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M9206-xxx-5S Series Electric Spring Return Actuators

Product Bulletin

Code No. 10.537 E
09 2005

The M9206-xxx-5S Series Actuators are direct-mount, spring return electric actuators intended for use with on/off, floating, or proportional controllers. BGx models operate on AC 24 V power, AGx and GGx models operate on AC/DC 24 V power, and BDx models operate on AC 230 V power. These bidirectional actuators are to be mounted onto Johnson Controls VG1000 Series Forged Brass Ball Valves using the M9000-520-5 Ball Valve Linkage Kit.

The M9206-xxx-5S Series Electric Spring Return Actuators provide a running torque of 6 Nm. The rotation range is mechanically adjustable. An integral line voltage auxiliary switch is available on the M9206-xxB models to indicate end-stop position, or to perform switching functions within the selected rotation range. Position feedback is provided on proportional control models through a proportional DC voltage signal.



Figure 1: M9206-xxx-5S Series Electric Spring Return Actuator

Table 1: Features and Benefits

Features	Benefits
Automatic Stroke Calibration at Installation.	Reduces installation time and costs, since the actuator self adjusts.
Reversible Mounting Design.	Provides Clockwise (CW) or Counterclockwise (CCW) return-to-normal positioning if a power loss occurs.
Electronic Stall Detection Throughout Entire Rotation Range	Extends the life of the actuator by deactivating the actuator motor when an overload condition is detected.
Removable Coupler	Enables actuator stroke adjustment, and/or adapts to a shorter damper shaft
Integral Auxiliary Switch (xxB Models)	Provides an adjustable switch point with 24 / 230 V capability
24 VAC, 24 VAC/VDC and 230 VAC Power Options; 0(2)...10 VDC and 0(4)... 20 mA Input Signal Options	Simplifies installation and provides application flexibility
Ambient Operating Temperature Limits of -32 to 60°C	Meets the temperature requirements of outside air applications

Product Details

The M9206-GGx-5S Series Proportional Electric Spring Return Actuators mount directly onto VG1000 Series Forged Brass Ball Valves using the M9000-520-5 Ball Valve Linkage Kit.

IMPORTANT: Use this M9206-xxx-5S Series Electric Spring Return Actuator 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.

This enables the occupant to request comfort condition at night or at the weekend when the building is normally unoccupied.

IMPORTANT: Do not install or use this M9206-xxx-5S Series Electric Spring Return Actuator in or near environments where corrosive substances or vapors could be present. Exposure of the electric actuator to corrosive environments may damage the internal components of the device, and will void the warranty.

Operation

When combined with a controller, the M9206-xxx-5S Series Electric Spring Return Actuator provides reliable, integrated valve control. The input signal from the controller to the electric actuator causes the motor to rotate in the proper direction. Upon loss of power, the electric actuator returns to its spring return position. Rotation is mechanically limited to 93° by integral end-stops.

Repairs and Replacements

If the M9206-GGx-5S Series Proportional Electric Spring Return Actuator fails to operate within its specifications, replace the unit. For a replacement electric actuator, contact the nearest Johnson Controls representative.

Table 2: Ordering Data

Code Number	Control Type	Input Signal	Feedback Signal	Auxiliary Switch	Power Requirements
M9206-AGA-5S	Floating or On/Off	24 VAC/VDC	-	-	24 VAC/VDC
M9206-AGB-5S				1	
M9206-BDA-5S	On/Off	230 VAC		-	230 VAC
M9206-BDB-5S				1	
M9206-BGA-5S		24 VAC		-	24 VAC
M9206-BGB-5S	1				
M9206-GGA-5S	Proportional	0(2)...10 VDC 0(4)...20 mA*	0(2)...10 VDC	-	24 VAC/VDC
M9206-GGB-5S				1	

*0(4) to 20 mA input signal requires field furnished 500 Ω resistor.

Mounting

The M9206-GGx-5S Series Proportional Electric Spring Return Actuators can be mounted on Johnson Controls VG1000 Series Forged Brass Ball Valves using the M9000-520-5 Ball Valve Linkage Kit; refer to the M9000-520-5 Ball Valve Linkage Kit Product Bulletin for more details.

