



## V47 Series Temperature Actuated Modulating Valve

### Description

The V47 is a temperature actuated modulating valve that regulates the flow of water or glycol to maintain a desired temperature. Three temperature ranges for each valve size are available.

Many valves come with a removable bypass plug that can be replaced by the bypass orifice provided separately with each valve.

Valve action is open on temperature increase. For open on temperature decrease models, contact Application Engineering.

Refer to the *V47 Series Temperature Actuated Modulating Water Valves Product Bulletin (LIT-125690)* for important product application information.

### Features

- no close fitting sliding parts in water passages
- range spring does not come in contact with the cooling water
- easy manual flushing, if required
- valve design minimizes chatter and water hammer

### Repair Information

If the V47 Series Temperature Actuated Modulating Valve fails to operate within its specifications, replace the unit. For a replacement valve, contact the nearest Johnson Controls® representative.



V47 Series Valve

### Selection Chart

Product Code Number <sup>1</sup>	Pipe Size, in.	Range (Opening Point) °F	Bulb Size, in. (Dia. length)	Std Bypass Orifice Dia., in.	Seat Repair Kit	Replacement Sensing Element	Bulb Well Number Order Separately
V47AA-1C	3/8	115 to 180 Heating	11/16 x 3-1/4	0.062	STT14A-600R	SET29A-622R	WEL18A-602R
V47AA-2C	3/8	160 to 230 Heating	11/16 x 3-1/4	0.062	STT14A-600R	SET29A-623R	WEL18A-602R
V47AA-3C	3/8	75 to 135 Cross Ambient	11/16 x 6	0.062	STT14A-600R	SET29A-601R	WEL17A-601R
V47AA-26C <sup>2</sup>	3/8	20 to 65 Cross Ambient	11/16 x 6 <sup>3</sup>	–	STT14A-600R	–	WEL17A-601R
V47AB-2C	1/2	75 to 135 Cross Ambient	11/16 x 10 <sup>3</sup>	–	STT15A-602R	SET29A-602R	WEL17A-600R
V47AB-3C	1/2	115 to 180 Heating	11/16 x 3-1/4	0.062	STT15A-602R	SET29A-624R	WEL18A-602R
V47AB-4C	1/2	160 to 230 Heating	11/16 x 3-1/4	0.062	STT15A-602R	SET29A-625R	WEL18A-602R
V47AB-5C	1/2	75 to 135 Cross Ambient	11/16 x 10	0.062	STT15A-602R	SET29A-602R	WEL17A-600R
V47AB-27C <sup>4</sup>	1/2	40 to 85 Cross Ambient	11/16 x 10 <sup>3</sup>	Yes <sup>5</sup>	STT15A-602R	–	WEL17A-600R
V47AC-3C	3/4	115 to 180 Heating	11/16 x 3-1/4	0.062	STT16A-601R	SET29A-626R	WEL18A-602R
V47AC-4C	3/4	160 to 230 Heating	11/16 x 3-1/4	0.062	STT16A-601R	SET29A-627R	WEL18A-602R
V47AC-6C	3/4	75 to 135 Cross Ambient	11/16 x 10	0.062	STT16A-601R	SET29A-604R	WEL17A-600R
V47AC-8C	3/4	75 to 135 Heating	11/16 x 3-1/4	–	STT16A-601R	SET98A-621R	WEL18A-602R
V47AC-40C	3/4	40 to 85 Cross Ambient	11/16 x 10	Yes <sup>5</sup>	STT16A-601R	–	WEL17A-600R
V47AD-1C	1	75 to 135 Cross Ambient	11/16 x 16-1/4	0.093	STT17A-609R	SET29A-605R	–
V47AD-2C	1	115 to 180 Heating	11/16 x 6	0.093	STT17A-609R	SET29A-629R	WEL17A-601R
V47AD-3C	1	160 to 230 Heating	11/16 x 6	0.093	STT17A-609R	SET29A-630R	WEL17A-601R
V47AD-19C	1	40 to 85 Cross Ambient	11/16 x 16-1/4	0.093	STT17A-609R	–	–
V47AE-1C	1-1/4	75 to 135 Cross Ambient	11/16 x 16-1/4	0.093	STT17A-610R	SET29A-605R	–
V47AE-2C	1-1/4	115 to 180 Heating	11/16 x 6	0.093	STT17A-610R	SET29A-629R	WEL17A-601R
V47AE-3C	1-1/4	160 to 230 Heating	11/16 x 6	0.093	STT17A-610R	SET29A-630R	WEL17A-601R
V47AE-13C	1-1/4	40 to 85 Cross Ambient	11/16 x 16-1/4	Yes <sup>5</sup>	STT17A-610R	–	–
V47AR-1	1-1/2 <sup>6</sup>	75 to 135 Cross Ambient	11/16 x 16-1/4	0.093	STT17A-610R	SET29A-605R	–
V47AR-2	1-1/2 <sup>6</sup>	115 to 180 Heating	11/16 x 6	0.093	STT17A-610R	SET29A-629R	WEL17A-601R
V47AR-3	1-1/2 <sup>6</sup>	160 to 230 Heating	11/16 x 6	0.093	STT17A-610R	SET29A-630R	WEL17A-601R
V47AS-1	2 <sup>6</sup>	115 to 160 Heating	11/16 x 10	0.125	STT18A-600R	SET29A-632R	WEL17A-600R
V47AS-2	2 <sup>6</sup>	160 to 205 Heating	11/16 x 10	0.125	STT18A-600R	SET29A-633R	WEL17A-600R
V47AS-3	2 <sup>6</sup>	75 to 115 Cross Ambient	11/16 x 43	0.125	STT18A-600R	SET29A-606R	–
V47AS-13C	2 <sup>6</sup>	40 to 85 Cross Ambient	11/16 x 43	Yes <sup>5</sup>	STT18A-600R	–	–
V47AT-1	2-1/2 <sup>6</sup>	115 to 160 Heating	11/6 x 10	0.125	STT18A-601R	SET29A-632R	WEL17A-600R
V47AT-2	2-1/2 <sup>6</sup>	160 to 205 Heating	11/6 x 10	0.125	STT18A-601R	SET29A-633R	WEL17A-600R
V47AT-3	2-1/2 <sup>6</sup>	75 to 115 Cross Ambient	11/16 x 43	0.125	STT18A-601R	SET29A-606R	–

