VZCR Series

DC Motor-Driven Capacitor-Return Zone Valves

- Provides economical control of hot or chilled water for zone, fan coil, baseboard radiator and VAV reheat applications
- Actuator screws 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
- 2-way normally-closed and 3-way mixing only are available
- For on/off, 3-wire floating or 0(2)-10 VDC input control signal
- 1,600 kPa system operating pressure
- 1/2”, 3/4”, 1” and 1-1/4” line size
- BSP end connections are standard; NPT optional
- Actuator can be field installed after piping is completed

The DC motor-driven zone valves are designed for capacitor-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.

A built-in capacitor in the actuator is charged up when power is turned on. The capacitor will discharge and return the actuator to its normal or power fail-safe position, either fully-closed or fully

-open depending on its DA or RA setting, when power is interrupted.

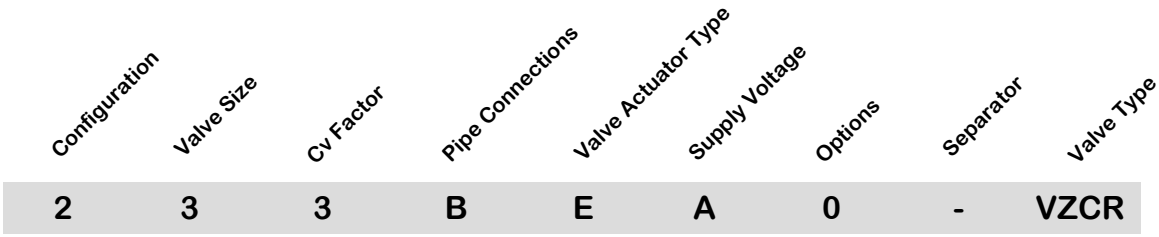
A selection of motor voltages is available for use of valves in different countries.

Specifications

Valve body pressure rating	PN16 (230 psig) system operating pressure			
Fluid / Ambient Temperature Limits	2 to 94°C water at an ambient temperature of 2 to 55°C			
Shipping & storage temperature limits	-20 to 65°C, 0-90% RH non-condensing			
Body sizes	See Fig. 1: Valve code number selection guide			
Service	Chilled and hot water, up to 50% Glycol solutions			
Power supply	24, 120 or 230 V 50/60 Hz ±10% is available			
Actuator leads	200 mm long 2x0.3 mm² cable for on-off models; 400 mm long 4x0.3 mm² cable for 3-wire floating and modulating models			
Power Consumption	2 VA			
Maximum stroke	6 mm			
Stroke speed	5 s/mm			
	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)	2.3 (2.0)	44 (300)	44 (300)
3/4"	3.3 (2.8)	3.3 (2.8)	44 (300)	44 (300)
1”	5.4 (4.6)	5.4 (4.6)	44 (300)	44 (300)
1-1/4”	11.7 (10)	11.7 (10)	44 (300)	44 (300)
Flow characteristic	Quick opening			
Body materials	Body	Forged brass		
	Stem	Stainless steel (AISI 302)		
	Seal material	NBR		
Actuator	Enclosure	Fire-retardant ABS (UL94V-0)		
	DC motor	Capacitor-return on power interruption		
	Force	150 N nominal		
	For 2-wire modulating models only:			
	Input signals	Field selectable 0-10 VDC, 2-10 VDC, 0-20 mA or 4-20 mA		
	Input impedances	200,000 Ω for 0-10/2-10 VDC input 500 Ω for 0-20/4-20 mA input		
	Feedback signal	0-10 VDC		
	Protection Class	IP54		
Agency approval	CE Mark compliant pending			
Dimensions	See Fig. 2: Dimensions in mm			
Shipping weight	1/2”: 630 g (1.4 lb); 3/4”: 700 g (1.5 lb); 1”: 1030 g (2.3 lb); 1-1/4”: 2100 g (4.6 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 Code Number Designations

Configuration
2 = 2-way
3 = 3-way mixing

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 = 2.3 for 1/2” valve body only
3 = 3.3 for 3/4” valve body only
5 = 5.4 for 1” valve body only
B = 11.7 for 1-1/4” valve body only

Pipe Connections
B = BSP
N = NPT

Valve Actuator Type
K = on-off actuator
F = 3-wire floating actuator
E = modulating actuator (for 24 VAC supply voltage only)

Supply 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
VZCR = VZCR Series capacitor-return zone valves

When ordering the body and actuator unassembled, enter the body and actuator code numbers as two separate items, example: 233B-VZCR and EA0-VZCR.

