERANT (Sporlan Code)	TYPE External Equalizer ⑦	NOMINAL CAPACITY Tons of Refrigeration	Thermostatic Charges Available	Blue figures are standard and will be furnished unless otherwise specified. Std. Tubing Lgth.-Ft.	⑩ CONNECTIONS – Inches ⑪ ODF Solder Flange INLET	OUTLET	Flange Ring Size OD x ID Inches	Net Weight-Lbs.	Shipping Weight-Lbs.
22 (V) 407C (N) 407A (V)	VVE-52	52	Refer to Recommended Thermostatic Charges on Page 4	5 10	1-1/8 or 1-3/8	1-1/8 or 1-3/8 1-5/8	1.75 x 1.25	9	10
	VVE-70	70							
	VVE-100	100							
134a (J) 12 (F) 401A (X) 409A (F)	VJE-35	35							
	VJE-45	45							
	VJE-55	55							
404A (S) 502 (R) 408A (R)	VSE-38	38							
	VSE-50	50							
	VSE-70	70							
507 (P) 402A (L)	VPE-38	38							
	VPE-50	50							
	VPE-70	70							

⑦ Standard External Equalizer Connection 1/4" SAE Flare. 1/4" ODF Solder connection available on request.
⑩ FPT connections also available on request; 1/2" FPT - Part Number 360-000, 3/4" FPT - Part Number 360-001, 1" FPT - Part Number 362-000.
⑪ ODF Solder indicates a female connection on the valve of proper diameter to receive copper tubing of corresponding OD size. Thus, 7/8" ODF will receive 7/8" OD tubing.



Diameter of Type X Charge Diaphragm Case is 4.75

DIMENSIONS – Inches		
SOLDER BUSHING	A	B
7/8	2.38	0.88
1-1/8, 1-3/8	2.75	0.94
1-5/8	3.22	1.22

BULB SIZES – Inches				
STANDARD CHARGES	REFRIGERANT			
	22	134a	404A	507
C	0.88 OD x 6.00			
Z & ZP Series	0.88 OD x 6.00	–	0.88 OD x 6.00	
X	0.88 OD x 6.00	–	0.88 OD x 6.00	
CP Series	0.75 OD x 4.00			–
VGA	0.75 OD x 4.00	–		

for Refrigerants 22-134a — ODF Solder-Flange Connections

for complete details of construction, see page 36

Sporlan Type W valve is a cast bronze body, externally adjustable valve available with ODF solder flange connections. The thermostatic element is replaceable, and the inlet connection has a permanent 12 mesh strainer. This valve features a dual port semi-balanced design, and it is designed primarily for large capacity chillers. A synthetic seating surface provides tight shut-off during system off periods. This valve provides the largest capacities available for flange connection TEVs.

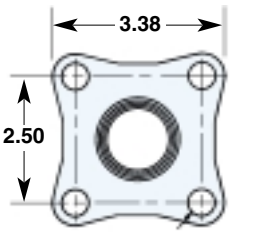
Refrigerant distributors that will mate directly to this valve are listed below. Refer to Sporlan Bulletin 20-10 for additional application information on this subject.

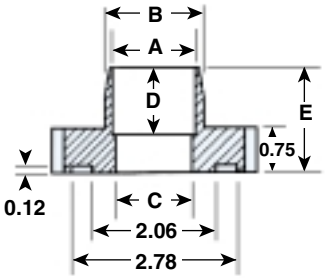
Outlet Connections	*Distributors*
1-3/8" ODF	1117, 1126, 1128, 1657(R)
1-5/8" ODF	1125, 1127, 1143, 1659(R)

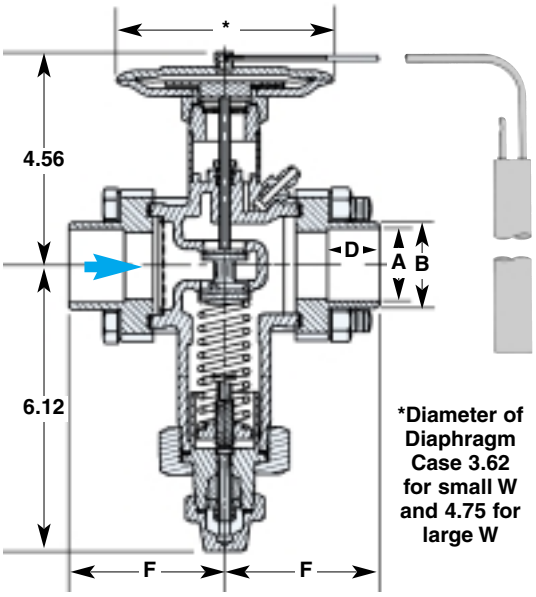
SPECIFICATIONS — ELEMENT SIZE NO.'s 63 and 7, GASKET JOINT

