


Table of Contents

PRODUCT	TORQUE	TECHNICAL INSTRUCTIONS	PAGE #
Overview			
Overview/Selection Guide			E-2
OpenAir™ Electronic Damper Actuators			
 GQD Series Spring Return Damper Actuator	20 lb.-in.	155-760	E-3
GMA Series Spring Return Damper Actuator	62 lb.-in.	155-315P25	E-7
GCA Series Spring Return Damper Actuator	142 lb.-in.	155-173/P25	E-11
GDE Series Non-spring Return Damper Actuator	44 lb.-in.	155-187/188P25	E-15
GLB Series Non-spring Return Damper Actuator	88 lb.-in.	155-187/188P25	E-19
GEB Series Non-spring Return Damper Actuator	132 lb.-in.	155-318P25	E-21
GBB Series Non-spring Return Damper Actuator	221 lb.-in.	155-176/177P25	E-23
GIB Series Non-spring Return Damper Actuator	310 lb.-in.	155-176/177P25	E-25
GND Series Spring Return Damper Actuator for UL Listed Fire/Smoke Control Dampers	53 lb.-in.	155-746	E-27
GGD Series Spring Return Damper Actuator for UL Listed Fire/Smoke Control Dampers	142 lb.-in.	152-046P25	E-31
Reference: OpenAir Part No. Nomenclature		—	E-34
Pneumatic Damper Actuators			
No. 3 Actuator		155-146P25	E-35
No. 4 Actuator		155-032P25	E-37
No. 6 Actuator		155-029P25	E-39
No. 6 Actuator—Tandem Mounting		155-277P25	E-41
Large Capacity Actuator		155-030P25	E-43
Accessories & Service Kits			E-45

Standard Shipping within 3 to 5 days Products ordered through the Rapid Response™ program can ship same day. Expect longer lead times for large quantities and unique parts. See page 1 for details on Rapid Response™ shipping.

Overview

Damper Actuators

Damper Actuators provide control, either electronically or pneumatically, for a variety of HVAC applications, including:

- VAV Systems
- Mixing Boxes
- Central Fan Systems
- Exhaust Dampers
- Fire/Smoke Dampers



Selection Guide

Application	Electronic						Pneumatic		
	Spring Return			Non-spring Return			Spring Return		
	GQD/GMA	GCA	GND/GGD	GDE/GLB	GEB	GBB/GIB	No. 3	No. 4	No. 6
Terminal Units	•			•			•		
Face and Bypass				•				•	
Multi-zone Mixing Boxes		•		•		•			
Bypass Damper				•					
Makeup Air Damper				•					
Outside Air Dampers	•	•			•	•			
Small Rooftop Units (RTU)	•				•				
Rooftop Units (RTU)		•				•	•		
Zone Isolation Dampers	•	•			•	•			
Vortex Dampers		•				•			
Inlet Vane Dampers		•				•			•
Return Air Dampers	•	•			•	•			
Unit Ventilators	•								
Central VAV Fans		•						••	
Fire/Smoke Dampers			•					•••	•••

*LC Model

**See data sheets for specific types

Damper Type	Damper Leakage at 1" H ₂ O (240 Pa) Static Pressure	Damper Torque for Approach Air of 1200 ft./min. (6 m/s) or less
Standard Leakage	More than 10 CFM/ft. ² (50.8 l/s per m ²)	2.5 lb.-in./ft. ² (0.3 Nm/m ²)
Low Leakage	5 to 10 CFM/ft. ² (25.4 to 50.8 l/s per m ²)	5.0 lb.-in./ft. ² (0.6 Nm/m ²)
Very Low Leakage	Less than 5 CFM/ft. ² (Less than 25.4 l/s per m ²)	7.0 lb.-in./ft. ² (0.8 Nm/m ²)

▶ For detailed damper actuator sizing information, please refer to the Engineering Section, I.

GQD Series

Spring Return Electric Damper Actuator New!

Easily Replaces:

- Belimo TF Series



20 lb.-in.

- 24 Vac/dc, 2-position (Open/Closed) Control
- 24 Vac/dc, 3-position (Floating) Control
- 24 Vac/dc, 2-10 Vdc/10-2 Vdc, (Modulating) Control



GQD Series Spring Return Direct Coupled Electric Damper Actuator.

Description

The OpenAir GQD Series direct-coupled, spring return electronic damper actuators are 24 Vac/dc rated and available in 2-position, 3-position and 2 to 10 Vdc control.

Features

- Bi-directional, fail-safe spring return
- Pre-cabled
- Plenum rated
- Signal inversion capability on modulating type (2 to 10 Vdc/10 to 2 Vdc)
- Small footprint for installation flexibility
- UL, cUL, CE rated
- Quiet operation

Applications

The small footprint and torque make this actuator ideal for small HVAC dampers or residential zone dampers requiring fail safe operation.

Specifications/Product Ordering

Operating Voltage24 Vac/dc ±20%
Frequency 50/60 Hz
Power Consumption
 Running <7 VA
 Holding <7 VA
Function
 Torque20 lb.-in. (2 Nm)
 Runtime 3PT and 2-10Vdc for 90° 30 sec.
 Runtime 2PT for 90° 15 sec.
 Spring Return 15 sec. nominal
 Nominal Angle of Rotation..... 90°
Shaft Size 3/8 to 1/2-in. (8 to 13.4 mm) round/square ● ■
Min. Shaft Length 1-in. (25.4 mm)

Housing Enclosure NEMA 1
Material Plenum rated rugged plastic
Ambient Temperature
 Operating -25 to 130°F (-32 to 55°C)
 Storage and Transport -40 to 158°F (-40 to 70°C)
Ambient Humidity 95% RH, non-condensing
Agency Approvals UL873, cUL, CE rated
Pre-Cabled Connection AWG 18
Cable Length 3 ft. (0.9m)
Dimensions <4.72" H x <2.75" W x <2.5" D
 (<120 mm H x <70 mm W x <63 mm D)
Shipping Weight <1.5 lbs. (<.68 kg)

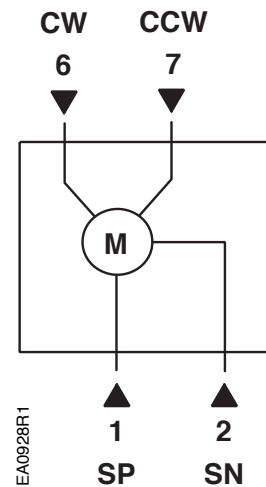
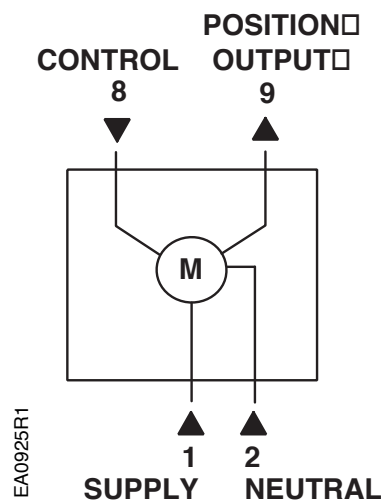
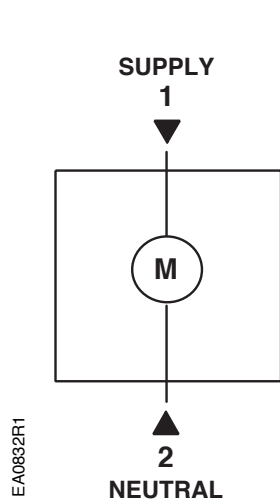
E-4

Damper Actuators

GQD Series	Control Signal	Cabling	Standard
	2-position (Open/Closed), 24 Vac/dc	Plenum Cable	GQD121.1P
Plenum Cable/Bulk		GQD121.1P/B	
3-position (Floating), 24 Vac/dc	Plenum Cable	GQD131.1P	
	Plenum Cable/Bulk	GQD131.1P/B	
2-10 Vdc/10-2 Vdc, (Modulating), 24 Vac/dc	Plenum Cable	GQD151.1P	
	Plenum Cable/Bulk	GQD151.1P/B	

