

# VBB/VBS Series Ball Valves

## with Floating Actuators

### 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

## NOTICE

### RISK OF EQUIPMENT DAMAGE

- Read and understand these instructions before installing or servicing this product.
- Do not install this product in hazardous or classified locations unless expressly permitted.
- Turn off all power supplying equipment before working on the product.
- Make all connections in accordance with the electrical wiring diagram.
- Do not exceed the product's technical ratings.
- Use copper conductors only. Make all connections in accordance with the appropriate electrical wiring diagram.
- Avoid installation locations exposed to vibration, excessive moisture, and/or corrosive or explosive vapours.
- Avoid electrical noise interference. Do not install near large conductors, electrical machinery, or welding equipment.
- When making wiring connections within the actuator, do not put leads or connectors below the motor.
- This product is a class 2 (Limited Voltage Limited Energy) device.
- The installer is responsible for conformance to all applicable codes.
- Check the Electrical terminals and any configuration switch settings before powering up the actuator.

**Failure to follow these instructions may cause equipment damage.**

If this product is used in a manner not specified by the manufacturer, the protection provided by the product may be impaired.

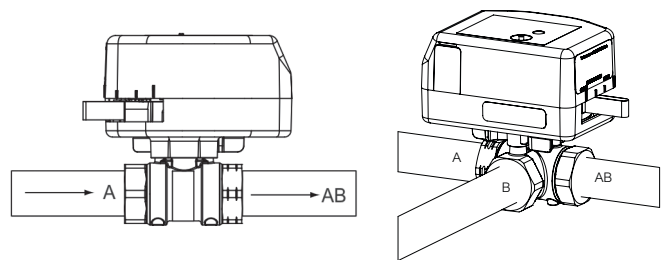
No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this product.

#### Tools (not provided)

- Wrench/adjustable spanners 1" ... 1-5/8"
- Pipe wrench according to pipe size
- Volt-ohm multimeter
- Phillips Head screwdriver

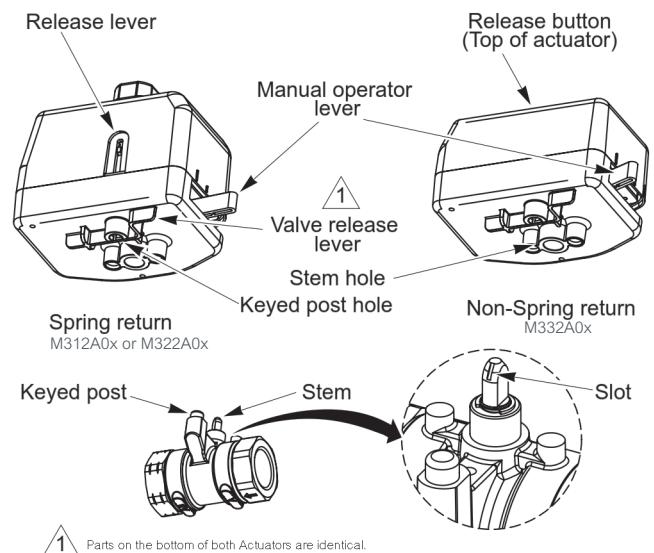
#### Training and Other Accessories

- Installer must be a qualified, experienced technician
- Other accessories as appropriate.



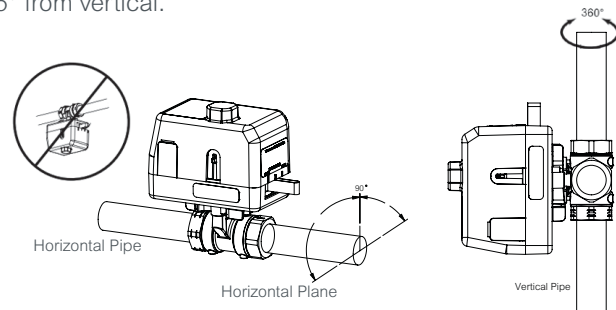
Two-Way Valve: Flow A to AB

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. When installed in horizontal piping the actuator can be tilted left or right but it must not be tilted below 45° from vertical.



## Piping

### NOTICE

#### RISK OF EQUIPMENT DAMAGE

- Do not install in open systems using substantial make-up water.
- Follow proper water treatment practices and system procedures.

