

M9300 Series Electric Non-Spring Return Actuators

Product Bulletin

M9308-AGA-2Z, M9308-AUA-2Z, M9310-AUA-2,
M9310-HGA-2, M9320-AUA-2, M9320-HGA-2,
M9335-AUA-2, M9335-HGA-2

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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 3/8 in. (10 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.

Figure 1: M9300 Series Electric Non-Spring Return Actuators without (Left) and with Accessory Switch Kit (Right)



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

Features	Benefits
Models with Automatic Signal Input Detection, On/Off, Floating, and Proportional Control with Adjustable Span and Offset	Increases availability at distributors and simplifies retrofits.
Line Voltage On/Off and Floating Models	Reduces total installation cost by avoiding installation of external power supply adapters.
High Speed On/Off and Floating Models	Allow applications in loops that require a quick response time.
Easy Conversion to Valve Operation—Same Actuator Used for Dampers or Valves	Increases availability at distributors with only one actuator to learn.
Optional Accessory Kit	Increases availability at distributors. The auxiliary switch kit provides two line-voltage-capable single-pole, double-throw (SPDT) switches with continuously adjustable switch points, and the auxiliary potentiometer kit provides several potentiometer feedback options. Facilitates safety interfacing or signaling.
Backward Compatible Auxiliary Switch Kits and Auxiliary Potentiometer	Allows for a seamless retrofit without the need to replace the controller.
Self-Calibrating Input Signal to Adjust Stroke	Eliminates the need for a complex calibration procedure when adjusting stops.
Direct-Coupled Design	Requires no crankarm or linkage.

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

Features	Benefits
Electronic Stall Detection	Protects from overload at all angles of rotation. The actuator may be stalled anywhere in its rotation range without the need for mechanical end switches.
Microprocessor-Controlled Brushless DC Motor	Provides constant runtime independent of torque and increases lifecycle by reducing wear.
Mode Configuration Switches	Permits calibration, input signal range selection, and control logic reversal for proportional control.
Integral Cables with Colored and Numbered Conductors	Simplify installation and field wiring.
Optional Integral 1/2 in. (13 mm) Threaded Conduit Connectors	Simplify installation and field wiring.
Plenum-Rated Models	Enable use in other environmental air spaces (plenums) in accordance with section 300.22(C) of the National Electric Code.
Small Footprint	Allows application in smaller spaces than the M9100 Series Actuators.
NEMA 5/IP54 Enclosure	Enhances the range of application environments.
Underwriters Laboratories Inc.® (UL), CE Mark, and RCM Compliance	Provides internationally recognized regulatory agency approvals.
Manufactured under International Standards Organization (ISO) 9001 Quality Control Standards	Ensures quality.
Bottom-Mounted Coupler	Simplifies short shaft damper applications.
5-Year Warranty	Protects consumer investment.

Product Details

Models with Automatic Signal Input Detection (M93xx-HGA-2)

These actuators operate with AC/DC 24 V to provide the rated torque and are designed to be used with on/off, floating, or proportional controls in HVAC systems. They have a constant runtime, independent of supply voltage frequency and load. When the actuator is in the proportional mode, it responds to DC 0 to 10 V or DC 2 to 10 V control signals. With the addition of a 500 ohm resistor, the actuator responds to a 0 to 20 mA or 4 to 20 mA signal. A DC 0 to 10 V or DC 2 to 10 V feedback signal indicates position. The actuators include a plenum-rated cable and are specially configured for installation in spaces used for environmental air-handling purposes, other than ducts and plenums, as specified in National Fire Protection Association (NFPA) 70: National Electrical Code section 300.22(C), Other Space Used for Environmental Air.

Floating and On/Off Models for Line Voltage (AC 85 to 264 V) for Standard Speed (M93xx-AUA-2)

These actuators operate with AC 85 to 264 V to provide the rated torque and are designed to be used with on/off and floating controls in HVAC systems. They

have a constant runtime, independent of supply voltage frequency and load. The actuators include a halogen-free appliance cable.