Application Overview
The VZCR Series DC motor-driven capacitor-return 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 DC motor, proven to be reliable in millions of installation worldwide. The actuator can be removed from the valve body quickly and easily, simplifying installation and servicing. No special linkage kit or commissioning is required.

Manual Operating Lever

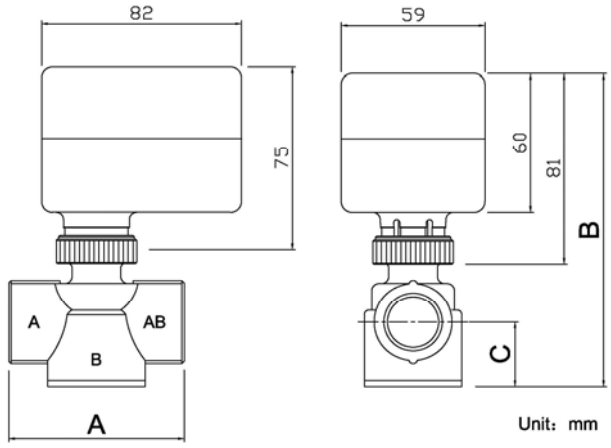
All VZCR Series motor-driven zone valves are equipped with a manual operating lever. This lever:

- 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.

To Order
Specify the code number from the Valve Code Number Selection Guide.

Repair Parts
Available repair parts for VZCR Series DC motor-driven capacitor-return zone valves include replacement valve bodies and replacement actuators. No other field repairs should be attempted.

Fig. 2: Dimensions in mm



	A				B				C			
Valve Size	2-Way		3-Way		2-Way		3-Way		2-Way		3-Way	
1/2" BSP or NPT	66	(2-5/8")	66	(2-5/8")	125	(4-15/16")	142	(5-5/8")	25	(63/164")	42	(1-21/32")
3/4" BSP or NPT	72	(2-13/16")	72	(2-13/16")	128	(5-1/32")	147	(5-25/32")	27	(1-1/16")	46	(1-13/16")
1" BSP or NPT	89	(3-1/2")	89	(3-1/2")	133	(5-15/64")	154	(6-1/16")	28	(1-9/64")	50	(1-31/32")
1-1/4" BSP or NPT	90	(3-1/2")	90	(3-1/2")	144	(5-21/32")	167	(6-9/16")	35	(1-3/8")	57	(2-1/4")

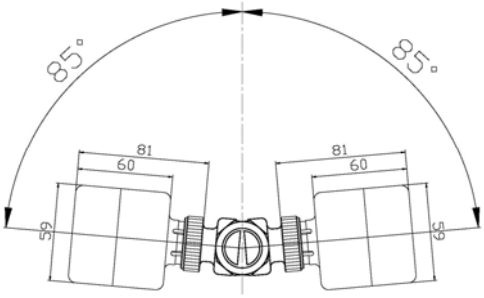
Mounting

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.

PIPING & INSTALLATION

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 "A" when no power is applied to the motor.
- On power-up, the valve closes to Port "B" on 3-way valves.
- Orient the 3-way valve body as needed for normally-closed or normally-open flow through coil.

