



Applications

The VA(M)S24- 27 Series On/Off Electric Spring Return Actuators are direct-mount valve actuators that operate on AC 24 V power at 50/60 Hz, DC 24 V power, or AC 85 to 264 V power at 50/60 Hz. These bidirectional actuators are used for on/off control on the ST2 Series ball valves 1/2, 3/4, and 1 in. (DN15, DN20, and DN25) ball valves in Heating, Ventilating, and Air Conditioning (HVAC) applications.

An integral line voltage auxiliary switch, available only on the VA(M)S24-27 -A models, indicates end-stop position, or performs switching functions within the selected rotation range.

IMPORTANT: Use this VA(M)S24-27 Series Valve Actuator only to control equipment under normal operating conditions. Where failure or malfunction of the VA(M)S24-27 Series Valve Actuator could lead to personal injury or property damage to the controlled equipment or other property, additional precautions must be designed into the control system.

Incorporate and maintain other devices, such as supervisory or alarm systems or safety or limit controls, intended to warn of or protect against failure or malfunction of the VA(M)S24-27 Series Actuator.

Installation

Install the ball valve with the actuator at or above the center line of the horizontal piping (see Figure 1).

IMPORTANT: In steam applications, install the valve with the stem horizontal to the piping. Failure to follow this precaution may shorten the life of the actuator.

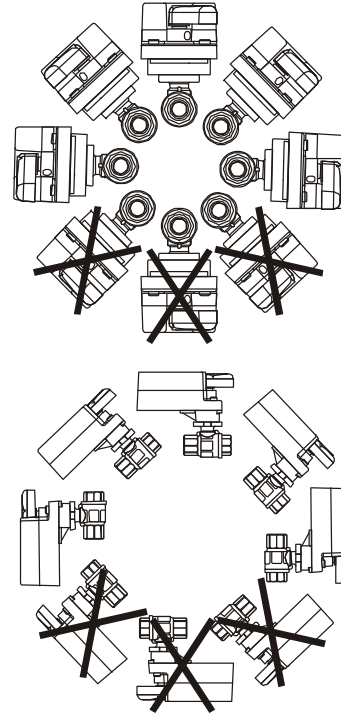


Figure 1: Mounting Positions for Chilled Water and Condensing Atmosphere Applications

IMPORTANT: Before specifying VA(M)S24-27 Series Valve Actuators for plenum applications, verify acceptance of exposed plastic materials in plenum areas with the local building authority. Building codes for plenum requirements vary by location. Some local building authorities accept compliance to UL 1995, Heating and Cooling Equipment, while others use different acceptance criteria.

IMPORTANT: Do not install or use this VA(M)S24-27 Series Valve Actuator in or near environments where corrosive substances or vapors could be present. Exposure of the actuator to corrosive environments may damage the device's internal components, and will void the warranty.

Special Tool Needed

- Commissioning Tool or digital voltmeter
- T-20 TORX® driver



Dimensions

Valve Actuator

See Figure 2, Table 1, and Table 2 for dimensions of Spring Return VA(M)S24-27 Series Actuated Ball Valves.