Floating and On/Off Models for AC/DC 24 V for High Speed (M9308-AUA-2Z)

These actuators have an 8-second constant runtime, independent of supply voltage frequency and load and they provide 70 lb·in. (8 N·m) rated torque. They are designed to be used with on/off or floating controls in HVAC systems. The actuators include a halogen-free appliance cable.

Floating and On/Off Models for AC/DC 24 V for High Speed (M9308-AGA-2Z)

These actuators have an 8-second constant runtime, independent of supply voltage frequency. They are designed to be used with on/off or floating controls in HVAC systems. The actuators include a plenum-rated cable and are specially configured for installation in spaces used for environmental air-handling purposes, other than ducts and plenums, as specified in National Fire Protection Association (NFPA) 70: National Electrical Code section 300.22(C), Other Space Used for Environmental Air.

Wiring

M9308-AGA-2Z Electric Actuator Wiring Diagrams

Figure 2: On/Off AC/DC 24 V Applications

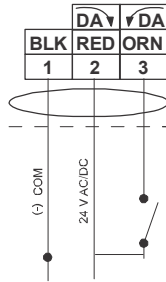
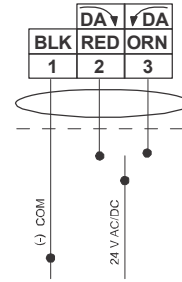


Figure 3: Floating AC/DC 24 V Applications



M9308-AUA-2Z and M9310-AUA-2 Electric Actuator Wiring Diagrams

Figure 4: On/Off AC 85 to 264 V Applications

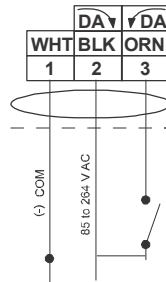
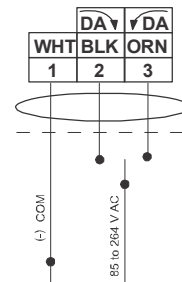


Figure 5: Floating AC 85 to 264 V Applications



M9310-HGA-2, M9320-HGA-2, and M9335-HGA-2 Electric Actuator Wiring Diagrams

Figure 6: On/Off AC 24 V Applications

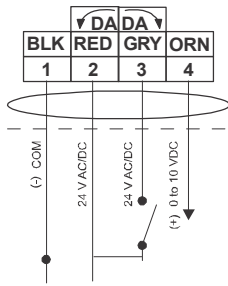


Figure 7: Floating AC 24 V Applications

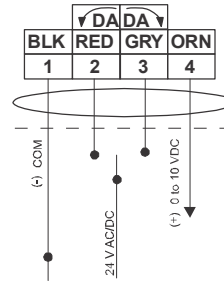


Figure 8: Proportional DC 0 (2) to 10 V Applications

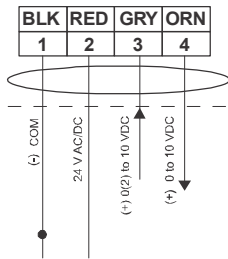
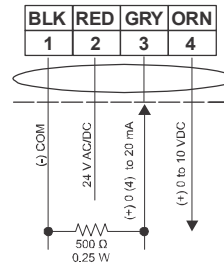


Figure 9: Proportional 0 (4) to 20 mA Applications with External Resistor



M9320-AUA-2 and M9335-AUA-2 Electric Actuator Wiring Diagrams

Figure 10: On/Off AC 120 V Applications

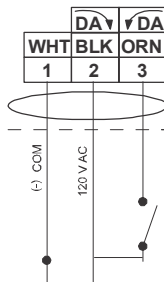
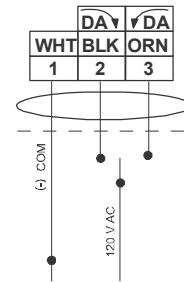


