

M9102-AGA-2S, -3S and M9104-xxA-2S, -3S Series Electric Non-Spring Return Actuators

Description

The M9102 and M9104 Series Actuators are direct-mount, non-spring return electric actuators that operate on AC 24 V or 100 to 240 VAC power. These motor-driven actuators provide floating control (AGA), floating control with automatic shutoff (IGA), proportional control with selectable 0-10 or 2-10 VDC (GGA), and line voltage power supply (IUA). The -2S models are equipped with plenum cables, and the -3S models are equipped with terminal blocks.

All models are compact in size and are easily installed on VAV boxes, Variable Air Volume and Temperature (VVT) two-position zone dampers with a round shaft up to 1/2 in. (13 mm) in diameter or a 3/8 in. (10 mm) square shaft.

The M9102 Series Electric Non-Spring Return Actuators provide a running torque of 18 lb·in (2 N·m), and the nominal travel time is 30 seconds at 60 Hz (36 seconds at 50 Hz) for 90° of rotation. The M9104 Series Electric Non-Spring Return Actuators provide a running torque of 35 lb·in (4 N·m), and the nominal travel time is 60 seconds at 60 Hz for 90° of rotation.

Refer to the *M9102-AGA-2S, -3S and M9104-xGA-2S, -3S Series Electric Non-Spring-Return Actuators Product Bulletin (LIT-1201742)* for important product application information.

Features

- Two Torques Available: 18 and 35 lb·in (2 and 4 N·m)
- Short 30-Second Travel Time Available
- 35 dBA Maximum Audible Noise Rating at 1 Meter
- Synchronous Drive (AGA, IGA, GGA models)
- 100,000 Cycle Rating
- Direct Shaft Mounting with Single-Screw Coupler
- Magnetic Clutch
- Manual Gear Release
- Plenum Cable or Screw Terminal Electric Connections
- Floating, Floating with Timeout, and Proportional 0(4) to 10 VDC Control Inputs Available
- Small, Compact Design

Applications

The M9102 and M9104 Series Electric Non-Spring Return Actuators are designed to position balancing, control, round, and zone dampers in HVAC systems. These electric actuators are also designed to position blades in a VAV box, or they can be used in VVT two-position zone applications.

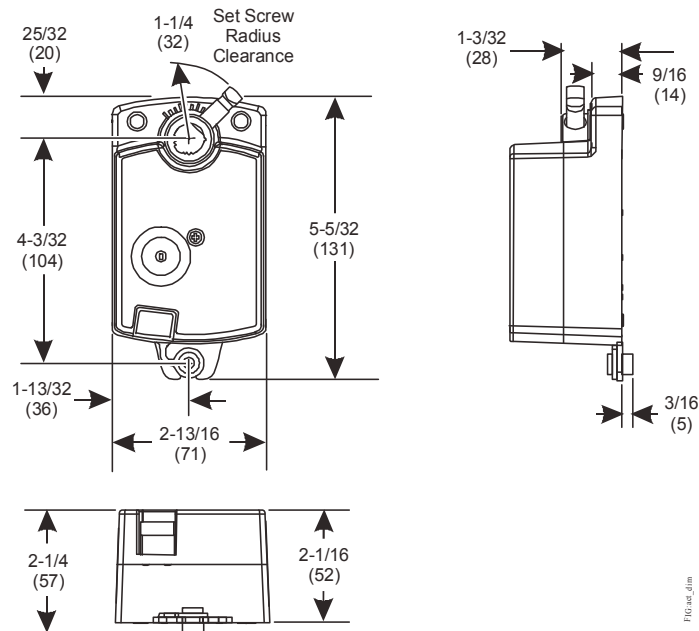
Each actuator mounts directly to the surface in any convenient orientation using a single No. 10 standard sheet metal screw (included with the actuator). No additional linkages or couplers are required. Electrical connections on the actuator are clearly labeled to simplify installation.

Repair Information

If the M9102 or M9104 Series Electric Non-Spring Return Actuator fails to operate within its specifications, replace the unit. For a replacement electric actuator, contact the nearest Johnson Controls® representative.



M9102 Series Electric Non-Spring Return Actuator



M9102/M9104 Series Electric Non-Spring Return Actuator Dimensions, in. (mm)

M9102-AGA-2S, -3S and M9104-xxA-2S, -3S Series Electric Non-Spring Return Actuators (Continued)

Selection Chart

Code Number	Control Type	Running Torque	Travel Time	Power Supply (VA rating)	Electrical Connections
M9102-AGA-2S	Floating	18 lb·in (2 N·m)	30 Seconds at 60 Hz 36 Seconds at 50 Hz	2.5	48 in. (1.2 m) UL 444 Type CMP Plenum Rated cable with 19 AWG (0.75 mm ²) conductors and .25 in. (6 mm) ferrule ends
M9102-AGA-3S	Floating	18 lb·in (2 N·m)	30 Seconds at 60 Hz 36 Seconds at 50 Hz	2.5	M3 Screw Terminals
M9104-AGA-2S	Floating	35 lb·in (4 N·m)	60 Seconds at 60 Hz 72 Seconds at 50 Hz	2.1	48 in. (1.2 m) UL 444 Type CMP Plenum Rated cable with 19 AWG (0.75 mm ²) conductors and .25 in. (6 mm) ferrule ends
M9104-AGA-3S	Floating	35 lb·in (4 N·m)	60 Seconds at 60 Hz 72 Seconds at 50 Hz	2.1	M3 Screw Terminals
M9104-IGA-2S	Floating or On/Off	35 lb·in (4 N·m)	60 Seconds at 60 Hz 72 Seconds at 50 Hz	3.0	48 in. (1.2 m) UL 444 Type CMP Plenum Rated cable with 19 AWG (0.75 mm ²) conductors and .25 in. (6 mm) ferrule ends
M9104-IGA-3S	Floating or On/Off	35 lb·in (4 N·m)	60 Seconds at 60 Hz 72 Seconds at 50 Hz	3.0	M3 Screw Terminals
M9104-GGA-2S	Proportional	35 lb·in (4 N·m)	60 Seconds at 60 Hz 72 Seconds at 50 Hz	2.9	48 in. (1.2 m) UL 444 Type CMP Plenum Rated cable with 19 AWG (0.75 mm ²) conductors and .25 in. (6 mm) ferrule ends
M9104-GGA-3S	Proportional	35 lb·in (4 N·m)	60 Seconds at 60 Hz 72 Seconds at 50 Hz	2.9	M3 Screw Terminals
M9104-IUA-2S	Floating or On/Off	35 lb·in (4 N·m)	60 Seconds at 50/60 Hz	7.5 (0.07A)	48 in. (1.2 m) UL 444 Type CMP Plenum Rated cable with 18 AWG (1.02 mm ²) conductors for 3/8 in. (10 mm) flexible metal conduit

Accessories

Code Number	Description
DMPR-KC003 ¹	7 in. (178 mm) blade pin extension without bracket for Johnson Controls direct-mount damper applications
DMPR-KR003 ¹	Sleeve pin kit for Johnson Controls round dampers with a 5/16 in. (8 mm) diameter shaft
M9000-200	Commissioning tool that provides a control signal to drive 24 V on/off, floating, proportional, and/or resistive electric actuators
M9104-100	Connector for 3/8 in. (10 mm) flexible metal conduit

1. Furnished with the damper and may be ordered separately.

M9102-AGA-2S, -3S and M9104-xxA-2S, -3S Series Electric Non-Spring Return Actuators (Continued)

Technical Specifications

Power Requirements	M910x-AGA-xS	AC 24 V +25%/-20% at 50/60 Hz, 2.1 VA, Class 2, Safety Extra-Low Voltage (SELV)
	M9104-IGA-xS	AC 24 V +25%/-20% at 50/60 Hz, 3.0 VA, Class 2, SELV
	M9104-GGA-xS	AC 24 V +25%/-20% at 50/60 Hz, 2.9 VA, Class 2, SELV
	M9104-IUA-2S	AC 100 to 240 V (-15%+10%) at 60 Hz, 0.07A, and 7.5 VA Supply
Control Type	M910x-AGA-xS	Floating Control without Timeout
	M9104-IGA-xS	Floating or On/Off Control with Timeout
	M9104-GGA-xS	Proportional Control
	M9104-IUA-2S	Floating or On/Off Control with Timeout
Input Signal	M910x-AGA-xS	AC 24 V +25%/-20% at 50/60 Hz, Class 2, SELV without Timeout
	M9104-IGA-xS	AC 24 V +25%/-20% at 50/60 Hz, Class 2, SELV with Timeout
	M9104-GGA-xS	0(2) to 10 VDC or 0(4) to 20 mA with Field-furnished 500 ohm Resistor
	M9104-IUA-2S	AC 100 to 240 V (-15%+10%) at 50/60 Hz, and 7.5 VA Supply
Feedback Signal	M9104-GGA-2S	0 VDC to 10 VDC or 2 VDC to 10 VDC for 90° (10 VDC at 1 mA) Corresponds to Input Signal Span Selection
Motor Input Impedance		200 ohms Nominal
Running Torque	M9102 Series	18 lb·in (2 N·m)
	M9104 Series	35 lb·in (4 N·m)
Travel Time	M9102 Series	30 Seconds at 60 Hz (36 Seconds at 50 Hz) for 90° of Rotation
	M9104 Series	60 Seconds at 60 Hz (72 Seconds at 50 Hz) for 90° of Rotation
	M9104 (IUA)	60 Seconds at 50/60 Hz for 90° of Rotation
Rotation Range		93° ±3°, CW or CCW
Cycles		100,000 Full Stroke Cycles; 2,500,00 Repositions at Rated Running Torque
Audible Noise Rating		35 dBA at 39-13/32 in. (1 m) Maximum
Electrical Connections	M9102-AGA-2S M9104-xxA-2S	48 in. (1.02 m) UL 444 Type CMP Plenum Rated Cable with 18 AWG (1.02 mm) Conductors and 1/4 in. (6 mm) Ferrule Ends
	M9102-AGA-3S M9104-xGA-3S	M3 Screw Terminals
	M9104-IUA-2S	48 in. (1.2 mm) with 18 AWG (1.02 mm ²) Conductors and Connector for 3/8 in. (10 mm) Flexible Metal Conduit
Mechanical Connections		Up to 1/2 in. (13 mm) Diameter Round Damper Shaft or 3/8 in. (10 mm) Square Damper Shaft
Enclosure	M9102-AGA-2S M9104-xxA-2S	NEMA 1, IP42
	M9102-AGA-3S M9104-xxA-3S	NEMA 1, IP40
Ambient Conditions	Operating	-4°F to 140°F (-20°C to 60°C); 90% RH Maximum, Noncondensing
	Storage	-20°F to 150°F (-29°C to 66°C); 90% RH Maximum, Noncondensing
Compliance	United States	UL Listed, CCN XAPX, File 27734 Plenum rated, UL2043, suitable for use in other environmental spaces (plenums) in accordance with section 300.22.(c) of the National Electrical Code
	Canada	cUL Listed, CCN XAPX7, File 27734 Plenum Rated Per CSA 22.2 No. 236/UL 1995, Heating and Cooling Equipment
	Europe	Johnson Controls 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		1.0 lb (0.5 kg)

M9104-AGx-2N Electric Non-Spring-Return Actuators

Description

The M9104-AGA-2N synchronous motor-driven actuator provides floating (three-wire) control and is easily installed on a VAV box or a small- to medium-sized damper with a round shaft up to 1/2 in. (13 mm) in diameter or a 3/8 in. (10 mm) square shaft. This compact, non-spring-return actuator has a 35 lb·in (4 N·m) running torque and 40 lb·in (4.5 N·m) minimum stall torque in a compact, easy-to-install package. It has a nominal 90-second travel time for 90° of rotation at 60 Hz (108 seconds at 50 Hz) for 90° of rotation.

The M9104-AGS-2N Actuator/Transmitter combines an M9104-AGA-2N with a pre-wired DPT-2015 Differential Pressure Transmitter that has a 0 in. to 1.5 in. water column (W.C.) (0 Pa to 374 Pa) differential pressure range.

Refer to the *M9104-AGx-2N Electric Non-Spring-Return Actuators Product Bulletin (LIT-2681121)* for important product application information.

Features

- 30 dBA rating meets audible noise requirements for open ceilings
- synchronous drive provides constant rotation time that is independent of load
- 100,000 cycle rating extends actuator life due to improved technology
- direct shaft mount with single-screw coupler simplifies installation and provides 3-point shaft gripping
- magnetic clutch provides torque protection for the actuator gear train and damper

- adjustable rotation stops allow application versatility with 30° to 90° clockwise (CW) or counterclockwise (CCW) rotation
- manual gear release simplifies setup and field adjustments
- screw terminal connection makes wiring easy

Applications

The M9104-AGx-2N actuator is used to position balancing, control, round, and zone dampers in typical HVAC applications. It is also used to position the blades in a VAV box.

The actuator mounts directly to the surface of a VAV box, round damper, or small rectangular damper with a single No. 10 self-drilling sheet metal screw (included). There are no additional linkages or couplers required. Clearly labeled electrical terminals simplify installation. Refer to the damper or VAV box manufacturer's information to select the proper timing for the actuator.

When combined with a VAV controller, the actuator provides reliable, integrated damper control. Refer to the *M9104-AGx-2N Series Electric Non-Spring-Return Actuators Application Note (LIT-2681110)* for various configurations with and without the DPT-2015 differential pressure transmitter.

For more information, refer to the *M9104-AGx-2N Electric Non-Spring-Return Actuators Installation Instructions (Part No. 34-636-631)*.



M9104-AGA-2N
Electric Non-Spring-Return Actuator

Repair Information

If the M9104-AGx-2N Electric Actuator fails to operate within its specifications, replace the unit. For a replacement actuator, contact the nearest Johnson Controls® representative.

Selection Chart

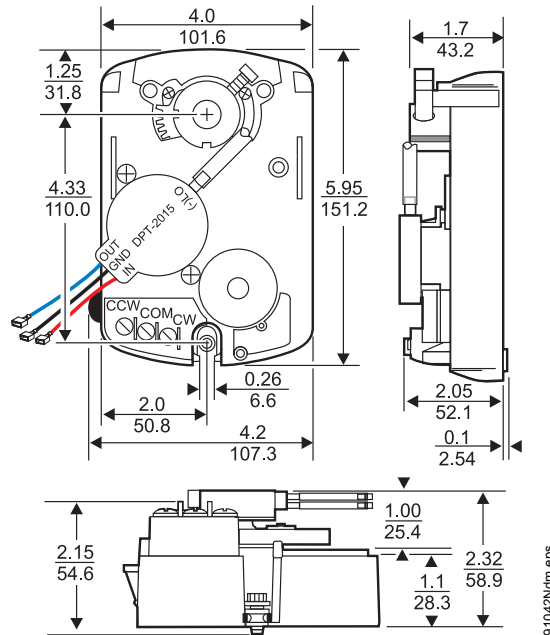
Code Number	Control Type	Torque / Timing / Voltage	Auxiliary Switches	Comments
M9104-AGA-2N	Floating	35 lb·in (4 N·m) 90 seconds at 60 Hz AC 24 V 50/60 Hz	None	Actuator only
M9104-AGS-2N		35 lb·in (4 N·m) 90 seconds at 60 Hz AC 24 V 50/60 Hz		Actuator includes a DPT-2015 and CBL-2000-1

Accessories

Code Number	Description
CBL-2000-1	20 in. (0.5 m) wiring harness (Underwriters Laboratories, Inc.® [UL] accepted for plenum use) supplied with the M9104-AGS-2N and may be ordered separately; connects the M9104 and DPT-2015 to the VAV controller
CBL-2000-2	20 in. (0.5 m) plenum rated wiring harness
CBL-2000-3	72 in. (1.8 m) plenum rated wiring harness
DPT-2015-0	0 in. to 1.5 in. W.C. (0 Pa to 374 Pa) differential pressure transmitter supplied with the M9104-AGS-2N and may be ordered separately
DMPR-KC003	Blade pin extension without bracket supplied with CD-1300 dampers and may be ordered separately

M9104-AGx-2N Electric Non-Spring-Return Actuators (Continued)

Dimensions



Note: All dimensions are nominal unless otherwise specified.

Dimensions, in. (mm)

Technical Specifications

M9104-AGx-2N Electric Non-Spring-Return Actuators		
Power Requirements	M9104-AGx-2N: 20 VAC to 30 VAC at 50 Hz or 60 Hz, 2.1 VA maximum, Class 2 DPT-2015: 15 VDC (14.5 VDC to 17 VDC, unregulated); 15 mA maximum	
Input Signal	M9104-AGx-2N: 24 VAC (20 VAC to 30 VAC) at 50 Hz or 60 Hz	
Motor Input Impedance	M9104-AGx-2N: 250 ohms, nominal	
DPT-2015-0	Pressure range: 0 in. to 1.5 in. W.C. (0 Pa to 374 Pa) Over pressure limit: 15 in. W.C. (3.74 kPa) Output voltage: 0.5 VDC to 4.5 VDC with 25,000 ohm minimum load impedance	
Audible Noise Rating	30 dBA maximum at 1 m	
Mechanical Output	Running torque: 35 lb·in (4 N·m)	
Rotation Range	Adjustable from 30° to 90°, CW or CCW	
Rotation Time	Nominal 90 seconds at 60 Hz for 90°; nominal 108 seconds at 50 Hz for 90°	
Cycles	100,000 full cycles, 2,500,000 repositions rated at 35 lb·in (4 N·m)	
Electrical Connection	No. 6-32 screw terminals on the M9104 actuator; 1/4 in. spade terminals on the DPT-2015	
Pressure Connection	6 in. (152 mm) length of silicone tubing with barbed fittings for 1/4 in. (6.35 mm) O.D. tubing	
Enclosure	NEMA 1, IP30	
Ambient Operating Conditions	M9104-AGA-2N: 32°F to 125°F (0°C to 52°C); 90% RH maximum, noncondensing M9104-AGS-2N: 32°F to 125°F (0°C to 52°C); 90% RH maximum, noncondensing 60°F to 100°F (16°C to 38°C); 90% RH maximum, noncondensing for DPT rated accuracy (Refer to the DPT-2015 Differential Pressure Transmitter for VAV Box Applications Installation Instructions [Part No. 24-7547-18].)	
Ambient Storage Conditions	-20°F to 150°F (-29°C to 66°C); 90% RH maximum, noncondensing	
Dimensions (H x W x D)	M9104-AGA-2N: 5.95 in. x 4.2 in. x 2.15 in. (151.2 mm x 107.3 mm x 54.6 mm) M9104-AGS-2N: 5.95 in. x 4.2 in. x 2.32 in. (151.2 mm x 107.3 mm x 58.9 mm) with the DPT-2015	
Shipping Weight	M9104-AGA-2N: 2.0 lb (0.91 kg) M9104-AGS-2N: 2.2 lb (0.99 kg) with the DPT-2015	
Compliance	United States	UL 873 Listed, File E27734, CCN XAPX
	Canada	CSA Certified C22.2 No. 139, File LR85083, Class 3221 02
	Europe	CE Mark - Johnson Controls declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive 2004/108/EC.

M9106-xGx-2 Series Electric Non-Spring-Return Actuators

Description

The M9106-xGx-2 Series direct-mount electric actuators operate on AC 24 V power and are available for use with on/off, floating, or proportional controllers. These non-spring-return actuators are easily installed on a VAV box, a damper with a round shaft up to 1/2 in. (13 mm) in diameter, or a square shaft up to 3/8 in. (10 mm). The M9106 with an M9000-520 linkage can also be used to position VG1000 Series 1/2 in. (DN15) to 1-1/2 in. (DN40) ball valves.

The M9106 Series models have 53 lb·in (6 N·m) running torque. These actuators have a nominal 60-second travel time for 90° of rotation at 60 Hz (72 seconds at 50 Hz) with a load-independent rotation time.

The M9106-xGC-2 models are available with integral auxiliary switches to perform switching functions at any angle within the selected rotation range. The -GGx models feature DC 0(2) to 10 V position feedback, and the -AGF models provide 10,000 ohm position feedback.

Features

- simple direct coupling reduces installation and commissioning time and improves reliability by eliminating damper linkages; single screw coupling provides three-point shaft gripping
- designed for zone damper and ball valve actuator applications
- small, compact design allows installation in tight-fitting locations
- on/off, floating, and proportional control inputs
- 60-second running time at 60 Hz
- long life brushless synchronous drive motor technology provides constant running time independent of load
- robust 53 lb·in (6 N·m) torque rating

- whisper quiet 35 dBA noise rating
- magnetic clutch provides over torque protection over the entire range of rotation
- -4°F to 125°F (-20°C to 52 °C) ambient temperature rating
- 100,000 full stroke cycle, 2,500,000 reposition rating
- manual gear release simplifies setup and field adjustments
- 1/2 in. NPT threaded conduit opening meets electrical code requirements and allows the use of flexible armored cable
- position feedback (-GGx models) provides simple, closed-loop control with accurate position sensing
- adjustable rotation stops allow application versatility with 30 to 90° clockwise or counterclockwise rotation

Applications

The M9106 actuators are used to position balancing, control, round, and zone dampers in typical HVAC applications. The M9106 can also be used with an M9000-520 linkage to control 1/2 in. (DN15) to 1-1/2 in. (DN40) VG1000 Series ball valves. The M9106 Series actuator mounts directly on the duct surface, round damper, or small rectangular damper with an anti-rotation bracket and two sheet metal screws (included). Additional linkages or couplers are not required.

Refer to the damper or VAV box manufacturer's information to select the proper timing for the actuator. Refer to the appropriate application note for specific wiring diagrams and information.



**M9106-xGx-2 Series
Electric Non-Spring-Return Actuator**

Refer to the *M9106-xGx-2 Electric Non-Spring-Return Actuators Product Bulletin (LIT-2681123)* or the *M9106-xGx-2 Electric Non-Spring-Return Actuators Installation Instructions (Part No. 34-636-1085)* for important product application information.

Repair Information

If the M9106-xGx-2 Series Electric Actuator fails to operate within its specifications, replace the unit. For a replacement actuator, contact the nearest Johnson Controls® representative.

Selection Chart

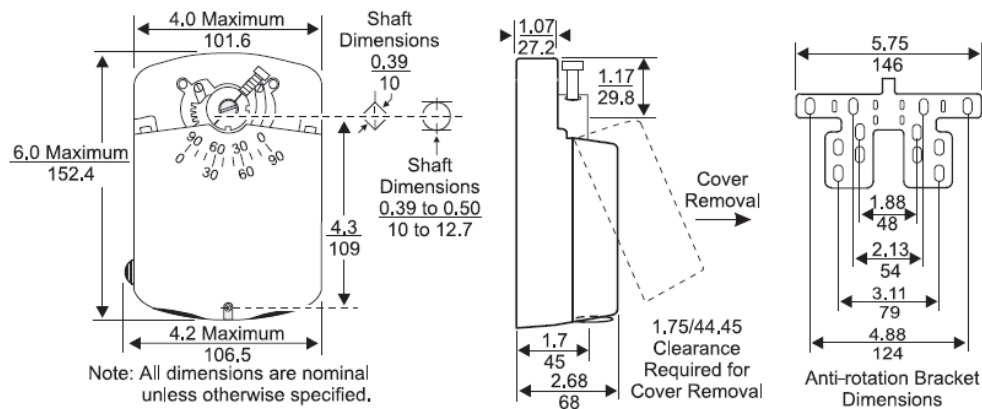
Code Number	Control Type	Torque / Timing / Voltage	Auxiliary Switches	Comments
M9106-AGA-2¹	Floating	53 lb·in (6 N·m) 60 seconds at 60 Hz AC 24 V 50/60 Hz	None	
M9106-AGC-2¹			2-SPDT	
M9106-AGF-2¹	Floating with resistive feedback		None	10,000 ohm feedback pot
M9106-GGA-2	DC 0(2) to 10 V		None	DC 0(2) to 10 V feedback
M9106-GGC-2	DC 0(4) to mA proportional		2-SPDT	
M9106-IGA-2	On/off / floating with timeout		None	Adjustable timing 1, 1.5, 2, 5.5, or 11 minutes
M9106-IGC-2			2-SPDT	

1. To avoid excessive wear or drive time on the motor for the -AGx models, use a controller and/or software that provides a time-out function to remove the signal at the end of rotation (stall). The -GGx and -IGx models have an auto shutoff to avoid excessive wear or drive time on the motor.

