VSR12 Series
Motor-Driven On-Off Zone Valves

Features

- Provides economical control of hot or chilled water for zone, fan coil, baseboard radiator and VAV reheat applications
- Actuator latches in place for quick and simple assembly and removal during installation and provides for quick replacement during service
- Forged brass body and stainless steel stem
- Bubble-tight shutoff conserves energy and accurately controls zone temperature for increased comfort
- 2-way normally-closed and 3-way diverting only
- On/Off control from a 2-wire thermostat
- 2,100 kPa system operating pressure
- 1/2", 3/4" , 1" and 1-1/4" line size
- Optional SPDT auxiliary switch available
- BSP end connections are standard; NPT optional

General

The motor-driven zone valves are designed for 2-position (on-off), spring-return control of chilled water and hot water flow through coils and heat exchanges of all types in a variety of Heating, Ventilation and Air Conditioning (HVAC) applications.

All valves feature a hysteresis synchronous motor, and a spring-return mechanism to return the valves to a power fail-safe position. A selection of motor voltages is available for use of valves in different countries.

To Order

Specify complete code number from Figure 1: Valve Code Number Selection Guide. All valves will be supplied with actuators factory-mounted as one-piece assemblies.

Specifications

Valve Body Pressure Rating	2,100 kPa (300 psig) system operating pressure			
Fluid / Ambient Temperature Limits	2 to 94°C (36 to 201°F) water at an ambient temperature of 0 to 60°C (32 to 140°F)			
Shipping & Storage Temperature Limits	-20 to 65°C (-4 to 149°F), 0-95% RH non-condensing			
Body Sizes	See Fig. 1: Valve code number selection guide			
Service	Chilled and hot water, up to 50% Glycol solutions			
Motor Voltages	24, 120 or 230 V 50/60 Hz ±10% available			
Motor Leads	6" 22 AWG wires, with 6.5 mm cable gland			
Power Consumption	6.5 W			
Motor Speed	4 rpm at 50 Hz / 4.8 rpm at 60 Hz			
Stroke Speeds	Power Stroke: 15 seconds at 50 Hz Spring Return Stroke: 5 seconds			
	Flow Coefficients & Maximum Close-Off Pressures:			
	Cv (Kv)		Close-Off ΔP PSI (kPa)	
Valve Size	2-way	3-way	2-way	3-way
1/2"	2.3 (2.0)	3.7 (3.2)	35 (250)	28 (200)
3/4"	3.7 (3.2)	5.4 (4.6)	28 (200)	21 (150)
1"	6.7 (5.7)	6.7 (5.7)	14 (100)	14 (100)
1-1/4"	11.7 (10.0)	9.8 (8.4)	11 (80)	11 (80)
Flow Characteristic	Quick Opening			
Seat Leakage	Zero leakage (100% bubble-tight shut-off)			
Body Materials	Body	Forged brass		
	Stem	Stainless steel		
	Seat	Brass		
	Seal Material	EPDM		
Actuator	Enclosure	Fire-retardant ABS		
	Hysteresis Synchronous Motor	CSA certified and CE Mark compliant		
	Protection Class	IP20		
Agency Approval	CE Mark compliant pending			
Dimensions	See Fig. 2: Dimensions in mm			
Shipping Weight	1360 g (3.0 lb) maximum for complete assembly			

The performance specifications above are nominal and subject to tolerances and application variables of generally acceptable industry standards. The Manufacturer shall not be liable for damages resulting from misapplication or misuse of its products.

Fig. 1: Valve Code Number Selection Guide

Valve Body Type	Configuration	Valve Size	Cv Factor	Pipe Connections	Valve Actuator Type	Motor Voltage	Options	Separator	Valve Type
VB	2	3	3	B	1	U	0	-	VSR12

Valve Code Number Designations

Valve Body Type

VB = VSR12 Series zone valve body

Congifuration

2 = 2-way normally-closed
3 = 3-way diverting

Valve Size

2 = 1/2” (15 mm)
3 = 3/4” (20 mm)
4 = 1” (25 mm)
5 = 1-1/4” (32 mm)

Cv Factor

2-Way	3-way
2 = 2.3	3 = 3.7
3 = 3.7	5 = 5.4
6= 6.7	6 = 6.7
11 = 11.7	9 = 9.8

Pipe Connections

B = BSP
N = NPT

Valve Actuator Type

1 = VSR12 Series valve actuator

Motor Voltage

A = 24 V 50/60 Hz ±10%
B = 120 V 50/60 Hz ±10%
U = 230 V 50/60 Hz ±10%

Options

0 = No options
S = with SPDT auxiliary switch

Valve Type

VSR12 = VSR12 Series on-off zone valves

When ordering the body and actuator as replacement parts, enter the body and actuator code numbers as two separate items, example: VB233B-VSR12 and 1U0-VSR12.

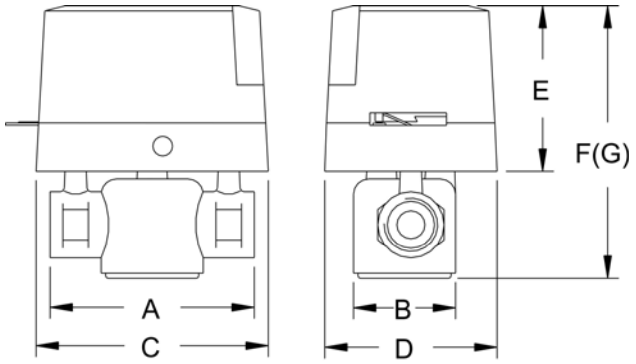
Application Overview

The VSR12 Series motor-driven zone valves accurately control the flow of chilled water and hot water through coils and heat exchanges of all types, in a wide range of Heating, Ventilating and Air Conditioning (HVAC) applications. Each zone valve is operated by a hysteresis synchronous motor, proven to be reliable in millions of installation worldwide. When the thermostat is satisfied, a spring returns the valve to its normal position. The actuator can be removed from the valve body quickly and easily, simplifying installation and servicing. No special linkage kit or commissioning is required.