Fig.3: 2-Way Valve Piped N.C. to the Coil

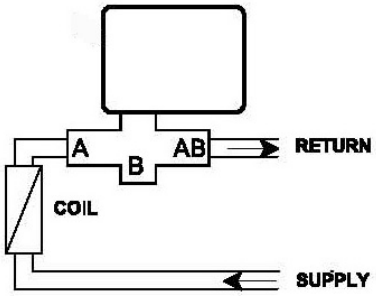


Fig.4: 3-Way Valve in Mixing Configuration N.C. to the Coil

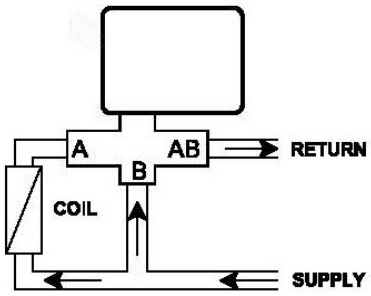


Fig.5: 3-Way Valve in Mixing Configuration N.O. to the Coil

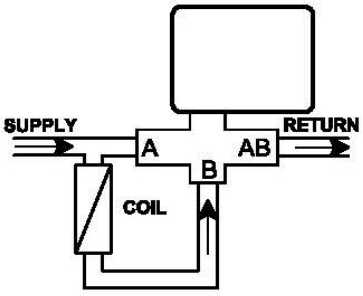
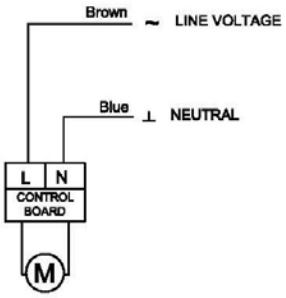
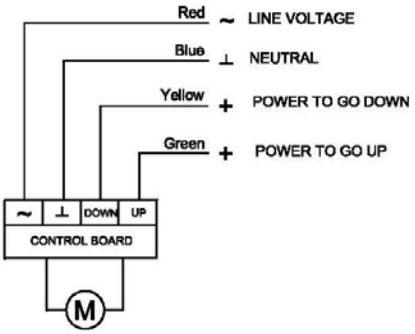


Fig. 6: Actuator Wiring

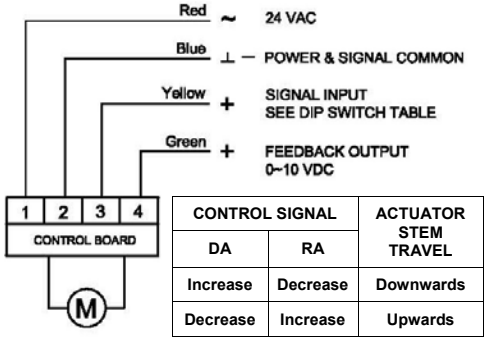
For 2-Wire On-Off Actuators



For 3-Wire Floating Actuators



For 2-Wire Modulating Actuators



CONTROL SIGNAL		ACTUATOR STEM TRAVEL
DA	RA	
Increase	Decrease	Downwards
Decrease	Increase	Upwards

Valve Stroke Self Calibration Procedure

Calibration Mode

Do not remove actuator cover. After power is turned on, press auto-calibration switch SW1. The actuator stem will start going down until reaching its maximum stroke. When the gear chain is blocked, the actuator stem will start reversing its travel until reaching its initial position. The valve stroke calibration data will be kept in the actuator's micro-computer memory and no further recalibration is required when power is turned on again.

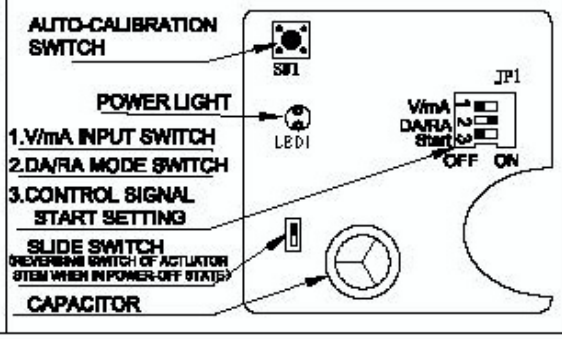
Change of Input Control Signal of Modulating Models

Remove actuator cover. After power is turned on, change the dip switch positions of JP1 as desired (see below JP1 switch setting), press the auto-calibration switch SW1 and power indicating light LED1 will start flashing. The actuator stem will start going down until reaching its maximum stroke. When the gear chain is blocked, the actuator stem will start reversing its travel until reaching its initial position. LED 1 will stop flashing when the calibration process has completed. The actuator will go into operating mode automatically. The valve stroke calibration data will be kept in the actuator's micro-computer memory and no further recalibration is required when power is turned on again.

JP1 SWITCH SETTING

MODE \ CTRL SIGNAL	0~10V DC	2~10V DC	0~20mA DC	4~20mA DC	DEFAULT SETTING
DA	OFF ON	OFF ON	OFF ON	OFF ON	OFF ON
RA	OFF ON	OFF ON	OFF ON	OFF ON	

PCB DIAGRAM



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