

V46 Series Pressure-Actuated Water-Regulating Valves

The V46 pressure-actuated modulating valves come in two types of control action: direct acting or reverse acting. Direct-acting V46 valves are typically used for regulating refrigerant head pressure in water-cooled condensers. Reverse-acting V46N valves are typically used for bypass service on refrigeration systems and heat pump applications. Commercial V46 valves may be used with standard non-corrosive refrigerants. V46 models are also available for ammonia refrigerant. For applications where the coolant may be corrosive to the valve trim, maritime models are available, which have nickel copper (monel) valve trim.

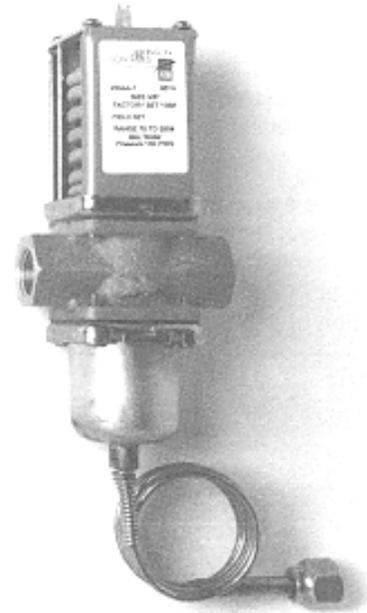


Figure 1: V46 Pressure-Actuated Water-Regulating Valve

Features and Benefits	
<input type="checkbox"/> No Close Fitting or Sliding Parts in Water Passages	Provides robust control in less than ideal conditions
<input type="checkbox"/> Corrosion Resistant Material for Parts that Come in Direct Contact with Water	Promotes longer valve life
<input type="checkbox"/> Accessible Range Spring	Allows easy manual flushing, if required
<input type="checkbox"/> Take-apart Construction	Interior of valves accessible without removing valve from refrigeration system or pumping down
<input type="checkbox"/> Pressure-balanced Design	Valve maintains consistent setpoint against both gradual and sudden water pressure changes

Application Overview

The V46 direct-acting models open on an increase in pressure. Models A, B, and C are typically used for regulating water-cooled condensers, while the low flow “D” model is generally used in ice machines. The reverse-acting V46N valve model closes on an increase in pressure and is typically used for bypass service on refrigeration systems and heat pumps that control water temperature.

Commercial V46 valves are available in 3/8 in. through 2-1/2 in. sizes. Commercial all range models (3/8 through 1-1/2 in.), may be used with standard non-corrosive refrigerants, or ammonia refrigerant applications, depending on the model.

V46 series valves also come in models designed for Navy or maritime salt water applications. These valve bodies are constructed of bronze, and any metal parts that come into contact with salt water are constructed of nickel copper (monel), which withstands the corrosive action of salt water.

IMPORTANT: All V46 Series water regulating valves are designed for use **only** as operating devices. Where system closure, improper flow, or loss of pressure due to valve failure can result in personal injury and/or loss of property, a separate pressure relief or safety shutoff valve, as applicable, must be added by the user.

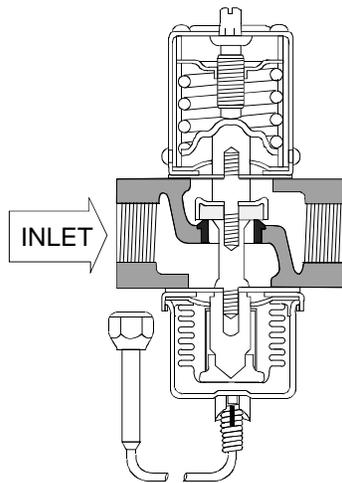


Figure 2: Threaded Type Direct-Acting Valve Cross Section

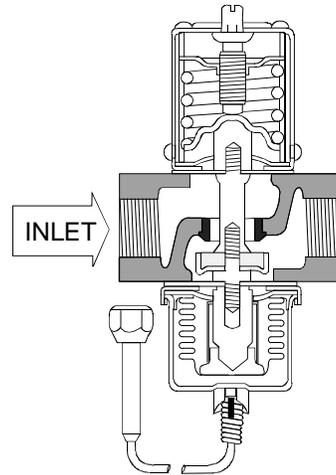


Figure 3: Threaded Type Reverse-Acting Valve Cross Section

Valve Sizing

Follow Steps 1 through 3, and use the information obtained to locate a point on one of the flowcharts found under *V46 Flowcharts* that satisfies all three steps.

1. Determine maximum water flow required using tables provided by the manufacturer of the condensing unit, or calculate the flow using the following formula:

$$\text{Flow (GPM)} = \frac{\text{Tons of Refrigeration} \times 15,000}{500 \times (\text{Outlet} - \text{Inlet Temperature})}$$

Note: If the outlet water temperature is unknown, assume it to be 10°F below the condensing temperature.

Example: A 9 ton capacity system has an inlet water temperature of 65°F and an outlet water temperature of 95°F. The maximum required water flow is:

$$\text{Flow (GPM)} = \frac{9 \times 15,000}{500 \times (95 - 65)} = 9 \text{ GPM}$$

2. Determine refrigerant head pressure rise above the valve opening point.
 - a. Valve closing point (to assure closure under all conditions) must be the refrigerant pressure equivalent to the highest ambient air temperature the equipment will be subjected to in the off cycle. Read this in psig from a “Saturated Vapor Table” for the refrigerant selected.

