VA9208-AGx / VA9208-Bxx / VA9208-GGx

Spring Return Actuators

Product Bulletin

The VA9208 Series Electric Spring Return Actuators are direct-mount actuators.

These bidirectional actuators are used to provide accurate positioning on Johnson Controls® VG1000 Series DN32 up to DN50 Ball Valves in Heating, Ventilating and Air Conditioning (HVAC) applications.

Two Integral line voltage auxiliary switches are available only on the VA9208-xxC-1 models, indicate end-stop position, or perform switching functions within the selected rotation range.

A graduated scale from 0% to 100% and a position indicator provide visual indication of the valve's opening.

When power fails during service, the mechanical spring return system open or close the valve ports.

The series includes the following control options:

- *ON/OFF, 24 V AC/DC, 230 V AC power*
- *ON/OFF and Floating Point, 24 V AC/DC power*
- *Proportional, 24 V AC/DC power, for 0(2) to 10 VDC or 0(4) to 20 mA Control*

VA9208 mounted on VG1000

- **8 Nm Rated Torque**
  Expands the range of VG1000 Ball Valve applications to include DN32, DN40 and DN50 sizes.
- **Mechanical Spring Return System**
  Provides the most reliable mechanism sold today, with no batteries to fail, wear out, or replace.
- **Direct-Coupled Design**
  Requires no separate linkage because the VA9208 Series Actuators are ready for direct attachment to Johnson Controls VG1000 Series valves by driving one captive screw.
- **Reversible Mounting**
  Provides either clockwise or counterclockwise operation.
- **Rugged IP54 Rated Enclosure**
  Provides a high degree of protection from dust, splashing water, and rough handling.
- **Electronic Stall Detection**
  Protects from overload at all angles of rotation and reduces power consumption in holding mode.
- **Double-Insulated Construction**
  Requires no electrical ground connection for regulatory agency compliance.
- **Microprocessor Controlled Brushless DC Motor (-AGx and -GGx Models)**
  Provides constant runtime independent of torque.
- **External Mode Selection Switch (-AGx and -GGx Models)**
  Permits control logic reversal for Floating Control (-AGx models) and permits calibration, input signal range selection, and control logic reversal for Proportional Control (-GGx models).
- **Integral Cables with Colored and Numbered Conductors**
  Simplify installation and field wiring.
- **Optional Integrated Auxiliary Switches**
  Provides two integrated line-voltage-capable Single-Pole, Double-Throw (SPDT) switches (continuously adjustable switch point) that facilitate safety interfacing or signaling.
- **UL, CE, and C-Tick Compliance**
  Provides internationally recognized regulatory agency approval.
- **Manufacturing under International Standards Organization (ISO) 9001 Quality Control Standards.**
  Ensures quality control standards.

Johnson Controls

VA9208-GGx-1 Series Proportional Actuators

VA9208-GGx-1 Series Actuators provide proportional modulation of Ball Valves 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.

VA9208-GGx-1 Series Actuators use 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.

Setup and Adjustments

Mode Selection Switch

Actuators have an external mode selection switch to calibrate, select input signal range, and reverse control logic.

The switch is accessible from both A and B sides of the actuator as illustrated in Figure 4. Actuators are delivered in Direct Acting (DA), DC 0 to 10 V input signal mode.

To change to Reverse Acting (RA) mode, move the mode selection switch from DA to RA *(see figure 1)*. The input signal range is selectable between DC 0 to 10 V or DC 2 to 10 V.

If the CAL function is not used, both input signal ranges are proportioned across the full rotation range of 0 to 100% rotation. For example, if a DC 0 to 10 V input signal is selected and the rotation range is limited to 75°, the rotation range limit will be reached at DC 8.3 V.

Figure 1: Mode Selection

Control Response

The installation side of the actuator and the position of the mode selection switch combine to determine control response from the actuator.

Input Signal	Installation Side: A	Installation Side: B
	Mode Selection Switch: DA (CAL, 2-10, 0-10) / RA (CAL, 2-10, 0-10)	Mode Selection Switch: RA (CAL, 2-10, 0-10) / DA (CAL, 2-10, 0-10)
Increasing	↷	↷
Decreasing	↶	↶

Direction	Feedback	Rotation Position 0°*	15°	30°	45°	60°	75°	90°
Direct Acting	0-10 V	0.0 V	1.7 V	3.3 V	5.0 V	6.7 V	8.3 V	10.0 V
	2-10 V	2.0 V	3.3 V	4.7 V	6.0 V	7.3 V	8.7 V	10.0 V
Reverse Acting	0-10 V	10.0 V	8.3 V	6.7 V	5.0 V	3.3 V	1.7 V	0.0 V
	2-10 V	10.0 V	8.7 V	7.3 V	6.0 V	4.7 V	3.3 V	2.0 V

* 0° is the Spring Return Position.

Figure 2: VA9208-GGx - Control Response

Calibration (CAL) Function

The CAL function enables the actuator to redefine the selected input signal range proportionally across a reduced rotation range. The actuator maintains calibration when power is lost or removed.

Follow these steps to calibrate the input signal range:

1. With power applied to the actuator, move the mode selection switch to the CAL position and leave it in this position for approximately 5 seconds. The actuator begins rotating until the end-stops are found.
2. Move the mode selection switch to the desired input signal range. Selection can be made while the calibration process is in progress, or after it is complete. The selected input signal is proportionally reconfigured to the reduced rotation range.

