Z-one™ Z1, Z2, Z3 Series

E239721 US LISTED 86BP

IAPMO R&T

Function

The Z-one, a two-position spring return zone valve, is used in heating and air-conditioning systems. The Z-one series consist of a Z1 actuator which is easily attached to a Z2 (2-way) or Z3 (3-way) valve body. Z1 actuator is equipped with or without auxiliary switch.

The Z-one actuator has a synchronous motor that winds the return spring and moves the valve paddle to the desired position. When power is removed the actuator spring returns the valve paddle. 24V actuators (except HCS) use sealed reed switch for end switch, requiring no minimum current load.

US Patent 7,048,251

Technical Characteristics of Body

Material:	- body:	forged brass (optional lead-free brass)
	- seat:	machined brass
	- stem:	stainless steel
	- two o-ring seals	EPDM
	- paddle	EPDM
Medium:		water and glycol
Maximum percent of glycol:		50%
Temperature range:		32 to 240°F (0 – 115°C)
Max. static pressure:		15 psi (1 bar) steam 300 psi (20 bar)
Connection:	- sweat	½", ¾" 1" & 1 ¼"
	- NPT	½", ¾" & 1"
	- SAE flare	½"
	- inverted flare	½", ¾" & 1" sweat fittings separate

Technical Characteristics of Actuator

Material:	- base and cover:	polycarbonate
	- base plate:	aluminum
Motor:	- voltage:	24 VAC 50/60 Hz Class 2 120 VAC 50/60 Hz 208 VAC 50/60 Hz 230 VAC 50/60 Hz 277 VAC 50/60 Hz
Wire lead length:		6" (15cm), 24V only -18" (45cm)
Power requirements:		5.0 W, 7 VA
Ambient temperature range:		32 - 104ºF (170ºF optional)
Auxiliary switch:		24 VAC: 0 A min, 0.4 A max, 24 V 120-277 VAC, HCS: 0.25A min, 5A max, 250 V
Humidity:		95% non-condensing
Approvals:		UL874, cUL Listed & CE UL 1995 sec. 18 (air plenum & ducts)

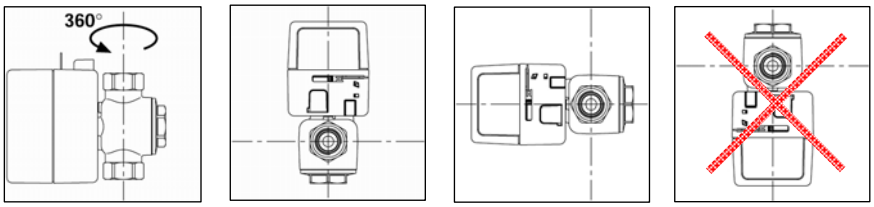
Normally Open Actuators must be powered down during off-season.

Flow Characteristics

Connection size	Flow Coefficient	Max. Close-off ΔP
1/2"	1.0 Cv (0.9 kv)	75 PSI (517 kPa)
1/2"	2.5 Cv (2.2 kv)	50 PSI (345 kPa)
3/4"		
1/2"	3.5 Cv (3.0 kv)	30 PSI (207 kPa)
3/4"		
3/4"	5.0 Cv (4.3 kv)	25 PSI (172 kPa)
1"		
3/4"	7.5 Cv (6.5 kv)	20 PSI (138 kPa)
1"		
1"	7.5 Cv (6.5 kv)	20 PSI (138 kPa)
1 1/4"		

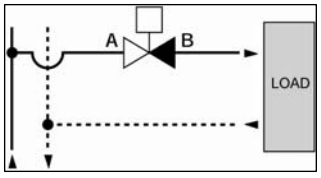
Installation

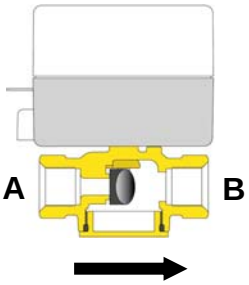
The valve can be installed vertically or horizontally, but not turned upside down.



- A 3-way valve cannot be transformed into a 2-way valve and vice versa.
- The flow is from A to B (see diagram below) and must be installed so the paddle closes against the direction of flow as indicated in the following diagrams.
- The 2-way valves can be installed on the supply or on the return; for correct installation it is necessary to respect the direction of flow indicated from the arrow on the body valve.