REFRIGERANT (Sporlan Code)	TYPE External Equalizer ⑦	NOMINAL CAPACITY Tons of Refrigeration	Thermostatic Charges Available	Element Size No.	Blue figures are standard and will be furnished unless otherwise specified. Std. Tubing Lgth.-Ft.	CONNECTIONS – Inches ⑫ ODF Solder Flange INLET	CONNECTIONS – Inches ⑫ ODF Solder Flange OUTLET	Flange Ring Size OD x ID Inches ⑮	Net Weight-Lbs.	Shipping Weight-Lbs.
22 (V) 407C (N) 407A (V)	WVE-135	**135**	⑬	63	**10**	1-1/8	1-1/8	2.75 x 2.19	10	11
	WVE-180	**180**	G only	7		1-3/8	1-3/8			
134a (J) 12 (F) 401A (X) 409A (F)	WJE-80	**80**	⑬	63		**1-5/8** or 2-1/8	1-5/8 or **2-1/8**			
	WJE-110	**110**	G only	7						

⑦ Standard External Equalizer Connection 1/4" SAE Flare, 1/4" ODF Solder connection available on request.
⑫ ODF Solder indicates a female connection on the valve of proper diameter to receive copper tubing of corresponding OD size. Thus, 1-1/8" ODF will receive 1-1/8" OD tubing.
⑬ Refer to Recommended Thermostatic Charges, Page 4.
⑮ For 1-1/2" NPT connections, order flanges separately for MA42 solenoid eg P/N 933-1. The customer must supply 5/8" diameter x 6" long bolts and 5/8" diameter nuts.







*Diameter of Diaphragm Case 3.62 for small W and 4.75 for large W

DIMENSIONS – Inches						
CONNECTIONS	A	B	C	D	E	F
1-1/8	1.12	1.27	1.06	0.91	1.56	3.09
1-3/8	1.38	1.53	1.28	0.97	1.62	3.16
1-5/8	1.62	1.78	1.50	1.09	1.75	3.28
2-1/8	2.12	2.44	1.94	1.34	1.53	3.25

BULB SIZES – Inches			
ELEMENT SIZE NO.	STANDARD CHARGES	REFRIGERANT 22	REFRIGERANT 134a
63	C	0.88 OD x 6.00	
	Z & ZP Series	0.88 OD x 6.00	–
	X	0.88 OD x 6.00	–
	CP Series	0.75 OD x 4.00	
	VGA	0.75 OD x 4.00	–
7	G	0.75 OD x 4.00	–

TYPE D

for Refrigerant 717 Ammonia — FPT Flange Connections

Sporlan Type D valve is a gray cast iron body, externally adjustable valve available with either FPT or socket weld flange connections. The thermostatic element is replaceable, and all internal parts are serviceable. An optional XD-074 (1/2'' FPT) external inlet strainer may be ordered with this valve. This valve type provides the smallest capacity TEVs for ammonia service. The nominal 1 and 2 ton Type D valves are identical with the exception of their discharge tubes. One of these valves can be converted to the other by exchanging the discharge tubes. The nominal 10 and 15 ton Type D valves are also identical with the exception of their discharge tubes, and may be converted to each other by exchanging discharge tubes.

Refrigerant distributors that will mate directly to this valve are listed below. Refer to Sporlan Bulletin 20-10 for additional application information on this subject. Note: The discharge tubes must be removed when a refrigerant distributor is applied to the valves.

