

Professional Series

GCA Spring Return Rotary Electronic Damper Actuator

Installation Instructions
Document No. 129-330
September 30, 2009

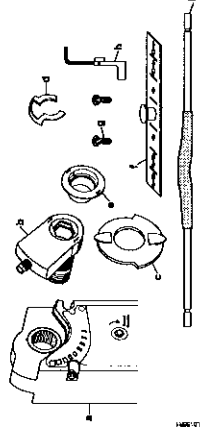


Figure 1. Parts of the GCA Actuator.

- Actuator
- Self-centering shaft adapter
- Position indicator
- Shaft adapter locking clip
- Position indicator adapter
- Mounting bracket
- Mounting screws
- 3 mm hex wrench
- 500 ohm resistor (GCA15x-xx/PS only)

Product Description

Instructions describe the steps for direct-coupled mounting of the GCA spring return electronic damper actuators.

Product Numbers

GCAx/PS

Warning/Caution Notations

	WARNING: Personal injury or loss of life may occur if you do not follow a procedure as specified.
	CAUTION: 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.

Item Number: 129-330-03, Rev. CA

Mounting Positions

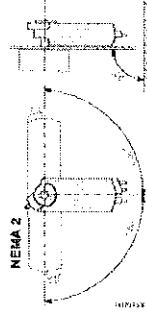


Figure 2. Acceptable NEMA 2 Positions.

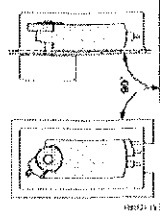


Figure 3. Only Acceptable Position for NEMA Type 3R Rating Using ASK75.1U Weather Shield.

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.

Damper Type	Determining the Actuator Mounting Orientation		3-Position		2-Position		Modulating Control	
	②	③	④	⑤	⑥	⑦	⑧	⑨
Power-Fail Spring Return Position								
Actuator Mounting Orientation								
Power On								
Power Off								
Y1								
Y2								
Y3								
Y4								
Y5								
Y6								
Y7								
Y8								
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Y10								
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Table 2. Wire Designations.

Standard Symbol	Function	Terminal Connection	Standard	Color
1	Supply (SP)	G	Red	Plenum
2	Neutral (SN)	G0	Black	Red
3	Line (120 Vac)	L	Black	Black
4	Neutral (120 Vac)	N	White	White
5	Control signal clockwise	Y1	Violet	Violet
7	Control signal counterclockwise (GCA13x.xx/PS)	Y2	Orange	Orange
8	Input Signal 0 to 10 Vdc (GCA15x.xx/PS) 2 to 10 Vdc (GCA15x.xx/PS)	Y	Gray	Gray
9	Position Output 0 to 10 Vdc (GCA16x.xx/PS) (GCA15x.xx/PS)	U	Pink	Pink
S1	Switch A Common	Q11	Gray/ red	Gray/ red
S2	Switch A NC	Q12	Gray/ blue	Gray/ blue
S3	Switch A NO	Q14	Gray/ pink	Gray/ pink
S4	Switch B Common	Q21	Black/ red	Black/ red
S5	Switch B NC	Q22	Black/ blue	Black/ blue
S6	Switch B NO	Q24	Black/ pink	Black/ pink
P1	Feedback Potentiometer 0 to 100% P1 - P2	a	White/ red	White/ red
P2	Feedback Potentiometer Common	b	White/ blue	White/ blue
P3	Feedback Potentiometer 100 to 0% P3 - P2	c	White/ pink	White/ pink

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

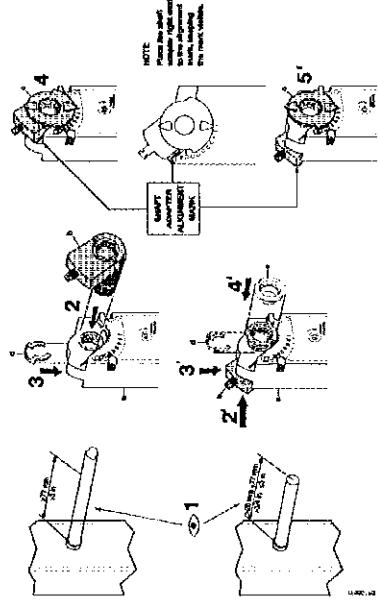
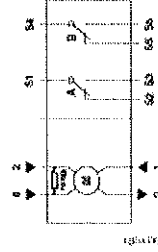
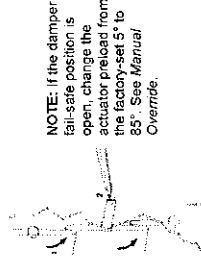


Figure 4. Shaft Length and Proper Shaft Adapter Location.