**Failure to follow these instructions may cause equipment damage.**

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

### Best Practice Guidelines

It is recommended to fit a strainer upstream of the valve to increase reliability and to follow water treatment guidelines as detailed in VDI 2035.

### Recommendations

The pipework system should be flushed prior to the operation.

### Installation Notes

- Verify 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-27895 for additional product specifications.

It is the responsibility of the installer or product specifier to verify media compatibility of the valves construction materials with the supplier of water treatment/heat transfer solution.

### Installing the Valve Body

Apply PTFE 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 the slot on top of the stem is pointing towards the large keyed post.
2. Do one of the following:
  - For a 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.
  - For a 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 so 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. Firmly press the valve and actuator together to lock into place.

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

### NOTICE

#### RISK OF EQUIPMENT DAMAGE

- Do not use the valve body to manually open the actuator.
- Failure to follow this instruction will result in damage to the actuator.**

**NOTE:** Make sure the valve stem rotates freely before and after installing the actuator. If the stem does not operate freely it may indicate that the stem was damaged and may require that the valve be replaced.

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

This series of floating valve actuator assemblies is 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. In order to prevent a false spring return, a solenoid is used to disengage the gear for spring return.

When power is removed for more than two seconds, spring return valve assemblies return to their normal position. Non-spring return valve assemblies 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 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 of continuous operation. Upon change in control signal direction, the actuator will resume operation. **NOTE:** Do not use the manual operator while power is applied to the actuator. If the actuator is manually positioned while power is applied, the calibration cycle must be completed again for the actuator to function properly. To recalibrate the actuator, cycle power off for more than 6 seconds.

### 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 provide for sustained optimum performance.

### Field Repair

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

### Agency Listings

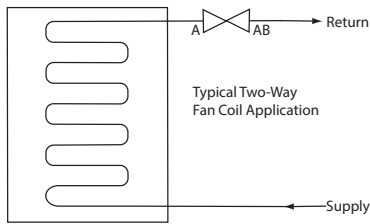
North America: c-UL-us LISTED per UL 60730-1 & -2-14 and CSA E60730-1 & -2-14. FCC part15 classB & ICES-003 classB emissions compliant.

European Union: LVD 2014/35/EU and EMC 2014/30/EU directives, per EN 60730-1 & -2-14. EN 61000-6-2 immunity & EN 61000-6-3 emissions compliant. Australia/NewZealand: Meets requirements to bear RCM mark.

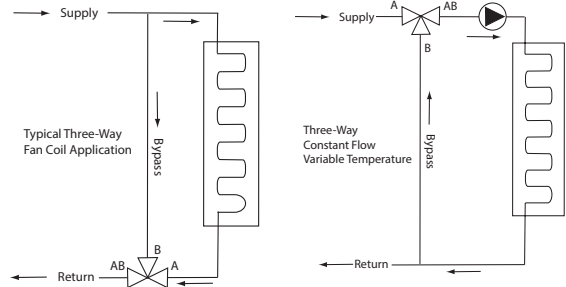
## Application Schematics

### Typical applications

For simplicity, balancing valves and control devices are not shown.



### Mixing applications



## Wiring and Wiring Diagrams

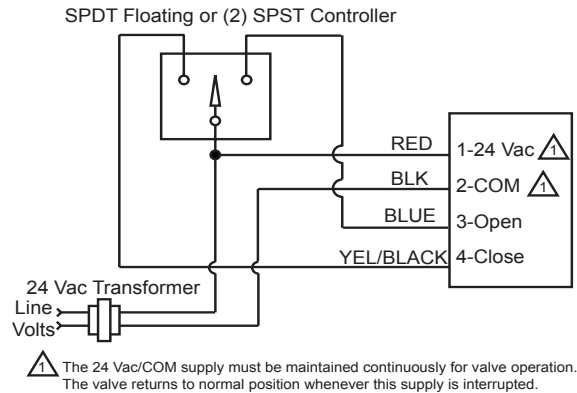
Make all connections according to job wiring diagrams and in compliance with local and national electrical codes. Refer to diagrams for typical wiring.