   Note: During normal operation, if the actuator stroke increases due to seal or seat wear, input signals are automatically reconfigured to the increased rotation range in approximately 0.5° increments.

3. If the actuator mounting position is changed or if the linkage is adjusted, repeat Step 1 and Step 2 to repeat the CAL function.

   Note: The mode selection switch must remain out of the CAL position for at least 2 seconds before re-initiating the CAL function.

   Note: If the mode selection switch is left in the CAL position, the actuator defaults to 0-10 V input signal range, DA.

VA9208-AGx-1 Series ON/OFF and Floating Point Actuators

VA9208-AGx-1 Series Actuators provide on/off control or floating modulation of in HVAC systems. Floating point control is 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.

VA9208-AGx-1 Series Actuators use 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.Actuators have an external mode selection switch to reverse control logic.
The switch is accessible from both A and B sides of the actuator. Actuators are delivered in Direct Acting (DA) mode and can be switched by the user to Reverse Acting (RA) mode.

Control Response

The installation side of the actuator and the position of the mode selection switch combine to determine control response from the actuator.

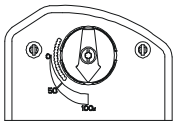
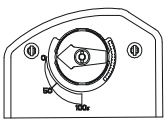
		Installation Side			
					
			A	B	
Control Inputs		**Mode Selection Switch**			
GRY	**ORN**	DA ▲ RA		RA ▲ DA	
3	**4**				
CLOSED	**OPEN**	↷	↶	↷	↶
OPEN	**CLOSED**	↶	↷	↶	↷
OPEN	**OPEN**	**STOP**	**STOP**	**STOP**	**STOP**
CLOSED	**CLOSED**	↷	↶	↷	↶

Figure 3: VA9208-AGx - Control Response

VA9208-Bxx-1 Series ON/OFF Actuators

VA9208-Bxx-1 Series Actuators provide on/off control of Ball valve . On/off control can be provided from a manual switch, controller, auxiliary switch from a fan motor contactor, or similar device.

VA9208-Bxx-1 Series Actuators use a DC brush motor controlled by analog electronics.

Power consumption is reduced in the holding mode. Two different voltage ratings are available for On/ Off Actuators:

- VA9208-BGx-1: AC 24 V 50/60 Hz or DC 24 V power
- VA9208-BDx-1: AC 230 V 50/60 Hz power

The VA9208-BDx-1 actuators are double-insulated so an electrical ground is not required.

Auxiliary Switches

The VA9208-xxC models include two integral auxiliary switches with a switch adjuster accessible on either face of the actuator.

The factory setting for the Auxiliary Switch is 10% closing (relative to the 0 to 100% rotation range as printed on the product label). The switch point continuously adjustable throughout the actuator's rotation range.

For the most accurate switch positioning, see Figure 4 and use the method in the following example.

To change the switch point, proceed as follows:

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

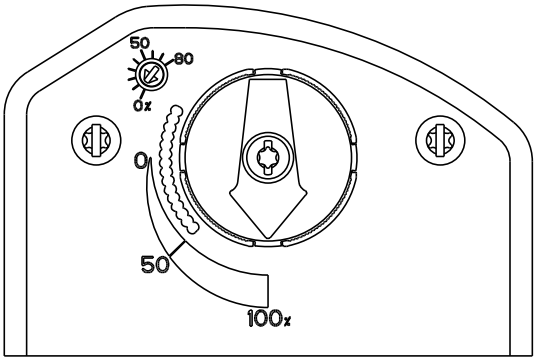


Figure 4: Switch Trip Point Settings

Mounting

Install the ball valve with the actuator at or above the center line of the horizontal piping.

WARNING:
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.

WARNING:
Do not install or use this 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.

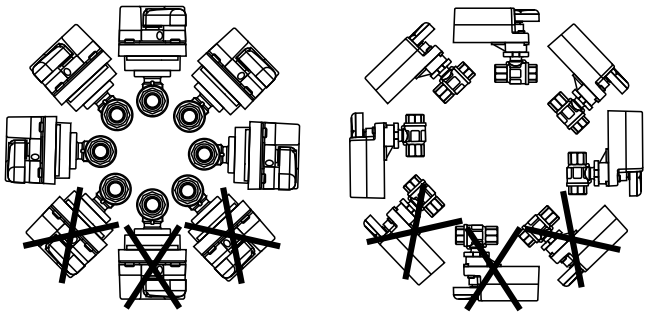


Figure 5: Mounting Positions for Chilled Water and Condensing Atmosphere Applications