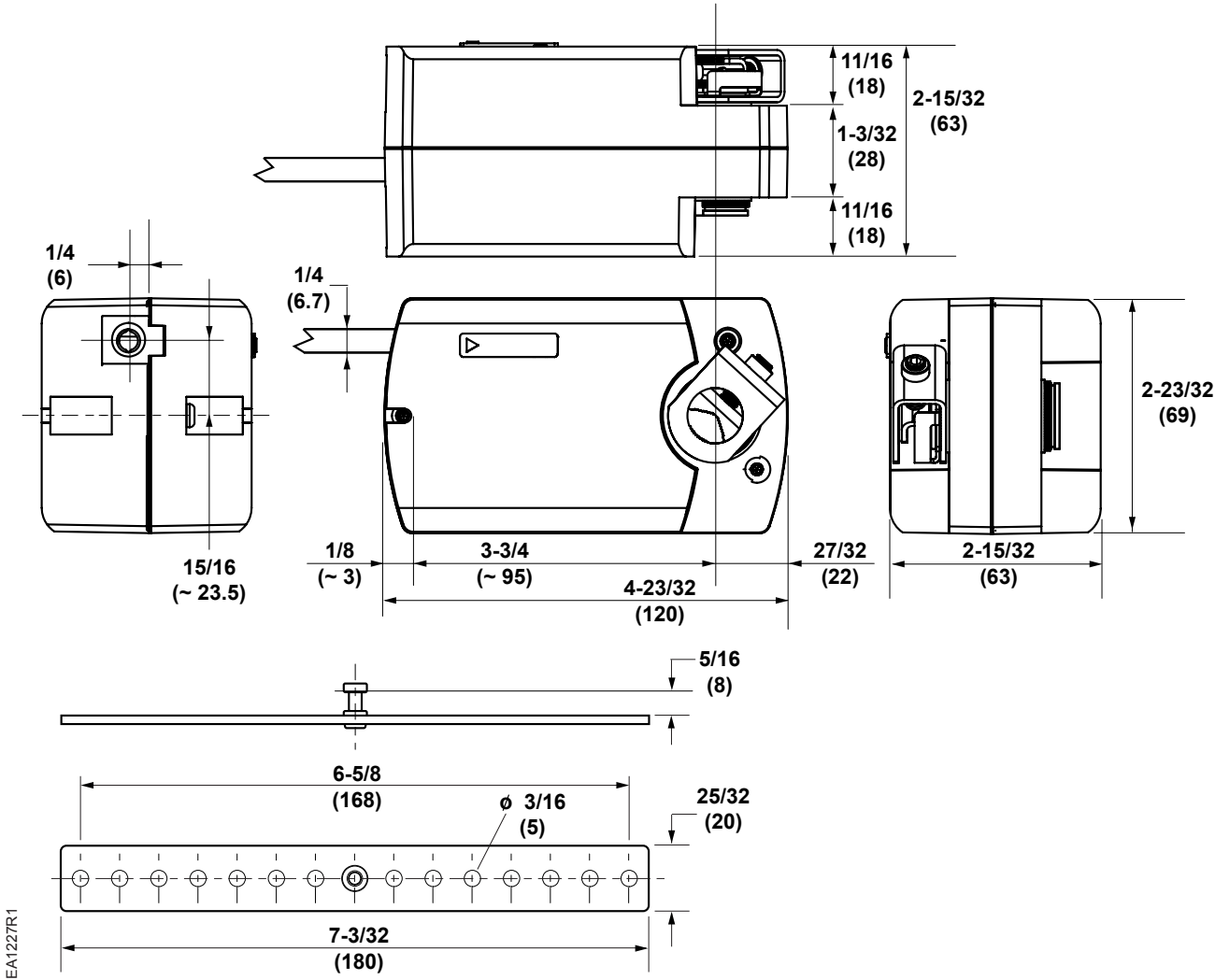
Ordering Note Bulk packages contain 10 actuators unless otherwise noted.

Wiring Diagrams



Dimensions

GQD Series Open Air Spring Return Electric Damper Actuator



Dimensions shown in inches (mm).



TECH TIPS

Visit us on the web at:

www.usa.siemens.com/hvaccomponents

You can:

- search for products by part number or description.
- print out product information for submittals.
- link to technical documentation.
- locate a distributor near you.

GMA Series

Spring Return Electric Damper Actuator

Easily Replaces:

- Belimo LN/NF Series



62 lb.-in.

- 24 Vac/Vdc, 2-position Control
- 120 Vac, 2-position Control
- 24 Vac/dc, 3-position Control
- 0 to 10 Vdc, Modulating Control
- 2 to 10 Vdc/10 to 2 Vdc, Modulating Control



GMA Series Spring Return Direct-coupled Electric Damper Actuator.

Description

The OpenAir GMA Series Direct-coupled, Spring Return Electronic Damper Actuators provide modulating, two-position and three-position control of building HVAC dampers.

Features

- 24 Vac/dc compatible
- Integral 1/2-inch conduit connector
- Small actuator footprint with 62 lb.-in. of torque
- Bi-directional fail-safe spring return
- Unique self-centering shaft coupling
- Floating control models available with feedback potentiometer
- Manual override
- Mechanical range adjustment capability
- Easily visible position indicator
- Brushless DC motor technology
- Precabled
- UL60730, cUL (C22.2 No. 24-93), and CE listed
- All modulating types contain built-in feedback

Options

- Dual independently adjustable auxiliary switch
- Adjustable offset and span
- Signal inversion

Applications

The OpenAir GMA Series Damper Actuators are ideal for Constant or Variable Air Volume installations for the control of return air, mixed air, exhaust, and face and bypass dampers that require up to 62 lb.-in. of torque.

The actuators are designed for application where the damper is required to return to a fail-safe position when there is a power failure.

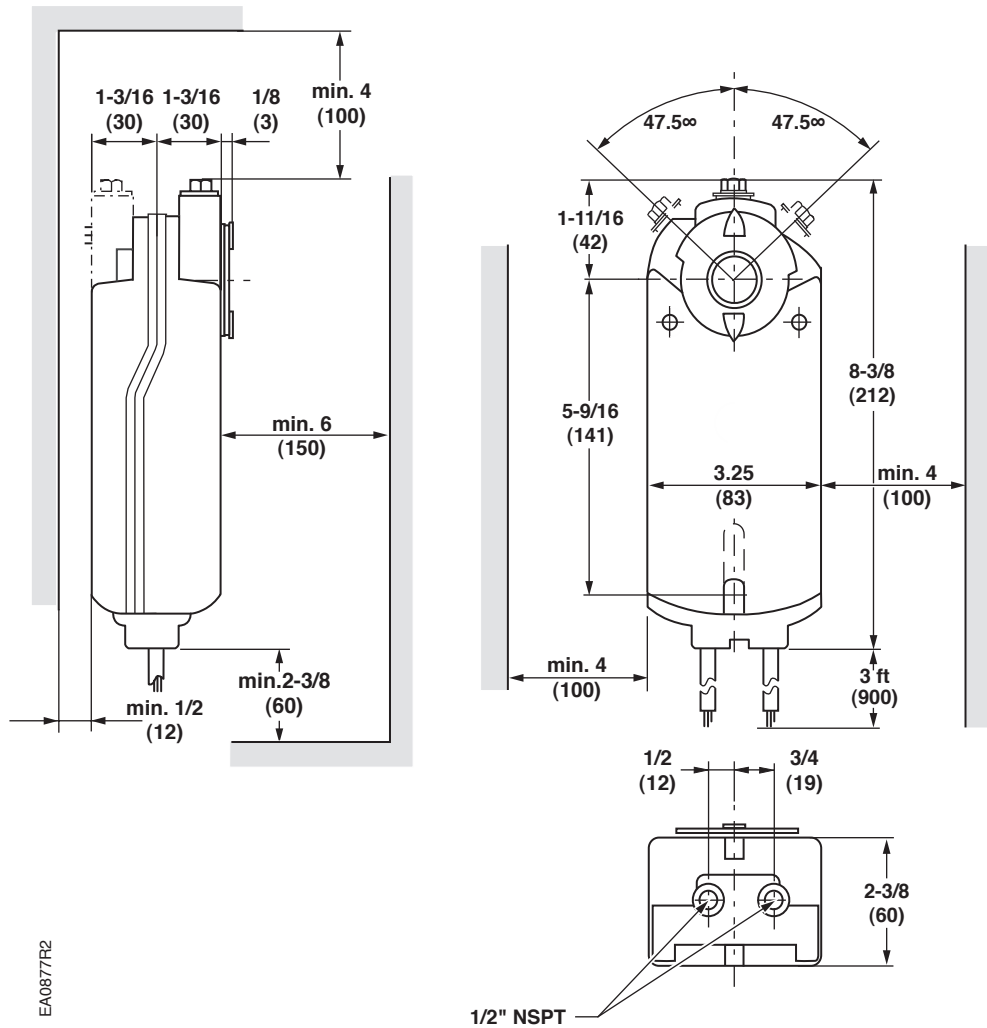
Models are available with either an appliance cable for wiring in conduit or a plenum-rated cable.

E-7

Damper Actuators

Dimensions

GMA/GEB Series OpenAir Damper Actuator



EA0877R2

Dimensions shown in inches (mm).

 **TECH TIPS****Rule of Thumb:**

When determining the torque required to move a damper, take the area of the damper (ft.²) and multiply by 7 to get the amount of lb.-in. needed to control the damper.

Example: 48" x 60" damper is 20 ft.²

$$20 \times 7 = 140 \text{ lb.-in.}$$

We always recommend doing a complete sizing routine, which can be found in the Engineering section.

GCA Series

Spring Return Electric Damper Actuator

Easily Replaces:

- Belimo AF Series



142 lb.-in. torque

- 24 Vac/dc, 2-position Control
- 120 Vac, 2-position Control
- 24 Vac/dc, 3-position Control
- 0 to 10 Vdc/2 to 10 Vdc, Modulating Control



GCA Series Spring Return Electric Damper Actuator.

Description

Designed for control of building HVAC dampers, the OpenAir GCA Series Direct-coupled, Spring Return Electric Actuators are available in 0 to 10 Vdc or 2 to 10 Vdc modulating, three-position (floating) and two-position (on/off) control models.

Features

- 24 Vac/dc compatible
- Visible position indication
- Self-centering shaft coupling
- Bidirectional fail-safe spring return
- Rugged all metal housing
- Accepts shaft diameters up to 1" (25 mm)
- Quiet, low-power operation
- Brushless DC motor technology with stall protection
- Assembled in the U.S.A.
- Manual override
- Precabled
- All modulating types contain built-in feedback.

Options

- Independently adjustable dual auxiliary switches
- Potentiometer for 3-position models
- Adjustable span and offset
- Signal inversion

Applications

The OpenAir GCA Series Damper Actuators are ideal for Constant or Variable Air Volume installations for the control of return air, mixed air, exhaust, and face and bypass dampers that require up to 142 lb.-in. (16 Nm) torque.

The actuators are designed for applications where the damper is required to return to a fail-safe position when there is a power failure.

Models are available with either an appliance cable for wiring in conduit or a plenum-rated cable for applications where conduit is not required.