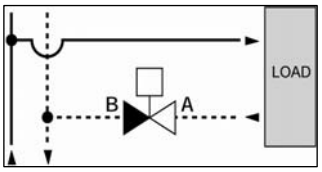
2-way installed on the supply

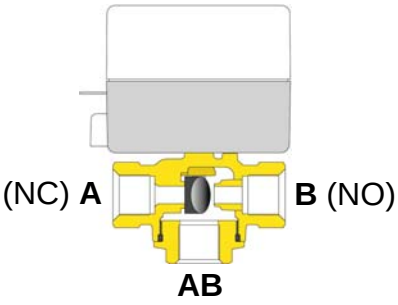




2-way valve with normally closed actuator

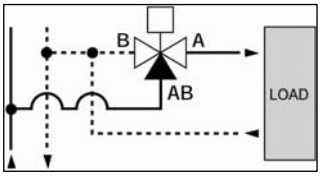
2-way installed on the return



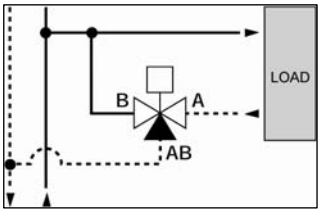


3-way valve with normally closed actuator
(Note: 3-way uses only normally closed actuator)

3-way installed on the supply in diverting configuration



3-way installed on the return

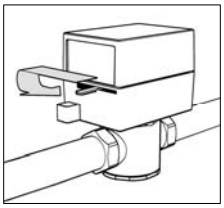


Operation of Normally Closed Valve

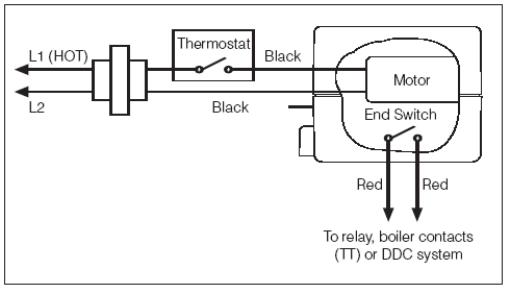
	2-way	3-way
N.C. without power	Port "A" closed	Port "A" closed Port "B" opened Port "AB" opened
N.C. opened with power	Port "A" opened	Port "A" opened Port "B" closed Port "AB" opened
N.C. manually opened	Port "A" opened	Port "A" opened Port "B" opened Port "AB" opened

Manual Open (NC act only)

The manual opening is achieved by moving the manual opening lever to the locked position. When power is applied, the manual lever unlocks automatically.

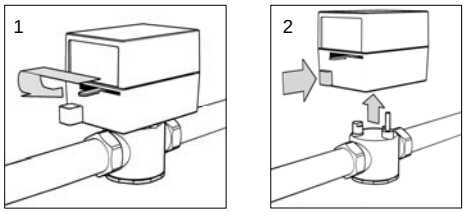


Wiring Diagram



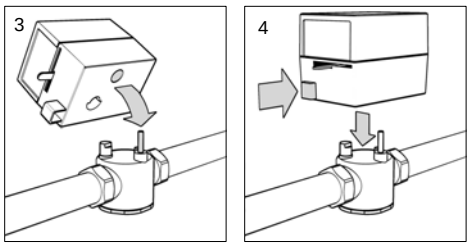
Removing the Actuator

1. Move the manual open lever to the lock open position.
2. Press the push button in and pull the actuator up.



Installing the Actuator

1. Move the manual open lever to the lock open position.
3. Verify the correct position of the valve stem into the mating actuator hole. Rotate stem if required to align.
4. Press the push button in and slide the actuator onto the valve body, release the push button.



SAFETY INSTRUCTION

This safety alert symbol will be used in this manual to draw attention to safety related instructions. When used, the safety alert symbol means **ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED! FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN A SAFETY HAZARD.**

CAUTION: All work must be performed by qualified personnel trained in the proper application, installation, and maintenance of systems in accordance with all applicable codes and ordinances.

CAUTION: Over-tightening and breakage can occur with the use of Teflon pipe joint compounds. Teflon provides lubricity so that care must be exercised not to over-tighten joints. Failure to follow these instructions could result in property damage and /or personal injury.

WARNING: System fluids are under pressure or temperature can be hazardous. Be sure the pressure has been reduced to zero and the system temperature is below 100ºF (38ºC). Failure to follow these instructions could result in property damage and/or personal injury.

CAUTION: Avoid locations with excessive moisture, explosive vapors, corrosive fumes or vibration. Failure to follow these instructions could result in stress corrosion resulting in property damage and/or personal injury.

Caleffi shall not be liable for damages resulting from stress corrosion, misapplication or misuse of it products.

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