M9106-xGx-2 Series Electric Non-Spring-Return Actuators (Continued)

Accessories

Code Number	Description
CBL-2000-1	20 in. (0.5 m) wiring harness, UL accepted for plenum use, connects the M9106 and DPT-2015 to the VAV controller
CBL-2000-2	20 in. (0.5 m) plenum rated wiring harness
CBL-2000-3	72 in. (1.8 m) plenum rated wiring harness
DPT-2015-0	0 in. to 1.5 in. W.C. (0 Pa to 374 Pa) differential pressure transmitter
DMPR-KC003	Square head blade pin extension without bracket supplied with Johnson Controls CD-1300 dampers and may be ordered separately for all direct-mount applications
DMPR-KC010	Adjustable blade position indicator switch kit with total switching load limited to 2,000 VA for the following applications: Pilot duty: AC 24 V, 50 VA; AC 125/250/277 V, 125 VA Motor load: AC 125/250/277 V, 1/3 hp Resistive load: AC 125 V, 11 A; AC 250 V, 8 A; AC 277 V, 7 A (all maximum values)
DMPR-KC011	Hex head blade pin extension without bracket
DMPR-KC012	Hex head blade pin extension with bracket
DMPR-KC213	Damper jackshaft 1/2 in. diameter, 1 panel
DMPR-KC214	Damper jackshaft 1/2 in. diameter, 2 panel
M9000-105	Pluggable 3-terminal block
M9000-106	Pluggable 4-terminal block
M9000-160	Replacement anti-rotation bracket for M9106 Series actuators
M9000-520	Valve linkage kit for field mounting an M9106 Series actuator to a 1/2 in. (DN15) to 1-1/2 in. (DN40) VG1000 Series ball valve



Dimensions, in./mm

M9106-xGx-2 Series Electric Non-Spring-Return Actuators (Continued)

Technical Specifications

M9106-xGx-2 Series Electric Non-Spring-Return Actuators		
Power Requirement	AGx: AC 20-30 V at 50/60 Hz, 2.5 VA supply, Class 2 IGx: AC 20-30 V at 50/60 Hz, 2.8 VA supply, Class 2 GGx: AC 20-30 V at 50/60 Hz, 3.2 VA supply, Class 2	
Control Type	AGx: floating IGx: on/off, floating GGx: DC 0(2) to 10 V or DC 0(4) to 20 mA proportional	
Input Signal	AGx and IGx: AC 20 to 30 V at 50/60 Hz GGx: DC 0 to 10 V or DC 0(4) to 20 mA	
Input Signal Adjustments:	AGx and IGx: CW and COM Terminals, CW rotation; CCW and COM terminals, CCW rotation GGx (voltage input or current input): Jumper selectable: DC 0(2) to 10 V or DC 0(4) to 20 mA Factory setting: DC 0 to 10 V, CW rotation with signal increase Action is jumper selectable direct (CW) or reverse (CCW) with signal increase.	
Input Impedance	AGx: 200 ohms, nominal IGx: 160 ohms, nominal GGx: voltage input, 150,000 ohms; current input, 500 ohms	
Feedback Signal	AGF: 10,000 ohm potentiometer, 1 W GGx: DC 0 to 10 V or DC 2 to 10 V for 90° (1 mA); Corresponds to input signal span selection	
Auxiliary Switch Rating	xGC: two single-pole, double-throw (SPDT) switches rated at AC 24 V, 1.5 A inductive, 3.0 A resistive, 35 VA maximum per switch, Class 2	
Torque Rating	1, 1.5, and 2 minute settings: 53 lb·in (6 N·m) 5.5 and 11 minute settings: 35 lb·in (4 N·m)	
Cycle Life	100,000 full cycles; 2,500,000 repositions rated at 53 lb·in (6 N·m)	
Audible Noise Rating	35 dBA maximum at 39.4 in. (1 m)	
Rotation Range	Adjustable from 30° to 90°, CW or CCW	
Rotation Time	IGx: adjustable with switch settings (factory set for 1 minute) 60, 90, 120, 330, or 660 seconds (1, 1.5, 2, 5.5 or 11 minutes) at 60 Hz and 72, 108, 144, 396, or 792 seconds at 50 Hz All other models: nominal 60 seconds at 60 Hz and 72 seconds at 50 Hz for 90°	
Electrical Connection	1/4 in. spade terminals (to order optional pluggable terminal blocks, see Accessories)	
Mechanical Connection	3/8 in. to 1/2 in. (10 mm to 12.7 mm) round shaft or 3/8 in. (10 mm) square shaft	
Enclosure Rating	NEMA 2, IP32	
Ambient Operating Rating	-4°F to 125°F (-20°C to 52°C); 90% RH maximum, noncondensing	
Ambient Storage Rating	IGx: -40°F to 186°F (-40°C to 86°C); 90% RH maximum, noncondensing All other models: -40°F to 176°F (-40°C to 80°C); 90% RH maximum, noncondensing	
Shipping Weight	2.4 lb (1.08 kg)	
Compliance CE	United States	UL 873 Listed, File E27734, CCN XAPX
	Canada	CSA C22.2 No. 139 Certified, File LR85083, Class 3221 02
	Europe	CE Mark - Johnson Controls declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive 2004/108/EC.

M9106-AGx-2N0x Series Electric Non-Spring-Return Actuators

Description

The M9106-AGA-2N0x synchronous motor-driven actuators provide floating (3-wire) control and are easily installed on a VAV box. They may also be installed on a small- to medium-sized damper with a round shaft up to 1/2 in. (13 mm) in diameter or a 3/8 in. (10 mm) square shaft.

These compact, non-spring-return actuators have 53 lb-in (6 N·m) running torque in a compact easy-to-install package. The actuators are available with either a nominal 60-second travel time at 60 Hz (72 seconds at 50 Hz) or a nominal 120-second travel time at 60 Hz (144 seconds at 50 Hz) for 90° of rotation.

The M9106-AGS-2N02 Actuator/Transmitter combines an M9106-AGA-2N02 with a prewired DPT-2015 Differential Pressure Transmitter that has a 0 in. to 1.5 in. W.C. (0 Pa to 374 Pa) differential pressure range.

Features

- simple direct coupling reduces installation and commissioning time by eliminating damper linkages
- whisper quiet 35 dBA rating meets audible requirements for open ceilings
- long life brushless synchronous drive
- motor technology provides constant rotation time independent of load
- 100,000 cycle rating, 2,500,000 repositions
- direct shaft mount with single-screw coupler simplifies installation and provides 3-point shaft gripping
- magnetic clutch provides torque protection for the actuator gear train and damper
- manual gear release simplifies setup and field adjustments

Applications

The actuators are used to position balancing, control, round, and zone dampers in typical HVAC applications. They are also used to position the blades in a VAV box. The actuators mount directly to the surface of a VAV box, round damper, or small rectangular damper with a single No. 10 self-drilling sheet metal screw (included). There are no additional linkages or couplers required. Clearly labeled electrical terminals simplify installation. Refer to the damper or VAV box manufacturer's information to select the proper timing for the actuator.

Note: The damper rotation time must be defined at the controller, and the damper point definition must match the rotation time of the actuator.

When combined with a VAV controller, the actuator provides reliable integrated damper control. Refer to the *M9106-AGx-2N0x Series Electric Non-Spring-Return Actuators Application Note (LIT-2681116)* for various configurations with and without the DPT-2015 Differential Pressure Transmitter.

Refer to the *M9106-AGx-2N0x Electric Non-Spring-Return Actuators Product Bulletin (LIT-2681126)* or the *M9106-AGx-2N0x Electric Non-Spring-Return Actuators Installation Instructions (Part No. 34-636-1077)* for important product application information.



**M9106-AGS-2N0x Series
Electric Non-Spring-Return Actuator**

Repair Information

If the M9106-AGx-2N0x Series Electric Actuator fails to operate within its specifications, replace the unit. For a replacement actuator, contact the nearest Johnson Controls® representative.

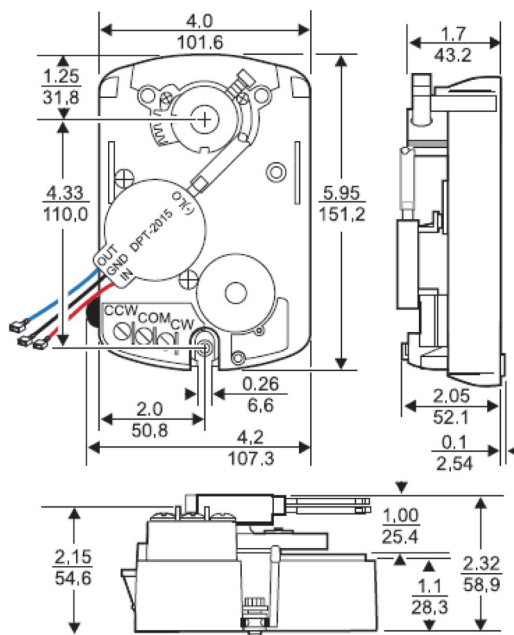
Selection Chart

Code Number	Control Type	Torque / Timing / Voltage	Auxiliary Switches	Comments
M9106-AGA-2N01	Floating	53 lb-in (6 Nm) 60 seconds at 60 Hz AC 24 V 50/60 Hz	None	Actuator only
M9106-AGA-2N02		53 lb-in (6 Nm) 120 seconds at 60 Hz AC 24 V 50/60 Hz		
M9106-AGS-2N02		53 lb-in (6 Nm) 120 seconds at 60 Hz AC 24 V 50/60 Hz		Actuator includes a DPT-2015 and CBL-2000-1

M9106-AGx-2N0x Series Electric Non-Spring-Return Actuators (Continued)

Accessories

Code Number	Description
CBL-2000-1	20 in. (0.5 m) wiring harness, UL accepted for plenum use, supplied with the M9106-AGS-2N02 and may be ordered separately; connects the M9106 and DPT-2015 to the VAV controller
CBL-2000-2	20 in. (0.5 m) plenum rated wiring harness; Underwriters Laboratories, Inc.® (UL) accepted for plenum use; connects the M9101 and DPT-2015-0 to the VAV controller
CBL-2000-3	72 in. (1.8 m) plenum rated wiring harness
DPT-2015-0	0 in. to 1.5 in. W.C. (0 Pa to 374 Pa) differential pressure transmitter
DMPR-KC003	Blade pin extension without bracket supplied with Johnson Controls CD-1300 dampers and may be ordered separately for all direct-mount applications
DMPR-KC011	Hex head blade pin extension without bracket
DMPR-KC012	Hex head blade pin extension with bracket
M9000-200	Commissioning tool provides a control signal to drive on/off, floating, proportional, or resistive actuators



Dimensions, in. (mm)

M9106-AGx-2N0x Series Electric Non-Spring-Return Actuators (Continued)

Technical Specifications

M9106-AGx-2N0x Series Electric Non-Spring-Return Actuators	
Power Requirement	M9106-AGA-2N01: AC 20...30 V at 50/60 Hz, 2.5 VA supply, Class 2 M9106-AGx-2N02: AC 20...30 V at 50/60 Hz, 2.1 VA supply, Class 2 DPT-2015: DC 15 V (DC 14.5...17 V) unregulated; 15 mA, maximum
Control Type	Floating
Input Signal	M9106-AGx-2N0x: 24 V (AC 20...30 V) at 50 or 60 Hz
DPT 2015-0	Pressure range: 0 in. to 1.5 in. W.C. (0 Pa to 374 Pa) Over pressure limit: 15 in. W.C. (3.74 kPa) Output voltage: 0.5 VDC to 4.5 VDC with 25,000 ohm minimum load impedance
Input Impedance	M9106-AGA-2N01: 200 ohms, nominal M9106-AGx-2N02: 250 ohms, nominal
Feedback Signal	N/A
Auxiliary Switch Rating	N/A
Torque Rating	53 lb·in (6 N·m)
Cycle Life	100,000 full cycles; 2,500,000 repositions rated at 53 lb·in (6 N·m)
Audible Noise Rating	35 dBA maximum at 39.4 in. (1 m)
Rotation Range	Adjustable from 30° to 90°, CW or CCW
Rotation Time	M9106-AGx-2N01: nominal 60 seconds at 60 Hz and 72 seconds at 50 Hz for 90° M9106-AGS-2N02: nominal 120 seconds at 60 Hz and 144 seconds at 50 Hz for 90°
Electrical Connection	No. 6-32 screw terminals
Mechanical Connection	3/8 in. to 1/2 in. (10 mm to 12.7 mm) round shaft or 3/8 in. (10 mm) square shaft
Enclosure Rating	NEMA1, IP30
Ambient Operating Rating	M9106-AGA-2N0x: 32°F to 125°F (0°C to 52°C); 90% RH maximum, noncondensing M9106-AGS-2N02: 32°F to 125°F (0°C to 52°C); 90% RH maximum, noncondensing 60°F to 100°F (16°C to 38°C); 90% RH maximum, noncondensing for DPT rated accuracy (Refer to the <i>DPT-2015 Differential Pressure Transmitter for VAV Box Applications Installation Instructions [Part No. 24-7547-18].</i>)
Ambient Storage Rating	-20°F to 150°F (-29°C to 66°C); 90% RH maximum, noncondensing
Shipping Weight	M9106-AGA-2N0x: 2.0 lb (0.91 kg) M9106-AGS-2N02: 2.2 lb (0.99 kg) with the DPT-2015
Agency Compliance	UL 873 Listed, File E27734, CCN XAPX CSA C22.2 No. 139 Certified, File LR85083, Class 3221 02 CE Mark, EMC Directive 2004/108/EC

M9109-xGx-2 Series Electric Non-Spring-Return Actuators

Description

The M9109 Series direct-mount electric actuators operate on AC 24 V power and are available for use with floating or proportional controllers. These non-spring-return actuators are easily installed on a VAV box, a round damper shaft up to 1/2 in. (13 mm) in diameter, or a 3/8 in. (10 mm) square shaft. The M9109 with an M9000-520 linkage can be used to control 2 in. (DN50) VG1000 Series ball valves.

The M9109 models have 80 lb-in (9 N·m) running torque. They have a nominal 60-second travel time for 90° of rotation at 60 Hz (72 seconds at 50 Hz) with a load-independent rotation time. The M9109-xGC-2 models are available with integral auxiliary switches to perform switching functions at any angle within the selected rotation range.

Refer to the *M9109 Series Electric Non-Spring-Return Actuators Product Bulletin (LIT-120112)* for important product application information.

Applications

The M9109 is used to position balancing, control, round, and zone dampers in typical HVAC applications. It can also be used with an M9000-520 linkage to control VG1000 Series ball valves. The M9109 mounts directly on the duct surface, round damper, or small rectangular damper with an anti-rotation bracket and two sheet metal screws (included). Additional linkages or couplers are not required. For more information, refer to the *M9109 Series Electric Non-Spring-Return Actuators Installation Instructions (Part No. 34-636-1190)*.

Features

- simple direct coupling reduces installation and commissioning time and improves reliability by eliminating damper linkages
- Single screw coupling provides three-point shaft gripping
- designed for zone damper and ball valve actuator applications
- small, compact design allows installation in tight-fitting locations
- designed for zone damper and ball valve actuator applications
- floating and proportional control inputs
- 60-second running time at 60 Hz
- long life brushless synchronous drive motor technology provides constant running time independent of load
- robust 80 lb-in (9 N·m) torque rating
- whisper quiet 35 dBA noise rating
- magnetic clutch provides over torque protection over the entire range of rotation
- -4°F to 125°F (-20°C to 52°C) ambient temperature rating
- 100,000 full stroke cycle, 2,500,000 reposition rating
- manual gear release simplifies setup and field adjustments
- 1/2 in. NPT threaded conduit opening meets electrical code requirements and allows the use of flexible armored cable
- position feedback (-GGX models) provides simple, closed-loop control with accurate position sensing
- adjustable rotation stops allow application versatility with 30 to 90° clockwise or counterclockwise rotation



**M9109-xGx-2 Series
Electric Non-Spring-Return Actuator**

Repair Information

If the M9109-xGx-2 Series Electric Actuator fails to operate within its specifications, replace the unit. For a replacement actuator, contact the nearest Johnson Controls® representative.

Selection Chart

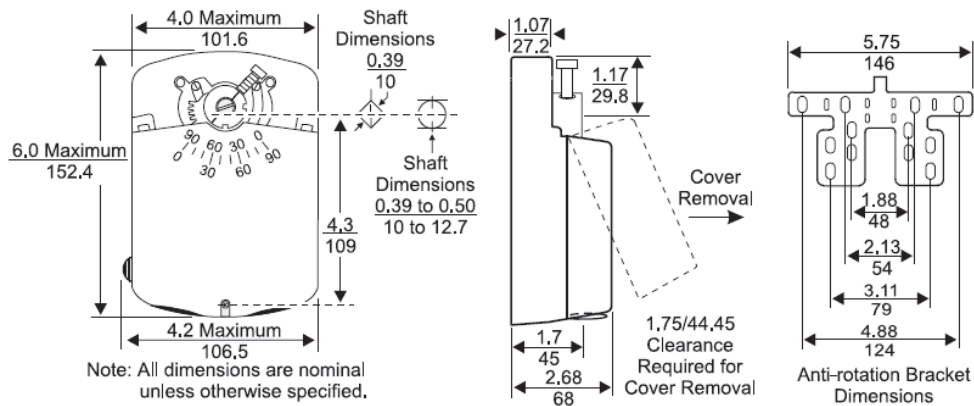
Code Number	Control Type	Torque / Timing / Voltage	Auxiliary Switches	Comments
M9109-AGA-2 ¹	Floating	80 lb-in (9 N·m) 60 seconds at 60 Hz AC 24 V 50/60 Hz	None	
M9109-AGC-2 ¹			2-SPDT	
M9109-GGA-2	DC 0(2) to 10 V		None	DC 0(2) to 10 V feedback
M9109-GGC-2	DC 0(4) to 20 mA proportional		2-SPDT	

1. To avoid excessive wear or drive time on the motor for the -AGx models, use a controller and/or software that provides a time-out function to remove the signal at the end of rotation (stall). The -GGx models have an auto shutoff to avoid excessive wear or drive time on the motor.

M9109-xGx-2 Series Electric Non-Spring-Return Actuators (Continued)

Accessories

Code Number	Description
DMPR-KC003	Square head blade pin extension without bracket
DMPR-KC010	Adjustable blade position indicator switch kit with total switching load limited to 2,000 VA for the following applications: Pilot duty: AC 24 V, 50 VA; AC 125/250/277 V, 125 VA Motor load: AC 125/250/277 V, 1/3 hp Resistive load: AC 125 V, 11 A; AC 250 V, 8 A; AC 277 V, 7 A (all maximum values)
DMPR-KC011	Hex head blade pin extension without bracket
DMPR-KC012	Hex head blade pin extension with bracket
DMPR-KC213	Damper jackshaft 1/2 in. diameter, 1 panel
DMPR-KC214	Damper jackshaft 1/2 in. diameter, 2 panel
M9000-105	Pluggable 3-terminal block
M9000-106	Pluggable 4-terminal block
M9000-160	Replacement anti-rotation bracket for M9106 and M9109 Series actuators
M9000-520	Valve linkage kit for field mounting an M9109 actuator to a 2 in. (DN50) VG1000 Series ball valve



Dimensions, in./mm

M9109-xGx-2 Series Electric Non-Spring-Return Actuators (Continued)

Technical Specifications

M9109-xGx-2 Series Electric Non-Spring-Return Actuators		
Power Requirement		AGx: AC 20 to 30 V at 50/60 Hz, 2.5 VA supply, Class 2 GGx: AC 20 to 30 V at 50/60 Hz, 3.2 VA supply, Class 2
Control Type		AGx: floating GGx: DC 0(2) to 10 V or DC 0(4) to 20 mA proportional
Input Signal		AGx: AC 20 to 30 V at 50/60 Hz GGx: DC 0(2) to 10 V or DC 0(4) to 20 mA
Input Signal Adjustments:		AGx: CW and COM terminals, CW rotation; CCW and COM terminals, CCW rotation GGx (voltage input or current input): Jumper selectable: DC 0(2) to 10 V or DC 0(4) to 20 mA Factory setting: DC 0 to 10 V, CW rotation with signal increase Action is jumper selectable direct (CW) or reverse (CCW) with signal increase.
Input Impedance		AGx: 200 ohms, nominal GGx: voltage input, 150,000 ohms; current input, 500 ohms
Feedback Signal		AGF: 10,000 ohm potentiometer, 1 W GGx: DC 0 to 10 V or DC 2 to 10 V for 90° (10 VDC at 1 mA); Corresponds to input signal span selection
Auxiliary Switch Rating		xGC: two single-pole, double-throw (SPDT) switches rated at AC 24 V, 1.5 A inductive, 3.0 A resistive, 35 VA maximum per switch, Class 2
Torque Rating		80 lb·in (9 N·m)
Cycle Life		100,000 full cycles; 2,500,000 repositions rated at 80 lb·in (9 N·m)
Audible Noise Rating		35 dBA maximum at 39.4 in. (1 m)
Rotation Range		Adjustable from 30° to 90°, CW or CCW
Rotation Time		60 seconds at 60 Hz and 72 seconds at 50 Hz for 90°
Electrical Connection		1/4 in. spade terminals (to order optional pluggable terminal blocks, see Accessories)
Mechanical Connection		3/8 in. to 1/2 in. (10 mm to 12.7 mm) round shaft or 3/8 in. (10 mm) square shaft
Enclosure Rating		NEMA 2, IP32
Ambient Operating Rating		-4°F to 125°F (-20°C to 52°C); 90% RH maximum, noncondensing
Ambient Storage Rating		-40°F to 176°F (-40°C to 80°C); 90% RH maximum, noncondensing
Shipping Weight		2.4 lb (1.08 kg)
Compliance 	United States	UL 873 Listed, File E27734, CCN XAPX
	Canada	CSA C22.2 No. 139 Certified, File LR85083, Class 3221 02
	Europe	CE Mark - Johnson Controls declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive 2004/108/EC.

M9116, M9124, and M9132 Series Electric Non-Spring-Return Actuators

Description

The M91xx Series includes M9116, M9124, and M9132 models. All of these direct-mount electric actuators operate on AC/DC 24 V power. The M91xx actuators are available for use with on/off, floating, proportional, or resistive controllers. These bidirectional actuators do not require a damper linkage, and are easily installed on a damper with a round shaft up to a 3/4 in. (20 mm) in diameter or a square shaft up to 5/8 in. (16 mm). They may be direct or remote mounted to a damper, or mounted to a valve using one of the M9000-5xx Valve Linkage Kits.

A single M91xx model delivers up to 280 lb·in (32 N·m) of torque. Two -AGx, -GGx, or -HGx models in tandem deliver twice the torque or 560 lb·in (64 N·m). The angle of rotation is mechanically adjustable from 0 to 90° in 5-degree increments. Integral auxiliary switches are available to indicate end-stop position or to perform switching functions at any angle within the selected rotation range. Position feedback is available through switches, a potentiometer, or a DC 0(2) to 10 V signal.