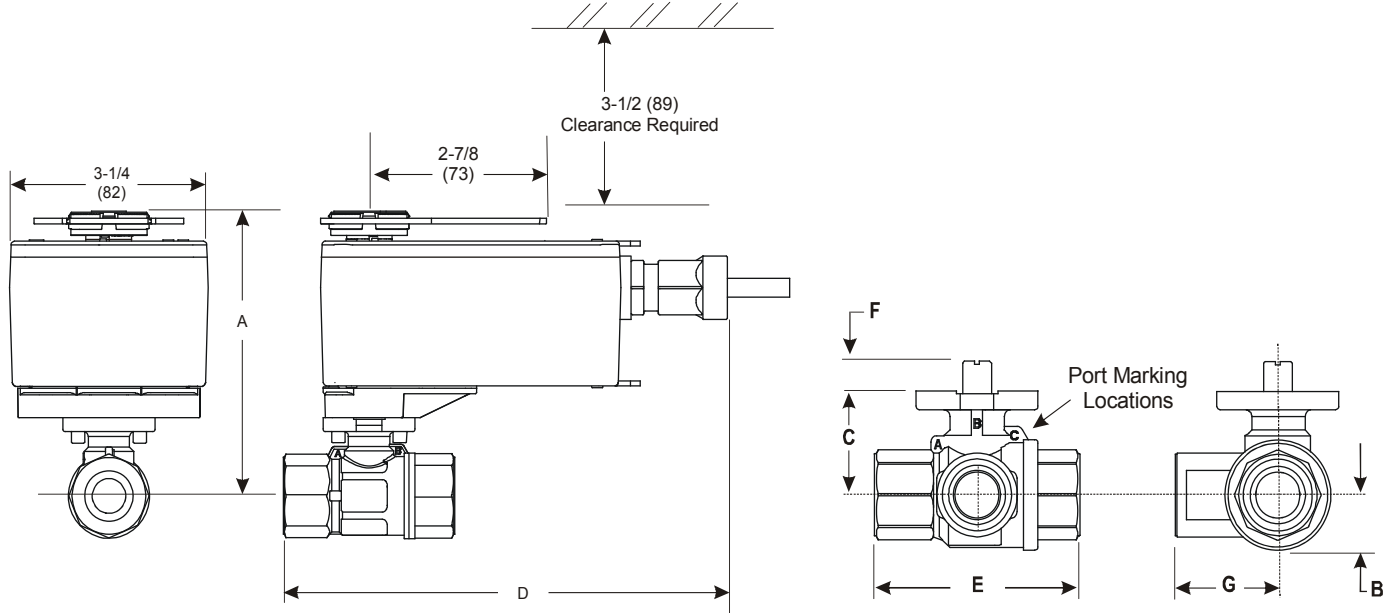


Figure 2: Spring Return VA(M)S24-27 Actuated ST2 Series Ball Valve Dimensions, in. (mm)

Table 1: VA(M)S24-27 Actuated ST2 Series NPT Ball Valve, Dimensions, in. (mm)

| Valve Size, in. (DN) ¹ | A | B | C | D | E | F | G |
|-----------------------------------|---------------|------------|--------------|---------------|--------------|-----------|--------------|
| 1/2 (DN15) | 4-5/8 (117) | 21/32 (17) | 1-7/32 (31) | 6-31/32 (177) | 2-33/64 (64) | 11/32 (9) | 1-1/4 (32) |
| 3/4 (DN20) | 4-5/8 (117) | 21/32 (17) | 1-7/32 (31) | 7-1/8 (181) | 2-51/64 (71) | 11/32 (9) | 1-13/32 (36) |
| 1 (DN25) | 4-11/16 (119) | 3/4 (19) | 1-19/64 (33) | 7-31/64 (190) | 3-13/32 (87) | 11/32 (9) | 1-45/64 (43) |

1. Port A must always be connected to the coil.

Table 2: VA(M)S24-27 Actuated ST2 Series Sweat Ball Valve, Dimensions, in. (mm)

| Valve Size, in. (DN) ¹ | A | B | C | D | E | F | G |
|-----------------------------------|---------------|------------|--------------|---------------|---------------|-----------|--------------|
| 1/2 (DN15) | 4-5/8 (117) | 21/32 (17) | 1-7/32 (31) | 7-13/64 (183) | 3-25/32 (96) | 11/32 (9) | 1-1/4 (32) |
| 3/4 (DN20) | 4-5/8 (117) | 21/32 (17) | 1-7/32 (31) | 7-3/4 (197) | 4-3/32 (104) | 11/32 (9) | 1-13/32 (36) |
| 1 (DN25) | 4-23/32 (120) | 3/4 (19) | 1-19/64 (33) | 8-3/16 (208) | 4-41/64 (118) | 11/32 (9) | 1-45/64 (43) |

1. Port A must always be connected to the coil.



Dimensions

Valve Actuator with Thermal Spacer

See Figure 3 and Table 3 for valve actuator dimensions with optional ST2-HT Thermal Barrier installed.

