

### OpenAir™ GCA Spring Return Rotary Electronic Damper Actuator

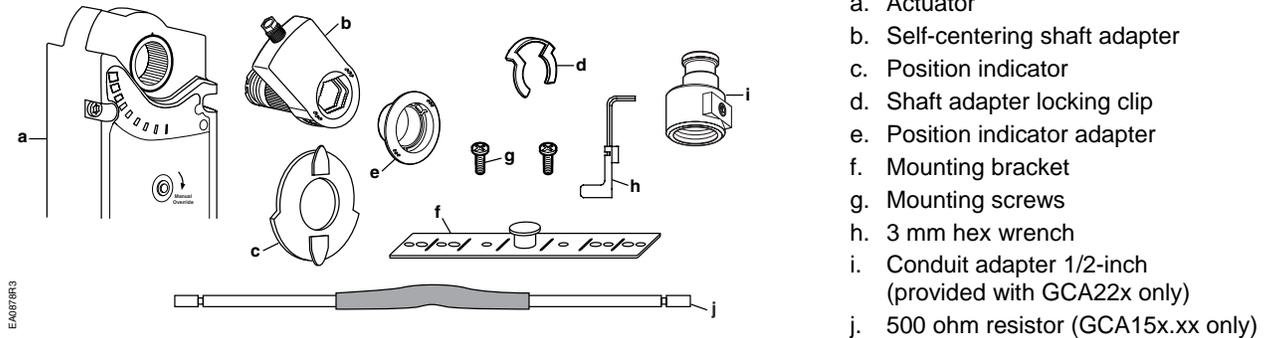


Figure 1. Parts of the GCA Actuator.

### Product Description

Describes the steps for direct-coupled mounting of the OpenAir GCA spring return electronic damper actuators.

### Product Numbers

GCAx

### Warning/Caution Notations

<b>WARNING:</b>		Personal injury or loss of life may occur if you do not follow a procedure as specified.
<b>CAUTION:</b>		Equipment damage or loss of data may occur if you do not follow a procedure as specified.

### Required Tools

- 10 mm (13/32-inch) open-end wrench
- Drill
- 4 mm (5/32-in) drill bit
- 3 mm hex wrench (provided)
- Phillips screwdriver
- Small flat-blade screwdriver
- Marker or pencil

### Expected Installation Time

30 minutes



**WARNING:**  
Do not open actuator.



**CAUTION:**  
Do not turn the 3 mm hex key against the direction of the arrow.

### Mounting Positions

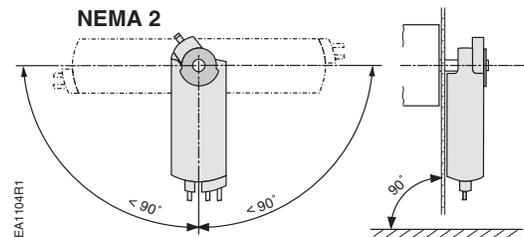


Figure 2. Acceptable NEMA 2-Positions.

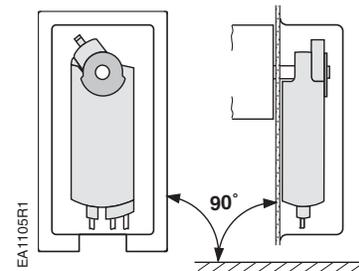


Figure 3. Only Acceptable Position for NEMA Type 3R Rating Using ASK75.1U Weather Shield.

The GCA actuator is UL listed to meet NEMA Type 3R requirements (a degree of protection against rain, sleet, and damage from external ice formation) when installed with the Weather Shield (product number ASK75.1U) and outdoor-rated conduit fittings. Actuator must be in the vertical position.

### Prerequisites

**NOTE:** Actuator is shipped from the factory with 5° preload. When power is applied to the actuator, the preload is released. To manually release the preload, insert the 3 mm hex key in the override opening and turn the key in the direction of the arrow. See *Manual Override*.

