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GA(M)24-67(-FS) Series - Installation, Operation and Maintenance Manual

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AND OTHER BRAY PRODUCTS
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| Technical Specifications - Actuators | | | | |
|--|--|----------------------------|-----------------------------------|----------------------------|
| Actuator Models | For CG Globe Valves Sizes 1/2" to 1" | | | |
| | GA24-67 ¹ | GA24-67-FS ¹ | GAM24-67 | GAM24-67-FS |
| | Floating | | Modulating | |
| | Non-Fail Safe | Fail Safe | Non-Fail Safe | Fail Safe |
| Positioning Force | 67 lbf (300 N) | | | |
| Supply Voltage | 24 VAC (+/- 20%) | | 24 VAC(+/-15%) or 24 VDC (+/-20%) | |
| Frequency | 50/60 Hz | | | |
| Power Consumption | 1.0 VAC | 3.0 VAC | 3.5 VAC; 1.5 W VDC | |
| Control Signal | 3-Position Floating: (Terminal Y1, Y2) | | Modulating: 0-10 VDC (Terminal Y) | |
| Input Impedance | N/A | 100.0k Ω | | |
| Feedback Signal | N/A | | 0-10VDC | |
| Parallel Operation (Number of Actuators) | 10 | | | |
| Operation Time | 88 s ± 25% | | 27.5 s ± 25% | |
| Fail Safe Function | N/A | Capacitor Driven (30 sec.) | N/A | Capacitor Driven (30 sec.) |
| Stall Detection | Current Limit | | | |
| Enclosure Rating | NEMA 2/ (Equivalent to IP20) - Not intended for outdoor use without additional protection. | | | |
| Ambient Temperature | Operation Temp: 34° to 122°F (1° to 50°C) Storage Temp: -13° to 158°F (-25° to 70°C) | | | |
| Humidity Rating (Non Condensing) | 5 to 95% R.H. | | | |
| Wire Size | 18...20 AWG (0.5..0.75 mm2), <0.22 In. | | | |
| Electrical Connection | G 1/2" Flex Conduit | | | |
| Manual Override | 3-mm Allen Wrench | | | |
| Dimensions | (L) 5.2" x (W) 1.9" x (H) 3.8" | | | |
| Weight | 10.0 ounces. (283g) | 10.5 ounces (298g) | 9.7 ounces (276g) | 10.5 ounces (298g) |
| Warranty | 5 Years limited from time of shipment | | | |
| Agency Listing | UL60730-2-14; CSA- CAN E60730-1,E730-2-14 FCC CFR 47 Part 15 Class B; CAN ICES-3 (B)/NMB-3 (B) | | | |

Disclaimer

The performance specifications are nominal and conform to acceptable industry standards.

For application at conditions beyond these specifications, consult the local Bray office.

Bray, Inc. shall not be liable for damages resulting from misapplication or misuse of its products.

¹GA24-67 & ¹GA24-67-FS: For parallel operation of floating fail-safe actuators all actuators in parallel must be the same part number.



Safety Instructions - Definition of Terms Read, Follow and Save these instructions



WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

NOTICE

Used without the safety alert symbol indicates a potential situation which, if not avoided, may result in an undesirable result or state, including property damage.

Qualified Personnel

A qualified person in terms of this document is one who is familiar with the installation, commissioning and operation of the device and who has appropriate qualifications, such as:

- Is trained in the operation and maintenance of electric equipment and systems in accordance with established safety practices.
- Is trained or authorized to energize, de-energize, ground, tag and lock electrical circuits and equipment in accordance with established safety practices.

- Is trained in the proper use and care of personal protective equipment (PPE) in accordance with established safety practices.

- Is trained in first aid.

- In cases where the device is installed in a potentially explosive (hazardous) location – is trained in the operation, commissioning, operation and maintenance of equipment in hazardous locations.

IMPORTANT: Use the GA24-67 Series as an operating control. Where failure or malfunction of the GA24-67 Series could lead to personal injury or property damage to the controlled equipment or other property, additional precautions must be designed into the 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 GA24-67 Series.

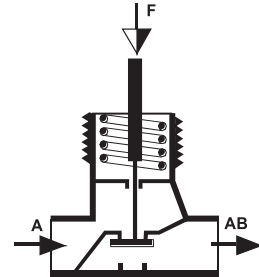
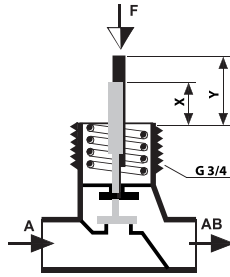
IMPORTANT: Take care to prevent foreign material such as weld slag, thread burrs, metal chips, and scale from entering the piping system. This debris can damage or severely impede the operation of the valve by embedding itself in the seats, scoring the valve, and ultimately resulting in seat leakage. If the debris becomes embedded in the seats, subsequent flushing and filtering of the piping system with the valve installed does not remedy the problem.