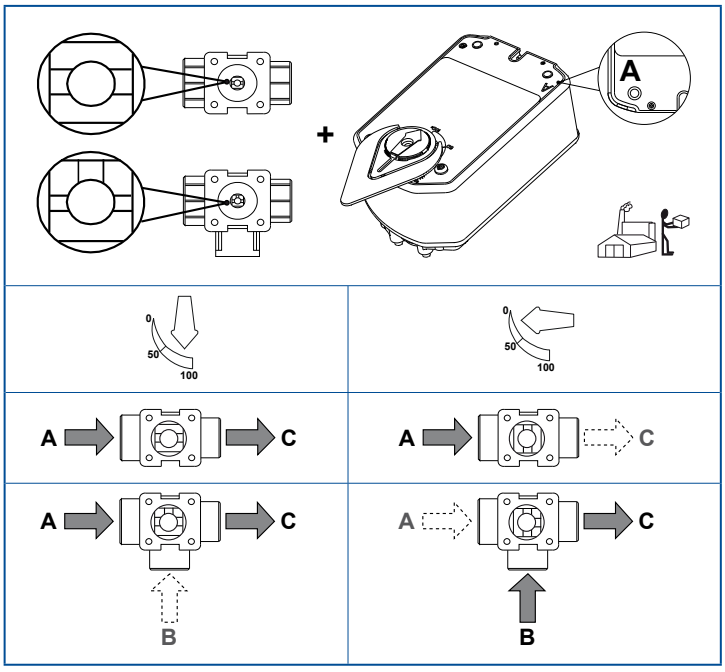


Figure 6: Spring open configuration

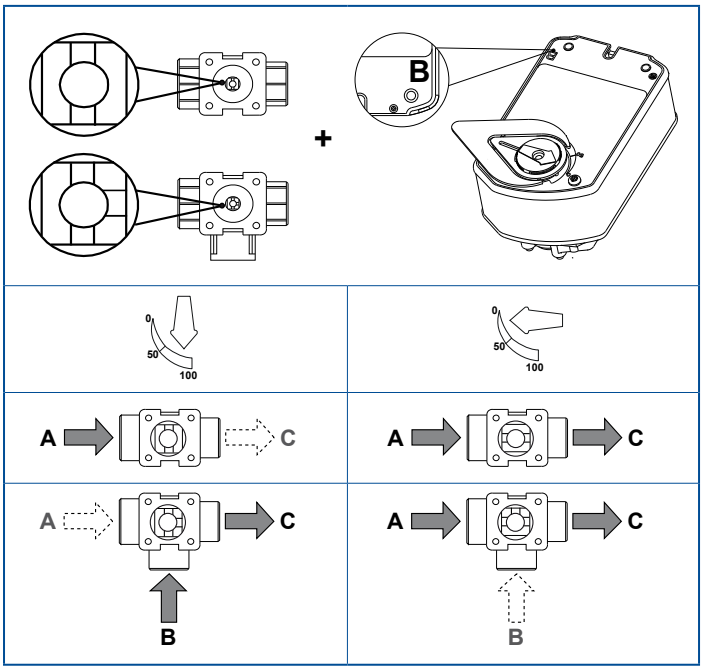


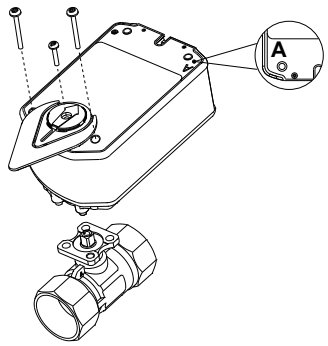
Figure 7: Spring close configuration

The actuators are delivered ready to be direct connected on a VG1000 in a "Spring Open Configuration"; the spring of the actuator, without power applied, connects port A with port C (see Figure 6). To link the actuator on the valve in a spring open configuration turn the valve stem to the position outlined in Figure 6, install the actuator on the valve tightening the mounting screw. The linkage must be on actuator Side B.

In the "Spring Close Configuration" the spring of the actuator, without power applied, closes port A with port C (see Figure 7).
To link the actuator on the valve in a spring close configuration, turn the valve stem to the position outlined in Figure 7, install the actuator on the valve tightening the mounting screw. The linkage must be on actuator Side A.

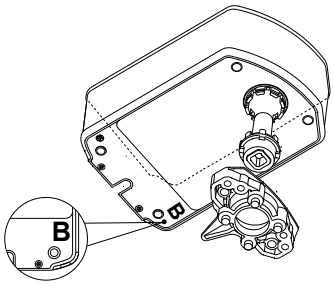
If it is necessary to change the position of the linkage from one side to the other, proceed as follow:

1



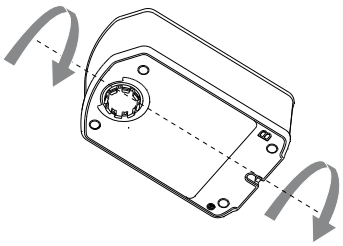
- Remove the screws from the actuator.

2



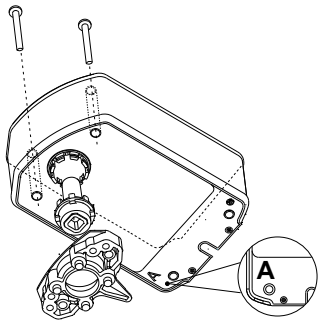
- Remove the linkage from the bottom of the actuator.

3



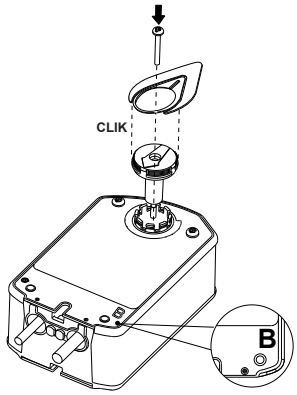
- Turn the actuator.

4



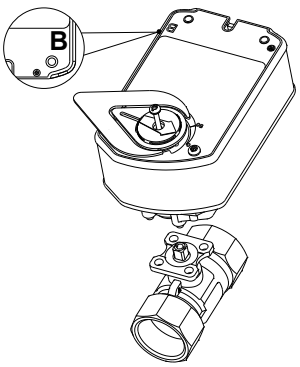
- Connect the linkage to the linkage.

5



- Snap the pointer.

