VBB/VBS Series Ball Valves with Floating Actuators

Installation

Inspection
Inspect the package for damage. If package is damaged, notify the appropriate carrier immediately. If undamaged, open the package and inspect the device for obvious damage. Return damaged products.

Requirements
Tools (not provided)
- — Wrench 1 to 1-5/8”
- — Pipe wrench according to pipe size
- — Volt-ohm multimeter
- — Philips Head screwdriver (for cover)

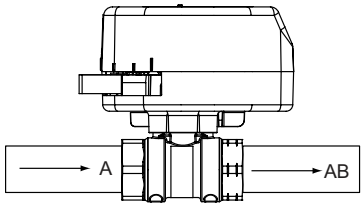
Training— Installer must be a qualified, experienced technician
Other accessories as appropriate

Warning	Electrical shock hazard! Disconnect power before installation to prevent electrical shock or equipment damage. Make all connections in accordance with the electrical wiring diagram and in accordance with national and local electrical codes. Use copper conductors only. All conductors shall be provided with insulation rated for the highest voltage motor and end switch circuits.
Caution	Avoid locations where excessive moisture, corrosive fumes, explosive vapors, or vibration are present. Avoid electrical noise interference. Do not install near large conductors, electrical machinery, or welding equipment. When making lead connections within the actuator, use caution not to put leads or connectors below the motor.

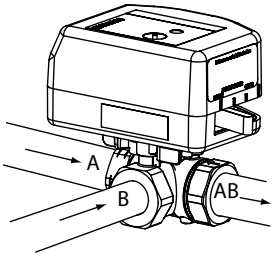
Piping
These valves must be piped according to the flow diagram below Two-Way valve flow should go A to AB. Three-Way valves should only be applied as mixing valves (see diagram).

Caution

Use in systems which have substantial make-up water (open systems) is not recommended. Follow proper water treatment practices and system procedures. Refer to document EN-205, F-26080.

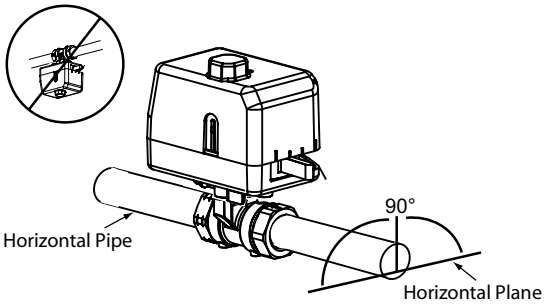


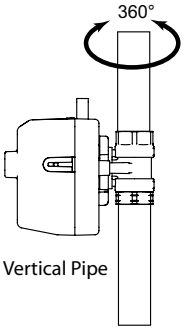
Two-Way Valve: Flow A to AB



Three-Way Valve: Mixing Only A and/or B to AB.

Mounting
The valves can be mounted in horizontal or vertical piping. When installed in horizontal piping, the actuator must be above the valve body. It can be tilted left or right but it must not be tilted below 90° from vertical.

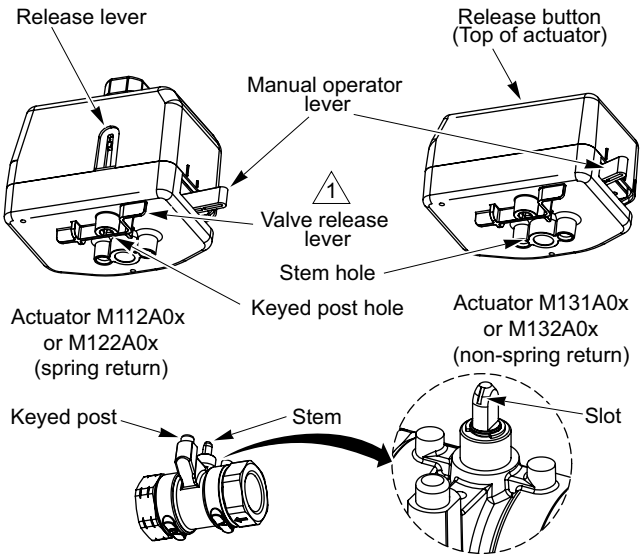




Installation Notes

- Make certain there is no overhead water source that may drip onto valve actuator.
- In normal service, some condensation may occur on or around the valve. A drip pan may be necessary or the valve body may be insulated.
- Do not cover the actuator or obstruct the manual operator lever.
- Reference product label and Product Datasheet F-27395 for additional product specifications.
- When using flexible conduit, the conduit should not place a load on the actuator.

