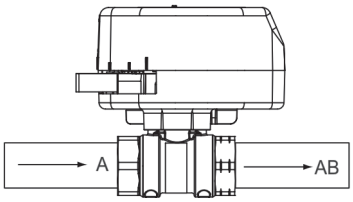
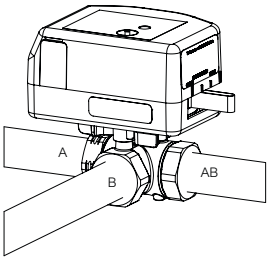
VBB/VBS Series Ball Valves

with Proportional Actuators



Two-Way Valve: Flow A to AB



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

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

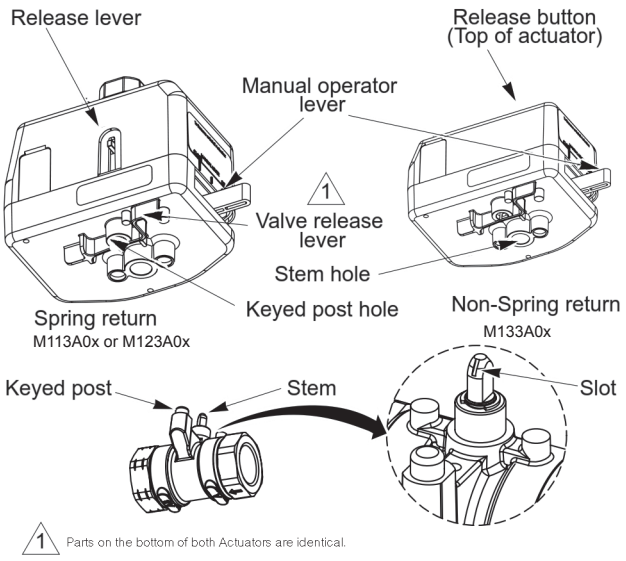
RISK OF EQUIPMENT DAMAGE

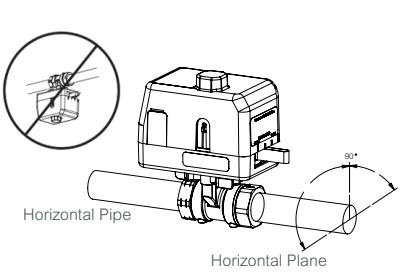
- Read and understand these instructions before installing or servicing this product.
- Do not install this product in hazardous or classified locations unless expressly permitted.
- Turn off all power supplying equipment before working on the product.
- Make all connections in accordance with the electrical 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.

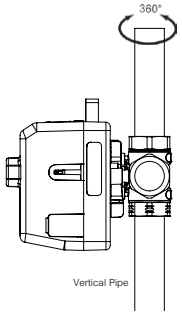
Failure to follow these instructions may cause equipment damage.

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: 24…42mm (1"…1-5/8")
- Pipe wrench according to pipe size
- Volt-ohm multimeter
- Phillips Head screwdriver

Training

- Installer must be a qualified, experienced technician

Other accessories

- As appropriate.

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November, 2017 tc

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. 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.

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

- Confirm 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 proportional 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.

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.

Proportional Actuators perform a self-calibration cycle on power-up. The actuator will run to the open direction for approximately 20 seconds and then closed direction for 145 seconds (approximately 2 ½ min.). Once this cycle is complete, the actuator will then accept and respond to the control signal.

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.

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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 establish sustained optimum performance.

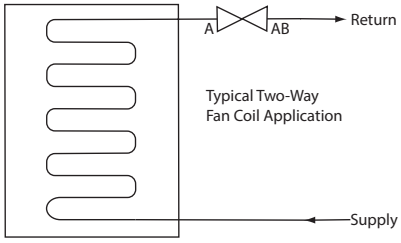
Field Repair

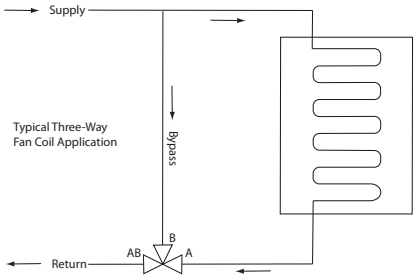
Neither valve nor actuator are field repairable.

Application Schematics

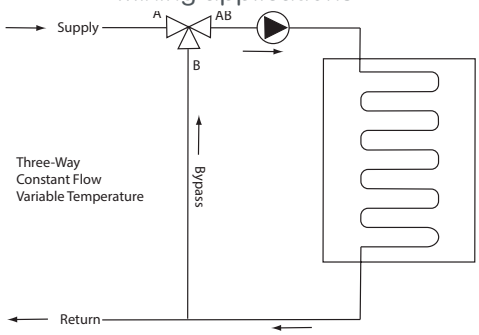
Typical applications

For simplicity, balancing valves and control devices not shown.