1. Standard capillary is 6 ft (Style 4)

2. 2 ft capillary

3. Style 1 bulb (does not include 1/2 in. external NPT fitting)

4. 4 ft capillary

5. Solid plug installed, orifice available separately

6. ASME Flange

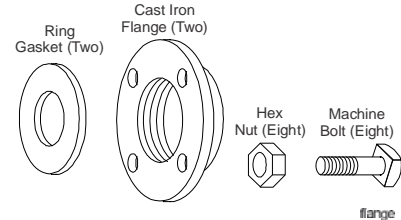
Note: For more information on Bulb Wells, refer to *Bulb Wells (LIT-19Bulb Wells Catalog Page (J22135))*.



## V47 Series Temperature Actuated Modulating Valve (Continued)

### Accessories (Companion Flanges and Gaskets)

Product Code Number		Water Valve Size (in.)
Flange Gasket (One Gasket per Package)	Companion Flange Kit (See Diagram)	
246-423	KIT14A-612	1-1/2 in.
246-424	KIT14A-613	2 in.
246-425	KIT14A-614	2-1/2 in.



Note: Flanges have NPT (National Pipe Thread).

Companion Flange Kit

### Technical Specifications

V47 Series Temperature Actuated Modulating Valves	
Maximum Bulb Temperature	20F° (-6.7 C°) above temperature range
Maximum Water Temperature	170°F (77°C)
Maximum Supply Water Pressure	150 psig (1,034 kPa)
Capillary	Nylon Armor <sup>1</sup>
Temperature Bulb Style 4 <sup>2</sup> (pictured)	(1/2 in. NPT closed tank immersion)

- For capillary length, refer to the selection chart on the previous page.
- V47AA-26, V47AB-2, V47AB-27 — Temperature Bulb Style 1 (no 1/2 in. NPT external fitting)

### Metric Conversion

°F	°C
20 to 65	-6 to 18
40 to 85	4 to 29
75 to 115	24 to 46
75 to 135	24 to 57
115 to 160	46 to 71
115 to 180	46 to 82
160 to 205	71 to 96
160 to 230	71 to 110

