

VA-4233-BGx Series Electric Valve Actuators

Installation

Refer to Figures 2 through 4 for proper actuator orientation before attempting to make the installation.

IMPORTANT: VA-4233-BGx Series Electric Valve Actuators are intended to control valves under normal operating conditions. Where failure or malfunction of VA-4233-BGx Series Actuators could lead to an abnormal operating condition that could result in personal injury or damage to the equipment or other property, additional devices (limit or safety controls) or systems (alarm or supervisory) intended to warn of, or protect against, failure or malfunction of VA-4233-BGx Series Actuators must be incorporated into and maintained as part of the control system.

VA-4233-BGx Series On/Off Electric Valve Actuators operate on 24 VAC at 50/60 Hz or 24 VDC, and use a stepper motor with stall detection circuitry that operates throughout the entire actuator stroke.

Application of a power signal will extend the actuator, driving the valve stem down to the end of travel and holding it in position. Removal of the power signal will cause a spring in the actuator to automatically return the valve to the full stem-up position.

To install the actuator onto the valve, proceed as follows:

1. Depress the socket for the manual override to be certain that the actuator is in the retracted position.
2. Using the manual hand crank (included with the actuator), push in and turn the crank in the direction of the arrow approximately four full turns. Lock this position by winding the manual hand crank counterclockwise to the Lock Area zone (engraved on the face of the actuator). Remove the manual hand crank.
3. If replacing a Johnson Controls M100, V-400, V-500, or MP8000 Series Actuator on a VG7000 Series Bronze Control Valve, thread a VG7000-1016 Bonnet Adaptor (ordered separately) onto the valve. Then proceed to Step 4.

If installing the VA-4233-BGx Series Actuator on a 1/2 through 1-1/4 in. Invensys VB-7xxx or VB-9xxx Series Valve, use the parts included in the V-9999-BC1 Mounting Kit (ordered separately). Refer to the literature included with this kit, *V-9999-BC1 Mounting Kit to Mount VA-715x or VA-720x Series Electric Actuators to Barber-Colman® 1/2 through 1-1/4 inch VB-9xxx Valve Bodies (Part No. 14-1116-3)*, to complete the actuator installation.
4. Thread the jam nut (included with the actuator) onto the valve stem to the bottom of the threads. Then thread the special stem nut (included with the actuator) onto the valve stem with the beveled side up. Position the stem nut so that half of a thread of the valve stem is exposed above the stem nut.
5. Using two adjustable wrenches, tighten the jam nut into the stem nut to secure the assembly in place.
6. Install the actuator and yoke assembly onto the stem nut assembly, making sure that the flats of the special stem nut are aligned with the internal flats of the actuator stem nut connector. When properly installed, the actuator will be aligned with the valve body.
7. Tighten the set screw to a torque of 10 to 20 lb-in (1.1 to 2.3 N·m), to secure the assembly.

