

M9106-AGx-4 Series Floating Electric Non-Spring Return Actuators

Installation

IMPORTANT: The M9106-AGx-4 Series Electric Actuator is intended to provide an input to 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 : Le M9106-AGx-4 Series Electric Actuator est destiné à transmettre des données entrantes à un équipement 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.

Parts Included

- M9106-AGx-4 actuator
- spade terminals

Special Tools Needed

- wire/terminal crimper

Mounting

The actuators are not position sensitive, and may be mounted in any convenient orientation onto VG1000 Series Ball Valves by the means of the M9000-520 or M9000-512 Valve Linkage Kit.

For more details, refer to the *M9000-520 Ball Valve Linkage Kit Mounting Instructions (P/N 14-1297-5)* or *M9000-512 Valve Linkage Kit Instructions (P/N 14-1201-13)*.

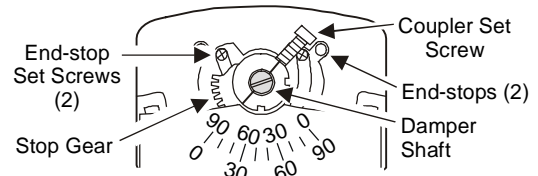


Figure 1: Setting the Rotation Range

Use the center of the coupler set screw as a pointer to observe the position on the scale when rotating the coupler from one side to the other.

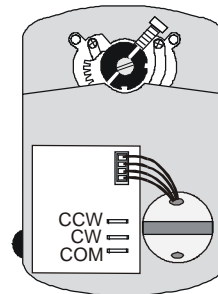
IMPORTANT: Do not remove the end-stop set screws, as this could interfere with the actuator's operation.

Setup and Adjustments

Direction of Action

In the Direct Acting (DA) mode, a minimum control signal drives the actuator to the full CCW position, and a maximum control signal drives it fully CW. For Reverse Acting (RA) operation, a minimum control signal drives the actuator to the full CW position, and a maximum control signal drives it fully CCW.

For CW rotation and RA operation, apply 24 VAC to the Common (COM) and CW Terminals. For CCW rotation and DA operation, apply 24 VAC to the COM and CCW Terminals. (See Figure 2.)



**Figure 2: Direction of Action on
AGx Model**

Wiring



CAUTION: Risk of Property Damage.

Do not apply power to the system before checking all wiring connections. Short circuited or improperly connected wires may result in permanent damage to the equipment.

MISE EN GARDE : Risque de dégâts matériels.

Ne pas mettre le système sous tension avant d'avoir vérifié tous les raccords de câblage. Des fils formant un court-circuit ou connectés de façon incorrecte risquent d'endommager irrémédiablement l'équipement.

IMPORTANT: Make all wiring connections in accordance with the National Electrical Code and all local regulations.

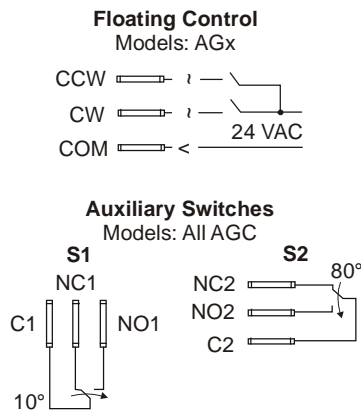


Figure 3: Wiring for M9106-AGx Models

Note: 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).

Through the Conduit Openings

Depending on the M9106 model selected, one or both conduit openings are used.

1. Loosen the cover screw and remove the actuator cover.
2. Push the plastic conduit plug out of the conduit opening with fingertip. (See Figure 4.)

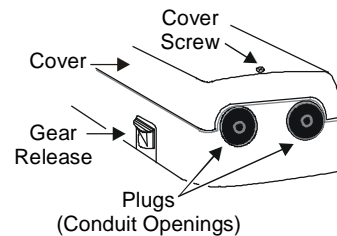


Figure 4: Location of the Conduit Openings

3. Use the Phillips No. 1 screwdriver to puncture a hole through the center of the plastic conduit plug. Reinsert the plug into the conduit opening.

Note: For applications requiring metal conduit, thread the conduit fitting into the conduit opening and hand tighten.

4. Insert the cable wires through the plastic plug, compression fitting, or conduit fitting, and connect to the terminals using the appropriate wiring diagram in Figure 3.

IMPORTANT: Install all quick-connect terminals in the same direction to prevent shorting. (See Figure 5.)



