V43/V243 Series Pressure-Actuated Water-Regulating Valves Product/Technical Bulletin

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Introduction

The V43/V243 Pressure-Actuated Water-Regulating Valves regulate water flow through the condenser of large refrigerated cooling systems. These pilot-operated valves open on an increase in refrigerant head pressure and facilitate modulating operation.

The V43/V243 water-regulating valves are available for commercial and maritime applications.

V43 valves are available for noncorrosive low- and medium-pressure refrigerants such as R-134A, R-404A, R-502, and R-507.

V243 valves are available for noncorrosive high-pressure refrigerants such as R410A.

Commercial V43/V243 valves feature a cast-iron body, brass internal parts, and bronze seat material.

To resist the corrosive action of sea water, the V43/V243 maritime and Navy models feature a red brass body, bronze and MONEL® interior parts, and MONEL seat material.

WARNING

Risk

This product is made of a copper alloy, which contains lead. The product is therefore not to be used on drinking water.

Figure 1: V43 Pressure-Actuated Valve



Features and benefits

Built-in pilot valve

Facilitates more precise throttling.

Easy adjustment

Facilitates service and adjustment without breaking line connections.

Drain plug

Drains water during shutdown to reduce the possibility of freeze-up.

Mesh MONEL screen

Protects the pilot valve from items such as dirt and scale. You can remove the screen for cleaning and servicing without breaking any line connections.

Application

Important: All V43/V243 water-regulating valves are designed for use only as operating devices. Where valve failure can result in personal injury and loss of property, it is the responsibility of the installer to add and maintain devices (pressure relief or safety shutoff) or systems (alarm or supervisory) that protect against, or warn of, device failure.

Note: The V43 and V243 Series Head Pressure Regulating Valves are available for cooling applications only (direct acting).

Operation

The V43/243 valves are refrigerant-actuated units that require only system refrigerant head pressure to operate. The valve does not require electrical power: if you make the inlet and outlet water lines and refrigerant head pressure connections, the valve functions.

Refrigerant head pressure drives a built-in pilot valve that operates the main valve. Water and spring pressures are the main valve's opening and closing forces.

The main valve seat disc assembly is suspended on a heavy-duty rubber diaphragm, eliminating any close-fitting or sliding parts. This reduces friction within the valve, facilitating more reliable control. This also reduces the chance of the valve stem sticking in dirty water conditions.

Determining the required valve size

Every system is unique and requires specific engineering data to correctly size and design. Typically, a valve is replaced with another valve of the same size.

Important: An undersized valve does not deliver the required amount of water flow under full load conditions, and an oversized valve tends to hammer under low load conditions.

To select the correct valve size, determine the following variables:

- Maximum water flow required
- Available water pressure drop across the valve, also known as the differential

Use these variables to locate a point on one of the flow capacity charts (from Figure 6 to Figure 13) that slightly exceeds the maximum water flow that you need. The flow capacity chart that contains this point represents the correct valve size.

Maximum water flow required

Use the information that the manufacturer of the condensing unit provides to determine the maximum water flow that you require. If this information is not available, calculate the maximum water flow with the following formula:

$$\text{Maximum Water Flow Required (GPM)} = \frac{\text{Tons of Refrigeration x 30}}{\text{Outlet Temperature - Inlet Temperature}}$$

Example: If a 100-ton capacity system has an inlet water temperature of 85°F and an outlet water temperature of 95°F, the maximum water flow that you require is:

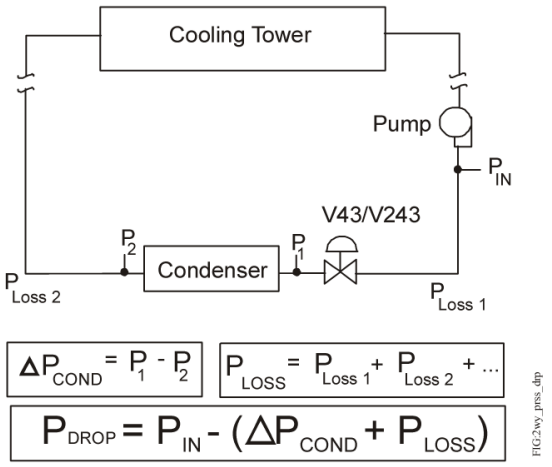
$$\text{Maximum water flow required} = \frac{100 \times 30}{95 - 85} = 300 \text{ gpm}$$

Available water pressure drop across the valve

The available differential, or water pressure drop, across the valve is the supply pressure to the valve minus all downstream pressures. This pressure drop is the force available to push water through the valve.

Water supply pressure is the water supply pressure to the inlet side of the valve from a cooling tower, a city water main, or other source.

Figure 2: Pressure drop across the valve



$$\text{Pressure Drop Across the Valve} = \text{Supply Pressure} - \text{All Downstream Pressure Drops (Across Condensor Piping, Pipe Fittings, and Valves)}$$

Opening point and refrigerant head pressure rise

The forces that operate the valve are refrigerant head pressure, water pressure, and spring pressure. These forces oppose each other.

When the head pressure rises, and the refrigerant pressure overcomes the spring force of the pilot valve, the valve begins to open; the disk lifts off of the seat. This point is called the opening point.

You can adjust the opening point if you use the adjustment stem to increase or decrease the spring force. If the head pressure continues to rise, the refrigerant pressure further opens the valve until the valve is fully open. The range from the opening point when the valve lifts off the seat to the point when the valve is fully open is called the throttling range.

The throttling range is fixed and you cannot adjust it. The throttling range is approximately 40 psig for the low-pressure V43 Series valves, approximately 50 psi for the medium-pressure V43 Series valves, and approximately 60 psi for the high-pressure V243 Series valves.