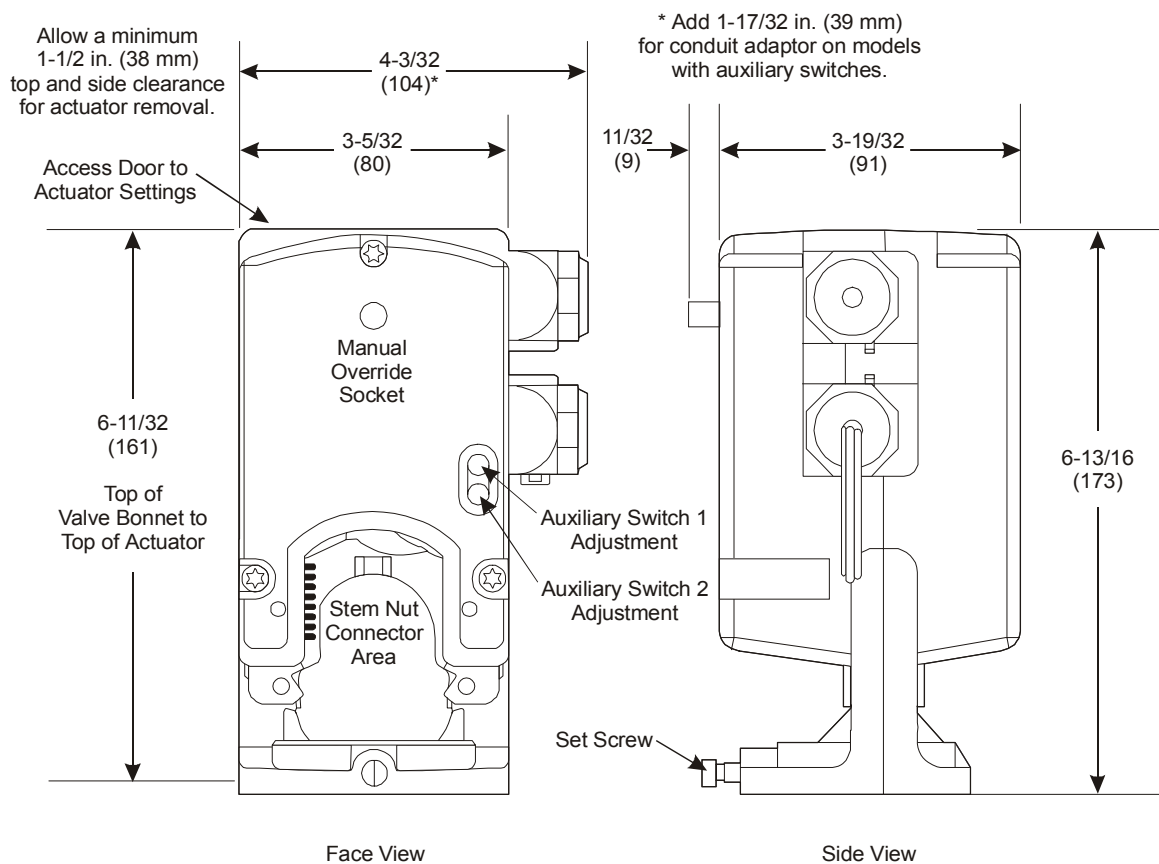
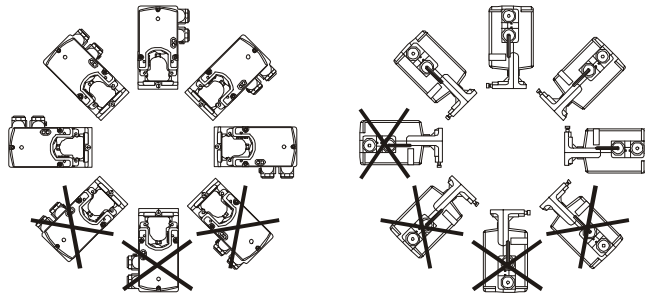


Figure 1: Actuator Dimensions, in. (mm)

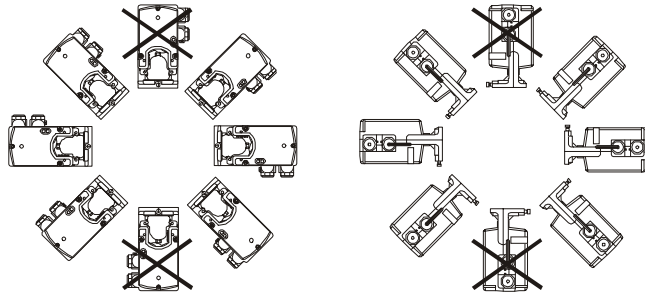
Mounting



Face View

Side View

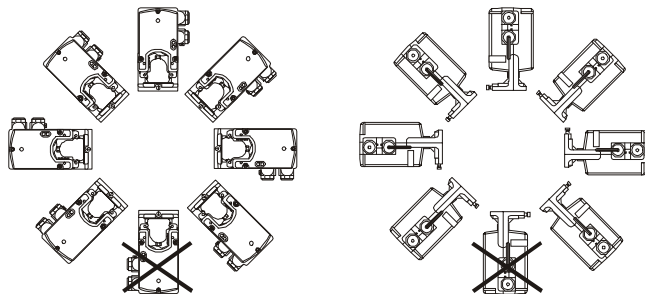
Figure 2: Mounting Positions for Chilled Water Applications and Condensing Atmospheres



Face View

Side View

Figure 3: Mounting Positions for Steam Applications



Face View

Side View

Figure 4: Mounting Positions for Hot Water Applications

Wiring

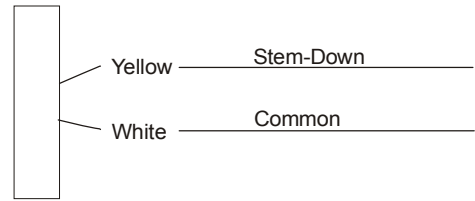
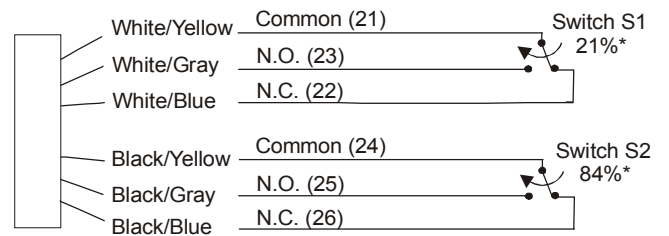


Figure 5: Actuator Wiring



* Refers to a full actuator stroke of 29/32 in. (23 mm).
Switches are readjustable to all applicable Johnson Controls stroke ranges.

