


# Damper Actuators

## Table of Contents

PRODUCT	TORQUE	TECHNICAL INSTRUCTIONS	PAGE #
<b>Overview</b>			
Overview/Selection Guide			E-2
<b>OpenAir™ Electronic Damper Actuators</b>			
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	160 lb.-in.	155-173/P25	E-11
GNP/GAP Fail Safe/Fail-In-Place Damper Actuator 	53 lb.-in.	155-771	E-15
GDE Series Non-spring Return Damper Actuator	44 lb.-in.	155-187/188P25	E-19
GLB Series Non-spring Return Damper Actuator	88 lb.-in.	155-187/188P25	E-23
GEB Series Non-spring Return Damper Actuator	132 lb.-in.	155-318P25	E-25
GBB Series Non-spring Return Damper Actuator	221 lb.-in.	155-176/177P25	E-27
GIB Series Non-spring Return Damper Actuator	310 lb.-in.	155-176/177P25	E-29
GND Series Spring Return Damper Actuator for UL Listed Fire/Smoke Control Dampers	53 lb.-in.	155-746	E-31
GGD Series Spring Return Damper Actuator for UL Listed Fire/Smoke Control Dampers	142 lb.-in.	152-046P25	E-35
Reference: OpenAir Part No. Nomenclature		—	E-38
<b>Pneumatic Damper Actuators</b>			
No. 3 Actuator		155-146P25	E-39
No. 4 Actuator		155-032P25	E-41
No. 6 Actuator		155-029P25	E-43
No. 6 Actuator—Tandem Mounting		155-277P25	E-45
Large Capacity Actuator		155-030P25	E-47
<b>Accessories &amp; Service Kits</b>			E-49

# 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



E-2

### Selection Guide Square footage is approximate, based on 4 lb-in/ft<sup>2</sup>

Application	Electronic												Pneumatic*		
	Spring Return						Non-spring Return						Spring Return		
	GQD 5 ft <sup>2</sup>	GMA 16 ft <sup>2</sup>	GCA 40 ft <sup>2</sup>	GNP 12 ft <sup>2</sup>	GND 12 ft <sup>2</sup>	GGD 36 ft <sup>2</sup>	GDE 11 ft <sup>2</sup>	GAP 12 ft <sup>2</sup>	GLB 22 ft <sup>2</sup>	GEB 32 ft <sup>2</sup>	GBB 55 ft <sup>2</sup>	GIB 77 ft <sup>2</sup>	No. 3 12 ft <sup>2</sup>	No. 4 16 ft <sup>2</sup>	No. 6 24 ft <sup>2</sup>
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					•	•								•••	•••
Fume Hoods/Supply and Exhaust Dampers				•				•							

\*Estimates for pneumatic actuators are based on the maximum stroke of the actuator and a 90° damper rotation

\*\*LC Model

\*\*\*See data sheets for specific types

Damper Type	Damper Leakage at 1" H <sub>2</sub> 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. <sup>2</sup> (50.8 l/s per m <sup>2</sup> )	2.5 lb.-in./ft. <sup>2</sup> (0.3 Nm/m <sup>2</sup> )
Low Leakage	5 to 10 CFM/ft. <sup>2</sup> (25.4 to 50.8 l/s per m <sup>2</sup> )	5.0 lb.-in./ft. <sup>2</sup> (0.6 Nm/m <sup>2</sup> )
Very Low Leakage	Less than 5 CFM/ft. <sup>2</sup> (Less than 25.4 l/s per m <sup>2</sup> )	7.0 lb.-in./ft. <sup>2</sup> (0.8 Nm/m <sup>2</sup> )

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

## Electronic Damper Actuators Spring Return

### Easily Replaces:

- Belimo TF Series



### 20 lb.-in. Torque

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



GQD Series Spring Return  
Direct Coupled Electronic Damper Actuator.