Head pressure rise above the opening point

When the head pressure rises, the force of the refrigerant head pressure overcomes the spring force and any hysteresis, and pushes the disc off the seat, facilitating water to start to flow through the valve.

Anything above that point is head pressure rise above the opening point. In standard scenarios, the opening point is approximately 7 psi above the closing point.

Refrigerant Head Pressure Rise Above Opening Point	=	Refrigerant Head Pressure greater than Opening Point	-	Refrigerant Head Pressure at Opening Point

Choosing the correct valve size

About this task:
A correctly sized valve meets the requirements of the maximum water flow that you need but functions at an acceptable level when you need minimum flow. It does not water-hammer, cut, or wire-draw the seats and seating discs. To select the correct valve size for your application, see V43 capacity flow charts and V243 capacity flow charts.

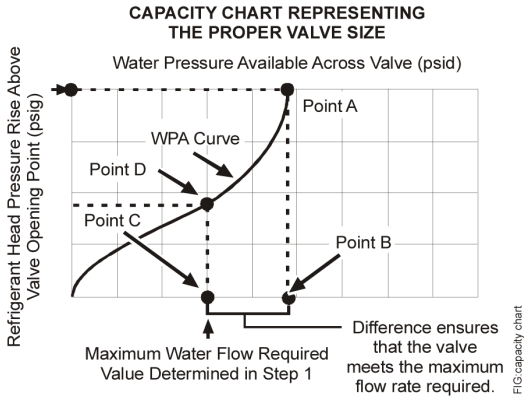
Use the following steps to determine the appropriate valve size for your application:

1. Locate the point where the valve is fully open on the y-axis. See Figure 3.
2. Draw a horizontal line from this point to where the line intersects with the water pressure available (WPA) curve. This is Point A.
3. Draw a vertical line from point A to where it intersects with the x-axis. This is Point B.

   Point B is the maximum amount of water that the valve can flow, when fully open, under the stated conditions. See Figure 3.
4. Locate the maximum water flow that you need for your application on the x-axis. This is Point C.
5. Draw a vertical line from Point C to where the line intersects with the WPA curve. This Point D.
6. Draw a horizontal line from Point D to the left where it intersects with the refrigerant head pressure rise above opening point.

   This is where the selected value meets the maximum flow requirement of the application.

Figure 3: Capacity chart



Use the flow charts to select the valve that is most appropriate for your application.

Example

In this example, the required flow for an R-404A system is 300 gpm. The cooling tower pump discharge pressure is 30 psig, and the condenser manufacturer's table gives a pressure drop of 8 psid through the condenser. The pressure drop through the installed piping, fittings, and valves is approximately 12 psi.

Maximum Water Flow Required = 300 gpm

Water Pressure Available= 30 - (12 + 8)

Water Pressure Available= 10 psid

You need to select the proper valve size. The proper size valve is indicated by the flow chart that slightly exceeds the maximum required flow when the valve is wide open.

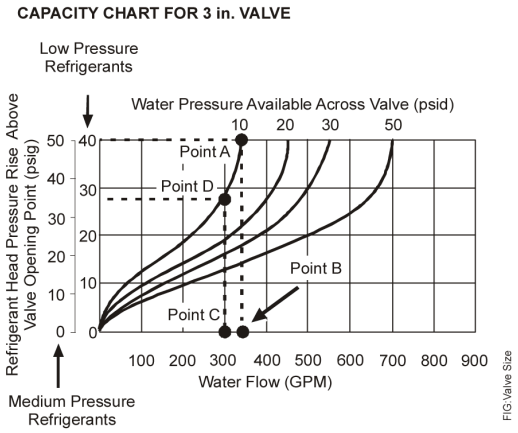
As indicated in Figure 5, the correct valve for this application is a 3-in. medium-pressure (160/260 psi), noncorrosive, commercially constructed V43 Series Valve. The maximum water flow that a 3-in. valve can deliver (330 gpm) under the stated condition is slightly greater than the maximum water flow required (300 gpm).

Figure 4: Example values

Point Where Valve is Wide Open and Intersects with the WPA Curve	= 50 psig	Point A
Maximum Flow the Valve Provides Under the Given Conditions (Valve Wide Open with a 10 psid)	= Appr. 330 GPM	Point B
Maximum Water Flow Required for the Application	= 300 GPM	Point C
Head Pressure Rise Above Opening Point Where Maximum Flow Required for the Application Occurs	= 36 psig	Point D

Note: The maximum flow required for the application is to the left of the dotted vertical line between Point A and Point B (300 gpm when the valve is approximately 72% open).

Figure 5: Correct valve size for the application



Select the valve type from Table 4 through Table 6.