for complete details of construction, see page 36

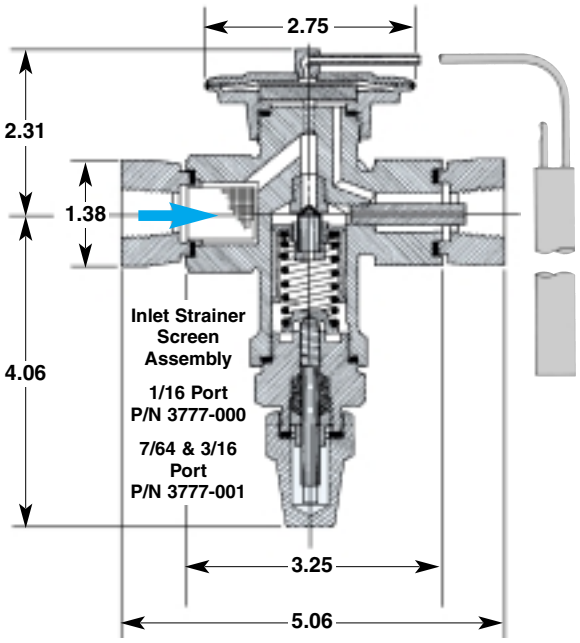
Refer to Sporlan Catalog 717 for complete information on Sporlan's line of products for ammonia refrigeration systems.

Outlet Connections	***Distributors***
"D" flange	1130, 1132, 1133, 1180 (aluminum) 1182 (aluminum)

SPECIFICATIONS — ELEMENT SIZE NO. 23, GASKET JOINT

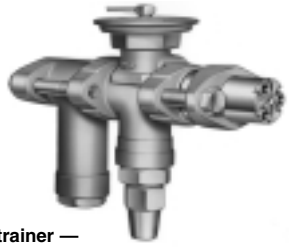
TYPE		NOMINAL CAPACITY Tons of Refrigeration	Port Size Inches	Discharge Tube Orifice Inches	⑬ Thermostatic Charges Available	Blue figures are standard and will be furnished unless otherwise specified.			Flange Ring Size OD X ID Inches	Net Weight-Lbs.	Shipping Weight-Lbs.
Internal Equalizer	External Equalizer 1/8" FPT					Std. Tubing Lgth.-Ft.	CONNECTIONS – Inches ⑭ FPT				
							INLET	OUTLET			
DA-1	DAE-1	1	1/16	1/32	C-Z-L	5 10 15	1/4, 3/8 or 1/2		1.12 x 0.75	8	9
DA-2	DAE-2	2	1/16	1/16							
DA-5	DAE-5	5	7/64	5/64							
DA-10	DAE-10	10	3/16	7/64							
DA-15	DAE-15	15	3/16	5/32							

⑬ Refer to Page 4 for Application Recommendations.
⑭ Socket weld connections available upon request.



BULB SIZES – Inches	
CHARGES	REFRIGERANT
	717 - Ammonia
C - Z - L	0.75 x 4.00

Compact combination of XD Strainer — MA5A3 Solenoid Valve — DA Thermostatic Expansion Valve & 1130 Steel Distributor



Types XD Strainer — DA Thermostatic Expansion Valve & 1132 Steel Distributor

for Refrigerant 717 – Ammonia — FPT Flange Connections

Sporlan Type A valve is a gray cast iron body, externally adjustable valve with either FPT or socket weld flange connections. The thermostatic element is replaceable. An optional 8004 (1/2'' FPT) or 8006 (3/4'' FPT) strainer may be ordered with this valve. This valve provides the largest capacity TEVs for ammonia service.

The nominal 20 and 30 ton Type A valves are identical with the exception of their discharge tubes. One of these valves can be converted to the other by exchanging their discharge tubes. The nominal 75 and 100 ton Type A valves do not employ a discharge tube, nor are their outlets tapped to receive one.

Refrigerant distributors that will mate directly to this valve are listed below. Refer to Sporlan Bulletin 20-10 for additional application information on this subject. Note that the discharge tube must be removed from the nominal 20, 30, and 50 ton Type A valves when a refrigerant distributor is applied.