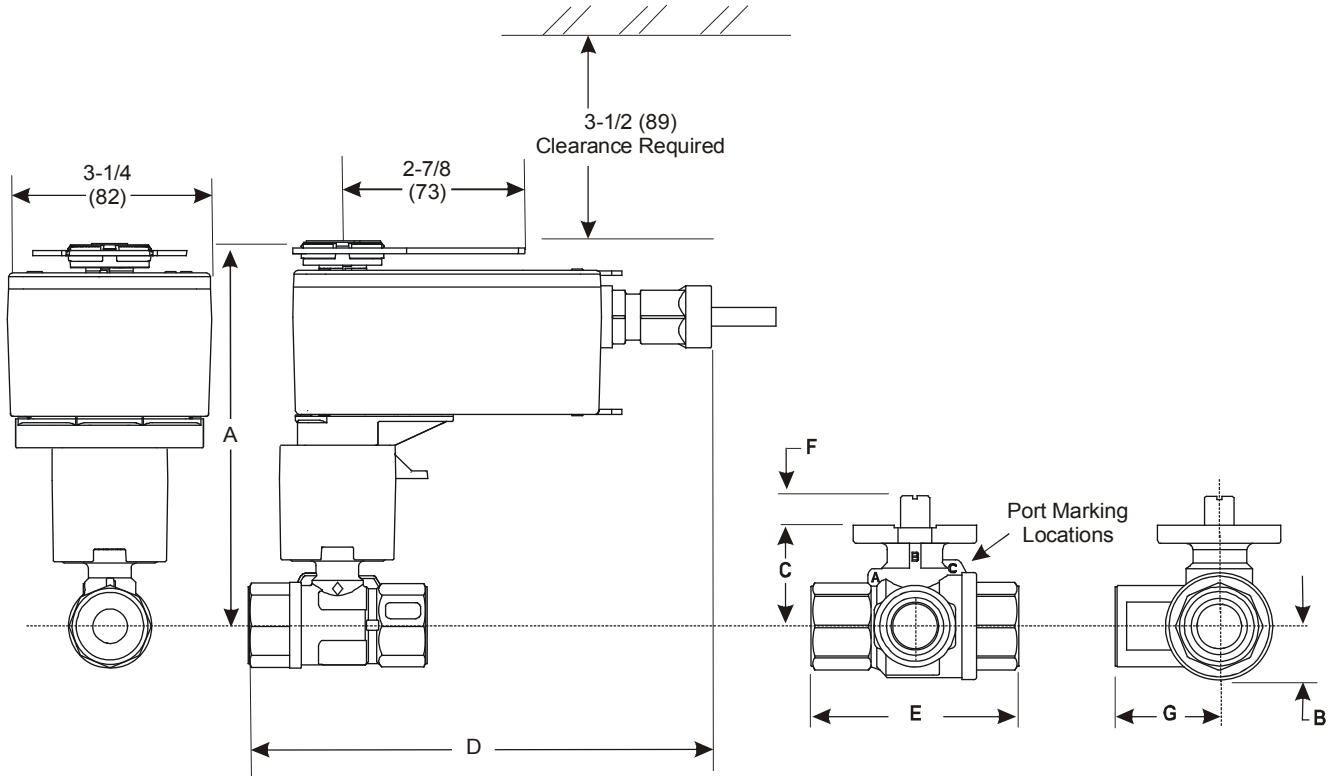


Figure 3: Spring Return VA(M)S24-27 Actuated ST2 Series Ball Valve with Optional ST2-HT Thermal Barrier Installed Dimensions, in. (mm)

Table 3: VA(M)S24-27 Actuated ST2 Series NPT Ball Valve with Optional ST2-HT Thermal Barrier Installed Dimensions, in. (mm)

| Valve Size, in. (DN) ¹ | A | B | C | D | E | F | G |
|-----------------------------------|--------------|------------|--------------|---------------|--------------|-----------|--------------|
| 1/2 (DN15) | 6 (152) | 21/32 (17) | 1-7/32 (31) | 6-31/32 (177) | 2-33/64 (64) | 11/32 (9) | 1-1/4 (32) |
| 3/4 (DN20) | 6 (152) | 21/32 (17) | 1-7/32 (31) | 7-1/8 (181) | 2-51/64 (71) | 11/32 (9) | 1-13/32 (36) |
| 1 (DN25) | 6-1/16 (154) | 3/4 (19) | 1-19/64 (33) | 7-31/64 (190) | 3-13/32 (87) | 11/32 (9) | 1-45/64 (43) |

1. Port A must always be connected to the coil.



Mounting the Actuator to Spring Return Port A (Coil) Open

To mount the actuator to spring return Port A (coil) open:

1. Turn the valve stem to the position outlined in Figure 4.

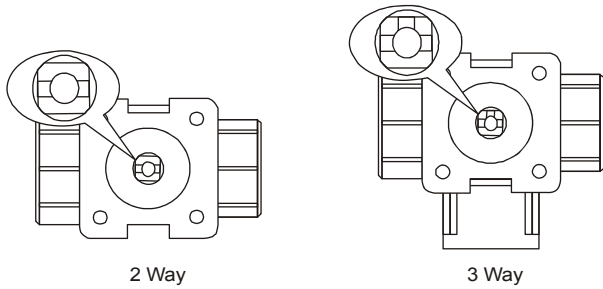


Figure 4: Positioning the Valve Stem

2. Mount optional ST2-HT Thermal Barrier to the valve if fluid temperature exceeds 212°F (100°C). See the Mounting the Thermal Barrier section for more information.