Specifications/Product Ordering

Operating Voltage (1–2)

GCA1xx	24 Vac ±20%, 24 Vdc ±10%
GCA22x	120 Vac ±10%

Frequency 50 to 60 Hz

Power Consumption

GCA15x.xx & GCA16x.xx	
Running	9 VA (7 W)
Holding	5 VA (4 W)

GCA12x.xx AC 24 Vac/dc	
Running	8 VA (6 W)
Holding	3 VA (3 W)

GCA22x.xx AC 120 Vac	
Running	9 VA (7 W)
Holding	9 VA (7 W)

GCA13x.xx AC 24 Vac/dc	
Running	8 VA (6 W)
Holding	5 VA (4 W)

Input Signal (8–2)

GCA16x	
Voltage-input	0 to 10 Vdc (max. 35 Vdc)
Input Resistance	>100 K Ohms

GCA15x	
Voltage-input	0 to 10 Vdc or 2 to 10 Vdc (max. 35 Vdc)
Input Resistance	>100 K Ohms

Position Output Signal (9–2)

GCA16x/GCA15x	
Voltage-output	0 to 10 Vdc
Max. Output Current	±1 mA

Equipment Rating for Operating Voltage, Input Signal, and Position Output Signal Class 2

Control Signal Adjustment

Offset (start point)	0 to 5 Vdc
Factory setting	0 V
Span	2 to 30 Vdc
Factory setting	10 V

Dual Auxiliary Switch

Contact Rating	
Standard Cable	6 A resistive, 2 A General Purpose
Plenum Cable	4 A resistive, 2 A General Purpose

Voltage	
Standard Cable	24 to 250 Vac
Plenum Cable	24 Vac

Switch Range	
Switch A	0 to 90° with 5° intervals
Recommended Range	0 to 45°
Switch B	0 to 90° with 5° intervals
Recommended Range	45 to 90°

Switching Hysteresis 2°

Position Feedback

GCA132.1x	0 to 1000 Ohm <10 mA
-----------------	----------------------

Torque

Running Torque	142 lb.-in. (16 Nm)
Spring Return	142 lb.-in. (16 Nm)
Max. Torque	<360 lb.-in. (40 Nm)

Runtime for 90° operating with motor

Closing (on power loss) with Spring Return	15 seconds
--	------------

Nominal Angle of Rotation 90°

Max. Angular Rotation 95°

Temperature

Operation	-25 to +130°F (-32 to +55°C)
Storage and Transport	-40 to +158°F (-40 to +70°C)

Humidity 95% RH, non-condensing

Shaft Size 3/8 to 1-in. (8 to 25 mm) Dia. ●
1/4 to 3/4-in. (6 to 18 mm) Sq. ■

Min. Shaft Length 3/4-in. (20 mm)

Housing Enclosure NEMA 2*

Material Die-cast Aluminum alloy

Pre-cabled Connection AWG 18

Cable Length 3 ft. (0.9 m)

Agency Approvals UL 873
cUL C22.2 No. 24-93

Dimensions 12" H x 4.75" W x 2.88" D
(305 mm H x 121 mm W x 73 mm D)

Shipping Weight 4.85 lb. (2.2 kg)

*Refer to Installation Instructions for acceptable mounting positions.

E-12

Damper Actuators

GCA Series	Input Signal	Cabling	Standard	Options			
				Span/Offset Adjustable	Dual Aux. Switches & Span/Offset Adjustable	Dual Aux. Switches Only	Position Feedback
0 to 10 Vdc, 24 Vac/dc	Standard	Standard	GCA161.1U	GCA163.1U	GCA164.1U	GCA166.1U	—
		Plenum Cable	GCA161.1P	GCA163.1P	GCA164.1P	GCA166.1P	—
		Plenum Cable/Bulk	GCA161.1P/B	—	—	—	—
0 to 10 Vdc or 2 to 10 Vdc Modulating 24 Vac/dc, (Signal Inversion)	Standard	Standard	GCA151.1U	—	—	GCA156.1U	—
		Plenum Cable	GCA151.1P	—	—	GCA156.1P	—
2-pos., 24 Vac/dc	Standard	Standard	GCA121.1U	—	—	GCA126.1U	—
		Standard/Bulk	GCA121.1U/B	—	—	—	—
		Plenum Cable	GCA121.1P	—	—	GCA126.1P	—
2-pos., 120 Vac	Standard	Standard	GCA221.1U	—	—	GCA226.1U	—
		Standard/Bulk	GCA221.1U/B	—	—	—	—
3-pos., 24 Vac/dc	Standard	Standard	GCA131.1U	—	—	GCA136.1U	GCA132.1U
		Plenum Cable	GCA131.1P	—	—	GCA136.1P	GCA132.1P

Ordering Note Bulk packages contain 8 actuators.

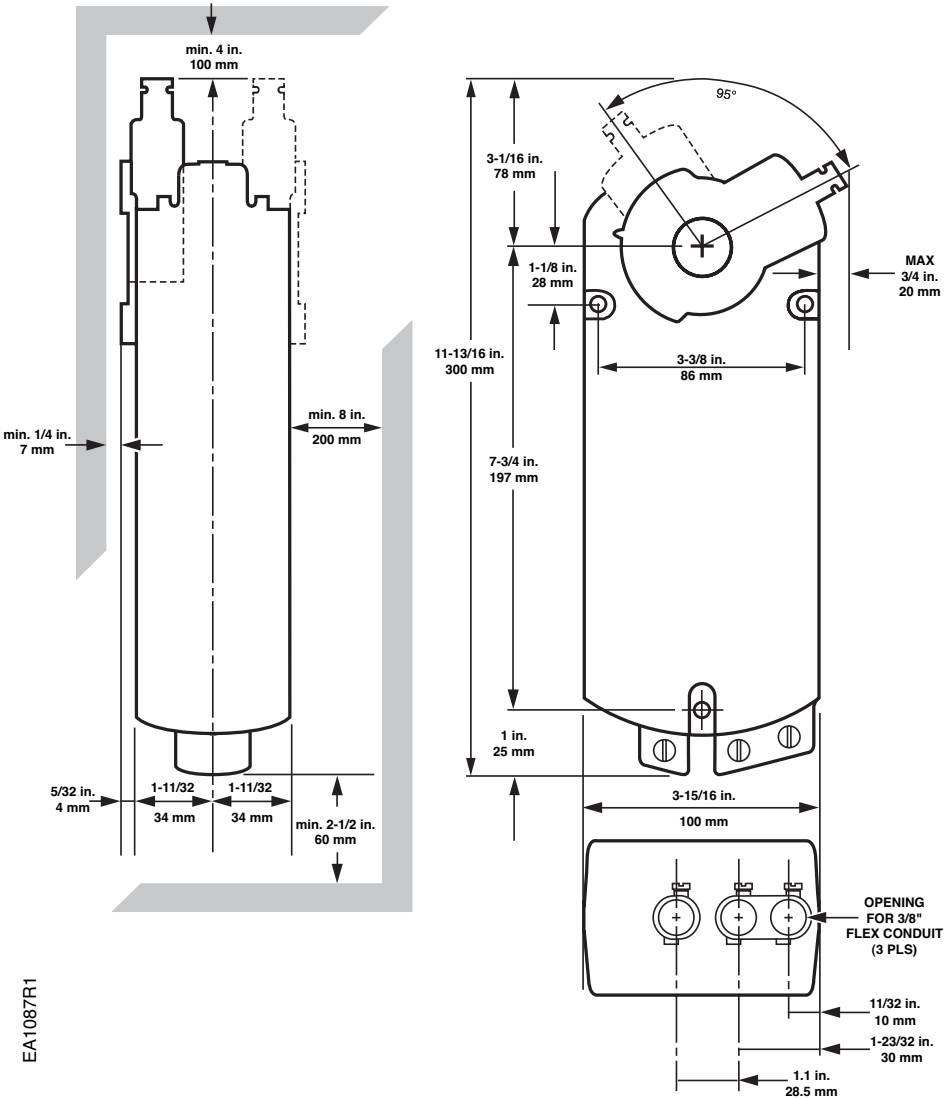


Part No. in black box Ships same day when requested through Rapid Response™ shipping. See page 1 for details.



Dimensions

GCA/GIB/GBB Series OpenAir Damper Actuator




EA1087R1

E-13

Damper Actuators

Accessories & Service Kits E-45



TECH TIPS

Visit us on the web at:
www.usa.siemens.com/hvaccomponents

You can:

- search for products by part number or description.
- print out product information for submittals.
- link to technical documentation.
- locate a distributor near you.

GDE Series

Non-spring Return Electric Damper Actuator

Easily Replaces:

- Belimo LM Series

44 lb.-in. torque

24 Vac, 3-position Control

0 to 10 Vdc, Modulating Control



GDE Series Non-spring Return Electric Damper Actuator.

Description

The OpenAir GDE Series Direct-coupled 24 Vac Non-spring Return Rotary Electric Actuator is designed for 0 to 10 Vdc or three-position (floating) control of building HVAC dampers.

Features

- Compact design
- Easy-to-see position indicator
- 0 to 10 V or 3-position models
- Self-adapting capability for maximum flexibility in damper positioning
- UL, cUL, CE listed
- Quiet, low-power operation
- Rated NEMA 2
- Assembled in the U.S.A.
- Manual override

Options

- Independently adjustable dual auxiliary switches
- Adjustable start/span
- Standard or plenum cable
- Available in bulk packs for additional savings

Applications

The OpenAir GDE Series Damper Actuators are used in Constant or Variable Air Volume installations for the control requiring up to 44 lb.-in. (5 Nm) torque.

Models are available with either a universal cable for wiring in conduit or a plenum-rated cable for applications where conduit is not required.