Direction of Action

The M9206-xxx-5S Series Proportional Electric Spring Return Actuators are factory set for Direct Acting (DA) operation. In this mode, applying an increasing input signal to the control input drives the actuator away from the spring return position.

Auxiliary Switch (M9206-xxB-5S)

The M9206-xxB-5S Proportional Electric Spring Return Actuator includes one auxiliary switch with a switch adjuster accessible on either face of the actuator (as illustrated in Figures 2 and 3). The nominal factory setting for this auxiliary switch is 20° opening. See the Technical Specifications table for the auxiliary switch rating.

Wiring

IMPORTANT: Make all wiring connections in accordance with local, national, and regional regulations.

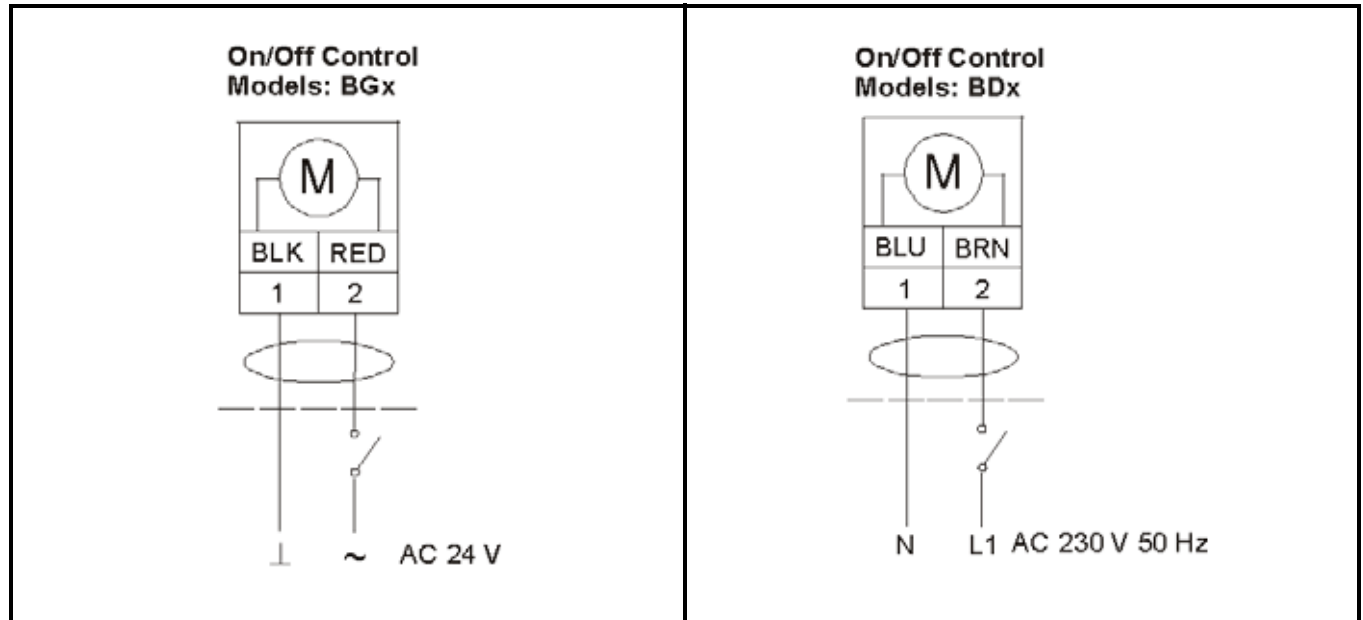


Figure 2: Wiring Diagrams for M9206-Bxx-5S Models

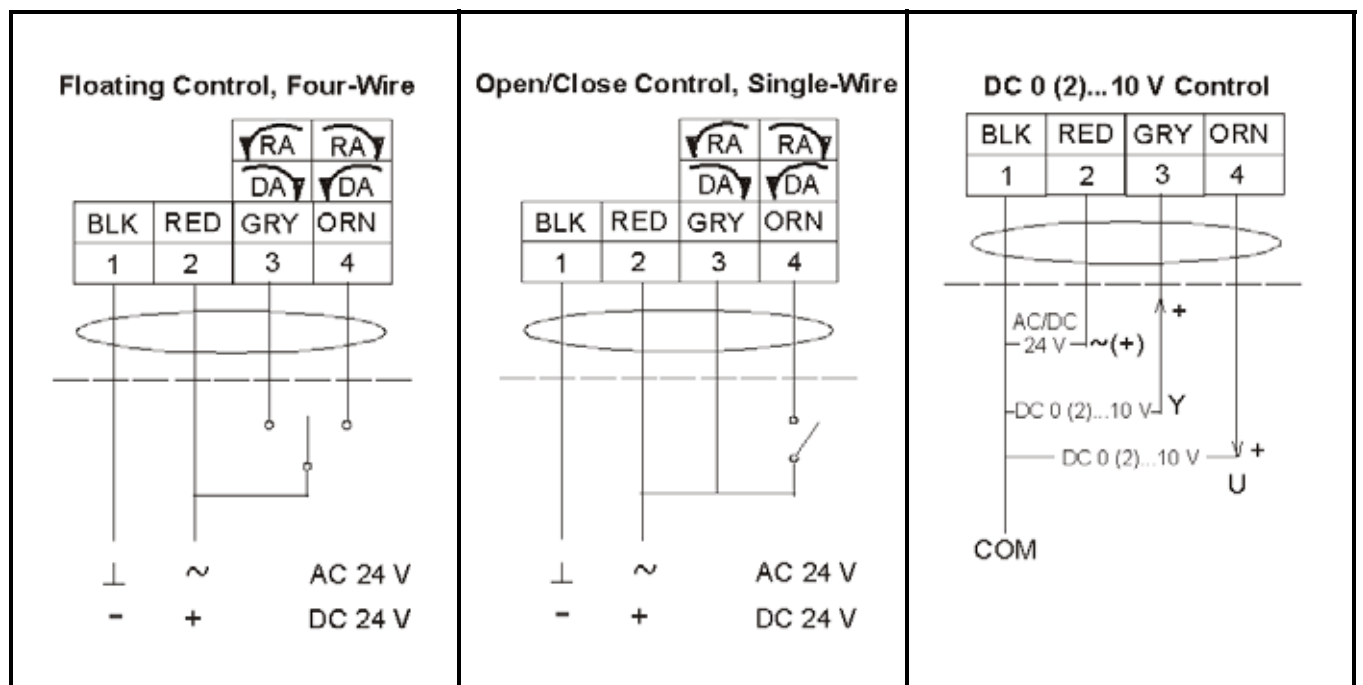


Figure 3: Wiring Diagrams for M9206-Axx-5S Models

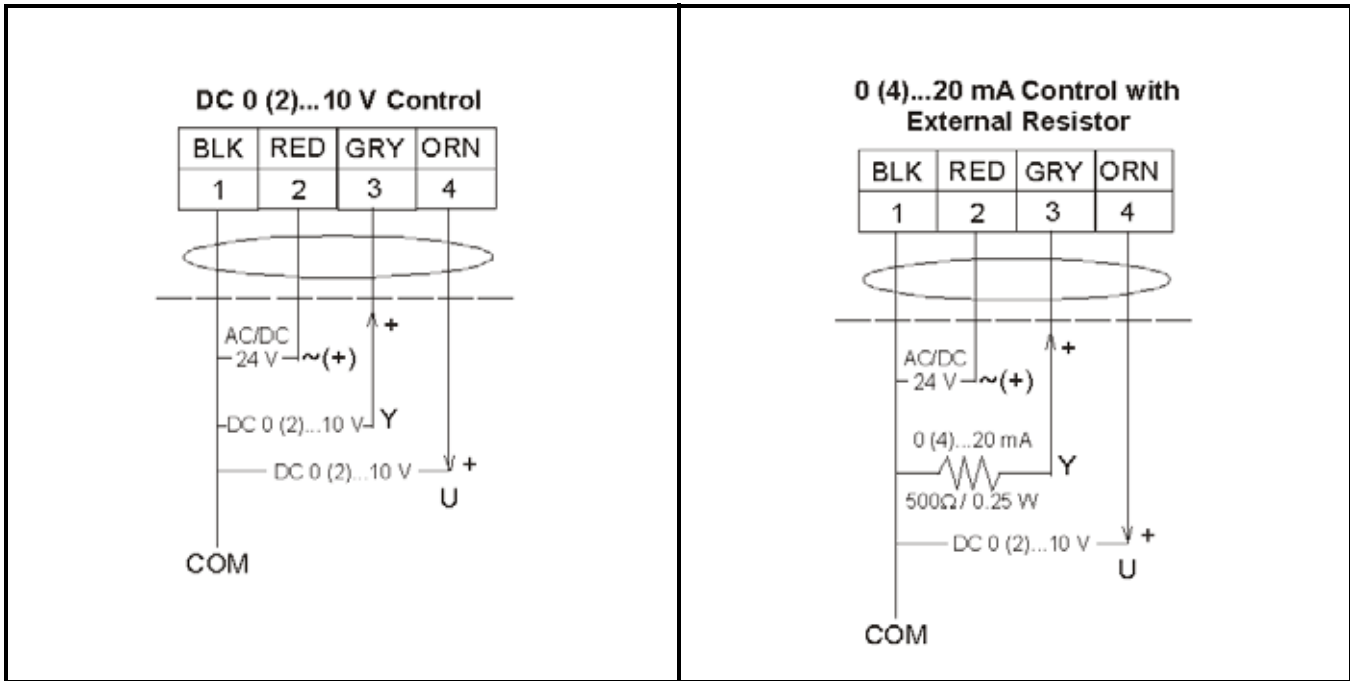