Features

- simple direct coupling reduces installation and commissioning time while improving reliability by eliminating damper linkages
- six torques: 70 lb·in to 560 lb·in (8 N·m to 64 N·m) offer the most suitable choice for the application
- four control inputs meet the needs of most applications
- output position feedback provides simple closed-loop control with accurate position sensing
- electronic stall detection ensures higher reliability by deactivating the actuator motor when a stall condition is detected

- master/slave operation allows synchronized control for two actuators
- stacked for tandem applications
- zero and span adjustment (-HGx models) allows sequential operation of dampers from a single input signal of DC 0(2) to 10 V, DC 0(4) to 20 V, or DC 0(4) to 20 mA
- jumper-selectable rotation direction and manual gear release simplify installation, setup, and field adjustments
- NPT threaded housing provides easy connection for electrical fittings
- manual gear release simplifies damper/valve setup and commissioning

Applications

M91xx actuators are designed to position air dampers and valves in HVAC systems. Applications include: positioning return air or exhaust dampers, controlling face and bypass dampers, positioning blades for variable volume fans, positioning VF Series butterfly valves, and positioning VG1000 Series ball valves. Two of the following models provide twice the amount of running torque of a single unit when mounted in tandem: M9116-GGx or -HGx, M9124-AGx, -GGx or -HGx, and M9132-AGx or -GGx.

Refer to the manufacturer's information to properly size the damper, valve, and/or actuator. These compact M91xx actuators use a DC motor with stall detection circuitry that operates throughout the entire stroke.

The -GGx, -HGx, and -JGx models employ noise-filtering techniques on the control signal to eliminate repositioning due to line noise.

Rotation is mechanically limited to 93° by integral end stops. The position of the actuator is visually indicated from 0° to 90° on the cover. An anti-rotation bracket prevents lateral movement of the actuator. Pressing the spring-loaded gear release on the actuator



M9116 Series Electric Non-Spring-Return Actuators

cover disengages the gear train for manual repositioning of the coupler.

Refer to the *M9116, M9124, M9132 Series Electric Non-Spring-Return Actuators Product Bulletin (LIT-2681058)* or the *M9116, M9124, M9132 Series Electric Non-Spring-Return Actuators Installation Instructions (Part No. 34-636-399)* for important product application information and single point of contact information.

Repair Information

If the M9116, M9124, or M9132 Series Electric Actuator fails to operate within its specifications, replace the unit. For a replacement actuator, contact the nearest Johnson Controls representative.

Selection Chart

M9116, M9124, and M9132 Series Electric Non-Spring-Return Actuators (Part 1 of 2)

Code Number	Control Type	Torque / Timing / Voltage	Auxiliary Switches	Comments
M9116 Electric Non-Spring-Return Actuators				
M9116-AGA-2	On/off, floating	140 lb·in (16 N·m) 70 to 115 seconds AC 24 V 50/60 Hz DC 24 V	None	
M9116-AGC-2			2-SPDT	
M9116-AGD-2			None	135 ohm potentiometer
M9116-AGE-2			None	1,000 ohm potentiometer
M9116-GGA-2	DC 0(2) to 10 V		None	DC 0(2) to 10 V feedback
M9116-GGC-2	DC 0(4) to mA proportional		2-SPDT	
M9116-HGA-2	DC 0 to 10 V		None	DC 0 to 10 V feedback
M9116-HGC-2	DC 0 to 20 mA proportional Adjustable start and span		2-SPDT	
M9116-JGA-2	100 ohm to 10,000 ohm potentiometer		None	
M9116-JGC-2			2-SPDT	

M9116, M9124, and M9132 Series Electric Non-Spring-Return Actuators (Continued)

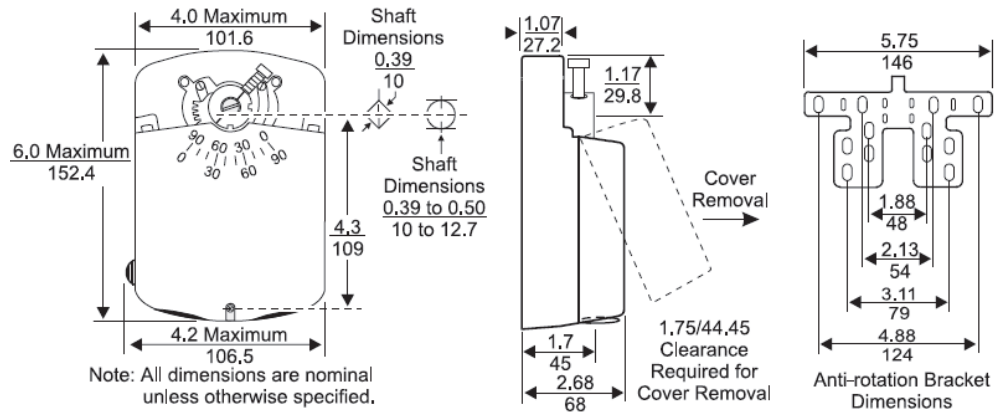
M9116, M9124, and M9132 Series Electric Non-Spring-Return Actuators (Part 2 of 2)

Code Number	Control Type	Torque / Timing / Voltage	Auxiliary Switches	Comments	
M9124 Electric Non-Spring-Return Actuators					
M9124-AGA-2	On/off, floating	210 lb-in (24 N·m) 115 to 175 seconds AC 24 V 50/60 Hz DC 24 V	None		
M9124-AGC-2			2-SPDT		
M9124-AGD-2			None		135 ohm potentiometer
M9124-AGE-2			None		1,000 ohm potentiometer
M9124-GGA-2	DC 0(2) to 10 V		None	DC 0(2) to 10 V feedback	
M9124-GGC-2	DC 0(4) to mA proportional		2-SPDT		
M9124-HGA-2	DC 0 to 10 V		None	DC 0 to 10 V feedback	
M9124-HGC-2	DC 0 to 20 mA proportional Adjustable start and span		2-SPDT		
M9124-JGA-2	100 ohm to 10,000 ohm potentiometer		None		
M9124-JGC-2			2-SPDT		
M9132 Electric Non-Spring-Return Actuators					
M9132-AGA-2	On/off, floating	280 lb-in (32 N·m) 115 to 205 seconds AC 24 V 50/60 Hz DC 24 V	None		
M9132-AGC-2			2-SPDT		
M9132-AGE-2			None		1,000 ohm potentiometer
M9132-GGA-2	DC 0(2) to 10 V		None	DC 0(2) to 10 V feedback	
M9132-GGC-2	DC 0(4) to mA proportional		2-SPDT		

Accessories

Code Number	Description
DMPR-KC003	Square head blade pin extension without bracket for Johnson Controls® CD-1300 direct-mount applications Note: Available with damper and may be ordered separately
DMPR-KC011	Hex head blade pin extension without bracket
DMPR-KC012	Hex head blade pin extension with bracket
DMPR-KC210	Damper jackshaft 1 in. diameter, 1 panel
DMPR-KC211	Damper jackshaft 1 in. diameter, 2 panel
DMPR-KC212	Damper jackshaft 1 in. diameter, 3 panel
DMPR-KC213	Damper jackshaft 1/2 in. diameter, 1 panel
DMPR-KC214	Damper jackshaft 1/2 in. diameter, 2 panel
M9000-103	14 VA transformer, 120/24 VAC, 60 Hz, Class 2
M9000-104	14 VA transformer, 230/24 VAC, 60 Hz, Class 2
M9000-105	Pluggable 3-terminal block
M9000-151	Base mount linkage kit for remote inside duct mounting (not intended for M9132 actuators or any tandem application)
M9000-153	Crankarm kit for remote mounting (not intended for M9132 actuators or any tandem application)
M9000-154	1 in. jackshaft coupler for mounting on a 1 in. diameter damper shaft
M9000-155	Manual handle for positioning a damper or valve when power is removed from an M91xx actuator
M9000-158	Mounting kit to tandem mount two M9116-GGx or -HGx models; two M9124-AGx, -GGx, or -HGx; or two M9132-AGx or -GGx models on a damper
M9000-160	Replacement anti-rotation bracket for M91xx Series actuators
M9000-518	Valve linkage kit for mounting M9124 actuators to 2-1/2 to 6 in. VG1xA5 Series flange body ball valves and to VG1243/VG1644 series 1 to 2 in. valves

M9116, M9124, and M9132 Series Electric Non-Spring-Return Actuators (Continued)



Dimensions, in./mm

M9116, M9124, and M9132 Series Electric Non-Spring-Return Actuators (Continued)

Technical Specifications

M9116, M9124, and M9132 Series Electric Non-Spring-Return Actuators	
Power Requirement	M9116-AGx: AC 20 to 30 V at 50/60 Hz or DC 24 V $\pm 10\%$; 6.5 VA supply minimum All other models: AC 20 to 30 V at 50/60 Hz or DC 24 V $\pm 10\%$; 7.5 VA supply minimum
Control Type	AGx: on/off and floating GGx: DC 0(2) to 10 V or DC 0(4) to 20 mA proportional HGx: DC 0 to 10 V or DC 0 to 20 mA proportional with adjustable start and span JGx: proportional from 100 ohm to 10,000 ohm potentiometer controller
Input Signal	AGx: V 24 AC at 50/60 Hz or DC 24 V GGx and HGx: DC 0(2) to 10 V, DC 0(4) to 20 V, or DC 0(4) to 20 mA JGx: potentiometer value is 100 ohms minimum to 10,000 ohms maximum
Input Signal Adjustments	AGx: factory setting, terminals 1 and 2, CW rotation; terminals 1 and 3, CCW rotation GGx and HGx (voltage input or current input): Jumper selectable: DC 0(2) to 10 V, DC 0(4) to 20 V, or DC 0(4) to 20 mA Adjustable: zero, DC 0 to 6 V, DC 0 to 12 V, or DC 0 to 12 mA Span, DC 2 to 10 V, DC 4 to 20 V, or DC 4 to 20 mA Factory setting: DC 0 to 10 V, DC 0 to 20 mA, CW rotation with signal increase GGx, HGx, and JGx: action is jumper selectable direct (CW) or reverse (CCW) with signal increase.
Input Impedance	GGx and HGx: voltage input, 205,000 ohms for 0 (2) to 10 V and 410,000 ohms for 0 (4) to 20 V; current input, 500 ohms JGx: 1.8 megohms
Feedback Signal	AGD: 135 ohm feedback potentiometer AGE: 1,000 ohm feedback potentiometer GGx and HGx: DC 0 to 10 V or DC 2 to 10 V for 90° (10 VDC at 1 mA) corresponds to input signal span selection. JGx: DC 0 to 10 V for 90° (10 VDC at 1 mA)
Auxiliary Switch Rating	xGC: two single-pole, double-throw (SPDT) switches rated at 24 VAC 1.5 A inductive, 3.0 A resistive, 35 VA maximum per switch, Class 2
Torque Rating	M9116: 140 lb·in (16 N·m) for one unit, 280 lb·in (32 N·m) for two in tandem (-GGx, -HGx) M9124: 210 lb·in (24 N·m) for one unit, 420 lb·in (48 N·m) for two in tandem (-AGx, -GGx, -HGx) M9132: 280 lb·in (32 N·m) for one unit, 560 lb·in (64 N·m) for two in tandem (-AGx, -GGx)
Cycle Life	M9116 and M9124 60,000 cycles at rated load M9132 30,000 cycles at rated load
Audible Noise Rating	45 dBA at 1 m
Rotation Range	0° to 90° in 5-degree increments, mechanically limited to 93° - rotation range is adjusted by repositioning the output hub
Rotation Time	M9116: 80 seconds at 50% rated load, 70 to 115 seconds for 0 lb·in to 140 lb·in (0 N·m to 16 N·m) M9124: 130 seconds at 50% rated load, 115 to 175 seconds for 0 lb·in to 210 lb·in (0 N·m to 24 N·m) M9132: 140 seconds at 50% rated load, 115 to 205 seconds for 0 lb·in to 280 lb·in (0 N·m to 32 N·m)
Electrical Connection	M9124- and M9132-AGx: 1/4 in. spade terminals with pluggable 3-terminal blocks (see Accessories) All other models: screw terminals for 22 AWG to 14 AWG; maximum of two 18, 20, or 22 AWG per terminal
Mechanical Connection	3/8 in. to 3/4 in. (10 mm to 20 mm) diameter round shaft or 3/8 in. to 5/8 in. (10 mm to 16 mm) square shaft 1 in. (25.4 mm) diameter jackshaft with M9000-154 coupler
Enclosure Rating	NEMA 2, IP42
Ambient Operating Rating	-4°F to 122°F (-20°C to 50°C); 0% to 95% RH, noncondensing
Ambient Storage Rating	-40°F to 186°F (-40°C to 86°C); 0% to 95% RH, noncondensing
Shipping Weight	2.9 lb (1.3 kg)
Compliance 	United States UL 873 Listed, File E27734, CCN XAPX
	Canada CSA C22.2 No. 139 Certified, File LR85083, Class 3221 02
	Europe CE Mark - Johnson Controls declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive and Low Voltage Directive.
	Australia and New Zealand RCM Mark, Australia/NZ Emissions Compliant (Models: All M9220-xGx and M9220-xDx)

M9203-xxx-2(Z) Series Electric Spring-Return Actuators

Description

The M9203-xxx-2(Z) Series Electric Spring-Return Actuators provide control of dampers in HVAC systems. All actuators in this series provide 27 lb-in (3 N·m) rated torque. A mechanical spring-return system provides rated torque with and without power applied to the actuator. The series includes the following control options:

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

These actuators are configured for direct mounting and do not require a damper linkage. Actuators can be mounted directly to a damper shaft from 1/4 to 1/2 in. (6 to 12 mm) diameter with a universal clamp. 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.

Refer to the *M9203-xxx-2(Z) Series Electric Spring-Return Actuators Product Bulletin (LIT-12011674)* for important product application information.

Features

- 27 lb-in (3 N·m) rated torque
- direct-coupled design
- reversible mounting
- electronic stall detection
- double-insulated construction
- microprocessor-controlled brushless DC motor (-AGx and -GGx types)
- external mode selection switch (-AGx and -GGx types)
- integral cables with colored and numbered conductors
- integral 1/2 in. (13 mm) threaded conduit connectors
- optional integrated auxiliary switch
- plenum rated models
- override control (proportional models only)
- Underwriters Laboratories Inc.® (UL), CE, and C-Tick compliance
- manufactured under International Standards Organization (ISO) 9001 quality control standards
- 5-year warranty



M9203-xxx-2(Z) Series Electric Spring-Return Actuator

Accessories and Replacement Parts

Code Number	Description
DMPR-KC003	7 in. (178 mm) Blade Pin Extension (without Bracket) for Johnson Controls Direct-Mount Damper Applications (Quantity 1) Note: Available with damper and may be ordered separately
M9000-322	Weather Shield Kit for Damper Application of M9203, M9208, VA9104, VA9308/9310 Series Electric Actuators (Quantity 1)
M9000-400	Jackshaft Linkage Adapter Kit (Quantity 1)
M9000-560	Ball Valve Linkage Kit for Applying M9104, M9203, and M9208 Series Electric Actuators to VG1000 Series Valves (Quantity 1)
M9000-561	Thermal Barrier Kit for M9000-560 Ball Valve Linkage. Extends M(VA)9104, M(VA)9203, and M(VA)9208 Series Electric Spring-Return Actuators Applications to Include Low-Pressure Steam (Quantity 1)
M9000-604	Replacement Anti-Rotation Bracket Kit for M9203, M9208, M9210, and M9220 Series Electric Spring-Return Actuators (Quantity 1)
M9000-606	Position Indicator for Damper Applications (Quantity 5)
M9000-607	Position Indicator for VG1000 Series Ball Valve Applications (Quantity 5)
M9203-100	Remote Mounting Kit with Crankarm Kit (Quantity 1)
M9203-110	Universal Mounting Kit without Crankarm Kit (Quantity 1)
M9203-115	Universal Mounting Kit with Crankarm Kit (Quantity 1)
M9203-150	Crankarm Kit (Quantity 1)
M9203-250	Remote Mounting Kit with Crankarm Kit and Damper Linkage for D1300 Dampers (Quantity 1)
M9203-601	Replacement Standard Coupler Kit (with Retainer) for Mounting M9203 Series Electric Spring-Return Actuators (Quantity 1)
M9203-602	Replacement Retainer for M9203 Series Electric Spring-Return Actuators (Quantity 5)
M9203-603	Adjustable Stop Kit for M9203 Series Electric Spring-Return Actuators (Quantity 1)

M9203-xxx-2(Z) Series Electric Spring-Return Actuators (Continued)

Selection Chart

Code Number	Rotation Time (Seconds) for 90°		Power Requirements		Power Consumption			Input Signal			Position Feedback	Auxiliary Switch	Electrical Connection		
	Power On — Running	Power Off — Spring Return	24 VAC +/- 20%, VDC +/-10%	85 to 264 VAC	VA Rating, Transformer Sizing	VA: Running (Holding)	Amperage: Running (Holding)	On/Off	On/Off and Floating Point	0(2) to 10 VDC 0(4) to 20 mA (with 500 Ohm Resistor)			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
M9203-AGA-2	150	< 25	■		6	4.7 (2.7)	—		■					■	■
M9203-AGB-2	150	< 25	■		6	4.7 (2.7)	—		■			■	■		■
M9203-AGA-2Z	90	< 25	■		6	5.1 (2.8)	—		■					■	■
M9203-AGB-2Z	90	< 25	■		6	5.1 (2.8)	—		■			■	■		■
M9203-BGA-2	< 75	< 25	■		6	5.0 (2.5)	—	■					■		■
M9203-BGB-2	< 75	< 25	■		6	5.0 (2.5)	—	■				■	■		■
M9203-BUA-2	< 75	< 25		■		—	0.06 (0.02)	■					■		■
M9203-BUB-2	< 75	< 25		■		—	0.06 (0.02)	■				■	■		■
M9203-BUA-2Z	< 30	< 25		■		—	0.08 (0.02)	■					■		■
M9203-BUB-2Z	< 30	< 25		■		—	0.08 (0.02)	■				■	■		■
M9203-GGA-2	150	< 25	■		6	4.7 (2.7)	—			■	■			■	■
M9203-GGB-2	150	< 25	■		6	4.7 (2.7)	—			■	■	■	■		■
M9203-GGA-2Z	90	< 25	■		6	5.1 (2.8)	—			■	■			■	■
M9203-GGB-2Z	90	< 25	■		6	5.1 (2.8)	—			■	■	■	■		■

M9203-xxx-2(Z) Series Electric Spring-Return Actuators (Continued)

Technical Specifications

M9203-GGx-2(Z) Series Proportional Electric Spring-Return Actuator (Part 1 of 2)		
Power Requirements	-GGx-2 Models	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 DC 24 V (DC 21.6 V to 28.8 V): Class 2 (North America) or SELV (Europe), 1.8 W Running, 1 W Holding Position Minimum Transformer Size: 6 VA per Actuator
	-GGx-2Z Models	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 DC 24 V (DC 19.2 V to 28.8 V): Class 2 (North America) or SELV (Europe), 1.9 W Running, 1.1 W Holding Position Minimum Transformer Size: 6 VA per Actuator
Input Signal / Adjustments		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 Ohms Current Input: 500 Ohms 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	-xxB Models	One 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 Damper or Valve: CCW Spring Return Actuator Face Labeled B is away from Damper or Valve: CW Spring Return
Rated Torque	Power On (Running)	27 lb-in (3 N·m) All Operating Temperatures
	Power Off (Spring Returning)	27 lb-in (3 N·m) 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) -GGx-2 Models	150 Seconds Constant for 0 lb-in to 27 lb-in (3 N·m) Load, at All Operating Conditions
	Power On (Running) -GGx-2Z Models	90 Seconds Constant for 0 lb-in to 27 lb-in (3 N·m) Load, at All Operating Conditions
	Power Off (Spring Returning)	12 to 17 Seconds for 0 lb-in to 27 lb-in (3 N·m) Load, at Room Temperature 16 Seconds Nominal at Full Rated Load 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 1,500,000 Repositions with 27 lb-in (3 N·m) Load
Audible Noise Rating	Power On (Running) -GGx-2 Models	< 28 dBA at 27 lb-in (3 N·m) Load, at a Distance of 39-13/32 in. (1 m)
	Power On (Running) -GGx-2Z Models	< 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	-GGA-2(Z) Models	120 in. (3.05 m) UL 444 Type CMP Plenum Rated Cable with 19 AWG (0.75 mm ²) Conductors and 0.25 in. (6 mm) Ferrule Ends
	Auxiliary Switch (-xxB Models)	48 in. (1.2 m) UL 758 Type AWM Halogen-Free Cable with 18 AWG (0.85 mm ²) Conductors and 0.25 in. (6 mm) Ferrule Ends
Conduit Connections		Integral 1/2 in. (13 mm) Threaded Conduit Connectors
Mechanical Connections	Round Shafts	Range of Sizes: 1/4 in. to 1/2 in. (6 mm to 12 mm)
	Square Shafts	Range of Sizes: 1/4 in. to 5/16 in. (6 mm to 8 mm)
Enclosure Rating		NEMA 2 (IP54) for All Mounting Orientations
Ambient Conditions	Standard Operating	-22°F to 140°F (-30°C to 60°C); 90% RH Maximum, Noncondensing
	Storage	-40°F to 185°F (-40°C to 85°C); 95% RH Maximum, Noncondensing
Dimensions		6.38 in. x 3.23 in. x 2.26 in. (162 mm x 82 mm x 57.5 mm)

The performance specifications are nominal and conform to acceptable industry standards. For applications at conditions beyond these specifications, consult the local Johnson Controls office. Johnson Controls shall not be liable for damages resulting from misapplication or misuse of its products. © 2019 Johnson Controls. www.johnsoncontrols.com

M9203-xxx-2(Z) Series Electric Spring-Return Actuators (Continued)

M9203-GGx-2(Z) Series Proportional Electric Spring-Return Actuator (Part 2 of 2)		
	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. (Models: All)
	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. (Models: All)
	Europe	CE Mark – Johnson Controls 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. (Models: All)
Shipping Weight		-GGA Models: 2.0 lb (0.9 kg) -GGB Models: 2.4 lb (1.1 kg)
M9203-AGx-2(Z) Series On/Off and Floating Point Control Electric Spring-Return Actuator (Part 1 of 2)		
Power Requirements	-AGx-2 Models	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 DC 24 V (DC 21.6 V to 28.8 V): Class 2 (North America) or SELV (Europe), 1.8 W Running, 1 W Holding Position Minimum Transformer Size: 6 VA per Actuator
	-AGx-2Z Models	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 DC 24 V (DC 19.2 V to 28.8 V): Class 2 (North America) or SELV (Europe), 1.9 W Running, 1.1 W Holding Position Minimum Transformer Size: 6 VA per Actuator
Input Signal	-AGx-2(Z) Models	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 ms
Control Input Impedance	-AGx-2(Z) Models	4,700 Ohms
Auxiliary Switch Rating	-xxB Models	One 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 Damper or Valve: CCW Spring Return Actuator Face Labeled B is away from Damper or Valve: CW Spring Return
Rated Torque	Power On (Running)	27 lb·in (3 N·m) All Operating Temperatures
	Power Off (Spring Returning)	27 lb·in (3 N·m) 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) -AGx-2 Models	150 Seconds Constant for 0 lb·in to 27 lb·in (3 N·m) Load, at All Operating Conditions
	Power On (Running) -AGx-2Z Models	90 Seconds Constant for 0 lb·in to 27 lb·in (3 N·m) Load, at All Operating Conditions
	Power Off (Spring Returning)	12 to 17 Seconds for 0 lb·in to 27 lb·in (3 N·m) Load, at Room Temperature 16 Seconds Nominal at Full Rated Load 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 1,500,000 Repositions with 27 lb·in (3 N·m) Load
Audible Noise Rating	Power On (Running) -AGx-2 Models	< 28 dBA at 27 lb·in (3 N·m) Load, at a Distance of 39-13/32 in. (1 m)
	Power On (Running) -AGx-2Z Models	< 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)