Note: Proceed to Step 7 if the ball valve linkage is on actuator Side B.

3. Remove the linkage from Side A (Figure 5).

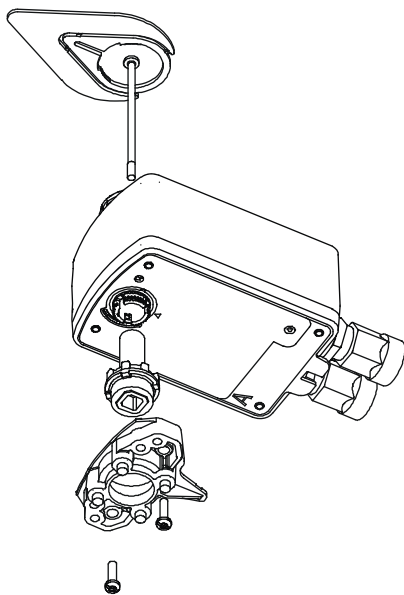


Figure 5: Removing the Linkage

4. Insert the drive shaft into Side B (Figure 6). The drive shaft is keyed for one-way assembly. With gentle pressure applied, rotate the drive shaft until the key aligns and the drive shaft falls into place.

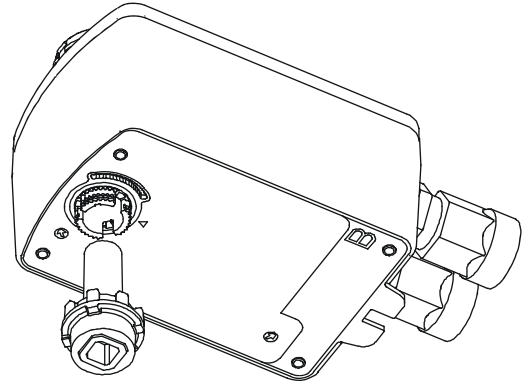


Figure 6: Inserting the Drive Shaft

5. Install linkage base on Side B using the two #8-32 x 0.625 in. long screws (Figure 7). The recommended torque is 29 to 33 lb-in. (3.3 to 3.7 N-m).

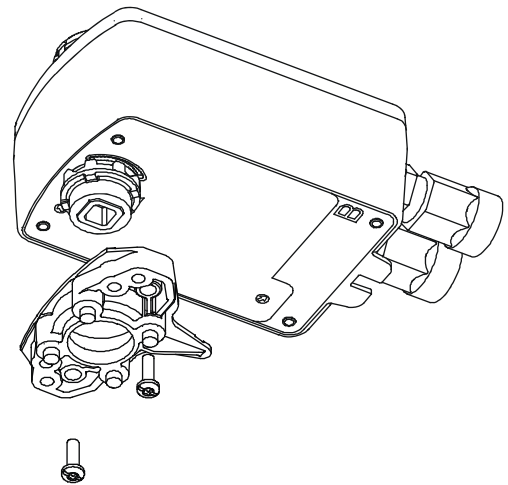


Figure 7: Installing the Linkage



6. Insert fixed pointer and M4x0.7x83 mm long screw into the Side A actuator hub (Figure 8). Direct the arrow on the pointer to 100%.

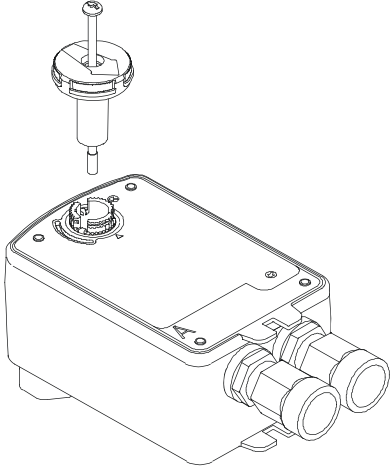


Figure 8: Installing the Fixed Pointer

7. Install the actuator on the ball valve (Figure 9). Tighten the actuator mounting screw to a torque of 10 to 12 lb-in. (1.1 to 1.4 N-m) and snap the large adjustable pointer into place.