IMPORTANT: Contact your local Bray representative for compatibility concerns before using GA24-67 Series to control the flow of fluids other than those outlined in the Technical Specifications table in this document.



Installation

- Threaded connections with coupling nut 3/4".
- Nominal force $F > 67 \text{ lbf}$ (300 N)
- Dimension $X \geq 0.50 \text{ in}$ (12.82 mm)
- Dimension $Y \leq 0.73 \text{ in}$ (18.65 mm)



Mounting



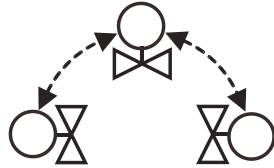
WARNING

- Do not use pipe wrenches, pliers or similar tools.
- Avoid lateral pressure or (cable) tension on the mounted actuator.

Valve and actuator are easy to assemble on site before commissioning:

- Remove protective cover from the valve body.
- Position the actuator and tighten the connection nut manually.
- See "Mounting instruction" for graphical instructions.

Orientation



Commissioning

When commissioning, check both wiring and functioning of the actuator.

- Actuator stem extends Normally open valve closes, normally closed valve opens
- Actuator stem retracts Normally open valve opens, normally closed valve closes



NOTICE

The actuator must be commissioned only with a correctly mounted valve in place!

Self-Calibration

When operating voltage is applied, the actuator self-calibrates (fully retracted > fully extended > setpoint).



CAUTION

Never intervene manually during self-calibration.



NOTICE

- Correct calibration is only possible with valve stroke $> 0.05 \text{ inch}$ (1.2 mm).
Valve stroke $< 0.05 \text{ inch}$ (1.2 mm) results in calibration failure.
- If calibration fails, the actuator performs another calibration automatically after 10 seconds.
- After three failed calibration attempts, the actuator stem remains in the extended position and the valves are open.

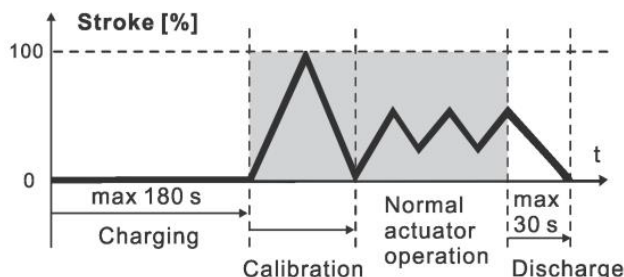
| Cabling Operation | | |
|--------------------|---------------------|---------------------------|
| GA24-67 | GA24-67-FS | GAM24-67, GAM24-67-FS |
| G = AC 24 | G = AC 24 V | G = AC/DC 24 V |
| Y1 = Stem Extends | G0 = System Neutral | G0 = System Neutral |
| Y2 = Stem Retracts | Y1 = Stem Extends | Y = DC 0...10 V |
| - | Y2 = Stem Retracts | U = Feedback Signal |
| - | - | M = Measurement Reference |



Electrical Fail-Safe Function (-FS Models)

When first connected to power, or after a power failure, the capacitor which stores energy for the fail-safe function will be charged. This process takes up to 180 seconds. While the capacitor is being charged, the actuator cannot respond to any control signals.

In the event of a power failure of more than 5 seconds, the actuator will return to its fail-safe position within 30 seconds.



Manual Operation for (All but GA24-67)

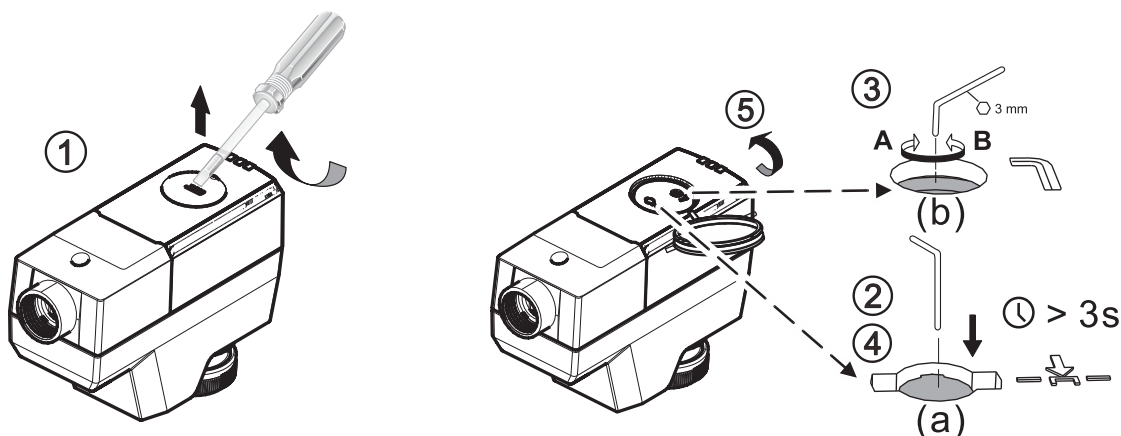
A 3-mm Allen wrench can be used to move the actuator to any position.

