

# VA9203-xxx-xx Series Electric Spring Return Valve Actuators

## Product Bulletin

VA9203-GGx-2Z, VA9203-AGx-2Z, VA9203-Bxx-2

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The VA9203-xxx-xx Series Electric Spring Return Valve Actuators are direct-mount valve actuators. These bidirectional actuators are used to provide accurate positioning on Johnson Controls® VG1000 Series 1/2, 3/4, and 1 in. (DN15, DN20, and DN25) ball valves in Heating, Ventilating, and Air Conditioning (HVAC) applications. A mechanical spring return system provides rated torque with or without power applied to the actuator. The series includes the following control options:

- On/Off, 24 V, or 85 to 264 VAC power
- On/Off and Floating Point, 24 V power
- Proportional, 24 V power, for 0(2) to 10 VDC or 0(4) to 20 mA Control Signal

An accessory crankarm and remote mounting kit are available for applications where the actuator cannot be direct-coupled to the damper shaft. An optional line voltage auxiliary switch indicates an end-stop position or performs switching functions within the selected rotation range.



**Figure 1: VA9203 Spring Return Electric Valve Actuator**

**Table 1: Features and Benefits (Part 1 of 2)**

| Features   | Benefits  |
|--|---|
| <b>Direct Mounting with a Single Screw</b>                                 | Reduces installation time and cost.   |
| <b>Electronic Stall Detection</b>  | Protects from overload at all angles of rotation. Power consumption is reduced holding mode. The actuator may be stalled anywhere in its rotation range without the need for mechanical end switches. |
| <b>Double-Insulated Construction</b>                                       | Eliminates need for electrical ground connection for regulatory agency compliance.  |
| <b>Microprocessor-Controlled Brushless DC Motor (-AGx and -GGx Models)</b> | Provides constant runtime independent of torque and ensures long life.  |
| <b>External Mode Selection Switch (-AGx and -GGx Models)</b>               | Permits control logic reversal for Floating Control (-AGx Models). Permits calibration input signal range selection, and control logic reversal for Proportional Control (-GGx Models).               |
| <b>Integral Cables with Colored and Numbered Conductors</b>                | Simplify installation and field wiring.   |
| <b>Integral 1/2 in. (13 mm) Threaded Conduit Connector(s)</b>              | Simplify installation and field wiring.   |
| <b>Optional Integrated Auxiliary Switch</b>                                | Provides adjustable switch point with line voltage capability.  |
| <b>Plenum Rated Models</b>   | Enable use in other environmental air spaces (plenums) in accordance with section 300.22(C) of the National Electric Code.  |
| <b>Optional Thermal Barrier</b>  | Provides for 284°F (140°C) hot water or 15 psi saturated steam applications.  |

**Table 1: Features and Benefits (Part 2 of 2)**

| Features   | Benefits  |
|--|---|
| Available Weather Shield for Field Mounting  | Provides NEMA 3R protection for the actuator.                             |
| Override Control (Proportional Models Only)  | Supports manual control system override application through field wiring. |
| Underwriters Laboratories Inc.® (UL), CE Mark, and C-Tick Compliance                         | Provides internationally recognized regulatory agency approvals.          |
| Manufactured under International Standards Organization (ISO) 9001 Quality Control Standards | Ensures quality.  |
| 5-Year Warranty  | Protects consumer investment.   |

**IMPORTANT:** Use these VA9203-xxx-xx Series Electric Spring Return Actuators only to control equipment under normal operating conditions. Where failure or malfunction of the electric 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 electric actuator.

**IMPORTANT:** Before specifying VA9203-xxx-xx Series Electric Spring Return 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, whereas others use different acceptance criteria.

### **VA9203-GGx-2Z Series Proportional Actuators**

The VA9203-GGx-2Z Series Actuators provide proportional modulation of VG1000 1/2, 3/4, and 1 inch ball valves in HVAC systems that are controlled by an electronic controller or positioner. The actuator responds to 0 to 10 VDC or 2 to 10 VDC control signals. With the addition of a 500 ohm resistor, the actuator responds to a 0 to 20 mA or 4 to 20 mA signal. A 0 to 10 VDC or 2 to 10 VDC feedback signal indicates position and provides support for master-slave applications.

Manual control system override applications are supported through field wiring, and include:

- override to MIN position
- override to MAX position
- override to MIN, MID, and MAX position

The VA9203-GGA-2Z actuators include plenum-rated cables and are specially configured for installation in spaces used for environmental air-handling purposes, other than ducts and plenums, as specified in National Fire Protection Association (NFPA) 70: National Electrical Code section 300.22(C), Other Space Used for Environmental Air. The space over a hung ceiling, when used for environmental air handling purposes, is an example of the type of space for which these actuators are configured.

### **VA9203-AGx-2Z Series On/Off and Floating Point Actuators**

The VA9203-AGx-2Z Series Actuators provide on/off control or modulation of VG1000 1/2, 3/4, and 1 inch ball valves in HVAC systems. Floating point control can be provided from a triac or relay. On/off control can be provided from a manual switch, controller, auxiliary switch from a fan motor contactor, or similar device.

The VA9203-AGA-2Z actuators include plenum-rated cables and are specially configured for installation in spaces used for environmental air-handling purposes other than ducts and plenums as specified in National Fire Protection Association (NFPA) 70: National Electrical Code section 300.22(C), Other Space Used for Environmental Air. The space over a hung ceiling, when used for environmental air handling purposes, is an example of the type of space for which these actuators are configured.

### **VA9203-Bxx-2 Series On/Off Actuators**

The VA9203-Bxx-2 Series Actuators provide on/off control of VG1000 1/2, 3/4, and 1 inch ball valves in HVAC systems. On/off control can be provided from a manual switch, controller, auxiliary switch from a fan motor contactor, or similar device.

#### **Operation**

VA9203-xxx-xx Series Actuators provide 95° of rotation. A graduated scale from 0% to 100% and a position indicator provide visual indication of stroke. When power fails during service, the mechanical spring return system returns the valve to the home position.

