2-Way and 3-Way Motorized Valves

- *Designed for Steam, Vacuum , and Hydronic Applications*
- *Floating 24VAC Actuators with and without Feedback*
- *Multi-Stack Packing provides longevity*

Motorized Valves
for Steam, Vacuum, and Hot Water

Distinctly Engineered for the HVAC Industry.

Both two-way On/Off or modulating valves and three-way mixing valves are available in a wide range of sizes. The valves are designed and constructed to withstand the temperature and pressure demands of all types of HVAC systems. Each valve comes as a complete package, including the body, motor, and transformer. The Heat-Timer floating motor has 3-wire (RWB) control. Current Heat-Timer motorized valves are the culmination of over 70 years of experience.

HT# 056081-00 D

HEAT-TIMER® CORPORATION
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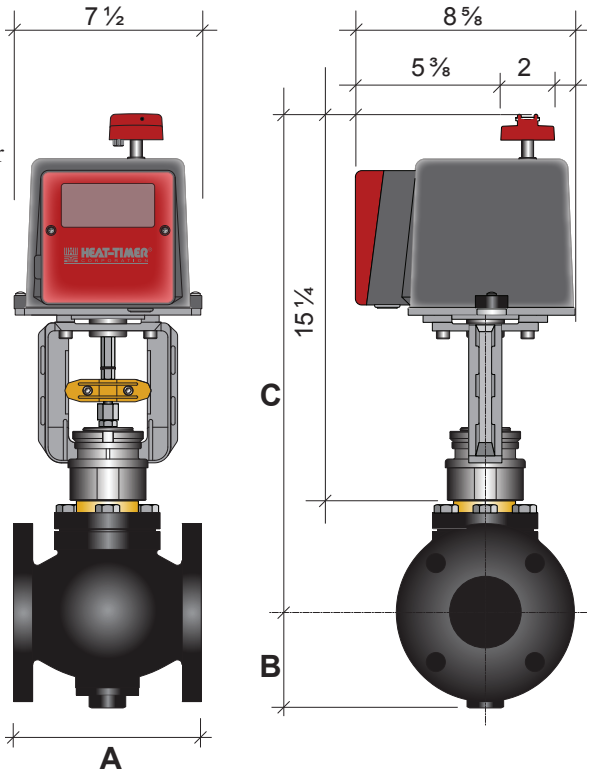
2-Way Steam Motorized Valves

Steam Heating. Two-way valves can turn on or off the flow of steam from the boiler or other sources into a steam distribution system. A typical example of this type of application would be using steam to heating radiators in a one or two pipe steam heated building using the MPC Platinum control.

Steam To Hot Water Heat Exchanger. Two-way valves can be used to control the amount of steam entering a system. A typical example of this type of application would be to regulate the amount of steam entering a heat exchanger to maintain the hot water output temperature using the HWR Platinum control. When the load changes, the valve is signaled to change the amount of steam entering the heat exchanger.



2-Way Steam Valve Sizing

The selection of a steam valve in a zoning situation should be based on minimizing the drop across a two-way valve. In the case of heat exchangers the objective is to allow maximum capacity flow as specified by the heat exchanger and/or pump capacity. This formula is used:

$$C_V = \frac{\text{Lb/hr.}}{2.1\sqrt{(P_1-P_2) \times (P_1+P_2)}}$$

Take this example in which the object is to calculate the C_V which will pass 5,000 lb/hr of saturated steam when the inlet pressure is 7 PSIG and a 2 PSIG pressure drop is desired. Remember to use absolute pressures.

$P_1 = 14.7 + 7.0 = 21.7$

$P_2 = P_1 - \Delta P = 19.7$

$$C_V = \frac{5{,}000}{2.1\sqrt{(21.7-19.7) \times (21.7+19.7)}} = 262$$

2-Way Steam Motorized Valve (Used in Low Pressure Steam and Steam to Hot Water Heating Applications)