1. Open the cover using a proper screwdriver.
2. Press and hold down button (a) illustrated below for at least three seconds.
 - The actuator ignores any control signal from the controller.
3. Adjust the position of the actuator stem by rotating Allen wrench (b) illustrated below clockwise or counter-clockwise.
 - The actuator stem moves down if you rotate clockwise; it moves up if you rotate counter-clockwise. The manually set position is retained.
4. To release the actuator from manual operation mode, press and hold down button (a) illustrated below again for at least three seconds.
 - The actuator runs a self-calibration automatically. Control signal sent from the controller takes effect.
5. Close the cover.



NOTICE

If operating voltage is applied to actuator, press button (a) before and after manually adjusting the position of the actuator stem. If no operating voltage and control signal are applied, manual operation can be done without pressing button (a).

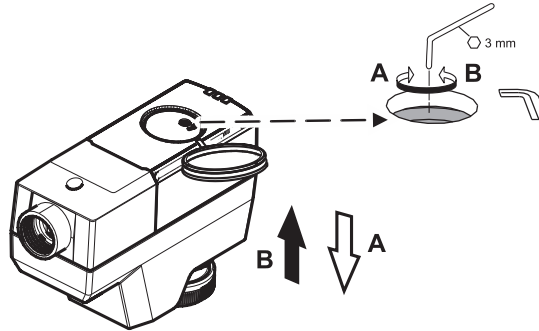




Manual Operation for (GA24-67 ONLY)

A 3-mm Allen wrench can be used to move the actuator to any position.

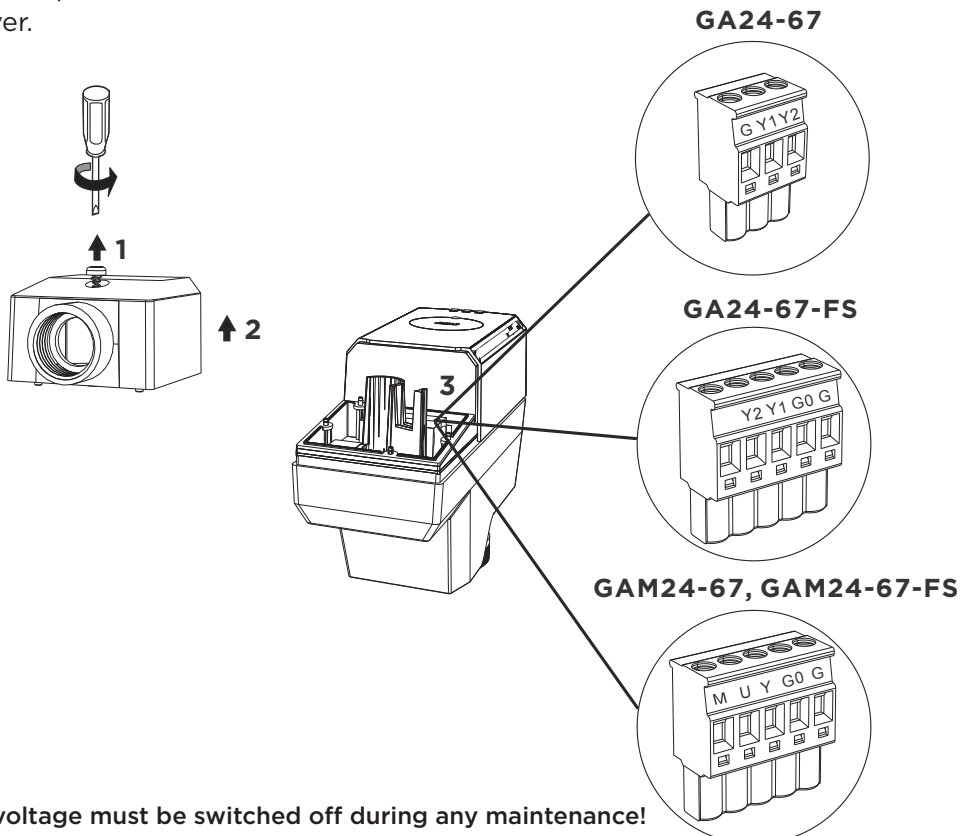
1. Open the cover using a proper screwdriver.
2. Adjust the position of the actuator stem by rotating Allen wrench (b) illustrated below clockwise or counter-clockwise.
 - The actuator stem moves down if you rotate clockwise; it moves up if you rotate counter-clockwise. The manually set position is retained.
3. Close the cover.