### **VA9203-GGx-2Z Series Proportional Actuators**

The VA9203-GGx-2Z Series uses a brushless DC motor controlled by a microprocessor. The microprocessor drives the motor at constant speed, independent of torque. The microprocessor also monitors the brushless DC motor's rotation to prevent damage to the actuator in a stall condition. The actuator can be stalled anywhere within its rotation range without the need for mechanical end switches. Power consumption is reduced in the holding mode.

The VA9203-GGC-2Z version is provided with one integrated, line-voltage-capable auxiliary Single-Pole, Double-Throw (SPDT) switch. The switch point is independently and continuously adjustable throughout the full range of actuator stroke. The auxiliary switch is double-insulated so an electrical ground is not required.

### **VA9203-AGx-2Z Series On/Off and Floating Point Actuators**

The VA9203-AGx-2Z Series uses a brushless DC motor controlled by a microprocessor. The microprocessor drives the motor at constant speed, independent of torque. The microprocessor also monitors the brushless DC motor's rotation to prevent damage to the actuator in a stall condition. The actuator can be stalled anywhere within its rotation range without the need for mechanical end switches. Power consumption is reduced in the holding mode.

The VA9203-AGB-2Z version is provided with one integrated, line-voltage-capable auxiliary SPDT switch. The switch point is independently and continuously adjustable throughout the full range of actuator stroke. The auxiliary switch is double-insulated so an electrical ground is not required.

### **VA9203-Bxx-2 Series On/Off Actuators**

The VA9203-Bxx-2 Series uses a DC brush motor controlled by analog electronics. The actuator can be stalled anywhere within its rotation range without the need for mechanical end switches. Power consumption is reduced in the holding mode. Two different voltage ratings are available for on/off actuators.

- VA9203-BGx-2: AC 24 V 50/60 Hz or DC 24 V power
- VA9203-BUx-2: AC 85 to 265 V 50/60 Hz power

The VA9203-BUx-2 actuators are double-insulated so an electrical ground is not required. The VA9203-BxB-2 versions are provided with one integrated, line-voltage-capable auxiliary SPDT switch. The switch point is independently and continuously adjustable throughout the full range of the actuator stroke. The auxiliary switch is double-insulated so an electrical ground is not required.