### V47 Valve Sizing Information

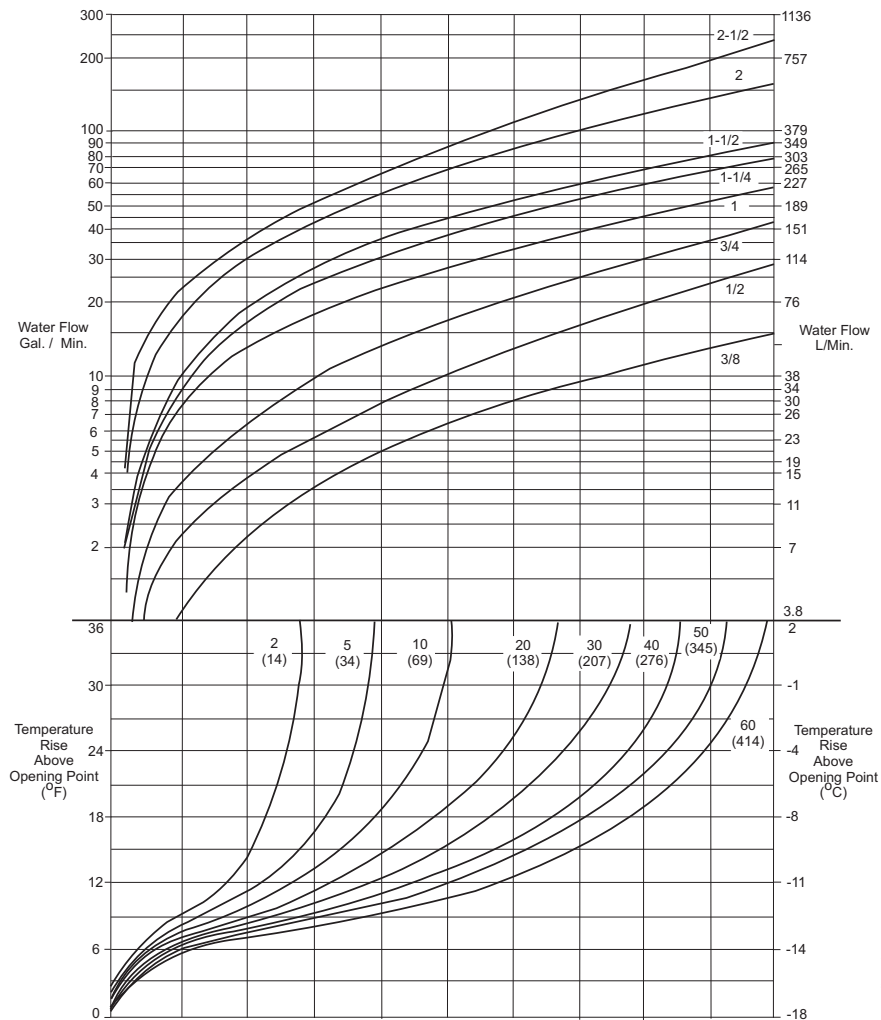
To Select Water Valve Size, see the flow chart for selection of water valves. Carefully follow the steps as outlined below.

- Determine the maximum water flow required.  
Draw a horizontal line through this flow across the upper half of the flow chart.
- Use the following method to determine the temperature rise above the opening point.
  - Valve closing point is the highest temperature at which it is desired to have no flow through the valve.
  - Valve opening point is about 5F° above the closing point.
  - Determine the temperature the valve is to maintain, this is the operating temperature.
  - Subtract the opening temperature from the operating temperature. This is the temperature rise above the opening point.
- Determine the available system pressure for use with the valve by the following appropriate method:
 

**Open System:**  
Available System Pressure = Inlet Pressure - condenser pressure drop - friction losses in piping.

**Closed System:**  
Available System Pressure = Inlet Pressure - static head - condenser pressure drop - friction losses in piping.

The available system pressure is represented by the curve in the lower half of the flow chart.
- In the lower half of the flow curve, draw a horizontal line from the temperature above the opening point (Step 2d) to the available system pressure (Step 3). If the point falls between two pressure drop curves, use the curve to the left (this gives an automatic factor of safety).
- From this point, draw a vertical line until it intersects the flow line from Step 1.
- If the intersection falls on a valve size curve, this is the valve size.
- If the intersection falls between two curves, use the curve to the left for the required valve size.



Flow Chart, V47 Valve

The performance specifications are nominal and conform to acceptable industry standards. For applications 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. © 2015 Johnson Controls, Inc. [www.johnsoncontrols.com](http://www.johnsoncontrols.com)