Figure 4: Wiring Diagrams for Proportional Control M9206-GGx-5S

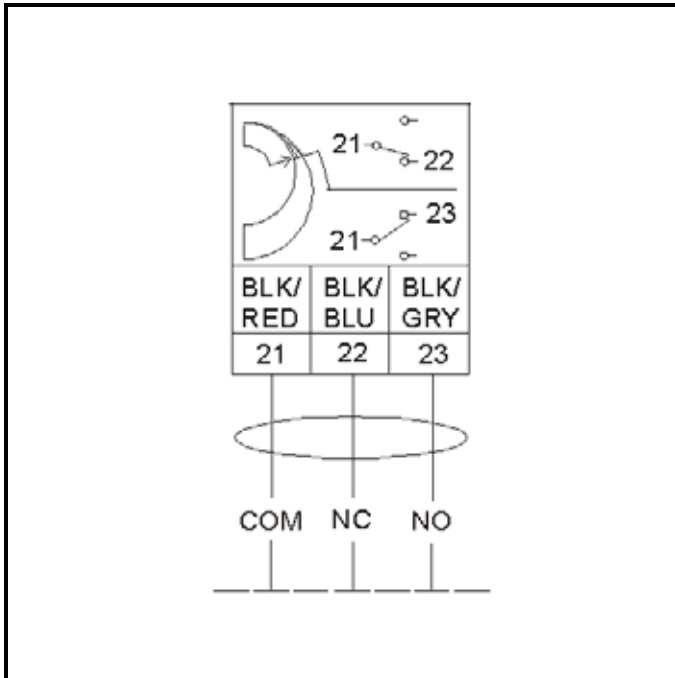


Figure 5: Wiring Diagrams for Auxiliary Switch for all M9206-xxB-5S Models

Dimensions

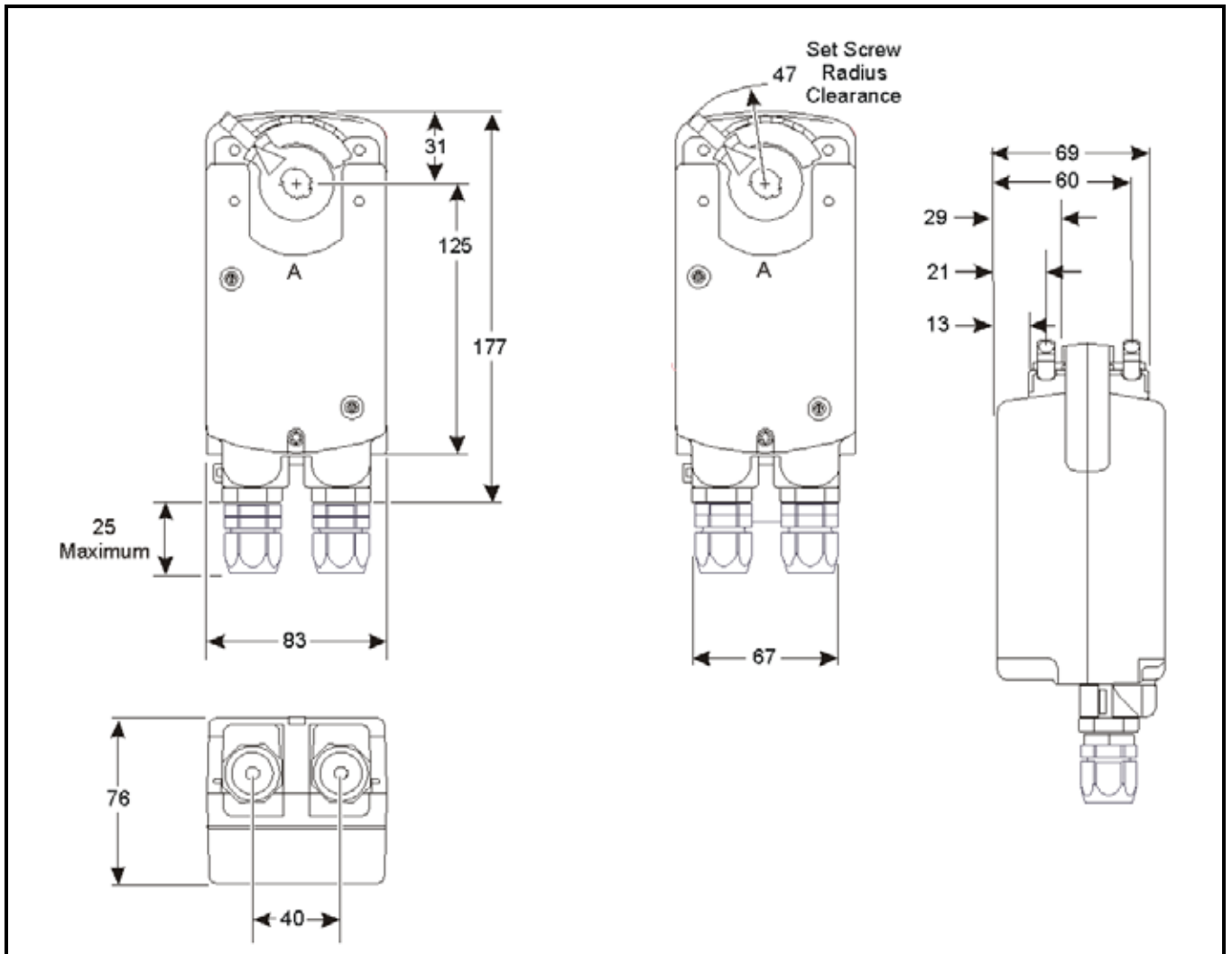


Figure 6: M9206-xxx-5S Series Electric Spring Return Actuator Dimensions, mm

Technical Specification

Product		M9206-xxx-5S Series Electric Spring Return Actuators
Power Requirements	AGx Models	Nominal 24 V \pm 25% at 50/60 Hz, Class 2 or SELV (Safety Extra-Low Voltage), Typical 8.0 VA Running, 6.0 VA Holding Position; DC 24 V \pm 10%, Class 2 or SELV (Safety Extra-Low Voltage), Typical 5.6 W Running, 2.2 W Holding Position
	BGx Models	Nominal 24 V \pm 25% at 50/60 Hz, Class 2 or SELV (Safety Extra-Low Voltage), Typical 9.8 VA Running, 5.8 VA Holding Position
	BDx Models	Nominal 230 V \pm 10% at 50 Hz, Typical 11.0 VA Running, 9.2 VA Holding Position