Wiring Diagrams

VA9203-GGx-2Z Series Proportional Actuators

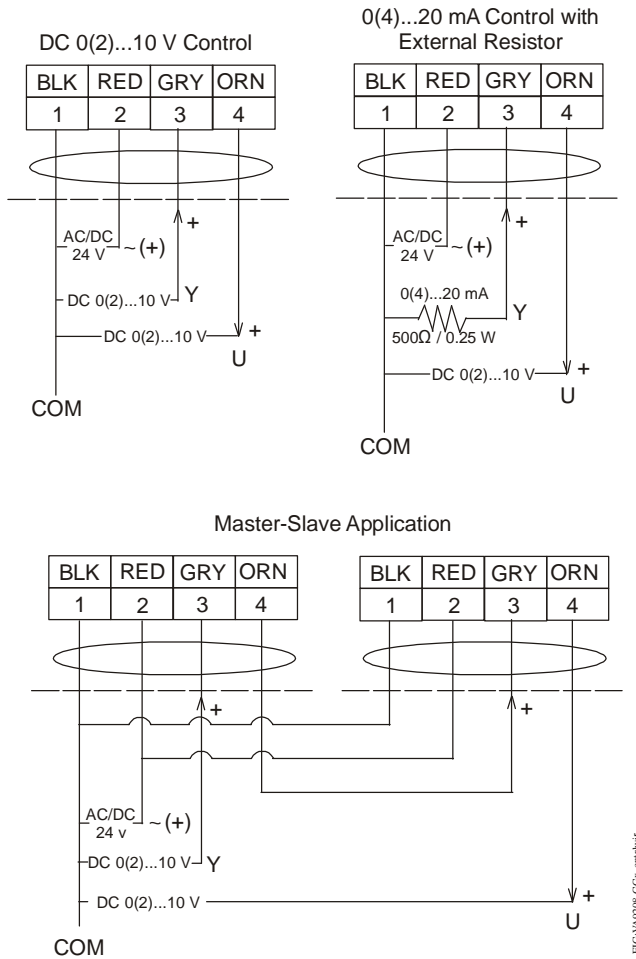


Figure 2: VA9203-GGx-2Z Control Wiring Diagrams

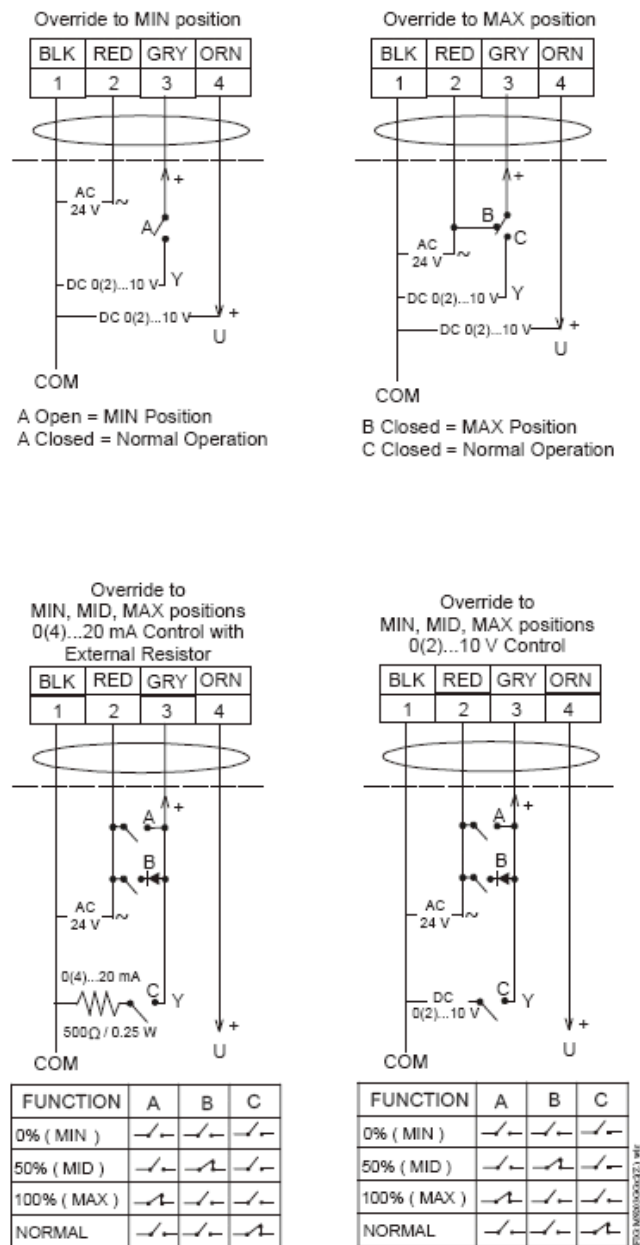


Figure 3: Control Wiring Diagrams (Overrides)

## VA9203-Bxx-2 Series On/Off Actuators

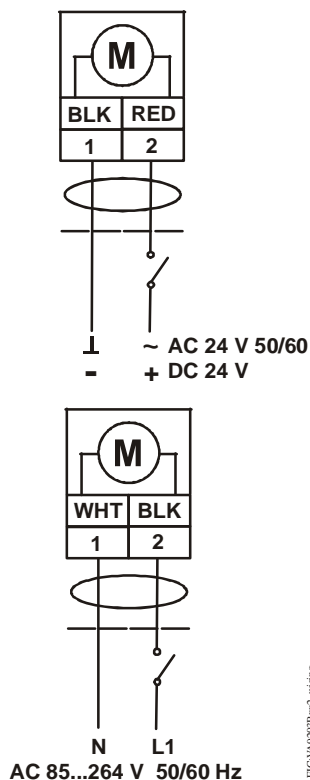


Figure 4: VA9203-Bxx-2 Control Wiring Diagrams

## VA9203-xxB-2x Auxiliary Switch

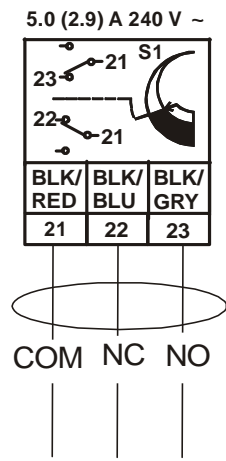


Figure 5: Optional Auxiliary Switch Wiring

## VA9203-AGx-2Z Series On/Off and Floating Point Actuators

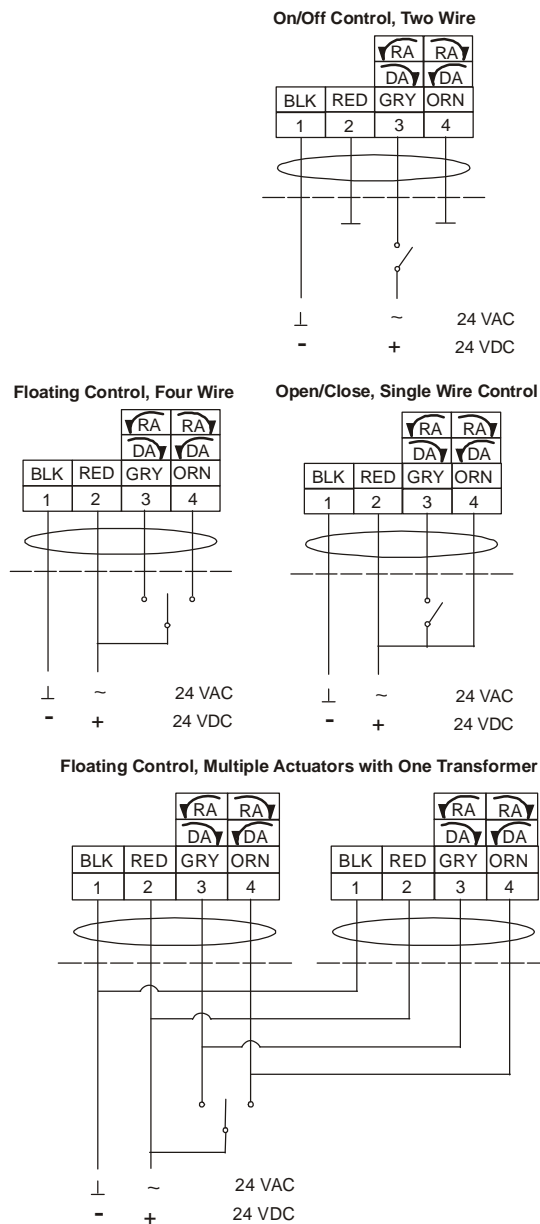


Figure 6: VA9203-AGx-2Z Control Wiring Diagrams

## Ordering Information

Table 2 shows the VA9203-xxx-xx Series Electric Spring Return Valve Actuator models.