M9203-xxx-2(Z) Series Electric Spring-Return Actuators (Continued)

M9203-AGx-2(Z) Series On/Off and Floating Point Control Electric Spring-Return Actuator (Part 2 of 2)		
Electrical Connections	-AGA-2(Z) Models	120 in. (3.05 m) UL 444 Type CMP Plenum Rated Cable with 19 AWG (0.75 mm ²) Conductors and 0.25 in. (6 mm) Ferrule Ends
	Auxiliary Switch (-xxB Models)	48 in. (1.2 m) UL 758 Type AWM Halogen-Free Cable with 18 AWG (0.85 mm ²) Conductors and 0.25 in. (6 mm) Ferrule Ends
Conduit Connections		Integral 1/2 in. (13 mm) Threaded Conduit Connectors
Mechanical Connections	Round Shafts	Range of Sizes: 1/4 in. to 1/2 in. (6 mm to 12 mm)
	Square Shafts	Range of Sizes: 1/4 in. to 5/16 in. (6 mm to 8 mm)
Enclosure Rating		NEMA 2 (IP54) for All Mounting Orientations
Ambient Conditions	Standard Operating	-22°F to 140°F (-30°C to 60°C); 90% RH Maximum, Noncondensing
	Storage	-40°F to 185°F (-40°C to 85°C); 95% RH Maximum, Noncondensing
Dimensions		6.38 in. x 3.23 in. x 2.26 in. (162 mm x 82 mm x 57.5 mm)
CE 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. (Models: All)
	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 (Models: All)
	Europe	CE Mark – Johnson Controls 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 (Models: All)
Shipping Weight		-AGA Models: 2.0 lb (0.9 kg) -AGB Models: 2.4 lb (1.1 kg)

M9203-Bxx-2(Z) Series On/Off Electric Spring-Return Actuators (Part 1 of 2)		
Power Requirements	-BGx-2 Models	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 DC 24 V (DC 21.6 V to 28.8 V): Class 2 (North America) or SELV (Europe), 2.8 W Running, 0.8 W Holding Position Minimum Transformer Size: 6 VA per Actuator
	-BUx-2 Models	AC 100 to 240 V (AC 85 V to 264 V) at 50/60 Hz: 0.06 A Running, 0.02 A Holding Position
	-BUx-2Z Models	AC 100 to 240 V (AC 85 V to 264 V) at 50/60 Hz: 0.08 A Running, 0.02 A Holding Position
Auxiliary Switch Rating	-xxB Models	One 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 Side A is away from Damper or Valve: CCW Spring Return Actuator Side B is away from Damper or Valve: CW Spring Return
Rated Torque	Power On (Running)	27 lb·in (3 N·m) All Operating Temperatures
	Power Off (Spring Returning)	27 lb·in (3 N·m) 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) -Bxx-2 Models	53 to 71 Seconds for 0 lb·in to 27 lb·in (3 N·m) Load, at Room Temperature 60 Seconds Nominal at Full Rated Load (0.25 rpm)
	Power On (Running) -BUx-2Z Models	24 to 28 Seconds for 0 lb·in to 27 lb·in (3 N·m) Load, at Room Temperature 27 Seconds Nominal at Full Rated Load (0.5 rpm)
	Power Off (Spring Returning)	19 to 23 Seconds for 0 lb·in to 27 lb·in (3 N·m) Load, at Room Temperature 22 Seconds Nominal at Full Rated Load 28 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

M9203-xxx-2(Z) Series Electric Spring-Return Actuators (Continued)

M9203-Bxx-2(Z) Series On/Off Electric Spring-Return Actuators (Part 2 of 2)		
Audible Noise Rating	Power On (Running) -Bxx-2 Models	< 36 dBA at 27 lb-in (3 N·m) Load, at a Distance of 39-13/32 in. (1 m)
	Power On (Running) -BUx-2Z Models	< 45 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)	< 51 dBA at 27 lb-in (3 N·m) Load, at a Distance of 39-13/32 in. (1 m)
Electrical Connections	Actuator (All Models)	48 in. (1.2 m) UL 758 Type AWM Halogen-Free Cable with 18 AWG (0.85 mm ²) Conductors and 0.25 in. (6 mm) Ferrule Ends
	Auxiliary Switch (-xxB Models)	48 in. (1.2 m) UL 758 Type AWM Halogen-Free Cable with 18 AWG (0.85 mm ²) Conductors and 0.25 in. (6 mm) Ferrule Ends
Conduit Connections		Integral 1/2 in. (13 mm) Threaded Conduit Connectors
Mechanical Connections	Round Shafts	Range of Sizes: 1/4 in. to 1/2 in. (6 mm to 12 mm)
	Square Shafts	Range of Sizes: 1/4 in. to 5/16 in. (6 mm to 8 mm)
Enclosure Rating		NEMA 2 (IP54) for All Mounting Orientations
Ambient Conditions	Standard Operating	-22°F to 140°F (-30°C to 60°C); 90% RH Maximum, Noncondensing
	Storage	-40°F to 185°F (-40°C to 85°C); 95% RH Maximum, Noncondensing
Dimensions		6.38 in. x 3.23 in. x 2.26 in. (162 mm x 82 mm x 57.5 mm)
CE 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. (Models: All)
	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 (Models: All).
	Europe	CE Mark – Johnson Controls 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 (Models: All)
Shipping Weight		-BxA Models: 2.0 lb (0.9 kg) -BxB Models: 2.4 lb (1.1 kg)

M9208-xxx-x Series Electric Spring-Return Actuators

Description

The M9208-xxx-x Series Electric Spring-Return Actuators provide control of dampers in HVAC systems. All actuators in this series provide 70 lb-in (8 N·m) rated torque. A mechanical spring-return system provides rated torque with and without power applied to the actuator. The series includes the following control options:

- On/Off, 24 V, 120 VAC, 230 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

These actuators are configured for direct mounting and do not require a damper linkage. Actuators can be mounted directly to a damper shaft from 5/16 to 5/8 in. (8 to 16 mm) diameter with a universal clamp. For shafts up to 3/4 in. (19 mm) diameter, use the accessory Large Shaft Coupler Kit M9208-600. An accessory crankarm and remote mounting kit are available for applications where the actuator cannot be direct coupled to the damper shaft. Optional line voltage auxiliary switches indicate an end-stop position or perform switching functions within the selected rotation range.

Refer to the *M9208-xxx-x Series Electric Spring-Return Actuators Product Bulletin (LIT-12011480)* for important product application and single point of contact information.

Features

- 70 lb-in (8 N·m) rated torque
- direct-coupled design
- reversible mounting
- electronic stall detection
- double-insulated construction
- microprocessor-controlled brushless DC motor (-AGx and -GGx types)
- external mode selection switch (-AGx and -GGx types)
- locking manual override with auto release and crank storage
- integral cables with colored and numbered conductors
- integral connectors for 3/8 in. (10 mm) Flexible Metal Conduit (FMC)
- optional integrated auxiliary switches
- UL, CE, and C-Tick compliance
- manufactured under International Standards Organization (ISO) 9001 quality control standards
- 5-year warranty



M9208-xxx-x Series Electric Spring-Return Actuator

Accessories and Replacement Parts

Code Number	Description
DMPR-KC003	7 in. (178 mm) Blade Pin Extension (without Bracket) for Johnson Controls Direct-Mount Damper Applications (Quantity 1) Note: Available with damper and may be ordered separately.
M9000-322	Weather Shield Kit for Damper Application of M9203, M9208, VA9104, and VA9308/9310 Series Electric Spring-Return Actuators (Quantity 1)
M9000-400	Jackshaft Linkage Kit. Open-Ended Design Enables Clamping onto a Jackshaft without Requiring Access to the Ends of the Jackshaft. (Quantity 1)
M9000-560	Ball Valve Linkage Kit for applying M9203 and M9208 Series Electric Spring-Return Actuators to VG1000 Series Valves (Quantity 1)
M9000-604	Replacement Anti-Rotation Bracket Kit for M9208, M9210, and M9220 Series Electric Spring-Return Actuators (Quantity 1)
M9000-606	Position Indicator for Damper Applications of M9203 and M9208 Series Actuators (Quantity 5)
M9200-100	Threaded Conduit Adapter, 1/2 NPSM, for M9210(20) and M(VA)9208 Series Actuators (Quantity 5)
M9208-100	Remote Mounting Kit, Including Mounting Bracket, M9208-150 Crankarm, Ball Joint, and Mounting Fasteners (Quantity 1)
M9208-150	Crankarm Adapter Kit (Quantity 1)
M9208-600	Large Shaft Coupler Kit (with Locking Clip) for Mounting M9208 Series Electric Spring-Return Actuators on Dampers with Round Shafts from 1/2 in. to 3/4 in. (12 mm to 19 mm) or Square Shafts from 3/8 in. to 9/16 in. (10 mm to 14 mm) (Quantity 1)
M9208-601	Replacement Standard Coupler Kit (with Locking Clip) for Mounting M9208 Series Electric Spring-Return Actuators on Dampers with Round Shafts from 5/16 in. to 5/8 in. (8 mm to 16 mm) or Square Shafts from 1/4 in. to 1/2 in. (6 mm to 12 mm) (Quantity 1)
M9208-602	Replacement Locking Clips for M9208 Series Electric Spring-Return Actuators (Quantity 5)
M9208-603	Adjustable Stop Kit for M9208 Series Electric Spring-Return Actuators (Quantity 1)
M9220-604	Replacement Manual Override Cranks for M9208 Series Electric Spring-Return Actuators with Long Crank Radius: 2.83 in. (72 mm) (Quantity 5)
M9208-605	Replacement Manual Override Cranks for M9208 Series Electric Spring-Return Actuators with Short Crank Radius: 1.83 in. (46.5 mm) (Quantity 5)

M9208-xxx-x Series Electric Spring-Return Actuators (Continued)

Selection Chart

Code Number	Rotation Time (Seconds) for 90°		Power Requirements				Power Consumption			Input Signal		Position Feedback	Auxiliary Switches	Electrical Connection		
	Power On (Running)	Power Off (Spring Return)	24 VAC +/- 25%, VDC +20%/-10%	24 VAC +/- 20%, VDC +20%/-10%	120 VAC +/- 10%	230 VAC +/- 10%	VA Rating, Transformer Sizing	VA: Running (Holding)	Amperage: Running (Holding)	On/Off	Floating Point			48 in. (1.2 m) 18 AWG Appliance Cable	120 in. (3.05 m) 19 AWG Plenum Cable	Integral 3/8 in. (10 mm) FMC Connectors
M9208-AGA-2	150	17 to 25 ¹	■	■			8	7.9 (5.5)	—	■	■				■	■
M9208-AGA-3	150	17 to 25 ¹		■			8	7.9 (5.5)	—	■	■			■		■
M9208-AGC-3	150	17 to 25 ¹		■			8	7.9 (5.5)	—	■	■		■	■		■
M9208-BGA-3	55 to 71	13 to 26 ²	■				7	6.1 (1.2)	—	■				■		■
M9208-BGC-3	55 to 71	13 to 26 ²	■				7	6.1 (1.2)	—	■			■	■		■
M9208-BAA-3	55 to 71	13 to 26 ²			■		—	—	0.05 (0.03)	■				■		■
M9208-BAC-3	55 to 71	13 to 26 ²			■		—	—	0.05 (0.03)	■			■	■		■
M9208-BDA-3	55 to 71	13 to 26 ²				■	—	—	0.04 (0.03)	■				■		■
M9208-BDC-3	55 to 71	13 to 26 ²				■	—	—	0.04 (0.03)	■			■	■		■
M9208-GGA-2	150	17 to 25 ¹		■			8	7.9 (5.5)	—			■			■	■
M9208-GGA-3	150	17 to 25 ¹		■			8	7.9 (5.5)	—			■		■		■
M9208-GGC-3	150	17 to 25 ¹		■			8	7.9 (5.5)	—			■	■	■		■

1. 22 seconds nominal at room temperature and rated load, 94 seconds maximum at rated load and -40°F (-40°C)

2. 21 seconds nominal at room temperature and rated load, 39 seconds maximum at rated load and -4°F (-20°C), 108 seconds maximum at 53 lb·in (6 N·m) and -40°F (-40°C)

M9208-xxx-x Series Electric Spring-Return Actuators (Continued)

Technical Specifications

M9208-GGx-x Series Proportional Electric Spring-Return Actuator (Part 1 of 2)		
Power Requirements	-GGx Models	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 / Adjustments	-GGx Models	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	-GGx Models	Voltage Input: 100,000 Ohms Current Input: 500 Ohms with Field Furnished 500 Ohm Resistor
Feedback Signal	-GGx Models	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	-xxC Models	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 Damper or Valve: CCW Spring Return Actuator Face Labeled B is away from Damper or Valve: CW Spring Return
Rated Torque	Power On (Running)	70 lb·in (8 N·m) All Operating Temperatures
	Power Off (Spring Returning)	70 lb·in (8 N·m) 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)	150 Seconds Constant for 0 lb·in to 70 lb·in (8 N·m) Load, At All Operating Conditions
	Power Off (Spring Returning)	17 to 25 Seconds for 0 lb·in to 70 lb·in (8 N·m) Load, at Room Temperature 22 Seconds Nominal at Full Rated Load 94 Seconds Maximum with 70 lb·in (8 N·m) Load, at -40°F (-40°C)
Life Cycles		60,000 Full Stroke Cycles with 70 lb·in (8 N·m) Load 1,500,000 Repositions with 70 lb·in (8 N·m) Load
Audible Noise Rating	Power On (Running)	< 35 dBA at 70 lb·in (8 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)	< 52 dBA at 70 lb·in (8 N·m) Load, at a Distance of 39-13/32 in. (1 m)
Electrical Connections	Models: GGx-3	48 in. (1.2 m) UL 758 Type AWM Halogen-Free Cable with 18 AWG (0.85 mm²) Conductors and 0.25 in. (6 mm) Ferrule Ends
	Models: GGA-2	120 in. (3.05 m) UL 444 Type CMP Plenum Rated Cable with 19 AWG (0.75 mm²) Conductors and 0.25 in. (6 mm) Ferrule Ends
	Auxiliary Switches (-xxC Models)	48 in. (1.2 m) UL 758 Type AWM Halogen-Free Cable with 18 AWG (0.85 mm²) Conductors and 0.25 in. (6 mm) Ferrule Ends
Conduit Connections		Integral Connectors for 3/8 in. (10 mm) Flexible Metal Conduit
Mechanical Connections	Round Shafts	Range of Sizes: 5/16 in. to 5/8 in. (8 mm to 16 mm)
	Square Shafts	Range of Sizes: 1/4 in. to 1/2 in. (6 mm to 12 mm)
Enclosure Rating		NEMA 2 (IP54) for All Mounting Directions
Ambient Conditions	Standard Operating	-40°F to 140°F (-40°C to 60°C); 90% RH Maximum, Noncondensing
	Storage	-40°F to 185°F (-40°C to 85°C); 95% RH Maximum, Noncondensing
Dimensions		6.33 in. x 3.90 in. x 2.26 in. (160.7 mm x 99 mm x 57.5 mm)

M9208-xxx-x Series Electric Spring-Return Actuators (Continued)

M9208-GGx-x Series Proportional Electric Spring-Return Actuator (Part 2 of 2)		
	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. (Models: All)
	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 (Models: All).
	Europe	CE Mark – Johnson Controls declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive and Low Voltage Directive.
	Australia and New Zealand	RCM Mark, Australia/NZ Emissions Compliant (Models: All)
Shipping Weight		Models: -GGA: 3.43 lb (1.6 kg) Models: -GGC: 3.8 lb (1.7 kg)
M9208-AGx-x Series On/Off and Floating Point Control Electric Spring-Return Actuator (Part 1 of 2)		
Power Requirements	-AGx Models	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	-AGx Models	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 ms
Control Input Impedance	-AGx Models	3,000 Ohm Control Inputs
Auxiliary Switch Rating	-xxC Models	Two 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 Damper or Valve: CCW Spring Return Actuator Face Labeled B is away from Damper or Valve: CW Spring Return
Rated Torque	Power On (Running)	70 lb-in (8 N·m) All Operating Temperatures
	Power Off (Spring Returning)	70 lb-in (8 N·m) 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)	150 Seconds Constant for 0 lb-in to 70 lb-in (8 N·m) Load, At All Operating Conditions
	Power Off (Spring Returning)	17 to 25 Seconds for 0 lb-in to 70 lb-in (8 N·m) Load, at Room Temperature 22 Seconds Nominal at Full Rated Load 94 Seconds Maximum with 70 lb-in (8 N·m) Load, at -40°F (-40°C)
Life Cycles		60,000 Full Stroke Cycles with 70 lb-in (8 N·m) Load 1,500,000 Repositions with 70 lb-in (8 N·m) Load
Audible Noise Rating	Power On (Running)	< 35 dBA at 70 lb-in (8 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)	< 52 dBA at 70 lb-in (8 N·m) Load, at a Distance of 39-13/32 in. (1 m)
Electrical Connections	Models: AGx-3	48 in. (1.2 m) UL 758 Type AWM Halogen-Free Cable with 18 AWG (0.85 mm²) Conductors and 0.25 in. (6 mm) Ferrule Ends
	Models: AGA-2	120 in. (3.05 m) UL 444 Type CMP Plenum Rated Cable with 19 AWG (0.75 mm²) Conductors and 0.25 in. (6 mm) Ferrule Ends
	Auxiliary Switches (-xxC Models)	48 in. (1.2 m) UL 758 Type AWM Halogen-Free Cable with 18 AWG (0.85 mm²) Conductors and 0.25 in. (6 mm) Ferrule Ends
Conduit Connections		Integral Connectors for 3/8 in. (10 mm) Flexible Metal Conduit
Mechanical Connections	Round Shafts	Range of Sizes: 5/16 in. to 5/8 in. (8 mm to 16 mm)
	Square Shafts	Range of Sizes: 1/4 in. to 1/2 in. (6 mm to 12 mm)
Enclosure Rating		NEMA 2 (IP54) for All Mounting Directions

M9208-xxx-x Series Electric Spring-Return Actuators (Continued)

M9208-AGx-x Series On/Off and Floating Point Control Electric Spring-Return Actuator (Part 2 of 2)		
Ambient Conditions	Standard Operating	-40°F to 140°F (-40°C to 60°C); 90% RH Maximum, Noncondensing
	Storage	-40°F to 185°F (-40°C to 85°C); 95% RH Maximum, Noncondensing
Dimensions		6.33 in. x 3.90 in. x 2.26 in. (160.7 mm x 99 mm x 57.5 mm)
CE 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. (Models: All)
	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 (Models: All).
	Europe	CE Mark – Johnson Controls declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive and Low Voltage Directive.
	Australia and New Zealand	RCM Mark, Australia/NZ Emissions Compliant (Models: All)
Shipping Weight		Models: -AGA: 3.43 lb (1.6 kg) Models: -AGC: 3.8 lb (1.7 kg)

M9208-Bxx-3 Series On/Off Electric Spring-Return Actuators (Part 1 of 2)		
Power Requirements	-BGx Models	AC 24 V (AC 18 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
	-BAx Models	AC 120 V (AC 102 V to 132 V) at 60 Hz: 0.05 A Running, 0.03 A Holding Position
	-BDx Models	AC 230 V (AC 198 V to 264 V) at 50/60 Hz: 0.04 A Running, 0.03 A Holding Position
Auxiliary Switch Rating	-xxC Models	Two 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 Side A is away from Damper or Valve: CCW Spring Return Actuator Side B is away from Damper or Valve: CW Spring Return
Rated Torque	Power On (Running)	70 lb-in (8 N·m) All Operating Temperatures
	Power Off (Spring Returning)	70 lb-in (8 N·m) at Standard Operating Temperatures 53 lb-in (6 N·m) at Extended 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)	55 to 71 Seconds for 0 lb-in to 70 lb-in (8 N·m) Load, at All Operating Conditions 60 Seconds Nominal at Full Rated Load (0.25 rpm)
	Power Off (Spring Returning)	13 to 26 Seconds for 0 lb-in to 70 lb-in (8 N·m) Load, at Room Temperature 21 Seconds Nominal at Full Rated Load 39 Seconds Maximum with 70 lb-in (8 N·m) Load at -4°F (-20°C) 108 Seconds Maximum with 53 lb-in (6 N·m) Load at -40°F (-40°C)
Life Cycles		60,000 Full-Stroke Cycles with 70 lb-in (8 N·m) Load
Audible Noise Rating	Power On (Running)	< 47 dBA at 70 lb-in (8 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)	< 52 dBA at 70 lb-in (8 N·m) Load, at a Distance of 39-13/32 in. (1 m)
Electrical Connections	Actuator (All Models)	48 in. (1.2 m) UL 758 Type AWM Halogen-Free Cable with 18 AWG (0.85 mm²) Conductors and 0.25 in. (6 mm) Ferrule Ends
	Auxiliary Switches (-xxC Models)	48 in. (1.2 m) UL 758 Type AWM Halogen-Free Cable with 18 AWG (0.85 mm²) Conductors and 0.25 in. (6 mm) Ferrule Ends
Conduit Connections		Integral Connectors for 3/8 in. in. (10 mm) Flexible Metal Conduit
Mechanical Connections	Round Shafts	Range of Sizes: 5/16 in. to 5/8 in. (8 mm to 16 mm)
	Square Shafts	Range of Sizes: 1/4 in. to 1/2 in. (6 mm to 12 mm)

M9208-xxx-x Series Electric Spring-Return Actuators (Continued)

M9208-Bxx-3 Series On/Off Electric Spring-Return Actuators (Part 2 of 2)		
Ambient Conditions	Extended Operating	-40°F to -4°F (-40°C to -20°C); 90% RH Maximum, Noncondensing
	Storage	-40°F to 185°F (-40°C to 85°C); 95% RH Maximum, Noncondensing
Dimensions		6.33 in. x 3.90 in. x 2.26 in. (160.7 mm x 99 mm x 57.5 mm)
Compliance CE	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. (Models: All)
	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 (Models: All).
	Europe	CE Mark – Johnson Controls declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive and Low Voltage Directive.
	Australia and New Zealand	RCM Mark, Australia/NZ Emissions Compliant (Models: All)
Shipping Weight		Models: -BGC: 3.75 lb (1.7 kg) Models: -BAC and -BDC: 4.15 lb (1.9 kg)

M9220 Series Electric Spring-Return Actuators

Description

The M9220-xxx-3 actuators are direct-mount, spring-return electric actuators that operate with these available power options:

- AC 24 V at 50/60 Hz or DC 24 V (AGx, BGx, GGx, HGx)
- AC 120 V at 60 Hz (BAX)
- AC 230 V at 50/60 Hz (BDx)

These bidirectional actuators do not require a damper linkage, and are easily installed on dampers with 1/2 in. to 3/4 in. or 12 mm to 19 mm round shafts, or 3/8 in. and 1/2 in. or 10 mm, 12 mm, and 14 mm square shafts using the standard shaft clamp included with the actuator. An optional M9220-600 Jackshaft Coupler Kit is available for 3/4 in. to 1-1/16 in. or 19 mm to 27 mm round shafts, or 5/8 in. and 3/4 in. or 16 mm, 18 mm, and 19 mm square shafts.

A single M9220-xxx-3 Electric Spring-Return Actuator provides a running and spring-return torque of 177 lb·in (20 N·m). Two or three models mounted in tandem deliver twice or triple the torque. Integral line voltage auxiliary switches are available on the -xxC models to indicate end-stop position or to perform switching functions within the selected rotation range.