## Installation

**Table 1. Actuator Positioning and Damper Control.**

EA1055R1	<b>Determining the Actuator Mounting Orientation</b>		①					
			②	<b>Power Fail Spring Return Position</b> <b>Close</b>	<b>Open</b>	<b>Close</b>	<b>Open</b>	
			③	<b>Actuator Mounting Orientation</b> 				
EA1038R1	<b>2-Position</b>	GCA12x	<b>Power On</b>	<b>Open</b>	<b>Close</b>	<b>Open</b>	<b>Close</b>	
		GCA22x		<b>Open</b>	<b>Close</b>	<b>Open</b>	<b>Close</b>	
EA1039R1	<b>3-Position</b>	GCA13x		<b>Open</b>	<b>Close</b>	<b>Open</b>	<b>Close</b>	
				<b>Close</b>	<b>Open</b>	<b>Close</b>	<b>Open</b>	
		GCA15x	$Y = 10V \Omega$	<b>Open</b>	<b>Close</b>	<b>Open</b>	<b>Close</b>	
			$Y = 2V \Omega$	<b>Open</b>	<b>Close</b>	<b>Open</b>	<b>Close</b>	
EA1040R1	<b>Modulating Control</b>	GCA16x	$Y = 10V$ (or $Y = U_o + \Delta U$ )	<b>Close</b>	<b>Open</b>	<b>Close</b>	<b>Open</b>	
		GCA15x	$Y = 2V \Omega$	<b>Close</b>	<b>Open</b>	<b>Close</b>	<b>Open</b>	
		GCA15x	$Y = 10V \Omega$	<b>Close</b>	<b>Open</b>	<b>Close</b>	<b>Open</b>	
		GCA16x	$Y = 0V$ (or $Y = U_o$ )	<b>Close</b>	<b>Open</b>	<b>Close</b>	<b>Open</b>	

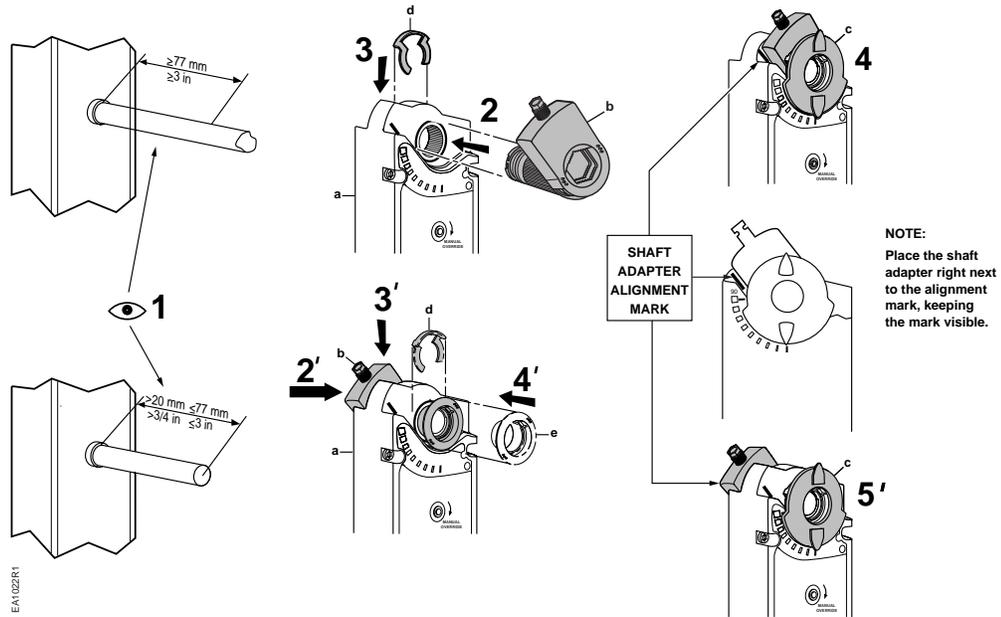


Figure 4. Shaft Length and Proper Shaft Adapter Location.

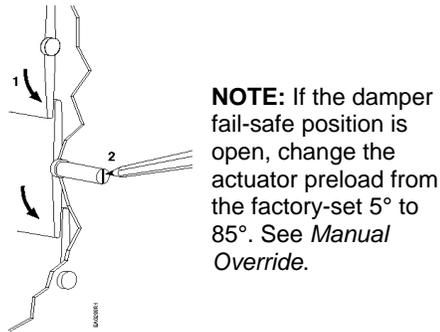


Figure 5. Close the Damper.

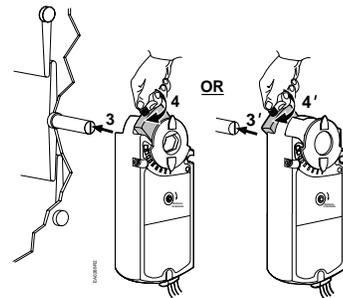


Figure 6. Place the Actuator on the Shaft.

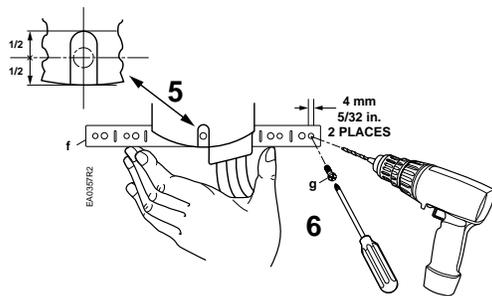


Figure 7. Fasten the Mounting Bracket.

