

M9106-xGx-2 Series

LIT-1900118

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 Variable Air Volume (VAV) box, a damper with a round shaft up to 1/2 inch (13 mm) in diameter or a square shaft up to 3/8 inch (10 mm). The M9106 with a M9000-520 linkage can also be used to position VG1000 series 1/2" (DN15) to 1-1/2" (DN40) ball valves.

The M9106 models have 53 lb·in (6 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 M9106-xGC-2 models are available with integral auxiliary switches to perform switching functions at any angle within the selected rotation range. GGx models feature DC 0(2)...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 Nm) torque rating
- whisper quiet 35 dBA noise rating
- magnetic clutch – provides over torque protection over the entire range of rotation
- -4 to 125 °F (-20 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" 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 a M9000-520 linkage to control 1/2" (DN15) to 1-1/2" (DN40) VG1000 series ball valves. M9106 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. For more information, 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.



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Repair Information

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

Selection Charts

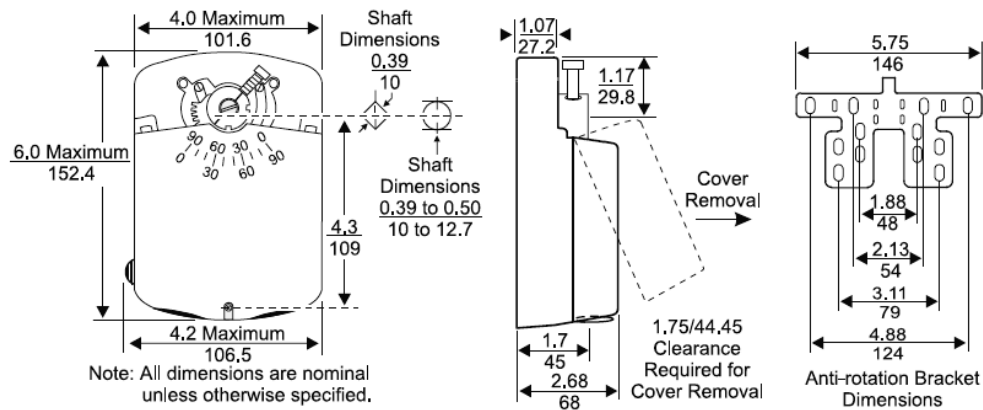
M9106-xGx-2 Electric Non-spring Return Actuators

Code Number	Control Type	Torque / Voltage	Auxiliary Switches	Comments
M9106-AGA-2	Floating	53 lb·in (6 Nm) 60 sec timing at 60 Hz AC 24 V 50/60 Hz	None	
M9106-AGC-2			2-SPDT	
M9106-AGF-2	Floating with resistive feedback		None	10,000 Ohm Feedback Pot
M9106-GGA-2	DC 0(2)...10 V		None	DC 0(2)...10 V Feedback
M9106-GGC-2	DC 0(4)...mA proportional		2-SPDT	
M9106-IGA-2	On-Off / Floating with timeout		None	Adjustable timing 1, 1.5, 2, 5.5 or 11 min.
M9106-IGC-2		2-SPDT		

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

Accessories for M9106-xGx-2 Actuators

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 to 1.5 in. W.C. (0 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 2000 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" Diameter, 1 Panel
DMPR-KC214	Damper Jackshaft 1/2" Diameter, 2 Panel
DMPR-KR003	Sleeve Pin Kit for use with Johnson Controls round dampers with a 5/16 in. (8 mm) shaft; Furnished with the damper and may be ordered separately
M9000-105	Pluggable 3-Terminal Block
M9000-106	Pluggable 4-Terminal Block
M9000-160	Replacement anti-rotation bracket for M9106 Series actuators
M9000-200	Commissioning Tool provides a control signal to drive on/off, floating, proportional, or resistive actuators
M9000-520	Valve Linkage Kit for field mounting an M9106 actuator to a 1/2 in. (DN15) to 1-1/2" (DN40) VG1000 Series ball valve



Dimensions, in./mm

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Technical Specifications

M9106-xGx-2 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)...10 V or DC 0(4)...20 mA proportional
Input Signal	AGx and IGx: AC 20...30 V at 50/60 Hz GGx: DC 0...10 V or DC 0(4)...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)...20 mA Factory Setting: DC 0...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...10 V or DC 2...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 min. settings: 53 lb·in (6 N·m) 5.5 and 11 min. 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 min.) 60, 90, 120, 330, or 660 sec (1, 1.5, 2, 5.5 or 11 min.) at 60 Hz and 72, 108, 144, 396, or 792 sec 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 chart.)
Mechanical Connection	3/8 to 1/2 in. (10 to 12.7 mm) round shaft or 3/8 in. (10 mm) square shaft
Enclosure Rating	NEMA 2, IP32
Ambient Operating Rating	-4 to 125°F (-20 to 52°C); 90% RH maximum, non-condensing
Ambient Storage Rating	IGx: -40 to 186°F (-40 to 86°C); 90% RH maximum, non-condensing All Other Models: -40 to 176°F (-40 to 80°C); 90% RH maximum, non-condensing
Shipping Weight	2.4 lb (1.08 kg)
Agency Compliance	UL 873 Listed, File E27734, CCN XAPX CSA C22.2 No. 139 Certified, File LR85083, Class 3221 02 CE Mark, EMC Directive 89/336/EEC