Repair Parts

Available repair parts for VSR12 Series motor-driven zone valves include replacement valve bodies and replacement motors. No other field repairs should be attempted.

Fig. 2: Dimensions in mm



Valve Size	A	B	C	D	E	F (2-Way)	G (3-Way)
1/2" 2-way BSP or NPT	80	40	91	68	65	108	—
1/2" 3-way BSP or NPT	80	40	91	68	65	—	118
3/4” 2-way BSP or NPT	89	44	91	68	65	108	—
3/4” 3-way BSP or NPT	89	44	91	68	65	—	120
1” 2-way BSP or NPT	93	44	91	68	65	110	—
1” 3-way BSP or NPT	93	44	91	68	65	—	126
1-1/4” 2-way BSP or NPT	105	54	91	68	65	124	—
1-1/4” 3-way BSP or NPT	105	54	91	68	65	—	139

Mounting

The valves can be mounted in horizontal or vertical piping. When installed in horizontal piping, the actuator must be above the valve body and can be tilted left or right but it must not be tilted below 85° from vertical.

Notes:

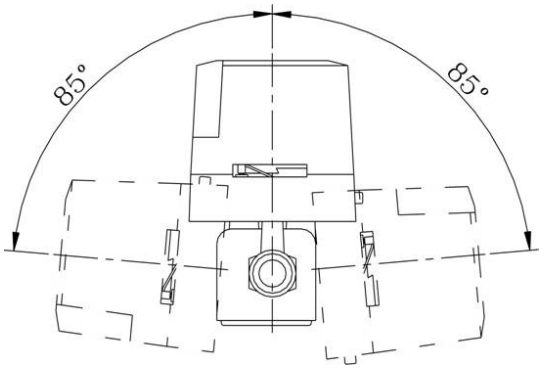
- Make certain there is no overhead water source that may drip onto valve actuator.
- In normal service, as some condensation may occur on or around the valve, the valve must be installed over a drip pan.
- For maintenance purposes, install the valve with sufficient headroom to allow complete valve actuator removal.

Manual Operating Lever

All VSR12 Series motor-driven zone valves are equipped with a manual operating lever. This lever:

- Allows the valve to be opened for system flushing before it is put into operation
- Resets to normal position the first time the valve is powered up

Mounting Orientation



In horizontal piping applications, mount the valve within 85° of the upright position.

Piping, Installation and Wiring

The zone valves must be piped so that the plug always closes against the direction of flow. Refer to Fig.3 to Fig.5. The valves are designed for application in closed hydronic heating and cooling systems and are not recommended for use in systems requiring high amounts of make-up water (open systems). High levels of dissolved oxygen and chlorine found in open systems may attack the valve materials and result in premature failure.

Notes:

- 2-way and 3-way valves are always closed at Port “B” when no power is applied to the motor.
- On power-up, the valve closes to Port “A” .
- Orient the 3-way valve body as needed for normally-closed or normally-open flow through coil.

Fig.3: 2-Way Valve Piped Normally-Closed to the Coil

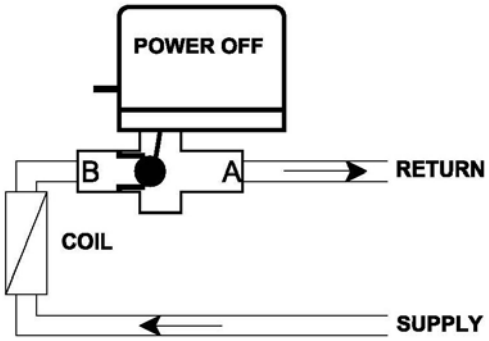


Fig.4: 3-Way Valve in Diverting Configuration Normally-Closed to the Coil

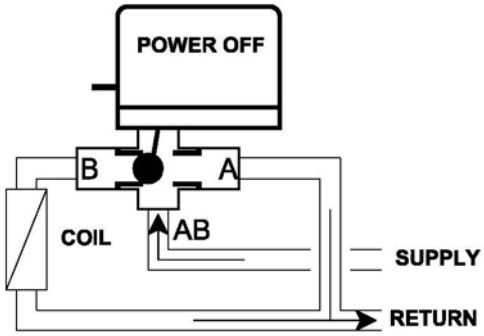


Fig.5: 3-Way Valve in Diverting Configuration Normally-Open to the Coil

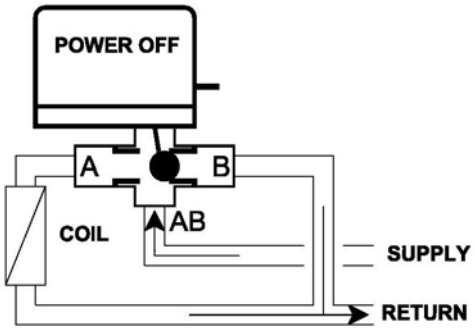
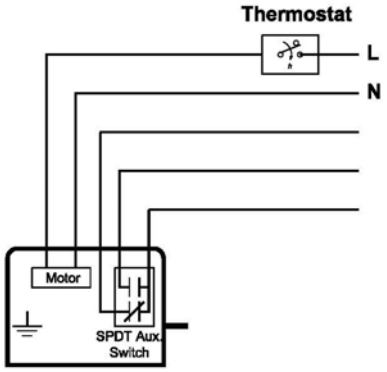


Fig.6: Actuator Wiring



Wiring with Auxiliary Switch

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