Figure 11: Floating AC 120 V Applications



Two M9335-HGA-2 Electric Actuators Wired in Tandem

Figure 12: Proportional DC 0 (2) to 10 V Applications

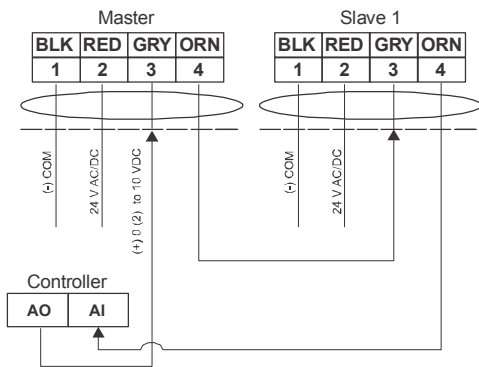
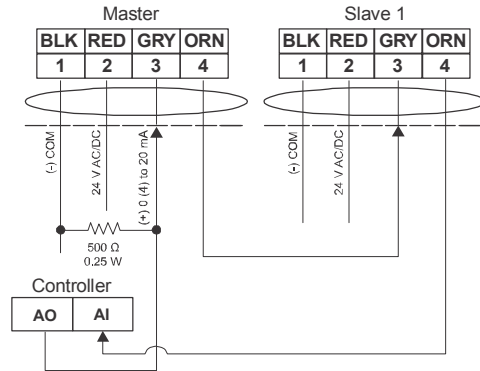
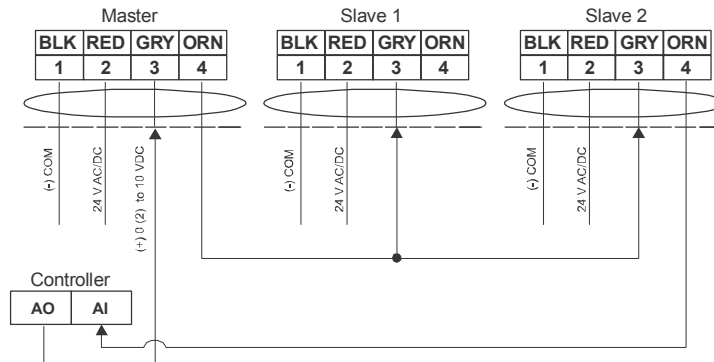


Figure 13: Proportional 0 (4) to 20 mA Applications with External Resistor



Three M9335-HGA-2 Electric Actuators Wired Collectively

Figure 14: Proportional DC 0 (2) to 10 V Applications



IMPORTANT: Use this M9300 Series Electric Non-Spring Return Actuator only to control equipment under normal operating conditions. Where failure or malfunction of the electric actuator could lead to personal injury or property damage to the controlled equipment or other property, additional precautions must be designed into the control system. Incorporate and maintain other devices, such as supervisory or alarm systems or safety or limit controls, intended to warn of or protect against failure or malfunction of the electric actuator.

IMPORTANT : Utiliser ce M9300 Series Electric Non-Spring Return Actuator uniquement pour commander des équipements dans des conditions normales de fonctionnement. Lorsqu'une défaillance ou un dysfonctionnement du electric actuator risque de provoquer des blessures ou d'endommager l'équipement contrôlé ou un autre équipement, la conception du système de contrôle doit intégrer des dispositifs de protection supplémentaires. Veiller dans ce cas à intégrer de façon permanente d'autres dispositifs, tels que des systèmes de supervision ou d'alarme, ou des dispositifs de sécurité ou de limitation, ayant une fonction d'avertissement ou de protection en cas de défaillance ou de dysfonctionnement du electric actuator.

Operation

M9300 Series Actuators use a brushless DC motor controlled by a microprocessor. The microprocessor drives the motor at constant speed, independent of torque. The actuator slows down before it reaches its stop position minimizing the impact on the gearbox, further reducing gear wear. The microprocessor also monitors the brushless DC motor's rotation to prevent damage to the actuator in a stall condition. The actuator can be stalled anywhere within its rotation range without the need for mechanical end switches.