V43 capacity flow charts

Figure 6: 2 in. V43 capacity flow chart

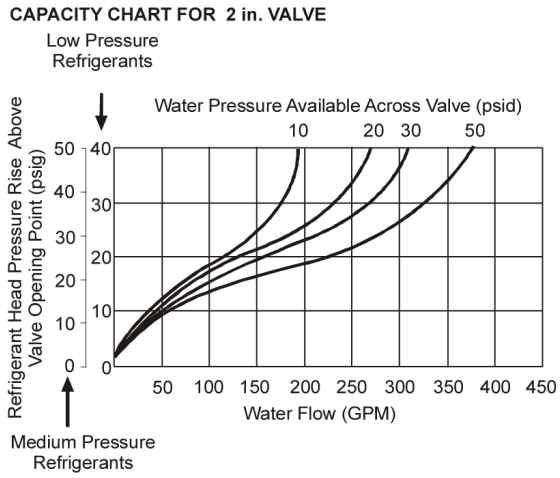


Figure 7: 2 1/2 in. V43 capacity flow chart

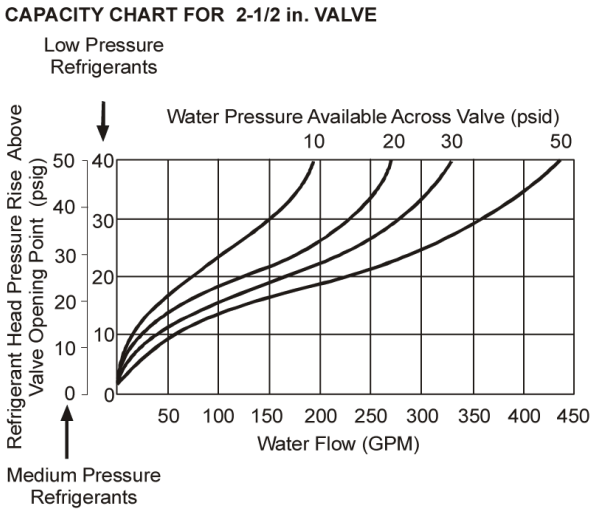


Figure 8: 3 in. V43 capacity flow chart

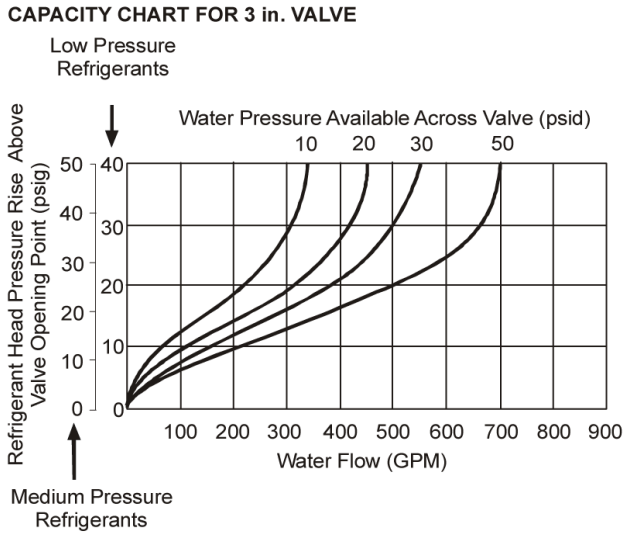
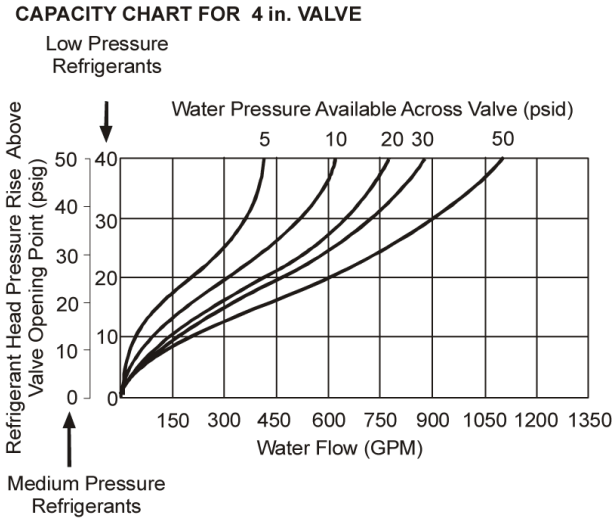