E-15

Damper Actuators

Specifications/Product Ordering

Operating Voltage24 Vac
Frequency50/60 Hz
Power Consumption2 to 3 VA
Input signal (8–2)
 Voltage-Input 0 to 10 Vdc
 Input Resistance 100K Ohms
Position Output Signal (9–2)
 Voltage-Output 0 to 10 Vdc
 Max. Output Current 1 mA
Equipment Rating for Operating Voltage, Input Signal, and Position Output Signal Class 2
Control Signal Adjustment
 Offset (Start Point) Between 0 to 5 Vdc
 Factory Setting 0 V
 Span Between 2 to 10 Vdc
Dual Auxiliary Switch
 Contact Rating 4 A resistive, 2 A General Purpose
 Voltage 24 Vac
 Switch Range
 Switch A 0 to 90° with 5° intervals
 Recommended Range Usage 0 to 45°
 Factory Setting 5°
 Switch B 0 to 90° with 5° intervals
 Recommended Range Usage 45 to 90°
 Factory Setting 85°
 Switching Hysteresis 3°
Position Feedback
 GDE132.1P 0 to 1000 Ohm <10 mA

Function
 Torque 44 lb.-in.(5 Nm)
 at 50 Hz 108 sec.
 at 60 Hz 90 sec.
 Nominal Angle of Rotation 90°
 Max. Angular Rotation 95°
Shaft Size 3/8 to 5/8-in. (8 to 16 mm) Dia. ●
 1/4 to 1/2-in. (6 to 13 mm) Sq. ■
Min. Shaft Length 3/4-in. (20 mm)
Housing Enclosure NEMA Type 2
Material Plenum Rated Rugged Plastic
Temperature
 Operation -25 to +130°F (-32 to +55°C)
 Storage and Transport -25 to +140°F (-30 to +60°C)
Humidity 95% RH, non-condensing
Agency Approvals UL873
 cUL C22.2 No. 24-93
 CE
Pre-cabled Connection AWG 18
Cable Length 3 ft. (0.9 m)
Dimensions 5.4" H x 2.6" W x 2.3" D
 (137 mm H x 68 mm W x 60 mm D)
Shipping Weight 1.06 lb. (0.45 kg)

E-16

Damper Actuators

	Input Signal	Cabling	Standard	Options			
				Span/Offset Adjustable	Dual Aux. Switches & Span/Offset Adjustable	Dual Aux. Switches Only	Position Feedback
GDE Series	0 to 10 Vdc	Plenum Cable	GDE161.1P	GDE163.1P	GDE164.1P	GDE166.1P	—
		Plenum Cable/Bulk	GDE161.1P/B	—	—	—	—
	3-position	Plenum Cable	GDE131.1P	—	—	GDE136.1P	GDE132.1P
		Plenum Cable/Bulk	GDE131.1P/B	—	—	—	—
	3-position	Standard	GDE131.1U	—	—	—	—
		Standard/Bulk	GDE131.1U/B	—	—	—	—
		6' Plenum Cable	GDE131.1Q	—	—	—	—
		6' Plenum Cable/Bulk (12)	GDE131.1Q/B	—	—	—	—
	0 to 10 Vdc	Terminal Strip	GDE161.1T	—	—	—	—
		Terminal Strip/Bulk	GDE161.1T/B	—	—	—	—
		6' Plenum Cable	GDE161.1Q	—	—	—	—
	3-position	Terminal Strip	GDE131.1T	—	—	—	—
Terminal Strip/Bulk		GDE131.1T/B	—	—	—	—	

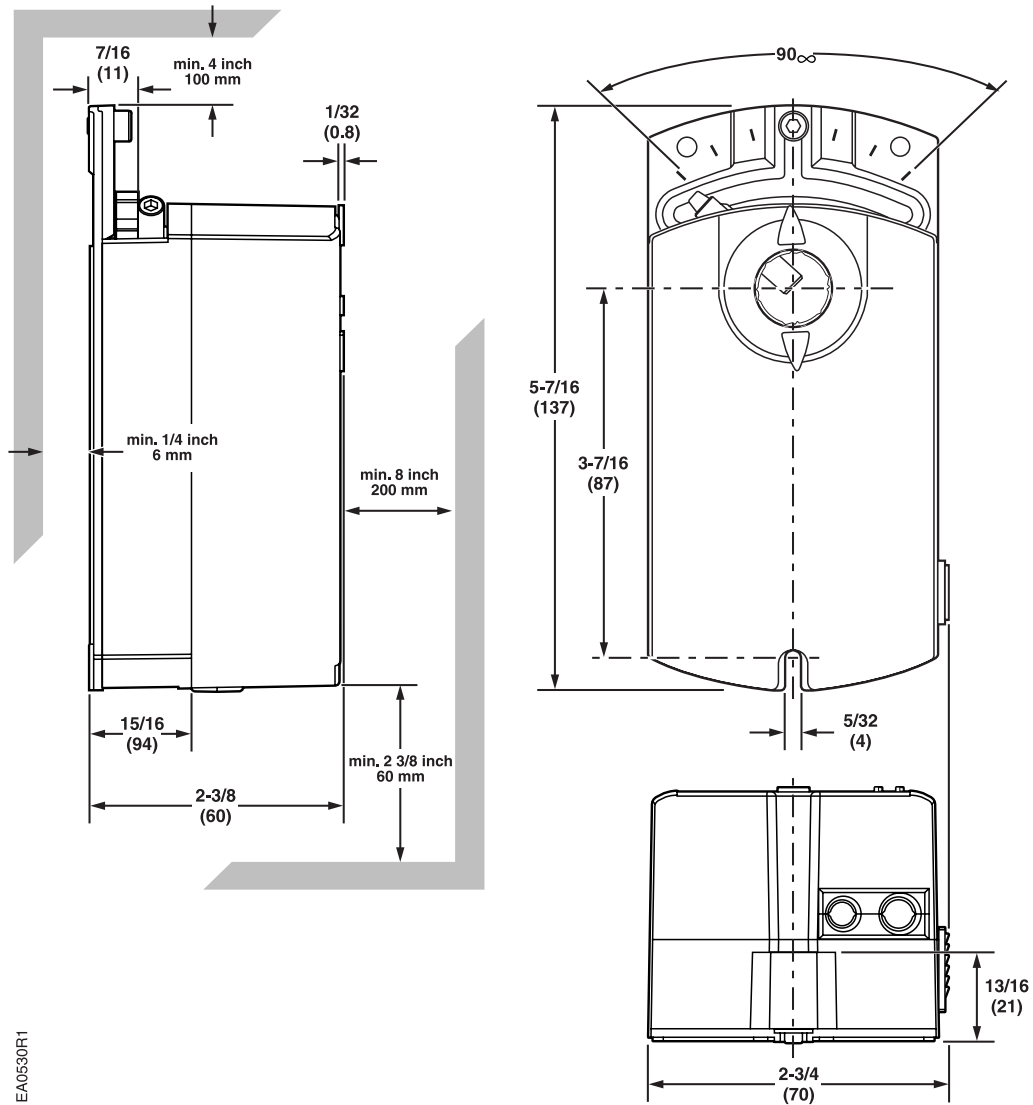
Ordering Note

Bulk packages contain 24 actuators unless otherwise noted.



Dimensions

GDE/GLB Series OpenAir Electric Damper Actuator



EA0530RT

Dimensions shown in inches (mm).

E-17

Damper Actuators

Accessories
& Service Kits

E-45



TECH TIPS

Visit us on the web at:

www.usa.siemens.com/hvaccomponents

You can:

- search for products by part number or description.
- print out product information for submittals.
- link to technical documentation.
- locate a distributor near you.

GLB Series

Non-spring Return Electric Damper Actuator

Easily Replaces:

- Belimo NM Series

88 lb.-in. torque

24 Vac, 3-position Control

0 to 10 Vdc, Modulating Control



GLB Series Non-spring Return Electric Damper Actuator.

Description

The OpenAir GLB Series Direct-coupled 24 Vac Non-spring Electric Actuator is designed for 0 to 10 Vdc or three-position (floating) control of building HVAC dampers.

Features

- Compact design
- Easy-to-see position indicator
- 0 to 10 V or 3-position models
- Self-adapting capability for maximum flexibility in damper positioning
- UL, cUL, CE listed
- Quiet, low-power operation
- Rugged all metal housing, rated NEMA 2
- Assembled in the U.S.A.
- Manual override
- Plenum-rated cable

Options

- Independently adjustable dual auxiliary switches
- Adjustable start/span

Applications

The OpenAir GLB Series Damper Actuators are used in Constant or Variable Air Volume installations for the control requiring up to 88 lb.-in. (10 Nm) torque.

GEB Series

Non-Spring Return Electric Damper Actuator

Easily Replaces:

- Belimo NM Series

132 lb.-in.

24 Vac, 3-position Control

0 to 10 Vdc or 2 to 10 Vdc, Modulating Control



GEB Series Non-spring Return Direct-coupled Electronic Damper Actuator.

Description

The OpenAir GEB Series Direct-coupled, Non-spring Return Electronic Damper Actuators provide modulating and three position control of building HVAC dampers.

Features

- Integral 1/2-inch conduit connector
- Unique self-centering shaft coupling
- Floating control models available with feedback potentiometer
- All metal housing
- Manual override
- DIP switches GEB16x.1x
 - Direction of rotation
 - Adaptation of rotational angle range.
 - Selection of 2 to 10 Vdc control signal
- Mechanical range adjustment capability
- Easily visible position indicator
- Precabled
- UL60730, cUL (C22.2 No. 24-93) and CE listed
- Brushless motor technology
- All modulating types contain built-in feedback

Options

- Dual independently adjustable auxiliary switches
- Adjustable offset/span

Applications

The OpenAir GEB Series Damper Actuators are ideal for Constant or Variable Air Volume installations for the control of return air, mixed air, exhaust, and face and bypass dampers that require up to 132 lb.-in. of torque.

E-21

Damper Actuators

GBB Series

Non-spring Return Rotary Electric Damper Actuator

Easily Replaces:

- Belimo SM/AM Series

221 lb.-in. torque
0 to 10 Vdc, Modulating Control
3-position Control



GBB Series Non-spring Return Electric Damper Actuator.