### Description

The OpenAir GQD Series direct-coupled, spring return electronic damper actuators are 24 Vac/dc and 120 Vac rated and available in 2-position, floating and 2 to 10 Vdc control.

### Features

- Bi-directional, fail-safe spring return
- Modulating actuators contain built-in feedback
- 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

### Options

- Available with dual auxiliary switches fixed at 5° and 85°

### Applications

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

## GQD Series Specifications

<b>Operating Voltage</b> .....	24 Vac/dc ±20%
	120 Vac ±15%
<b>Frequency</b> .....	50/60 Hz
<b>Power Consumption</b>	
GQD121.1P (24 Vac/24 Vdc)	
Running .....	6.5 VA (4.5W)
Holding .....	4 VA (2.5W)
GQD131.1P (24 Vac/24 Vdc)	
Running .....	4 VA (2.5W)
Holding .....	3 VA (1.5W)
GQD151.1P (24 Vac/24 Vdc)	
Running .....	4.5 VA (3W)
Holding .....	3.5 VA (2W)
GQD221.1U (120 Vac)	
Running .....	10 VA
Holding .....	7 VA
<b>Function</b>	
Torque .....	20 lb.-in. (2 Nm)
Runtime for 90° .....	30 sec.
Spring Return .....	15 sec. nominal
Nominal Angle of Rotation .....	90°

<b>Dual Auxiliary Switches</b>	
Fixed at 5° and 85°	
AC Rating .....	24 to 250 Vac
	AC 6A resistive
	AC 2A General Purpose
DC Rating (Standard/Plenum Cable) .....	12 to 30 Vdc
	DC 2A
<b>Shaft Size</b> .....	
	3/8 to 1/2-in. (8 to 13.4 mm) round/square ● ■
<b>Min. Shaft Length</b> .....	
	1-in. (25.4 mm)
<b>Conduit Connection</b> .....	
	(GQD221.1U only) 1/2" NPT
<b>Housing Enclosure</b> .....	
	NEMA 1
<b>Material</b> .....	
	Plenum rated rugged plastic
<b>Ambient Temperature</b>	
Operating .....	-25 to 130°F (-32 to 55°C)
Storage and Transport .....	-40 to 158°F (-40 to 70°C)
<b>Ambient Humidity</b> .....	
	95% RH, non-condensing
<b>Agency Approvals</b> .....	
	UL873, cUL, CE rated
<b>Pre-Cabled Connection</b> .....	
	AWG 18
<b>Cable Length</b> .....	
	3 ft. (0.9m)
<b>Dimensions</b> .....	
	<4.72" H x <2.75" W x <2.5" D
	(<120 mm H x <70 mm W x <63 mm D)
<b>Shipping Weight</b> .....	
	<1.5 lbs. (<.68 kg)