for complete details of construction, see page 36

Outlet Connections
"A" flange

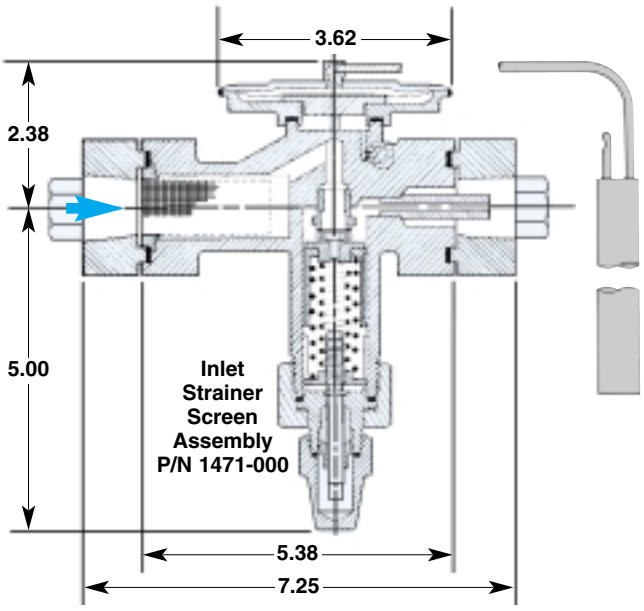
Distributors
1138, 1185 (aluminum)

Refer to Sporlan Catalog 717 for complete information on Sporlan's line of products for ammonia refrigeration systems.

SPECIFICATIONS — **ELEMENT SIZE NO. 12, GASKET JOINT**

TYPE		NOMINAL CAPACITY Tons of Refrigeration	Port Size Inches	Discharge Tube Orifice Inches	Thermostatic Charges Available	Blue figures are standard and will be furnished unless otherwise specified.			Flange Ring Size OD x ID Inches	Net Weight-Lbs.	Shipping Weight-Lbs.
Internal Equalizer	External Equalizer 1/8" FPT					Std. Tubing Lgth.-Ft.	CONNECTIONS – Inches ⑭ FPT				
							INLET	OUTLET			
AA-20	AAE-20	**20**	5/16	1/8	L Only	10	1/2, 3/4 or 1		1.75 x 1.25	10	11
AA-30	AAE-30	**30**	5/16	5/32							
AA-50	AAE-50	**50**	3/8	3/16		15					
AA-75	AAE-75	**75**	3/8	–			3/4 or 1				
AA-100	AAE-100	**100**	7/16	–							

⑭ Socket weld connections available upon request.



BULB SIZES – Inches	
CHARGE	REFRIGERANT
	717 - Ammonia
L - Only	0.88 OD x 6.00

8004 Strainer – AA Thermostatic Expansion Valve & 1185 Aluminum Distributor

MATERIALS & DETAILS OF CONSTRUCTION

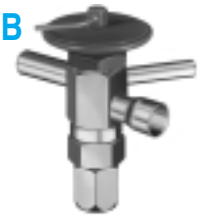
<table>
<tr><th>VALVE TYPE</th><th>BODY</th><th>SEAT</th><th>PIN</th><th>PIN CARRIER</th><th>PUSHROD(S)</th><th>TYPE OF JOINTS</th><th>CONNECTIONS</th><th>INLET STRAINER</th></tr>
<tr><td>NI</td><td rowspan="7">Machined Brass Bar</td><td rowspan="2">Monel</td><td rowspan="13">Stainless Steel</td><td rowspan="10">Brass</td><td>Triangular Stainless Steel</td><td rowspan="19">Knife Edge, Metal to Metal</td><td>SAE Flare, Inlet Fitting Silver Soldered to Body</td><td>Removable Strainer Screen</td></tr>
<tr><td>RI</td><td rowspan="6">Stainless Steel</td><td rowspan="2">SAE Flare Fittings Silver Soldered to Body</td><td>No Strainer</td></tr>
<tr><td>F</td><td rowspan="5">Brass</td><td>Removable Strainer Screen</td></tr>
<tr><td>EF</td><td>Extended Copper Fittings Silver Soldered to Body</td><td>Insert Strainer</td></tr>
<tr><td>Q</td><td>SAE Flare Fittings Silver Soldered to Body</td><td rowspan="3">Removable Strainer Screen</td></tr>
<tr><td>SQ</td><td rowspan="2">Extended Copper Fittings Silver Soldered to Body</td></tr>
<tr><td>EQ</td><td>Insert Strainer</td></tr>
<tr><td>G</td><td rowspan="3">Brass Forging</td><td rowspan="4">Monel</td><td rowspan="4">Internally Equalized: Triangular Stainless Steel