Cabling Operation

A 3-mm Allen wrench can be used to move the actuator to any position.

1. Open the cover using a proper screwdriver.
2. Adjust the position of the actuator stem by rotating Allen wrench (b) illustrated below clockwise or counter-clockwise.
 - The actuator stem moves down if you rotate clockwise; it moves up if you rotate counter-clockwise. The manually set position is retained.
3. Close the cover.

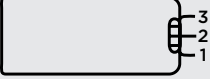
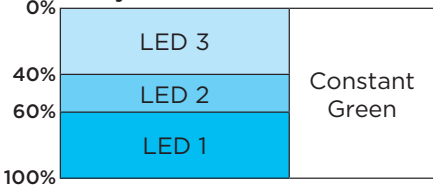


WARNING

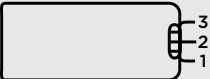
Operating voltage must be switched off during any maintenance!



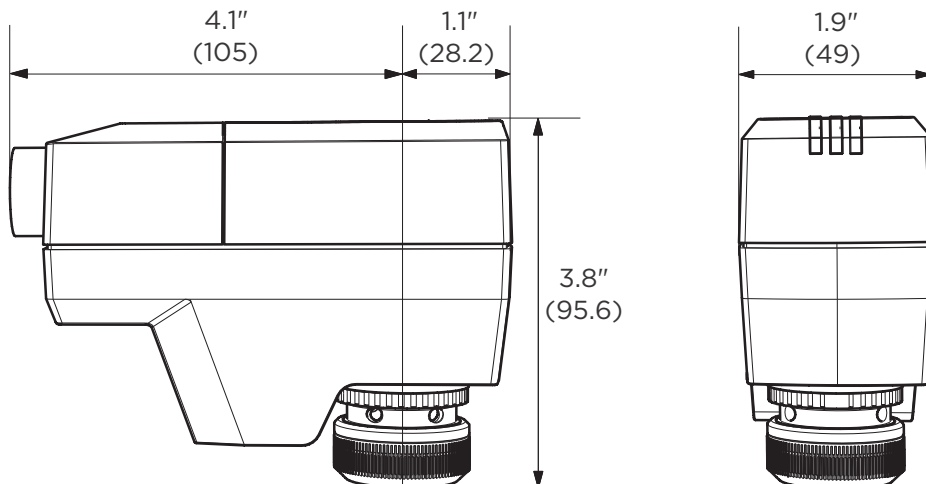
GA(M)24-67(-FS) - Installation, Operation & Maintenance Manual Continued

| Status | LED Indication Patterns |
|---|--|
| GA24-67-FS, GAM24-67(-FS) Variants  | <div style="text-align: center;"> Fully Retracted  Fully Extended </div> |
| Modulation: Stem | Retracting Flashing green in sequence: LED 1-->LED 2-->LED 3 (500 ms each) |
| Modulation: Stem Extending | Flashing green in sequence: LED 3-->LED 2-->LED 1 (500 ms each) |
| Stem Position | 0% - 40% Extended - LED 3 - Constant Green 40% - 60% Extended - LED 2 - Constant Green 60% - 100% Extended - LED 1 - Constant Green |
| Fail-Safe* | Flashing red (LED2): 500 ms on, 500 ms off |
| Calibration | Flashing green (LED 2): 100 ms on, 100 ms off |
| Error | Constant red (LED 2) |
| Manual Operation | Flashing green/red alternatively (LED 2): Green 500 ms, red 500 ms |
| Ultra-cap initial charging* | Constant green & red simultaneously (LED 2): Constant orange |

* Only available for FS Models

| Status | LED Indication Patterns | | | |
|--|-------------------------|-------|----------|-------------------------------------|
| GA24-67 Variants  | LED | Color | Pattern | Description |
| | LED 1 | Green | Constant | Actuator stem is fully extended. |
| | LED 2 | Green | Constant | Actuator stem is moving in-between. |
| | LED 3 | Green | Constant | Actuator stem is fully retracted. |