Refer to the *M9220-xxx-3 Electric Spring-Return Actuators Product Bulletin (LIT-12011057)* for important product application information and single point of contact information.

Features

- Available torques of 177 lb·in (20 N·m) for single actuators, 354 lb·in (40 N·m) for two models, and 531 lb·in (60 N·m) for three models mounted in tandem—offer a selection that is most suitable for the application.
- Reversible mounting design—simplifies installation and enables the actuator to spring return in either direction.
- 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—adapts to a shorter damper shaft.
- Integral 48 in. (1.2 m) halogen-free cables with colored and numbered conductors—simplify field wiring.
- Integral auxiliary switches (xxC Models)—provide one fixed and one adjustable switch point with line voltage capability.
- NEMA 2 (IP54) rated aluminum enclosure—protects the internal components of the actuator from dirt and moisture.
- Easy-to-use locking manual override with auto release and crank storage—allows for manual positioning of the actuator hub.
- Integral connectors for 3/8 in. flexible metal conduit—simplify installation and field wiring.
- Microprocessor-controlled brushless DC motor (-AGx, -GGx, and -HGx types)—provides constant run-time independent of torque.

M9220 Series Electric Spring-Return Actuator



Applications

The M9220-xxx-3 Electric Spring-Return Actuators provide reliable control of dampers and valves in HVAC systems. The M9220-xxx-3 Actuators are available for use with on/off, floating, and proportional controllers.

Repair Information

If the M9220 Series Electric Actuator fails to operate within its specifications, replace the unit. For a replacement actuator, contact the nearest Johnson Controls® representative.

Selection Chart

Code Number	Control Type	Auxiliary Switches	Power Requirements
M9220-AGA-3	Floating	None	AC 24 V at 50/60 Hz or DC 24 V
M9220-AGC-3	Floating	Two	AC 24 V at 50/60 Hz or DC 24 V
M9220-BAA-3	On/Off	None	AC 120 V at 60 Hz
M9220-BAC-3	On/Off	Two	AC 120 V at 60 Hz
M9220-BDA-3	On/Off	None	AC 230 V at 50/60 Hz
M9220-BDC-3	On/Off	Two	AC 230 V at 50/60 Hz
M9220-BGA-3	On/Off	None	AC 24 V at 50/60 Hz or DC 24 V
M9220-BGC-3	On/Off	Two	AC 24 V at 50/60 Hz or DC 24 V
M9220-GGA-3	Proportional	None	AC 24 V at 50/60 Hz or DC 24 V
M9220-GGC-3	Proportional	Two	AC 24 V at 50/60 Hz or DC 24 V
M9220-HGA-3	Proportional with Adjustable Zero and Span	None	AC 24 V at 50/60 Hz or DC 24 V
M9220-HGC-3	Proportional with Adjustable Zero and Span	Two	AC 24 V at 50/60 Hz or DC 24 V

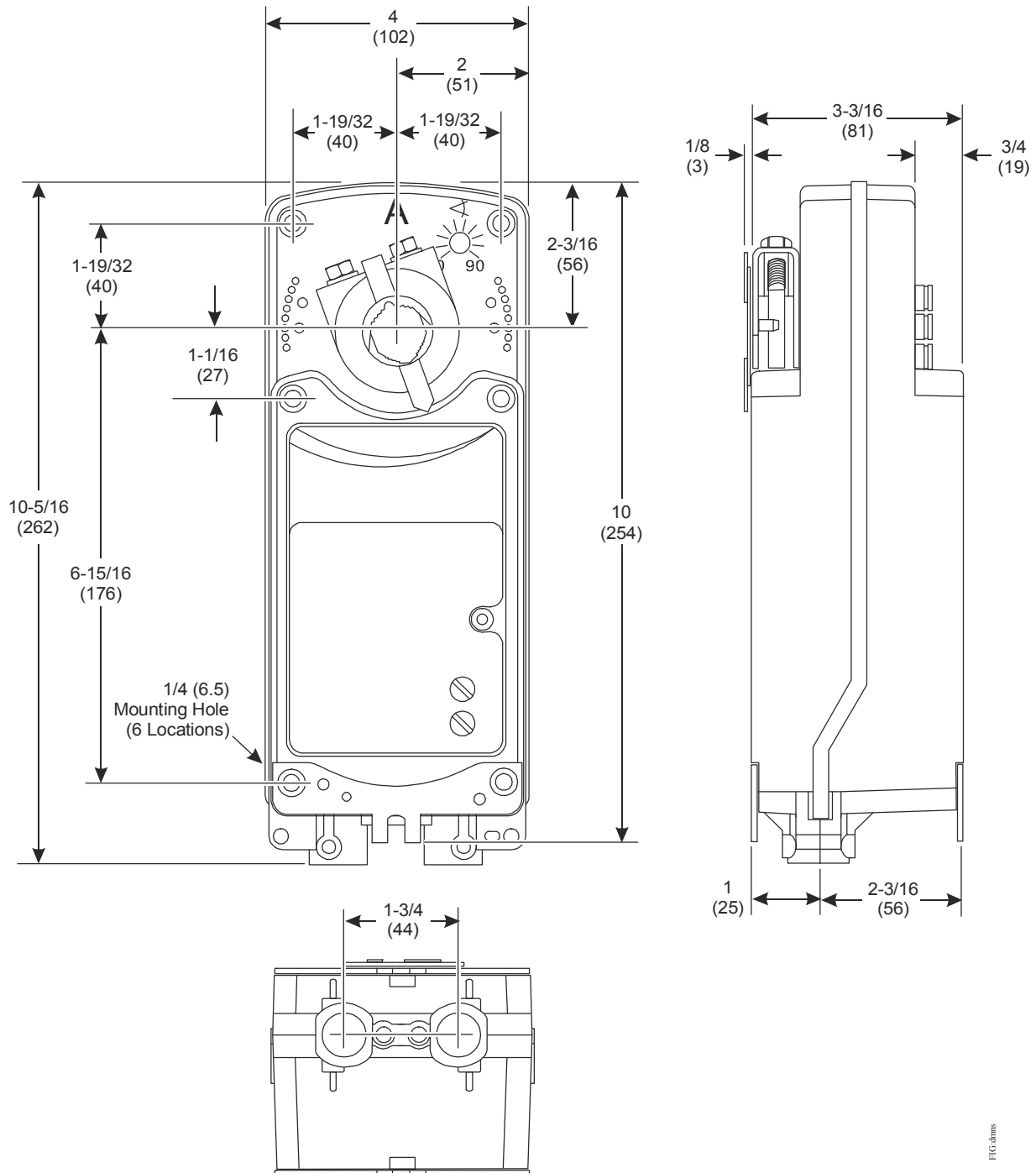
M9220 Series Electric Spring-Return Actuators (Continued)

Accessories

Code Number	Description
DMPR-KC003	7 in. (178 mm) blade pin extension (without bracket) for Johnson Controls direct-mount damper applications (quantity 5) Note: Available with damper and may be ordered separately
M9000-153	Crankarm (quantity 1)
M9000-158	Tandem Mounting Kit used to mount two models of M9220-xxx-3 Series Proportional Electric Spring-Return Actuators (quantity 1)
M9000-170	Remote Mounting Kit, horizontal. Kit includes mounting bracket, M9000-153 crankarm, ball joint, and mounting bolts (quantity 1)
M9000-171	Remote Mounting Kit, Vertical. Kit Includes mounting bracket, M9000-153 crankarm, ball joint, and mounting bolts (quantity 1)
M9000-320	Weather Shield Enclosure - NEMA 3R enclosure for protecting a single M9210/20 Actuator from rain, sleet, or snow (quantity 1)
M9000-400	Jackshaft Linkage Kit. Open-ended design enables clamping onto a jackshaft without requiring access to the ends of the jackshaft (quantity 1)
M9000-519	Valve linkage for mounting M9220 actuator to 2-1/2 to 6 in. flanged ball valves
M9000-604	Replacement Anti-Rotation Bracket Kit (with Screws) for M9220-xxx-3 Series Proportional Electric Spring-Return Actuators (quantity 1)
M9200-100	Threaded Conduit Adapter, 1/2 NPSM, for M9210(20) and M(VA)9208 Series Actuators (quantity 5)
M9220-600	1 in. (25 mm) Jackshaft Coupler Kit (with locking clip) for mounting M9220-xxx-3 Proportional Electric Spring-Return Actuators on dampers with 3/4 in. to 1-1/16 in. or 19 mm to 27 mm round shafts, or 5/8 in. and 3/4 in. or 16 mm, 18 mm, and 19 mm square shafts (quantity 1)
M9220-601	Replacement Coupler Kit (with locking clip) for mounting M9220-xxx-3 Proportional Electric Spring-Return Actuators on dampers with 1/2 in. to 3/4 in. or 12 mm to 19 mm round shafts, or 3/8 in. and 1/2 in. or 10 mm, 12 mm, and 14 mm square shafts (quantity 1)
M9220-602	Replacement Locking Clips for M9220-xxx-3 Proportional Electric Spring-Return Actuators (five per bag)
M9220-603	Adjustable Stop Kit for M9220-xxx-3 Proportional Electric Spring-Return Actuators (quantity 1)
M9220-604	Replacement Manual Override Cranks for M9220-xxx-3 Proportional Electric Spring-Return Actuators (five per bag)
M9220-610	Replacement Shaft Gripper, 10 mm square shaft with locking clip (quantity 1)
M9220-612	Replacement Shaft Gripper, 12 mm square shaft with locking clip (quantity 1)
M9220-614	Replacement Shaft Gripper, 14 mm square shaft with locking clip (quantity 1)

M9220 Series Electric Spring-Return Actuators (Continued)

Dimensions



M9220-xxx-3 Electric Spring-Return Actuator Dimensions, in. (mm)

FIG. dmm

M9220 Series Electric Spring-Return Actuators (Continued)

Technical Specifications

M9220 Series Electric Spring-Return Actuators (Part 1 of 2)		
Product Codes		M9220-AGx-3 Models: Floating M9220-Bxx-3 Models: On/Off M9220-GGx-3 Models: Proportional M9220-HGx-3 Models: Proportional Adjustable
Power Requirements	AGx, HGx, GGx Models	AC 24 V (19.2 V to 30 V) at 50/60 Hz: Class 2, 15.5 VA running, 7.7 VA holding position; DC 24 V (21.6 V to 26.4 V): Class 2, 6.7 W running, 2.9 W holding position
	BAx Models	AC 120 V (AC 102 to 132 V) at 60 Hz: 0.25 A running, 0.13 A holding position
	BDx Models	AC 230 V (AC 198 to 264 V) at 50/60 Hz: 0.15 A running, 0.09 A holding position
	BGx Models	AC 24 V (19.2 to 30 V) at 50/60 Hz: Class 2, 24.6 VA running, 7.7 VA holding position; DC 24 V (21.6 to 26.4 V): Class 2, 17.6 W running, 2.8 W holding position
Transformer Sizing Requirements	AGx, HGx, GGx Models	20 VA minimum per actuator
	Bxx Models	25 VA minimum per actuator
Input Signal/Adjustments	AGx Models	DC 0 (2) to 10 V or 0 (4) to 20 mA with field furnished 500 Ohm resistor; Switch selectable direct or reverse action with signal increase, 500 ms minimum pulse width
	GGx Models	Factory set 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
	HGx Models	Factory set DC 0 to 10 V, CW rotation with signal increase; Selectable DC 0 to 10 V or 0 to 20 mA with field furnished 500 Ohm, 0.25 W minimum resistor; Start point programmable DC 0 to 10 V; Span programmable DC 2 to 10 V; Switch selectable direct or reverse action with signal increase
Control Input Impedance	GGx, HGx Models	Voltage Input: 200,000 Ohms; Current Input: 500 Ohms with field furnished 500 Ohm resistor
Feedback Signal	GGx Models	0 (2) to 10 VDC for desired rotation range up to 90°; Corresponds to rotation limits, 1 mA maximum
	HGx Models	0 to 10 VDC for desired rotation range up to 90°; Corresponds to rotation limits, 1 mA maximum
Auxiliary Switch Rating	xxC Models	Two Single-Pole, Double-Throw (SPDT), double-insulated switches with gold flash 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: Side A, actuator face away from Damper for CCW spring return; Side B, actuator face away from Damper for CW spring return
Running and Spring Return Torque		177 lb-in (20 N·m) for a single actuator; 354 lb-in (40 N·m) for two models mounted in tandem 531 lb-in (60 N·m) for three models mounted in tandem
Valid Tandem Combinations		Two M9220-Bxx-3 Three M9220-AGx-3 One M9220-HGx-3 master with one or two M9220-GGX-3 slaves One M9220-GGX-3 master with one or two M9220-GGX-3 slaves
Rotation Range		Adjustable from 30° to 90° CW or CCW with optional M9220-603 Adjustable Stop Kit; mechanically limited to 90°
Rotation Time Power On (Running)	AGx, HGx, GGx Models	150 seconds for 0 lb-in to 177 lb-in (0 N·m to 20 N·m) at all operating conditions; independent of load
	BGx Models	24 to 57 seconds for 0 lb-in to 177 lb-in (0 N·m to 20 N·m) at all operating conditions; 35 seconds nominal at full rated load
Rotation Time Power Off (Spring Returning)	AGx, HGx, GGx Models	20 seconds for 0 lb-in to 177 lb-in (0 N·m to 20 N·m) at room temperature
	BGx Models	11 to 15 seconds for 0 lb-in to 177 lb-in (0 N·m to 20 N·m) at room temperature; 35 seconds maximum for 0 lb-in to 177 lb-in (0 N·m to 20 N·m) at -22°F (-30°C) 130 seconds maximum for 0 lb-in to 177 lb-in (0 N·m to 20 N·m) at -40°F (-40°C)
Cycles		60,000 full stroke cycles; 1,500,000 repositions
Audible Noise Rating (AGx, HGx, GGx Models)	Power On (Running)	< 40 dBA at 39-13/32 in. (1 m)
	Power On (Holding)	< 20 dBA at 39-13/32 in. (1 m)
	Power Off (Spring Returning)	< 55 dBA at 39-13/32 in. (1 m)

M9220 Series Electric Spring-Return Actuators (Continued)

M9220 Series Electric Spring-Return Actuators (Part 2 of 2)		
Audible Noise Rating (BGx Models)	Power On (Running)	< 66 dBA at 39-13/32 in. (1 m)
	Power On (Holding)	< 18 dBA at 39-13/32 in. (1 m)
	Power Off (Spring Returning)	< 66 dBA at 39-13/32 in. (1 m)
Electrical Connections	Actuator (All Models)	48 in. (1.2 m) halogen-free cable with 18 AWG (0.75 mm ²) wire leads
	Auxiliary Switches (xxC Models)	48 in. (1.2 m) halogen-free cable with 18 AWG (0.75 mm ²) wire leads
Conduit Connections		Integral connectors for 3/8 in. (10 mm) flexible metal conduit
Mechanical Connections	Standard Shaft Clamp Included with Actuator	1/2 in. to 3/4 in. or 12 mm to 19 mm diameter round shafts, or 3/8 in. and 1/2 in. or 10 mm, 12 mm, and 14 mm square shafts
	Optional M9220-600 Jackshaft Coupler Kit	3/4 in. to 1-1/16 in. or 19 mm to 27 mm diameter round shafts, or 5/8 in. and 3/4 in. or 16 mm, 18 mm, and 19 mm square shafts
Aluminum Enclosure		NEMA 2 (IP54) for all mounting orientations
Ambient Conditions	Operating	-40°F to 131°F (-40°C to 55°C); 90% RH maximum, noncondensing
	Storage	-85°F to 185°F (-65°C to 85°C); 95% RH maximum, noncondensing
Dimensions		See <i>Dimensions</i> .
Compliance CE	United States	UL Listed, CCN XAPX, File E27734; to UL 60730-1, Automatic Controls for Household and Similar Use and UL 60730-2-14 Part 2, Particular Requirements for Electric Actuators (Models: All)
	Canada	UL Listed, CCN XAPX7, File E27734; to CAN/CSA E60730-1, Automatic Controls for Household and Similar Use; and CAN/CSA E60730-2-14 Part 2, Particular Requirements for Electric Actuators (Models: All)
	Europe	CE Mark - Johnson Controls declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive and Low Voltage Directive.
	Australia and New Zealand	RCM Mark, Australia/NZ Emission Compliant (Models: All M9220-xGx and M9220-xDx)
Shipping Weight	xGx Models	6.4 lb (2.9 kg)
	BAx and BDx Models	7.6 lb (3.5 kg)

M9300 Series Electric Non-Spring Return Actuators

Description

The M9300 Series Electric Non-Spring Return Actuators provide control of dampers in HVAC systems. Actuators in this series provide rated torques from 70 lb·in (8 N·m) to 310 lb·in (35 N·m).

The series consists of models for on/off and floating control as well as models with Automatic Signal Input Detection, which allows automatic recognition of input signals for on/off, floating, and proportional control.

These actuators are configured for direct mounting and do not require damper linkage. Actuators can be mounted directly with a universal clamp to a round damper shaft from 3/4 in. (19 mm) up to 1-1/16 in. (27 mm), and to a square damper shaft from 3/8 in. (10 mm) up to 3/4 in. (19 mm).

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 kit can be field installed to indicate an end-stop position or perform switching functions within the selected rotation range. The M9300 actuators also feature an optional NEMA 4X/IP66 weather shield for applications in harsh environments.

Refer to the *M9300 Series Electric Non-Spring Return Actuators Product Bulletin (LIT-12012069)* for important product application information.

Features

- models with Automatic Signal Input Detection, on/off, floating, and proportional control with adjustable span and offset
- line voltage on/off and floating models
- high speed on/off and floating models
- easy conversion to valve operation—same actuator used for dampers or valves
- optional accessory kit
- backward compatible auxiliary switch kits and auxiliary potentiometer
- self-calibrating input signal to adjust stroke
- direct-coupled design
- electronic stall detection
- microprocessor-controlled brushless DC motor
- mode configuration switches
- integral cables with colored and numbered conductors
- optional integral 1/2 in. (13 mm) threaded conduit connectors
- plenum-rated models
- small footprint
- NEMA 5/IP54 enclosure
- Underwriters Laboratories Inc.® (UL), CE Mark, and RCM compliance
- manufactured under International Standards Organization (ISO) 9001 quality control standards
- bottom-mounted coupler
- 5-year warranty

M9300 Series Electric Non-Spring Return Actuator without Accessory Switch Kit



M9300 Series Electric Non-Spring Return Actuator with Accessory Switch Kit



Repair Information

If the M9300 Series Electric Non-Spring Return Actuator fails to operate within its specifications, replace the unit. For a replacement electric actuator, contact the nearest Johnson Controls® representative.

M9300 Series Electric Non-Spring Return Actuators (Continued)

Selection Charts

M9300 Series Electric Non-Spring Return Actuators

Code Number	Running Torque	Rotation Time For 90°	Power Supply		Input Signal			Position Feedback					Auxiliary Switches		Electrical Connection	
	lb-in (N·m)	Running (Seconds)	AC/DC 24 V	VA 85 to 264 V	On/Off	Floating	Proportional DC 0 (2) to 10 V (with Adjustable Span and Offset)	DC 0 (2) to 10 V	140 Ω	1 k Ω	2 k Ω	10 k Ω	1 x SPDT, 3 (0.5) A, AC 240 V	2 x SPDT, 3 (0.5) A, AC 240 V	120 in. (3 m) Plenum Cable	48 in. (1 m) Halogen-Free Cable
M9308-AGA-2Z	70 lb·in (8 N·m)	8	X		X	X			X ¹	X ¹	X ¹	X ¹	X ²	X ²	X	
M9308-AUA-2Z	70 lb·in (8 N·m)	8		X	X	X			X ¹	X ¹	X ¹	X ¹	X ²	X ²		X
M9310-AUA-2	90 lb·in (10 N·m)	90		X	X	X			X ¹	X ¹	X ¹	X ¹	X ²	X ²		X
M9310-GUA-2	90 lb·in (10 N·m)	90		X			X	X ³	X ¹	X ¹	X ¹	X ¹	X ²	X ²		X
M9310-HGA-2	90 lb·in (10 N·m)	90	X		X	X	X	X ³	X ¹	X ¹	X ¹	X ¹	X ²	X ²	X	
M9316-AGA-2Z	140 lb·in (16 N·m)	16	X		X	X			X ¹	X ¹	X ¹	X ¹	X ²	X ²		X
M9316-AUA-2Z	140 lb·in (16 N·m)	16		X	X	X			X ¹	X ¹	X ¹	X ¹	X ²	X ²		X
M9320-AUA-2	180 lb·in (20 N·m)	90		X	X	X			X ¹	X ¹	X ¹	X ¹	X ²	X ²		X
M9320-GUA-2	180 lb·in (20 N·m)	90		X			X	X ³	X ¹	X ¹	X ¹	X ¹	X ²	X ²		X
M9320-HGA-2	180 lb·in (20 N·m)	90	X		X	X	X	X ³	X ¹	X ¹	X ¹	X ¹	X ²	X ²		X
M9335-AUA-2	310 lb·in (35 N·m)	150		X	X	X			X ¹	X ¹	X ¹	X ¹	X ²	X ²		X
M9335-GUA-2	310 lb·in (35 N·m)	150		X			X	X ³	X ¹	X ¹	X ¹	X ¹	X ²	X ²		X
M9335-HGA-2	310 lb·in (35 N·m)	150	X		X	X	X	X ³	X ¹	X ¹	X ¹	X ¹	X ²	X ²		X

1. With optional external feedback potentiometer kit (M9300-140, M9300-1K, M9300-2K, or M9000-10K).
2. With optional external auxiliary switch kit (M9300-1 or M9300-2).
3. Feedback is available when 0 (2) to 10 V proportional input is used.