Description

Designed for control of building HVAC dampers, the OpenAir GBB Series Direct-coupled 24 Vac Non-spring Return Electric Damper Actuators are available in 0 to 10 Vdc and three-position control.

Features

- Brushless motor technology with stall protection
- Self-centering shaft coupling
- Rugged all metal housing
- Quiet, low-power operation
- Accepts shaft diameters up to 1" (25 mm)
- Manual override
- Assembled in the U.S.A.
- UL, cUL and CE listed

Options

- Independently adjustable dual auxiliary switches
- Adjustable offset and span
- Potentiometer for 3-position models

Applications

The OpenAir GBB Series Damper Actuators are used in Constant or Variable Air Volume installations for the control of return air, mixed air, exhaust, and face and bypass dampers that require up to 221 lb.-in. (25 Nm) torque.

Models are available with either an appliance cable for wiring in conduit or a plenum-rated cable for applications where conduit is not required.

E-23

Damper Actuators

Specifications/Product Ordering

Operating Voltage 24 Vac ± 20%

Frequency 50 to 60 Hz

Power Consumption

0-10 Vdc 8 VA

3-position 7 VA

Input Signal (8–2)

Voltage-input 0 to 10 Vdc (max. 35 Vdc)

Input Resistance 100 K Ohms

Position Output Signal (9–2)

Voltage-output 0 to 10 Vdc

Max. Output Current ±1 mA

Equipment Rating for Operating Voltage Class 2

Runtime for 90° Opening or Closing

60 Hz 125 sec.

50 Hz 150 sec.

Nominal Angle of Rotation 90°

Max. Angular Rotation 95°

Dual Auxiliary Switch

Contact Rating

Standard Cable 6 A resistive, 2 A General Purpose

Plenum Cable 4 A resistive, 2 A General Purpose

Voltage

Standard Cable 24 to 250 Vac

Plenum Cable 24 Vac

Switch Range

Switch A 0 to 90° with 5° intervals

Recommended Range 0 to 45°

Switch B 0 to 90° with 5° intervals

Recommended Range 45 to 90°

Switching Hysteresis 2°

Position Feedback 0 to 1000 Ohm <10 mA

Torque 221 lb.-in. (25 Nm)

Temperature

Operating -25 to +130°F (-32 to +55°C)

Storage and Transport -40 to +158°F (-40 to +70°C)

Humidity 95% RH, non-condensing

Agency Approvals UL873

cUL C22.2 No. 24-93

CE

Shaft Size 3/8 to 1-in. (8 to 25 mm) Dia. ●

1/4 to 5/8-in. (6 to 16 mm) Sq. ■

Min. Shaft Length 3/4-in. (20 mm)

Housing Enclosure NEMA 2*

Material Die-cast aluminum alloy

Cable Length 3 ft. (0.9 m)

Dimensions 12" H x 4.75" W x 2.88" D

(305 mm H x 121 mm W x 73 mm D)

Shipping Weight 4.4 lb. (2.0 kg)

*Refer to Installation Instructions for acceptable mounting positions.

E-24

Damper Actuators

◀ Refer to page E-13 for Dimensions.

Accessories & Service Kits **E-45**

GBB Series	Input Signal	Cabling	Standard	Options			
				Span/Offset Adjustable	Dual Aux. Switches & Span/Offset Adjustable	Dual Aux. Switches Only	Position Feedback
0 to 10 Vdc	Standard	Standard	GBB161.1U	GBB163.1U	GBB164.1U	GBB166.1U	—
		Plenum Cable	GBB161.1P	GBB163.1P	GBB164.1P	GBB166.1P	—
3-position	Standard	Standard	GBB131.1U	—	—	GBB136.1U	GBB132.1U
		Plenum Cable	GBB131.1P	—	—	GBB136.1P	GBB132.1P

GIB Series

Non-spring Return Electric Damper Actuator

Easily Replaces:

- Belimo GM Series

310 lb.-in.

0 to 10 Vdc, Modulating Control
3-position Control



GIB Series Non-spring Return Electric Damper Actuator.

Description

The OpenAir GIB Series Direct-coupled 24 Vac Non-spring Return Electric Actuators are designed for modulating and three-position control of building HVAC dampers.

Features

- Visible position indication
- Unique self-centering shaft coupling
- Rugged all metal housing
- Shaft diameters up to 1-inch (25 mm)
- All modulating types include built-in feedback
- Brushless motor technology
- Assembled in the U.S.A.
- Manual Override
- Tandem mount capability with standard GIB actuators

Options

- Independently adjustable dual auxiliary switches
- Adjustable offset and span
- Potentiometer for 3-position models

Applications

The OpenAir GIB Series Damper Actuators are used in Constant or Variable Air Volume installations for the control of return air, mixed air, exhaust, and face and bypass dampers requiring up to 310 lb.-in. (35 Nm) torque.

Models are available with either an appliance cable for wiring in conduit or a plenum-rated cable for applications where conduit is not required.

E-25

Damper Actuators

Specifications/Product Ordering

Operating Voltage (1-2) 24 Vac ±20%
Frequency 50/60 Hz
Power Consumption
 0-10 Vdc 8 VA
 3-position 7 VA
Input signal (8-2)
 Voltage-Input 0 to 10 Vdc
 Input Resistance 100K Ohms
Position Output Signal (9-2)
 Voltage-Output 0 to 10 Vdc
 Max. Output Current 1 mA
Equipment Rating for Operating Voltage, Input Signal, and Position Output Signal Class 2
Control Signal Adjustment
 Offset (Start Point) Between 0 to 5 Vdc
 Factory Setting 0 V
 Span Between 2 to 30 Vdc
Dual Auxiliary Switch
 Contact Rating
 Standard Cable 6 A resistive, 2 A General Purpose
 Plenum Cable 4 A resistive, 2 A General Purpose
 Voltage
 Standard Cable 24 to 250 Vac
 Plenum Cable 24 Vac
 Switch Range
 Switch A 0 to 90° with 5° intervals
 Recommended Range Usage 0 to 45°
 Factory Setting 5°
 Switch B 0 to 90° with 5° intervals
 Recommended Range Usage 45 to 90°
 Factory Setting 85°
 Switching Hysteresis 2°
Position Feedback 0 to 1000 Ohm <10 mA

Function
 Torque 310 lb.-in. (35 Nm)
 Runtime for 90° Opening or Closing
 60 Hz 125 sec
 50 Hz 150 sec.
 Nominal Angle of Rotation 90°
 Max. Angular Rotation 95°
 Noise Level <45 dBA
Shaft Dimensions 3/8 to 1-in. (8 to 26 mm) Dia. ●
 1/4 to 5/8-in. (6 to 16 mm) Sq. ■
Min. Shaft Length 3/4-in. (20 mm)
Housing
 Enclosure NEMA 2*
 Material Die-cast Aluminum alloy
Temperature
 Operation -25 to +130°F (-32 to +55°C)
 Storage and Transport -40 to +158°F (-40 to +70°C)
Humidity 95% RH, non-condensing
Agency Approvals UL873
 cUL C22.2 No. 24-93
 CE
Pre-cabled Connection AWG 18
Cable Length 3 ft. (0.9 m)
Dimensions 12" H x 4.75" W x 2.88" D
 (305 mm H x 121 mm W x 73 mm D)
Shipping Weight 4.4 lb. (2.0 kg)

*Refer to the Installation Instructions for acceptable mounting positions.

E-26

Damper Actuators

◀ Refer to page E-13 for Dimensions.

Accessories & Service Kits **E-45**

GIB Series	Input Signal	Cabling	Standard		Options		
				Span/Offset Adjustable	Dual Aux. Switches & Span/Offset Adjustable	Dual Aux. Switches Only	Position Feedback
0 to 10 Vdc	Standard	GIB161.1U	GIB163.1U	GIB164.1U	GIB166.1U	—	
	Plenum Cable	GIB161.1P	GIB163.1P	GIB164.1P	GIB166.1P	—	
3-position	Standard	GIB131.1U	—	—	GIB136.1U	GIB132.1U	
	Plenum Cable	GIB131.1P	—	—	GIB136.1P	GIB132.1P	

GND Series

Electric Damper Actuator

Designed for UL Listed Fire/Smoke and Smoke Control Dampers



53 lb.-in.
2-position, 15-second Run Time
15-second Spring Return Time



GND Series Electronic Damper Actuator.

Description

Intended for use on UL listed smoke control dampers and combination fire/smoke rated dampers, the OpenAir GND Series Direct Coupled, Fast-Acting, Two-position, Spring Electronic Actuators are available in 24 Vac/dc, 120 Vac, and 230 Vac models.

Features

- Optional built-in auxiliary switches: Fixed switch points at 5° and 85° rotation
- Optional built-in Electronic Fusible Link (EFL) capability with four temperature ratings: 165°F (74°C), 212°F (100°C), 250°F (121°C), 350°F (177°C)
- Reversible fail-safe spring return
- All metal housing
- Pre-cabled Teflon® insulated lead wires
- Fifteen-second operation at rated torque, temperature and voltage.