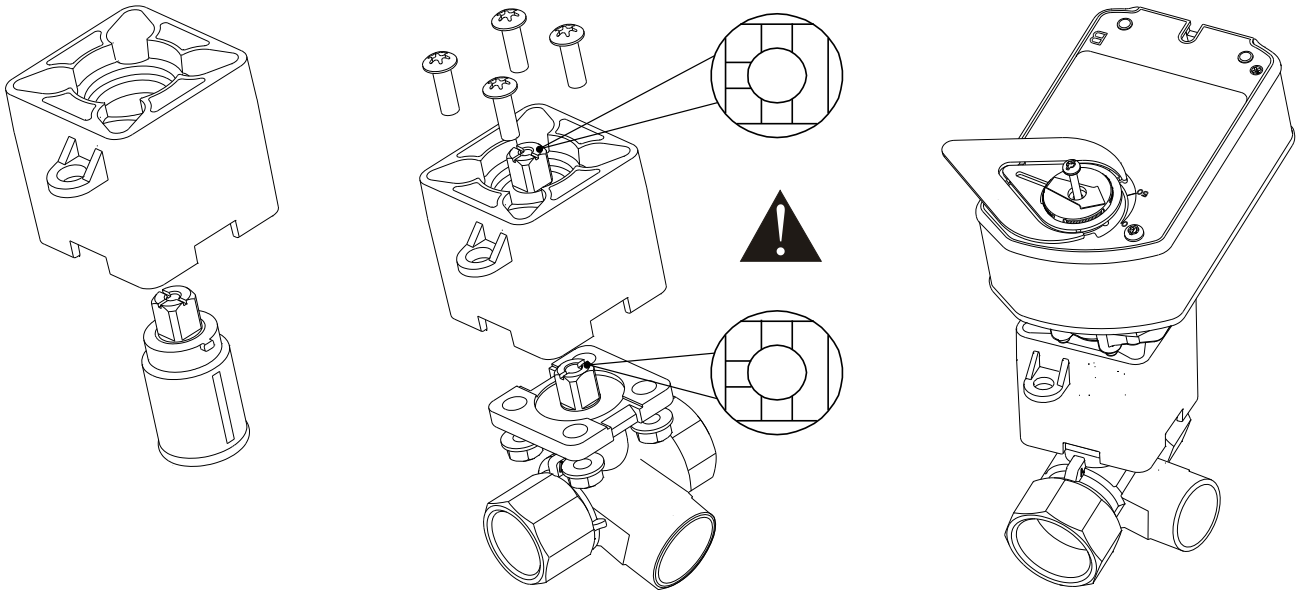
6



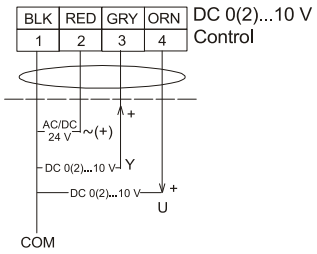
- Connect the actuator to the valve.

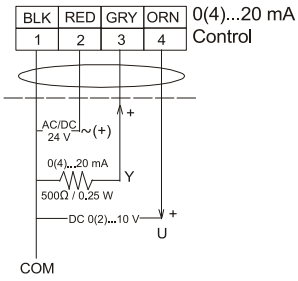
M9000-561 Thermal Barrier

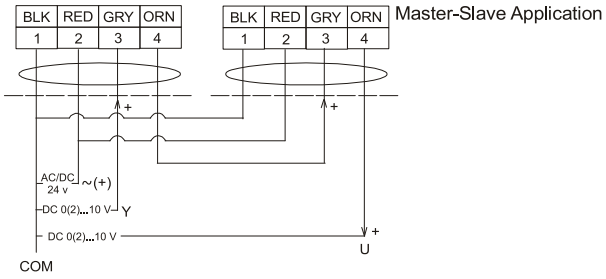
The Thermal barrier optional kit extends the application of the VA9208 actuators in combination with VG1000 ball valves. Linking together valve and actuator using the M9000-561 you can include applications with low pressure steam up to 123 °C at 103kPa (250 °F at 15 psig) and hot water up to 140 °C (284 °F).



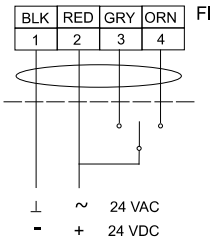
Wiring Diagrams

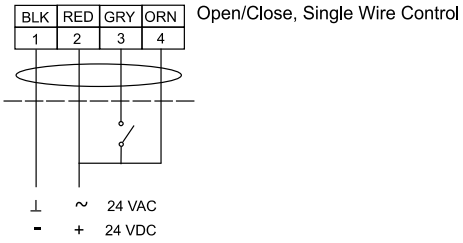


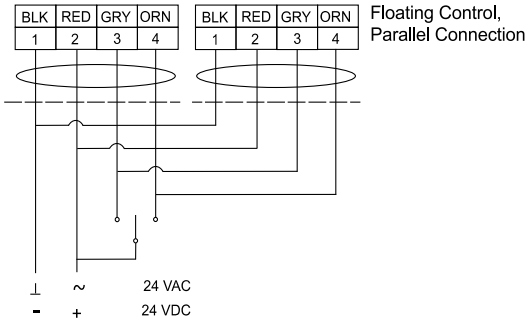


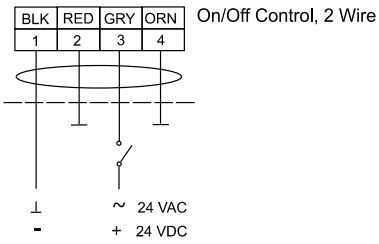


VA9208-GGx

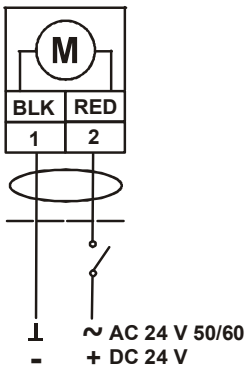




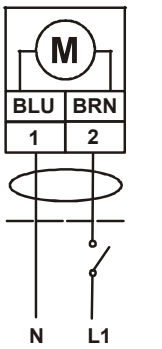




VA-9208-AGx



VA9208-BGx



VA9208-BDx

Dimensions

Valve Actuator

See Table 1 and Figure 8 for the dimensions of the VA9208 Series Actuated Ball Valves.