- b. To determine the valve opening point, add about 7 psig (48 kPa) to the closing point.
 - c. From the same table, read the operating head pressure corresponding to the selected condensing temperature.
 - d. Subtract the valve opening point from the operating head pressure. This gives the head pressure rise.
3. Determine water pressure drop across the valve. This is the pressure actually available to force water through the valve.
 - a. Determine minimum water pressure available from city mains or other sources.
 - b. From condensing unit manufacturer's tables, read the pressure drop through condenser corresponding to the required flow.
 - c. To the value found in 3b, add the estimated or calculated drop through installed piping.
 - d. Subtract the total condenser, piping, and static head (if applicable) pressure drop from the available water pressure found in 3a. This is the available pressure drop across the valve.
 4. Select the proper valve size from the V46 flowcharts by locating a point on a chart that will satisfy the flow, the head pressure rise above opening point, and the pressure drop across the valve.

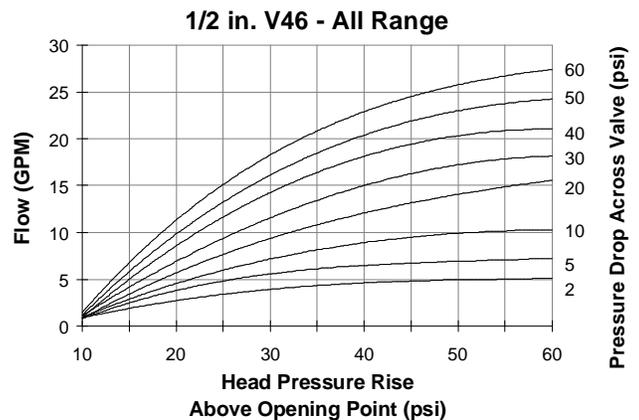
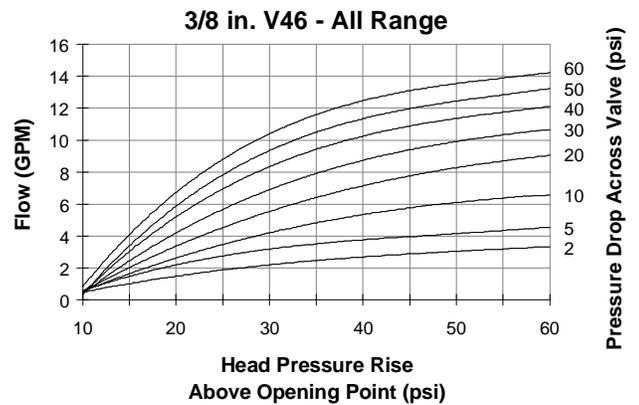
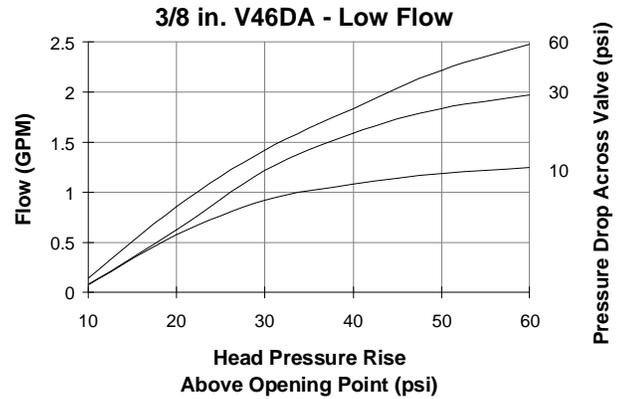
Example: The required flow for a low-range system is found to be 27 GPM. Condensing pressure is 125 psig, and the maximum ambient temperature is estimated at 86°F. City water pressure is 40 psig and the manufacturer's table gives a pressure drop through the condenser and the accompanying piping and valves at 15 psi. Drop through the installed piping is approximately 4 psi.