Mixing applications



Power/Failure Action (Proportional)

Control Signal	Position upon power loss		
	Non-Spring Return Actuator	Spring Return Open Actuator - Fail Open	Spring Return Closed Actuator - Fail Closed
DA Dip Switch selected (SW6 OFF)- Increase in control signal will open A to AB	Maintain last position	Will spring A to AB open	Will spring A to AB closed
RA Dip Switch selected (SW6 ON)- increase in control signal will close A to AB			

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.

Wiring and Wiring Diagrams

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

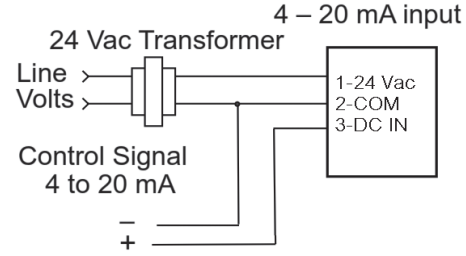
- Multiple actuators may be connected to a single controller.
- Do not exceed the maximum current draw of the controller.
- Use only one spring return actuator per 10 VA transformer.
- Use properly sized, inherently limited, Class 2 transformer(s).
- Use only 18…24 AWG (0.75…0.22 mm^2) copper wire for all connectors.
- For 4…20 mAdc control, a separate isolation transformer must be used with each valve.

Control Signal and Action Selection

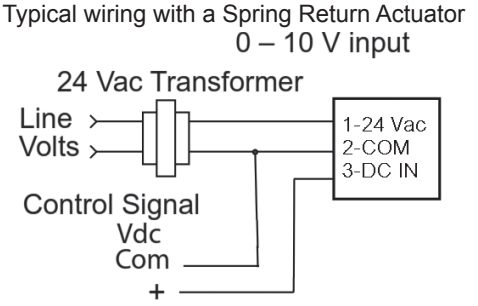
M1 Proportional models have a DIP switch module for mode selection located behind a door/flap on the side of the actuator. The drawings show the module sideways.

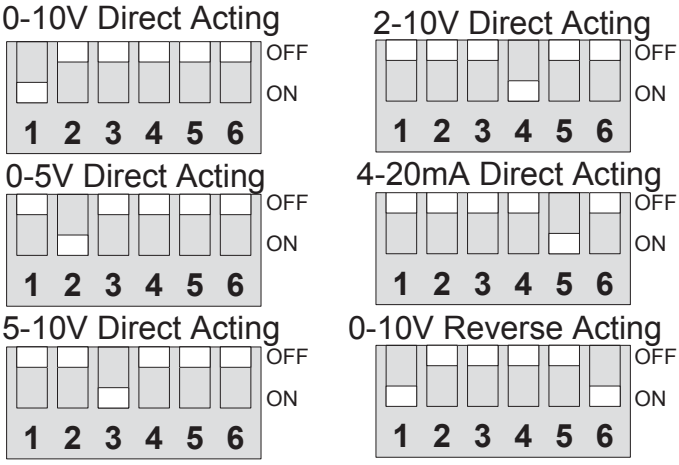
- Actuators are shipped from factory with SW1 ON and SW2-6 OFF for 0…10 Vdc control signal and for direct action (DA; valve opens with increasing control signal).
- When using SW1 through 4, the lowest numbered dip switch set to ON takes priority, e.g. if both SW2 and SW4 are ON, SW2 takes precedent.
- SW5 must be ON (SW1 through SW4 must be OFF) for 4-20 mA mode.
- For more information see Guidelines for Powering Multiple Actuators EN-206 (F-26363).