Figure 9: 4 in. V43 capacity flow chart



V243 capacity flow charts

Figure 10: 2 in. V43 capacity flow chart

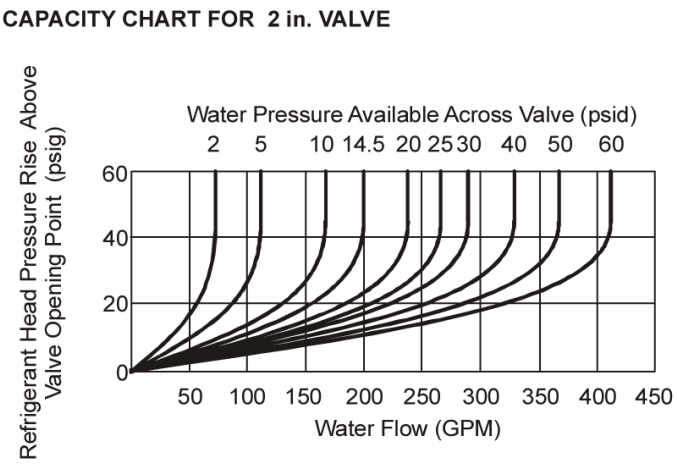


Figure 11: 2 1/2 in. V43 capacity flow chart

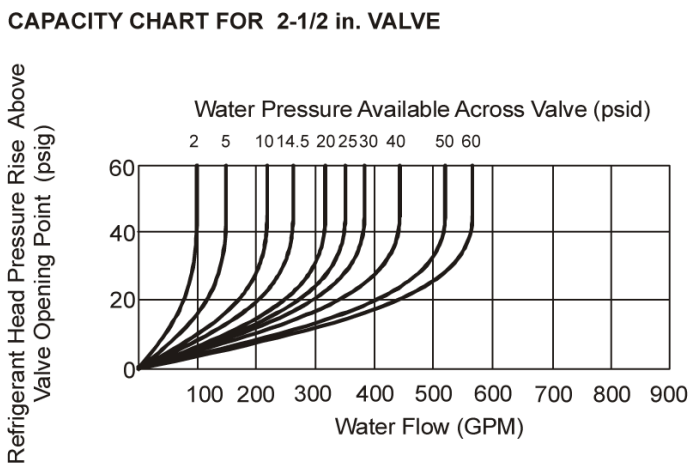


Figure 12: 3 in. V43 capacity flow chart

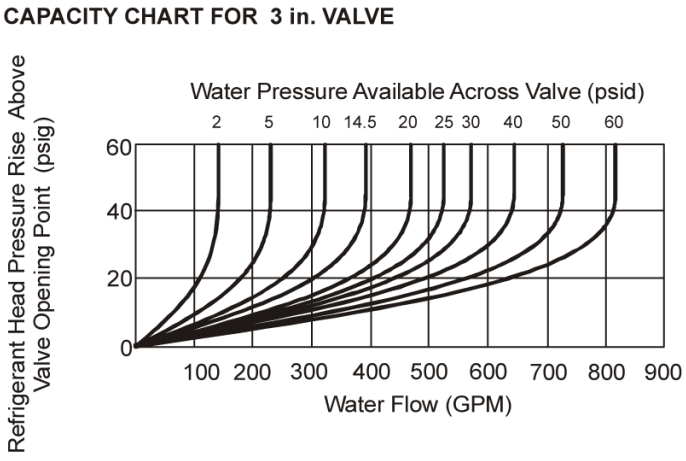
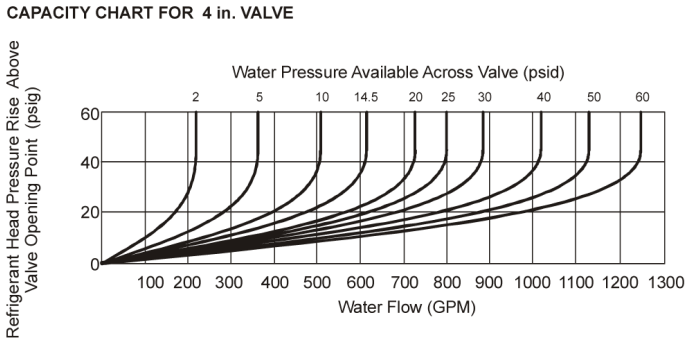


Figure 13: 4 in. V43 capacity flow chart

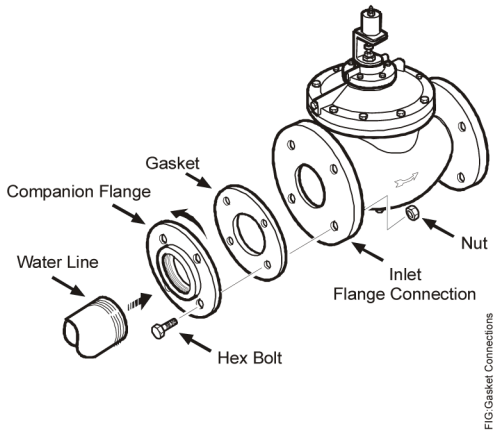


Installation and initial adjustment

1. Flush the lines to remove any foreign matter before you connect the lines to the valve. See Servicing.
2. Screw each companion flange and gasket onto the inlet and outlet water lines. See Figure 14. The inside of the companion flange is threaded. For flange and gasket kit information, see Table 9.
3. Mount the V43/V243 valves so that the water flow follows in the direction indicated by the arrow on the V43/V243 casting.

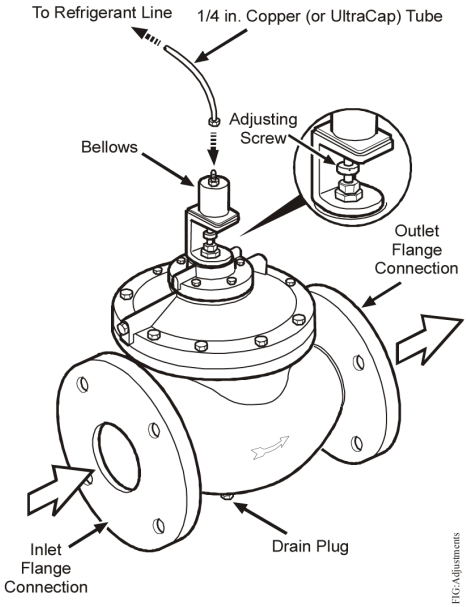
   Note: Mount the V43/V243 valves onto a horizontal water line, with the bellows up.
4. Secure the inlet and outlet water lines with companion flange and gasket to the inlet and outlet flange connections on the V43/V243 valves with hex bolts and nuts.

Figure 14: V43/V243 gasket and flange connections for V43AV



5. Connect a 1/4-inch copper (or UltraCap) tube from the bellows of the V43/V243 valves to the refrigerant line. See Figure 15. In reciprocating compressor applications, make the refrigerant connection as far from the compressor discharge as possible. If possible, make the connection on the outlet side of the condenser.
6. Manually flush the valve to remove debris. See Servicing.
7. Put the system into operation under normal operating conditions.
8. Determine the correct refrigerant operating head pressure for the system. Observe the refrigerant pressure that the high side pressure service gauge indicates.
9. If necessary, adjust the operating head pressure. See Adjusting the valve.

Figure 15: V43/V243 connections and adjustments for V43AV



Checkout procedure

Note: Before you operate equipment, always manually flush the valve. See Servicing.

Before you leave the installation site, observe at least three complete operating cycles (bellows open and close) to verify that all components function properly.

Adjusting the valve

About this task:
Make adjustments gradually. Adjust by a 1/2 revolution at a time. Wait for the system to stabilize after each adjustment change. The throttling range, also known as the differential, is not adjustable.

- To increase the opening point of the valve, turn the adjusting screw inward, clockwise, away from main valve body as viewed from the bottom up. See Figure 16.
- To decrease the opening point, turn the adjusting screw outward, counterclockwise, toward the main valve body.

Servicing

You can disassemble, clean, and reassemble the V43/V243 valves without breaking the line connections.

Accessing internal parts

1. Shut off the water flow to the V43/V243 valves.
2. Remove the hex bolts from the top of the bellows flange. See Figure 16.
3. Remove the bellows flange.

> **Note:** For internal parts replacement instructions, refer to the respective replacement parts instruction sheet.

Manually flushing the valve

About this task:
Before you start equipment, manually flush the valve to remove any foreign material from the valve.