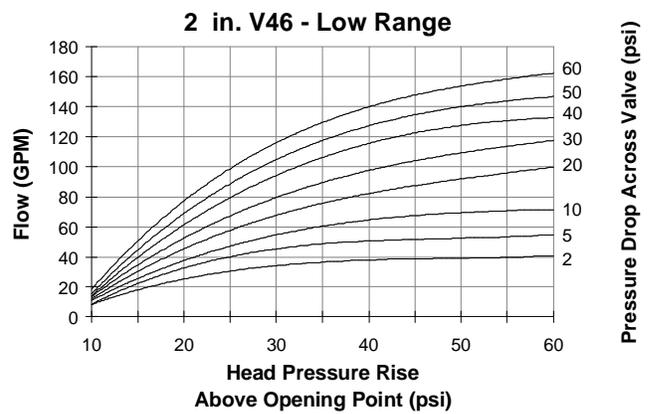
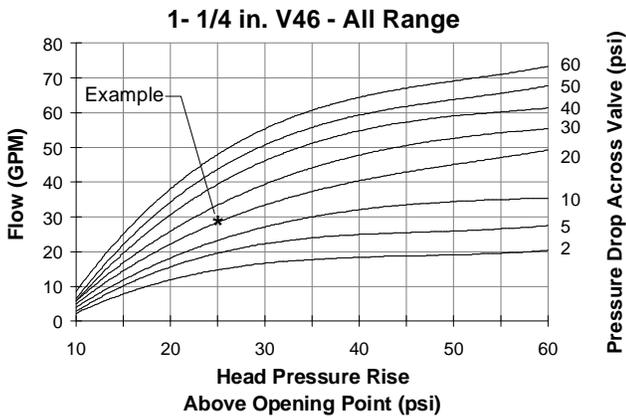
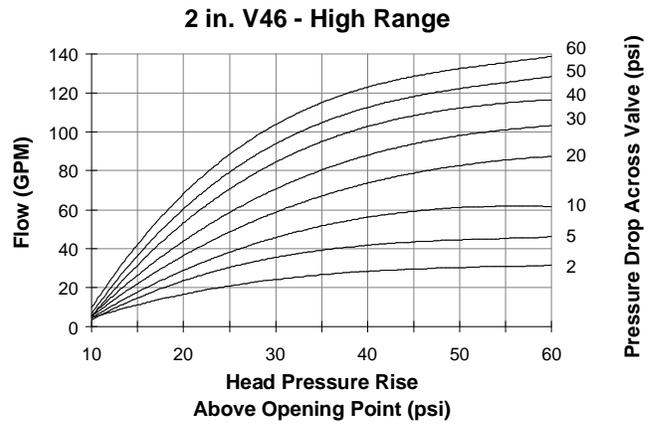
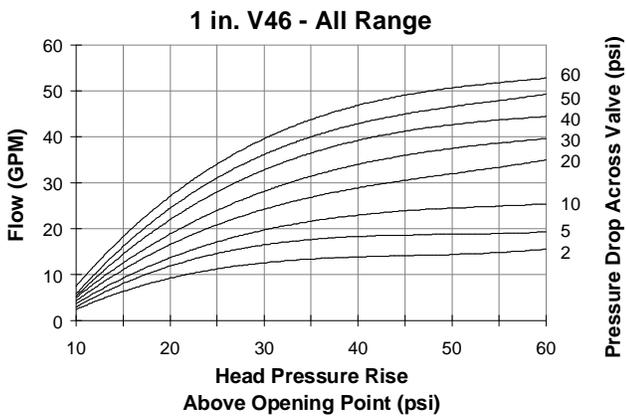
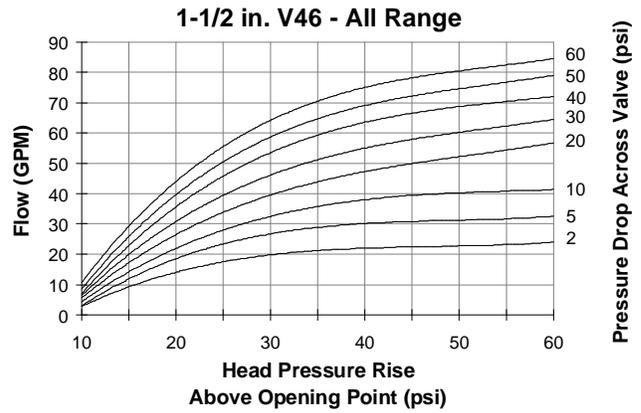
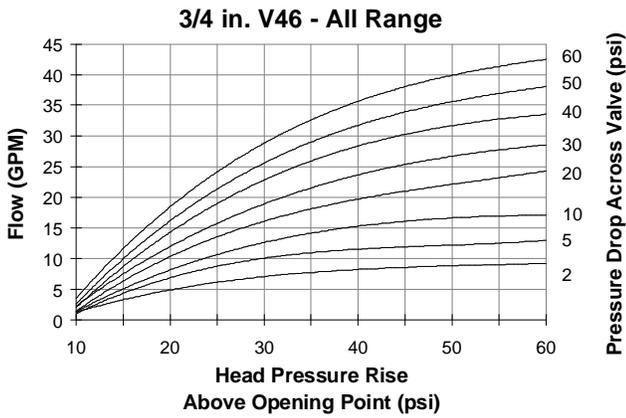
- Step 1: 27 GPM
- Step 2: Closing point is pressure of refrigerant corresponding to 86°F = 93 psig
 Opening point = 93+7 = 100 psig
 Operating head pressure = 125 psig
 Head pressure rise = 125-100 = 25 psi
- Step 3: Minimum pressure = 40 psig
 Pressure drop through condenser = 15 psi
 Combined pressure drop = 15+4 = 19 psi
 Pressure drop across valve = 40-19 = 21 psi

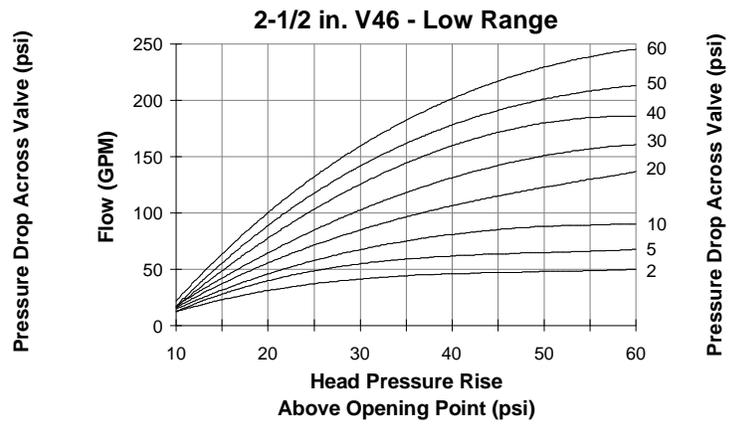
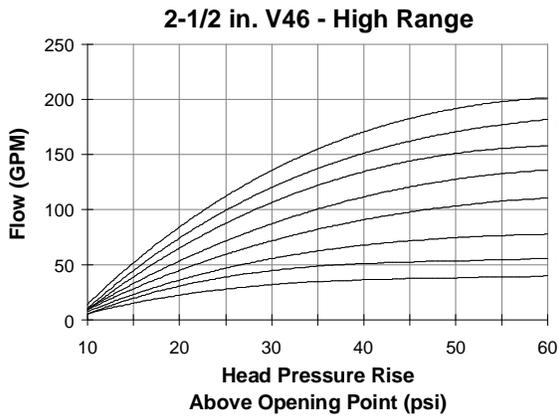
Using a flow of 27 GPM, a head pressure rise of 25 psi, and a pressure drop across the valve of 21 psi, the only valve that satisfies all three criteria is a 1-1/4 in. valve. See the 1-1/4 in. V46 - All Range chart on the next page.

V46 Flowcharts

Note: The maximum differential water pressure across a valve is 60 psi.