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1 Parts on bottom of both actuators are identical.

Installing the Valve Body

Apply Teflon* tape to the male pipe thread. Hand screw the pipe into the valve, turning it as far as it will go. Use a wrench to fully tighten the valve to the pipe. Do not over tighten or strip the threads.

Installing the Actuator on the Valve Body

1. Turn the valve stem so that the slot on the top of the stem is pointing towards the large keyed post.
2. Do one of the following.
   a.On the spring return actuator, press the red lever down and rotate the manual operating lever to align the stem hole with the valve stem. Then slide the red lever up to lock the manual lever in place.
   b. On the non-spring actuator, press and hold the red release button on the top of the actuator and rotate the manual operating lever to align the stem hole with the valve stem. Then release the red button.
3. Align the valve body with the actuator to ensure the stem lines up with the large stem hole and the large keyed post lines up with the post hole on the bottom of the actuator.
4. Press the valve and actuator firmly together to lock into place.
5. The first time the valve is operated electrically, the manual operating lever of the actuator will move to the automatic position. The manual operating lever can be used to allow flushing of the system after installation.

Removing the Actuator

1. Press and hold the valve release lever inward, towards the valve.
2. Lift the actuator from the valve.

Caution:

- Do not use the valve body to manually open the actuator as damage to the valve actuator will result.

*Teflon is a registered trademark of Dupont.

Checkout

1. Make sure the valve stem rotates freely before and after installing the actuator.
2. If the stem does not operate freely it may indicate that the stem was damaged and may require that the valve be replaced.
3. After the piping is under pressure, check the valve body and the connections for leaks.
4. After the valve and actuator are installed, power the actuator and check the operation by varying the control signal. On spring return models, the valve should return to its normal position when power is removed.

Theory of Operation

DuraDrive VBB/VBS Series are floating valve actuator assemblies designed to make incremental adjustments to flow based on the control signal input. This actuator is not intended for continuous use in zero dead band control systems.

When power is removed for more than two seconds, spring return valves return to their normal position. Non-spring return valves remain at their last position when power is removed. The spring return feature should not be used for routine, normal operation

Spring Return and Non-Spring Return actuators with time-out will automatically limit the running time of the actuator. The Time-out feature automatically cuts off the control signal to the valve after three minutes (see Table-1) of continuous operation. Upon change in control signal direction, the actuator will resume operation. The controller or thermostat used to operate the Non-Spring Return Floating actuator must be configured to turn off the control signal after being continuously on for three minutes. Multiple actuators may be connected to a single controller. Do not exceed the maximum current draw of the controller or transformer.

Caution



Do not use the manual operator while power is applied to the actuator. Manual positioning of the actuator while power is applied is NOT recommended.

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Power/Failure Action

	Control Signal	Position upon loss of power		
		Non-Spring Return Actuator	Spring Return Open Actuator - Fail Open	Spring Return Closed Actuator - Fail Closed
Floating	Power to "Open" terminal will open A to AB	Maintain last position	Will spring A to AB open	Will spring A to AB closed

*Two-Way valve operation described. For a Three-Way valve, A to AB operation is the same. B to AB operation is opposite that of A to AB operation.

Wiring

Make all connections according to job wiring diagrams and in compliance with local and national electrical codes. Refer to diagrams below for typical wiring.

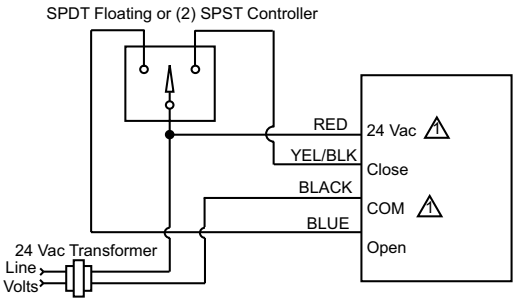
Notice

- Multiple actuators may be connected to a single controller. Do not exceed the maximum current draw of the controller.
- Use only one spring return actuator per 10 VA transformer.
- Use of a properly sized, inherently limited, Class 2 transformer is recommended.
- Use only 18 to 24 AWG copper wire for all connectors. When using multiple wires under one terminal do not exceed 2 wires or 20 AWG wire.