Valve Size	Catalog Number	Flow Coeff. C_V	Dimensions			Mount	Body	Trim	Est Shipping Weight	Medium Temp Range °F	Actuator
			A	B	C						
1 ½"	928051-50-VM♦	24	5 ¾	3 ¼	19"	NPT	Bronze	S. Steel	31	32 to 400	VM-660
2"	928052-00-VM♦	40	6 ½"	3 ⅝ "	19 ¼"	NPT	Bronze	S. Steel	35	32 to 400	VM-660
2 ½"	928252-50-VM♦	65	9"	4 ¾"	20 ¾"	Flanged	Iron	Bronze	71	32 to 350	VM-660
3"	928253-00-VM♦	90	10"	5 ⅜"	21 ⅝"	Flanged	Iron	Bronze	88	32 to 350	VM-660
4"	928254-00-VM♦	170	13"	6 ⅜"	22 ⅝"	Flanged	Iron	Bronze	135	32 to 350	VM-660
5"	928255-00-VM♦	280	15 ¾"	5 ¾"	23 ¼"	Flanged	Iron	Bronze	150	32 to 350	VM-660
6"	928256-00-VM♦	360	17 ¾"	6 ½"	23 ⅞"	Flanged	Iron	Bronze	191	32 to 350	VM-660
8"	928058-00-VM♦♦	680	16 ¼"	8 ⅞"	25 ⅛"	Flanged	Iron	Bronze	306	32 to 350	VM-660
10"	928060-00-VM♦♦	960	20"	9 ⅞"	25 ⅞"	Flanged	Iron	Bronze	451	32 to 350	VM-660

♦ Single-Seated Valves
♦♦ Double-Seated Valves

2-Way Valve Specifications

Body: . . . . . (1 ½" -2" Valves) ANSI B16.15 Bronze 250lb. Threaded (NPT)
. . . . . (2 ½" - 10" Valves) ANSI B16.1 Iron 125lb. Flange
Trim: . . . . . (1 ½" -2" Valves) 316 Stainless Steel
. . . . . (2 ½" - 10" Valves) Bronze
Packing: . . . . . Long-Life Multi-Stack, EPDM for temperatures up to 350°F
Seat Closure: . . (1 ½" - 2" Valves) Single-Seat ANSI Class IV and Class VI shut-off
. . . . . (2 ½" - 6" Valves) Single-Seat ANSI Class IV shut-off
. . . . . (8" - 10" Valves) Double-Seat ANSI Class IV shut-off

Actuator without Feedback Specifications (VM-660)

Actuator Input Signal: . . . . . .24VAC Floating
Power Consumption:. 10VA
Operating temperature . . . . . .Ambient 15°F to 120°F
Manual Override: . . . . . .Manual Crank Handle
Construction: . . . . . Aluminum Bracket and Housing
Locations: . . . . . NEMA Type 2 / IP54 Indoor Only
Clearance: . . . . . Minimum of 4- 6" above the actuator for manual operation
Mounting: . . . . . Vertical above center line of valve

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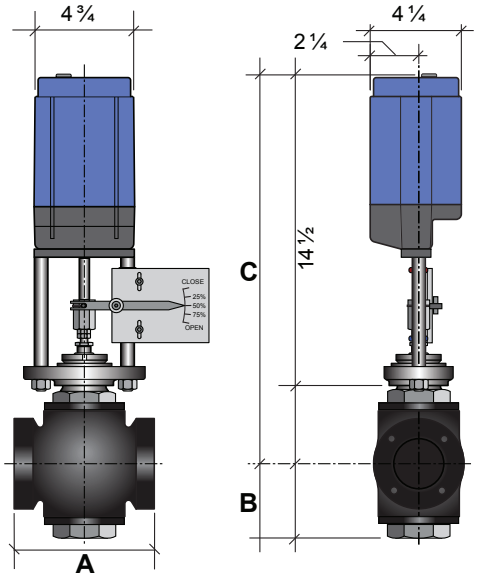
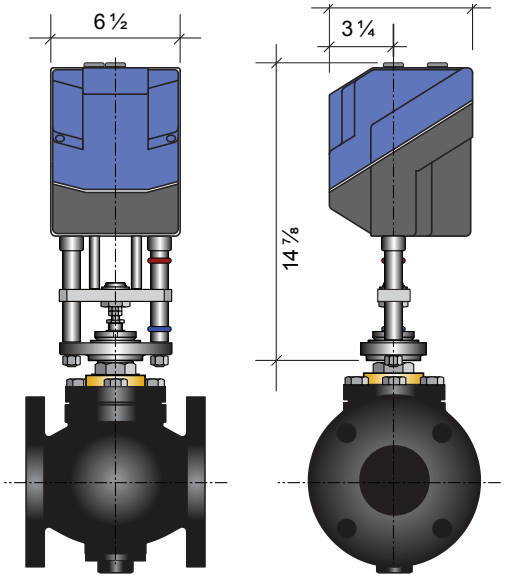
2-Way Vacuum Motorized Valves with Feedback

Vacuum Steam Heating. Two-way valves can modulate the flow of sub-atmospheric steam from the boiler or other source into a steam distribution system. Actuators are equipped with a position feedback signal. In addition, valve sizes up to 6" can be ordered with a valve percent opening gauge. A typical example of this type of application would be using vacuum steam to heat radiators in a building. When the control, such as the SRC Platinum , calls to put heat into the system, the two-way valve partially modulates open and steam flows into the radiators based on the outdoor air temperature. Then when the control determines that sufficient heat has entered the radiators, the control marginally closes the two-way valve reducing the flow of steam, or closes the valve.