Auto-Calibration Mode (M93xx-HGA-2)

The actuator self-calibrates the control signal when an end stop is adjusted on the stroke. An auto-calibration has to be performed to change the feedback of the actuator. The auto-calibration mode identifies the available range of travel of the coupler. During the auto-calibration mode, the actuator moves the coupler to the maximum and minimum end stops to identify the range of travel.

DIP Switches and Status LEDs

The actuators allow easy setting of the input signals. Through the DIP switches located under the removable oval cover in the front of the unit, it is possible to set reverse or direct acting and to select 0 to 10 V or 2 to 10 V input or other offsets and spans. See Figure 15, Table 2, and Table 3.

Figure 15: DIP Switches and LEDs

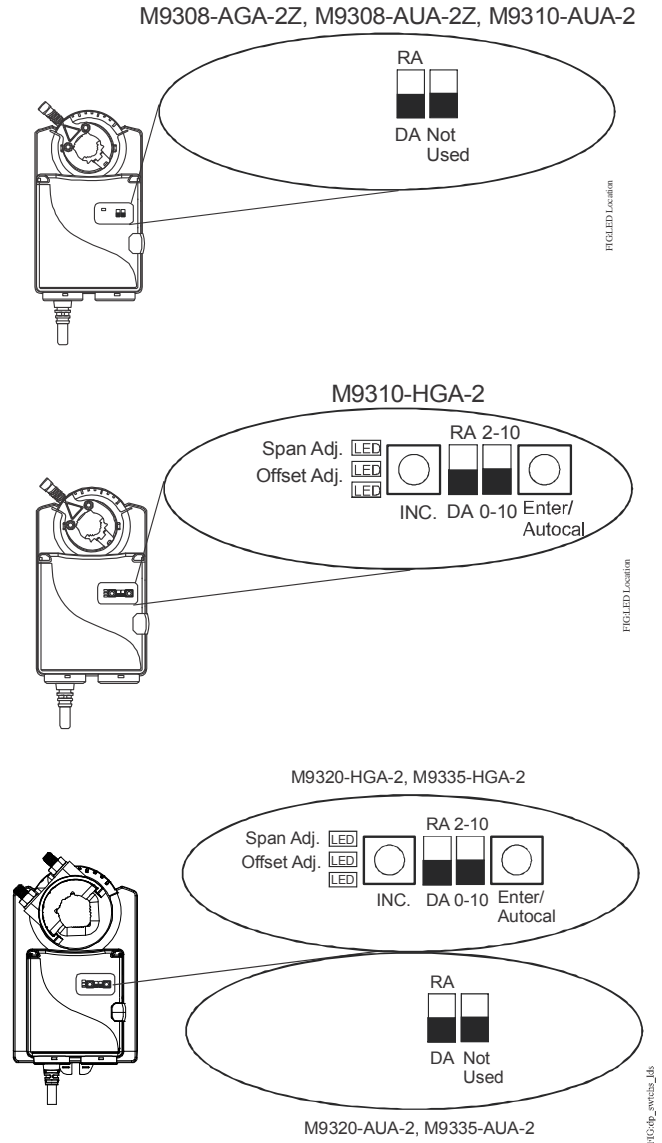


Table 2: DIP Switch Settings for M9308-AGA-2Z, M9308-AUA-2Z, and M93xx-AUA-2



Command Signal	Actuator Mode	Settings for User Interface
Floating or On/Off	Direct Acting	 RA DA Not Used
Floating or On/Off	Reverse Acting	 RA DA Not Used

Figure 16: Graphed Examples of Table Command Signals

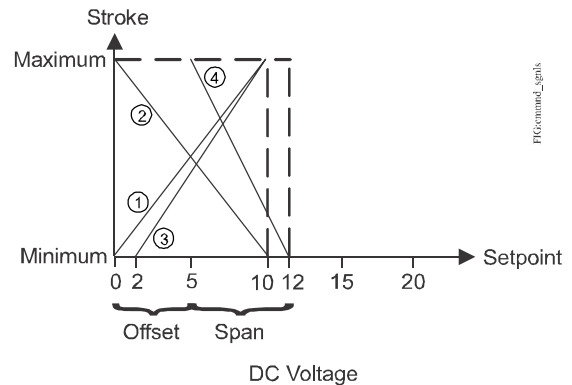
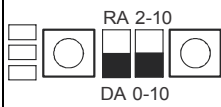
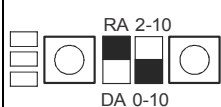




