

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 Variable Air Volume (VAV) box. They may also be installed on a small or medium-sized damper with a round shaft up to 1/2 inch (13 mm) in diameter or a 3/8 inch (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 to 1.5 in. W.C. (0 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. See 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.

For more information, 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*.



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

## Repair Information

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



## Selection Charts

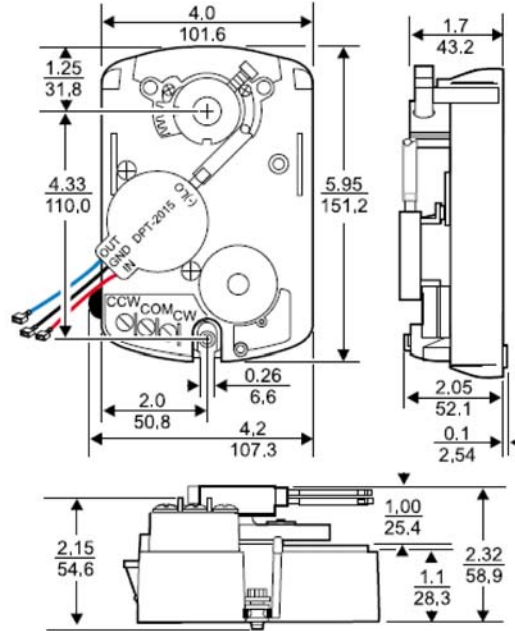
### M9106-AGx-2N0x Electric Non-spring Return Actuators

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

## Electric Non-spring Return Actuators (Continued)

### Accessories for M9106-AGx-2N0x Actuators

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 to 1.5 in. W.C. (0 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)

## Electric Non-spring Return Actuators (Continued)

### Technical Specifications

M9106-AGx-2N0x Electric Non-spring Return Actuators	
<b>Power Requirement</b>	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
<b>Control Type</b>	Floating
<b>Input Signal</b>	M9106-AGx-2N0x: 24 V (AC 20...30 V) at 50 or 60 Hz
<b>DPT 2015-0</b>	Pressure Range: 0 to 1.5 in. W.C. (0 to 374 Pa) Over Pressure Limit: 15 in. W.C. (3.74 kPa) Output Voltage: 0.5 to 4.5 VDC with 25,000 ohm minimum load impedance
<b>Input Impedance</b>	M9106-AGA-2N01: 200 ohms, nominal M9106-AGx-2N02: 250 ohms, nominal
<b>Feedback Signal</b>	N/A
<b>Auxiliary Switch Rating</b>	N/A
<b>Torque Rating</b>	53 lb-in. (6 N-m)
<b>Cycle Life</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 39.4 in. (1 m)
<b>Rotation Range</b>	Adjustable from 30 to 90°, CW or CCW
<b>Rotation Time</b>	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°
<b>Electrical Connection</b>	No. 6-32 screw terminals
<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 Rating</b>	NEMA1, IP30
<b>Ambient Operating Rating</b>	M9106-AGA-2N0x: 32 to 125°F (0 to 52°C); 90% RH maximum, non-condensing M9106-AGS-2N02: 32 to 125°F (0 to 52°C); 90% RH maximum, non-condensing 60 to 100°F (16 to 38°C); 90% RH maximum, non-condensing for DPT rated accuracy (See <i>DPT-2015</i> Differential Pressure Transmitter for VAV Box Applications Installation Instructions, Part No. 24-7547-18.)
<b>Ambient Storage Rating</b>	-20 to 150°F (-29 to 66°C); 90% RH maximum, non-condensing
<b>Shipping Weight</b>	M9106-AGA-2N0x: 2.0 lb (0.91 kg) M9106-AGS-2N02: 2.2 lb (0.99 kg) with the DPT-2015
<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