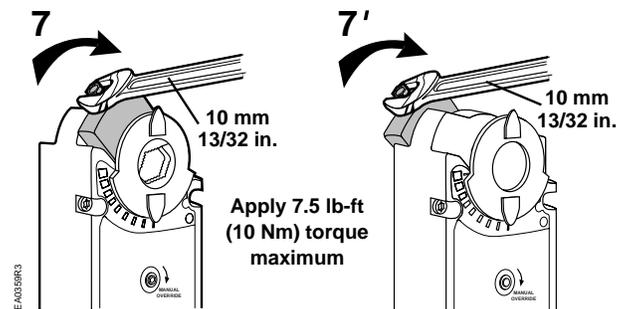


Figure 8. Fasten the Shaft Adapter to the Damper Shaft.

## Manual Override

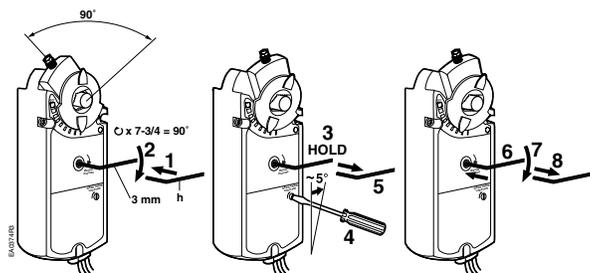


Figure 9. Manual Override.

To use manual override or set preload, do the following: (Figure 9)

1. Insert the 3 mm hex key in the override opening, (Step 1).
2. Turn the key in the direction of the arrow until you reach the desired degree of opening, (Step 2).
3. Hold the key in place, (Step 3).
4. Insert a small flat-blade screwdriver into the gear train lock pin. Turn the screwdriver in the same direction as the arrow until you hear a click or meet slight resistance, (Step 4).



### CAUTION:

When engaging the gear train lock pin, cautiously turn only about 5 degrees until you hear a click or meet slight resistance. Turning too far will strip the lock pin.

5. Remove the key or keep it in place, (Step 5).

### To release manual override or preload

1. Insert the 3 mm hex key in the override opening, (Step 6).
2. Turn the key only a short distance in the direction of the arrow, (Step 7).
3. Remove the key, (Step 8).

The actuator will return to "0" (fail-safe) position.

**NOTE:** Applying power and sending a control signal will release manual override.

## Mechanical Range Adjustment

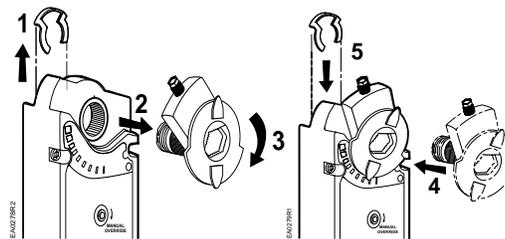


Figure 10. The Angular Rotation is Adjustable Between 0° and 90° at 5 Degree Intervals.

Make sure the actuator is in the "0" (fail-safe) position when making this adjustment. If making the adjustment before the actuator is in service, take into account the factory set 5° preload. To release the preload, see *To Release Manual Override or Preload* section.

### Other settings

For adjustment of auxiliary switches and span/offset options, see the individual Technical Instructions listed under *References* in the following table:

References	Document Number
EA GCA-1 OpenAir™ Spring Return Rotary Electric Damper Actuator Modulating Control	155-173P25
EA GCA-2 OpenAir™ Spring Return Rotary Electric Damper Actuator 24 Vac/dc and 120 Vac 2-Position Control	155-174P25
EA GCA-3 OpenAir™ Spring Return Rotary Electric Damper Actuator 24 Vac/dc 3-Position Control	155-175P25
OpenAir Weather Shield Kits Installation Instructions	129-261

## Wiring

- All wiring must conform to NEC and local codes and regulations.
- Use earth ground isolating step-down Class 2 transformers. Do not use autotransformers.

**NOTE:** The maximum rating for a Class 2 step-down transformer is 100 VA. Determine the supply transformer rating by summing the VA ratings of all actuators and all other components used. It is recommended that not more than 80% of the transformer VA be utilized. The GCA actuator consumes 8 VA or 9 VA.



### CAUTION:

Mixed switch operation to the switching outputs of both auxiliary switches (A and B) is not permitted.