Figure 6: Auxiliary Switch Wiring

Setup and Adjustments

Auxiliary Switch Adjustments (VA-4233-BGC-2 Only)

**WARNING: Electrical Shock Hazard.**

Be sure that all unused auxiliary switch leads are insulated to avoid the risk of electric shock or damage to the equipment.

The VA-4233-BGC-2 Electric Valve Actuator features two integral auxiliary switches, with switch adjusters accessible on either face of the actuator.

IMPORTANT: Do not force the switch adjuster out of the allowable range, or damage to the auxiliary switch may occur.

Switch points are independently and continuously adjustable from approximately 0 to 74% of maximum actuator travel for Auxiliary Switch 1, and approximately 22 to 100% of maximum actuator travel for Auxiliary Switch 2.

If only one auxiliary switch is needed, use the appropriate switch. Use Auxiliary Switch 1 for the upper switch point, and Auxiliary Switch 2 for the lower switch point.

To change the switch point(s) to the desired setting, proceed as follows:

1. Disconnect the actuator from the system controller.
2. Use the manual hand crank (included with the actuator) to position the valve stem to the desired switch point.
3. Use a 1/8 in. (3 mm) blade screwdriver to turn the auxiliary switch until it just trips.

Looking at the actuator face **with** the engraved markings, clockwise rotation of the switch adjuster lowers the stem setting toward the valve, while counterclockwise rotation raises the stem setting away from the valve.

Looking at the actuator face **without** the engraved markings, the switch adjuster rotation would be reversed.
4. Reconnect the actuator to the system controller.

Checkout

To confirm that the auxiliary switches are set at the desired switch points, proceed as follows:

1. Disconnect the actuator from the system controller.
2. Apply an external power supply and check the upper and lower switch point settings. The Johnson Controls M9000-200 Commissioning Tool (ordered separately) is a convenient method for applying power to the actuator.

If the upper and lower settings are set at the desired switch points, proceed to Step 3; if not, repeat the auxiliary switch adjustment steps until the desired switch point settings are obtained.
3. Remove the M9000-200 Commissioning Tool (if used) and reconnect the actuator to the system controller.

Technical Data

Product		VA-4233-BGx Series Electric Valve Actuators
Models	VA-4233-BGA-2	Direct Mount, On/Off Control
	VA-4233-BGC-2	Direct Mount, On/Off Control, with Two Auxiliary Switches
Force Output		Minimum 61 lb (271 N)
Power Requirements		20 to 30 VAC at 50/60 Hz or 24 VDC $\pm 10\%$; Class 2, 12 VA
Input Signal		20 to 30 VAC at 50/60 Hz or 24 VDC $\pm 10\%$, 2 mA
Switch Contact Rating (VA-4233-BGC-2 Only)		Two Single-Pole, Double-Throw (SPDT), Double Insulated Switches: 24 VAC, 50 VA Pilot Duty; 120 VAC, 5.8 A Resistive, 1/4 hp, 275 VA Pilot Duty; 240 VAC, 2.9 A Resistive, 1/4 hp, 275 VA Pilot Duty
Maximum Stroke		29/32 in. (23 mm)
Nominal Timing for 29/32 in. Stroke		76 Seconds (Proportionally Less for Shorter Strokes)
Nominal Spring Return Timing for 29/32 in. Stroke		3 to 15 Seconds at Room Temperature and No Load (Proportionally Less for Shorter Strokes)
Spring Return Direction		Stem-Up
Electrical Connections	Actuator	48 in. (122 cm) Cable with 20 AWG Wire Leads
	Auxiliary Switches (VA-4233-BGC-2 Only)	48 in. (122 cm) Cable with 18 AWG Wire Leads
Ambient Temperature Limits	Operating	32 to 122°F (0 to 50°C)
	Storage	-85 to 185°F (-65 to 85°C)
Maximum Ambient Humidity Limits		90% RH Non-Condensing at 70°F (21°C) Ambient Temperature and 40°F (4°C) Fluid Temperature
Fluid Temperature Limits (Actuator and Valve Assembly)		35 to 250°F (2 to 121°C); 15 psig (103 kPa) Saturated Steam
Acoustic Noise		35 dB(A) Maximum at 39 in. (100 cm) per DIN 1946 and ISO 3745
Agency Compliance	All Models	UL 873 Listed, File E27734, CCN XAPX; CSA C22.2 No. 139 Certified, File LR85083, Class 3221 02; CE Mark, EMC Directive 89/336/EEC
	VA-4233-BGC-2 Only	Low Voltage Directive 73/23/EEC
Enclosure Rating		NEMA 2, IP 42
Shipping Weight		3.1 lb (1.4 kg)

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



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