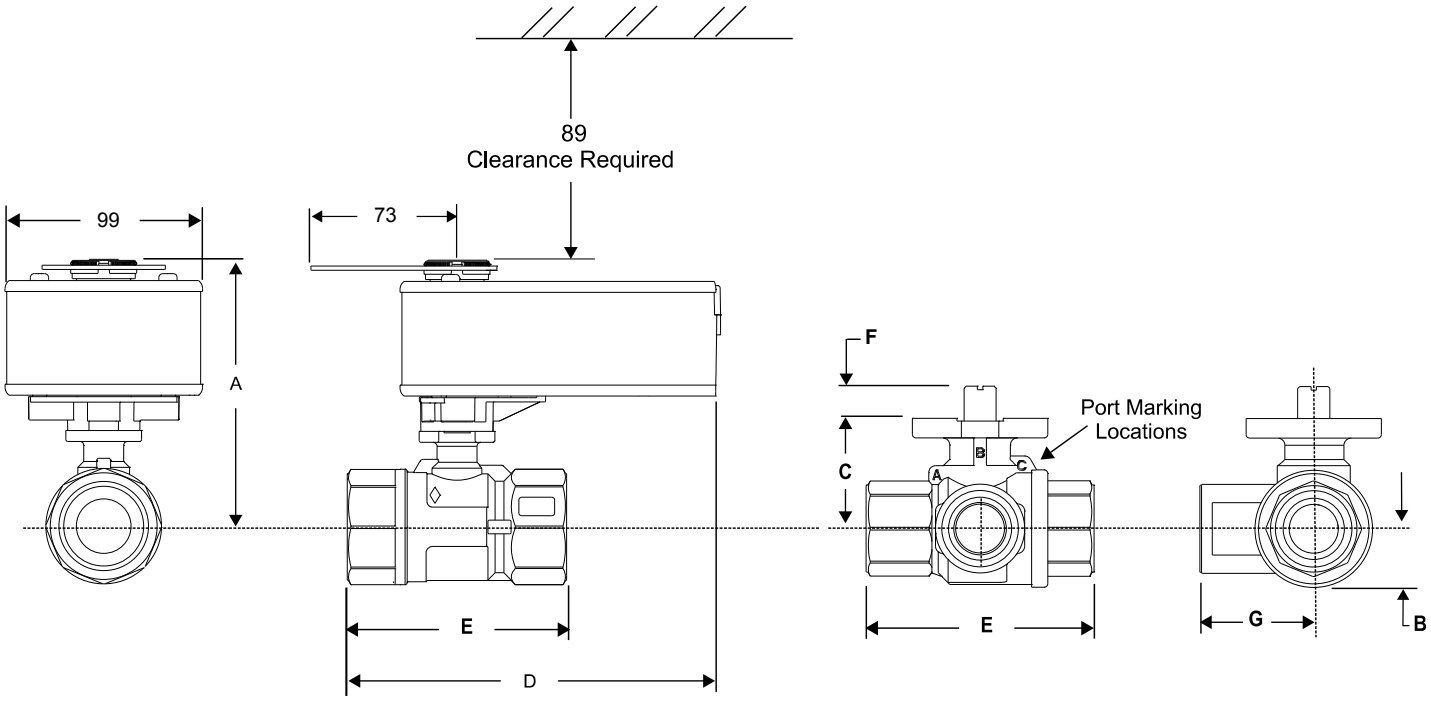


Figure 8: Spring Return VA9208 Actuated VG1205 and VG1805 Series Ball Valve Dimensions, in mm

Table 1: VA9208 Actuated VG1205 and VG1805 Series Ball Valve Dimensions, in mm

Valve Size mm (DN)	A	B	C	D	E	F	G
DN32	195	26	44	184	109	9	54
DN40	200	29	48	189	119	9	59
DN50	204	37	53	195	139	9	74

Valve Actuator

See Table 2 and Figure 9 for valve actuator dimensions with optional M9000-561 thermal barrier installed.