**Table 2: VA9203-xxx-xx Series Electric Spring Return Valve Actuator Models**

| Code Number   | Rotation Time For 90°        |                                     | Power Requirement            |                       | Power Consumption             |                       |                             | Input Signal |                           |   | Position Feedback | Auxiliary Switch                         | Electrical Connection                 |                                      |                                    |
|---------------|------------------------------|-------------------------------------|------------------------------|-----------------------|-------------------------------|-----------------------|-----------------------------|--------------|---------------------------|---|-------------------|--|---------------------------------------|--------------------------------------|------------------------------------|
|               | Power On – Running (Seconds) | Power Off – Spring Return (Seconds) | 24 VAC +/- 20% VDC +20%/-10% | 85 to 264 VAC +/- 10% | VA Rating, Transformer Sizing | VA: Running (Holding) | Amperage: Running (Holding) | On/Off       | On/Off and Floating Point | 0(2) to 10 VDC<br>0(4) to 20 mA (with 500 ohm Resistor) | 0(2) to 10 VDC    | 1 SPDT, 5.0 A (2.9 A Inductive) at 240 V | 48 in. (1.2 m) 18 AWG Appliance Cable | 120 in. (3.05 m) 19 AWG Plenum Cable | 1/2 in. (13 mm) Conduit Connectors |
| VA9203-AGA-2Z | 90                           | <25                                 | X                            |                       | 6                             | 5.1 (2.8)             | –                           |              | X                         |   |                   |  |                                       | X                                    | X                                  |
| VA9203-AGB-2Z | 90                           | <25                                 | X                            |                       | 6                             | 5.1 (2.8)             | –                           |              | X                         |   |                   | X  | X                                     |                                      | X                                  |
| VA9203-BGA-2  | <75                          | <75                                 | X                            |                       | 6                             | 5.0 (2.5)             | –                           | X            |                           |   |                   |  | X                                     |                                      | X                                  |
| VA9203-BGB-2  | <75                          | <75                                 | X                            |                       | 6                             | 5.0 (2.5)             | –                           | X            |                           |   |                   | X  | X                                     |                                      | X                                  |
| VA9203-BUA-2  | <75                          | <75                                 |                              | X                     | –                             | –                     | 0.06 (0.02)                 | X            |                           |   |                   |  | X                                     |                                      | X                                  |
| VA9203-BUB-2  | <75                          | <75                                 |                              | X                     | –                             | –                     | 0.06 (0.02)                 | X            |                           |   |                   | X  | X                                     |                                      | X                                  |
| VA9203-GGA-2Z | 90                           | <25                                 | X                            |                       | 6                             | 5.1 (2.8)             | –                           |              |                           | X   | X                 |  |                                       | X                                    | X                                  |
| VA9203-GGB-2Z | 90                           | <25                                 | X                            |                       | 6                             | 5.1 (2.8)             | –                           |              |                           | X   | X                 | X  | X                                     |                                      | X                                  |

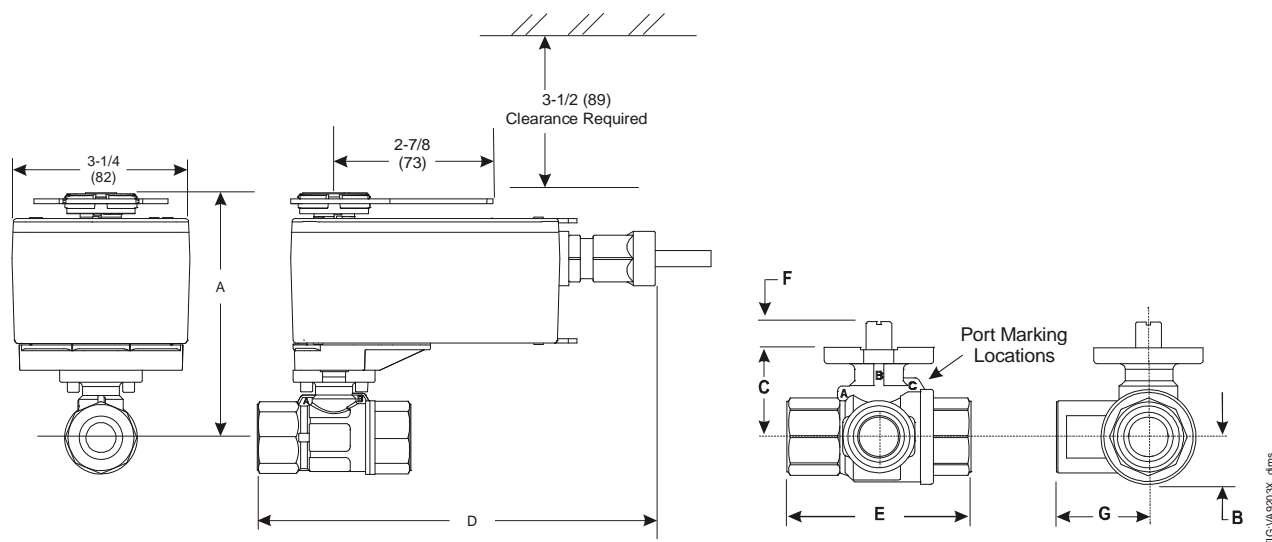
## Accessories

**Table 3: Accessories/Repair Parts (Order Separately)**

| Code Number      | Description  |
|------------------|--|
| <b>M9000-200</b> | Commissioning Tool that Provides a Control Signal to Drive 24 V On/Off, Floating, Proportional, and/or Resistive Electric Actuators                        |
| <b>M9000-560</b> | Ball Valve Linkage Kit for Applying M9203 and M9208 Series Actuators to VG1000 Series Valves (Quantity 1)  |
| <b>M9000-561</b> | Thermal Barrier Extends M(VA)9104, M(VA)9203, and M(VA)9208 Series Electric Spring Return Actuator Applications to Include Low Pressure Steam (Quantity 1) |
| <b>M9000-341</b> | Weathershield Kit for VG1000 Series Ball Valve Application of M(VA)9104, M(VA)9203, and M(VA)9208 Series Electric Spring Return Actuators (Quantity 1)     |
| <b>M9000-607</b> | Position Indicator for VG1000 Series Ball Valve Applications (Quantity 5)  |

## Dimensions

See Figure 7, Table 4, and Table 5 for valve actuator dimensions.