	GGx Models	Nominal 24 V \pm 25% at 50/60 Hz, Class 2 or SELV (Safety Extra-Low Voltage), Typical 12.0 VA Running, 5.0 VA Holding Position; DC 24 V \pm 10%, Class 2 or SELV (Safety Extra-Low Voltage), Typical 5.6 W Running, 2.2 W Holding Position
Transformer Sizing Requirements		14 VA Minimum per Actuator
Input Signal	AGx Models	24 V \pm 25% at 50/60 Hz or DC 24 V \pm 10%, Class 2 or SELV (Safety Extra-Low Voltage)
	BGx Models	24 V \pm 25% at 50/60 Hz, Class 2 or SELV (Safety Extra-Low Voltage)
	BDx Models	230 V \pm 10% at 50 Hz
	GGx Models	0(2)...10 VDC or 0(4)...20 mA with Field Furnished 500 Ω Resistor
Input Signal Adjustments	GGx Models	Factory Set at 0...10 VDC, CW Rotation with Signal Increase; Selectable 0(2)...10 VDC or 0(4)...20 mA with Field Furnished 500 Ω Resistor; Switch Selectable Direct or Reverse Action with Signal Increase
Control Input Impedance	GGx Models	Voltage Input: 200 k Ω ; Current Input: 500 Ω with Field Furnished 500 Ω Resistor
