

## OpenAir® GCA Spring Return Rotary Electronic Damper Actuator

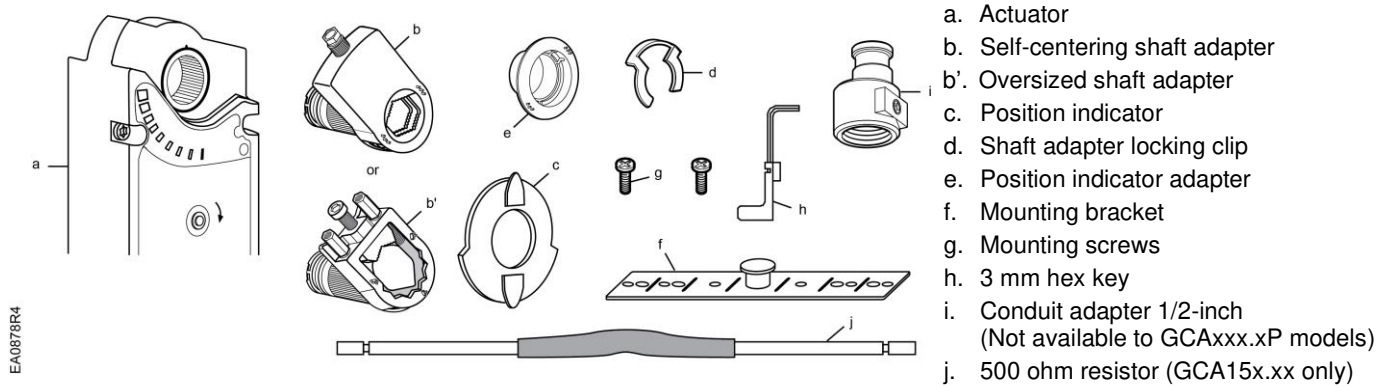


Figure 1. Parts of the GCA Actuator.

### 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 and 4 mm (5/32-in) drill bit
- 3 mm hex key (provided)
- Phillips screwdriver
- Small flat-blade screwdriver
- Marker or pencil

Additional for oversized shaft adapter:

- 10 mm (13/32-inch) socket wrench
- 6 mm hex key

### 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

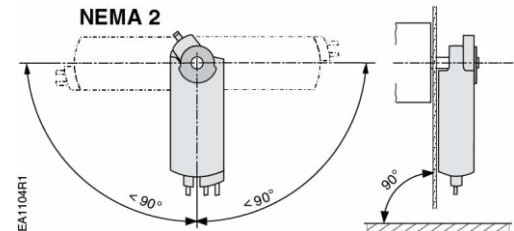


Figure 2. Acceptable NEMA 2-Positions.

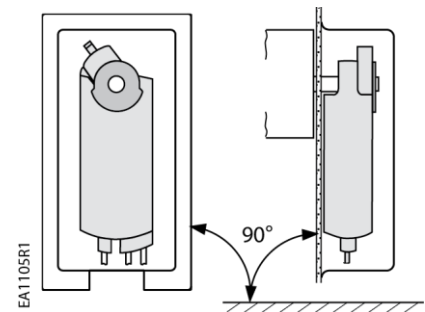


Figure 3. Only Acceptable Position for NEMA Type 3R Rating Using ASK75.1U Weather Shield.

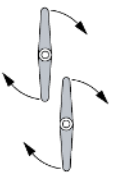
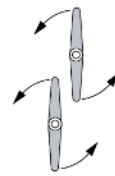

































The GCA actuator is UL listed to meet NEMA Type 3R requirements (a degree of protection against rain, sleet, and damage from external ice formation) when installed with the Weather Shield (product number ASK75.1U) and outdoor-rated conduit fittings. Actuator must be in the vertical position.

### 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> 	
			③	<b>Actuator Mounting Orientation</b>		 	
EA1039R1	<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	Y1 	 <b>Open</b>	 <b>Close</b>	 <b>Open</b>	 <b>Close</b>
			Y2 	 <b>Open</b>	 <b>Close</b>	 <b>Open</b>	 <b>Close</b>
EA1058R2	<b>Modulating Control</b>	GMA15x	Y = 10V 	 <b>Open</b>	 <b>Close</b>	 <b>Open</b>	 <b>Close</b>
			Y = 2V 				
		GMA16x	Y = 10V (or Y = Uo + DU)	 <b>Close</b>	 <b>Open</b>	 <b>Close</b>	 <b>Open</b>
			Y = 2V 				
		GMA16x	Y = 0V (or Y = Uo)				