E-4

## GQD Series Product Ordering

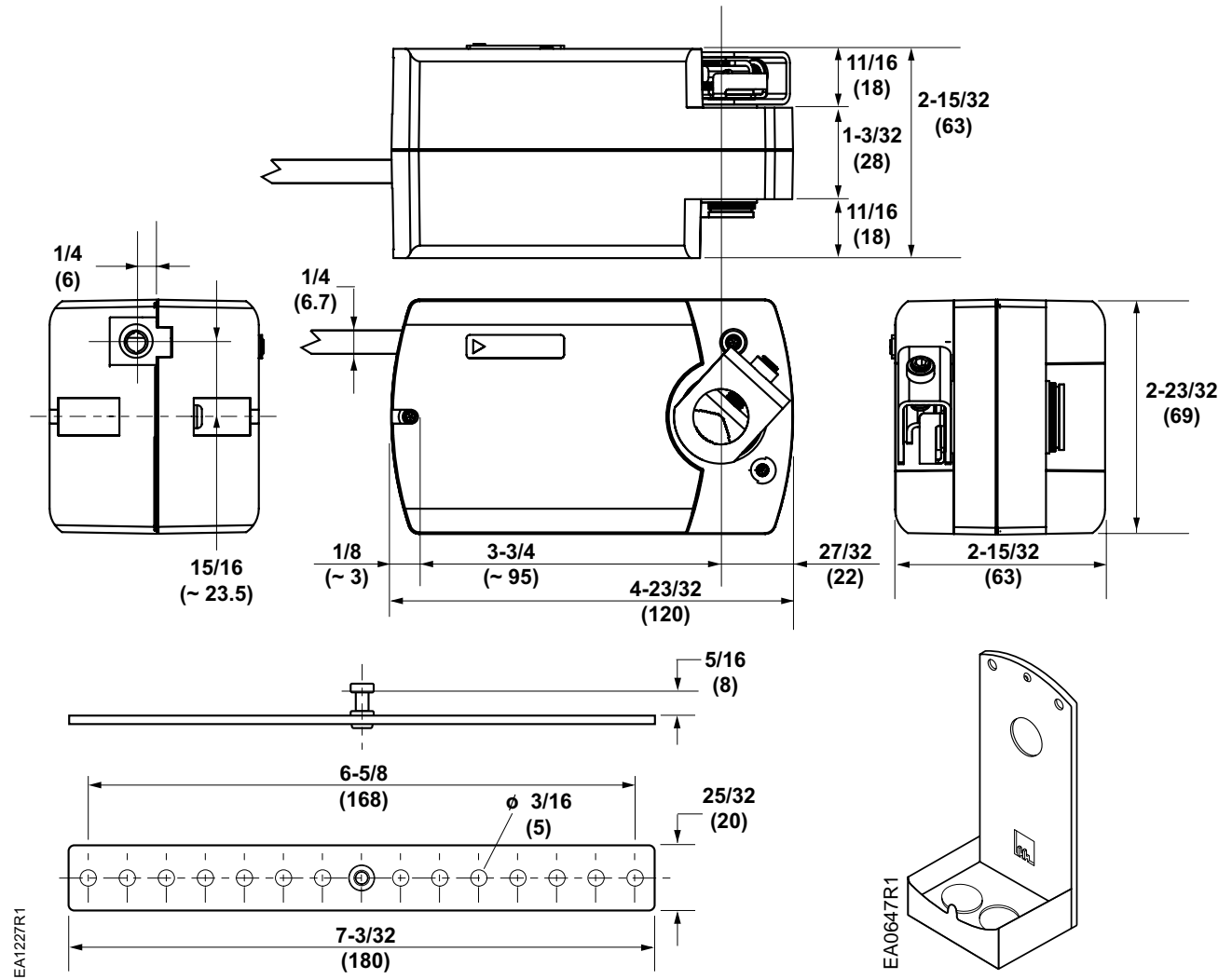
Control Signal	Cabling	Standard	Dual Auxiliary Switches
2-position (Open/Closed), 24 Vac/dc	Plenum Cable	<b>GQD121.1P</b>	<b>GQD126.1P</b>
	Plenum Cable/Bulk	<b>GQD121.1P/B</b>	—
2-position (Open/Closed), 120 Vac	Standard Cable	<b>GQD221.1U</b>	<b>GQD226.1U</b>
	Standard Cable/Bulk	<b>GQD221.1U/B</b>	—
Floating, 24 Vac/dc	Plenum Cable	<b>GQD131.1P</b>	<b>GQD136.1P</b>
	Plenum Cable/Bulk	<b>GQD131.1P/B</b>	—
2 to 10 Vdc/10 to 2 Vdc, (Modulating), 24 Vac/dc	Plenum Cable	<b>GQD151.1P</b>	<b>GQD156.1P</b>
	Plenum Cable/Bulk	<b>GQD151.1P/B</b>	—

**Ordering Note** Bulk packages contain 10 actuators unless otherwise noted.

Damper Actuators

# Dimensions

## GQD Series Open Air Spring Return Electronic Damper Actuator



Dimensions shown in inches (mm).