### NOTE:

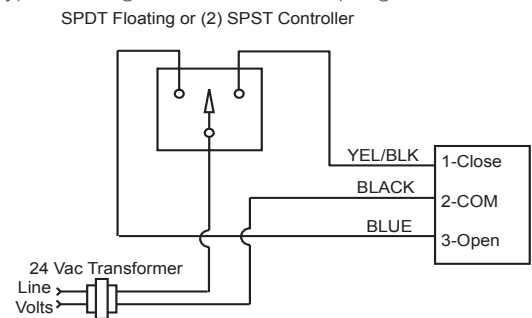
- Multiple actuators may be connected to a single controller
- Do not exceed the maximum current draw of the controller.
- Use only one spring return actuator per 10 VA transformer.
- Use of a properly sized, inherently limited, Class 2 transformer is recommended.
- Use only 18...24 AWG (0.75...0.22 mm<sup>2</sup>) 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 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 control signal). For more information see Guidelines for Powering Multiple Actuators EN-206 (F-26363).

### Typical Wiring for M312A0x or M322A0x Spring Return Actuators



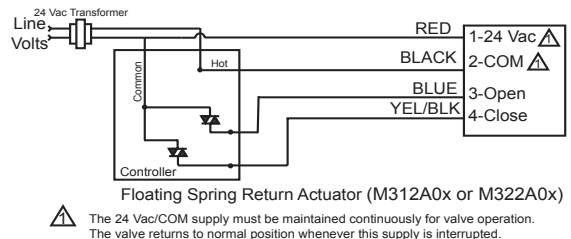
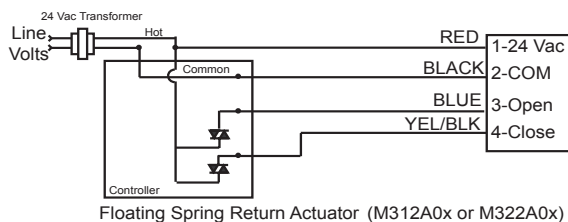
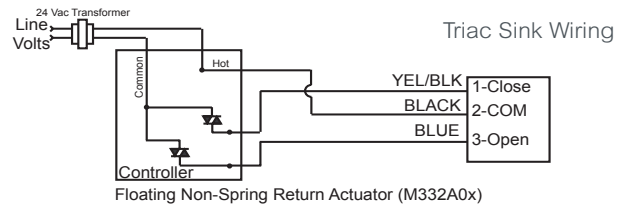
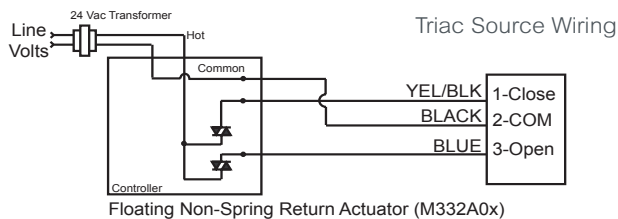
### Typical Wiring for M332A0x Non-Spring Return Actuators



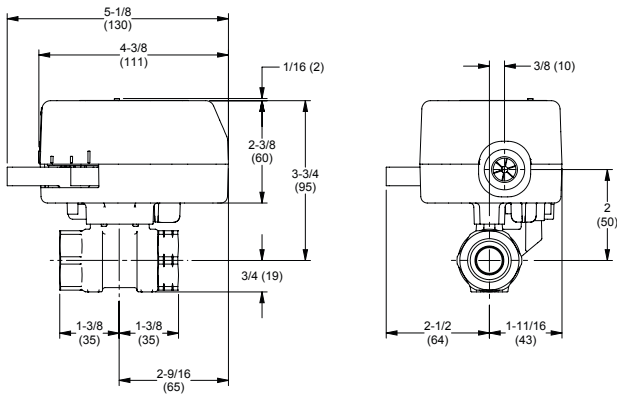
### Power/Failure Action (Floating)

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

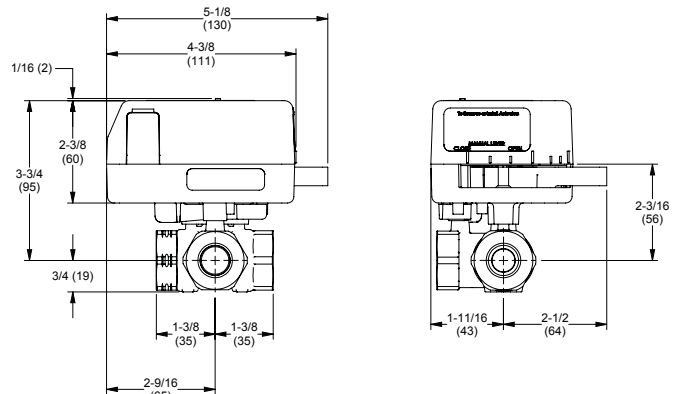
NOTE: Two-Way valve operation described. For a three-way valve, A to AB operation is the same. B to AB operation is opposite that of A to AB operation.