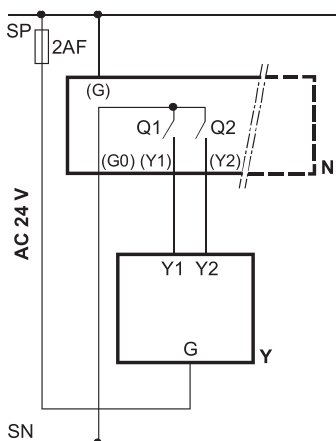
GA(M)24-67(-FS) Series Actuators - Dimensions



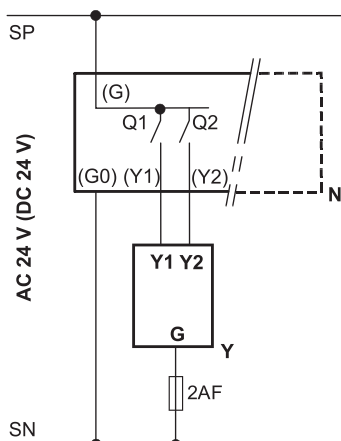


GA24-67 Series Actuators - On/Off Wiring

Neutral switch



Hot switch



N = Controller

Y = Actuator

SP, G = System Potential AC 24 V

SN, G0 = System Neutral

Y1, Y2 = Control Signal OPEN, CLOSE

Q1, Q2 = Controller Contacts

2AF = Fuse Rated Current is 2A

Connection Terminal



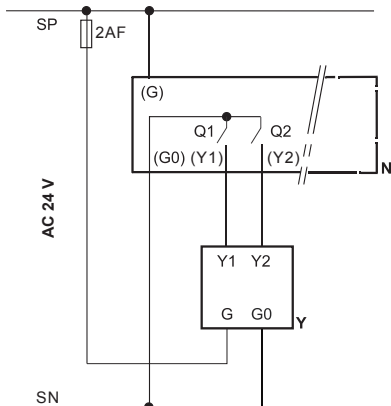
G System Potential (AC 24 V)

Y1 3-Position

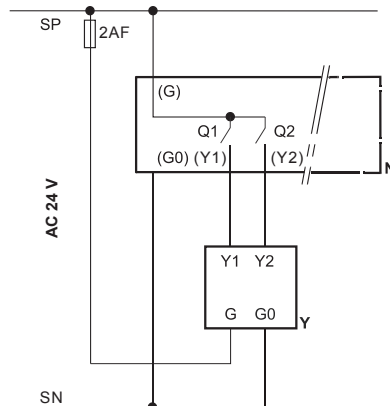
Y2 3-Position

GA24-67-FS Series Actuators - On/Off with Failsafe Wiring

Neutral switch



Hot switch



N = Controller

Y = Actuator

SP, G = System Potential AC 24 V

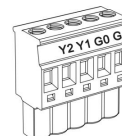
SN, G0 = System Neutral

Y1, Y2 = Control Signal OPEN, CLOSE

Q1, Q2 = Controller Contacts

2AF = Fuse Rated Current is 2A

Connection Terminal



G System Potential (AC 24 V)

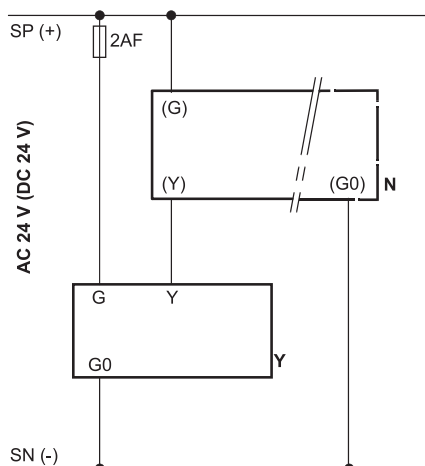
G0 System Neutral

Y1 Stem Extends

Y2 Stem Retracts

The GA24-67-FS floating fail-safe actuators cannot be run in parallel with legacy actuators. For parallel operation all actuators in parallel must be the same part number.

GAM24-67 & GAM24-67-FS Series Actuators - Modulating Wiring



N = Controller

Y = Actuator

SP, G = System potential AC/DC 24 V

SN, G0 = System neutral

Y = Control signal

U = Feedback signal

M = Measurement reference

2AF = Fuse rated current is 2A

Connection Terminal



G System Potential (AC 24 V)

G0 System Neutral

Y Control Signal DC...10 V

U Feedback Signal

M Measurement Reference