Feedback Signal	GGx Models	0(2)...10 VDC for Desired Rotation Range Up to 90°; 10 VDC at 2 mA with Field Furnished 500 Ω Resistor; Corresponds to Input Signal Selection and Rotation Limits
Auxiliary Switch Rating	xxB Models	One Single-Pole, Double-Throw (SPDT), Double-Insulated Switch; 24 VAC, 50 VA Pilot Duty; 230 VAC, 2.9 A Inductive, 5.0 A Resistive, 1/4 hp, 275 VA Pilot Duty
Spring Return		Direction is Selectable with Mounting Position of Actuator: CCW Actuator Face Away from Damper for CCW Spring Return; CW Actuator Face Away from Damper for CW Spring Return
Running Torque		6 Nm
Rotation Range		Adjustable from 34.5 to 90° CW or CCW; Mechanically Limited to 93°
Rotation Time	AGx Models	Selectable 60 or 90 s \pm 10% at Nominal Conditions, Load Independent; Factory Set at 90 s
	Bxx Models	10 to 40 s for 0 to 6 Nxm at All Operating Conditions
	GGx Models	25 to 40 s for 0 to 6 Nxm at All Operating Conditions
Spring Return Time No Power (Off)	AGx and GGx Models	Nominal 35 s; 90 s Maximum
	Bxx Models	Nominal 35 s; 70 s Maximum
Cycles		60,000 Full Stroke Cycles
	AGx and GGx Models	1,500,000 Repositions Rated at 6 Nxm
Audible Noise Rating	AGx and GGx Models	51 dBA Nominal at 1 m
	Bxx Models	55 dBA Nominal at 1 m
Electrical Connections	Actuator	1.2 m Halogen-Free Cable with 0.75 mm ² Wire Leads
	Auxiliary Switch	1.2 m Halogen-Free Cable with 0.75 mm ² Wire Leads
Mechanical Connections		Mounted onto Johnson Controls DN15 through DN40 VG1000 Series Forged Brass Valves using M9000-520-5 Ball Valve Linkage Kit

Enclosure		NEMA 2, IP42
Ambient Conditions	Operating	-32 to 60°C; 90% RH Maximum, Noncondensing
	Storage	-40 to 85°C; 95% RH Maximum, Noncondensing
Compliance	European Union	CE Mark, EMC Directive 89/336/EEC
		CE Mark, Low Voltage Directive 73/23/EEC (xDx and xxB Models)
	Australia and New Zealand	C-Tick Mark, Australia/NZ Emissions Compliant
Shipping Weight		1.6 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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