## Installation, Continued

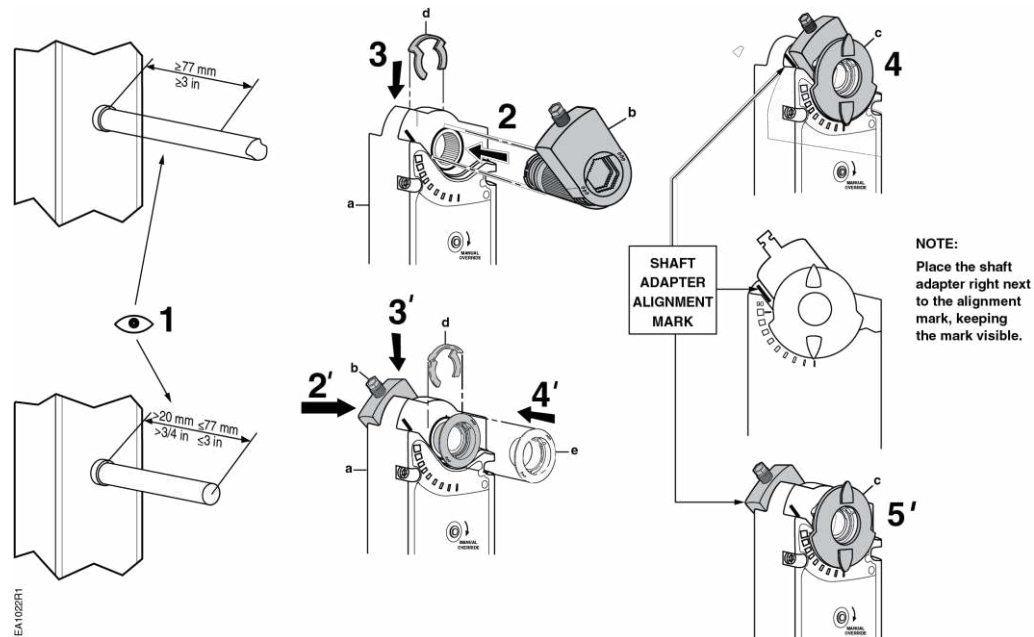


Figure 4. Shaft Length and Proper Shaft Adapter Location.

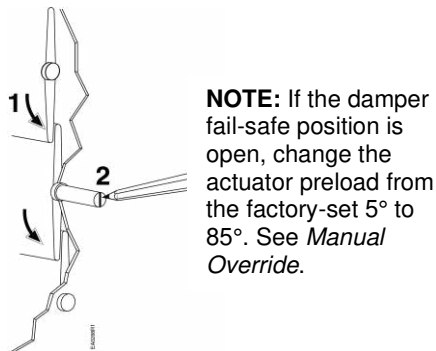


Figure 5. Close the Damper.

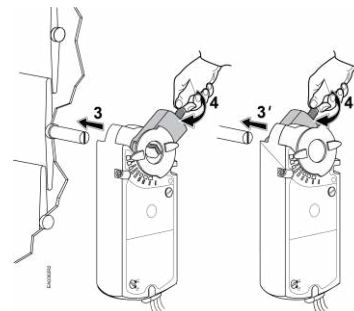


Figure 6. Place the Actuator on the Shaft.

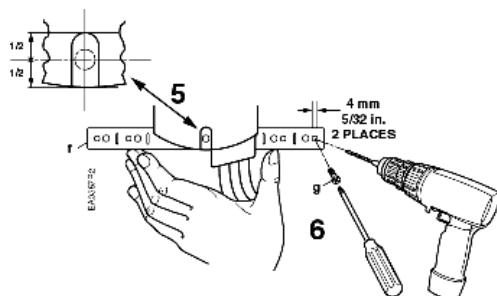
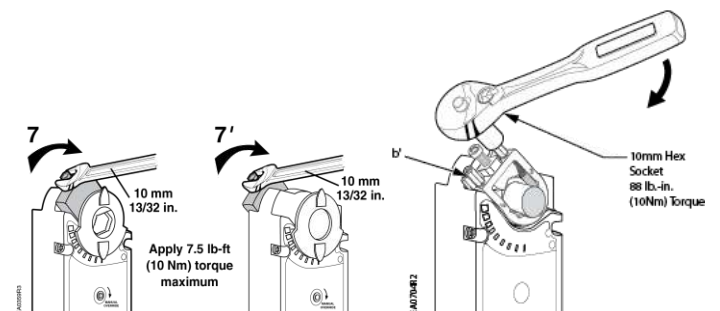


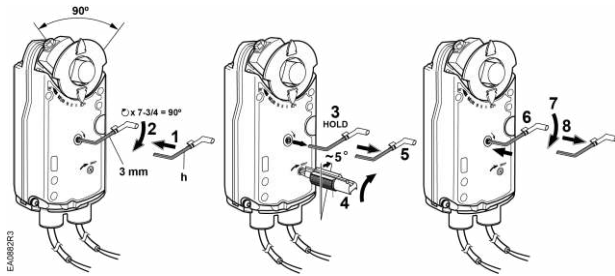
Figure 7. Fasten the Mounting Bracket.