**Figure 7: Spring Return VA9203 Actuated VG1241, VG1245, VG1841, and VG1845 Series Ball Valve Dimensions, in. (mm)**

**Table 4: VA9203 Actuated VG1241, VG1245, VG1841, and VG1845 Series NPT Ball Valve Dimensions, in. (mm)**

| Valve Size<br>in. (DN) <sup>1</sup> | A             | B          | C            | D             | E            | F         | G            |
|-------------------------------------|---------------|------------|--------------|---------------|--------------|-----------|--------------|
| 1/2 (DN15)                          | 4-5/8 (117.3) | 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 (117.3) | 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) |

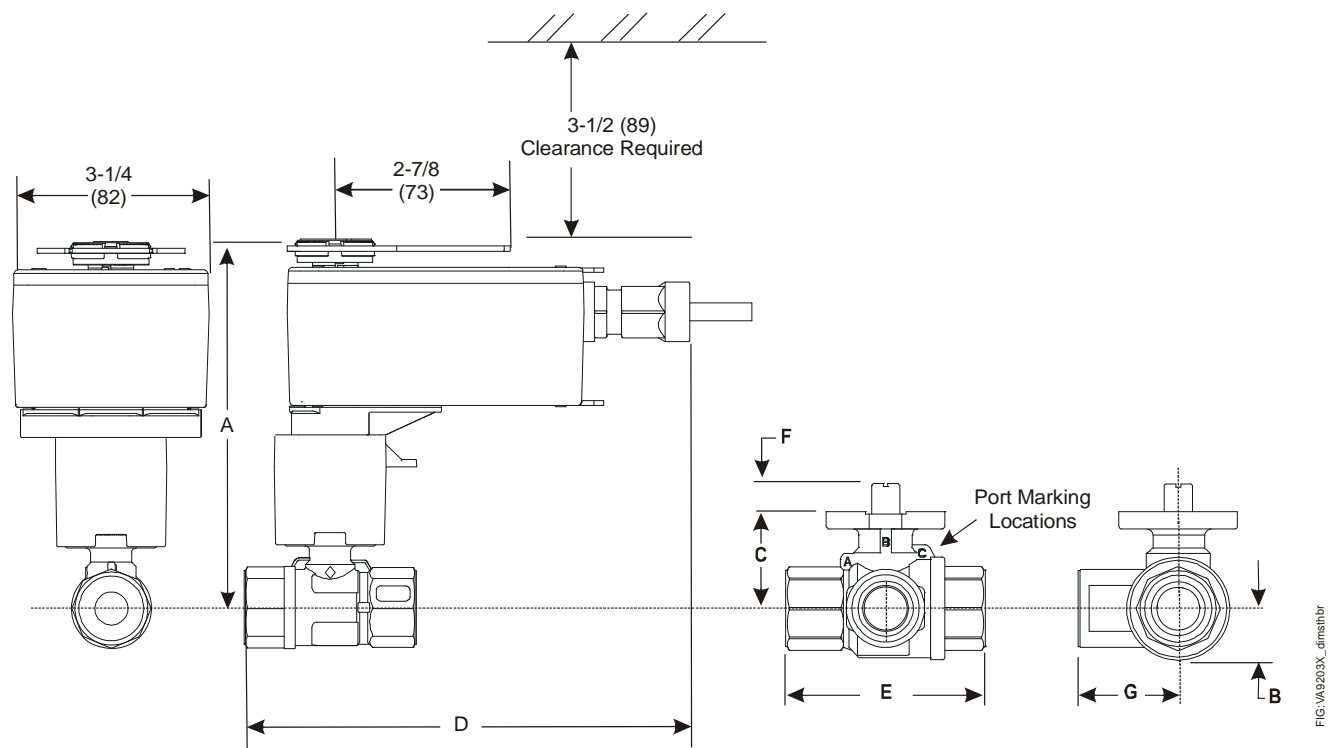
1. Port A must always be connected to the coil.

**Table 5: VA9203 Actuated VG1271, VG1275, VG1871, and VG1875 Series Sweat Ball Valve and VA9203 Actuated VG1291, VG1295, VG1891, and VG1895 Series Press Ball Valve Dimensions, in. (mm)**

| Valve Size,<br>in. (DN) <sup>1</sup> | A             | B          | C            | D             | E             | F         | G            |
|--------------------------------------|---------------|------------|--------------|---------------|---------------|-----------|--------------|
| 1/2 (DN15)                           | 4-5/8 (117.3) | 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 (117.3) | 21/32 (17) | 1-7/32 (31)  | 7-3/4 (197)   | 4-3/32 (104)  | 11/32 (9) | 1-13/32 (36) |
| 1 (DN25)                             | 4-11/16 (119) | 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.

See Figure 8 and Table 6 for valve actuator dimensions with optional M9000-561 Thermal Barrier installed.



**Figure 8: Spring Return VA9203 Actuated VG1241, VG1245, VG1841, and VG1845 Series Ball Valve with Optional M9000-561 Thermal Barrier Installed Dimensions, in. (mm)**

**Table 6: VA9203 Actuated VG1241, VG1245, VG1841, and VG1845 Series Ball Valve with Optional M9000-561 Thermal Barrier Installed Dimensions, in. (mm)**

| Valve Size in. (DN) <sup>1</sup> | 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.

## Repair Information

A number of replacement parts are available; see Table 3 for more details. If a VA9203-xxx-xx Series Electric Spring Return Actuator fails to operate within its specifications, replace the unit. For a replacement electric actuator, contact the nearest Johnson Controls® representative.




