

M9106-xGx-2 Series

# Electric Non-spring Return Actuators



M9106-xGx-2

## Description

The M9106-xGx-2 Series direct-mount electric actuators operate on 24 VAC 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 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 0 to 10 VDC position feedback, and the AGF models provide 10,000 ohm position feedback.

## Features

- 35 dBA rating meets audible requirements for open ceilings
- synchronous drive provides constant rotation time that is independent of load
- direct shaft mount with single-screw coupler simplifies installation and provides 3-point shaft gripping
- magnetic clutch provides torque protection for the damper and actuator
- field-selectable rotation time (IGx models only) replaces M9104, EDA-2040, and ATP-2040 actuators and provides optimum rotation time for the specific application
- jumper-selectable rotation direction (GGx models only) simplifies installation
- adjustable rotation stops allow application versatility with 30 to 90° clockwise or counterclockwise rotation

- 1/2 in. NPT threaded conduit opening meets electrical code requirements and allows the use of armored cable
- manual gear release simplifies setup and field adjustments
- output position feedback provides simple, closed-loop control with accurate position sensing

## Applications

The M9106 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 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*.

## Accessories

Code Number	Description
CBL-2000-1 (a)	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 (a)	0 to 1.5 in. W.C. (0 to 375 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-KC010 (b)	Adjustable Blade Position Indicator Switch Kit with total switching load limited to 2000 VA for the following applications: Pilot Duty: 24 VAC, 50 VA; 125/250/277 VAC, 125 VA Motor Load: 125/250/277 VAC, 1/3 hp Resistive Load: 125 VAC, 11 A; 250 VAC, 8 A; 277 VAC, 7 A (all maximum values)
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.
M9000-512	Valve Linkage Kit for field mounting an M9106 actuator to a 1/2 in. (DN15) 2-way VG1000 Series ball valve

(a) Use with an M9106-AGC-2 actuator to replace an ATP-2040 actuator and an EDA-2040-102 switch kit. Note: An external relay (not provided) is needed for line voltage auxiliary switching.

(b) Use with an M9106 actuator to replace an EDA-2040 or ATP-2040 actuator and an EDA-2040-102 switch kit, when line voltage switches are required and an external relay is not desired.

## Repair Parts

Replace the unit.

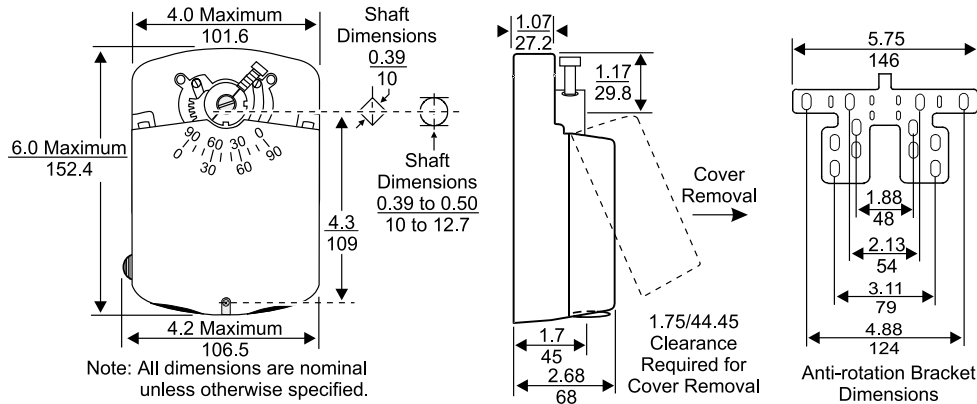
## To Order

Specify the code number from the following selection chart.

## Selection Chart

M9106-xG-x-2 Series Electric Actuator 53 lb-in (N-m)	M9106-AGA-2	M9106-AGC-2	M9106-AGF-2	M9106-GGA-2	M9106-GGC-2	M9106-IGA-2	M9106-IGC-2
On/Off Control						■	■
Floating Control	■	■	■			■	■
Proportional Control				■	■		
Feedback							
10,000 ohm Potentiometer			■				
0 to 10 VDC Feedback				■	■		
2 Auxiliary Switches		■			■		■
Adjustable Rotation Time						■	■

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



**Dimensions, in./mm**

**Specifications**

<b>M9106-xGx-2 Series Electric Non-spring Return Actuators</b>	
<b>Power Requirements</b>	AGx: (20 to 30 VAC) at 50/60 Hz; 2.5 VA supply, Class 2 IGx: (20 to 30 VAC) at 50/60 Hz; 2.8 VA supply, Class 2 GGx: (20 to 30 VAC) at 50/60 Hz; 3.2 VA supply, Class 2
<b>Input Signal</b>	AGx and IGx: 20 to 30 VAC at 50/60 Hz GGx: 0 to 10 VDC or 0 to 20 mA
<b>Input Signal Adjustments</b>	AGx and IGx: CW and COM Terminals, CW rotation; CCW and COM Terminals, CCW rotation GGx (Voltage Input or Current Input): Jumper Selectable: 0 (2) to 10 VDC or 0 (4) to 20 mA Factory Setting: 0 to 10 VDC, CW rotation with signal increase Action is jumper selectable Direct (CW) or Reverse (CCW) with signal increase.
<b>Input Impedance</b>	AGx: 200 ohms, nominal IGx: 160 ohms, nominal GGx: Voltage Input, 150,000 ohms; Current Input, 500 ohms
<b>Feedback Signal</b>	AGF: 10,000 ohm potentiometer, 1 W GGx: 0 to 10 VDC or 2 to 10 VDC for 90° (10 VDC at 1 mA); Corresponds to input signal span selection
<b>Auxiliary Switch Rating</b>	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
<b>Mechanical Output (Running Torque)</b>	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)
<b>Cycles</b>	100,000 full cycles; 2,500,000 repositions rated at 53 lb-in (6 N·m)
<b>Audible Noise Rating</b>	35 dBA maximum at 1 m
<b>Rotation Range</b>	Adjustable from 30 to 90°, CW or CCW
<b>Rotation Time</b>	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°
<b>Electrical Connection</b>	1/4 in. spade terminals (To order optional pluggable terminal blocks, see Accessories chart.)
<b>Mechanical Connection</b>	3/8 to 1/2 in. (10 to 12.7 mm) round shaft or 3/8 in. (10 mm) square shaft
<b>Enclosure</b>	NEMA 2, IP32
<b>Ambient Operating Conditions</b>	-4 to 125°F (-20 to 52°C); 90% RH maximum, non-condensing
<b>Ambient Storage Conditions</b>	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
<b>Dimensions (H x W x D)</b>	5.9 x 4.2 x 2.64 in. (150.1 x 106.5 x 67.0 mm)
<b>Shipping Weight</b>	2.4 lb (1.08 kg)
<b>Agency Compliance</b>	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