



# V246 Series 2-Way Pressure-Actuated Water-Regulating Valves for High-Pressure Refrigerants

## Installation Instructions

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Refer to the [QuickLIT Web site](#) for the most up-to-date version of this document.

### Applications

**IMPORTANT:** The V246 Series 2-Way Pressure-Actuated Water-Regulating Valves for High-Pressure Refrigerants is intended to control coolant media flow under normal operating conditions. Where failure or malfunction of the V246 valve could lead to personal injury or property damage to the controlled equipment or other property, additional precautions must be designed into the control system. Incorporate and maintain other devices, such as supervisory or alarm systems or safety or limit controls, intended to warn of or protect against failure or malfunction of the V246 valve.

The V246 Series 2-Way Pressure-Actuated Water-Regulating Valves for High-Pressure Refrigerants come in two types of control action: direct acting and reverse acting. V246 valves regulate water flow to control refrigerant head pressure in systems with water-cooled condensers.

The V246 Series Valves are available in 3/8 in. through 2 in. sizes and have a maximum allowable water pressure of 150 psi (10.3 bar). Direct acting V246 valves have an adjustable opening point in a refrigerant pressure range of 200 to 400 psi (13.8 to 27.6 bar), and reverse acting valves have a range of 135 to 300 psi (9.3 to 20.7 bar). V246 valves may be used with standard non-corrosive refrigerants.

Maritime models, which have nickel copper (Monel®) internal parts, are available for applications where the coolant may be corrosive to the internal parts.

### Installation



**CAUTION: Risk of Environmental Damage.**

Provide proper containment for any potential release of refrigerant, solvent, or oil. Such hazardous materials can be harmful to the environment if they are released.

**IMPORTANT:** If the V246 valve is installed on equipment that contains hazardous or regulated materials such as certain refrigerants or lubricants, you must comply with all standards and regulations governing the containment and handling of those materials.

**IMPORTANT:** After installing the V246 valve, evacuate pressure connection lines to remove air, moisture, and other contaminants in a manner consistent with applicable environmental regulations and standards.

**IMPORTANT:** Take care to prevent foreign materials such as weld slag, thread burrs, metal chips, and scale from entering the piping system. This debris can damage or severely impede the operation of the valve by embedding itself in the seats, scoring the valve, and ultimately resulting in seat leakage. If the debris becomes embedded in the seats, subsequent flushing and filtering of the piping system with the valve installed does not remedy the problem.

Install the valve vertically with the range adjustment screw on the top, and the sensing element and pressure connection line on the bottom, to allow oil and refrigerant to drain away from the valve sensing element.

Mount the valve so that the valve sensing element is above the refrigerant tap point, if possible. If it is not possible to mount the bellows of the valve above the tap point, loop the capillary above the tap point and below the bellows and then connect to the valve. Tap off of the topside of the high side line. This minimizes the effect of refrigerant oil in the capillary on valve reaction time.

Do not mount the valve in any position other than vertical unless specified by the manufacturer of the equipment on which the valve is installed. Follow the manufacturer's installation instructions.

The direction of water flow is indicated by an arrow on the valve body. See Figure 1.

### Setup and Adjustments

If the system is located in an area with high ambient temperatures, refrigerant head pressures may remain high enough during Off cycles to prevent the valve from closing completely. In such instances, raise the opening point pressure of the valve just enough to cause the valve to stop flow to the condenser during compressor standby periods.

#### Manually Flushing the Valve

Manually flush the fluid piping after installation to remove filings, chips, or other foreign material. Manual flushing does not affect valve adjustment.

To flush the valve, insert screwdrivers under both sides of the valve spring guide and lift upwards. See Figure 1.