## Technical Specifications

### VA9203-GGx-2Z Series Proportional Electric Spring Return Actuator (Part 1 of 2)

|   |                                     |  |
|---|-------------------------------------|--|
| <b>Power Requirements</b>                     |                                     | AC 24 V (AC 19.2 V to 28.8 V) at 50/60 Hz: Class 2 (North America) or Safety Extra-Low Voltage (SELV) (Europe), 4.7 VA Running, 2.7 VA Holding Position<br>DC 24 V (DC 21.6 V to 28.8 V): Class 2 (North America) or SELV (Europe)<br>1.8 W Running, 1 W Holding Position<br>Minimum Transformer Size: 6 VA per Actuator |
| <b>Input Signal/Adjustments</b>               |                                     | Factory Set at DC 0 to 10 V, CW Rotation with Signal Increase<br>Selectable DC 0 (2) to 10 V or 0 (4) to 20 mA with Field -Furnished 500 ohm<br>0.25 W Minimum Resistor<br>Switch Selectable Direct or Reverse Action with Signal Increase   |
| <b>Control Input Impedance</b>                |                                     | Voltage Input: 100,000 ohm<br>Current Input: 500 ohm with Field-Furnished 500 ohm Resistor   |
| <b>Feedback Signal</b>                        |                                     | DC 0 (2) to 10 V for Desired Rotation Range up to 95°<br>Corresponds to Rotation Limits, 0.5 mA at 10 V Maximum  |
| <b>Auxiliary Switch Rating</b>                | <b>-xxB Models</b>                  | One Single-Pole, Double-Throw (SPDT), Double-Insulated Switch with Silver Contacts:<br>AC 24 V, 50 VA Pilot Duty<br>AC 120 V, 5.8 A Resistive, 1/4 hp, 275 VA Pilot Duty<br>AC 240 V, 5.0 A Resistive, 1/4 hp, 275 VA Pilot Duty   |
| <b>Spring Return</b>                          |                                     | Direction is Selectable with Mounting Position of Actuator:<br>Actuator Face Labeled A is Away from Valve: CCW Spring Return<br>Actuator Face Labeled B is Away from Valve: CW Spring Return   |
| <b>Rated Torque</b>                           | <b>Power On (Running)</b>           | 27 lb-in (3 N·m) All Operating Temperatures  |
|   | <b>Power Off (Spring Returning)</b> | 27 lb-in (3 N·m) All Operating Temperatures  |
| <b>Rotation Range</b>                         |                                     | Maximum Full Stroke: 95°<br>Adjustable Stop: 35° to 95° Maximum Position   |
| <b>Rotation Time for 90 Degrees of Travel</b> | <b>Power On (Running)</b>           | 90 Seconds Constant for 0 to 27 lb-in. (3 N·m) Load, at all Operating Conditions   |
|   | <b>Power Off (Spring Returning)</b> | 12 to 17 Seconds for 0 to 27 lb-in. (3 N·m) Load, at Room Temperature<br>16 Seconds Nominal at Full Rated Load<br>22 Seconds Maximum with 27 lb-in. (3 N·m) Load, at -22°F (-30°C)   |
| <b>Life Cycles</b>                            |                                     | 60,000 Full Stroke Cycles with 27 lb-in. (3 N·m) Load<br>1,500,000 Repositions with 27 lb-in. (3 N·m) Load   |
| <b>Audible Noise Rating</b>                   | <b>Power On (Running)</b>           | <37 dBA at 27 lb-in. (3 N·m) Load, at a Distance of 39-13/32 in. (1 m)   |
|   | <b>Power On (Holding)</b>           | <20 dBA at a Distance of 39-13/32 in. (1 m)  |
|   | <b>Power Off (Spring Returning)</b> | <56 dBA at 27 lb-in. (3 N·m) Load, at a Distance of 39-13/32 in. (1 m)   |
| <b>Electrical Connections</b>                 | <b>-GGA-2Z Models</b>               | 120 in. (3.05 m) UL 444 Type CMP Plenum Rated Cable with 19 AWG (0.75 mm <sup>2</sup> ) Conductors and 1/4 in. (6 mm) Ferrule Ends   |
|   | <b>-GGB-2Z Models</b>               | 48 in. (1.2 m) UL 758 Type AWM Halogen Free Cable with 18 AWG (0.85 mm <sup>2</sup> ) Conductors and 1/4 in. (6 mm) Ferrule Ends   |
| <b>Conduit Connections</b>                    |                                     | Integral 1/2 in. (13 mm) Threaded Conduit Connector(s)   |

### VA9203-GGx-2Z Series Proportional Electric Spring Return Actuator (Part 2 of 2)

|  |  |   |
|--|--|---|
| <b>Fluid Temperature Limits</b>  | <b>VG12x1 and VG18x1 Series</b>  | 23 to 203°F (-5 to 95°C), Not Rated for Steam Service   |
|  | <b>VG12x5 and VG18x5 Series</b>  | -22 to 212°F (-30 to 100°C), Not Rated for Steam Service  |
|  | <b>VG12x5 and VG18x5 Series with M9000-561 Thermal Barrier Installed</b> | -22 to 284°F (-30 to 140°C) water; 15 psig (103 kPa) at 250°F (121°C) Saturated Steam   |
| <b>Ambient Conditions</b>  | <b>Standard Operating</b>  | -22 to 140°F (-30 to 60°C); 90% RH Maximum, Noncondensing   |
|  | <b>Storage</b>   | -40 to 185°F (-40 to 85°C); 95% RH Maximum, Noncondensing   |
| <b>Enclosure Rating</b>  |  | NEMA 2 (IP54) for all Mounting Directions   |
| <b>Compliance</b><br><br> | <b>United States</b>   | UL Listed, CCN XAPX, File E27734; to UL 60730-1A: 2003-08, Ed. 3.1, Automatic Electrical Controls for Household and Similar Use; and UL 60730-2-14: 2002-02, Ed. 1, Part 2 Particular Requirements for Electric Actuators |
|  | <b>Canada</b>  | UL Listed, CCN XAPX7, File E27734; to UL 60730-1:02-CAN/CSA: July 2002, 3rd Ed., Automatic Electrical Controls for Household and Similar Use; and CSA C22.2 No. 24-93 Temperature Indicating and Regulating Equipment     |
|  | <b>Europe</b>  | CE Mark – Johnson Controls, Inc., declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive 2004/108/EC and Low Voltage Directive 2006/95/EC.        |
|  | <b>Australia and New Zealand</b>   | C-Tick Mark, Australia/NZ Emissions Compliant   |
| <b>Shipping Weight</b>   | <b>-GGA Models</b>   | 2.0 lb (0.9 kg)   |
|  | <b>-GGB Models</b>   | 2.4 lb (1.1 kg)   |