**NOTE:** With an oversized shaft adapter (b'), tighten the middle screw so that the shaft is in the center of the shaft adapter opening.

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).

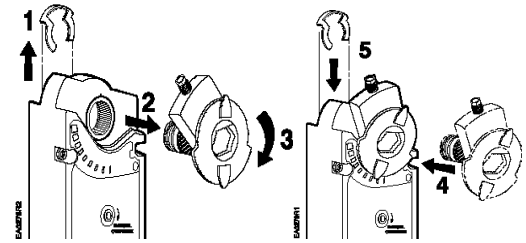
## To release manual override or preload

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.**

Ensure that 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.

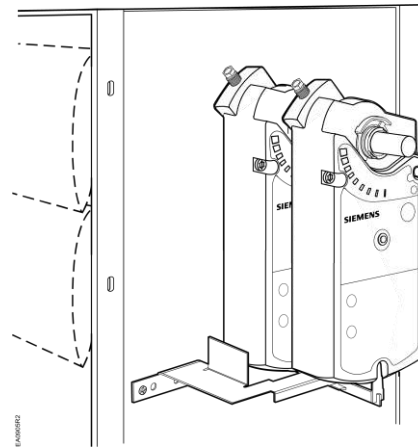
### Other settings

For adjustment of auxiliary switches and span/offset options see the Technical Instructions listed under *References*.

## Tandem Operation

Two GCA Actuators with 2-position or floating control signal are mounted to the same side of the damper shaft using the ASK73.1 Tandem Mounting Bracket as shown in Figure 11.

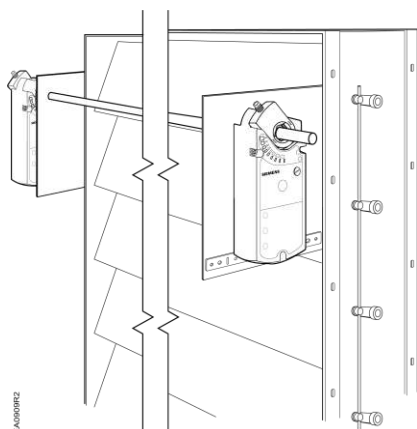
Two GCA Actuators with a modulating control signal are mounted to the same side of the damper shaft using the ASK73.2U Tandem Mounting Bracket also as shown in Figure 11.



**Figure 11. Tandem Mounting on Same Side of Damper Shaft.**

**NOTE:** For applications requiring single damper shaft operation by up to four GCA modulating control signal actuators mounted on each side of the damper shaft, use the GCA15x Series Actuators with Master/Slave mode operation selected. See Figure 12.

(See *Wiring Diagrams* for GCA15x Series master/slave operation wiring instructions.) (See *OpenAir™ Spring Return Electric Damper Actuator Modulating Control Technical Instructions* document 155-173P25 for complete tandem mounting instructions.)



**Figure 12. Tandem Mounting on Each End of Damper Shaft.**

## References

*OpenAir™ Spring Return Electric Damper Actuator Modulating Control Technical Instructions (155-173P25).*

*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 less.



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

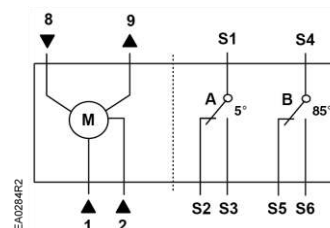
Either AC line voltage from the same phase must be applied to all six outputs of the dual auxiliary switches, or UL-Class 2 voltage must be applied to all six outputs.