Table 3: DIP Switch Settings for M93xx-HGA-2

Example	Command Signal	Feedback Signal	Settings for User Interface
1	DC 0 to 10 V	Direct DC 0 to 10 V	 RA 2-10 DA 0-10
2	DC 0 to 10 V	Reverse DC 0 to 10 V	 RA 2-10 DA 0-10
3	DC 2 to 10 V	Direct DC 2 to 10 V	 RA 2-10 DA 0-10
	AC 24 V	—	
4	Offset = 5 Span = 7	Reverse DC 10 to 2 V	 RA 2-10 DA 0-10

Mounting Options

Optional Conversion Kit for Ball Valve Applications

M9308 and M9310 Series Electric Damper Actuators can be converted into VA9308 and VA9310 Series Electric Valve Actuators using an optional M9310-500 Ball Valve Linkage Kit.

Optional External Switch Kit

For control requiring line-voltage-capable switches, an optional external switch kit can couple to the electric actuator. The switch kit provides independent and continuously adjustable switch points throughout the full range of the actuator stroke. Auxiliary switches are double insulated so an electrical ground is not required.

Optional External Potentiometer Kit

For control requiring potentiometer feedback, an optional external potentiometer kit can couple to the electric actuator. The potentiometer kit provides a resistive signal proportional to the degree of rotation.

Ordering Information

Table 4: Selection Chart

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	AC 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
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-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	
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-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-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.

Table 5: 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
M9000-400	Jackshaft linkage kit
M9000-604	Replacement anti-rotation bracket kit
M9000-606	Position indicator (five per kit)
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)
M9300-140	External auxiliary feedback potentiometer, 140 ohm (optional for 140 ohm position feedback)
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 to 3/4 in. (10 to 19 mm) and square 3/8 to 5/8 in. (10 to 16 mm)

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

Dimensions

Figure 17: M9308 and M9310 Series Electric Damper Actuators, Dimensions (without Switch Kit or Potentiometer Kit)