### VA9203-AGx-2Z Series On/Off and Floating Point Electric Spring Return Actuators (Part 1 of 2)

|                                 |                                     |  |
|---------------------------------|-------------------------------------|--|
| <b>Power Requirements</b>       |                                     | AC 24 V (AC 19.2 V to 28.8 V) at 50/60 Hz: Class 2 (North America) or Safety Extra-Low Voltage (SELV) (Europe), 5.1 VA Running, 2.8 VA Holding Position<br>DC 24 V (DC 21.6 V to 28.8 V): Class 2 (North America) or SELV (Europe)<br>1.9 W Running, 1.1 W Holding<br>Holding Position Minimum Transformer Size: 6 VA per Actuator |
| <b>Input Signal/Adjustments</b> |                                     | AC 19.2 to 28.8 V at 50/60 Hz or DC 24 V +20%/-10%<br>Class 2 (North America) or SELV (Europe)<br>Minimum Pulse Width: 500 ms  |
| <b>Control Input Impedance</b>  |                                     | 4,700 ohm Control Inputs   |
| <b>Auxiliary Switch Rating</b>  | <b>-xxB Models</b>                  | One Single-Pole, Double-Throw (SPDT), Double-Insulated Switch with Silver Contacts:<br>AC 24 V, 50 VA Pilot Duty<br>AC 120 V, 5.8 A Resistive, 1/4 hp, 275 VA Pilot Duty<br>AC 240 V, 5.0 A Resistive, 1/4 hp, 275 VA Pilot Duty   |
| <b>Spring Return</b>            |                                     | Direction is Selectable with Mounting Position of Actuator:<br>Actuator Face Labeled A is Away from Valve: CCW Spring Return<br>Actuator Face Labeled B is Away from Valve: CW Spring Return   |
| <b>Rated Torque</b>             | <b>Power On (Running)</b>           | 27 lb-in. (3 N-m) All Operating Temperatures   |
|                                 | <b>Power Off (Spring Returning)</b> | 27 lb-in. (3 N-m) All Operating Temperatures   |
| <b>Rotation Range</b>           |                                     | Maximum Full Stroke: 95°   |


## VA9203-AGx-2Z Series On/Off and Floating Point Electric Spring Return Actuators (Part 2 of 2)

|  |   |   |
|--|---|---|
| Rotation Time for 90 Degrees of Travel | Power On (Running)  | 90 Seconds Constant for 0 to 27 lb-in. (3 N·m) Load, at all Operating Conditions  |
|  | Power Off (Spring Returning)                                      | 12 to 17 Seconds for 0 to 27 lb-in. (3 N·m) Load, at Room Temperature<br>16 Seconds Nominal at Full Rated Load<br>22 Seconds Maximum with 27 lb-in. (3 N·m) Load, at -22°F (-30°C)  |
| Life Cycles                            |   | 60,000 Full Stroke Cycles with 27 lb-in. (3 N·m) Load<br>1,500,000 Repositions with 27 lb-in. (3 N·m) Load  |
| Audible Noise Rating                   | Power On (Running)  | <37 dBA at 27 lb-in. (3 N·m) Load, at a Distance of 39-13/32 in. (1 m)  |
|  | Power On (Holding)  | <20 dBA at a Distance of 39-13/32 in. (1 m)   |
|  | Power Off (Spring Returning)                                      | <56 dBA at 27 lb-in. (3 N·m) Load, at a Distance of 39-13/32 in. (1 m)  |
| Electrical Connections                 | AGA-2Z Models   | 120 in. (3.05 m) UL 444 Type CMP Plenum Rated Cable with 19 AWG (0.75 mm <sup>2</sup> ) Conductors and 1/4 in. (6 mm) Ferrule Ends  |
|  | AGB-2Z Models   | 48 in. (1.2 m) UL 758 Type AWM Halogen Free Cable with 18 AWG (0.85 mm <sup>2</sup> ) Conductors and 1/4 in. (6 mm) Ferrule Ends  |
| Conduit Connections                    |   | Integral 1/2 in. (13 mm) Threaded Conduit Connectors  |
| Fluid Temperature Limits               | VG12x1 and VG18x1 Series  | 23 to 203°F (-5 to 95°C), Not Rated for Steam Service   |
|  | VG12x5 and VG18x5 Series  | -22 to 212°F (-30 to 100°C), Not Rated for Steam Service  |
|  | VG12x5 and VG18x5 Series with M9000-561 Thermal Barrier Installed | -22 to 284°F (-30 to 140°C) water; 15 psig (103 kPa) at 250°F (121°C) Saturated Steam   |
| Ambient Conditions                     | Standard Operating  | -22 to 140°F (-30 to 60°C); 90% RH Maximum, Noncondensing   |
|  | Storage   | -40 to 185°F (-40 to 85°C); 95% RH Maximum, Noncondensing   |
| Enclosure Rating                       |   | NEMA 2 (IP54) for all Mounting Directions   |
| <div>CE</div>                          | United States   | UL Listed, CCN XAPX, File E27734; to UL 60730-1A: 2003-08, Ed. 3.1, Automatic Electrical Controls for Household and Similar Use; and UL 60730-2-14: 2002-02, Ed. 1, Part 2 Particular Requirements for Electric Actuators |
|  | Canada  | UL Listed, CCN XAPX7, File E27734; to UL 60730-1:02-CAN/CSA: July 2002, 3rd Ed., Automatic Electrical Controls for Household and Similar Use; and CSA C22.2 No. 24-93 Temperature Indicating and Regulating Equipment     |
|  | Europe  | CE Mark – Johnson Controls, Inc., declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive 2004/108/EC and the Low Voltage Directive 2006/95/EC.    |
|  | Australia and New Zealand   | C-Tick Mark, Australia/NZ Emissions Compliant   |
| Shipping Weight                        | -AGA Models   | 2.0 lb (0.9 kg)   |
|  | -AGB Models   | 2.4 lb (1.1 kg)   |