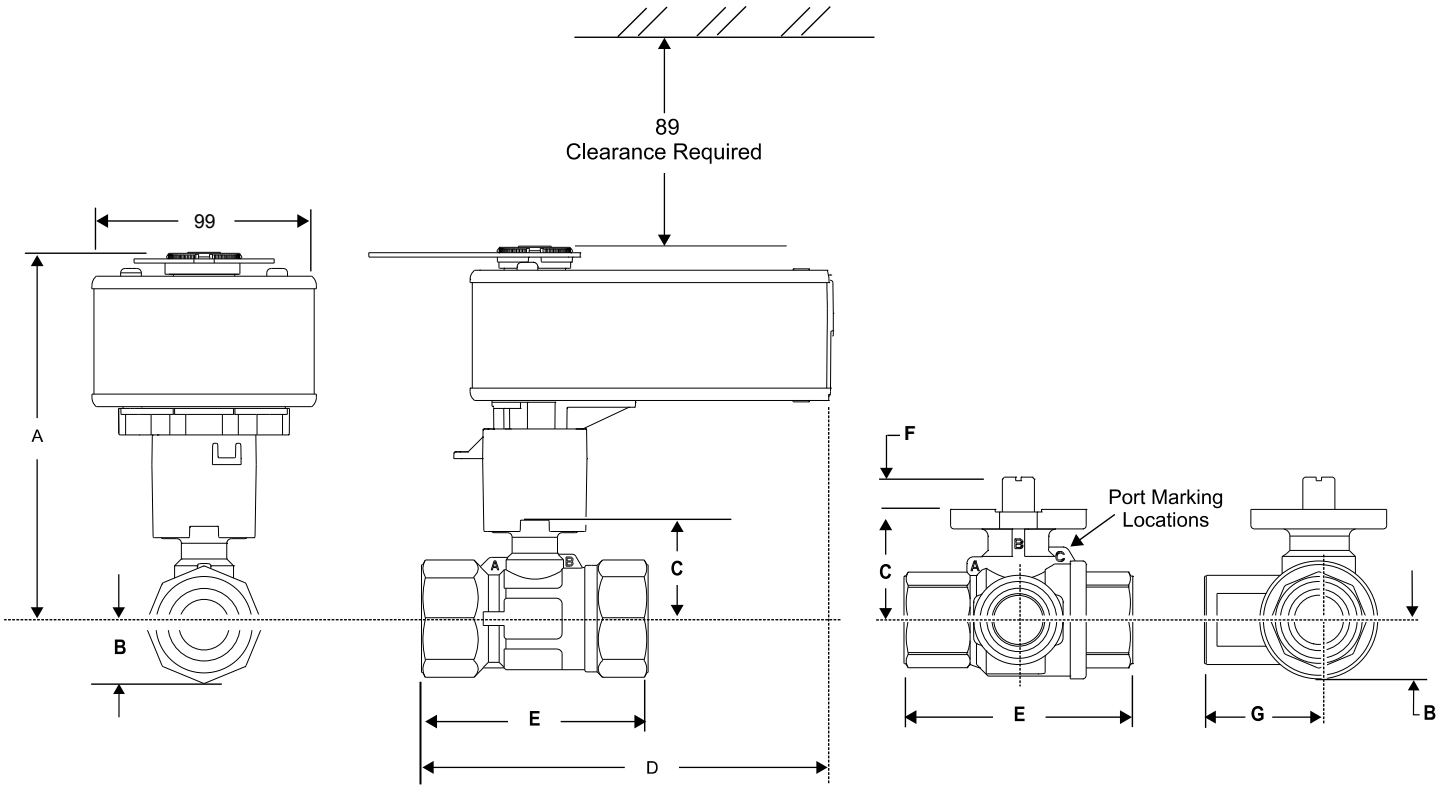


Figure 9: Spring Return VA9208 Actuated VG1205 and VG1805 Series Ball Valve with Optional M9000-561 Thermal Barrier Installed Dimensions, in mm

Table 2: VA9208 Actuated VG1205 and VG1805 Series NPT Ball Valve with Optional Thermal Barrier Installed Dimensions, in mm

Valve Size mm (DN)	A	B	C	D	E	F	G
DN32	235	26	44	184	109	9	54
DN40	240	29	48	189	119	9	59
DN50	244	37	53	195	139	9	74

Ordering Code

Table 3: VA9208 Spring Return Actuators

Code Number	Description
VA9208-GGA-1	8 Nm Spring Return Actuator for Valves, Proportional, 24 V AC/DC
VA9208-GGC-1	8 Nm Spring Return Actuator for Valves, Proportional, 24 V AC/DC, 2 Switch
VA9208-AGA-1	8 Nm Spring Return Actuator for Valves, Floating & ON/OFF, 24 V AC/DC
VA9208-AGC-1	8 Nm Spring Return Actuator for Valves, Floating & ON/OFF, 24 V AC/DC, 2 Switch
VA9208-BGA-1	8 Nm Spring Return Actuator for Valves, ON/OFF, 24 V AC/DC
VA9208-BGC-1	8 Nm Spring Return Actuator for Valves, ON/OFF, 24 V AC/DC, 2 Switch
VA9208-BDA-1	8 Nm Spring Return Actuator for Valves, ON/OFF, 230 V AC
VA9208-BDC-1	8 Nm Spring Return Actuator for Valves, ON/OFF, 230 V AC, 2 Switch

Table 4: Accessory (Order Separately)

Code Number	Description
M9000-200	Commissioning Tool that Provides a Control Signal to Drive 24 V On/Off, Floating, Proportional, and/or Resistive Electric Actuators
M9000-560	Ball Valve Linkage Kit for applying M9203 and M9208 Series Actuators to VG1000 Series Valves (quantity 1)
M9000-561	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)
M9000-341	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)
M9000-607	Position Indicator for VG1000 Series Ball Valve Applications (Quantity 5)