Externally Equalized: Round Stainless Steel</td><td>SAE Flare, Integral Part of Brass Forged Body</td><td rowspan="4">Removable Strainer Screen</td></tr>
<tr><td>EG</td><td>Extended Copper Fittings Silver Soldered to Body</td></tr>
<tr><td>C</td><td>SAE Flare, Integral Part of Brass Forged Body</td></tr>
<tr><td>S</td><td rowspan="8">Machined Brass Bar</td><td>Wrought Copper Fittings Silver Soldered to Body</td><td>Coarse Mesh Strainer Disc</td></tr>
<tr><td>BF</td><td rowspan="3">Brass</td><td rowspan="9">—</td><td rowspan="11">Stainless Steel</td><td>SAE Flare Fittings Silver Soldered to Body</td><td rowspan="2">Removable Strainer Screen</td></tr>
<tr><td>SBF</td><td rowspan="3">Extended Copper Fittings Silver Soldered to Body</td></tr>
<tr><td>EBF</td><td>Insert Strainer</td></tr>
<tr><td>EBS</td><td rowspan="3">Brass Port Machined In Body</td><td rowspan="3">Brass Piston With Synthetic Seating Surface</td><td rowspan="5">Coarse Mesh Strainer Disc</td></tr>
<tr><td>SMALL O</td><td rowspan="2">Wrought Copper Fittings Silver Soldered to Body</td></tr>
<tr><td>LARGE O</td><td rowspan="2">Knife Edge At Element and Bottom Cap Gasket At Seal Cap</td></tr>
<tr><td>H</td><td rowspan="2">Stainless Steel or Brass</td><td rowspan="2">Stainless Steel</td><td rowspan="2">Brass</td><td rowspan="4">Solder-Flange, Pipe Flange</td></tr>
<tr><td>M</td><td rowspan="3">Bronze Casting</td><td rowspan="3">Gasket</td></tr>
<tr><td>V</td><td>Dual Port, Seats Machined In Valve Body</td><td>Bronze Piston With Synthetic Seating Surface</td><td>—</td></tr>
<tr><td>W</td><td rowspan="2">Gray Iron Casting</td><td rowspan="2">Stainless Steel or Steel Alloy</td><td>Tungsten Carbide</td><td rowspan="2">Stainless Steel</td><td rowspan="2">Pipe Flange, Socket Weld</td><td rowspan="2">Removable Strainer Screen</td></tr>
<tr><td>D</td><td rowspan="2">Stainless Steel</td><td rowspan="2">20 & 30 Ton: Tungsten Carbide
50, 75, & 100 Ton: Stainless Steel</td></tr>
<tr><td>A</td></tr>
</table>

NOTE: Materials and Construction specifications listed on this page may change without notice. Contact Sporlan Valve Company for current specifications on materials and other details of construction.

OEM TYPE THERMOSTATIC EXPANSION VALVES

In addition to the standard line of Thermostatic Expansion Valves listed in this bulletin, special valve types are also available to fill manufacturers' specific requirements. Listed below are examples of valves that are supplied for quantity orders.