Dimensions

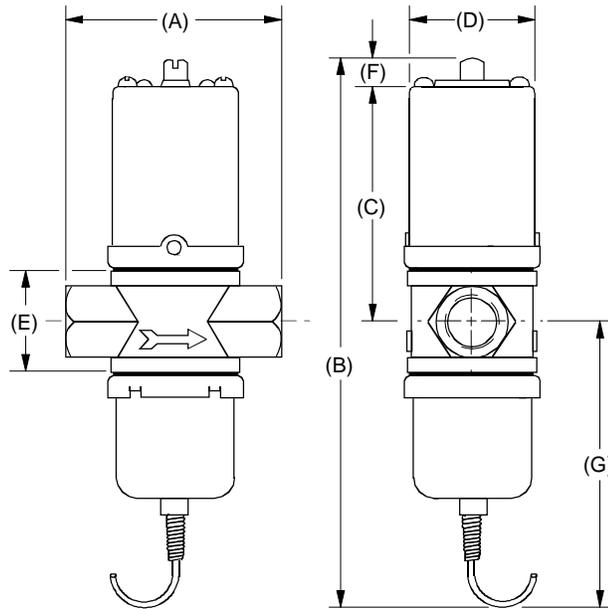


Figure 4: Threaded Type Valves

Table 1: Commercial Service V46 Threaded Connection Dimensions

Dimensions in Inches							
Valve Size	A	B	C	D	E	F	G
3/8 in.	2-5/8	6-3/4	3-1/8	1-1/2	1-1/4	13/32	3-7/32
1/2 in.	3-1/8 (3-1/4)*	7-13/32	3-3/8	1-27/32	1-1/2	13/32	3-5/8
3/4 in.	3-3/8 (3-5/8)*	7-7/8	3-7/8	2-1/32	1-3/4	13/32	3-21/32
1 in.	4-1/2 (4-7/8)*	10-3/4	5-1/2	2-25/32	2	1/2	4-3/4
1-1/4 in.	4-7/8	11-1/8	5-3/4	2-5/8	2-3/8	1/2	4-29/32

*Note: Values in parenthesis are for maritime valves. All other dimensions remain the same.

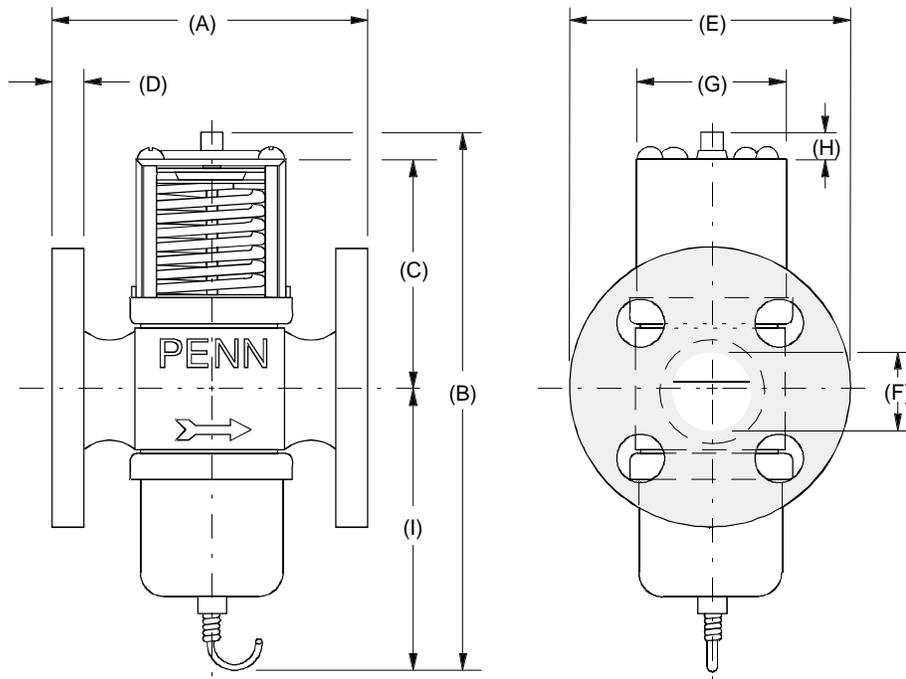


Figure 5: Flange Type Valves

Table 2: Commercial Service: V46 Flange Connection Dimensions

Dimensions in Inches									
Valve Size	A	B	C	D	E	F	G	H	I
1-1/2 in.	5-5/16	11-1/8	5-3/4	9/16	5	1-7/8	2-5/8	1/2	4-29/32
2 in.	6-5/8	13	6-15/32	5/8	6	2-1/4	3-1/2	1/2	6-1/8
2-1/2 in.	6-3/4	13-1/2	6-3/8	3/4	7	2-23/32	3-1/2	1-1/32	6-3/32
Flange Specifications									
Valve Size	No. of Holes		Hole Size		Bolt Circle				
1-1/2 in.	4		5/8		3-7/8				
2 in.	4		3/4		4-3/4				
2-1/2 in.	4		3/4		5-1/2				

Table 3: Maritime Service: ASME Flange Connection Dimensions

Dimensions									
Valve Size	A	B	C	D	E	F	G	H	I
1-1/2 in.	5-5/16	10-1/2	5-5/8	9/16	5	1-7/8	2-5/8	1/2	5
2 in.	6-3/8	13-1/8	6-1/2	1/2	6	2-3/4	3-1/2	5/8	6
2-1/2 in.	6-3/4	13-1/8	6-1/2	11/16	7	2-3/4	3-1/2	5/8	6
Maritime Service: ASME Flange Specifications									
Valve Size	No. of Holes		Hole Size		Bolt Circle				
1-1/2 in.	4		5/8		3-7/8				
2 in.	4		3/4		4-3/4				
2-1/2 in.	4		3/4		5-1/2				

