VSR4 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 iocks in place by a wing key for quick and simple assembly and removal during installation and provides for quick replacement during service
- Forged stainless steel body and stainless steel stem
- Bubble-tight shutoff conserves energy and accurately controls zone temperature for increased comfort
- 2-way normally-closed only
- On/Off control from a 2-wire thermostat
- 2,100 kPa system operating pressure
- 3/4" line size only
- 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.

Specifications

Valve Body Pressure Rating	2,500 kPa (360 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 220 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	2-way
3/4"	2.3 (2.0)	29 (200)
3/4"	3.7 (3.2)	21.8 (150)
Flow Characteristic	Quick Opening	
Seat Leakage	Zero leakage (100% bubble-tight shut-off)	
Body Materials	Body	Casting stainless steel 304
	Chassis	Stainless steel
	Seal Material	Nitrite butadiene rubber (NBR)
Actuator	Cover	Aluminum
	Hysteresis Synchronous Motor	CE Mark compliant
	Protection Class	IP20
Agency Approval	CE Mark compliant pending	
Dimensions	See Fig. 2: Dimensions in mm	
Shipping Weight	0.8 kg (1.8 lb)	

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	-	VSR4

Valve Code Number Designations

Valve Body Type

VB = VSR12 Series zone valve body

Congifuration

2 = 2-way normally-closed

Valve Size

3 = 3/4” (20 mm)

Cv Factor

2-Way
2 = 2.3
3 = 3.7

Pipe Connections

B = BSP
N = NPT

Valve Actuator Type

1 = VSR4 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

Valve Type

VSR4 = VSR4 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-VSR4 and 1U0-VSR4.

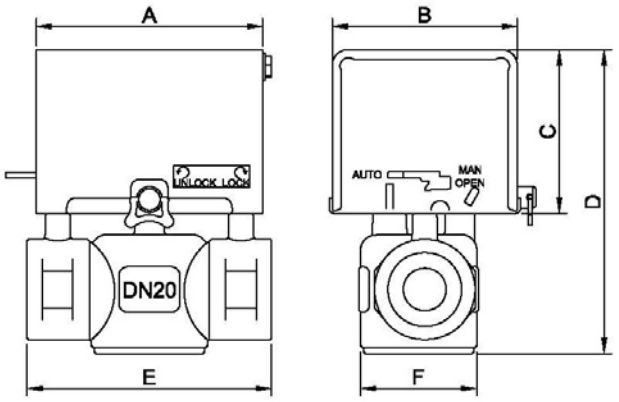
Application Overview

The VSR4 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 VSR4 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
3/4" 2-way	76 (3)	60 (2-3/8)	54 (2-1/8)	100 (4)	80 (3-5/32)	38 (1-1/2)

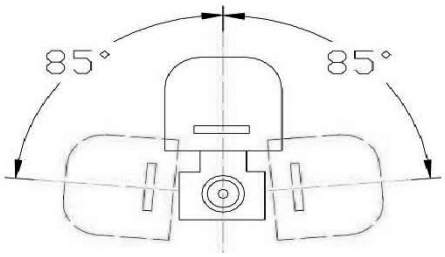
Mounting

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.

Mounting Orientation



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

Manual Operating Lever

All VSR4 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.

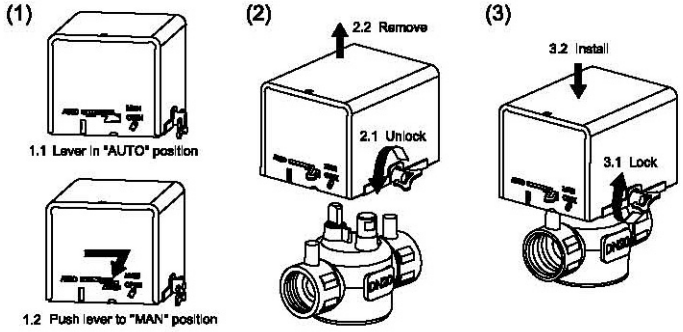
Actuator Remove and Re-install Procedure

The zone valves are shipped as complete assemblies. Actuators can be removed and re-installed as illustrated in the diagram:

(1) The manual lever must first be moved to the "manual open" position and locked.

(2) Turn the wing key counter-clockwise for about 4 turns to disengage the valve body from the actuator. Pull the actuator away from the valve body completely. Slightly rock the actuator if necessary.

(3) After installation of the valve body to the pipeline, make sure that the manual lever is in its "manual open" position and re-install the actuator by plugging into the valve stem and lock stud. When the actuator and valve body are properly aligned, turn the wing key clockwise until it is tight.



Piping, Installation and Wiring

The zone valves must be piped so that the seating paddle always closes against the direction of flow. Refer to Fig.3. 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 valves are always closed at Port “B” when no power is applied to the motor.

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

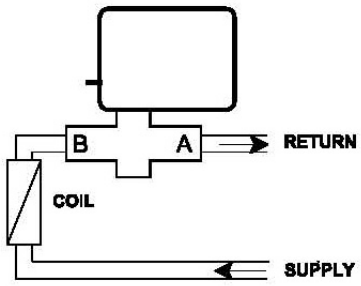
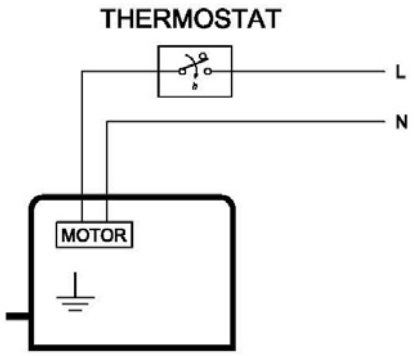


Fig. 4: Actuator Wiring



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