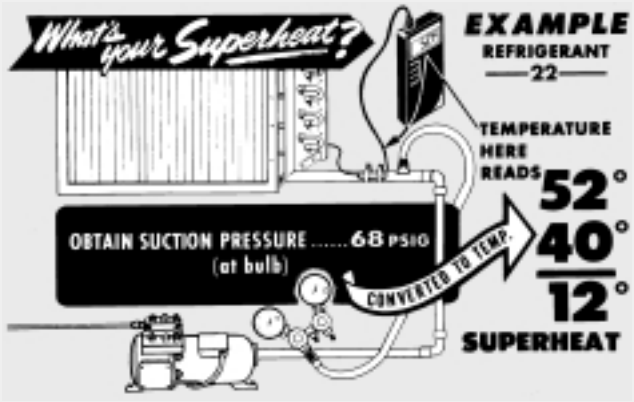
VALVE TYPE	CONNECTION TYPE	VALVE DESCRIPTION and APPLICATION	TYPICAL REPLACEMENT TEVs
BI/BBI 	SAE Flare or ODF Solder	Small brass body valve available with either angle style or straight through connections. Type BI valves with straight through connections are normally supplied non-adjustable. The Type BBI is a Type BI valve modified to incorporate balanced port construction. The thermostatic element is not replaceable on valves manufactured prior to 1994. Current models use a replaceable No. 43 element. Typical applications: small capacity R-22 air conditioning and heat pump systems.	RI, G, EG, C, S, Q, SQ, EQ
Y997-BI 	SAE Flare or ODF Solder	Type BI valve modified to incorporate an internal check valve and bypass tube to allow for *reverse* flow with heat pump applications. The valve is not adjustable. The thermostatic element is not replaceable on valves manufactured prior to 1994. Current models use a replaceable No. 43 element. Typical applications: small capacity R-22 heat pump systems.	RI, G, EG, C, S, Q, SQ, EQ Note: A check valve must be installed around the TEV to allow flow in the reverse direction.
I 	SAE Flare or ODF Solder	Small brass body valve available with either angle style or straight through connections. Type I valves with straight through connections are normally supplied non-adjustable. Current models use a replaceable No. 43 element. This valve is available with the Rapid Pressure Balancer (RPB) feature for off-cycle pressure equalization. Typical applications: small capacity R-22 air conditioning and heat pump systems.	RI, G, EG, C, S, Q, SQ, EQ
CBI/CBBI 	SAE Flare or ODF Solder	Type BI/BBI valves modified to incorporate an internal check valve to allow for *reverse* flow with heat pump applications. Type CBI/CBBI valves with straight through connections are normally supplied non-adjustable. The valve uses a replaceable No. 43 element. Typical applications: small capacity R-22 heat pump systems.	RI, G, EG, C, S, Q, SQ, EQ Note: A check valve must be installed around the TEV to allow flow in the reverse direction.
FB 	SAE Flare or ODF Solder	Small brass body valve available only with straight through connections and external adjustment. The thermostatic element is not replaceable on valves manufactured prior to 1994. Current models use a replaceable No. 43 element. Typical applications: small capacity air conditioning and refrigeration applications where an external adjustment is desired.	RI, G, EG, C, S, Q, SQ, EQ
X 	SAE Flare or ODF Solder	Brass body valve available with either angle style or straight through connections. Angle style valve is available only with SAE flare connections. Type X valves with straight through connections are normally supplied non-adjustable. The thermostatic element is a replaceable type, size number 53. This valve is available with the Rapid Pressure Balancer (RPB) feature in certain nominal capacities for off-cycle pressure equalization. Typical applications: R-22 air conditioning and heat pump systems.	RI, G, EG, C, S, Q, SQ, EQ

FEATURES NOT INCLUDED IN THIS BULLETIN

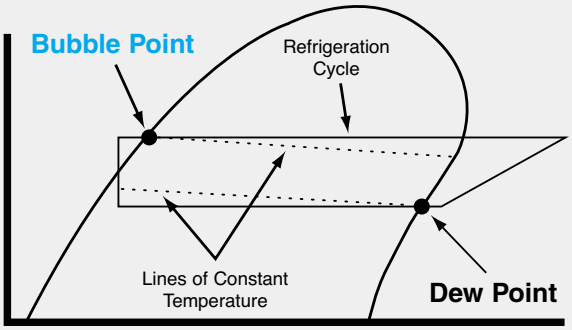
Special features such as non-adjustable construction or similar modifications are also available for both standard and special valves when ordered in reasonable quantities.

Automatic (constant pressure) expansion valves are also available on special order.

If you have a special valve application, contact your Sporlan Sales Engineer or Sporlan Valve Company, 206 Lange Drive, Washington, Missouri 63090, 636-239-1111.



P-H DIAGRAM — BLENDS



To determine superheat, use **Dew Point** values.
To determine subcooling, use **Bubble Point** values.