M9300 Series Electric Non-Spring Return Actuators (Continued)

Accessories (Order Separately)

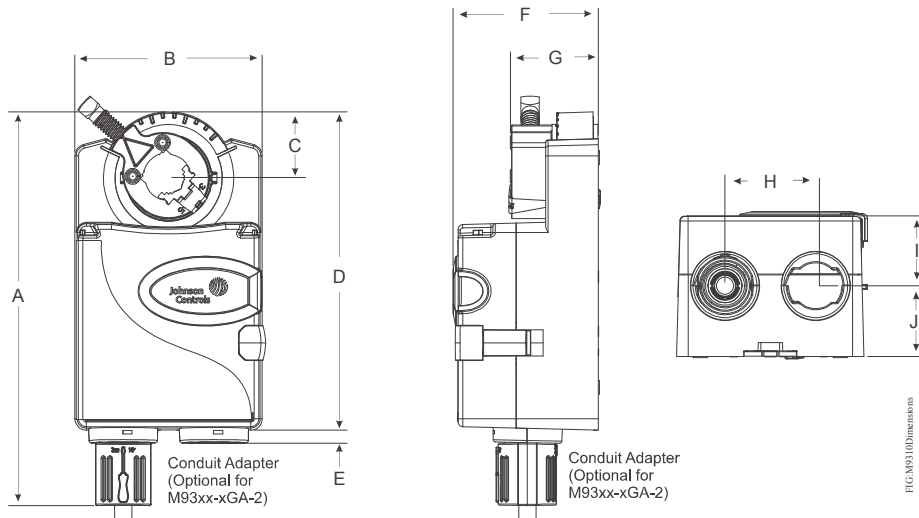
Code Number	Description
DMPR-KC003¹	7 in. (178 mm) blade pin extension without bracket for Johnson Controls® direct-mount damper applications
M9000-158	Tandem mounting bracket for mounting two M9335 Series Electric Actuators in damper applications
M9000-322	NEMA 4X/IP66 weather shield kit for Johnson Controls M9102, M9104, M9203, M9208, M9308, and M9310 Series Electric Damper Actuators
M9000-323	NEMA 4X/IP66 weather shield kit for Johnson Controls M9320 and M9335 Series Electric Damper Actuators
M9000-343	NEMA 4X/IP66 weather shield kit for Johnson Controls M9320 and M9335 Series actuators for applications on VG1000 Series Flanged Ball Valves (2-1/2 in. to 6 in.)
M9000-400	Jackshaft linkage kit
M9000-539	Adapter Kit to mount M9316 and M9320 Series Actuators on M9000-53x linkage kits for the operation of VG2000 Series Flanged Control Globe valves
M9000-604	Replacement anti-rotation bracket kit
M9000-606	Position indicator (five per kit)
M9000-700	Universal ball valve linkage kit for mounting VA9308 and VA9310 actuators to other manufacturers ball valves.
M9300-1	External auxiliary switch kit; one single-pole, double-throw (SPDT)
M9300-2	External auxiliary switch kit; two SPDT
M9300-100	Threaded conduit adapters for 1/2 in. (13 mm) electrician's fittings (five per kit)
M9300-100D	Butterfly Valve Mounting Kit for Tandem M9300 Series Non-Spring Return Electric Actuators to 4, 5 and 6 in. (DN 100, 125 & 150)
M9300-100S	Butterfly Valve Mounting Kit for a Single M9300 Series Non-Spring Return Electric Actuator to 2, 3 and 4 in. (DN 50, 80 & 100)
M9300-140	External auxiliary feedback potentiometer, 140 ohm (optional for 140 ohm position feedback)
M9300-200S	Butterfly Valve Mounting Kit for a Single M9300 Series Non-Spring Return Electric Actuator to 8 in. (DN 200)
M9300-1K	External auxiliary feedback potentiometer, 1k ohm (optional for 1k ohm position feedback)
M9300-2K	External auxiliary feedback potentiometer, 2k ohm (optional for 2k ohm position feedback)
M9300-10K	External auxiliary feedback potentiometer, 10k ohm (optional for 10k ohm position feedback)
M9000-151	Remote mounting kit, with crankarm and damper linkage for Johnson Controls M9108, M9116, M9124, and M9300 Series Electric Damper Actuators
M9310-500	Ball valve linkage kit for converting Johnson Controls M9308 and M9310 Series Electric Damper Actuators into VA9308 and VA9310 Series Electric Valve Actuators
M9310-600	Standard coupler kit for Johnson Controls M9308 and M9310 Series Electric Damper Actuators; round 3/8 in. to 3/4 in. (10 mm to 19 mm) and square 3/8 in. to 5/8 in. (10 mm to 16 mm)
M9320-500	Ball valve linkage kit for converting Johnson Controls M9320 and M9335 Series Electric Damper Actuators into VA9320 and VA9335 Series Electric Valve Actuators
M9320-600	Standard coupler kit for Johnson Controls M9316, M9320, M9335 Series Electric Damper Actuators; round 3/4 in. to 1-1/16 in. (19 mm to 27 mm) and square 5/8 in. to 3/4 in. (16 mm to 19 mm)

1. Furnished with the damper and may be ordered separately.

M9300 Series Electric Non-Spring Return Actuators (Continued)

M9300 Dimensions

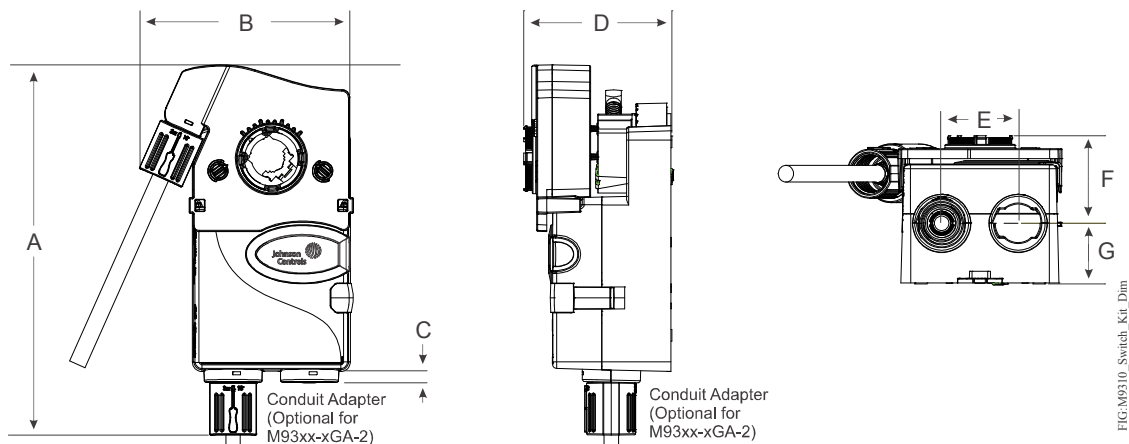
M9308 and M9310 Series Electric Damper Actuators, Dimensions (without Switch Kit or Potentiometer Kit)



M9308 and M9310 Series Electric Damper Actuators, Dimensions (without Switch Kit or Potentiometer Kit)

Dimensions, in. (mm)	A	B	C	D	E	F	G	H	I	J
	6-21/32 (169)	3-3/16 (81)	1-3/32 (28)	5-13/32 (137)	1/4 (6)	2-7/16 (62)	1-1/2 (38)	1-17/32 (39)	1-3/16 (30)	1-7/32 (31)

M9308 and M9310 Series Electric Damper Actuators, Dimensions (with Switch Kit or Potentiometer Kit)

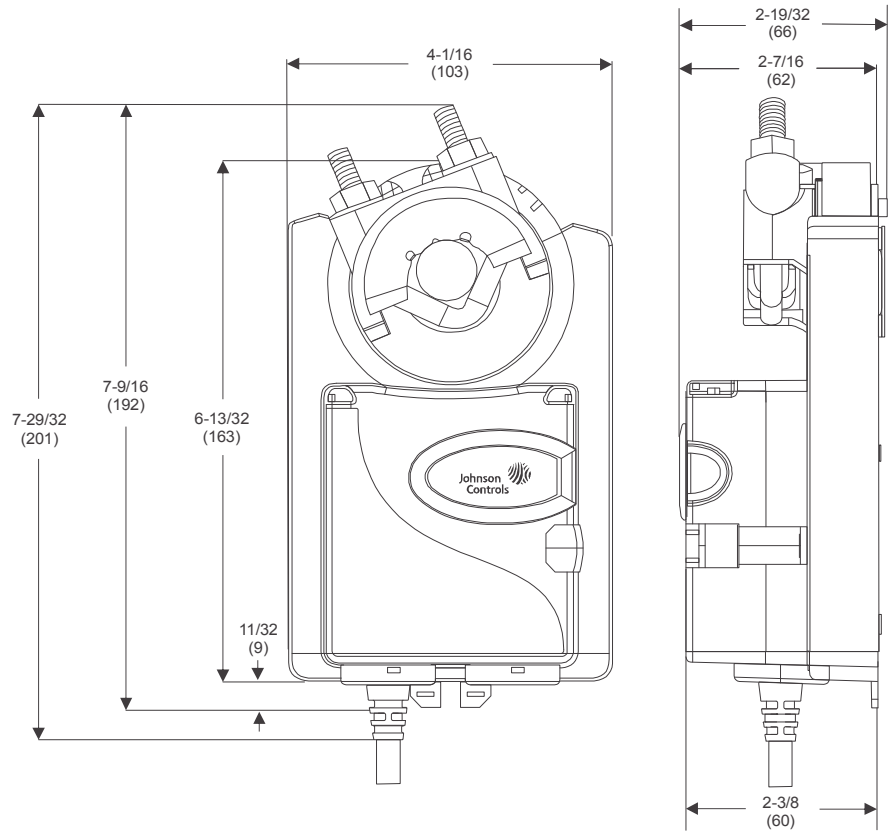


M9308 and M9310 Series Electric Damper Actuators, Dimensions (with Switch Kit or Potentiometer Kit)

Dimensions, in. (mm)	A	B	C	D	E	F	G
	7-3/16 (183)	4-3/16 (106)	1/4 (6)	2-31/32 (75)	1-17/32 (39)	1-3/4 (45)	1-7/32 (31)

M9300 Series Electric Non-Spring Return Actuators (Continued)

**M9320 and M9335 Series Electric Damper Actuators,
Dimensions, in. (mm)**



M9300 Series Electric Non-Spring Return Actuators (Continued)

Technical Specifications

M9308-AxA-2Z and M9310-AUA-2 Series Electric Non-Spring Return Actuators

Product Description	M9308-AGA-2Z: Floating and on/off mode	M9308-AUA-2Z: Floating and on/off mode	M9310-AUA-2: Floating and on/off mode
Power Requirements	AC 24 V ±20% at 50/60 Hz, Class 2 (North America) or SELV (Europe), 12.7 VA running; DC 24 V ±10% Class 2 (North America) or SELV (Europe), 5.7 W running	Nominal AC 120 V at 60 Hz: 0.11 A running	Nominal AC 120 V at 60 Hz: 0.04 A running
Transformer Sizing Requirements	≥13 VA	—	—
Input Signal/Adjustments	AC 19.2 V to 28.8 V at 50/60 Hz or DC 24 V ±10% Class 2 (North America) or SELV (Europe)	AC 100 V to 240 V (AC 85 V to 264 V) at 50/60 Hz	
Running Torque	70 lb·in (8 N·m)		90 lb·in (10 N·m)
Rotation Range	Mechanically limited 35° to 95° (±3°) in 5° increments		
Rotation Time for 90° of Travel	8 seconds, constant at all operating conditions		90 seconds, constant at all operating conditions
Cycles	60,000 full stroke cycles; 1,500,000 repositions		100,000 full stroke cycles; 2,500,000 repositions
Audible Noise	<45 dBA at 0 lb·in to 70 lb·in (8 N·m) load, at a distance of 39-13/32 in. (1 m)		<35 dBA at 39-13/32 in. (1 m)
Electrical Connections	120 in. (3.05 m) UL 444 type CMP plenum rated cable with 19 AWG (0.75 mm ²) conductors and 0.25 in. (6 mm) ferrule ends	48 in. (1.2 m) halogen free cable with 18 AWG (0.82 mm ²) conductors and 0.25 in. (6mm) ferrule ends	
Conduit Connections	1/2 in. NPSM (13 mm) threaded conduit connectors with M9300-100 Conduit Connector (optional with the M9308-AGA-2Z)		
Ambient Conditions	Operating: -22°F to 140°F (-30°C to 60°C), 95% RH, noncondensing Storage: -40°F to 185°F (-40°C to 85°C), 95% RH, noncondensing		
Enclosure	NEMA 5/IP54		
Shipping Weight	2 lb (0.9 kg)		
Compliance	United States: UL Listed, CCN XAPX, File E27734; to UL 60730-1: Automatic Electrical Controls for Household and Similar Use, Part 1; and UL 60730-2-14: Part 2, Particular Requirements for Electric Actuators. Plenum Rated (UL 2043). Suitable for use in Other Environmental Air Space (Plenum) in accordance with section 300.22 (c) of the National Electrical Code.		
	Canada: UL Listed, CCN XAPX7, File E27734; to CAN/CSA E60730-1:02: Automatic Electrical Controls for Household and Similar Use, Part 1; and CAN/CSA-E60730-2-14, Particular Requirements for Electric Actuators.		
	Europe: CE Mark—Johnson Controls declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive and the Low Voltage Directive.		
	Australia and New Zealand: RCM Mark, Australia/NZ Emissions Compliant		

M9300 Series Electric Non-Spring Return Actuators (Continued)

M9310-HGA-2 Electric Non-Spring Return Actuator

Product Description	M9310-HGA-2: On/off and floating mode	M9310-HGA-2: Proportional mode
Power Requirements	AC 24 V ±20% at 50/60 Hz, Class 2 (North America) or SELV (Europe), 4.7 VA running; DC 24 V ±10% Class 2 (North America) or SELV (Europe), 1.3 W running	
Transformer Sizing Requirements	≥6.5 VA	
Input Signal/Adjustments	AC 19.2 V to 28.8 V at 50/60 Hz or DC 24 V ±10% Class 2 (North America) or SELV (Europe)	DC 0 (2) to 10 V or 0 (4) to 20 mA with field furnished 500 ohm 1/4 W resistor Offset: DC 0 to 10 V SPAN: DC 2 to 10 V
Control Impedance	4.7k ohm	100k ohm
Feedback Signal	—	DC 0 (2) to 10 V
Running Torque	90 lb·in (10 N·m)	
Rotation Range	Mechanically limited 35° to 95° (±3°) in 5° increments	
Rotation Time for 90° of Travel	90 seconds, constant for all operating conditions	
Rotation Time Auto-Calibration	35 seconds	
Cycles	100,000 full stroke cycles; 2,500,000 repositions	
Audible Noise	<35 dBA at 0 lb·in to 90 lb·in (10 N·m) load, at a distance of 39-13/32 in. (1 m)	
Electrical Connections	120 in. (3.05 m) UL 444 type CMP plenum rated cable with 19 AWG cable (0.75 mm²) conductors and 0.25 in. (6 mm) ferrule ends	
Conduit Connections	1/2 in. NPSM (13 mm) threaded conduit connectors with M9300-100 conduit connector (optional with the M9310-HGA-2)	
Ambient Conditions	Operating: -22°F to 140°F (-30°C to 60°C), 95% RH, noncondensing Storage: -40°F to 185°F (-40°C to 85°C), 95% RH, noncondensing	
Enclosure	NEMA 5/IP54	
Shipping Weight	2 lb (0.9 kg)	
Compliance	United States: UL Listed, CCN XAPX, File E27734; to UL 60730-1: Automatic Electrical Controls for Household and Similar Use, Part 1; and UL 60730-2-14: Part 2, Particular Requirements for Electric Actuators. Plenum Rated (UL 2043). Suitable for use in Other Environmental Air Space (Plenum) in accordance with section 300.22 (c) of the National Electrical Code.	
	Canada: UL Listed, CCN XAPX7, File E27734; to CAN/CSA E60730-1:02: Automatic Electrical Controls for Household and Similar Use, Part 1; and CAN/CSA-E60730-2-14, Particular Requirements for Electric Actuators.	
	Europe: CE Mark—Johnson Controls declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive and the Low Voltage Directive.	
	Australia and New Zealand: RCM Mark, Australia/NZ Emissions Compliant	



M9300 Series Electric Non-Spring Return Actuators (Continued)

M9316-AxA-2Z Non-Spring Return Actuator

Product Description	M9316-AGA-2Z: On/off and floating mode	M9316-AUA-2Z: On/off and floating mode
Power Requirements	AC 24 V $\pm 20\%$ at 50/60 Hz, 11.6 VA Running; DC 24 V $\pm 10\%$, 5.4 W Running; Class 2 (North America) or SELV (Europe)	Nominal AC 120 V at 60 Hz, 0.1 A Running
Transformer Sizing Requirements	$\geq 12\text{VA}$	—
Input Signal/Adjustments	AC 19.2 V to 28.8 V at 50/60 Hz or DC 24 V $\pm 10\%$ Class 2 (North America) or SELV (Europe)	AC 100 V to 240 V (AC 85 to 264 V) at 50/60 Hz
Control Impedance	100k ohm	100k ohm
Feedback Signal	—	—
Running Torque	144 lb·in (16 N·m)	
Rotation Range	Mechanically limited 35 to 95° ($\pm 3^\circ$) in 5° increments	
Rotation Time for 90° of Travel	16 seconds, constant for all operating conditions	
Rotation Time Auto-Calibration	16 seconds	
Cycles	60,000 full stroke cycles; 1,500,000 repositions	
Audible Noise	<55 dBA at 0 lb·in to 144 lb·in (16 N·m) load, at a distance of 39-13/32 in. (1 m)	
Electrical Connections	48in. (1.2 m) halogen free cable with 18AWG (0.82 mm ²) conductors and 0.25 in. (6 mm) ferrule ends	
Conduit Connections	1/2 in. NPSM (13 mm) threaded conduit connectors with M9300-100 conduit connector (optional with the M9316-AGA-2Z)	
Ambient Conditions	Operating: -22°F to 140°F (-30°C to 60°C), 95% RH, noncondensing Storage: -40°F to 185°F (-40°C to 85°C), 95% RH, noncondensing	
Enclosure	NEMA 5/IP54	
Shipping Weight	3 lb (1.36 kg)	
Compliance	United States: UL Listed, CCN XAPX, File E27734; to UL 60730-1: Automatic Electrical Controls for Household and Similar Use, Part 1; and UL 60730-2-14: Part 2, Particular Requirements for Electric Actuators. Plenum Rated (UL 2043). Suitable for use in Other Environmental Air Space (Plenum) in accordance with section 300.22 (c) of the National Electrical Code.	
	Canada: UL Listed, CCN XAPX7, File E27734; to CAN/CSA E60730-1:02: Automatic Electrical Controls for Household and Similar Use, Part 1; and CAN/CSA-E60730-2-14, Particular Requirements for Electric Actuators.	
	Europe: CE Mark—Johnson Controls declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive and the Low Voltage Directive.	
	Australia and New Zealand: RCM Mark, Australia/NZ Emissions Compliant	

M9300 Series Electric Non-Spring Return Actuators (Continued)

M93xx-GUA-2 Non-Spring Return Actuator

Product Description	M9310-GUA-2: Proportional mode	M9320-GUA-2: Proportional mode	M9335-GUA-2: Proportional mode
Power Requirements	Nominal AC 120 V at 60 Hz: 0.05 A running	Nominal AC 120 V at 60 Hz: 0.05 A running	Nominal AC 120 V at 60 Hz: 0.06 A running
Transformer Sizing Requirements	—		
Input Signal/Adjustments	AC 100...240 V (AC 85...264 V) at 50/60 Hz		
Feedback Signal	DC 0 (2) to 10 V		
Running Torque	90 lb·in (10 N·m)	180 lb·in (20 N·m)	310 lb·in (35 N·m)
Rotation Range	Mechanically limited 35° to 95° (±3°) in 5° increments		
Rotation Time for 90° of Travel	90 seconds, constant at all operating conditions		150 seconds, constant at all operating conditions
Cycles	100,000 full stroke cycles; 2,500,000 repositions		30,000 full stroke cycles; 750,000 repositions
Audible Noise	<35 dBA at 0 lb·in to 90 lb·in (10 N·m) load, at a distance of 39-13/32 in. (1 m).	<45 dBA at rated load, at a distance of 39-13/32 in. (1 m).	
Electrical Connections	48 in. (1.2 m) halogen free cable with 18 AWG (0.82 mm ²) conductors and 0.25 in. (6mm) ferrule ends		
Conduit Connections	1/2 in. NPSM (13 mm) threaded conduit connectors with M9300-100 Conduit Connector		
Ambient Conditions	Operating: -22°F to 140°F (-30°C to 60°C), 95% RH, noncondensing Storage: -40°F to 185°F (-40°C to 85°C), 95% RH, noncondensing		
Enclosure	NEMA 5/IP54		
Shipping Weight	2 lb (0.9 kg)	3 lb (1.36 kg)	
Compliance	United States: UL Listed, CCN XAPX, File E27734; to UL 60730-1: Automatic Electrical Controls for Household and Similar Use, Part 1; and UL 60730-2-14: Part 2, Particular Requirements for Electric Actuators. Plenum Rated (UL 2043). Suitable for use in Other Environmental Air Space (Plenum) in accordance with section 300.22 (c) of the National Electrical Code.		
	Canada: UL Listed, CCN XAPX7, File E27734; to CAN/CSA E60730-1:02: Automatic Electrical Controls for Household and Similar Use, Part 1; and CAN/CSA-E60730-2-14, Particular Requirements for Electric Actuators.		
	Europe: CE Mark—Johnson Controls declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive and the Low Voltage Directive.		
	Australia and New Zealand: RCM Mark, Australia/NZ Emissions Compliant		

M9300 Series Electric Non-Spring Return Actuators (Continued)

M9320 and M9335 Series Electric Non-Spring Return Actuators (Part 1 of 2)

Product Description	M9320-HGA-2 and M9335-HGA-2		M9320-AUA-2 and M9335-AUA-2
	On/off and floating mode	Proportional mode	On/off and floating mode
Power Requirements	AC 24 V (AC 19.2 V to 28.8 V) at 50/60 Hz, Class 2 (North America) or SELV (Europe) M9320-HGA-2: 6.6 VA running M9335-HGA-2: 6.4 VA running DC 24 V (DC 21.6 to 26.4 V) Class 2 (North America) or SELV (Europe) M9320-HGA-2: 2.2 W running M9335-HGA-2: 2.2 W running		Nominal AC 120 V at 60 Hz M9320-AUA-2: 0.05 A running M9335-AUA-2: 0.05 A running
Transformer Sizing Requirements	≥7 VA		—
Input Signal/Adjustments	AC 19.2 V to 28.8 V at 50/60 Hz or DC 24 V ±10% Class 2 (North America) or SELV (Europe)	DC 0 (2) to 10 V or 0 (4) to 20 mA with field furnished 500 ohm 1/4 W resistor Offset: DC 0 to 10 V Span: DC 2 to 10 V	AC 100 V to 240 V (AC 85 to 264 V) at 50/60 Hz
Control Impedance	4.7k ohm	100k ohm	—
Feedback Signal	—	DC 0 (2) to 10 V	—
Running Torque	M9320-HGA-2 and M9320-AUA-2: 180 lb·in (20 N·m) M9335-HGA-2 and M9335-AUA-2: 310 lb·in (35 N·m)		
Rotation Range	Mechanically limited 35° to 95° (±3°) in 5° increments		
Rotation Time for 90° of Travel	M9320-HGA-2 and M9320-AUA-2: 90 seconds; constant for all operating conditions M9335-HGA-2 and M9335-AUA-2: 150 seconds; constant for all operating conditions		
Rotation Time Auto-Calibration	M9320-HGA-2 and M9320-AUA-2: 35 seconds M9335-HGA-2 and M9335-AUA-2: 75 seconds		
Cycles	M9320-HGA-2 and M9320-AUA-2: 100,000 full stroke cycles; 2,500,000 repositions M9335-HGA-2 and M9335-AUA-2: 30,000 full stroke cycles; 750,000 repositions		
Audible Noise	<45 dBA at maximum load, at a distance of 39-13/32 in. (1 m)		
Electrical Connections	48 in. (1.2 m) halogen-free cable with 18 AWG (0.82 mm ²) conductors and 1/4 in. (6 mm) ferrule ends		
Conduit Connections	Optional 1/2 in. NPSM (13 mm) threaded conduit connectors with M9300-100 conduit connector (optional with M93xx-HGA-2 models)		
Mechanical Connections	Round: 3/4 in. to 1-1/16 in. (19 mm to 27 mm) Square: 5/8 in. to 3/4 in. (16 mm to 19 mm)		
Ambient Conditions	Operating: -22°F to 140°F (-30°C to 60°C), 95% RH, noncondensing Storage: -40°F to 185°F (-40°C to 85°C), 95% RH, noncondensing		
Enclosure	NEMA 5/IP54		

M9300 Series Electric Non-Spring Return Actuators (Continued)

M9320 and M9335 Series Electric Non-Spring Return Actuators (Part 2 of 2)

Compliance	United States: UL Listed, CCN XAPX, File E27734; to UL 60730-1: Automatic Electrical Controls for Household and Similar Use, Part 1; and UL 60730-2-14: Part 2, Particular Requirements for Electric Actuators. Canada: UL Listed, CCN XAPX7, File E27734; to CAN/CSA E60730-1:02: Automatic Electrical Controls for Household and Similar Use, Part 1; and CAN/CSA-E60730-2-14, Particular Requirements for Electric Actuators. Europe: CE Mark—Johnson Controls declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive and the Low Voltage Directive. IEC 60730-1: Automatic Electrical Controls for Household and Similar Use, Part 1: General Requirements and IEC 60730-2-14, Automatic Electrical Controls for Household and Similar Use; Part 2—Particular Requirements for Electric Actuators Australia and New Zealand: RCM Mark, Australia/NZ Emissions Compliant
Shipping Weight	3 lb (1.36 kg)

M9000-3xx Series Weather Shield Enclosures

Description

The M9000-3xx Series Weather Shield Enclosures are cost-effective and durable weather shields designed to provide a degree of protection for a single Johnson Controls® M(VA)9000 Series Electric Actuator used in control damper, ball valve, and iron flanged valve applications. These weather shield enclosures are manufactured to National Electrical Manufacturers' Association (NEMA) specifications, and protect the electric actuator from corrosion, rain, freezing rain, sleet, and snow. The enclosure can be mounted indoors or outdoors; however, the enclosure may not prevent externally formed ice from restricting the motion of the rotary shaft.