Actuator (VM-330Lbs) used with Valves (1 ½" - 6")



Actuator (VM-1100Lbs) used with Valves (8" - 10")

2-Way Double-Seat Motorized Valve with Feedback (Used in Vacuum Steam Heating Applications)

Valve Size	Catalog Number	Flow Coeff. C_V	Dimensions			Mount	Body	Trim	Valve Body Rate Lbs	Est Shipping Weight	Medium Temp Range °F	Actuator
			A	B	C							
1 ½"	928651-50-VM♦	30	7 ⅜"	3 ⅞"	24 ¼"	NPT Thread	Iron	Bronze	250	25	32 to 400	VM-330
2"	928652-00-VM♦	42	7 ⅜"	3 ⅞"	24 ¼"	NPT Thread	Iron	Bronze	250	30	32 to 400	VM-330
2 ½"	928152-50-VM♦	70	7 ¾"	4 ⅛"	24 ⅝"	Flanged	Iron	Bronze	125	50	32 to 350	VM-330
3"	928153-00-VM♦	100	9"	4 ⅜"	24 ⅞"	Flanged	Iron	Bronze	125	70	32 to 350	VM-330
4"	928154-00-VM♦	200	11 ⅜"	5"	26 ⅝"	Flanged	Iron	Bronze	125	105	32 to 350	VM-330
5"	928155-00-VM♦	260	12"	6 ⅞"	27⅜"	Flanged	Iron	Bronze	125	160	32 to 350	VM-330
6"	928156-00-VM♦	350	14 ⅛"	7 ⅝"	28 ¼"	Flanged	Iron	Bronze	125	200	32 to 350	VM-330
8"	928658-00-VM♦	680	16 ¼"	8 ⅞"	29 ¾"	Flanged	Iron	Bronze	125	295	32 to 350	VM-1100
10"	928653-00-VM♦	960	20"	9 ⅞"	30 ½"	Flanged	Iron	Bronze	125	440	32 to 350	VM-1100

♦ Actuator or valve used may look different from image.
All valves are double-seated

2-Way Valve Specifications

Body: . . . . . (1 ½" -2" Valves) ANSI B16.15 Bronze 250lb. Threaded (NPT)
. . . . . (2 ½" - 10" Valves) ANSI B16.1 Iron 125lb. Flange
Trim: . . . . . (1 ½" -2" Valves) 316 Stainless Steel
. . . . . (2 ½" - 10" Valves) Bronze
Packing: . . . . . Long-Life Multi-Stack, EPDM for temperatures up to 350°F
Seat Closure: . . (1 ½" - 2" Valves) Single-Seat ANSI Class IV and Class VI shut-off
. . . . . (2 ½" - 10" Valves) Double-Seat ANSI Class III shut-off

Actuator with Feedback Specifications (VM-330 and VM-1100)

Actuator Input Signal: . . . . . 24VAC Floating
Power Consumption: . . . . . 12VA (1 ½" - 6" Valves), 25VA (8" - 10" Valves)
Feedback Signal: . . . . . 1000 Ohm Potentiometer Feedback signal
Manual Override: . . Hex wrench provided (VM-1100 Has a Clutch Release Button)
Construction: . . . . . Polycarbonate Motor Housing with Steel Linkage and Yoke
Locations: . . . . . NEMA Type 2 / IP54 Indoor Only
Temperature Limits: . . . . . Ambient +32ºF to 122ºF, 250ºF at bonnet
Clearance: . . . . . Minimum 6" for easy cover removal
Mounting: . . . . . Vertical above centerline of valve
Position Indicator: . . . . . Built-in position indicator for the VM-330 Actuator only