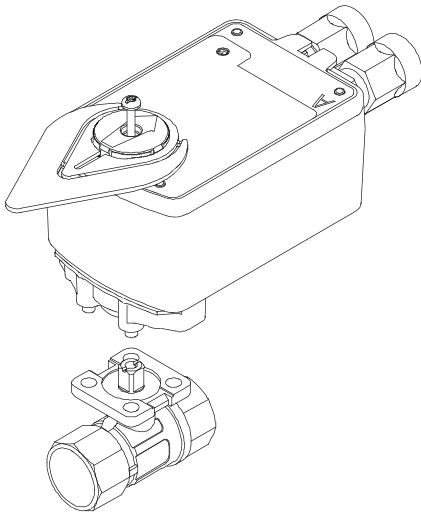


Figure 9: Mount the Actuator

Mounting the Actuator to Spring Return Port A (Coil) Closed

To mount the actuator to spring return Port A (coil) closed:

1. Turn the valve stem to the position outlined in Figure 10.

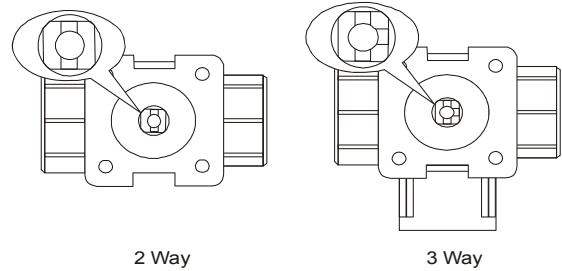


Figure 10: Positioning the Valve Stem

2. Mount optional ST2-HT Thermal Barrier to the valve if fluid temperature exceeds 212°F (100°C). See the Mounting the Thermal Barrier section for more information.

Note: Proceed to Step 7 if the ball valve linkage is on actuator Side A.

3. Remove the linkage from Side B (Figure 13).

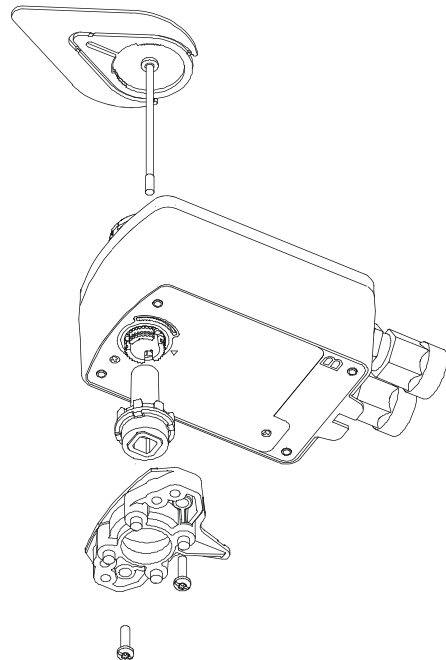


Figure 11: Removing the Linkage



4. Insert the drive shaft into Side A (Figure 12). The drive shaft is keyed for one-way assembly. With gentle pressure applied, rotate the drive shaft until the key aligns and the drive shaft falls into place.

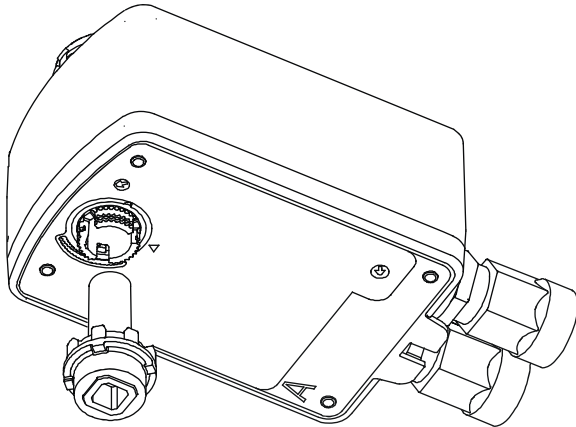


Figure 12: Inserting the Drive Shaft

5. Install linkage base on Side A using the two #8-32 x 0.625 in. long screws (Figure 13). The recommended torque is 29 to 33 lb-in. (3.3 to 3.7 N·m).

