

**EBZV Series**  
**Non-Spring Return Energy Balancing Zone Valves**

**Features**

- Maintains a constant, pre-set flow rate regardless of pressure changes
- Modulates flow to maintain a target return water temperature
- 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
- Low seat leakage
- 2-way normally-closed only
- On/Off control from a 2-wire thermostat
- 2,000 kPa system operating pressure
- 1/2", 3/4", 1" and 1-1/4" line sizes
- BSPP, BSPT or NPT end connections

**General**

The EBZV Series non-spring return energy balancing zone valves are designed for regulating chilled water or hot water flow through coils and heat exchanges of all types in a variety of Heating, Ventilation and Air Conditioning (HVAC) applications, and fulfill the protection class requirements of IP54.

An energy balancing zone valve maintains optimal system efficiency by ensuring each zone receives exactly the right amount of energy (heating or cooling) it needs, no more and no less. It achieves this through two fundamental operating principles: dynamic flow regulation and load-based temperature control.

The valve is equipped with a

temperature sensor that continuously measures the return water temperature from a heating or cooling coil. This temperature is a direct indicator of how much energy is being used by the zone.

The valve assembly is constructed by combining a temperature sensor and a 3-wire floating ball valve into a single unit, which becomes a pressure independent flow balance regulating valve that integrates temperature sensing, control, balancing, and opening/closing functions.

The valve adopts a typical wiring method called "3-wire zone control", which uses three distinct wires to operate the valve. When an on-off thermostat calls for cooling or heating, it feeds power to the valve motor and opens the valve mechanically. At the fully-open position, the temperature sensor at the valve's return water outlet starts taking over the control and throttles the valve according to the fixed return water temperature setpoint, hence achieving precise adjustment of water flow and keeping the system's common return water temperature close to the desired temperature setting.

By maintaining a constant return water temperature, this method stabilizes the overall system, enabling the central plant (like a boiler or chiller) to operate at peak efficiency. It also prevents the common problem of "hunting", where control valves continuously overcorrect.

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



**To Order**

Specify complete code number from Figure 3: Valve Code Number Selection Guide. All valves will be shipped with actuators factory-mounted as one-piece assemblies.

**Repair Parts**

Available repair parts for EBZV Series energy balancing zone valves include replacement valve bodies and replacement motors. No other field repairs should be attempted.

## Specifications

Valve body pressure rating	2,000 kPa (290 PSIG) system operating pressure	
Fluid/ambient temperature limits	0 to 94°C (32 to 201°F) water at an ambient temperature of 0 to 65°C (32 to 149°F)	
Shipping & storage temperature limits	-40 to 65°C (-40 to 149°F), 10-90% RH non-condensing	
Body sizes	See Fig. 3: Valve code number selection guide	
Service	Chilled and hot water without coagulation, up to 50% ethylene glycol solutions	
Motor voltages	24, 120 or 230 V 50/60 Hz ±10% available	
Power consumption	6 W at 50 Hz; 7.5 W at 60 Hz;	
Electrical connections	AVVR 3x0.3 mm <sup>2</sup> , external diameter Φ5.5 mm, length 300 mm	
Motor output torque	2.5 ± 0.5 Nm	
AC synchronous motor output speed	1 rpm at 50 Hz / 1.2 rpm at 60 Hz	
Operating time	15 seconds at 50 Hz from fully-closed to fully-open	
Temperature sensing element	NTC thermistor, 10 kΩ@25°C	
Sensing element cable	RVV 2x0.5 mm <sup>2</sup> , external diameter Φ5.5 mm, quick connection wires, length 300 mm	
Control action	3-wire reversible floating type controlled by fixed return water setpoint	
Auto cooling/heating changeover temperatures	Water temperature < 35°C = cooling mode	
	Water temperature > 40°C = heating mode	
Flow Coefficients & Maximum Close-Off Pressures:		
Default return water temperature setpoint	Fixed at 12°C for cooling and 50°C for heating	
Valve size	Cv (Kv)	Close-Off ΔP PSI (kPa)
1/2"	4.68 (4.0)	87 (600)
3/4"	8.19 (7.0)	87 (600)
1"	9.36 (8.0)	87 (600)
1-1/4"	11.70 (10.0)	87 (600)
Flow characteristic	Quick opening	
Seat leakage	0.05% of Kv	
Body materials	Body	Forged brass (HPb59-1)
	Stem	Stainless steel (0Cr18Ni9)
	Seat	PTFE
	O Ring	EPDM
Actuator	Enclosure	Fire-retardant ABS
	Protection Class	IP54
	Bi-directional Hysteresis Synchronous Motor	CE Mark compliant
Electric shock safeguard	☑ Type II structure	
Agency approval	CE Mark compliant pending	
Dimensions	See Fig. 4: Dimensions in mm	
Shipping weights	Size	Weight kg (lb.)
	1/2"	0.55 (1.21)
	3/4"	0.65 (1.43)
	1"	0.80 (1.76)
	1-1/4"	0.88 (1.94)