Applications

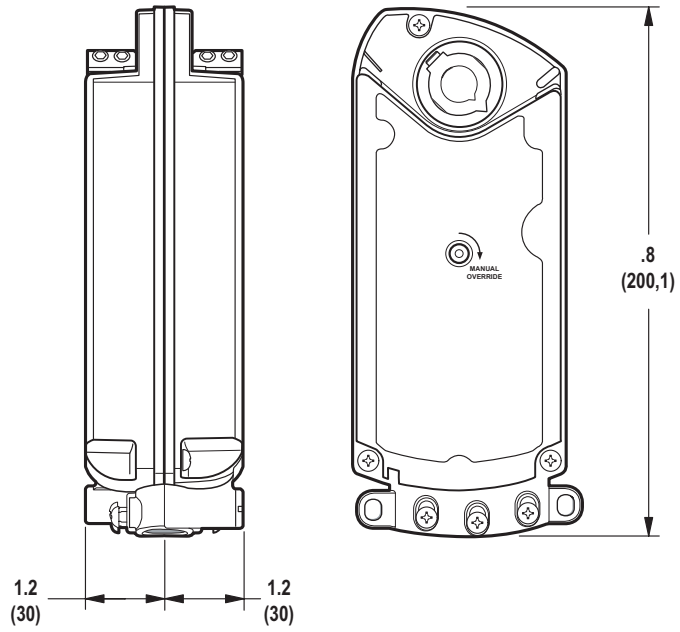
The GND Series Spring Return Electronic Actuator is used for the control of dampers requiring up to 53 lb-in (6Nm) driving torque. It is intended for control of UL listed smoke control dampers and combination fire/smoke HVAC dampers. This actuator is designed to meet the 2002 revisions to the UL 555/555S and the AMCA Standard 520 specifications.

E-27

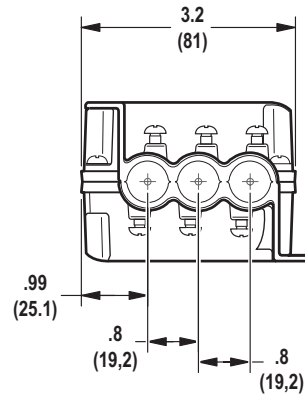
Damper Actuators

Dimensions

GND Series OpenAir Damper Actuator



EA1148R1



Dimensions shown in inches (mm).



TECH TIPS

To carry the UL555 and UL555S ratings, the fire/smoke damper manufacturer must test, manufacture and sell the damper and actuator as an assembly. Field replacement of fire/smoke damper actuators falls under the local authority having jurisdiction. The Authority Having Jurisdiction (AHJ) is the person or organization that approves the application of the product. The degree to which the AHJ controls the approval process varies according to local codes.

GGD Series

Electric Damper Actuator

Designed for UL Listed Fire/Smoke and Smoke Control Dampers



142 lb.-in. torque
 2-position, 15-second Runtime
 15-second Spring Return Time



GGD Series Electronic Damper Actuator.

Description

Intended for use on UL listed smoke control dampers or combination fire/smoke rated dampers, the OpenAir GGD Series Direct-coupled, Fast Acting, Two-position, Spring Return Electronic Actuators are available in 24 Vac, 115 Vac, and 230 Vac models.

Features

- High temperature rated drive system
- Reversible fail-safe spring return
- All metal housing
- Teflon® insulated lead wires
- Mechanical range adjustment
- Multiple shaft couplings available; will accommodate up to 1.05-inch shafts
- 15 second nominal open time
- 15 second nominal spring return time
- 24, 115 and 230 Vac models

Applications

The GGD Series Spring Return Actuator is used for the control of dampers requiring up to 142 lb.-in. (16Nm) driving torque. It is intended for control of UL listed smoke control dampers or combination fire/smoke HVAC dampers. This actuator is designed to meet the 2002 revisions to the UL 555S rating up to 350°F (177°C) and AMCA 500-D specifications.

E-31

Damper Actuators

Specifications/Product Ordering

Operating Voltage 24 Vac ±20%
 115 Vac ±15%
 230 Vac ±10%

Frequency 50/60 Hz

Power Consumption
 Running 150 VA
 Holding 10 VA

Torque
 Running 142 lb.-in. (16 Nm)
 Spring Return 108 lb.-in. (12 Nm)
 Minimum Stall 350 lb.-in. (39 Nm)

Runtime for 90°
 Operating with motor at 60 Hz 15 seconds nominal
 Closing (on power loss) with spring return 15 seconds maximum

Nominal Angle of Rotation 95°

Life Expectancy Minimum 35,000 full stroke cycles

Damper Shaft Size
 Standard 3/8 to 1-in. (8 to 25.6 mm)
 Oversized 1.05-in. max. (26.6 mm)

Min. Shaft Length 3/4-in. (20 mm)

Housing
 Enclosure NEMA 1
 Material Die-cast Aluminum alloy

Temperature
 Operation 0 to 130°F (-18 to +55°C)
 One time 350°F (177°C) for 1/2 hour (per UL555S)
 Storage and Transport -25 to +158°F (-32 to +70°C)

Humidity Maximum 95% RH, non-condensing

Agency Certifications UL listed to UL873
 C-UL certified to Canadian standard
 C22.2 No. 24-93
 Australian EMC Framework (C-tick)
 with the limits per AS/NZS 2064 1/2:1997

Pre-cabled Connection AWG 18

Dimensions 12" H x 4.76" W x 2.88" D
 (305 mm H x 120 mm W x 72 mm D)

Shipping Weight
 Single Pack 7.0 lbs. (3.2 kg)
 Bulk Pack 56 lbs. (25.4 kg)

Accessories & Service Kits **E-45**

E-32

Damper Actuators

GGD Series	Description	Rotation	Shaft Adapter	24 Vac	115 Vac	230 Vac
	Standard	95°	Self-centering	GGD121.1U	GGD221.1U	GGD321.1U
Standard/Bulk	95°	Self-centering	GGD121.1U/B	GGD221.1U/B	GGD321.1U/B	
Standard	95°	Oversized	GGD121.3U	GGD221.3U	—	
Standard/Bulk	105°	Self-centering	GGD121.1U/BR/B	GGD221.1U/BR/B	—	

Ordering Note Bulk packages contain 8 actuators.

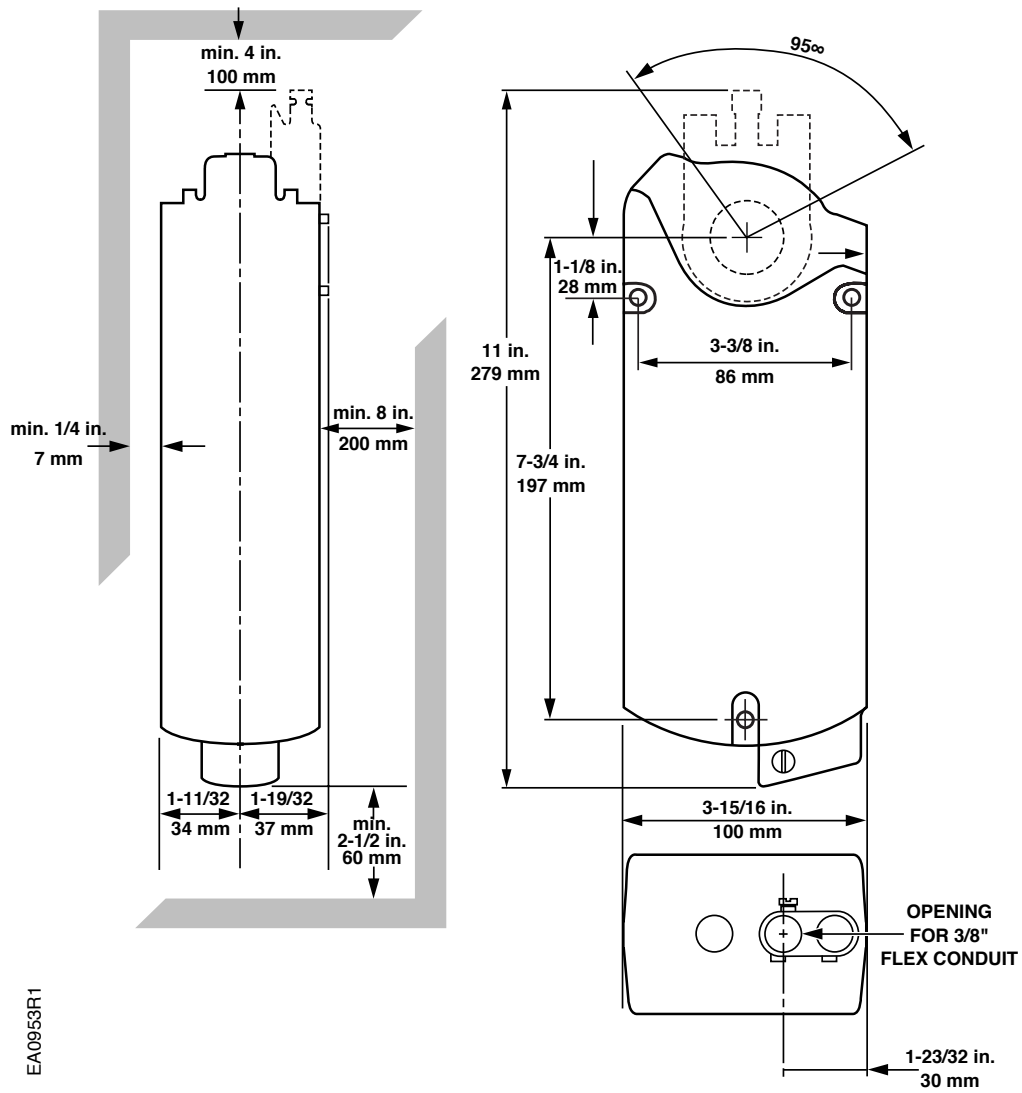


Part No. in black box Ships same day when requested through Rapid Response™ shipping. See page 1 for details.