## VA9203-Bxx-x Series On/Off Electric Spring Return Actuator (Part 1 of 2)

|   |  |  |
|---|--|--|
| <b>Power Requirements</b>                     | <b>-BGx-2 Models</b>   | AC 24 V (AC 19.2 V to 28.8 V) at 50/60 Hz: Class 2 (North America) or Safety Extra-Low Voltage (SELV) (Europe), 5 VA Running, 1.6 VA Holding Position<br>DC 24 V (DC 21.6 V to 28.8 V): Class 2 (North America) or SELV (Europe)<br>2.8 W Running, 0.8 W Holding Position<br>Minimum Transformer Size: 6 VA per Actuator |
|   | <b>-BUx-2 Models</b>   | AC 100 V to 240 V (AC 85 V to 264 V) at 50/60 Hz: 0.06 A Running, 0.02 A Holding Position  |
| <b>Auxiliary Switch Rating</b>                | <b>-xxB-2 Models</b>   | One Single-Pole, Double-Throw (SPDT), Double-Insulated Switch with Silver Contacts:<br>AC 24 V, 50 VA Pilot Duty<br>AC 120 V, 5.8 A Resistive, 1/4 hp, 275 VA Pilot Duty<br>AC 240 V, 5.0 A Resistive, 1/4 hp, 275 VA Pilot Duty   |
| <b>Spring Return</b>                          |  | Direction is Selectable with Mounting Position of Actuator:<br>Actuator Face Labeled A is Away from Valve: CCW Spring Return<br>Actuator Face Labeled B is Away from Valve: CW Spring Return   |
| <b>Rated Torque</b>                           | <b>Power On (Running)</b>  | 27 lb-in. (3 N-m) All Operating Temperatures   |
|   | <b>Power Off (Spring Returning)</b>                                      | 27 lb-in. (3 N-m) All Operating Temperatures   |
| <b>Rotation Range</b>                         |  | Maximum Full Stroke: 95°   |
| <b>Rotation Time for 90 Degrees of Travel</b> | <b>Power On (Running) Bxx-2 Models</b>                                   | 53 to 71 Seconds Constant for 0 to 27 lb-in. (3 N-m) Load, at Room Temperature<br>60 Seconds Nominal at Full Rated Load (0.25 rpm)   |
|   | <b>Power Off (Spring Returning)</b>                                      | 37 to 46 Seconds for 0 to 27 lb-in. (3 N-m) Load, at Room Temperature<br>44 Seconds Nominal at Full Rated Load<br>75 Seconds Maximum with 27 lb-in. (3 N-m) Load at -22°F (-30°C)  |
| <b>Life Cycles</b>                            |  | 60,000 Full Stroke Cycles with 27 lb-in. (3 N-m) Load  |
| <b>Audible Noise Rating</b>                   | <b>Power On (Running)</b>  | <36 dBA at 27 lb-in. (3 N-m) Load, at a Distance of 39-13/32 in. (1 m)   |
|   | <b>Power On (Holding)</b>  | <20 dBA at a Distance of 39-13/32 in. (1 m)  |
|   | <b>Power Off (Spring Returning)</b>                                      | <35 dBA at 27 lb-in. (3 N-m) Load, at a Distance of 39-13/32 in. (1 m)   |
| <b>Electrical Connections</b>                 | <b>Actuator (All Models)</b>   | 48 in. (1.2 m) UL 758 Type AWM Halogen Free Cable with 18 AWG (0.85 mm <sup>2</sup> ) Conductors and 0.25 in. (6 mm) Ferrule Ends  |
|   | <b>Auxiliary Switches (-xxB-2 Models)</b>                                | 48 in. (1.2 m) UL 758 Type AWM Halogen Free Cable with 18 AWG (0.85 mm <sup>2</sup> ) Conductors and 0.25 in. (6 mm) Ferrule Ends  |
| <b>Conduit Connections</b>                    |  | Integral 1/2 in. (13 mm) Threaded Conduit Connectors   |
| <b>Fluid Temperature Limits</b>               | <b>VG12x1 and VG18x1 Series</b>  | 23 to 203°F (-5 to 95°C), Not Rated for Steam Service  |
|   | <b>VG12x5 and VG18x5 Series</b>  | -22 to 212°F (-30 to 100°C), Not Rated for Steam Service   |
|   | <b>VG12x5 and VG18x5 Series with M9000-561 Thermal Barrier Installed</b> | -22 to 284°F (-30 to 140°C) water; 15 psig (103 kPa) at 250°F (121°C) Saturated Steam  |
| <b>Ambient Conditions</b>                     | <b>Standard Operating</b>  | -22 to 140°F (-30 to 60°C); 90% RH Maximum, Noncondensing  |
|   | <b>Storage</b>   | -40 to 185°F (-40 to 85°C); 95% RH Maximum, Noncondensing  |

## VA9203-Bxx-x Series On/Off Electric Spring Return Actuator (Part 2 of 2)

|  |                                  |   |
|--|----------------------------------|---|
| <b>Enclosure Rating</b>  |                                  | NEMA 2 (IP54) for all Mounting Directions   |
| <b>Compliance</b><br><br> | <b>United States</b>             | UL Listed, CCN XAPX, File E27734; to UL 60730-1A: 2003-08, Ed. 3.1, Automatic Electrical Controls for Household and Similar Use; and UL 60730-2-14: 2002-02, Ed. 1, Part 2 Particular Requirements for Electric Actuators |
|  | <b>Canada</b>                    | UL Listed, CCN XAPX7, File E27734; to UL 60730-1:02-CAN/CSA: July 2002, 3rd Ed., Automatic Electrical Controls for Household and Similar Use; and CSA C22.2 No. 24-93 Temperature Indicating and Regulating Equipment     |
|  | <b>Europe</b>                    | CE Mark – Johnson Controls, Inc., declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive 2004/108/EC and the Low Voltage Directive 2006/95/EC.    |
|  | <b>Australia and New Zealand</b> | C-Tick Mark, Australia/NZ Emissions Compliant   |
| <b>Shipping Weight</b>   | <b>-xxA Models</b>               | 2.0 lb (0.9 kg)   |
|  | <b>-xxB Models</b>               | 2.4 lb (1.1 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.*



### Building Efficiency

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