E-6

## Damper Actuators

### More torque, less energy consumption.

Siemens damper actuators ship ready to install, with built-in time and cost-saving features such as a patented self-centering shaft adapter, standardized wiring, and brushless motor technology.

With torques ranging from 20 to 310 lb.-in., this powerful and flexible line-up delivers out-of-the-box performance and long-lasting reliability for all types of HVAC applications.



**SIEMENS**

## Electronic Damper Actuator Spring Return

### Easily Replaces:

- Belimo LN/NF Series



Indoor  
Environmental  
Quality

### 62 lb.-in. Torque

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



GMA Series Spring Return  
Direct-coupled Electronic Damper Actuator.

### Description

The OpenAir GMA Series Direct-coupled, Spring Return Electronic Damper Actuators provide modulating, two-position and floating 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
- Assembled in the U.S.A

### 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 applications where the damper is required to return to a fail-safe position when there is a power failure.

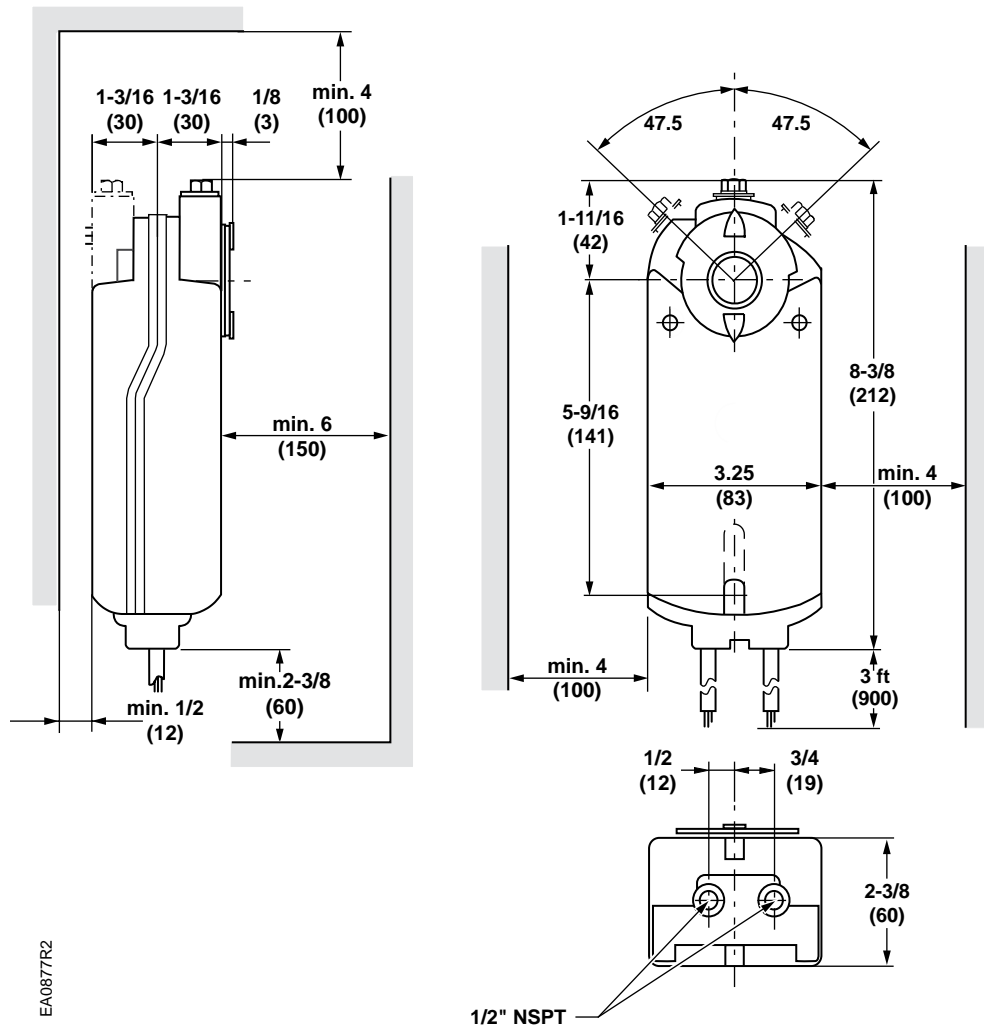
Models are available with either an appliance cable for wiring in conduit or a plenum-rated cable.