1. Turn the adjusting screw clockwise, to raise the adjusting screw away from the valve body as much as possible. See Figure 16. Count the number of turns for reference.
2. Insert a standard slotted screwdriver tip between the adjusting screw and the push pin.
3. Pry the push pin down with the screwdriver to open the valve as indicated.
4. Hold the push pin down to hold the valve open. Flush the valve for several minutes, to remove all foreign matter from the V43/V243 valves.
5. After you flush the V43/V243 valves, remove the screwdriver and set the adjusting screw to the desired operating pressure. See Adjusting the valve.

Cleaning the MONEL screen

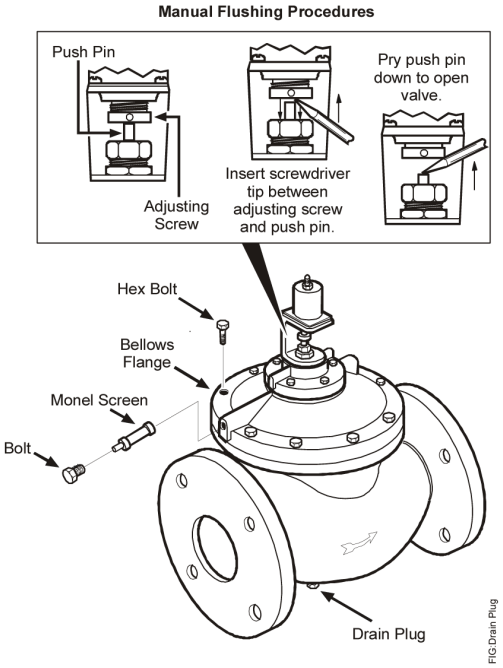
A fine mesh MONEL screen protects the pilot valve from debris. To clean the screen, shut off the water supply, relieve the water pressure, and unscrew the hex bolt. See Figure 16. Remove the MONEL screen, brush, and rinse clean.

Draining the V43/V243 valves during shutdown

To reduce the possibility of freeze-up, drain the V43/V243 valves during shutdown. To drain, unscrew the drain plug at the base of the V43/V243 valves. See Figure 16.

> **Note:** In order to drain, you must mount the V43/V243 valves in a horizontal water line with the bellows up and the drain plug down.

Figure 16: MONEL screen, drain plug, and manual flushing procedures



Dimensions

Figure 17: V43/V243 flange connection valves dimensions

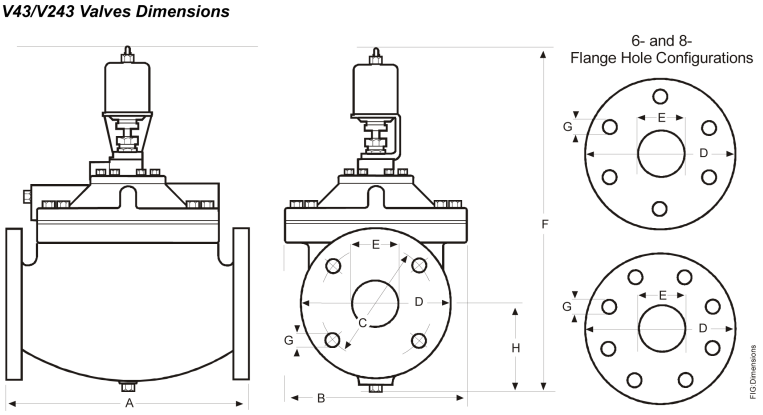


Table 1: Dimensions

Symbol	2 in.	2 1/2 in.	3 in.	4 in.
A[1]	9 1/2 in. (241 mm)	10 3/4 in. (273 mm)	11 3/4 in. (298 mm)	14 in. (356 mm)
B	7 1/2 in. (191 mm)	8 in. (203 mm)	9 in. (229 mm)	10 3/4 in. (273 mm)
C	4 3/4 in. (121 mm)	5 1/2 in. (140 mm)	6 in. (152 mm)	7 1/2 in. (191 mm)
D	6 in. (152 mm)	7 in. (178 mm)	7 1/2 in. (191 mm)	9 in. (229 mm)
E	2 1/8 in. (54 mm)	2 5/8 in. (67 mm)	3 1/8 in. (80 mm)	4 1/8 in. (105 mm)
F[2]	15 1/4 in. (387 mm)	15 9/16 in. (395 mm)	16 9/16 in. (421 mm)	18 7/32 in. (462 mm)
F[3]	15 29/32 in. (404 mm)	16 7/32 in. (412 mm)	17 7/32 in. (437 mm)	18 7/8 in. (479 mm)
G	3/4 in. (19.05 mm) Dia. (4)	3/4 in. (19.05 mm) Dia. (4)	3/4 in. (19.05 mm) Dia. (4)	3/4 in. (19.05 mm) Dia. (8)
H	3 5/8 in. (92 mm)	3 15/16 in. (100 mm)	4 1/4 in. (108 mm)	5 1/16 in. (128 mm)

1 Flange face to flange face.
2 Measurements for the V43 valves.
3 Measurements for the V243 valves.

Selection

When you order V43/V243 valves, specify the complete product code number including an optional companion flange and gasket kit. You need a companion flange and gasket kit to mount the water lines to commercial type V43/V243 water-regulating valves.

Table 2: Valve construction and pressure type

Designator	Construction and pressure type
A	Commercial service with iron body, open on pressure increase, V43
B	Maritime service with brass body, open on pressure increase, V43
C	Navy service with brass body, open on pressure increase, V43
G	Commercial service with iron body, open on pressure increase, V243
H	Maritime service with brass body, open on pressure increase, V243

Table 3: Flange size

Designator	Flange size
S	2 in.
T	2 1/2 in.
V	3 in.
W	4 in.