SIEMENS

Dimensions

GGD Series OpenAir Damper Actuator



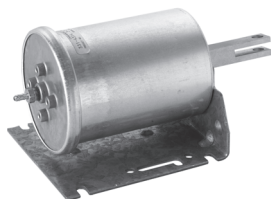
OpenAir Part No. Nomenclature

Global Actuator Program		G	B	B	1	6	1	•	1	U
Type	Non-Spring Return 221 lb-in.	B								
	Spring Return 142 lb-in.	C								
	Non-Spring Return 44 lb-in.	D								
	Non-Spring Return 132 lb-in.	E								
	Fire and Smoke 142 lb-in.	G								
	Non-Spring Return 310 lb-in.	I								
	Non-Spring Return 88 lb-in.	L								
	Spring Return 62 lb-in.	M								
	Fire and Smoke 53 lb-in.	N								
	Spring Return 20 lb-in.	Q								
Running Time	90 sec.	A								
	150(125) s AT 50(60) Hz	B								
	60 s	C								
	15 s	D								
	108(90) s AT 50(60) Hz	E								
Voltage	24 Vac	1								
	120 Vac	2								
	230 Vac	3								
Functionality	2PT	2								
	3PT	3								
	Modulating with Signal Inversion (0...10V or 2...10V)	5								
	Modulating (0...10V)	6								
Optional Features	Standard Version	1								
	Potentiometer 1 K Ohm	2								
	Signal adjustable	3								
	Switches+Signal adjustable	4								
	Switches	6								
Action	Rotary Self-Centering Shaft Adapter	1								
Cabling	Standard USA 3 ft. Cable	U								
	Plenum USA 3 ft. Cable	P								

E-34

Damper Actuators

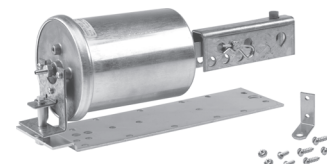
No. 3 Pneumatic Actuator



331-4314 Actuator with fixed mounting bracket and clevis.



331-4312 Actuator with pivot mounting bracket.



331-4311 Actuator, clevis and rocker arm. Mounting for extended shaft.

Description

Designed with a 2-3/8-inch (60 mm) stroke, the No. 3 Pneumatic Actuator is a rugged, metal-fabricated device that provides gradual or positive actuation of HVAC dampers. The actuator is available in a variety of spring ranges for energy optimizing and sequencing with other devices.

Features

- Ozone-resistant rolling rubber diaphragm
- Variety of installation options, including:
 - Fixed bracket mounting
 - Direct front mounting
 - Pivot mounting for extended shaft
- Available with positioning relay

Applications

Recommended for control of mixing box dampers or air valves and damper control for unit ventilators, unit conditioners and small HVAC systems, the No. 3 Pneumatic Actuator is also available with 2-3/4-inch (70 mm) stroke in the three spring ranges.

For more information, contact your local Siemens Building Technologies representative.

E-35

Damper Actuators

Thrust/Torque Ratings	Nominal Spring Rating	Max. Thrust lb. (N)				Torque Rating lb.-in (Nm)			
		Full Stroke Forward			Spring Return (No Stroke) 0 psig (0 kPa)	Gradual Operation	2-position Operation or with Positioner		
		15 psi (103 kPa)	18 psi (124 kPa)	25 psi (172 kPa)			15 psi (103 kPa)	18 psi (124 kPa)	25 psi (172 kPa)
3 to 7 psi (21 to 48 kPa)	64 (285)	88 (391)	144 (641)	24 (107)	10 (1.1)	20.2 (2.3)	20.2 (2.3)	20.2 (2.3)	
5 to 10 psi (35 to 69 kPa)	40 (178)	64 (285)	120 (534)	40 (178)	10 (1.1)	33.6 (3.8)	33.6 (3.8)	33.6 (3.8)	
8 to 13 psi (55 to 90 kPa)	16 (71)	40 (178)	96 (427)	64 (285)	10 (1.1)	53.8 (6.1)	53.8 (6.1)	53.8 (6.1)	

With maximum hysteresis of 2.5 psi (17.2 kPa) @ 90° rotation.

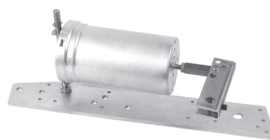
No. 4 Pneumatic Actuator



331-2929 No. 4
Pneumatic Actuator
for frame mounting.



331-2904 No. 4
Pneumatic Actuator with
pivot mounting bracket.



331-2973 No. 4
Pneumatic Actuator with clevis, and crank.
Universal Mounting Plate for extended
shaft or frame mounting.



331-2974 No. 4
Pneumatic Actuator with
non-pivot bracket
for unit ventilator.

Description

Designed with a 4-inch (102 mm) stroke, the No. 4 Pneumatic Actuator is a rugged, metal-fabricated device that provides gradual or positive actuation of HVAC and fire/smoke dampers.

Features

- Replaceable diaphragm
- Positioning relay (optional)
- Forward travel stops (optional)
- Hesitation model (provides minimum ventilation without separate damper/actuator)
- Variety of spring ranges for sequencing with other control devices
- Stainless steel actuator shaft

Applications

Recommended for control of outdoor, return air, exhaust, face and bypass, fan discharge, and static pressure control dampers, the No. 4 Pneumatic Actuator also is excellent for controlling specialized dampers and air valves in terminal units, such as unit ventilators and mixing boxes.

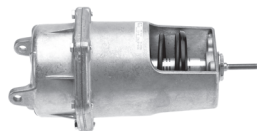
The No. 4 actuator hesitation model is frequently used to operate the outdoor air damper on unit ventilators and mixing boxes.

An actuator marked with an asterisk (*) is a component recognized under UL's Damper Actuator category (EMKU2) for use on fire dampers and leakage-related dampers.

Thrust/Torque Ratings	Nominal Spring Rating	Max. 121 Thrust lb. (N)				Torque Rating lb.-in. (Nm)			
		Full Stroke Forward			Spring Return (No Stroke)	Gradual Operation	2-position Operation or with Positioner		
		15 psi (103 kPa)	18 psi (124 kPa)	25 psi (172 kPa)			0 psig (0 kPa)	15 psi (103 kPa)	18 psi (124 kPa)
3 to 7 psi (21 to 48 kPa)	88 (391)	121 (538)	198 (881)	33 (147)	30 (3.4)	46 (5.2)	46 (5.2)	46 (5.2)	
3 to 13 psi (21 to 90 kPa)	22 (198)	55 (245)	132 (587)	33 (147)	30 (3.4)	46 (5.2)	46 (5.2)	46 (5.2)	
5 to 10 psi (35 to 90 kPa)	55 (245)	88 (391)	165 (734)	55 (245)	30 (3.4)	77 (8.7)	77 (8.7)	77 (8.7)	
8 to 13 psi (55 to 90 kPa)	22 (98)	55 (245)	132 (587)	88 (391)	30 (3.4)	123 (14)	123 (14)	123 (14)	
2 to 3, 8 to 13 psi (14 to 20, 55 to 90 kPa) Hesitation	22 (98)	55 (245)	132 (587)	22 (98)	23 (2.6)	—	—	—	

With maximum hysteresis of 2.5 psi (17.2 kPa) @ 90° rotation.

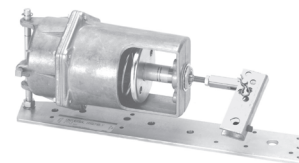
No. 6 Pneumatic Actuator



331-2792 and 331-3060 No. 6
Pneumatic Actuator,
pivot mounting type.



331-2856 No. 6
Pneumatic Actuator and
clevis for frame mounting.



331-3011 No. 6 Pneumatic Actuator,
clevis, crank and rocker arm. Universal
mounting for extended shaft or frame mounting.

Description

Designed with a 4-inch (102 mm) stroke, the No. 6 Pneumatic Actuator is a rugged, metal-fabricated device that provides gradual or positive actuation of HVAC and fire/smoke dampers.

Features

- Replaceable diaphragm
- Variety of spring ranges for sequencing with other control devices
- High torque

Options

- Positioning relay
- Forward travel stops

Applications

Recommended for multiple applications, the No. 6 Pneumatic Actuator is excellent for control of outdoor air, return air, mixed air, exhaust, face and bypass, fan discharge, multisection, static pressure control, fan inlet vanes and other special applications.

An actuator marked with an asterisk is recognized under UL's Damper Actuator category (EMKU2) for use on fire dampers and leakage-rated dampers.

E-39

Damper Actuators

Thrust/Torque Ratings	Nominal Spring Rating	Max. Thrust lb. (N)				Torque Rating lb.-in. (Nm)			
		Full Stroke Forward			Spring Return (No Stroke) 0 psig (0 kPa)	Gradual Operation	2-position Operation or with Positioner		
		15 psi (103 kPa)	18 psi (124 kPa)	25 psi (172 kPa)			15 psi (103 kPa)	18 psi (124 kPa)	25 psi (172 kPa)
3 to 8 psi (21 to 55 kPa)	125 (556)	179 (796)	304 (1352)	54 (240)	50 (5.6)	75 (8.5)	75 (8.5)	75 (8.5)	
3 to 13 psi (21 to 90 kPa)	36 (160)	89 (396)	214 (952)	54 (240)	50 (5.6)	75 (8.5)	75 (8.5)	75 (8.5)	
8 to 13 psi (55 to 90 kPa)	36 (160)	89 (396)	214 (952)	144 (640)	50 (5.6)	202 (22.8)	202 (22.8)	202 (22.8)	

With maximum hysteresis of 2.5 psi (17.2 kPa) @ 90° rotation.

No. 6 Pneumatic Actuator— Tandem Mounting



331 No. 6 Pneumatic Damper Actuator—
Tandem Mounting.

Description

A rugged, metal-fabricated device for tandem mounting, the No. 6 Pneumatic Damper Actuator, is piloted by a positioning relay, mounted on a sturdy angle iron frame.