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

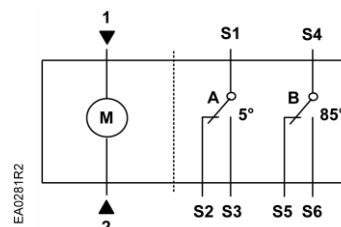
Actuator	Operating Voltage	Power Consumption
Modulating Control		
GCA16x	24 Vac	7 VA/5W
GCA15x	24 Vac/dc	7 VA/5W
2-Position and Floating Control		
GCA12x, GCA13x	24 Vac/dc	7 VA/5W
GCA22x	120 Vac	8 VA

## Wiring Diagrams

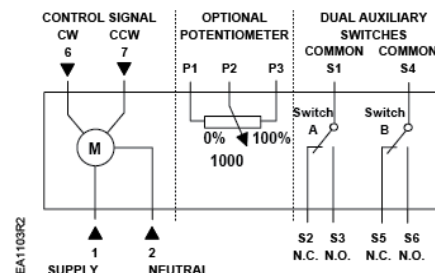
**Modulating 0 to 10 Vdc Control, 24 Vac: GCA16x**  
**Modulating 2 to 10 Vdc Control, 24 Vac/dc: GCA15x**



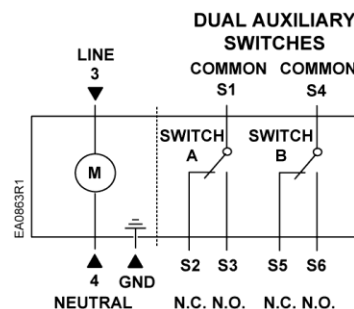
**2-position Control, 24 Vac/dc: GCA12x**



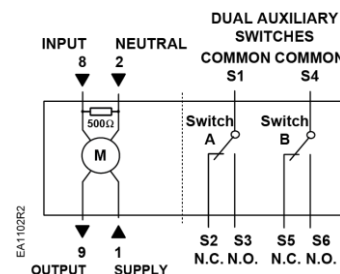
**Floating Control, 24 Vac/dc: GCA13x**



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



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



## Wiring Diagrams, Continued

Master/Slave: GCA15x

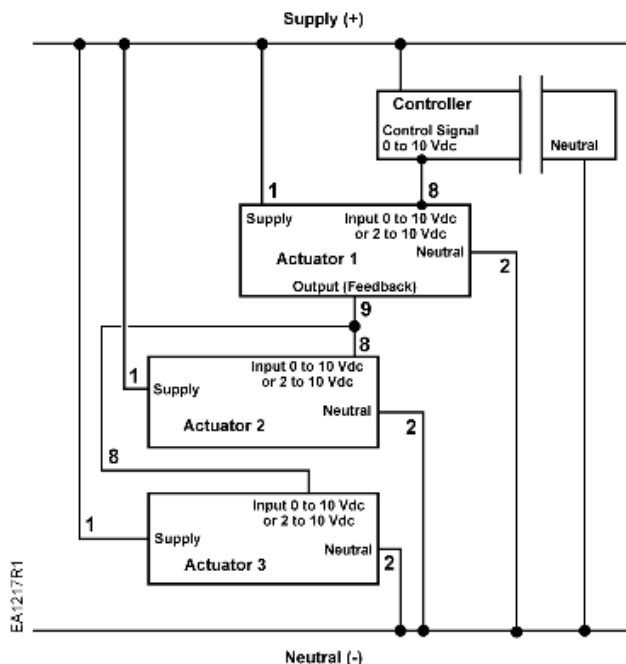


Table 2. Wire Designations.

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

## Retrofit Wiring

Modulating Control (0 to 10 Vdc) Function	Siemens GCA Series		Belimo AFB Series		Honeywell MS7520 Series		Johnson M9220 Series	
	Color	Number	Color	Number	Color	Number	Color	Number
Supply (24V)	Red	1	Red	2	Red	1	Red	2
Common	Black	2	Black	1	Black	2	Black	1
0(2) to 10 Vdc Input	Gray	8	White	3	White	3	Gray	3
0(2) to 10 Vdc Feedback	Pink	9	Orange	5	Blue	5	Orange	4

2-Position Control (24 Vac/Vdc) Function	Siemens GCA Series		Belimo AFB Series		Honeywell MS8120 Series		Johnson M9220 Series	
	Color	Number	Color	Number	Color	Number	Color	Number
Supply (24V)	Red	1	Red	2	Red	1	Red	2
Common	Black	2	Black	1	Black	2	Black	1

2-Position Control (120 Vac) Function	Siemens GCA Series		Belimo AFB Series		Honeywell MS4120 Series		Johnson M9220 Series	
	Color	Number	Color	Number	Terminal Only	Number	Color	Number
Line (120V)	Black	3	Black	2		1	Black	2
Neutral	White	4	White	1		2	White	1