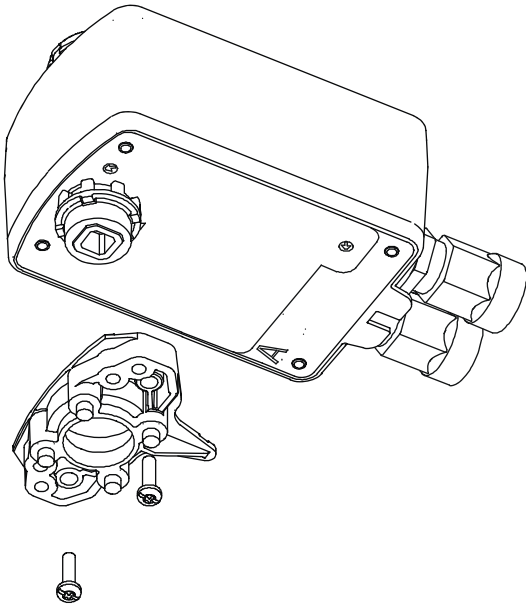


Figure 13: Installing the Linkage

6. Insert fixed pointer and M4x0.7x83 mm long screw into the Side B actuator hub (Figure 14). Direct the arrow on the pointer to 0%.

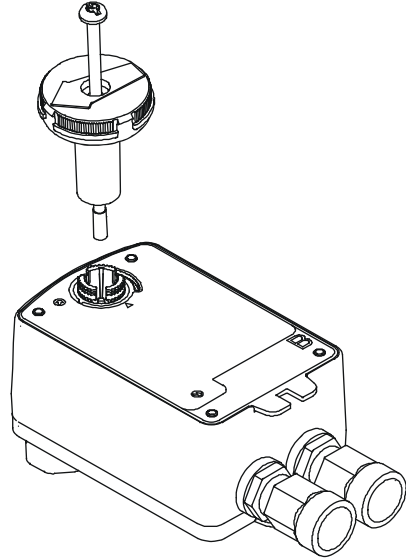


Figure 14: Installing the Fixed Pointer

7. Install the actuator on the ball valve (Figure 15). Tighten the actuator mounting screw to a torque of 10 to 12 lb-in. (1.1 to 1.4 N·m) and snap the large adjustable pointer into place.

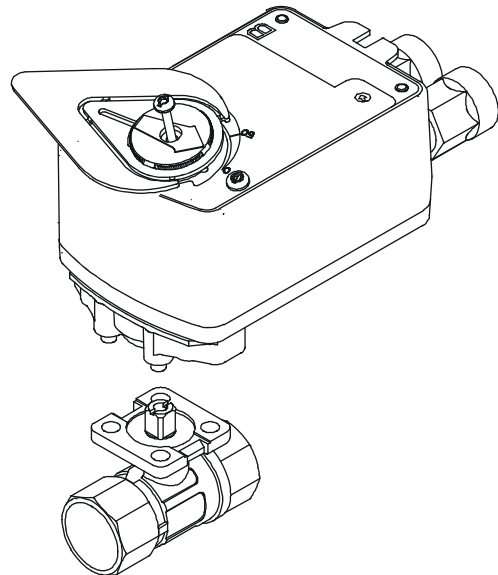


Figure 15: Mount the Actuator



Mounting the ST2-HT Thermal Barrier

Figure 16 shows the optional ST2-HT Thermal Barrier.

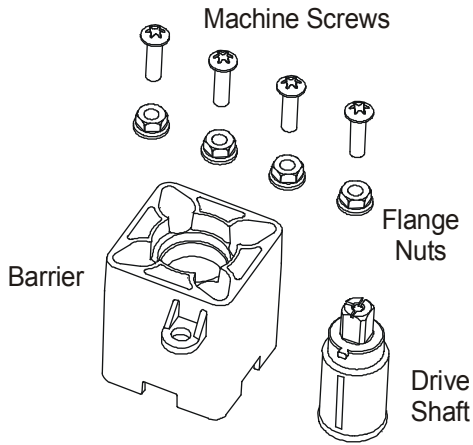


Figure 16: Optional ST2-HT Thermal Barrier

To mount the optional ST2-HT thermal barrier:

1. Install the thermal barrier drive shaft into the thermal barrier by aligning the tab on the drive shaft with the slot on the thermal barrier (Figure 17).