Features

- Adjustable spring span and start point
- Spring return actuators
- Replaceable diaphragms

Arm Length vs. Rotation	Lever or Crank Arm Length In. (mm)	Damper Rotation in Degrees
	2.3" (58 mm)	120°
	2.8" (71 mm)	90°
	3" (76 mm)	84°
	4" (102 mm)	60°
	5" (127 mm)	47°
	6" (152 mm)	39°
	7" (178 mm)	33°
	8" (203 mm)	29°
	9" (229 mm)	25°

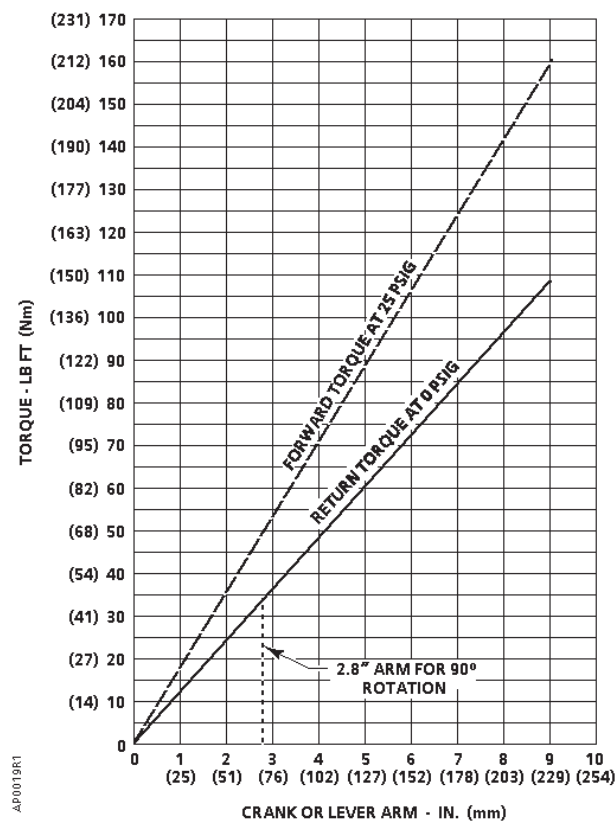
Arm Length Versus Rotation

If the damper rotation is other than 90°, use the Arm Length vs. Rotation Chart and the Thrust and Torque Ratings to determine the actuator assembly torque rating. Then divide the actuator assembly torque rating by the damper torque rating per unit of area for job conditions to determine the damper area that can be controlled. Make sure the torque units used are the same.

Applications

The No. 6 Pneumatic Damper Actuator with tandem mounting is recommended to position inlet vanes on fans or large dampers that use a jack shaft.

Torque Rating



Specifications/Product Ordering

Effective Diaphragm Area 35.8 in.² (230 cm²)
Stroke 4-in. (102 mm)
Max. Air Pressure 30 psig (207 kPa)
Spring Start Point (Adjustable) 3 to 10 psig (21 to 69 kPa)
Spring Span (Adjustable) 3 to 12 psig (21 to 83 kPa)
Spring Range
 Factory Setting 8 to 13 psig (55 to 90 kPa)
Temperature Range
 Operating -20 to +160°F (-29 to +71°C)
 Storage -20 to +160°F (-29 to +71°C)

Materials
 Housing Aluminum
 Stem Type 416SS
 Diaphragm Silicone rubber
 Spring Steel
 Bearing Bronze Oilite
Air Connection 1/8" NPT Female
Type of Mounting Pivot; Universal (extended shaft for female)
Shipping Weight 30.0 lb. (13.5 kg)

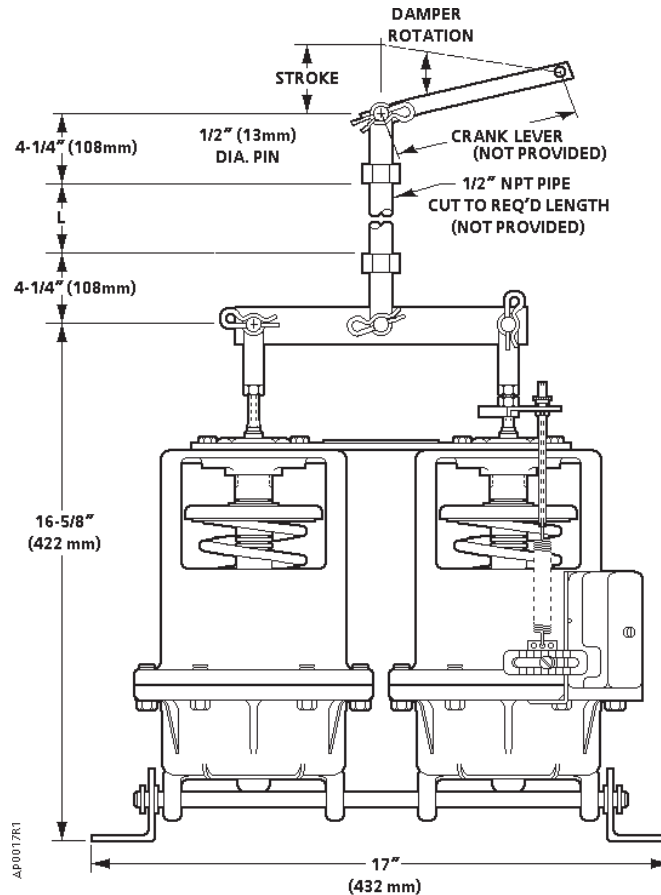
331 No. 6 Tandem	Description	Part No.
	Damper Actuator with Tandem Mounting	331-3070

Accessories & Service Kits **E-50**

E-42

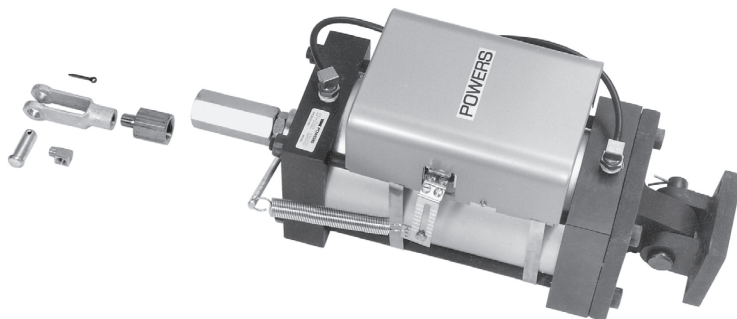
Dimensions

Damper Actuators



Dimensions shown in inches (mm).

Large Capacity Pneumatic Actuator



331 Large Capacity Pneumatic Actuator.

Description

Designed to develop very high thrust, the 331 Large Capacity Pneumatic Actuator has the capacity to handle heavy loads.

Features

- Max. 30 psi (207 kPa) inlet pressure
- All mounting hardware included
- Adjustable start point
- Adjustable span

Applications

The 331 Large Capacity Pneumatic Actuator controls large dampers and equipment that requires high operating thrust.

Caution

Actuator cannot be used when spring return to fail safe position is required.

Specifications/Product Ordering

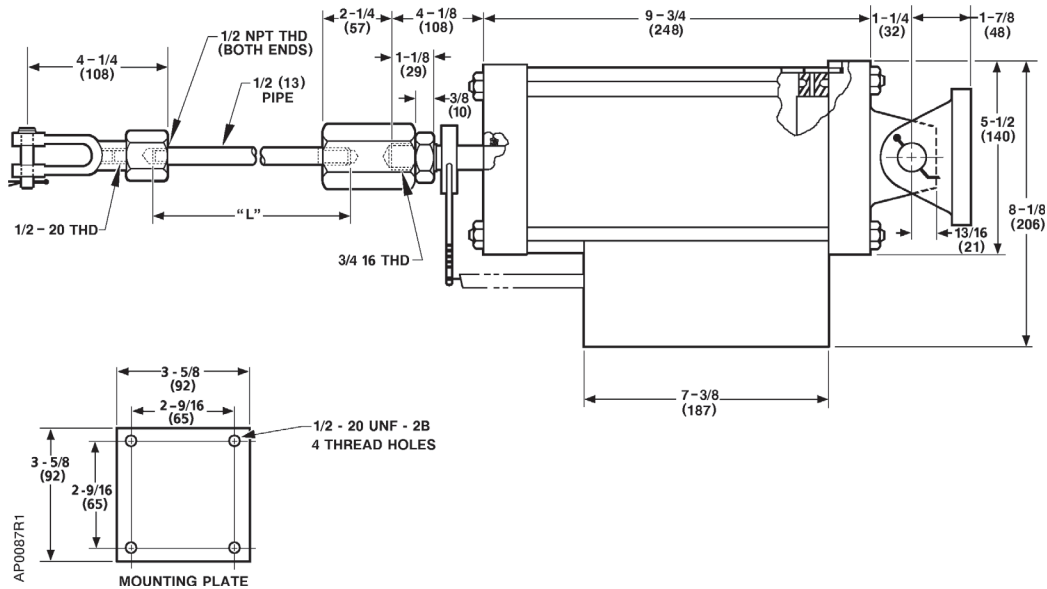
Air Supply Pressure 25 psi (172 kPa)
Max. Pressure 30 psi (207 kPa)
Temperature Range
 Operating 50 to 140°F (10 to 60°C)
 Storage -20 to +160°F (-29 to +71°C)
Effective Piston Area 19.6 in.² (126 cm²)
Stroke 7-in. (18 cm)
Span (adjustable) 3 to 12 psi (21 to 83 kPa)

Response 0.5 psi (3.4 kPa)
Torque Rating (90° rotation) with 25 psig (172 kPa) air supply 130 lb.-ft. (176 Nm)
Spring Start Point (adjustable) 3 to 10 psig (21 to 69 kPa)
Mounting Pivot
Air Connection 1/8" NPT
Shipping Weight 35.0 lb. (16.0 kg)

331	Description	Part No.
	Large Capacity Pneumatic Actuator	331-2882

Accessories & Service Kits
E-50

Dimensions



Dimensions shown in inches (mm).

E-44

Damper Actuators