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 Piping Configuration

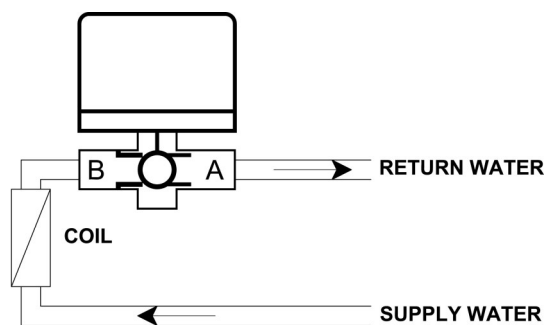
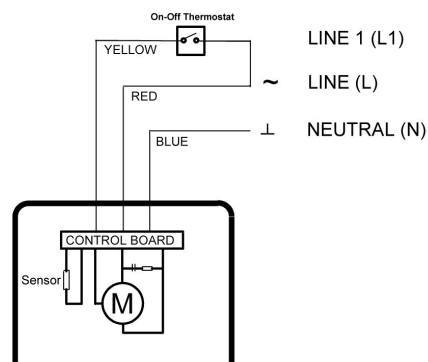


Fig.2: Actuator Wiring



**Fig. 3: Valve Code Number Selection Guide**

Configuration	Valve Size	Flow Coefficient	Pipe Connections	Valve Actuator Type	Motor Voltage	Options	Separator	Valve Type
2	4	9	G	1	U	0	-	EBZV

**Valve Code Number Designations**

<p><b>Congifuration</b></p> <p>2 = 2-way normally-closed only</p>	<p><b>Valve Actuator Type</b></p> <p>1 = EBZV Series valve actuators</p>															
<p><b>Valve Size</b></p> <p>2 = 1/2" (15 mm)                  3 = 3/4" (20 mm)                  4 = 1" (25 mm)                  5 = 1-1/4" (32 mm)</p>	<p><b>Motor Voltage</b></p> <p>A = 24 V 50/60 Hz ±10%                  B = 120 V 50/60 Hz ±10%                  U = 230 V 50/60 Hz ±10%</p>															
<p><b>Flow Coefficient</b></p> <table border="1"> <thead> <tr> <th></th> <th>Kv</th> <th>Cv</th> </tr> </thead> <tbody> <tr> <td>4 (1/2" only)</td> <td>4.0</td> <td>4.68</td> </tr> <tr> <td>8 (3/4" only)</td> <td>7.0</td> <td>8.19</td> </tr> <tr> <td>9 (1" only)</td> <td>8.0</td> <td>9.36</td> </tr> <tr> <td>B (1-1/4" only)</td> <td>10.0</td> <td>11.70</td> </tr> </tbody> </table>		Kv	Cv	4 (1/2" only)	4.0	4.68	8 (3/4" only)	7.0	8.19	9 (1" only)	8.0	9.36	B (1-1/4" only)	10.0	11.70	<p><b>Options</b></p> <p>0 = No options</p>
	Kv	Cv														
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9 (1" only)	8.0	9.36														
B (1-1/4" only)	10.0	11.70														
<p><b>Pipe Connections</b></p> <p>G = BSPP = Rp (parallel)                  T = BSPT = Rc (tapered)                  N = NPT</p>	<p><b>Valve Type</b></p> <p>EBZV = EBZV Series energy balancing zone valves</p>															