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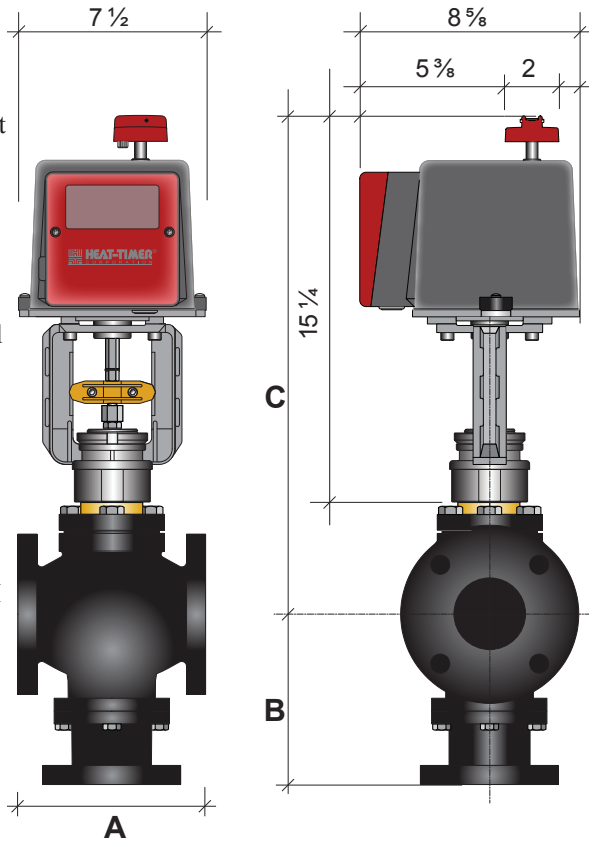
3-Way Mixing Motorized Valves

Hot Water/Hydronic Heating. Three-way valves are used to mix heating water to a desired temperature. The hot water from the boiler is blended with the correct proportion of cooler water returning from the system to maintain the target temperature as the HWR Platinum control resets the hot water temperature based on outside temperature.



3-Way Water Valve Sizing

The selection of a hot water valve should be based on a C_V rating approximately 10% greater than the calculated requirement to maintain control at the maximum flow rate. The following formula is used to calculate the required C_V rating:

$$C_V = \frac{G.P.M.}{\sqrt{\Delta P}}$$

The objective is to minimize the pressure drop across the valve. Take this example in which the objective is to calculate the C_V which will pass 200GPM of water while limiting the pressure drop to 3 PSIG. These calculations must use absolute pressures.

$$C_V = \frac{200\ GPM}{\sqrt{3\ PSI}} = 115$$

Select the valve size where the C_V matches or exceeds the 115. In this case, a 4" thre-way valve.

3-Way Mixing Motorized Valve (Used in Hot Water / Hydronic Heating Applications)

Valve Size	Catalog Number	Flow Coeff. C_V	Dimensions			Mount	Body	Trim	Est Shipping Weight	Medium Temp Range °F	Actuator
			A	B	C						
1"	928301-00-VM	11.6	4 ¼"	2 ¾"	18 ⅜'	NPT	Bronze	S. Steel	25	32 to 400	VM-660
1 ½"	928301-50-VM	29	5 ¾"	3 ⅞"	19	NPT	Bronze	S. Steel	32	32 to 400	VM-660
2"	928302-00-VM	46.3	6 ½"	4"	19 ½"	NPT	Bronze	S. Steel	36	32 to 400	VM-660
2 ½"	928302-50-VM	69	9"	7 ⅛"	20 ¾"	Flanged	Iron	Bronze	80	32 to 350	VM-660
3"	928303-00-VM	86	10"	8"	21 ⅝"	Flanged	Iron	Bronze	99	32 to 350	VM-660
4"	928304-00-VM	156	13"	9 ⅞"	22 ⅝"	Flanged	Iron	Bronze	155	32 to 350	VM-660
5"	928305-00-VM	270	15 ¾	9 ¼"	21 ½"	Flanged	Iron	Bronze	173	32 to 350	VM-660
6"	928306-00-VM	347	17 ¾	9 ⅞"	22 ¼'	Flanged	Iron	Bronze	218	32 to 350	VM-660
8"	928308-00-VM♦	450	16 ¼	11 ½"	25 ⅞"	Flanged	Iron	Bronze	331	32 to 350	VM-1100

♦ Actuator used may look different from image.

3-Way Valve Specifications

Body: . . . . . (1" -2" Valves) ANSI B16.15 Bronze 250lb. Threaded (NPT)
. . . . . (2 ½" - 8" Valves) ANSI B16.1 Iron 125lb. Flange
Trim: . . . . . .(1" -2" Valves) 316 Stainless Steel
. . . . . (2 ½" - 8" Valves) Bronze
Packing: . . . . . Long-Life Multi-Stack, EPDM for temperatures up to 350°F
Seat Closure: . . . . . .(1" - 8" Valves) ANSI Class IV shut-off

Actuator without Feedback Specifications (VM-660)

Actuator Input Signal: . . . . . .24VAC Floating
Power Consumption:. 10VA
Operating temperature . . . . . .Ambient 15°F to 120°F
Manual Override: . . . . . .Manual Crank Handle
Construction: . . . . . Aluminum Bracket and Housing
Locations: . . . . . NEMA Type 2 / IP54 Indoor Only
Clearance: . . . . . Minimum of 4- 6" above the actuator for manual operation
Mounting: . . . . . Vertical above center line of valve

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