NOTE: If the damper fail-safe position is open, change the actuator preload from the factory-set 5° to 85°. See Manual Override.

Figure 5. Close the Damper.

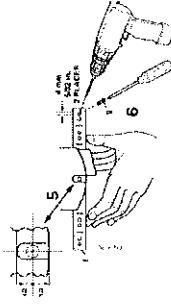


Figure 7. Fasten the Mounting Bracket.



Figure 6. Place the Actuator on the Shaft.

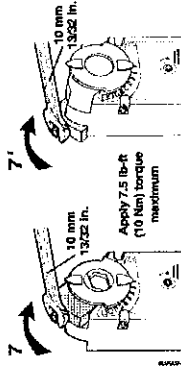


Figure 8. Fasten the Shaft Adapter to the Damper Shaft.

Manual Override

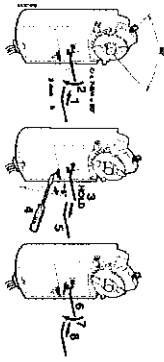


Figure 9. Manual Override.

To use manual override or set preload, do the following:

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 5).
 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

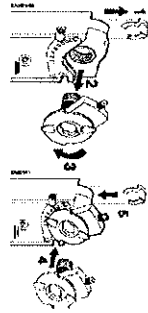


Figure 10. The Angular Rotation is Adjustable Between 0° and 90° at 5 Degree Intervals.

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.

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

Wiring for GCA15x.xx/PS When Used in Tandem (Master/Slave) Applications

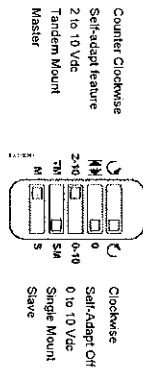
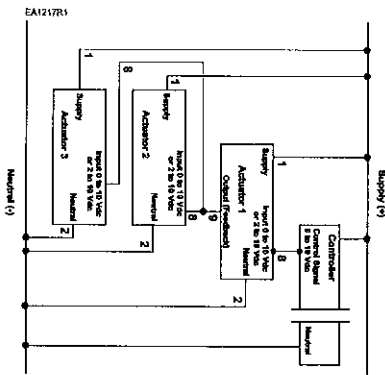


Figure 11. Tandem Application DIP Switches.

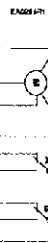
- After setting the 4th DIP switch for TM (tandem mount) on all actuators used in the tandem application, one actuator must be identified as the Master by selecting the "M" on the 5th DIP switch.
 - The rest of the actuators used in the application should have the "S" (slave) set on the 5th DIP switch.
 - Connect all the 2 (black) Neutral wires and connect them to the power supply.
 - Connect all the 1 (red) Supply wires and connect them to the power supply.
 - The Output Signal 6 (pink) wire identified as the Master actuator, needs to be connected to all the Control Signal Wires 8 (gray) of the slave actuators used in the tandem application.
- GCA15x.1x/PS (0 to 10 Vdc or 2 to 10 Vdc) for Tandem Application (Master/Slave)



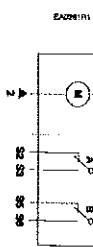
Actuator	Operating Voltage	Power Consumption
Modulating Control		
GCA15x.xx/PS	24 Vdc/dc	9 VA/7W
GCA15x.xx/PS	9 VA/7W	
2-Position and 3-Position Control		
GCA12x.xx/PS	24 Vdc/dc	8 VA/6W
GCA13x.xx/PS	24 Vdc/dc	8 VA/6W
GCA22x.xx/PS	120 Vac	9 VA

Wiring Diagrams

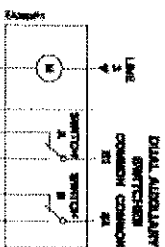
Modulating 0 to 10 Vdc Control, 24 Vac/dc:
 GCA15x.xx/PS
 Modulating 2 to 10 Vdc or 0 to 10 Vdc Control,
 24 Vac/dc: GCA15x.xx/PS



2-position Control, 24 Vac/dc: GCA12x.xx/PS



2-position Control, 120 Vac: GCA22x.xx/PS



3-position Control, 24 Vac/dc: GCA13x.xx/PS