Table 4: Navy “BuShips” Service: Navy Flange Connection Dimensions

Dimensions in Inches									
Valve Size	A	B	C	D	E	F	G	H	I
3/4 in.	4-3/16	7-3/4	4	7/16	3-13/16	1-1/8	2-1/32	1/2	3-5/16
1 in.	5-5/16	9	4-1/2	1/2	4-1/4	1-1/4	2-5/8	1/2	4
1-1/4 in.	5-5/16	9-11/32	4-11/16	1/2	4-1/2	1-5/8	2-5/8	1/2	4-5/32
1-1/2 in.	5-5/16	10-7/32	5-3/4	1/2	5-1/16	1-7/8	2-5/8	1/2	4
2 in.	6-3/8	14-1/8	6-13/32	1/2	5-9/16	2-3/4	3-1/2	7/16	7-9/32
2-1/2 in.	6-3/8	14-5/16	6-1/2	1/2	6-1/8	2-3/4	3-1/2	5/8	7-3/16
Navy Flange Specifications									
Valve Size	No. of Holes		Hole Size			Bolt Circle			
3/4 in.	4		9/16			2-11/16			
1 in.	4		9/16			3-1/8			
1-1/4 in.	4		9/16			3-3/8			
1-1/2 in.	6		9/16			3-15/16			
2 in.	6		9/16			4-7/16			
2-1/2 in.	6		9/16			5			

Mounting



CAUTION: Equipment Damage Hazard.

To prevent damage to the capillary, avoid sharp bends or kinks in the capillary. Coil and secure excess capillary at the valve end to avoid tube breakage due to vibration. Because harmonic vibration can also break the tube, some slack must be left in the capillary. Do not permit the tubing to rub against metal surfaces where friction can damage the capillary.

Flush water lines to clear any foreign matter that may interfere with valve operation. Mount valves vertically on the inlet side of the condenser with spring housing up. If it is necessary to keep the condenser flooded with coolant, the valve can be mounted on the outlet side. When mounting the valve in a position other than vertical, follow the instructions of the equipment in which the valve will be installed. Make refrigerant head pressure connection to bellows. If additional capillary tubing is required, use 1/4 in. O.D. tubing or larger.

Adjustment

Valves may be adjusted with standard service valve wrenches or screwdrivers, see Table 5. All range valve settings can be changed quickly from low-range refrigerants such as R134 to high-range refrigerants such as R22 or vice versa. To raise the valve opening point, turn the adjusting screw, located at the top of range spring housing, counterclockwise. See Figure 8. Turn the adjusting screw clockwise to lower the opening point. Exact settings can be made using a pressure gauge in the refrigerant line to determine the throttling point. Put the system under normal operating load and adjust to the desired operating pressure. See Table 14 for pressure range specifications.

Table 5: Range Adjustment Screw

Valve Size (in.)	Range Adjusting Screw
3/8, 1/2, 3/4	1/4 in. square head adjusting screw with a screwdriver slot
1, 1-1/4, 1-1/2	5/16 in. square head adjusting screw
2, 2-1/2	1/2 in. square head adjusting screw and a slotted cam

If the compressor operates in high ambient temperatures, head pressures may remain high enough during off cycles to prevent the valve from closing completely. In such instances, the opening point of the valve should be raised just enough to cause the valve to close during compressor standby periods. This will also raise the throttling point.

Manual Flushing

To clear any sediment that might accumulate, valves may be manually flushed. Insert screwdrivers under both sides of the valve spring guide and lift upwards to flush the valve. See Figure 6. Manual flushing does not affect valve adjustment.

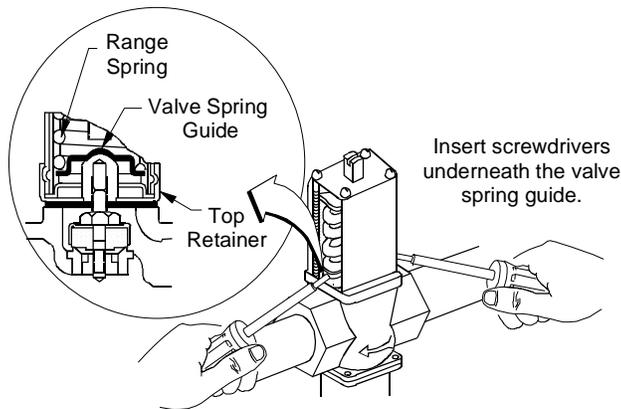


Figure 6: Manual Flushing

Repair Data

Replacement of the sensing element, internal parts, and the rubber diaphragm can be made. For a replacement valve or replacement parts kit, contact the nearest Johnson Controls/PENN distributor. For replacement part kit numbers, refer to Tables 9 through 13. For replacement kit instructions and details refer to the following bulletins: V46, V47, V48, and V49 Sensing Element Replacement and V46, V47, 246, and 247 Repair Parts and Service Instructions.

Ordering Information

When ordering water valves, specify the following:

1. Complete product number.
2. If product number is not known, answer the following questions and select a valve using Tables 9 through 13.
 - a. What is the valve size needed? See *Valve Sizing* section.
 - b. What refrigerant will be used in the system? See *Table 14: Pressure Range Specifications*.

Note: 3/8 in. through 1-1/2 in. valves are supplied with all range construction,

allowing a single valve to be used for either low or high range refrigerants.

- c. Is a standard open high, or reverse action close high valve required? See *Table 7: Type Number Selection Matrix*.
 - d. Is a commercial, maritime, or Navy service valve needed? Maritime and Navy valves have bronze bodies and monel internal parts.
3. Companion flange kit by part number, if required. See section below and *Table 6: Companion Flange Kits*.
 4. Mounting bracket (3/8 in. and 1/2 in. valve sizes only) if required, and its position on valve. See *Table 8: Pressure Connection Styles*.

Companion Flanges and Gaskets

Kits are available, at additional cost, for 1-1/2, 2, and 2-1/2 in. flange connection (ASME specifications) valves only. Each flange kit contains two ring gaskets, two cast iron flanges, eight machine bolts, and eight hex nuts.