Table 4: V43 Series pressure-actuated water valves, except NAVSEA valves

Product code	Pipe size, in.	Inlet and outlet	Opening point adjustment range, psig (kPa)	Ship weight, lb (kg)
Commercial type – noncorrosive refrigerants (R)				
V43AS-1C	2	4-hole American Society of Mechanical Engineers (ASME) flanged	70 to 150 (483 to 1,034)	59 (26.76)
V43AS-2C			160 to 260 (1,103 to 1,793)	
V43AT-2C	2 1/2		140 to 260 (1,103 to 1,793)	65 (29.48)
V43AV-1C	3		70 to 150 (483 to 1,034)	90 (40.82)
V43AV-2C			160 to 260 (1,103 to 1,793)	90 (40.82)
V43AW-2C	4	8-hole ASME flanged		142 (64.41)
Maritime type – noncorrosive refrigerants (R)				
V43BS-7C	2	4-hole ASME flanged	160 to 260 (1,103 to 1,793)	59 (26.76)
V43BT-7C	2 1/2		140 to 260 (1,103 to 1,793)	65 (29.48)
V43BV-10C	3		70 to 150 (483 to 1,034)	90 (40.82)
V43BV-7C			140 to 260 (1,103 to 1,793)	

Table 5: V43 Series pressure-actuated water valves, Navy NAVSEA certified

Product code	Pipe size, in.	Inlet and outlet	Pressure connector	Opening point adjustment range, psig (kPa)	Ship weight, lb (kg)
Navy NAVSEA certified – noncorrosive refrigerants (R)					
V43CS-1C	2	6-hole Navy flange	1/4 in. male flared	70 to 150 (483 to 1,034)	59 (26.76)
V43CS-2C			Female sweat connector		
V43BT-3C	2 1/2	4-hole ASME flange	1/4 in. male flared connector		65 (29.48)
V43BV-4C	3	4-hole ASME flange	Female sweat connector		90 (40.82)
V43CV-1C		8-hole Navy flange	1/4 in. male flared connector		
V43CV-2C			Female sweat connector		
V43BW-7C	4	8-hole ASME flange	1/4 in. male flared		142 (64.41)

Table 6: V243 Series pressure-actuated water valves

Product code	Pipe size, in.	Inlet and outlet	Opening point adjustment range, psig (kPa)	Ship weight, lb (kg)
Commercial type – high pressure refrigerants				
V243GS-1C	2	4-hole ASME flange	200 to 400 (1,379 to 2,758)	59 (26.76)
V243GT-1C	2 1/2			65 (29.48)
V243GV-1C	3			90 (40.82)
Maritime type – high pressure refrigerants				
V243HS-1C	2	4-hole ASME flange	200 to 400 (1,379 to 2,758)	59 (26.76)
V243HT-1C	2 1/2			65 (29.48)
V243HV-1C	3			90 (40.82)
V243HW-1C	4	8-hole ASME flange		142 (64.41)

Repair and replacement information

If a V43/V243 Pressure-Actuated Water-Regulating Valve fails to operate within its specifications, replacement sensing elements, internal parts, and diaphragms are available for valve repair. See Servicing for servicing instructions.

To obtain replacement parts kit instructions and details, contact your nearest Johnson Controls® distributor. For replacement parts kit product code numbers, see Table 7 and Table 8.

Table 7: Repair parts

Model[1]	Diaphragm kit	Seat disc and diaphragm kit	Seat repair kit	Screen repair kit	Push rod kit[2]	Sensing element kit	Disc body kit
V43AS-1C	DPM18A-600R	DSC16A-600R	STT19A-602R	SCN10A-600R	ROD18A-600R	SEP88A-600R	DBK11A-600R
V43AS-2C	DPM18A-600R	DSC16A-600R	STT19A-602R	SCN10A-600R	ROD18A-600R	SEP88A-601R	DBK11A-600R
V43AS-5C	DPM18A-600R	DSC16A-600R	STT19A-602R	SCN10A-600R	ROD18A-600R	SEP87A-600R	DBK11A-600R
V43AT-1C	DPM18A-601R	DSC16A-601R	STT19A-603R	SCN10A-600R	ROD18A-601R	SEP88A-600R	DBK11A-601R
V43AT-2C	DPM18A-601R	DSC16A-601R	STT19A-603R	SCN10A-600R	ROD18A-601R	SEP88A-601R	DBK11A-601R
V43AT-5C	DPM18A-601R	DSC16A-601R	STT19A-603R	SCN10A-600R	ROD18A-601R	SEP87A-600R	DBK11A-601R
V43AV-1C	DPM18A-602R	DSC16A-602R	STT19A-606R	SCN10A-600R	ROD18A-601R	SEP88A-600R	DBK11A-602R
V43AV-2C	DPM18A-602R	DSC16A-602R	STT19A-606R	SCN10A-600R	ROD18A-601R	SEP88A-601R	DBK11A-602R
V43AV-5C	DPM18A-602R	DSC16A-602R	STT19A-606R	SCN10A-600R	ROD18A-601R	SEP87A-600R	DBK11A-602R
V43AW-1C	DPM18A-603R	DSC16A-603R	STT19A-608R	SCN10A-600R	ROD18A-602R	SEP88A-600R	DBK11A-603R
V43AW-2C	DPM18A-603R	DSC16A-603R	STT19A-608R	SCN10A-600R	ROD18A-602R	SEP88A-601R	DBK11A-603R
V43AW-5C	DPM18A-603R	DSC16A-603R	STT19A-608R	SCN10A-600R	ROD18A-602R	SEP87A-600R	DBK11A-603R
V43BS-1C[1]	DPM18A-600R	DSC16A-600R	STT19A-602R	SCN10A-601R	ROD18A-602R	SEP88A-600R	DBK11A-600R
V43BS-2C[1]	DPM18A-600R	DSC16A-600R	STT19A-602R	SCN10A-601R	ROD18A-602R	SEP88A-601R	DBK11A-600R
V43BS-3C	DPM18A-600R	DSC16A-600R	STT19A-600R	SCN10A-601R	ROD18A-602R	SEP88A-600R	DBK10A-600R
V43BS-6C	DPM18A-600R	DSC16A-600R	STT19A-600R	SCN10A-601R	ROD18A-602R	SEP88A-600R	DBK10A-600R
V43BS-7C	DPM18A-600R	DSC16A-600R	STT19A-600R	SCN10A-601R	ROD18A-602R	SEP88A-601R	DBK10A-600R
V43BT-1C[1]	DPM18A-601R	DSC16A-601R	STT19A-603R	SCN10A-601R	ROD18A-603R	SEP88A-600R	DBK11A-601R
V43BT-2C[1]	DPM18A-601R	DSC16A-601R	STT19A-603R	SCN10A-601R	ROD18A-603R	SEP88A-601R	DBK11A-601R
V43BT-3C	DPM18A-601R	DSC16A-601R	STT19A-605R	SCN10A-601R	ROD18A-603R	SEP88A-600R	DBK10A-602R
V43BT-6C	DPM18A-601R	DSC16A-601R	STT19A-605R	SCN10A-601R	ROD18A-603R	SEP88A-600R	DBK10A-602R
V43BT-7C	DPM18A-601R	DSC16A-601R	STT19A-605R	SCN10A-601R	ROD18A-603R	SEP88A-601R	DBK10A-602R