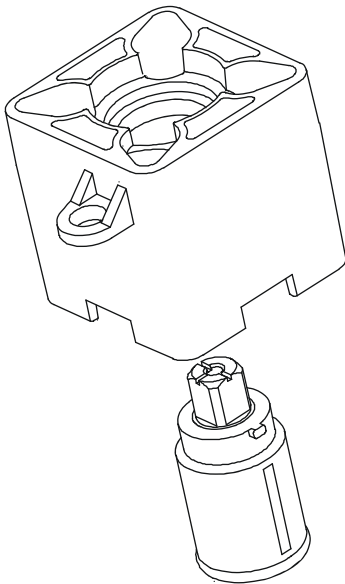


Figure 17: Installing the Drive Shaft into the Thermal Barrier

2. Rotate the drive shaft to align marks on the top of the thermal drive shaft with matching marks on the valve stem.
3. Mount the thermal barrier onto the valve using the four included M5x16 mm machine screws and four M5 flange nuts. Tighten the screws to a recommended torque of 21 to 25 lb·in. (2.4 to 2.8 N·m) (Figure 18).

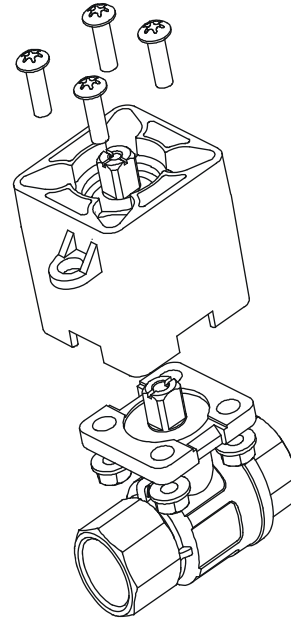


Figure 18: Installing the Barrier

4. Proceed to actuator mounting instructions. Follow the same steps as mounting directly to the valve when mounting the actuator to the thermal barrier.



Using Conduit

All VA(M)S24-27 Series Actuators accept 1/2 in. threaded electrician’s fittings (Figure 21).

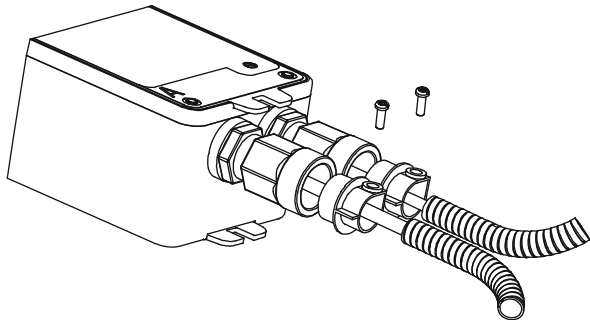


Figure 21: Adding Flexible Metal Conduit

1. Feed the actuator cables through the field-supplied electrician’s fitting and conduit.
2. Thread the electrician’s fitting into the actuator and secure the conduit to the fitting in accordance with local building code requirements.

Setup and Adjustments

Auxiliary Switch (VA(M)S24-27 -A Models)

The VA(M)S24-27-A models include one integral auxiliary switch with a switch adjuster accessible on either face of the actuator (Figure 22). The factory setting for Auxiliary Switch is 10% closing (relative to the 0 to 100% rotation range as printed on the product label). See the Technical Specifications section for the auxiliary switch ratings.

The switch point is continuously adjustable throughout the actuators’s rotation range. For the most accurate switch positioning, see Figure 22 and use the method in the following example. To change the switch point of auxiliary switch, proceed as follows:

1. Position the actuator in the full spring return position.

Note: The switch is factory set to trip when the actuator reaches the 10% position.

2. Rotate the switch adjuster until it points to the desired switch point.
3. Connect the auxiliary switch to a power source or an ohmmeter and apply power to the actuator. The actuator moves to the fully open position and holds while power is applied.
4. Observe the switch point. If required, repeat Step 1 through Step 3.