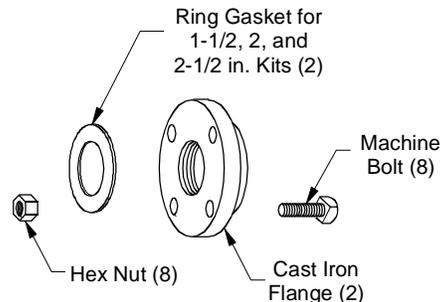


Figure 7: Flange Kit

Table 6: Companion Flange Kits

Kit Number	Water Valve Size
KIT 14A-612	1-1/2 in.
KIT 14A-613	2 in.
KIT 14A-614	2-1/2 in.

Product Number Selection

For applications that call for valves not listed in Tables 9 through 13, *Table 7: Type Number Selection Matrix* can be used to specify a custom valve.

Example: To order a direct-acting, commercial valve with a 1-1/4 in. NPT threaded connection, specify a V46AE.

For more information, contact Application Engineering
at (414) 274-5535.

Table 7: Type Number Selection Matrix

V46	A	Open on Rise, Commercial
	B	Open on Rise, Maritime
	C	Open on Rise, Navy
	D	Open on Rise, Commercial Low Flow
	E	Open on Rise, Commercial with High Pressure Bellows
	F	Open on Rise, Maritime with High Pressure Bellows
	G	Open on Rise, Navy with High Pressure Bellows
	L	Open on Rise, Commercial Low Flow No-Repair
	N	Open on Fall, Commercial
	P	Open on Fall, Maritime
	Q	Open on Fall, Commercial Low Flow with High Pressure Bellows
	A	3/8 in. NPT Threaded
	B	1/2 in. NPT Threaded
	C	3/4 in. NPT Threaded
	D	1 in. NPT Threaded
	E	1-1/4 in. NPT Threaded
	F	1-1/2 in. NPT Threaded
	G	9/16–18 Threaded
	H	3/8 in. Sweat
	J	1/2 in. Sweat
K	3/4 in. Sweat	
L	1 in. Sweat	
M	1-1/4 in. Sweat	
N	3/4 in. Flange	
P	1 in. Flange	
Q	1-1/4 in. Flange	
R	1-1/2 in. Flange	
S	2 in. Flange	
T	2-1/2 in. Flange	

Table 8: Pressure Connection Styles

Commercial Service: Non-corrosive Refrigerant		
Valve	Style No.	Description
1-1/2 in. and Smaller	45	30 in. (762 mm) copper capillary with 1/4 in. flare nut and valve depressor
	5*	1/4 in male flare fitting
	34*	30 in. (762 mm) copper capillary with 1/4 in. section for sweat or flare connection
2 in. and 2-1/2 in.	5	1/4 in. male flare fitting
Commercial Service: Ammonia		
1/2 in. to 2-1/2 in.	15	1/4 in. female NPT
Navy and Marine Service		
All Sizes	34	30 in. (762 mm) copper capillary with 1/4 in. section for sweat or flare connection

*Optional, quantity orders only.

Options

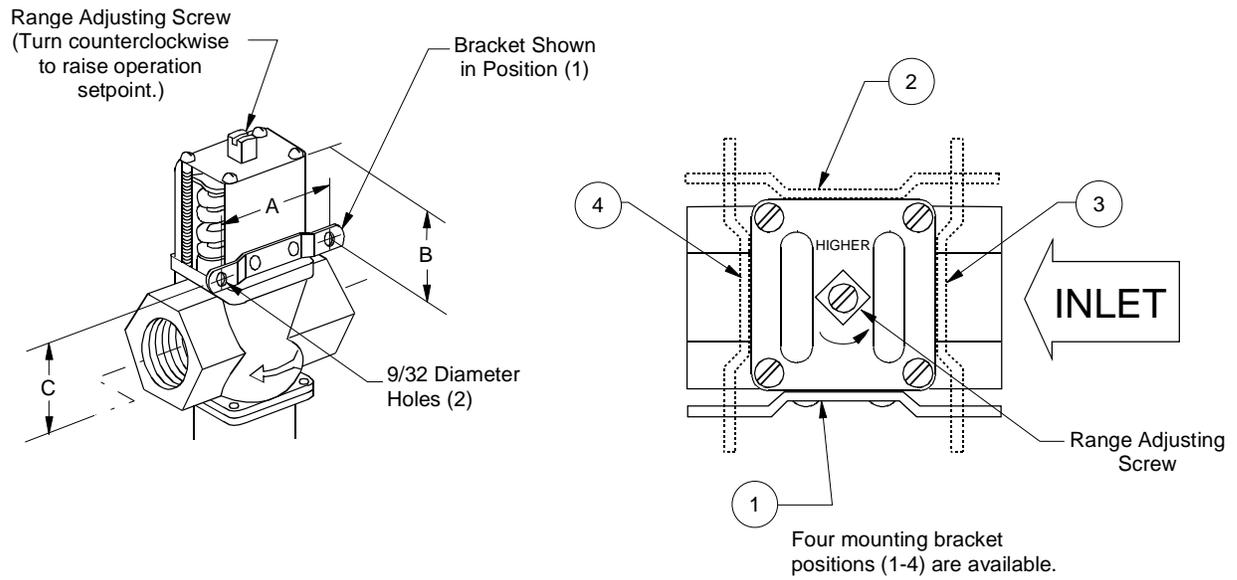
Capillary Tubing Length

Standard length is 30 in. on valves 1-1/2 in. and smaller. Optional 48 in. (1219 mm) capillary can be furnished at additional cost, when specified.

Mounting Bracket

A mounting bracket as illustrated in Figure 8, is available on 3/8 in. and 1/2 in. valves only when specified. Desired bracket position must also be specified.

Other styles of brackets on 3/8 in. and 1/2 in. valves available on quantity orders. For more information, contact Application Engineering at (414) 274-5535.