Table 7: Repair parts

Model[1]	Diaphragm kit	Seat disc and diaphragm kit	Seat repair kit	Screen repair kit	Push rod kit[2]	Sensing element kit	Disc body kit
V43BV-1C[1]	DPM18A-602R	DSC16A-602R	STT19A-606R	SCN10A-601R	ROD18A-603R	SEP88A-600R	DBK11A-602R
V43BV-2C[1]	DPM18A-602R	DSC16A-602R	STT19A-606R	SCN10A-601R	ROD18A-603R	SEP88A-601R	DBK11A-602R
V43BV-4C	DPM18A-602R	DSC16A-602R	STT19A-607R	SCN10A-601R	ROD18A-603R	SEP88A-600R	DBK10A-601R
V43BV-5C[1]	DPM18A-602R	DSC16A-602R	STT19A-606R	SCN10A-601R	ROD18A-603R	SEP88A-600R	DBK11A-602R
V43BV-6C[1]	DPM18A-602R	DSC16A-602R	STT19A-606R	SCN10A-601R	ROD18A-603R	SEP88A-601R	DBK11A-602R
V43BV-7C	DPM18A-602R	DSC16A-602R	STT19A-607R	SCN10A-601R	ROD18A-603R	SEP88A-601R	DBK10A-601R
V43BV-8C	DPM18A-602R	DSC16A-602R	STT19A-607R	SCN10A-601R	ROD18A-603R	SEP88A-600R	DBK10A-601R
V43BV-9C	DPM18A-602R	DSC16A-602R	STT19A-607R	SCN10A-601R	ROD18A-603R	SEP88A-601R	DBK10A-601R
V43BV-10C	DPM18A-602R	DSC16A-602R	STT19A-607R	SCN10A-601R	ROD18A-603R	SEP88A-600R	DBK10A-601R
V43BW-1C	DPM18A-603R	DSC16A-603R	STT19A-609R	SCN10A-601R	ROD18A-602R	SEP88A-600R	DBK10A-603R
V43BW-2C	DPM18A-603R	DSC16A-603R	STT19A-609R	SCN10A-601R	ROD18A-602R	SEP88A-601R	DBK10A-603R
V43BW-5C	DPM18A-603R	DSC16A-603R	STT19A-609R	SCN10A-601R	ROD18A-602R	SEP88A-600R	DBK10A-603R
V43BW-6C	DPM18A-603R	DSC16A-603R	STT19A-609R	SCN10A-601R	ROD18A-602R	SEP88A-601R	DBK10A-603R
V43BW-7C	DPM18A-603R	DSC16A-603R	STT19A-609R	SCN10A-601R	ROD18A-602R	SEP88A-600R	DBK10A-603R
V43CS-1C	DPM18A-600R	DSC16A-600R	STT19A-600R	SCN10A-601R	ROD18A-602R	SEP88A-600R	DBK10A-600R
V43CS-2C	DPM18A-600R	DSC16A-600R	STT19A-600R	SCN10A-601R	ROD18A-602R	SEP88A-600R	DBK10A-600R
V43CS-3C	DPM18A-600R	DSC16A-600R	STT19A-600R	SCN10A-601R	ROD18A-604R	SEP88A-600R	DBK10A-600R
V43CT-1C	DPM18A-601R	DSC16A-601R	STT19A-605R	SCN10A-601R	ROD18A-603R	SEP88A-600R	DBK10A-602R
V43CT-2C	DPM18A-601R	DSC16A-601R	STT19A-605R	SCN10A-601R	ROD18A-603R	SEP86A-600R	DBK10A-602R
V43CV-1C	DPM18A-602R	DSC16A-602R	STT19A-607R	SCN10A-601R	ROD18A-603R	SEP86A-600R	DBK10A-601R
V43CV-2C	DPM18A-602R	DSC16A-602R	STT19A-607R	SCN10A-601R	ROD18A-603R	SEP88A-600R	DBK10A-601R
V243GS-1C	DPM18A-600R	DSC16A-600R	STT19A-602R	SCN10A-600R	ROD18A-600R	SEP90A-600R	DBK11A-600R
V243GT-1C	DPM18A-601R	DSC16A-601R	STT19A-603R	SCN10A-600R	ROD18A-601R	SEP90A-600R	DBK11A-601R
V243GV-1C	DPM18A-602R	DSC16A-602R	STT19A-606R	SCN10A-600R	ROD18A-601R	SEP90A-600R	DBK11A-602R
V243GW-1C	DPM18A-603R	DSC16A-603R	STT19A-608R	SCN10A-600R	ROD18A-600R	SEP90A-600R	DBK11A-603R
V243HS-1C	DPM18A-600R	DSC16A-600R	STT19A-600R	SCN10A-601R	ROD18A-602R	SEP90A-600R	DBK10A-600R
V243HT-1C	DPM18A-601R	DSC16A-601R	STT19A-605R	SCN10A-601R	ROD18A-603R	SEP90A-600R	DBK10A-601R
V243HV-1C	DPM18A-602R	DSC16A-602R	STT19A-607R	SCN10A-601R	ROD18A-603R	SEP90A-600R	DBK10A-602R
V243HW-1C	DPM18A-603R	DSC16A-603R	STT19A-609R	SCN10A-601R	ROD18A-602R	SEP90A-600R	DPK10A-603R