Three-Wire Notice

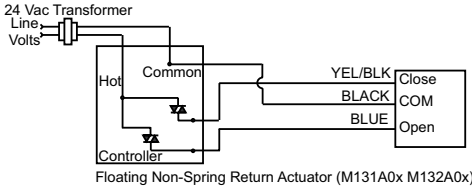
Spring return floating valves (M112A0x and M122A0x actuators) feature a two second delay upon power loss to prevent the loss of valve position during brief power outages. There is a three-second delay at power-up.

For more information see Guidelines for Powering Multiple Actuators EN-206 (F-26363).

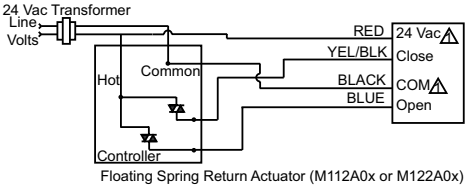


⚠ The 24 Vac/COM supply must be maintained continuously for valve operation. The valve returns to normal position whenever this supply is interrupted.

Typical Wiring for M112A0x or M122A0x Spring Return Actuators



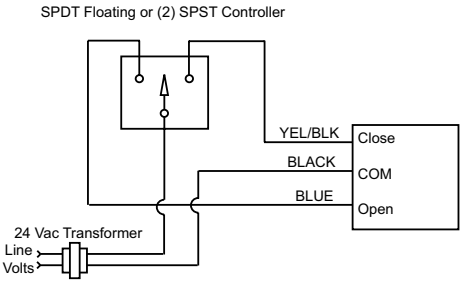
Floating Non-Spring Return Actuator (M131A0x M132A0x)



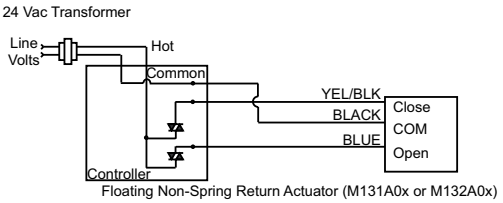
Floating Spring Return Actuator (M112A0x or M122A0x)

⚠ The 24 Vac/COM supply must be maintained continuously for valve operation. The valve returns to normal position whenever this supply is interrupted.

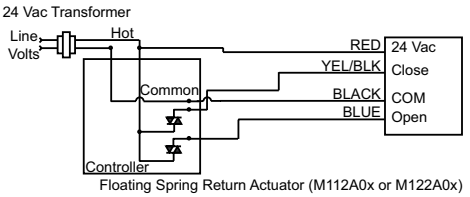
Triac Source Wiring



Typical Wiring for M131A0x or M132A0x Non-Spring Return Actuators



Floating Non-Spring Return Actuator (M131A0x or M132A0x)



Floating Spring Return Actuator (M112A0x or M122A0x)

Triac Sink Wiring

Maintenance

The ball valve assembly itself requires no maintenance. The stem and packing design eliminates the need for packing adjustment for the life of the valve. However, regular maintenance of the total heating and cooling system is recommended to ensure sustained optimum performance.

Field Repair

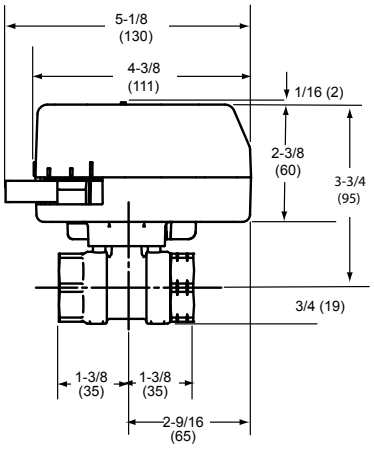
Neither valve nor actuator are field repairable. Replace entire unit as necessary.

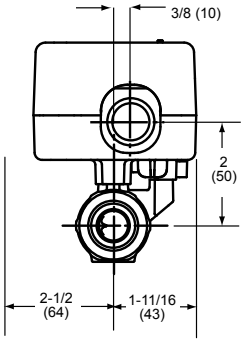
Agency Listings

UL873: Underwriters laboratories (File #E9429 Category Temperature Indicating and Regulating Equipment) CUL: Listed for use in Canada by Underwriters Laboratory. Canadian Standards C22.2 No. 24. European Community: EMC Directive (89/336/EEC). Low Voltage Directive (72/23/EEC). Australia: This product meets requirements to bear the C-Tick Mark according to the terms specified by the Communications Authority under the Radio Communications Act of 1992.