Dimensions: in. (mm)			
Valve Size	A	B	C
3/8	2 (51)	1.25 (32)	1.38 (35)
1/2	2 (52)	1.85 (47)	1.52 (39)

**Figure 8: Mounting Bracket for 3/8 in.
and 1/2 in. Valves**

Table 9: Direct-Acting Commercial Type - Non-corrosive Refrigerants

Product	Size (in.)	Inlet and Outlet	Service	Element Style	Shipping Weight lb (kg)	Seat Repair Kit	Replacement Power Element
V46AA-1	3/8 NPT	Threaded	All Range	45	2.3 (1.0)	STT14A-600R	SEP91A-600R and SEC37A-601R*
V46DA-2	3/8 NPT	Threaded	Extended All Range**	45	2.3 (1.0)	STT14A-603R	SEP91A-600R and SEC37A-601R*
V46AB-1	1/2 NPT	Threaded	All Range	45	3.3 (1.5)	STT15A-602R	SEP91A-602R and SEC37A-602R*
V46AC-1	3/4 NPT	Threaded	All Range	45	4.3 (2.0)	STT16A-601R	SEP91A-601R and SEC37A-602R*
V46AD-1	1 NPT	Threaded	All Range	45	9.3 (4.0)	STT17A-609R	SEP91A-603R and SEC37A-600R*
V46AE-1	1-1/4 NPT	Threaded	All Range	45	10.0 (4.5)	STT17A-610R	SEP91A-603R and SEC37A-600R*
V46AR-1	1-1/2 NPT	4 Hole ASME Flange	All Range	45	13.1 (6.0)	STT17A-610R	SEP91A-603R and SEC37A-600R*
V46AS-1	2	4 Hole ASME Flange	Low Range	5	25.5 (11.6)	STT18A-600R	SEP81A-602R†
V46AS-2	2	4 Hole ASME Flange	High Range	5	25.5 (11.6)	STT18A-600R	SEP81A-601R
V46AT-1	2-1/2	4 Hole ASME Flange	Low Range	5	29.5 (11.6)	STT18A-601R	SEP81A-602R†
V46AT-2	2-1/2	4 Hole ASME Flange	High Range	5	29.5 (11.6)	STT18A-601R	SEP81A-601R

† Non-stock item, built to order.

* Replacement element supplied with 1/4 in. SAE connector. Order SEC37A capillary kit with flare nuts separately, if needed. Use only on valves specified.

** Maximum opening point of 70 to 300 psi (483 to 2068 kPa), maximum permissible refrigerant pressure of 440 psi (3034 kPa).

Table 10: Commercial Type - Ammonia

Product	Size (in.)	Inlet and Outlet	Service	Element Style	Shipping Weight lb (kg)	Seat Repair Kit	Replacement Power Element
V46AB-11†	1/2 NPT	Threaded	Ammonia	15	3.2 (1.5)	STT15A-602R	SEP70A-603R†
V46AC-8†	3/4 NPT	Threaded	Ammonia	15	4.2 (1.9)	STT16A-601R	SEP70A-601R
V46AD-4†	1 NPT	Threaded	Ammonia	15	7.7 (3.5)	STT17A-609R	SEP70A-604R
V46AE-4†	1-1/4 NPT	Threaded	Ammonia	15	9.2 (4.2)	STT17A-610R	SEP70A-604R
V46AR-2†	1-1/2	4 Hole ASME Flange	Ammonia	15	12.3 (5.6)	STT17A-610R	SEP70A-604R
V46AS-3	2	4 Hole ASME Flange	Ammonia	15	25.5 (11.6)	STT18A-600R	SEP70A-605R†
V46AT-3	2-1/2	4 Hole ASME Flange	Ammonia	15	29.5 (11.6)	STT18A-601R	SEP70A-605R†

† Non-stock item, built to order.

Table 11: Reverse Acting Commercial Type - Non-corrosive Refrigerants

Product	Size (in.)	Inlet and Outlet	Service	Element Style	Shipping Weight lb (kg)	Seat Repair Kit	Replacement Power Element
V46NA-1†	3/8 NPT	Threaded	All Range	45	2.3 (1.0)	STT14A-600R	SEP91A-600R and SEC37A-601R*
V46NB-1†	1/2 NPT	Threaded	All Range	45	3.6 (1.6)	STT15A-602R	SEP91A-602R and SEC37A-602R*
V46NB-2	1/2 NPT	Threaded	Low Range	45	3.6 (1.6)	STT15A-602R	SEP91A-602R and SEC37A-602R*
V46NC-1†	3/4 NPT	Threaded	All Range	45	4.5 (2.0)	STT16A-601R	SEP91A-601R and SEC37A-602R*
V46NC-2	3/4 NPT	Threaded	Low Range	45	4.5 (2.0)	STT16A-601R	SEP91A-601R and SEC37A-602R*
V46ND-1†	1 NPT	Threaded	All Range	45	7.5 (3.4)	STT17A-609R	SEP91A-603R and SEC37A-600R*
V46ND-2	1 NPT	Threaded	Low Range	45	7.5 (3.4)	STT17A-609R	SEP91A-603R and SEC37A-600R*
V46NE-1†	1-1/4 NPT	Threaded	All Range	45	8.8 (4.0)	STT17A-610R	SEP91A-603R and SEC37A-600R*
V46NE-2†	1-1/4 NPT	Threaded	Low Range	45	8.8 (4.0)	STT17A-610R	SEP91A-603R and SEC37A-600R*

† Non-stock item, built to order.

* Maximum bellows pressure is 320 psig (2206 kPa). Replacement element supplied with 1/4 in. SAE connector. Order SEC37A capillary kit with flare nuts separately, if needed. Use only on valves specified.