PRESSURE TEMPERATURE CHART

PSIG	Temperature, °F												
	Yellow	Green	Blue	Pink	Sand	Orange	Green	Lt. Brown	Purple	Yellow	Purple	Teal	White
	REFRIGERANT (Sporlan Code)												
	12(F)	22(V)	134a(J)	MP39 401A(X)	HP80 402A(L)	HP62 404A(S)	KLEA 60 407A(V)	9000 KLEA 66 407C(N)	FX-10 408A(R)	FX-56 409A(F)	502(R)	507(P)	717(A)
5*	-38	-56	-31	-32	-67	-65	-52	-48	-62	-30	-65	-66	-42
4*	-34	-53	-27	-28	-64	-62	-49	-45	-58	-27	-61	-63	-39
3*	-31	-50	-24	-25	-61	-59	-46	-42	-55	-23	-58	-60	-36
2*	-28	-47	-21	-22	-58	-56	-43	-39	-52	-20	-55	-57	-33
1*	-24	-44	-18	-19	-55	-53	-41	-36	-49	-17	-52	-55	-30
0	-22	-41	-15	-16	-53	-51	-38	-34	-47	-15	-50	-52	-28
1	-19	-39	-12	-13	-50	-48	-36	-31	-44	-12	-47	-50	-26
2	-16	-36	-10	-11	-48	-46	-33	-29	-42	-9	-45	-47	-23
3	-14	-34	-8	-9	-45	-43	-31	-27	-39	-7	-42	-45	-21
4	-11	-32	-5	-6	-43	-41	-29	-24	-37	-5	-40	-43	-19
5	-9	-30	-3	-4	-41	-39	-27	-22	-35	-2	-38	-41	-17
6	-7	-28	-1	-2	-39	-37	-25	-20	-33	0	-36	-39	-15
7	-4	-26	1	0	-37	-35	-23	-18	-31	2	-34	-37	-13
8	-2	-24	3	2	-36	-33	-21	-17	-29	4	-32	-35	-12
9	0	-22	5	4	-34	-32	-20	-15	-27	6	-30	-34	-10
10	2	-20	7	6	-32	-30	-18	-13	-26	8	-29	-32	-8
11	4	-19	8	8	-30	-28	-16	-12	-24	9	-27	-30	-7
12	5	-17	10	9	-29	-27	-15	-10	-22	11	-25	-29	-5
13	7	-15	12	11	-27	-25	-13	-8	-21	13	-24	-27	-4
14	9	-14	13	13	-26	-23	-12	-7	-19	14	-22	-25	-2
15	11	-12	15	14	-24	-22	-10	-5	-18	16	-20	-24	-1
16	12	-11	16	16	-23	-20	-9	-4	-16	18	-19	-23	1
17	14	-9	18	17	-21	-19	-8	-3	-15	19	-18	-21	2
18	16	-8	19	19	-20	-18	-6	-1	-13	21	-16	-20	3
19	17	-7	21	20	-19	-16	-5	0	-12	22	-15	-18	4
20	19	-5	22	21	-17	-15	-4	1	-11	23	-13	-17	6
21	20	-4	24	23	-16	-14	-2	3	-9	25	-12	-16	7
22	21	-3	25	24	-15	-12	-1	4	-8	26	-11	-15	8
23	23	-1	26	25	-14	-11	0	5	-7	27	-9	-13	9
24	24	0	27	27	-12	-10	1	6	-5	29	-8	-12	10
25	26	1	29	28	-11	-9	2	8	-4	30	-7	-11	11
26	27	2	30	29	-10	-8	4	9	-3	31	-6	-10	13
27	28	4	31	30	-9	-6	5	10	-2	32	-5	-9	14
28	30	5	32	32	-8	-5	6	11	-1	34	-3	-8	15
29	31	6	33	33	-7	-4	7	12	0	35	-2	-6	16
30	32	7	35	34	-6	-3	8	13	1	36	-1	-5	17
31	33	8	36	35	-5	-2	9	14	3	37	0	-4	18
32	34	9	37	36	-4	-1	10	15	4	38	1	-3	19
33	36	10	38	37	-2	0	11	16	5	39	2	-2	20
34	37	11	39	38	-1	1	12	17	6	40	3	-1	21
35	38	12	40	39	0	2	13	18	7	41	4	0	22
36	39	13	41	40	0	3	14	19	8	42	5	1	22
37	40	14	42	41	1	4	15	20	9	44	6	2	23
38	41	15	43	43	2	5	16	21	10	45	7	3	24
39	42	16	44	44	3	6	17	22	11	46	8	4	25