Either AC line voltage from the same phase must be applied to all six outputs of the dual auxiliary switches, or UL-Class 2 voltage must be applied to all six outputs.

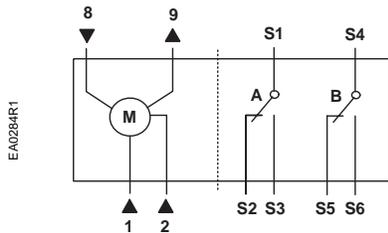
**NOTE:** With Plenum cables, only UL-Class 2 voltage is permitted.

## Wiring, continued

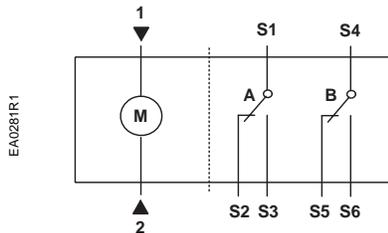
Actuator	Operating Voltage	Power Consumption
Modulating Control		
GCA16x	24 Vac	9 VA
GCA15x	24 Vac/dc	9 VA/7W
2-Position and 3-Position Control		
GCA12x, GCA13x	24 Vac/dc	8 VA/6W
GCA22x	120 Vac	9 VA

## Wiring Diagrams

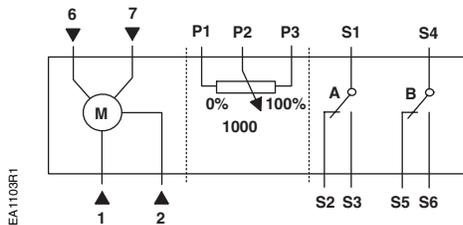
**Modulating 0 to 10 Vdc Control, 24 Vac: GCA16x**  
**Modulating 2 to 10 Vdc Control, 24 Vac/dc: GCA15x**



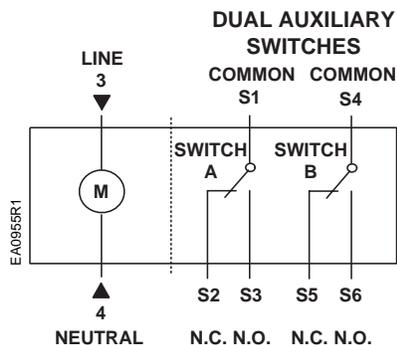
**2-position Control, 24 Vac/dc: GCA12x**



**3-position Control, 24 Vac/dc: GCA13x**



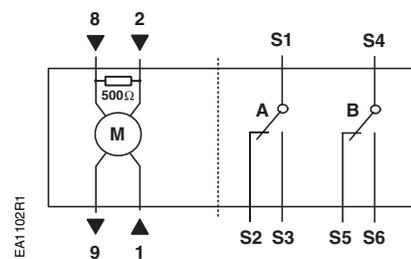
**2-position Control, 120 Vac: GCA22x**



**Table 2. Wire Designations.**

Standard Symbol	Function	Terminal Connection	Color	
			Standard	Plenum
1	Supply (SP)	G	Red	Red
2	Neutral (SN)	G0	Black	Black
3	Line	L	Black	Black
4	Neutral	N	White	White
6	Control signal clockwise	Y1	Violet	Violet
7	Control signal counterclockwise (GCA16x)	Y2	Orange	Orange
8	Input Signal 0 to 10 Vdc (GCA16x) 2 to 10 Vdc (GCA15x)	Y	Gray	Gray
9	Position Output 0 to 10 Vdc (GCA16x) 2 to 10 Vdc (GCA15x)	U	Pink	Pink
S1	Switch A Common	Q11	Gray/red	Gray/red
S2	Switch A N.C.	Q12	Gray/blue	Gray/blue
S3	Switch A N.O.	Q14	Gray/pink	Gray/pink
S4	Switch B Common	Q21	Black/red	Black/red
S5	Switch B N.C.	Q22	Black/blue	Black/blue
S6	Switch B N.O.	Q24	Black/pink	Black/pink
P1	Feedback Potentiometer 0 to 100% P1 - P2	a	White/red	Black
P2	Feedback Potentiometer Common	b	White/blue	Black
P3	Feedback Potentiometer 100 to 0% P3 - P2	c	White/pink	Black

**Special Application: Modulating 4 to 20 mA Control with GCA15x and external 500 ohm resistor**



## Dimensions

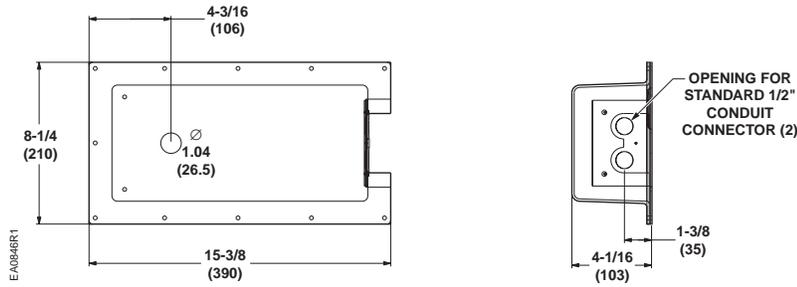


Figure 11. Dimensions of the ASK75.1U Weather Shield in Inches (Millimeters).