Table 12: Maritime Type - Non-corrosive Refrigerants

Product	Size (in.)	Inlet and Outlet	Service	Element Style	Shipping Weight lb (kg)	Seat Repair Kit	Replacement Power Element
V46BA-2†	3/8 NPT	Threaded	All Range	34	2.3 (1.0)	STT14A-610R	SEP13A-602R
V46BB-2†	1/2 NPT	Threaded	All Range	34	3.3 (1.5)	STT15A-603R†	SEP13A-600R†
V46BC-2	3/4 NPT	Threaded	All Range	34	4.3 (2.0)	STT17A-613R	SEP13A-603R
V46BD-2	1 NPT	Threaded	All Range	34	9.5 (4.3)	STT17A-611R†	SEP50A-600R
V46BE-2	1-1/4 NPT	Threaded	All Range	34	10.3 (4.7)	STT17A-612R	SEP50A-600R
V46BS-4	2	4 Hole ASME Flange	High Range	34	25.5 (11.6)	STT18A-602R	SEP50A-601R†
V46BT-4†	2-1/2	4 Hole ASME Flange	High Range	34	29.5 (13.4)	STT18A-602R	SEP50A-601R†

† Non-stock item, built to order.

Table 13: Navy Type - Non-corrosive Refrigerants

Product	Size (in.)	Inlet and Outlet	Service	Element Style	Shipping Weight lb (kg)	Seat Repair Kit	Replacement Power Element
V46CJ-2†	1/2	Sweat Connector	All Range	34	3.6 (1.6)	STT15A-603R†	SEP13A-600R†
V46CN-2†	3/4	4 Hole Navy Flange	All Range	34	7.1 (3.2)	STT17A-613R	SEP13A-603R
V46CP-2†	1	4 Hole Navy Flange	All Range	34	12.0 (5.4)	STT17A-611R†	SEP50A-600R
V46CQ-2†	1-1/4	4 Hole Navy Flange	All Range	34	10.3 (4.7)	STT17A-612R	SEP50A-600R
V46BR-2†	1-1/2	4 Hole ASME Flange	All Range	34	13.5 (6.1)	STT17A-612R	SEP50A-600R
V46CR-2†	1-1/2	4 Hole Navy Flange	All Range	34	13.8 (6.3)	STT17A-612R	SEP50A-600R
V46BS-3†	2	4 Hole ASME Flange	Low Range	34	25.5 (11.6)	STT18A-602R	SEP50A-601R†
V46CS-3†	2	4 Hole Navy Flange	Low Range	34	24.4 (11.1)	STT18A-602R	SEP50A-601R†
V46CS-4†	2	4 Hole Navy Flange	Low Range	34	24.4 (11.1)	STT18A-602R	SEP50A-601R†
V46BT-3†	2-1/2	4 Hole ASME Flange	Low Range	34	29.5 (13.4)	STT18A-602R	SEP50A-601R†
V46CT-3†	2-1/2	4 Hole Navy Flange	Low Range	34	25.5 (11.6)	STT18A-602R	SEP50A-601R†
V46CT-4†	2-1/2	4 Hole Navy Flange	High Range	34	25.5 (11.6)	STT18A-602R	SEP50A-601R†

† Non-stock item, built to order.

Table 14: Pressure Range Specifications

Refrigerant	Maximum Opening Point psig (kPa)*	Modulation Start Point psig (kPa)*	Maximum Permissible Pressure psig (kPa)	
	V46A, B, C, D	V46N	Water	Refrigerant
All Range R12, R22, R134a, R502, R404a, R507	70 to 260 (483 to 1793)	90 to 280 (621 to 1931) 40 to 100 (276 to 690)**	150 (1034)	320 (2206)
All Range with High Overpressure	70 to 260 (483 to 1793)	_____	150 (1034)	370 (2551)
3/8 in. Extended All Range	70 to 300 (483 to 2068)	_____	150 (1034)	440 (3034)
2 and 2-1/2 in. Low Range R12, R134a	70 to 170 (483 to 1172)	100 to 200 (690 to 1379)	150 (1034)	230 (1586)
2 and 2-1/2 in. High Range R22, R502, R404a, R507	160 to 260 (1103 to 1793)	180 to 280 (1241 to 1931)	150 (1034)	320 (2206)
Ammonia R717	100 to 200 (690 to 1379)	130 to 230 (896 to 1586)	150 (1034)	320 (2206)

* V46A, B, C direct acting valve ranges indicate the valve opening point, V46N reverse acting valve ranges indicates the modulation start point.

** For heat pump applications (3/8 in. through 1-1/2 in. sizes only).

Notes

Specifications

Product	V46 Series Pressure Actuated Valve	
Body Material	Commercial:	3/8, 1/2, or 3/4 in. Sizes Have Cast Brass Bodies, Other Commercial Types Have Cast Iron Bodies with Rust Resisting Finish
	Navy and Maritime:	Cast Naval Bronze
Extension Sleeve, Disc, Stud, Disc Holder Material	Commercial:	Brass; Monel is Available at Additional Cost
	Navy and Maritime:	Monel
Valve Seat Material	Commercial:	Aluminum Bronze; Monel is Available at Additional Cost
	Navy and Maritime:	Monel
Valve Disc	Buna-N	
Diaphragm	Nylon Reinforced Buna-N	
Water Supply Pressure	150 psig (1034 kPa) Maximum	
Water Supply Temperature	170°F (77°C) Maximum	
Sensing Element	Non-corrosive Refrigerants:	Brass and Phosphor Bronze Bellows in Brass Cup
	Navy and Maritime:	Monel Bellows in Brass Cup
	2 and 2-1/2 in. High Range Service:	Monel Bellows in Brass Cup
	Ammonia Service:	Stainless Steel Bellows in Brass Cup
Pressure Range	See Table 14: Pressure Range Specifications.	
Shipping Weight	See Tables 9-13.	

The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the local Johnson Controls office. Johnson Controls, Inc. shall not be liable for damages resulting from misapplication or misuse of its products.



Controls Group
 507 E. Michigan Street
 P.O. Box 423
 Milwaukee, WI 53201

Printed in U.S.A.