Each enclosure is constructed of impact-grade plastic that provides excellent impact resistance. The cover features ultraviolet (UV) inhibitors that extend service life by preventing the cover from becoming brittle or damaged by the sun or other environmental elements. The transparent cover provides an unobstructed view of the electric actuator without having to disassemble the enclosure. An appliance cord in the M9000-310 and M9000-330 Weather Shield Enclosures enable control wiring installation, and a form-fitting seal prevents water or moisture from entering the unit and damaging the actuator.

Refer to the *M9000-3xx Series Weather Shield Enclosures Product Bulletin (LIT-1201704)* for important product application information.

Features

- Durable construction—provides a degree of protection from the elements for a single Johnson Controls M(VA)9000 Series Electric Actuator used in control damper, ball valve, and iron flanged valve applications.
- Fully enclosed design—protects the electric actuator from corrosion, rain, freezing rain, sleet, and snow.
- Impact-grade plastic enclosure—provides impact resistance.
- Cover constructed using UV inhibitors—extends service life by preventing the cover from becoming brittle or damaged by the sun or other environmental elements.
- Transparent cover—allows the electric actuator to be fully viewable without having to disassemble the enclosure.
- Appliance cord (M9000-310 and M9000-330 Models)—facilitates control wiring installation.
- Strain relief conduit fittings—protect the electric actuator from damage by preventing tension on the electrical connection.

M9000-3xx Series Weather Shield Enclosures Mounted on a Control Damper, Flanged Ball Valve, Threaded Ball Valve, and Flanged Cast Iron Valve



Repair Information

If the M9000-3xx Series Weather Shield Enclosure fails to operate within its specifications, replace the unit. For a replacement weather shield enclosure, contact the nearest Johnson Controls representative.

Selection Chart

Code Number	Enclosure Protection Rating	Application				Spring Return Actuators						Non-Spring Return Actuators														
		Dampers	VG2000 Flanged Globe Valves	VG1000 Threaded Ball Valves	VG1000 Flanged Ball Valves	M9203	M9205	M9208	M9220	VA9203	VA9208	M9102	M9104	M9106	M9108	M9109	M9116	M9124	M9132	M9308	M9310	M9320	M9335	VA9104	VA9308	VA9310
M9000-310 ¹	NEMA 3R, IP32	X	X										X	X	X	X	X	X								
M9000-320 ¹	NEMA 3R, IP32	X	X						X																	
M9000-322 ¹	NEMA 4X, IP66	X				X	X	X				X	X						X	X						
M9000-323 ¹	NEMA 4X, IP66	X																			X	X				
M9000-330 ¹	NEMA 5, IP54				X											X	X									
M9000-340 ¹	NEMA 5, IP54				X				X																	
M9000-342 ¹	NEMA 4X, IP66			X						X	X													X	X	X

1. Kit includes one enclosure base and seal assembly, one cover and gasket, and all necessary mounting hardware. One weather shield enclosure is required per electric actuator.

M9000-3xx Series Weather Shield Enclosures (Continued)

Technical Specifications

M9000-3xx Series Weather Shield Enclosures		
Enclosure	M9000-310, M9000-320, M9000-330, M9000-340	Impact-grade ABS plastic
	M9000-322, M9000-323, M9000-342	UV resistant polycarbonate plastic
Enclosure Seal		Nitrile
Cover	M9000-310, M9000-320, M9000-330, M9000-340	Transparent impact-grade ABS plastic with UV inhibitors
	M9000-322, M9000-323, M9000-342	Transparent UV resistant polycarbonate plastic
Cover Gasket	M9000-310, M9000-320, M9000-330, M9000-340	Neoprene
	M9000-322, M9000-323, M9000-342	Polyurethane
Enclosure Protection Rating	M9000-310	NEMA 3R, IP32
	M9000-320	NEMA 3R, IP32
	M9000-330	NEMA 5, IP54
	M9000-340	NEMA 5, IP54
	M9000-322	NEMA 4X, IP66
	M9000-323	NEMA 4X, IP66
Weather Shield Enclosure Ambient Storage Temperature Limits	M9000-342	NEMA 4X, IP66
		-40 to 176°F (-40 to 80°C)
Electrical Connections		Strain relief conduit fittings with 1/2 in. (13 mm) National Pipe Straight Mechanical (NPSM) exit
Appliance Cord (M9000-310 and M9000-320)		6 conductor, 18 AWG wire gauge, 43 in. (110 cm)
Shipping Weight	M9000-310	2.0 lb (0.9 kg)
	M9000-320	3.3 lb (1.5 kg)
	M9000-322	4.2 lb (1.9 kg)
	M9000-323	4.2 lb (1.9 kg)
	M9000-330	3.2 lb (1.45 kg)
	M9000-340	4.2 lb (1.9 kg)
	M9000-342	4.2 lb (1.9 kg)

Rotary Actuator Accessories

Direct Mount Actuator Accessories (Part 1 of 4)

	Code Number	Description	Qty	Non-Spring Return				Spring Return			
				M(VA)9104(6)-AGx-2Nxx	M9102(4)-xGA-xS	M9106(9)-xGx-2	M(VA)9308/9310	M(VA)9316/9320/9335	M(VA)9203	M(VA)9208	M9220
VAV Accessories	CBL-2000-1	20 in. wire harness, actuator/transmitter to controller	1	■							
	CBL-2000-2	20 in. cable, actuator/transmitter to controller, plenum rated	1	■							
	CBL-2000-3	72 in. cable, actuator/transmitter To controller, plenum rated	1	■							
	DPT-2015-0	Differential pressure transmitter, 0 to 1-1/2 in. W.C. (0 to 374 Pa.)	1	■							
Shaft Couplers / Position Indicators	M9000-606	Position indicators	5				■		■	■	
	M9000-611	Position indicators	5								■
	M9000-154	Jackshaft coupler kit, M9108 (16) (24) (32) Series (Ø 1 in.)	1								
	M9203-601	Standard coupler kit, M9203 Series (Ø 1/4 to 1/2 in.) (□ 1/4 to 5/16 in.)	1						■		
	M9203-602	Retainer for M9203 coupler	5						■		
	M9208-601	Standard coupler kit, M9208 Series (Ø 5/16 to 5/8 in.) (□ 1/4 to 1/2 in.)	1							■	
	M9208-600	Large coupler kit, M9208 Series (Ø 1/2 to 3/4 in.) (□ 3/8 to 9/16 in.)	1							■	
	M9220-601	Standard coupler kit M9220 Series (1/2 to 3/4 in.) (□ 3/8 to 1/2 in.)	1								■
	M9220-600	Jackshaft coupler kit, M9220 Series (3/4 to 1-1/16 in.) (□ 5/8 to 3/4 in.)	1								■
	M9220-610	10 mm square shaft adapter with retainer	1								■
	M9220-612	12 mm square shaft adapter with retainer	1								■
	M9220-614	14 mm square shaft adapter with retainer	1								■
	M9208-602	Retainer for M9208 coupler	5							■	
	M9220-602	Retainer for M9220 coupler	5								■
	M9310-600	Damper Shaft Adaptor for VA9300 actuators	1				■				
Mounting Brackets	M9000-152	Reinforcement plate for mounting to thin sheet metal	1								■
	M9000-158	Tandem mounting bracket	1								■
	M9000-160	Anti-rotation bracket	1			■					
	M9000-604	Anti-rotation bracket	1				■		■	■	■
	M9300-100D	Butterfly Valve Mounting Kit for Tandem M9300 Series Non-Spring Return Electric Actuators to 4, 5 and 6 in. (DN 100, 125 & 150)	1					■			
	M9300-100S	Butterfly Valve Mounting Kit for a Single M9300 Series Non-Spring Return Electric Actuator to 2, 3 and 4 in. (DN 50, 80 & 100)	1					■			
	M9300-200S	Butterfly Valve Mounting Kit for a Single M9300 Series Non-Spring Return Electric Actuator to 8 in. (DN 200)	1					■			

Rotary Actuator Accessories (Continued)

Direct Mount Actuator Accessories (Part 2 of 4)

	Code Number	Description	Qty	Non-Spring Return				Spring Return		
				M(VA)9104(6)-AGx-2Nxx	M9102(4)-xGA-xS	M9106(9)-xGx-2	M(VA)9308/9310	M(VA)9316/9320/9335	M(VA)9203	M(VA)9208
Damper Linkages / Accessories	DMPR-KC003	Blade pin extension (Ø 1/2 x 7 in.) for D1300 dampers Not used with VA9308, VA9320, VA9335	1			■	■	■	■	■
	DMPR-KC054	Damper blade arm for D1300 dampers	1						■	■
	DMPR-KC100	Damper blade linkage for D1300 dampers	1						■	■
	DMPR-KC102	Damper push rod, Ø 5/16 x 48 in. length	1						■	■
	DMPR-KC254	Damper mount linkage kit for D1300 dampers	1							
	DMPR-KC260	Damper mount linkage kit for D1300 dampers	1							■
	DMPR-KC300	Ball joint for Ø 5/16 in. rod, 1/4-20 x 9/16 in. thread mount	10			■				
	M9000-150	Damper mount linkage kit for D1300 dampers	1							
	M9000-151	Remote mounting kit with crankarm and damper linkage	1				■	■		
	M9000-153	Crankarm kit	1							■
	M9000-170	Remote mounting kit (horizontal) with crankarm	1							■
	M9000-171	Remote mounting kit (vertical) with crankarm	1							■
	M9000-270	Remote mounting kit (horizontal) with crankarm and damper linkage for D1300 dampers	1							■
	M9000-271	Remote mounting kit (vertical) with crankarm and damper linkage for D1300 dampers	1							■
	M9000-400	Jackshaft mounting kit, Ø 1/2 to 1.05 in.	1				■	■		■
	M9000-402	Replacement hardware for M9000-400 jackshaft mounting kit	1							■
	M9000-605	Ball joint for Ø 1/4 or 5/16 in. rods, 5/16-24 x 33/64 in. thread mount	5						■	■
	M9203-100	Remote mounting kit with crankarm	1						■	
	M9203-110	Universal mounting kit	1						■	
	M9203-115	Universal mounting kit with crankarm	1						■	
	M9203-150	Crankarm kit	1						■	
	M9203-250	Remote mounting kit with crankarm and damper linkage for D1300 dampers	1						■	
	M9208-100	Remote mounting kit with crankarm	1							■
	M9208-150	Crankarm kit	1							■
	M9208-250	Remote mounting kit with crankarm and damper linkage for D1300 dampers	1							■
	M9220-605	Ball joint for M8x1.25 threaded rod, M8x1.25 x 16.5 mm thread mount	5							■

Rotary Actuator Accessories (Continued)

Direct Mount Actuator Accessories (Part 3 of 4)

	Code Number	Description	Qty	Non-Spring Return					Spring Return		
				M(VA)9104(6)-AGx-2Nxx	M9102(4)-xGA-xS	M9106(9)-xGx-2	M(VA)9308/9310	M(VA)9316/9320/9335	M(VA)9203	M(VA)9208	M9220
Valve Linkages	M9000-155	Manual handle	1								
	M9000-518	Ball valve linkage for non-spring return, 2-1/2 to 6 in. VG1000 flanged valves with 11 mm square stem	1								
	M9000-519	Ball valve linkage for spring return, 2-1/2 to 6 in. VG1000 flanged valves with 11 mm square stem	1								■
	M9000-530	Linkage for 2-1/2 in. flanged iron globe valves for single actuator mounting	1					■ ¹			■
	M9000-531	Linkage for 3 in. flanged iron globe valves for single actuator mounting	1					■ ¹			■
		Linkage for 4 in. flanged iron globe valves for single actuator mounting	1					■ ¹			■
	M9000-532	Linkage for 3 in. flanged iron globe valves for tandem actuator mounting	1					■ ¹			■
		Linkage for 4 in. flanged iron globe valves for tandem actuator mounting	1					■ ¹			■
	M9000-533	Linkage for 5 in. flanged iron globe valves for single actuator mounting	1					■ ¹			■
	M9000-534	Linkage for 5 in. flanged iron globe valves for tandem actuator mounting	1					■ ¹			■
	M9000-535	Linkage for 6 in. flanged iron globe valves for single actuator mounting	1					■ ¹			■
	M9000-536	Linkage for 6 in. flanged iron globe valves for tandem actuator mounting	1					■ ¹			■
	M9000-537	Linkage for 4 in. flanged iron globe valves for tandem actuator mounting	1					■ ¹			■
	M9000-539	Adapter for M9000-53x linkages						■			
	M9000-551	Ball valve linkage, 1/2 to 1 in. hot/chilled water applications	1		■						
	M9000-560	Ball valve linkage, 1/2 to 2 in. hot/chilled water applications	1						■	■	
	M9000-561	Thermal barrier	1		■		■		■	■	
	M9000-607	Position indicators, VA9203 and VA9208 Series	5								
	M9000-610	Tandem actuator adapter kit for VG2000 Series iron globe valve linkages	1								■
	M9310-500	Ball valve linkage kit for M9310 on VG1000 Series valves	1				■				
	M9000-700	Universal Ball Valve Linkage Kit	1	■	■		■		■		
Weather Shields	M9000-310	Weather shield NEMA 3R, control dampers and VG2000 Series iron globe valve linkages, non-spring return	1			■					
	M9000-320	Weather shield NEMA 3R, control dampers and VG2000 Series iron globe valve linkages, spring return	1								■
	M9000-322	Weather shield, NEMA 4X (IP66), control dampers	1	■	■		■		■	■	
	M9000-323	Weather shield, NEMA 4X (IP66), control dampers	1					■			
	M9000-330	Weather shield NEMA 3R, VG1000 Series ball valves with M9000-518 linkage, non-spring return	1								
	M9000-340	Weather shield NEMA 3R, VG1000 Series ball valves with M9000-517 or M9000-519 linkage, spring return	1								■
	M9000-342	Weather shield, NEMA 4X (IP66), 1/2 to 2 in. VG1000 Series ball valves	1	■	■		■		■	■	
	M9000-343	Weather shield, NEMA 4X (IP66), 2-1/2" to 6 in. VG1000 Series ball valves	1					■			

1. Adapter kit M9000-539 is required.

Rotary Actuator Accessories (Continued)

Direct Mount Actuator Accessories (Part 4 of 4)

	Code Number	Description	Qty	Non-Spring Return					Spring Return	
				M(VA)9104(6)-AGx-2Nxx	M9102(4)-xGA-xS	M9106(9)-xGx-2	M(VA)9308/9310	M(VA)9316/9320/9335	M(VA)9203	M(VA)9208
Switch Kit	M9300-2	Auxiliary Switch Kit 2x SPDT	1				■	■		
Feedback Kit	M9300-1K	Potentiometer Feedback Kit 1k Ohm	1				■	■		
	M9300-2K	Potentiometer Feedback Kit 2k Ohm	1				■	■		
	M9300-10K	Potentiometer Feedback Kit 10k Ohm	1				■	■		
	M9300-140	Potentiometer Feedback Kit 140 Ohm	1				■	■		
Adj. Stops	M9203-603	Adjustable stop kit	1						■	
	M9208-603	Adjustable stop kit	1							■
	M9220-603	Adjustable stop kit	1							■
Wiring Accessories	M9000-105	Pluggable 3-terminal block	1			■				
	M9000-106	Pluggable 4-terminal block	1			■				
	M9104-100	Conduit adapter for 3/8 in. flexible metal conduit	10		■					
	M9200-100	Threaded conduit adapters for 1/2 in. electrician's fittings	5							■
	M9300-100	Threaded conduit adapters for 1/2 in. electrician's fittings	5				■			■
Tools	M9220-604	Manual crank, long, crank radius 2-13/16 in. (75 mm)	5							■
	M9208-605	Manual crank, short, crank radius 1-13/16 in. (46.5 mm)	5							■
Miscellaneous	M9000-103	Transformer, 14 VA Class 2, 120 to 24 VAC 60 Hz	1				■		■	
	M9000-104	Transformer, 14 VA Class 2, 230 to 24 VAC 60 Hz	1				■		■	
	Y63T22-0	Transformer, 50 VA Class 2, 120/208/240 to 24 VAC 60 Hz, box mounting	1	■	■	■	■		■	■
	Y63T31-0	Transformer, 50 VA Class 2, 120/208/240 to 24 VAC 60 Hz, foot/box mounting	1	■	■	■	■		■	■
	Y64T15-0	Transformer, 92 VA Class 2, 120/208/240 to 24 VAC 60 Hz, foot mounting	1	■	■	■	■		■	■
	Y64T21-0	Transformer, 92 VA Class 2, 120/208/240 to 24 VAC 60 Hz, box mounting	1	■	■	■	■		■	■
	Y64T22-0	Transformer, 92 VA Class 2, 120/208/240 to 24 VAC 60 Hz, box mounting	1	■	■	■	■		■	■
	Y65A13-0	Transformer, 40 VA Class 2, 120 to 24 VAC 60 Hz, foot mounting	1	■	■	■	■		■	■
	Y65A21-0	Transformer, 40 VA Class 2, 120 to 24 VAC 60 Hz, box mounting	1	■	■	■	■		■	■
	Y65G13-0	Transformer, 40 VA Class 2, 24 to 24 VAC 60 Hz isolation, foot mounting	1	■	■	■	■		■	■
	Y65S13-0	Transformer, 40 VA Class 2, 208/240 to 24 VAC 60 Hz, foot mounting	1	■	■	■	■		■	■
	Y66T12-0	Transformer, 75 VA Class 2, 120/208/240 to 24 VAC 60 Hz, foot mounting	1	■	■	■	■		■	■
	Y66T13-0	Transformer, 75 VA Class 2, 120/208/240 to 24 VAC 60 Hz, foot mounting	1	■	■	■	■		■	■

Rotary Actuator Accessories (Continued)

M9104-AGx-2Nxx and M9106-AGx-2Nxx Series Actuator Accessories



M9106-AGA-2N



M9106-AGS-2N

M9104-AGx-2Nxx and M9106-AGx-2Nxx Series Actuator Accessories

	Code Number	Description	Qty
Variable Air Volume (VAV) System Accessories			
 (CBL-2000-1.tif)	CBL-2000-1	20 in. (0.5 m) plenum rated wiring harness	1
 (CBL-2000-2.tif)	CBL-2000-2	20 in. (0.5 m) plenum rated wiring harness	1
 (CBL-2000-3.tif)	CBL-2000-3	72 in. (1.8 m) plenum rated wiring harness	1
 (DPT-2015-0.tif)	DPT-2015-0	0 to 1.5 in W.C. (0 to 375 Pa) differential pressure transmitter	1

Rotary Actuator Accessories (Continued)

M9102-xGA-xS and M(VA)9104-xGA-xS Series Actuator Accessories

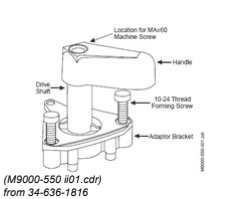


M9102/9104-xGA-2S
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M9102/9104-xGA-3S
(M9102-IGA-3S.tif)

M9102-xGA-xS and M(VA)9104-xGA-xS Series Actuator Accessories

		Code Number	Description	Qty
Valve Linkages				
	 (M9000-550.tif)	M9000-551	VG1000 ball valve linkage (for use with M9104 Series actuators only)	1
 (M9000_561.jpg)		M9000-561	Thermal barrier for M9000-560 and M9000-551 ball valve linkages. Permits use of M(VA)9xxx actuators on VG1000 Series ball valves with low-pressure steam	1
		M9000-700	Universal Ball Valve Linkage Kit	
Weather Shields				
 (M9000_341.jpg)		M9000-342	Weather shield NEMA4x (IP66), 1/2 to 2 in. for VG1000 Series ball valves	1
Wiring Accessories				
 (M9104-100.tif)		M9104-100	3/8 in. (10 mm) flexible metal conduit adapter kit (for use with M9102-xxx-2S or M9104-xxx-2S actuators with integrated wiring harness only)	10

The performance specifications are nominal and conform to acceptable industry standards. For applications at conditions beyond these specifications, consult the local Johnson Controls office. Johnson Controls shall not be liable for damages resulting from misapplication or misuse of its products. © 2019 Johnson Controls www.johnsoncontrols.com

Rotary Actuator Accessories (Continued)

M9106-xGx-2 and M9109-xGx-2 Series Actuator Accessories



M9106-GGA-2
(M9106-GGA-2.tif)

M9106-xGx-2 and M9109-xGx-2 Series Actuator Accessories

	Code Number	Description ¹	Qty
Mounting Brackets			
 (M9000-160.tif)	M9000-160	Anti-rotation bracket for M9106(9) and M9108(16)(24)(32) Series actuators	1
Damper Linkages / Accessories			
 (DMPR-KC003.tif)	DMPR-KC003	Blade pin extension (Ø 1/2 x 7 in.) (for use with D1300 dampers only)	1
Weather Shields			
 (M9000-310.tif)	M9000-310	NEMA 3R weather shield for control dampers	1
Wiring Accessories			
 (M9000-105.tif)	M9000-105	Pluggable 3-terminal block	1
 (M9000-106.tif)	M9000-106	Pluggable 4-terminal block	1

1. Ø means round shaft size (diameter); □ means square shaft size (each side)

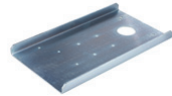
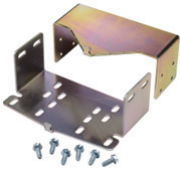
Rotary Actuator Accessories (Continued)

M9108, M9116, M9124, and M9132 Series Actuator Accessories



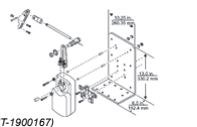
M9108-AGA-2
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M9108, M9116, M9124, and M9132 Series Actuator Accessories (Part 1 of 4)

		Code Number	Description ¹	Qty
Shaft Couplers / Position Indicators				
 (from LIT-1900167)	 (M9000-154.tif)	M9000-154	Jackshaft coupler kit for M9108 (16) (24) (32) Series actuators, (Ø 1 in.)	1
Mounting Brackets				
 (M9000-152.tif)		M9000-152	Reinforcing plate for mounting to thin sheet metal	1
 (M9000-158.tif)		M9000-158	Tandem mounting bracket	1
 (M9000-160.tif)		M9000-160	Anti-rotation bracket	1
Damper Linkages / Accessories				
 (DMPR-KC003.tif)		DMPR-KC003	Blade pin extension (Ø 1/2 x 7 in.) (for use with D1300 dampers only)	1
 (DMPR-KC054.tif)		DMPR-KC054	Blade pin extension (Ø 1/2 x 7 in.) (for use with D1300 dampers only)	1

Rotary Actuator Accessories (Continued)

M9108, M9116, M9124, and M9132 Series Actuator Accessories (Part 2 of 4)