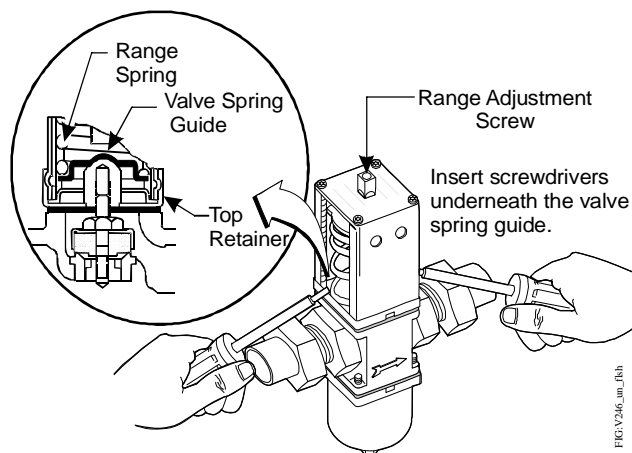


Figure 1: Manual Flushing

### Pressure Connections



#### **WARNING: Risk of Personal Injury.**

Shut off the liquid supply and relieve pressure in the line before servicing the valve. Contents of liquid lines could be under pressure and the release of liquid under pressure may cause severe personal injury.

Connect the refrigerant side of the valve to the high pressure side of the system, preferably away from the compressor as far as possible. Additional tubing may be used to make the connection if needed. Use 1/4-inch tradesize copper tubing.

Follow these guidelines when making pressure connections:

- Purge all tubing and lines before making pressure connections.
- Use pressure tap points located on the top side of the refrigerant lines; these reduce the possibility of oil, liquids, or sediment accumulating in the pressure connection line or valve sensing element, which could cause valve malfunction.
- Avoid sharp bends in the capillary tubes. Sharp bends can weaken or kink capillary tubes, which may result in refrigerant leaks or restrictions.
- Allow for slack in the capillary tubes to dampen vibration. Mechanical vibration can weaken or damage the capillary tubes.
- Avoid contact between the capillary tubing and sharp or abrasive objects. Vibration or rubbing of sharp or abrasive objects in contact with capillary tubes can cause leaks.
- Coil and secure excess capillary tubing away from contact with sharp or abrasive objects or surfaces. Carefully loop any excess capillary tubing into smooth, circular coils (minimum 2 in. [5 cm] diameter). Securely fasten the coiled capillary tube.
- Do not overtighten flare nuts on pressure connection line fittings. Overtightening flare connections may damage the threads and result in refrigerant leaks. Do not exceed 10 ft·lb (14 N·m) of torque when tightening flare connections.
- Avoid severe pressure pulsation at pressure tap points. Install pressure connection lines to pressure tap points away from the compressor discharge to minimize the effects of pressure pulsation from reciprocating compressors.

## Adjustments

The V246 valves are factory adjusted for the settings shown in Table 1.

The **opening point pressure** (also called the crack-open point) is the refrigerant pressure (at the valve's sensing element) necessary to just lift the valve disc off of the valve seat and allow water to flow through the valve body. Turning the range adjustment screw changes the opening point pressure.

Use a standard service valve wrench or screwdriver to adjust the opening point pressure.

- Turn the range adjustment screw **counterclockwise to raise the opening point pressure.**
- Turn the range adjustment screw **clockwise to lower the opening point pressure.**

Use a refrigerant pressure gauge to adjust the opening point pressure. Operate the system at normal load conditions and adjust the valve's opening point to the desired pressure. See Table 1 for refrigerant pressure specifications.

**Table 1: Specifications for V246 Series Valves for High-Pressure Refrigerants**

Valve Type	Maximum Refrigerant Pressure at Sensing Element	Opening Point Adjustment Range	Factory-Set Opening Point
Direct Acting	630 psi (43.4 bar)	200 to 400 psi (13.8 to 27.6 bar)	200 psi (13.8 bar)
Reverse Acting	630 psi (43.4 bar)	135 to 300 psi (9.3 to 20.7 bar)	165 psi (11.4 bar)

## Torque Specifications

To prevent water leakage, ensure that the spring housing and sensing element screws are tightened to the torque specification in Table 2. To prevent refrigerant leakage, ensure that the 1/4 in. flare pressure connection is tightened to 10 lb-ft (14 N-m).