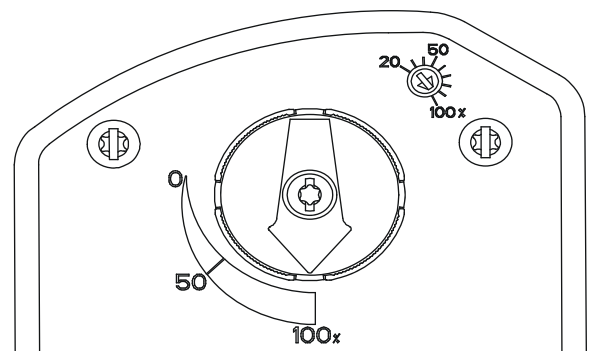


Figure 22: Switch Trip Point Settings



WARNING: Risk of Electric Shock and Property Damage.

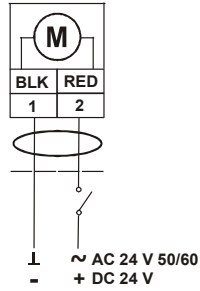
Insulate and secure each unused wire lead before applying power to the actuator. Failure to insulate and secure each unused wire lead may result in property damage, electric shock, and severe personal injury or death.



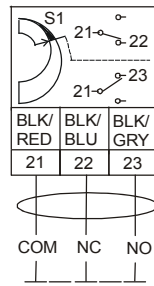
VA(M)S24-27 Series — Installation Instructions - Continued

VAS24-27-(A)

On/Off

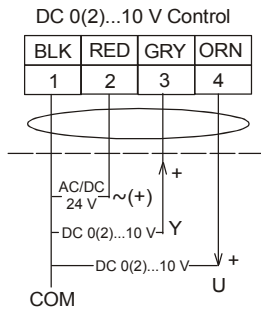


(-A) Auxiliary Switches

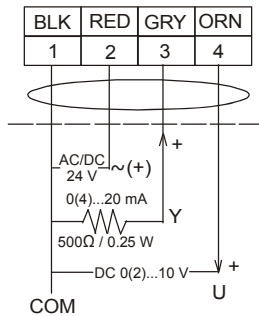


VAMS24-27(A)

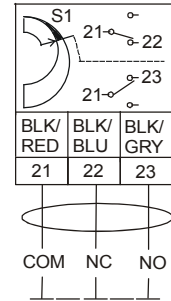
Modulating



0(4)...20 mA Control with External Resistor



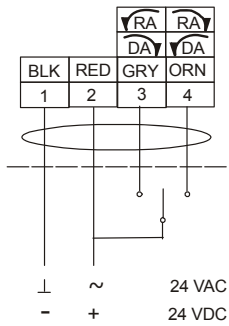
(-A) Auxiliary Switches



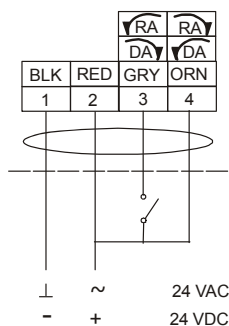
VAS24-27-T(A)

On/Off and Floating

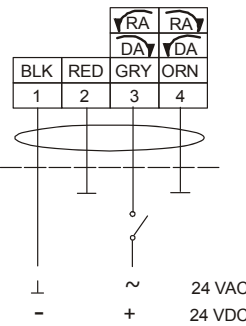
Floating Control, Four Wire



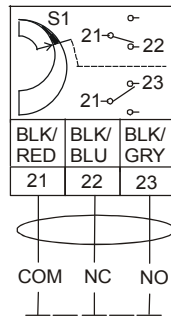
Open/Close, Single Wire Control



On/Off Control, Two Wire

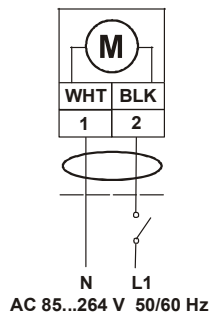


(-A) Auxiliary Switches

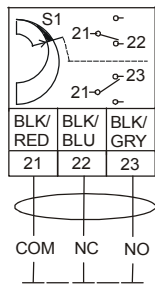


VASU20-27-(A)

On/Off



(-A) Auxiliary Switches



NOTE: WARNING: All VA(M)S-27 Series actuators are designed for use only in conjunction with operating controls. Where an operating control failure would result in personal injury and/or loss of property, it is the responsibility of the installer to add safety devices or alarm systems that protect against, and/or warn of, control failure.

To avoid excessive wear or drive time on the motor, use a controller and/or software that provides a time-out function to remove the signal at the end of rotation (stall).

The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the nearest Bray office. Bray controls shall not be liable for damages resulting from misapplication or misuse of its products.