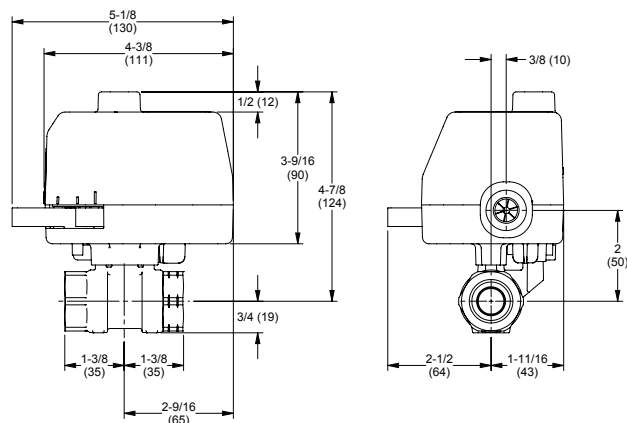
## Dimensions (mm)



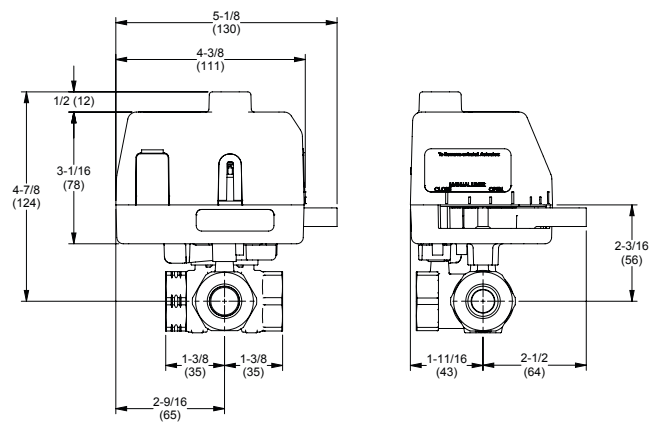
Two-Way Non-Spring Return. Shipping Weight: 2.07 lbs (940 g)



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)

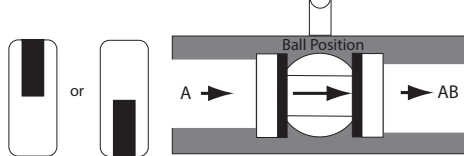
All dimensions shown in inches format and are rounded to the nearest 1/16". An additional 1 inch is required to remove the actuator from the valve.

## Flow Direction

A notch is cut into the tip of the valve stem. This notch is an external indicator of the closed portion of the ball within the valve. Check the notch position prior to assembling the actuator to verify the ball is orientated in the correct plane.

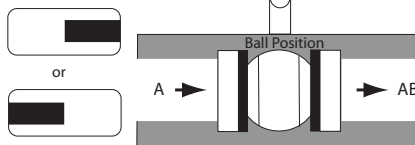
The drawings below indicate the stem notch position and the corresponding ball valve flow path.

### Notched Stem



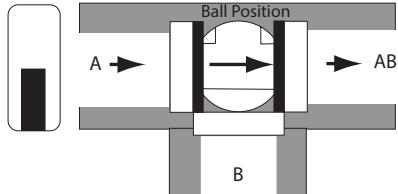
Two-Way Open

### Notched Stem



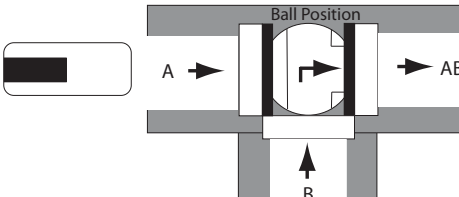
Two-Way Closed

### Notched Stem



Three-Way, A-Port Open, B-Port Closed

### Notched Stem



Three-Way, A-Port Closed, B-Port Open