Technical Specifications

VA9208-AGx-1 Series On/Off and Floating Point Electric Spring Return Actuator

Actuator	VA9208-AGA-1	VA9208-AGC-1
Power Requirements	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), 7.9 VA Running, 5.5 VA Holding Position DC 24 V (DC 21.6 V to 28.8 V): Class 2 (North America) or SELV (Europe), 3.5 W Running, 1.9 W Holding Position Minimum Transformer Size: 8 VA per Actuator	
Input Signal / Adjustment	AC 19.2 to 28.8 V at 50/60 Hz or DC 24 V +20%/-10% Class 2 (North America) or SELV (Europe) Minimum Pulse Width: 500 msec	
Control Input Impedance	3,000 ohm Control Inputs	
Auxiliary Switch Rating	---	Two Single-Pole, Double-Throw (SPDT), Double-Insulated Switches with Gold over Silver Contacts: AC 24 V, 50 VA Pilot Duty AC 120 V, 5.8 A Resistive, 1/4 hp, 275 VA Pilot Duty AC 240 V, 5.0 A Resistive, 1/4 hp, 275 VA Pilot Duty
Spring Return	Direction is Selectable with Mounting Position of Actuator: Actuator Face Labeled A Is Away from Valve: CCW Spring Return Actuator Face Labeled B Is Away from Valve: CW Spring Return	
Rated Torque *- Power On (Running)* *- Power Off (Spring Returning)*	 8 Nm All Operating Temperatures 8 Nm All Operating Temperatures	
Rotation Range	Maximum Full Stroke: 95° Adjustable Stop: 35° to 95° Maximum Position	
Rotation Time for 90 Degrees of Travel *- Power On (Running)* *- Power Off (Spring Returning)*	 150 Seconds for 0 to 8 Nm Load, at all Operating Conditions 17 to 25 Seconds for 0 to 8 Nm Load, at Room Temperature 22 Seconds Nominal at Full Rated Load 94 Seconds Maximum with 8 Nm Load, at -40 °C (-40 °F)	
Life Cycles	60,000 Full Stroke Cycles with 8 Nm Load 1,500,000 Repositions with 8 Nm Load	
Audible Noise Rating *- Power On (Running)* *- Power On (Holding)* *- Power Off (Spring Returning)*	 <35 dBA at 8 Nm Load, at a Distance of 1 m <20 dBA at a Distance of 1 m <52 dBA at 8 Nm Load, at a Distance of 1 m	
Electrical Connections	1.2 m UL 758Type AWM Halogen Free Cable with 18 AWG (0.85 mm²) Conductors and 6 mm Ferrule Ends	
Fluid Temperature Limits *-VG1205 and VG1805 Series* *-VG1205 and VG1805 Series with M9000-561*	 -30 to 100 °C (-22 to 212 °F), Not Rated for Steam Service -30 to 140 °C (-22 to 284 °F) water; 103 kPa (15 psig) at 121 °C (250 °F) Saturated Steam	
Enclosure Rating	IP54 (NEMA 2) for all Mounting Orientations	
Ambient Conditions *- Standard Operating* *- Storage*	 -40 to 60 °C (-40 to 140 °F); 90% RH Maximum, Noncondensing -40 to 85 °C (-40 to 185 °F); 95% RH Maximum, Noncondensing	
Dimensions	See tables	
Shipping Weight	1.6 kg	1.8 kg

VA9208-Bxx-1 Series ON/OFF Electric Spring Return Actuator

Actuator	**VA9208-BGx-1**	**VA9208-BDx-1**
Power Requirements	AC 24 V (AC 18.2 V to 30 V) at 50/60 Hz: Class 2 (North America) or Safety Extra-Low Voltage (SELV) (Europe), 6.1 VA Running, 1.2 VA Holding Position DC 24 V (DC 21.6 V to 28.8 V): Class 2 (North America) or SELV (Europe), 3.5 W Running, 0.5 W Holding Position Minimum Transformer Size: 7 VA per Actuator	AC 230 V (AC 198 V to 264 V) at 50/60 Hz: 0.04 A Running, 0.03A Holding Position
Auxiliary Switch Rating ***- xxB-1 Models only***	Two Single-Pole, Double-Throw (SPDT), Double-Insulated Switch with Silver Contacts: AC 24 V, 50 VA Pilot Duty AC 120 V, 5.8 A Resistive, 1/4 hp, 275 VA Pilot Duty AC 240 V, 5.0 A Resistive, 1/4 hp, 275 VA Pilot Duty	
Spring Return	Direction is Selectable with Mounting Position of Actuator: Actuator Face Labeled A Is Away from Valve: CCW Spring Return Actuator Face Labeled B Is Away from Valve: CW Spring Return	
Rated Torque ***- Power On (Running)*** ***- Power Off (Spring Returning)***	 8 Nm All Operating Temperatures 8 Nm at Standard Operating Temperatures 6 Nm at Extended Operating Temperatures	
Rotation Range	Maximum Full Stroke: 95°	
Rotation Time for 90 Degrees of Travel ***- Power On (Running)*** ***- Power Off (Spring Returning)***	 53 to 71 Seconds Constant for 0 to 8 Nm Load, at all Operating Conditions 60 Seconds Nominal at Full Rated Load (0.25 rpm) 13 to 26 Seconds for 0 to 8 Nm Load, at Room Temperature 21 Seconds Nominal at Full Rated Load 39 Seconds Maximum with 8 Nm Load, at -20 °C (-4 °F) 108 Seconds Maximum with 6 Nm Load at -40 °C (-40 °F)	
Life Cycles	60,000 Full Stroke Cycles with 8 Nm Load	
Audible Noise Rating ***- Power On (Running)*** ***- Power On (Holding)*** ***- Power Off (Spring Returning)***	 <47 dBA at 8 Nm Load, at a Distance of 1 m <20 dBA at a Distance of 1 m <52 dBA at 8 Nm Load, at a Distance of 1 m	
Electrical Connections ***- Actuator (All Models)*** ***- Auxiliary Switches (-xxC Models)***	 1.2 m UL 758Type AWM Halogen Free Cable with 18 AWG (0.85 mm²) Conductors and 6 mm Ferrule Ends 1.2 m UL 758Type AWM Halogen Free Cable with 18 AWG (0.85 mm²) Conductors and 6 mm Ferrule Ends	
Fluid Temperature Limits ***-VG1205 and VG1805 Series*** ***-VG1205 and VG1805 Series with M9000-561***	 -30 to 100 °C (-22 to 212 °F), Not Rated for Steam Service -30 to 140 °C (-22 to 284 °F) water; 103 kPa (15 psig) at 121 °C (250 °F) Saturated Steam	
Enclosure Rating	IP54 (NEMA 2) for all Mounting Orientations	
Ambient Conditions ***- Standard Operating*** ***- Extended Operating*** ***- Storage***	 -20 to 60 °C (-4 to 140 °F); 90% RH Maximum, Noncondensing -40 to -20 °C (-40 to -20 °C); 90% RH Maximum, Noncondensing -40 to 85 °C (-40 to 185 °F); 95% RH Maximum, Noncondensing	
Dimensions	See tables	
Shipping Weight ***- xxA Models*** ***-xxC Models***	 1.5 Kg 1.7 Kg	 1.7 Kg 1.9 Kg