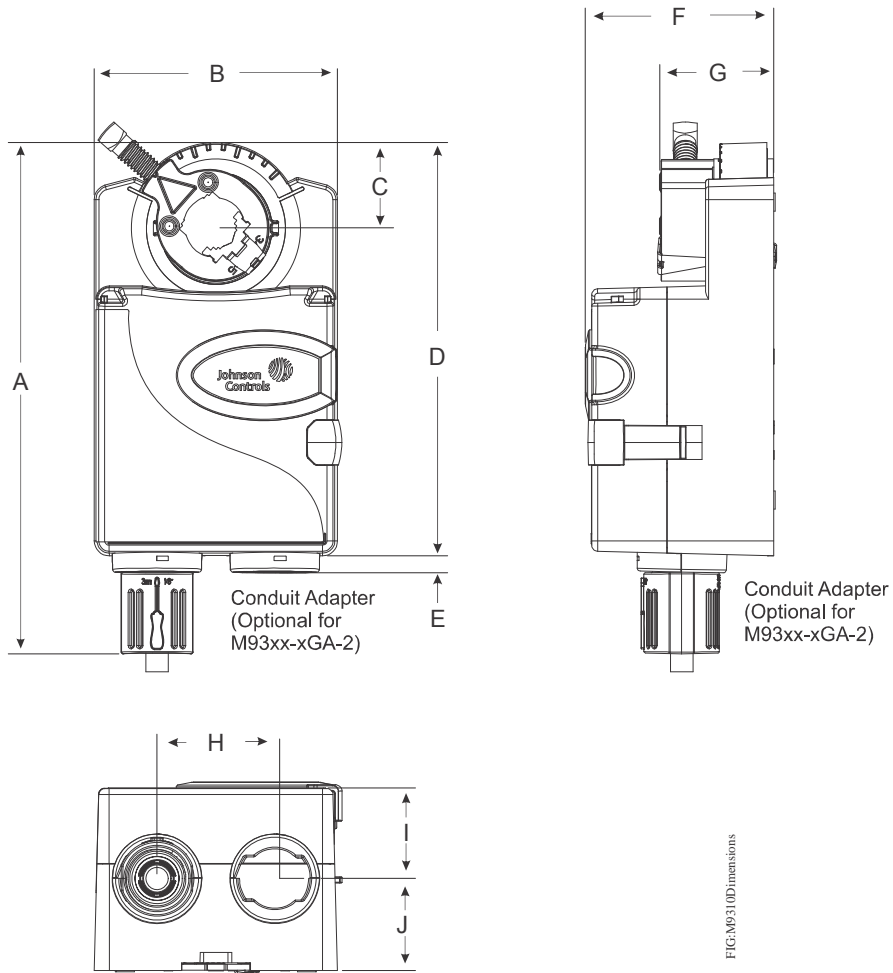


Table 6: M9308 and M9310 Series Electric Damper Actuators, Dimensions (without Switch Kit or Potentiometer Kit)

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)

Figure 18: M9308 and M9310 Series Electric Damper Actuators, Dimensions (with Switch Kit or Potentiometer Kit)