## Dimensions

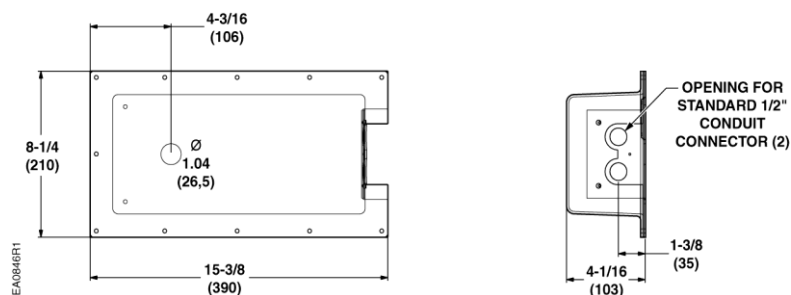


Figure 13. Dimensions of the ASK75.1U Weather Shield in Inches (Millimeters).

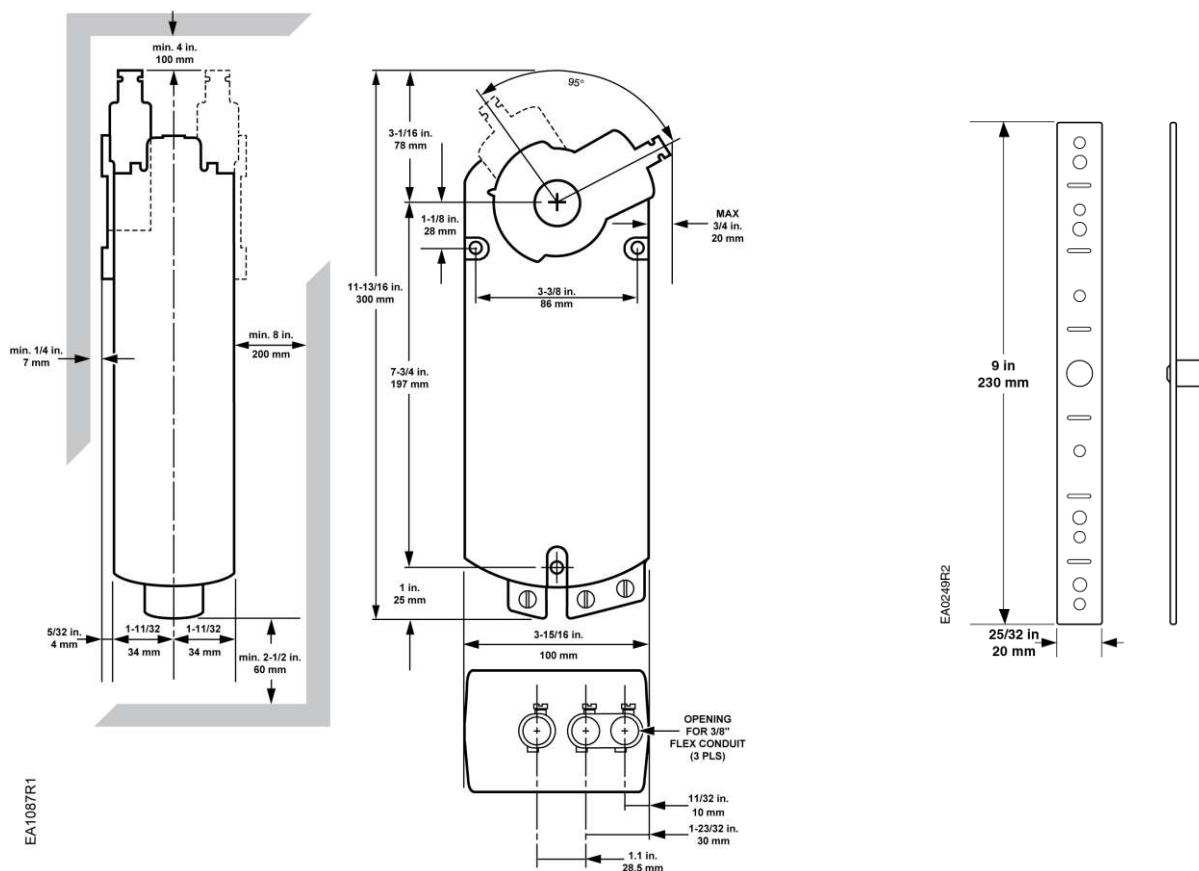


Figure 14. Dimensions of the GCA OpenAir Actuator and Mounting Bracket in Inches (Millimeters).

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