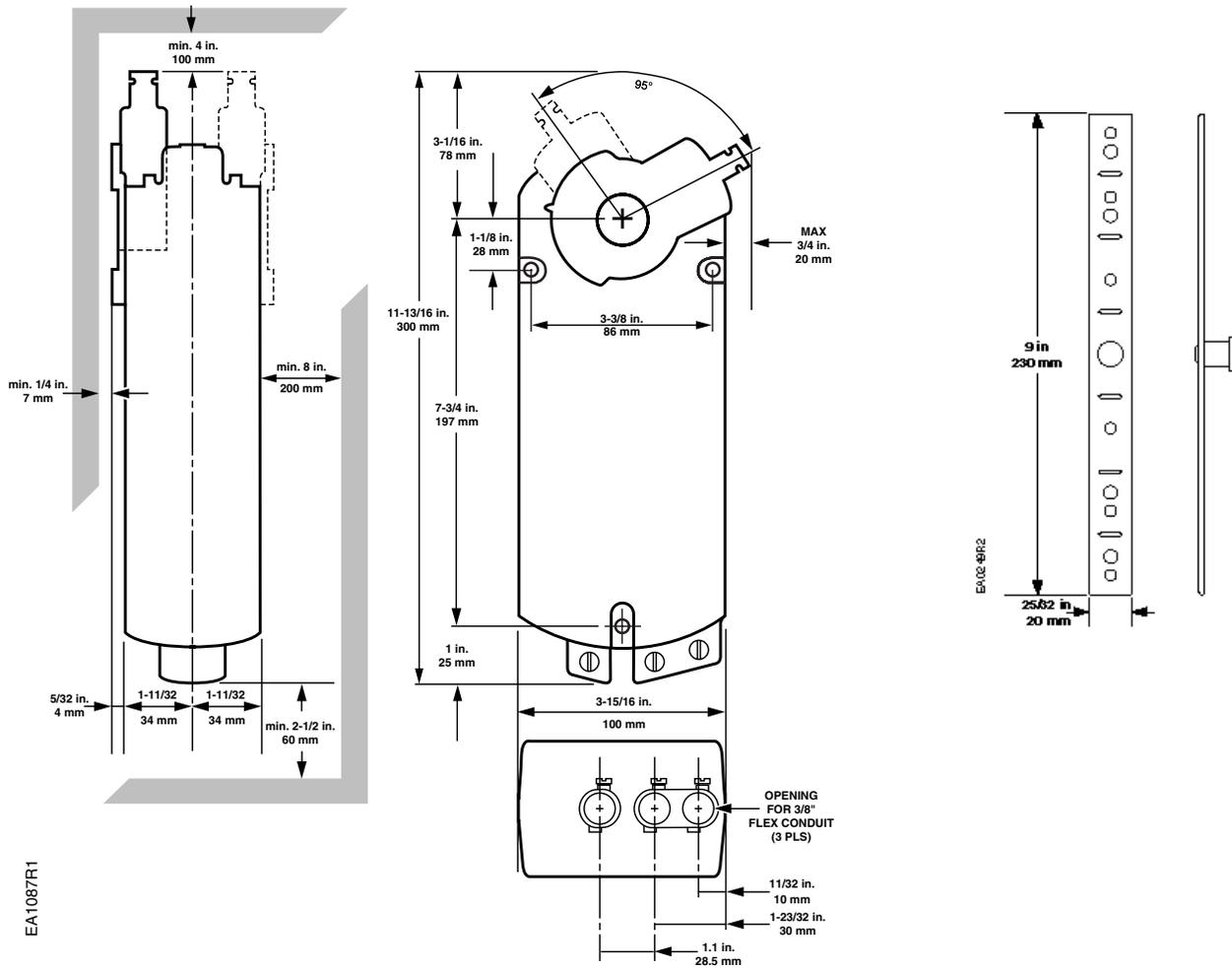


Figure 12. Dimensions of the GCA OpenAir Actuator and Mounting Bracket in Inches (Millimeters).

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