VA9208-GGx-1 Series Proportional Electric Spring Return Actuator

Actuator	**VA9203-GGA-1**	**VA9203-GGC-1**
Power Requirements	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), 7.9 VA Running, 5.5 VA Holding Position DC 24 V (DC 21.6 V to 28.8 V): Class 2 (North America) or SELV (Europe), 3.5 W Running, 1.9 W Holding Position Minimum Transformer Size: 8 VA per Actuator	
Input Signal / Adjustment	Factory Set at DC 0 to 10 V, CW Rotation with Signal Increase Selectable DC 0 (2) to 10 V or 0 (4) to 20 mA with Field -Furnished 500 ohm 0.25 W Minimum Resistor Switch Selectable Direct or Reverse Action with Signal Increase	
Control Input Impedance	Voltage Input: 100,000 ohm Current Input: 500 ohm with Field Furnished 500 ohm Resistor	
Feedback Signal	DC 0 (2) to 10 V for Desired Rotation Range up to 95° Corresponds to Rotation Limits, 0.5 mA at 10 V Maximum	
Auxiliary Switch Rating	---	Two Single-Pole, Double-Throw (SPDT), Double-Insulated Switches with Gold over Silver Contacts: AC 24 V, 50 VA Pilot Duty AC 120 V, 5.8 A Resistive, 1/4 hp, 275 VA Pilot Duty AC 240 V, 5.0 A Resistive, 1/4 hp, 275 VA Pilot Duty
Spring Return	Direction is Selectable with Mounting Position of Actuator: Actuator Face Labeled A Is Away from Valve: CCW Spring Return Actuator Face Labeled B Is Away from Valve: CW Spring Return	
Rated Torque ***- Power On (Running)*** ***- Power Off (Spring Returning)***	 8 Nm All Operating Temperatures 8 Nm All Operating Temperatures	
Rotation Range	Maximum Full Stroke: 95° Adjustable Stop: 35° to 95° Maximum Position	
Rotation Time for 90 Degrees of Travel ***- Power On (Running)*** ***- Power Off (Spring Returning)***	 150 Seconds Constant for 0 to 8 Nm Load, at all Operating Conditions 17 to 25 Seconds for 0 to 8 Nm Load, at Room Temperature 22 Seconds Nominal at Full Rated Load 94 Seconds Maximum with 8 Nm Load, at -40 °C (-40 °F)	
Life Cycles	60,000 Full Stroke Cycles with 8 Nm Load 1,500,000 Repositions with 8 Nm Load	
Audible Noise Rating ***- Power On (Running)*** ***- Power On (Holding)*** ***- Power Off (Spring Returning)***	 <35 dBA at 8 Nm Load, at a Distance of 1 m <20 dBA at a Distance of 1 m <52 dBA at 8 Nm Load, at a Distance of 1 m	
Electrical Connections	1.2 m UL 758Type AWM Halogen Free Cable with 18 AWG (0.85 mm²) Conductors and 6 mm Ferrule Ends	
Fluid Temperature Limits ***-VG1205 and VG1805 Series*** ***-VG1205 and VG1805 Series with M9000-561***	 -30 to 100 °C (-22 to 212 °F), Not Rated for Steam Service -30 to 140 °C (-22 to 284 °F) water; 103 kPa (15 psig) at 121 °C (250 °F) Saturated Steam	
Enclosure Rating	IP54 (NEMA 2) for all Mounting Orientations	
Ambient Conditions ***- Standard Operating*** ***- Storage***	 -40 to 60 °C (-40 to 140 °F); 90% RH Maximum, Noncondensing -40 to 85 °C (-40 to 185 °F); 95% RH Maximum, Noncondensing	
Dimensions	See tables	
Shipping Weight	1.6 Kg	1.8 Kg

Compliance

- 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 Low Voltage Directive 2006/95/EC.
- Australia and New Zealand	C-Tick Mark, Australia/NZ Emissions Compliant