	Code Number	Description ¹	Qty
 (DMPR-KC100.tif)	DMPR-KC100	Damper blade linkage (for use with D1300 dampers only)	1
 (DMPR-KC102.tif)	DMPR-KC102	Damper push rod, Ø 5/16 x 48 in.	1
 (DMPR-KC260.tif)	DMPR-KC254	Damper mount linkage kit (for use with D1300 dampers only)	1
 (DMPR-KC300)	DMPR-KC300	Ball joint for Ø 5/16 in. rod, 1/4-20 x 9/16 in. thread mount	10
 (M9000-150.tif)	M9000-150	Damper mounting kit for remote, inside-duct mounting an M9108 (16) (24) Series actuator to a three-blade or larger damper	1
 (from LIT-1900167)	 (M9000-151.tif)	M9000-151 Remote mounting kit, with crankarm and damper linkage for M9108 (16) (24) Series actuators Use the M9000-151 linkage only on three-blade or larger dampers (not for use with M9132 Series actuators or tandem applications)	1
 (M9000-153.tif)	M9000-153	Crankarm kit (not for use with M9132 Series actuators or tandem applications)	1
 (M9000_400.jpg)	M9000-400	Jackshaft mounting kit, Ø 0.5 to 1.05 in.	1
 (M9000_402.jpg)	M9000-402	Replacement hardware for M9000-400 jackshaft mounting kit	1

Rotary Actuator Accessories (Continued)

M9108, M9116, M9124, and M9132 Series Actuator Accessories (Part 3 of 4)

	Code Number	Description ¹	Qty
Valve Linkages			
 (M9000-155.tif)	M9000-155	Manual handle	1
 (M9000-531.tif)	M9000-530	VG2000 linkage kit for single M9116 (24) Series electric actuator and Johnson Controls® 2-1/2 in. cast iron globe valves with 3/8 in. stems	1
	M9000-531	VG2000 linkage kit for a single M9116 (24) Series electric actuator and Johnson Controls 3 to 4 in. cast iron globe valves with 3/8 in. stems	1
	M9000-533	VG2000 linkage kit for a single M9124 Series electric actuator and Johnson Controls 5 in. cast iron globe valves with 1/2 in. stems	1
	M9000-535	VG2000 linkage kit for a single M9124 Series electric actuator and Johnson Controls 6 in. cast iron globe valves with 1/2 in. stems	1
 (M9000-534.tif)	M9000-532	VG2000 linkage kit for tandem M9124 Series electric actuators and Johnson Controls 3 to 4 in. cast iron globe valves with 3/8 in. stems	1
	M9000-534	VG2000 linkage kit for tandem M9124 Series electric actuators and Johnson Controls 5 in. cast iron globe valves with 1/2 in. stems	1
	M9000-536	VG2000 linkage kit for tandem M9124 Series electric actuators and Johnson Controls 6 in. cast iron globe valves with 1/2 in. stems	1
	M9000-537	VG2000 linkage kit for tandem M9124 Series electric actuators and Johnson Controls 3 to 4 in. cast iron globe valves with 1/2 in. stems	1
 (M9000-610.tif)	M9000-610	Tandem actuator adapter kit for VG2000 Series iron globe valve linkages (not for use with the M9000-530 linkage)	1

Rotary Actuator Accessories (Continued)

M9108, M9116, M9124, and M9132 Series Actuator Accessories (Part 4 of 4)

	Code Number	Description ¹	Qty
Weather Shields			
 (M9000-310.tif)	M9000-310	NEMA 3R weather shield for control dampers or M9000-53x linkage kits on VG2000 Series cast iron flanged globe valves	1
 (M9000-330.tif)	M9000-330	NEMA 3R weather shield for VG1000 Series non-spring-return ball valves with M9000-518 linkage	1
Wiring Accessories			
 (M9000-105.tif)	M9000-105	Pluggable 3-terminal block	
Miscellaneous (Unique to M9108[16][24][32] Series Actuators)			
 (M9000-103.tif)	M9000-103	Transformer, Class 2, 120/24 VAC	1
 (M9000-104.tif)	M9000-104	Transformer, Class 2, 230/24 VAC	1

1. Ø means round shaft size (diameter); □ means square shaft size (each side)

Rotary Actuator Accessories (Continued)

M(VA)9308 M(VA)9310 Series Actuator Accessories



M9310



VA9310

Accessories (Order Separately) (Part 1 of 3)

	Code Number	Description	Qty
Damper Linkages / Accessories			
	DMPR-KC003	Blade pin extension (Ø 1/2 x 7 in.) (for use with D1300 dampers only)	1
 (M9000_400.jpg)	M9000-400	Jackshaft mounting kit, Ø 0.5 to 1.05 in.	1
Weather Shields			
 (M9000_321.jpg)	M9000-322	Weather shield NEMA 4x (IP66), for M9300 on dampers	1
	M9000-342	Weather shield NEMA4x (IP66), 1/2 to 2 in. for VA9300 on VG1000 Series ball valves	1

Rotary Actuator Accessories (Continued)

Accessories (Order Separately) (Part 2 of 3)

	Code Number	Description	Qty
Valve Linkages			
 (M9000_561.jpg)	M9000-561	Thermal barrier	1
 (M9000_561.jpg)	M9000-700	Universal Ball Valve Linkage Kit	1
Mounting Brackets			
 (M9000_604.jpg)	M9000-604	Anti-rotation bracket	1
Shaft Couplers / Position Indicators			
	M9000-606	Position indicators, M9203, M9208, and M9300 Series	1
	M9300-2	Auxiliary Contact Kit	1
	M9300-100	Threaded Conduit Adapters for 1/2 in. electrician's fittings	5

Rotary Actuator Accessories (Continued)

Accessories (Order Separately) (Part 3 of 3)

	Code Number	Description	Qty
	M9300-140	Feedback Potentiometer 140k ohms	1
	M9000-151	Remote mounting kit, with crank arm and damper linkage for M9108 (16) (24) Series Actuators	1
	M9300-1K	Feedback Potentiometer 1k ohms	1
	M9300-2K	Feedback Potentiometer 2k ohms	1
	M9300-10K	Feedback Potentiometer 10k ohms	1
	M9310-500	Replacement VA9308/9310 valve linkage kit	1
	M9310-600	Replacement M9308/9310 gripper assembly	1

Rotary Actuator Accessories (Continued)

M(VA)9316, M(VA)9320 and M(VA)9335 Series Actuator Accessories



M9335



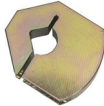
VA9320

Accessories (Order Separately) (Part 1 of 3)

	Code Number	Description	Qty
Damper Linkages / Accessories			
	DMPR-KC003	Blade pin extension (Ø 1/2 x 7 in.) (for use with D1300 dampers only)	1
 (M9000_400.jpg)	M9000-400	Jackshaft mounting kit, Ø 0.5 to 1.05 in.	1
Weather Shields			
 (M9000_321.jpg)	M9000-323	Weather shield NEMA 4x (IP66), for M9300 on dampers	1
	M9000-343	Weather shield NEMA4x (IP66), 1/2 to 2 in. for M9300 on VG1000 Series ball valves	1
Valve Linkages			

Rotary Actuator Accessories (Continued)

Accessories (Order Separately) (Part 2 of 3)

	Code Number	Description	Qty
 (M9000_561.jpg)	M9000-539	Adapter for M9000-53x linkages	1
Mounting Brackets			
 (M9000_604.jpg)	M9000-604	Anti-rotation bracket	1
	M9300-100D	Butterfly Valve Mounting Kit for Tandem M9300 Series Non-Spring Return Electric Actuators to 4, 5 and 6 in. (DN 100, 125 & 150)	1
	M9300-100S	Butterfly Valve Mounting Kit for a Single M9300 Series Non-Spring Return Electric Actuator to 2, 3 and 4 in. (DN 50, 80 & 100)	1
	M9300-200S	Butterfly Valve Mounting Kit for a Single M9300 Series Non-Spring Return Electric Actuator to 8 in. (DN 200)	1
Shaft Couplers / Position Indicators			
	M9000-606	Position indicators, M9203, M9208, and M9300 Series	1
	M9300-2	Auxiliary Contact Kit	1

Rotary Actuator Accessories (Continued)

Accessories (Order Separately) (Part 3 of 3)

	Code Number	Description	Qty
	M9300-100	Threaded Conduit Adapters for 1/2 in. electrician's fittings	5
	M9300-140	Feedback Potentiometer 140k ohms	1
	M9000-151	Remote mounting kit, with crank arm and damper linkage for M9108 (16) (24) Series Actuators	1
	M9300-1K	Feedback Potentiometer 1k ohms	1
	M9300-2K	Feedback Potentiometer 2k ohms	1
	M9300-10K	Feedback Potentiometer 10k ohms	1
	M9320-500	Replacement VA9320/9335 valve linkage kit	1
	M9320-600	Replacement M9320/9335 gripper assembly	1

Rotary Actuator Accessories (Continued)

M(VA)9203 Series Actuator Accessories



M9203-GGB-2
(M9203.jpg)

M(VA)9203 Series Actuator Accessories (Part 1 of 4)

	Code Number	Description ¹	Qty
Shaft Couplers / Position Indicators			
 (M9000_606.jpg)	M9000-606	Position indicators, M9203 and M9208 Series	5
 (M9203_601.jpg)	M9203-601	Standard coupler kit, M9203 Series (Ø 1/4 to 1/2 in.) (□ 1.4 to 5/16 in.)	1
 (M9203_602.jpg)	M9203-602	Retainer for M9203 coupler	5
Mounting Brackets			
 (M9000_604.jpg)	M9000-604	Anti-rotation bracket	1

Rotary Actuator Accessories (Continued)

M(VA)9203 Series Actuator Accessories (Part 2 of 4)

	Code Number	Description ¹	Qty
Weather Shields			
 (M9000_321.jpg)	M9000-322	Weather shield NEMA 4x (IP66), control dampers	1
 (M9000_341.jpg)	M9000-342	Weather shield NEMA 4x (IP66), 1/2 to 2 in. VG1000 Series ball valves	1
Damper Linkages / Accessories			
 (DMPR-KC003.tif)	DMPR-KC003	Blade pin extension (Ø 1/2 x 7 in.) (for use with D1300 dampers only)	1
 (DMPR-KC054.tif)	DMPR-KC054	Damper blade arm (for use with D1300 dampers only)	1
 (DMPR-KC100.tif)	DMPR-KC100	Damper blade linkage (for use with D1300 dampers only)	1
 (DMPR-KC102.tif)	DMPR-KC102	Blade pin extension (Ø 1/2 x 7 in.) (for use with D1300 dampers only)	1
 (M9203_100.jpg)	M9203-100	Remote mounting kit with crankarm	1

Rotary Actuator Accessories (Continued)

M(VA)9203 Series Actuator Accessories (Part 3 of 4)

	Code Number	Description ¹	Qty
 (M9203_110.jpg)	M9203-110	Universal mounting kit	1
 (M9203_115.jpg)	M9203-115	Universal mounting kit with crankarm	1
 (M9203_150.jpg)	M9203-150	Crankarm kit	1
 (M9203_250.jpg)	M9203-250	Remote mounting kit with crankarm and damper linkage for D1300 dampers	1
 (M9000_605.jpg)	M9000-605	Ball joint for Ø 1/4 and Ø 5/16 in. rods, 5/16-24 x 33/64 in. thread mount	5
Adjustable Stops			
 (M9203_603.jpg)	M9203-603	Adjustable stop kit	1

Rotary Actuator Accessories (Continued)

M(VA)9203 Series Actuator Accessories (Part 4 of 4)

	Code Number	Description ¹	Qty
Valve Linkages			
 (M9000_607.jpg)	M9000-607	Position indicators, VA9203 and VA9208 Series	5
 (M9000_560.jpg)	M9000-560	Ball valve linkage for spring return, 1/2 to 2 in. hot and chilled water applications	1
 (M9000_561.jpg)	M9000-561	Thermal barrier	1
 (M9000_561.jpg)	M9000-700	Universal Ball Valve Linkage Kit	1

1. Ø means round shaft size (diameter); □ means square shaft size (each side)

Rotary Actuator Accessories (Continued)

M(VA)9208 Series Actuator Accessories



M9208-BAC-3
(M9208-BAC-3.tif)

M(VA)9208 Series Actuator Accessories (Part 1 of 3)

	Code Number	Description ¹	Qty
Shaft Couplers / Position Indicators			
 (M9208-600.tif)	M9208-600	Large coupler kit for use with M9208 Series actuators (Ø 1/2 to 3/4 in. and □ 3/8 to 9/16 in.)	1
 (M9208-601.tif)	M9208-601	Standard coupler kit for use with M9208 Series actuators (Ø 5/16 to 5/8 in. and □ 1/4 to 1/2 in.)	1
 (M9208-602.tif)	M9208-602	Retainer for M9208 coupler	5
Mounting Brackets			
 (M9000-604.tif)	M9000-604	Anti-rotation bracket	1
Tools			
 (M9220-604.tif)	M9220-604	Long manual crank, 2-13/16 in. (72 mm) crank radius	5
 (M9208-605.tif)	M9208-605	Short manual crank, 1-13/16 in. (47 mm) crank radius	5
 (M9000_321.jpg)	M9000-322	Weather shield NEMA 4X(IP66), control dampers	1

Rotary Actuator Accessories (Continued)

M(VA)9208 Series Actuator Accessories (Part 2 of 3)

	Code Number	Description ¹	Qty
Weather Shields			
 (M9000_341.jpg)	M9000-342	Weather shield NEMA 4X(IP66), 1/2 to 2 in. VG1000 Series ball valves	1
Damper Linkages / Accessories			
 (DMPR-KC003.tif)	DMPR-KC003	Blade pin extension (Ø 1/2 x 7 in.) (for use with D1300 dampers only)	1
 (DMPR-KC054.tif)	DMPR-KC054	Damper blade arm (for use with D1300 dampers only)	1
 (DMPR-KC100.tif)	DMPR-KC100	Damper blade linkage (for use with D1300 dampers only)	1
 (DMPR-KC102.tif)	DMPR-KC102	Damper push rod, Ø 5/16 x 48 in.	1
 (M9000_400.jpg)	M9000-400	Jackshaft mounting kit, Ø 0.5 to 1.05 in.	
 (M9000_402.jpg)	M9000-402	Replacement hardware for M9000-400 jackshaft mounting kit	
 (M9000_605.jpg)	M9000-605	Ball joint for Ø 1/4 and Ø 5/16 in. rods, 5/16-24 x 33/64 in. thread mount	5
 (M9208-100.tif)	M9208-100	Remote mounting kit with crankarm	1

Rotary Actuator Accessories (Continued)

M(VA)9208 Series Actuator Accessories (Part 3 of 3)

	Code Number	Description ¹	Qty
Damper Linkages / Accessories			
 (M9208-150.tif)	M9208-150	Crankarm kit	1
 (M9208-250.tif)	M9208-250	Remote mounting kit with crankarm and damper linkage (for use with D1300 dampers only)	1
Adjustable Stops			
 (M9208-603.tif)	M9208-603	Adjustable stop kit	1
Wiring Accessories			
 (M9200_100.jpg)	M9200-100	Threaded conduit adapters for 1/2 in. electrician's fittings	1
Valve Linkages			
 (M9000_607.jpg)	M9000-607	Position indicators, VA9203 and VA9208 Series	5
 (M9000-560.jpg)	M9000-560	Ball valve linkage for spring return, 1/2 to 2 in. hot and chilled water applications	1
 (M9000_561.jpg)	M9000-561	Thermal barrier	1
 (M9000_561.jpg)	M9000-700	Universal Ball Valve Linkage Kit ²	1

1. Ø means round shaft size (diameter); □ means square shaft size (each side)

2. For VA9208 Series Actuators: Use field furnished #10-24 x 3 1/2" screws and two locking nuts #10-24.

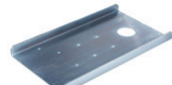
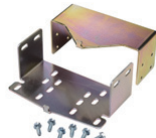
Rotary Actuator Accessories (Continued)

M9220 Series Actuator Accessories



M9220-BAC-3
(M9220-BAC-3.tif)

M9220 Series Actuator Accessories (Part 1 of 4)

	Code Number	Description ¹	Qty
Shaft Couplers / Position Indicators			
 (M9000-611.tif)	M9000-611	Position indicators for use with M9220 Series actuators	5
 (M9220-600A.tif)	M9220-600	Jackshaft coupler kit for use with M9220 Series actuators Ø 3/4 in. to 1-1/16 in. (19 to 27 mm) round shafts; or 5/8 and 3/4 in. (16, 18 and 19 mm) square shafts	1
 (M9220-601.tif)	M9220-601	Standard coupler kit for use with M9220 Series actuators Ø 1/2 to 3/4 in. (12 to 19 mm) round shafts; or 3/8 and 1/2 in. (10, 12 and 14 mm) square shafts	1
 (M9220-602.tif)	M9220-602	Retainer for M9220 coupler	5
 (M9220-610.tif)	M9220-610	10 mm square shaft adapter with retainer	1
	M9220-612	12 mm square shaft adapter with retainer	1
	M9220-614	14 mm square shaft adapter with retainer	1
Mounting Brackets			
 (M9000-152.tif)	M9000-152	Reinforcing plate for mounting to thin sheet metal	1
 (M9000-158.tif)	M9000-158	Tandem mounting bracket	1

Rotary Actuator Accessories (Continued)

M9220 Series Actuator Accessories (Part 2 of 4)

	Code Number	Description ¹	Qty
 (M9000-604.tif)	M9000-604	Anti -rotation bracket	1
Damper Linkages / Accessories			
 (DMPR-KC003.tif)	DMPR-KC003	Blade pin extension (Ø 1/2 x 7 in.) (for use with D1300 dampers only)	1
 (DMPR-KC054.tif)	DMPR-KC054	Damper blade arm (for use with D1300 dampers only)	1
 (DMPR-KC100.tif)	DMPR-KC100	Damper blade linkage (for use with D1300 dampers only)	1
 (DMPR-KC102.tif)	DMPR-KC102	Damper push rod, Ø 5/16 x 48 in.	1
 (DMPR-KC260.tif)	DMPR-KC260	Damper mount linkage kit (for use with D1300 dampers only)	1
 (M9000-153.tif)	M9000-153	Crankarm kit (not for use with M9132 series actuators or tandem applications)	1
 (M9000-170.tif)	M9000-170	Remote mounting kit (horizontal) with crankarm and ball joint	1
 (M9000-171.tif)	M9000-171	Remote mounting kit (vertical) with crankarm and ball joint	1
 (M-9000-270.tif)	M9000-270	Remote mounting kit (horizontal) with crankarm and damper linkage (for use with D1300 dampers only)	1

Rotary Actuator Accessories (Continued)

M9220 Series Actuator Accessories (Part 3 of 4)

	Code Number	Description ¹	Qty
 (M9000-271.tif)	M9000-271	Remote mounting kit (vertical) with crankarm and damper linkage (for use with D1300 dampers only)	1
 (M9000_400.jpg)	M9000-400	Jackshaft mounting kit, Ø 0.5 to 1.05 in.	1
 (M9000_402.jpg)	M9000-402	Replacement hardware for M9000-400 jackshaft mounting kit	1
 (M9000_605.jpg)	M9000-605	Ball joint for Ø 1/4 and Ø 5/16 in. rods, 5/16-24 x 33/64 in. thread mount	5
 (M9220-605.tif)	M9220-605	Ball joint for M8x1.25 threaded rod, M8x1.25 x 16.5 mm thread mount	5
Valve Linkages			
 (M9000-518.tif)	M9000-519	Ball valve linkage for spring return, 2-1/2 to 6 in. VG1000 flanged valves with 11 mm square stem	1
 (M9000-531.tif)	M9000-530	VG2000 linkage kit for M9220 Series electric actuator and Johnson Controls 2-1/2 in. cast iron globe valves with 3/8 in. stems	1
	M9000-531	VG2000 linkage kit for a single M9220 Series electric actuator and Johnson Controls 3 in. and 4 in. cast iron globe valves with 3/8 in. stems	1
	M9000-533	VG2000 linkage kit for a single M9220 Series electric actuator and Johnson Controls 5 in. cast iron globe valves with 1/2 in. stems	1
	M9000-535	VG2000 linkage kit for a single M9220 Series electric actuator and Johnson Controls 6 in. cast iron globe valves with 1/2 in. stems	1

Rotary Actuator Accessories (Continued)

M9220 Series Actuator Accessories (Part 4 of 4)

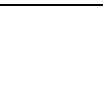
	Code Number	Description ¹	Qty
 (M9000-535.tif)	M9000-532	VG2000 linkage kit for tandem M9220 Series electric actuators and Johnson Controls 3 in. and 4 in. cast iron globe valves with 3/8 in. stems	1
	M9000-534	VG2000 linkage kit for tandem M9220 Series electric actuators and Johnson Controls 5 in. cast iron globe valves with 1/2 in. stems	1
	M9000-536	VG2000 linkage kit for tandem M9220 Series electric actuators and Johnson Controls 6 in. cast iron globe valves with 1/2 in. stems	1
	M9000-537	VG2000 linkage kit for tandem M9220 Series electric actuators and Johnson Controls 3 in. and 4 in. cast iron globe valves with 1/2 in. stems	1
 (M9000-610.tif)	M9000-610	Tandem actuator adapter kit for VG2000 Series iron globe valve linkages (not for use with the M9000-530 linkage)	1
Weather Shields			
 (M9000-320.tif)	M9000-320	NEMA 3R weather shield for control dampers or M9000-53x Series linkage kits on VG2000 Series cast iron flanged globe valves	1
 (M9000-340.tif)	M9000-340	NEMA 5 weather shield for VG1000 Series ball valves with M9000-517 or M9000-519 linkage, spring return	1
Adjustable Stops			
 (M9220-603.tif)	M9220-603	Adjustable stop kit	1
Wiring Accessories			
 (M9200_100.jpg)	M9200-100	Threaded conduit adapters for 1/2 in. electrician's fittings	
Tools			
 (M9220-604.tif)	M9220-604	Manual crank	5

1. Ø means round shaft size (diameter); □ means square shaft size (each side)

Rotary Actuator Accessories (Continued)

Miscellaneous Accessories

Miscellaneous Accessories

	Code Number	Description	Qty
Transformers			
 (Y63T22.tif)	Y63T22-0	Transformer, 50 VA Class 2, 120/208/240 to 24 VAC 60 Hz, box mounting	1
 (Y63T31.tif)	Y63T31-0	Transformer, 50 VA Class 2, 120/208/240 to 24 VAC 60 Hz, foot/box mounting	1
 (Y64T15.tif)	Y64T15-0	Transformer, 92 VA Class 2, 120/208/240 to 24 VAC 60 Hz, foot mounting	1
 (Y64T21.tif)	Y64T21-0	Transformer, 92 VA Class 2, 120/208/240 to 24 VAC 60 Hz, box mounting	1
 (Y64T22.tif)	Y64T22-0	Transformer, 92 VA Class 2, 120/208/240 to 24 VAC 60 Hz, box mounting	1
 (Y65A13.tif)	Y65A13-0	Transformer, 40 VA Class 2, 120 to 24 VAC 60 Hz, foot mounting	1
 (Y65A21.tif)	Y65A21-0	Transformer, 40 VA Class 2, 120 to 24 VAC 60 Hz, box mounting	1
 (Y65G13.tif)	Y65G13-0	Transformer, 40 VA Class 2, 24 to 24 VAC 60 Hz isolation, foot mounting	1
 (Y65S13.tif)	Y65S13-0	Transformer, 40 VA Class 2, 208/240 to 24 VAC 60 Hz, foot mounting	1
 (Y66T12.tif)	Y66T12-0	Transformer, 75 VA Class 2, 120/208/240 to 24 VAC 60 Hz, foot mounting	1
 (Y66T13.tif)	Y66T13-0	Transformer, 75 VA Class 2, 120/208/240 to 24 VAC 60 Hz, foot mounting	1