Typical wiring with a Non-Spring Return Actuator



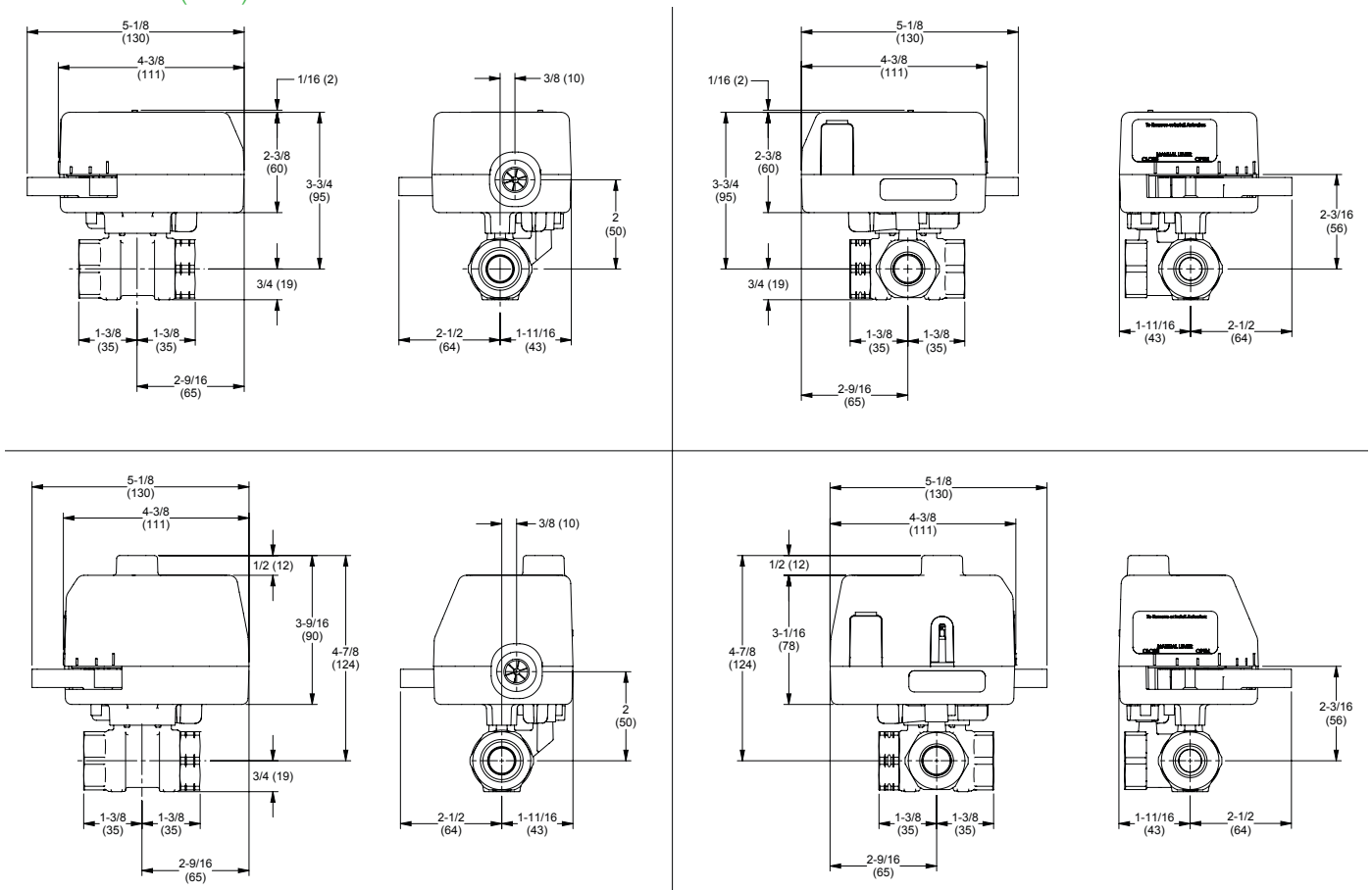
Typical wiring with a Spring Return Actuator





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Dimensions (mm)

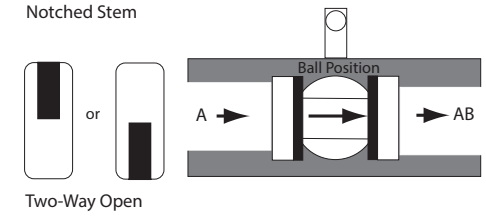


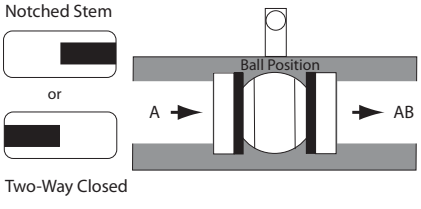
An additional 1 inch is required to remove the actuator from the valve.

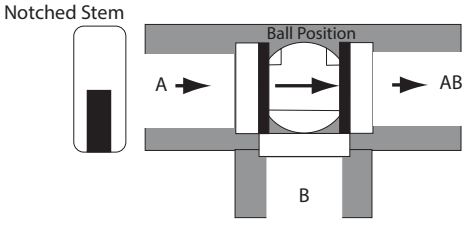
Flow Direction

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.

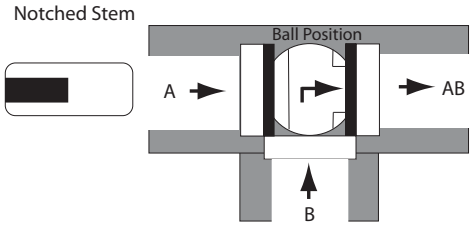
The drawings below indicate the stem notch position and the corresponding ball valve flow path.



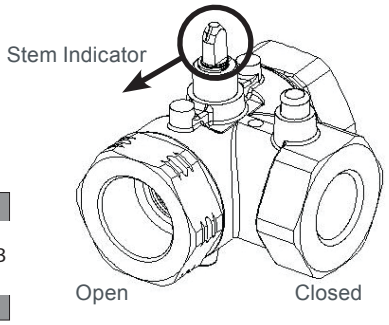




Three-Way, A-Port Open, B-Port Closed



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



Agency Listings

European Community: EMC Directive 2014/30/EU. Low Voltage Directive 2014/35/EU. UL873 Listed: 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. Australia: This product meets requirements to bear the RSM mark according to the terms specified by the Communications Authority under the Radio Communications Act of 1992.

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