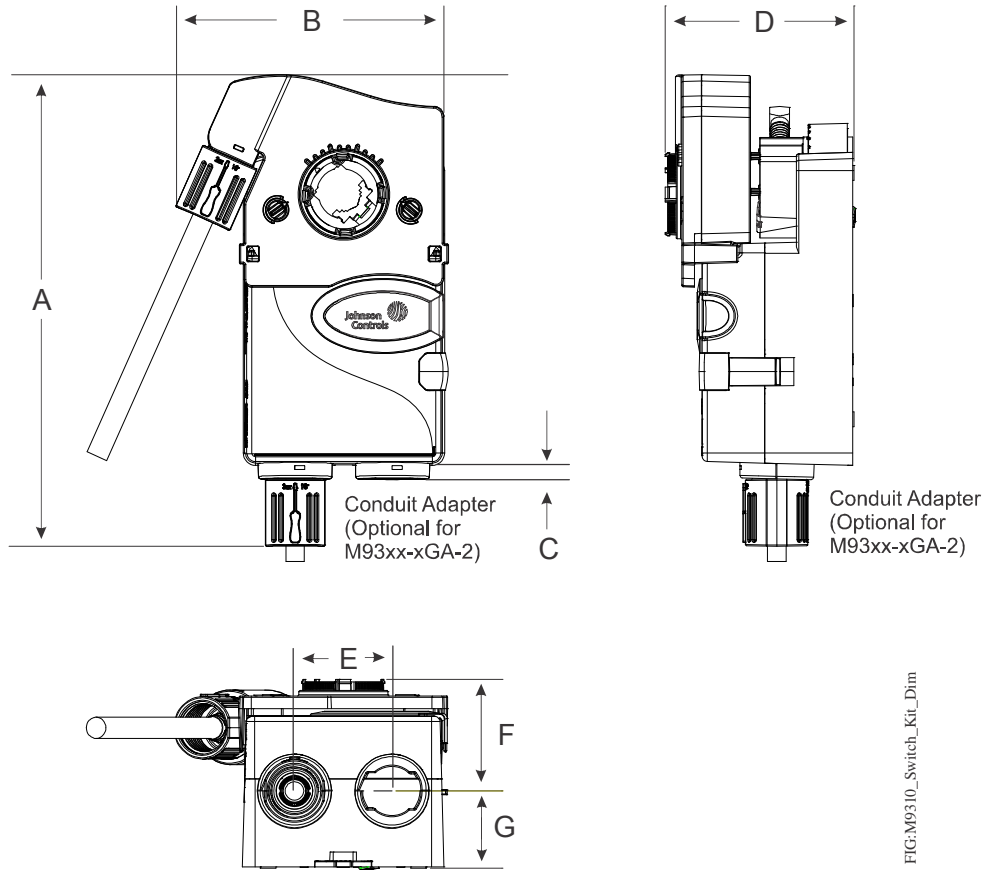
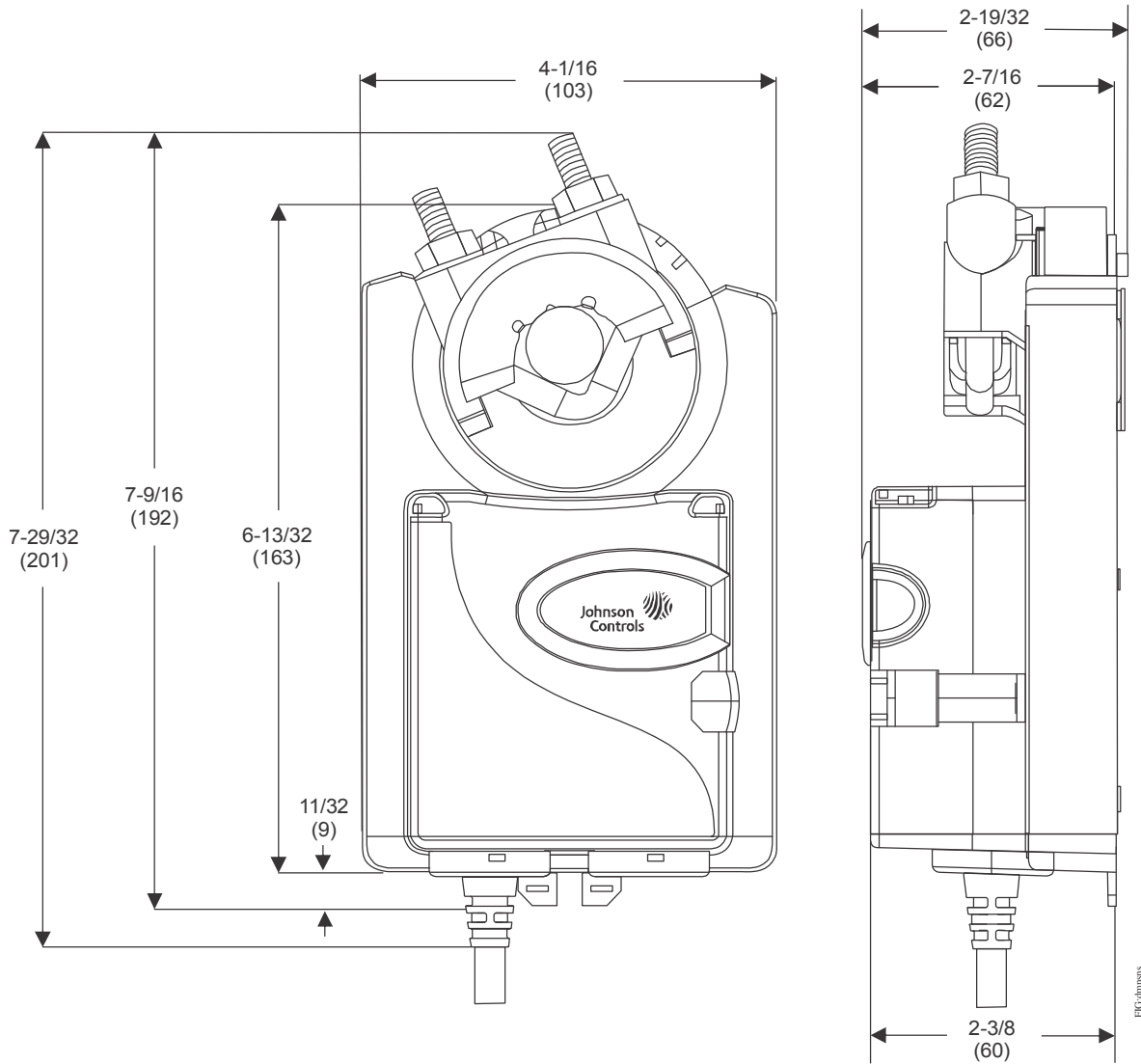