When ordering the body and actuator as replacement parts, enter the body and actuator code numbers as two separate items, example: 248B-EBZV and 1U0-EBZV.

**Application Overview**

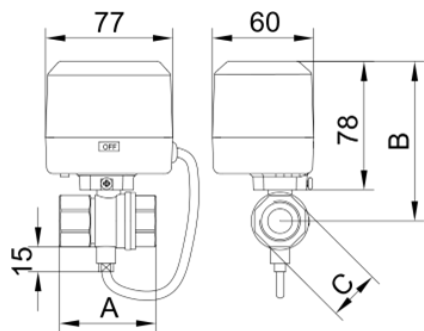
The EBZV Series energy balancing zone valves accurately control the flow of chilled water or hot water through coils and heat exchanges of all types, in a wide range of Heating, Ventilating and Air Conditioning (HVAC) applications. Each zone valve is operated by a bi-directional hysteresis synchronous 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.

The valves can be mounted in horizontal or vertical piping.

Notes:

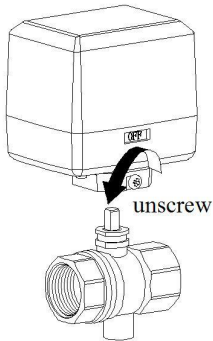
- Make certain there is no overhead water source that may drip onto valve actuator.
- In normal service, as some condensation may occur on or around the valve, the valve must be installed over a drip pan.
- For maintenance purposes, install the valve with sufficient headroom to allow complete valve actuator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

**Fig. 4: Dimensions in mm**



Valve Size	A	B	C
1/2" (15 mm)	52	100	25
3/4" 20 mm	60	100	31
1" (25 mm)	66	105	39
1-1/4" (32 mm)	78	105	48

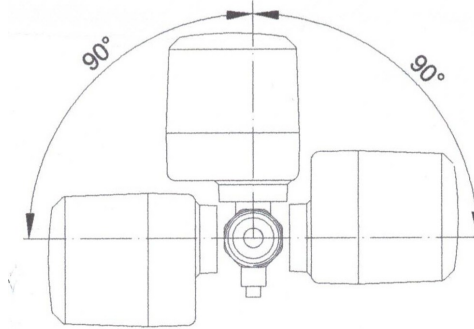
## Actuator Mounting and Dismounting



To dismount the actuator, loosen the locking screw and then remove the actuator from the valve body.

To mount the actuator, align and insert the valve stem into the actuator and then tighten the locking screw.

## Valve Mounting Orientation



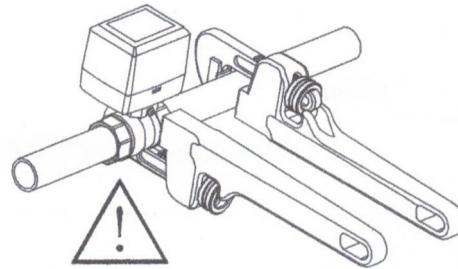
In horizontal piping applications, mount the valve within 90° of the upright position.

## Piping and Installation

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.

The valves must be installed on the return water side of the heating or cooling coil to reduce thermal stress on the valves. When the built-in temperature sensor fails, either open circuit or short circuit, the valves will switch to on-off control mode.

To prevent valve body rupture or unsecured pipe connections, double-wrenches method is recommended when installing or uninstalling the valves from the pipeline, as shown.



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