Figure 5: Orientation of Terminals

Note: If using optional pluggable terminal blocks (M9000-105 or M9000-106), insert the cable wires through the conduit opening, and then connect the wires to the terminals.

Auxiliary Switches (AGC Model)

The M9106-AGC-4 models have two built-in auxiliary switches that may be set for any angle between 0 and 90° (factory set for 10 and 80°, nominal). Refer to the *Technical Data* section for auxiliary switch ratings.

The following procedures serve as examples to change the position of the auxiliary switch angles when starting at full CCW position.

Switch S1

To change the angle of Switch S1 to 20°, refer to Figure 6 and proceed as follows:

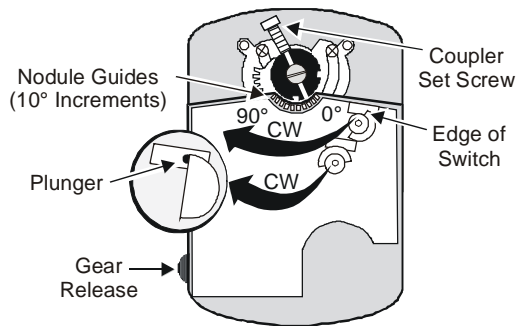


Figure 6: Switch Angle Settings

1. Press and hold the gear release. Using the 0 to 90° nodule guides, rotate the coupler until the center of the coupler set screw is at 20°.
2. Rotate Switch S1 CW, and align the edge of the switch with the plunger until the plunger rises. (See Figure 6.)

Note: At this point, the normally closed contact closes, and the normally open contact opens. (See Auxiliary Switches in Figure 3.)

Switch S2

To change the angle of Switch S2 to 70°, refer to Figure 6 and proceed as follows:

1. Press and hold the gear release. Using the 0 to 90° nodule guides, rotate the coupler until the center of the coupler set screw is at 70°.
2. Rotate Switch S2 CW, and align the edge of the switch with the plunger until the plunger rises. (See Figure 6.)

Note: At this point, the normally closed contact opens, and the normally open contact closes. (See Auxiliary Switches in Figure 3.)

3. Press and hold the gear release. Rotate the coupler until the center of the coupler set screw is back to 0°.
4. Check all the wiring and system settings, and apply power to the controller. Provide signals to the actuator to drive it at least one complete cycle open and closed to verify proper operation.

Repairs and Replacement

Field repairs must not be made. For a replacement or an accessory, refer to the *Ordering Information* section in the *Product Bulletin (LIT-1681123)*.

Technical Data

Product	M9106-AGx-4 Series Electric Non-Spring Return Actuators
Power Requirements	20 to 30 VAC at 50/60 Hz; 2.5 VA supply, Class 2
Input Signal	20 to 30 VAC at 50/60 Hz
Input Signal Adjustments	CW and COM Terminals, CW rotation CCW and COM Terminals, CCW rotation
Input Impedance	200 ohms, nominal
Auxiliary Switch Rating	AGC: 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
Mechanical Output	Running Torque: 53 lb·in (6 N·m)
Cycles	100,000 full cycles; 2,500,000 repositions rated at 53 lb·in (6 N·m)
Audible Noise Rating	35 dBA maximum at 1 m
Rotation Range	Adjustable from 30 to 90°, CW or CCW
Rotation Time	Nominal 60 seconds at 60 Hz and 72 seconds at 50 Hz for 90°
Electrical Connection	1/4 in. spade terminals (Optional pluggable terminal blocks are available.)
Conduit Connection	PG11 threaded
Mechanical Connection	3/8 to 1/2 in. (10 to 12.7 mm) round steel shaft or 3/8 in. (10 mm) square steel shaft
Enclosure	NEMA 2, IP32
Ambient Operating Conditions	-4 to 125°F (-20 to 52°C); 90% RH maximum, non-condensing
Ambient Storage Conditions	-40 to 176°F (-40 to 80°C); 90% RH maximum, non-condensing
Dimensions (H x W x D)	5.9 x 4.2 x 2.64 in. (150.1 x 106.5 x 67.0 mm)
Shipping Weight	2.4 lb (1.08 kg)
Agency Compliance	UL Listed, File E27734, CCN XAPX CESA Certified, File LR85083, Class 3221 02 CE Mark – Johnson Controls, Inc., declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive

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

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