FIG:M9310_Switch_Kit_Dim

Table 7: 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)

Figure 19: M9320 and M9335 Series Electric Damper Actuators, Dimensions, in. (mm)



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 \pm 20% at 50/60 Hz, Class 2 (North America) or SELV (Europe), 12.7 VA running; DC 24 V \pm 10% Class 2 (North America) or SELV (Europe), 5.7 W running	Nominal AC 120 V at 60 Hz: 0.07 A running	Nominal AC 120 V at 60 Hz: 0.04 A running
Transformer Sizing Requirements	\geq 13 VA	—	—
Input Signal/Adjustments	AC 19.2 to 28.8 V at 50/60 Hz or DC 24 V \pm 10% Class 2 (North America) or SELV (Europe)	AC 100 to 240 V (AC 85 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° (\pm 3°) in 5° increments		
Rotation Time for 90° of Travel	8 seconds, constant at all operating conditions		90 second, 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	<52 dBA at 0 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 to 140°F (-30 to 60°C), 95% RH, noncondensing Storage: -40 to 185°F (-40 to 85°C), 95% RH, noncondensing		
Enclosure	NEMA 5/IP54		
Shipping Weight	2 lb (0.9 kg)		
Compliance	<p>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.</p> <p>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.</p> <p>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.</p> <p>Australia and New Zealand: RCM Mark, Australia/NZ Emissions Compliant</p>		

The performance specifications are nominal and conform to acceptable industry standard. For application 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.

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 $\pm 20\%$ at 50/60 Hz, Class 2 (North America) or SELV (Europe), 4.7 VA running; DC 24 V $\pm 10\%$ Class 2 (North America) or SELV (Europe), 1.3 W running	
Transformer Sizing Requirements	≥ 6 VA	
Input Signal/Adjustments	AC 19.2 to 28.8 V at 50/60 Hz or DC 24 V $\pm 10\%$ 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° ($\pm 3^\circ$) 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 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 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 M9310-HGA-2)	
Ambient Conditions	Operating: -22 to 140°F (-30 to 60°C), 95% RH, noncondensing Storage: -40 to 185°F (-40 to 85°C), 95% RH, noncondensing	
Enclosure	NEMA 5/IP54	
Shipping Weight	2 lb (0.9 kg)	
Compliance	<p>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.</p> <p>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.</p> <p>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.</p> <p>Australia and New Zealand: RCM Mark, Australia/NZ Emissions Compliant</p>	

The performance specifications are nominal and conform to acceptable industry standard. For application 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.

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 to 28.8 V) at 50/60 Hz, Class 2 (North America) or SELV (Europe) M9320-HGA-2: 5.7 VA running M9335-HGA-2: 6.1 VA running DC 24 V (DC 21.6 to 26.4 V) Class 2 (North America) or SELV (Europe) M9320-HGA-2: 2.1 W running M9335-HGA-2: 2.1 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 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 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	1/2 in. NPSM (13 mm) threaded conduit connectors with M9300-100 Conduit Connector	
Mechanical Connections	Round: 3/4 to 1-1/16 in. (19 to 27 mm) Square: 5/8 to 3/4 in. (16 to 19 mm)		
Ambient Conditions	Operating: -22 to 140°F (-30 to 60°C), 95% RH, noncondensing Storage: -40 to 185°F (-40 to 85°C), 95% RH, noncondensing		
Enclosure	NEMA 5/IP54		

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

	<p>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.</p> <p>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.</p>
	<p>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</p>
	<p>Australia and New Zealand: RCM Mark, Australia/NZ Emissions Compliant</p>
Shipping Weight	3 lb (1.36 kg)

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