**Table 2: Maximum Torque Specifications, lb-in. (N-m)**

Valve Size	Spring Housing Screws	Sensing Element Screws	Flare Pressure Connection
3/8 in.	15 (1.7)	15 (1.7)	10 lb-ft (14 N-m)
1/2 in.	25 (2.8)	25 (2.8)	10 lb-ft (14 N-m)
3/4 in.	35 (4.0)	35 (4.0)	10 lb-ft (14 N-m)
1 in.	55 (6.2)	72 (8.1)	10 lb-ft (14 N-m)
1-1/4 in.	55 (6.2)	72 (8.1)	10 lb-ft (14 N-m)
1-1/2 in.	55 (6.2)	72 (8.1)	10 lb-ft (14 N-m)
2 in.	95 (10.7)	95 (10.7)	10 lb-ft (14 N-m)

## Repair Information

Replacement of the sensing element, internal parts, and the rubber diaphragm can be made. To obtain replacement kit instructions and details:

- In North America, contact Johnson Controls® Product Sales Operations Team at 1-800-275-5676.
- In Europe, contact your local sales office.

For North American replacement kit product code numbers, see Table 3. For European replacement kit product code numbers, see Table 4.

**Table 3: North American Replacement Kits**

Nominal Valve Size	Valve Type	Seat Replacement Kit Product Code Number	Diaphragm Replacement Kit Product Code Number	Sensing Element Replacement Kit Product Code Number
3/8 in.	Commercial	STT14A-600R	DPM14A-600R	SEP93A-600R
	Maritime/Navy	STT14A-601R		
3/8 in. Low Flow	Commercial	STT14A-603R	DPM14A-600R	SEP93A-600R
	Maritime/Navy	Not Applicable		
1/2 in.	Commercial	STT15A-602R	DPM15A-602R	SEP93A-601R
	Maritime/Navy	STT15A-603R		
3/4 in.	Commercial	STT16A-601R	DPM16A-601R	SEP93A-602R
	Maritime/Navy	STT17A-613R		
1 in.	Commercial	STT17A-609R	DPM17A-600R	SEP93A-603R
	Maritime/Navy	STT17A-611R		
1-1/4 in.	Commercial	STT17A-610R	DPM17A-600R	SEP93A-603R
	Maritime/Navy	STT17A-612R		
1-1/2 in.	Commercial	STT17A-610R	DPM17A-600R	SEP93A-603R
	Maritime/Navy	STT17A-612R		
2 in.	Commercial	STT18A-620R	DPM17A-601R	SEP93A-604R
	Maritime/Navy	STT18A-622R		

**Table 4: European Replacement Kits**

Nominal Valve Size	Valve Type	Seat Replacement Kit Product Code Number	Diaphragm Replacement Kit Product Code Number	Sensing Element Replacement Kit Product Code Number
3/8 in.	Commercial	STT002N600R	DPM14A-600R	SEP93A-600R
	Maritime/Navy	STT14A-601R		
1/2 in.	Commercial	STT003N600R	DPM15A-602R	SEP93A-601R
	Maritime/Navy	STT15A-603R		
3/4 in.	Commercial	STT004N600R	DPM16A-601R	SEP93A-602R
	Maritime/Navy	STT17A-613R		
1 in.	Commercial	STT17A-609R	DPM17A-600R	SEP93A-603R
	Maritime/Navy	STT17A-611R		
1-1/4 in.	Commercial	STT17A-610R	DPM17A-600R	SEP93A-603R
	Maritime/Navy	STT17A-612R		
1-1/2 in.	Commercial	STT17A-610R	DPM17A-600R	SEP93A-603R
	Maritime/Navy	STT17A-612R		
2 in.	Commercial	STT18A-620R	DPM17A-601R	SEP93A-604R
	Maritime/Navy	STT18A-622R		

## Technical Specifications

### V246 Series 2-Way Pressure-Actuated Water-Regulating Valves for High-Pressure Refrigerants

<b>Factory-Set Opening Point</b>	Direct Acting 200 psi (13.8 bar), Reverse Acting 165 psi (11.4 bar)
<b>Maximum Working Pressure</b>	630 psi (43.4 bar)
<b>Opening Point Adjustment Range</b>	Direct Acting 200 to 400 psi (13.8 to 27.6 bar), Reverse Acting 135 to 300 psi (9.3 to 20.7 bar)
<b>Media</b>	150 psi (10.3 bar) Maximum, -4°F to 170°F (-20°C to 77°C) glycol/water or liquids with low freezing points that are compatible with valve materials

*The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, contact Johnson Controls/PENN Refrigeration Technical Support at 1-800-275-5676. Johnson Controls, Inc. shall not be liable for damages resulting from misapplication or misuse of its products.*



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