BUBBLE POINT ↓ 30 31 32 33

*Inches mercury below one atmosphere

PRESSURE TEMPERATURE CHART

PSIG	Temperature, °F												
	Yellow	Green	Blue	Pink	Sand	Orange	Green	Lt. Brown	Purple	Yellow	Purple	Teal	White
	REFRIGERANT (Sporlan Code)												
	12(F)	22(V)	134a(J)	MP39 401A(X)	HP80 402A(L)	HP62 404A(S)	KLEA 60 407A(V)	9000 KLEA 66 407C(N)	FX-10 408A(R)	FX-56 409A(F)	502(R)	507(P)	717(A)
40	43	17	45	44 34	4	7	18	23	12	47 32	9	5	26
42	45	19	47	46 36	6	9	19	25	13	48 34	11	6	28
44	47	21	49	48 38	8	10	21	26	15	50 36	13	8	29
46	49	23	51	50 40	10	12	23	28	17	38	15	10	31
48	51	24	52	42	11	14	24	30	19	39	16	12	32
50	53	26	54	44	13	16	26	31	20	41	18	13	34
52	55	28	56	45	14	17	28	33	22	43	20	15	35
54	57	29	57	47	16	19	29	34	24	45	21	16	37
56	59	31	59	49	18	20	31	36	25	46	23	18	38
58	60	32	60	50	19	22	32	37	27	48	24	19	40
60	62	34	62	52	20	23	33	39	28	50	26	21	41
62	64	35	64	53	22	25	35	40	30	51	27	22	42
64	65	37	65	55	23	26	36	42	31	53	29	24	44
66	67	38	66	56	25	27	38	43 32	32 32	54	30	25	45
68	68	40	68	58	26	29	39	44 33	34 33	56	32	27	46
70	70	41	69	59	27	30	40	46 34	35 34	57	33	28	47
72	71	42	71	61	29	32 31	41 31	47 36	37 36	58	34	29	49
74	73	44	72	62	30	33 32	43 32	48 37	38 37	60	36	30	50
76	74	45	73	64	31	34 33	44 34	49 38	39 38	61	37	32	51
78	76	46	75	65	32	35 34	45 35	51 39	40 40	63	38	33	52
80	77	47	76	66	34 31	37 36	46 36	41	42 41	64	40	34	53
85	81	51	79	69	37 34	40 39	49 39	44	45 44	67	43	37	56
90	84	53	82	73	40 37	42 42	52 42	46	48 47	70	46	40	59
95	87	56	85	76	42 40	45 44	45	49	50 50	73	49	43	61
100	90	59	88	78	45 43	48 47	47	52	52	76	51	46	64
105	93	62	90	81	48 45	51 50	50	54	55	79	54	48	66
110	96	64	93	84	50 48	52	53	57	57	82	57	51	68
115	99	67	96	87	50	55	55	59	60	84	59	53	71
120	102	69	98	89	53	57	57	62	62	87	62	56	73
125	104	72	100	92	55	59	60	64	65	89	64	58	75
130	107	74	103	94	57	62	62	66	67	92	67	60	77
135	109	76	105	96	60	64	64	69	69	94	69	62	79
140	112	78	107	99	62	66	66	71	71	96	71	64	81
145	114	81	109	101	64	68	68	73	73	99	73	67	83
150	117	83	112	103	66	70	70	75	76	101	75	69	85
155	119	85	114	105	68	72	72	77	78	103	77	71	86
160	121	87	116	108	70	74	74	79	80	105	80	73	88
165	123	89	118	110	72	76	76	81	81	107	82	74	90
170	126	91	120	112	74	78	78	82	83	109	83	76	92
175	128	92	121	114	75	80	80	84	85	111	85	78	93
180	130	94	123	116	77	82	81	86	87	113	87	80	95
185	132	96	125	117	79	83	83	88	89	115	89	82	96
190	134	98	127	119	81	85	85	90	91	117	91	83	98
195	136	100	129	121	82	87	87	91	92	119	93	85	99
200	138	101	130	123	84	88	88	93	94	121	95	87	101
205	140	103	132	125	86	90	90	95	96	123	96	88	102
210	141	105	134	126	87	92	91	96	97	124	98	90	104
220	145	108	137	130	91	95	94	99	100	128	101	93	107
230	149	111	140	133	94	98	97	102	104	131	104	96	110
240	152	114	143	136	97	101	100	105	106	134	108	99	112
250	155	117	146	139	99	104	103	108	109	137	111	102	115
260	159	120	149	143	102	107	106	111	112	141	114	105	117
275	163	124	153	147	106	111	110	115	116	145	118	109	121
290	168	128	157	151	110	115	114	119	120	149	122	112	124
305	172	132	161	155	114	118	117	123	124	153	126	116	128
320	176	136	165	159	118	122	121	126	128	157	130	120	131
335	181	139	169	163	121	125	124	130	131	161	133	123	134
350	184	143	172	167	124	129	128	133	135	165	137	126	137
365	188	146	176	170	128	132	131	137	138	169	141	129	140

DEW POINT ↑ BUBBLE POINT ↓

*Inches mercury below one atmosphere

SPORLAN VALVE COMPANY
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www.sporlan.com