1 Repair parts are supplied in kits only and include all parts that you need to recondition that portion of the valve. To order, specify the code number only.
2 Replacement push rod kit requires a seat repair kit or a diaphragm kit when you replace it.

The following valves, manufactured after date code 8702, contain MONEL interior trim. To order replacement kits, see Table 7 or refer to *V43xx and V243xx Series Repair Parts Kits Technical Bulletin (LIT-121690)*.

Table 8: Parts kits

Valve model	Order parts kits for:
V43BS-1C	V43BS-6C
V43BS-2C	V43BS-7C
V43BT-1C	V43BT-6C
V43BT-2C	V43BT-7C
V43BV-1C	V43BV-10C
V43BV-2C	V43BV-7C
V43BV-5C	V43BV-10C
V43BV-6C	V43BV-9C

Accessories

Table 9: Companion flanges and gaskets

Kit code number	Water valve size, in.	Shipping weight, lb (kg)
KIT14A-613 [1,2]	2	11.8 (5.4)
KIT14A-614 [1,2]	2-1/2	16.5 (7.5)
FLG15A-600 [1,3]	3	20 (9.1)
FLG15A-601 [1,3]	4	34 (15.4)

1 Commercial valves only.
2 See Figure 18 for a diagram of the parts included in the flange and gasket kit for the 2-in. and 2 1/2-in. valves.
3 See Figure 19 for a diagram of the parts included in the flange and gasket kit for the 3-in. and 4-in. valves.

You need a companion flange and gasket kit to mount the water lines to commercial type V43/V243 water-regulating valves.

Figure 18: KIT14A

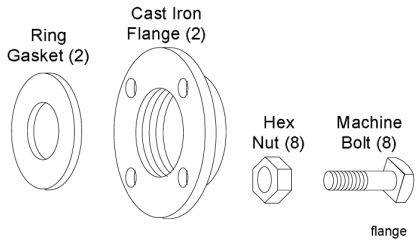
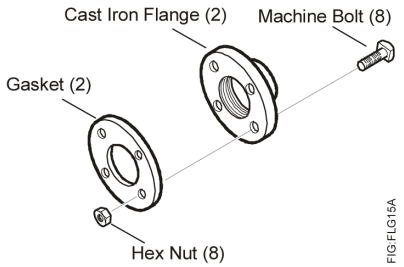


Figure 19: FLG15A



V43/V243 Pressure-Actuated Water-Regulating Valves technical specifications

Table 10: V43/V243 Pressure-Actuated Water-Regulating Valves technical specifications

Specification			Description
Maximum water supply pressure			150 psig (1,034 kPa)
V43 maximum head pressure			300 psig (2,068 kPa)
V243 maximum head pressure			630 psig (4,344 kPa)
Head pressure range, opening points	V43	Low-pressure refrigerants	R-134A – 70 to 150 psig (482 to 1,034 kPa)
		Medium-pressure refrigerants	R-22, R-502, R404A – 160 to 260 psig (1,103 to 1,793 kPa)
	V243	High-pressure	R410A – 200 to 400 psig (1,379 to 2,758 kPa)
Factory settings[1]	V43	Low-pressure refrigerants	90 psig (621 kPa)
		Medium-pressure refrigerants	180 psig (1,241 kPa)
	V243	High-pressure	200 psig (1,379 kPa)
Maximum water supply temperature			160°F (71°C)
Valve body material		Commercial	Cast iron
		Maritime	Red brass
Internal parts material		Commercial	Brass
		Maritime	Bronze, MONEL
Seat material		Pilot	MONEL
		Main valve	Commercial – bronze, Maritime – MONEL
Seat disc material			Buna N™

Table 10: V43/V243 Pressure-Actuated Water-Regulating Valves technical specifications

Specification		Description
Packing – bellows assembly		Brass stem, stainless steel spring, synthetic rubber boot
Pressure connection refrigerant side	Noncorrosive	1/4 in. SAE male flare

1 You can adjust the factory setpoint for the valve.

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 shall not be liable for damages resulting from misapplication or misuse of its products.

Product warranty

This product is covered by a limited warranty, details of which can be found at www.johnsoncontrols.com/buildingswarranty.

Single point of contact

APAC	Europe	NA/SA
JOHNSON CONTROLS C/O CONTROLS PRODUCT MANAGEMENT NO. 32 CHANGJIJANG RD NEW DISTRICT WUXI JIANGSU PROVINCE 214028 CHINA	JOHNSON CONTROLS WESTENDHOF 3 45143 ESSEN GERMANY	JOHNSON CONTROLS 507 E MICHIGAN ST MILWAUKEE WI 53202 USA

Contact information

Contact your local branch office: www.johnsoncontrols.com/locations

Contact Johnson Controls: www.johnsoncontrols.com/contact-us

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