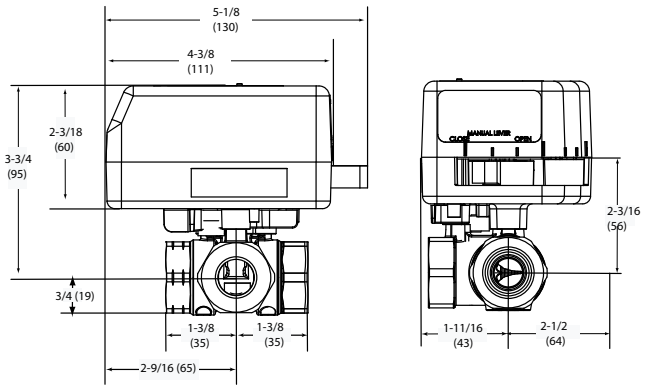
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Dimensions

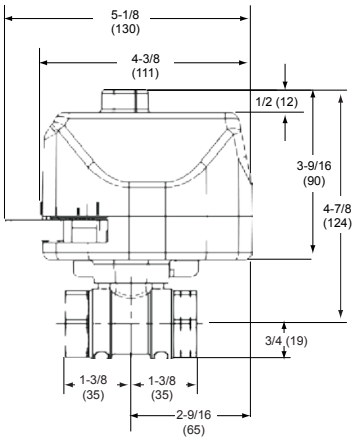


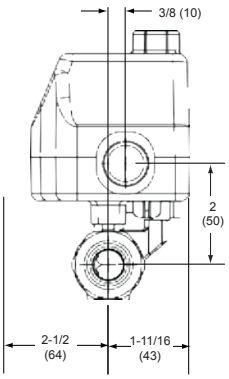


Two-Way Non-Spring Return
Shipping Weight: 2.07 lbs (940 g)

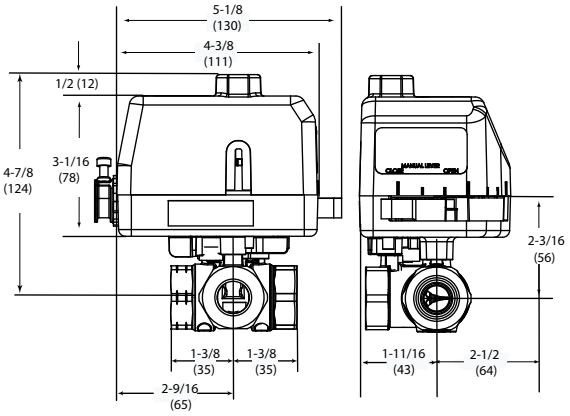


Three-Way Non-Spring Return
Shipping Weight: 2.34 lbs (1060 g)





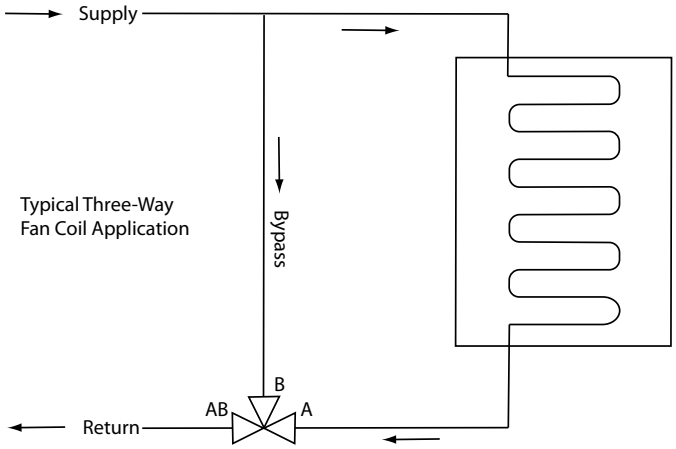
Two-Way Spring Return
Shipping Weight: 2.25 lbs (1020 g)

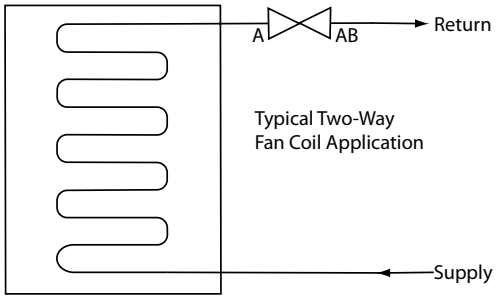


Three-Way Spring Return
Shipping Weight: 2.51 lbs (1140 g)

All dimensions shown in inches (mm) format and are rounded to the nearest 1/16".
An additional 1 in (25 mm) is required to remove the actuator from the valve.

Application Drawing





Note: Typical applications. For simplicity, balancing valves and control devices not shown.

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