# GMA Series Dimensions

## GMA/GEB Series OpenAir Damper Actuator



Dimensions shown in inches (mm).

## Maximize energy-savings. Optimize performance.

Our HVAC products help drive down energy costs and improve indoor air quality. Look for these icons throughout this catalog for products that can help contribute to achieving LEED credits.

Sustainable Sites (SS)

Water Efficiency (WE)

Energy & Atmosphere (EA)

Materials & Resources (MR)

Indoor Environmental Quality (IEQ)

Innovation in Design/Operations (EB)

Regional Priority (RP)

**Find more information on LEED beginning on pg. 3**



Sustainable Sites



Water Efficiency



Energy & Atmosphere



Materials & Resources



Indoor Environmental Quality



Innovation in Design/Operations



Regional Priority

## Electronic Damper Actuator Spring Return

### Easily Replaces:

- Belimo AF Series



Indoor  
Environmental  
Quality

### 160 lb.-in. Torque

24 Vac/dc, 2-position Control

120 Vac, 2-position Control

24 Vac/dc, Floating Control

24 Vac/dc, 0 to 10 Vdc/2 to 10 Vdc, Modulating Control



GCA Series Spring Return  
Electronic Damper Actuator.

### Description

Designed for control of building HVAC dampers, the OpenAir GCA Series Direct-coupled, Spring Return Electronic Actuators are available in 0 to 10 Vdc or 2 to 10 Vdc modulating, 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 floating 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 160 lb.-in. (18 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.

# GCA Series Specifications

**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 ..... 160 lb.-in. (18 Nm)  
 Spring Return ..... 160 lb.-in. (18 Nm)  
 Max. Torque ..... <380 lb.-in. (43 Nm)

**Runtime for 90° operating with motor** ..... 90 seconds  
 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  
 CE

**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 Product Ordering

Input Signal	Cabling	Part No.				
		Standard	Span/Offset Adjustable	Dual Aux. Switches & Span/Offset Adjustable	Dual Aux. Switches Only	Position Feedback Only
0 to 10 Vdc, 24 Vac/dc	Standard	<b>GCA161.1U</b>	GCA163.1U	GCA164.1U	GCA166.1U	—
	Plenum Cable	<b>GCA161.1P</b>	GCA163.1P	GCA164.1P	GCA166.1P	—
	Plenum Cable/Bulk	<b>GCA161.1P/B</b>	—	—	—	—
0 to 10 Vdc or 2 to 10 Vdc Modulating 24 Vac/dc, (Signal Inversion)	Standard	<b>GCA151.1U</b>	—	—	GCA156.1U	—
	Plenum Cable	<b>GCA151.1P</b>	—	—	GCA156.1P	—
2-position, 24 Vac/dc	Standard	<b>GCA121.1U</b>	—	—	<b>GCA126.1U</b>	—
	Standard/Bulk	<b>GCA121.1U/B</b>	—	—	—	—
	Plenum Cable	<b>GCA121.1P</b>	—	—	<b>GCA126.1P</b>	—
2-position, 120 Vac	Standard	<b>GCA221.1U</b>	—	—	<b>GCA226.1U</b>	—
	Standard/Bulk	<b>GCA221.1U/B</b>	—	—	—	—
Floating, 24 Vac/dc	Standard	<b>GCA131.1U</b>	—	—	GCA136.1U	GCA132.1U
	Plenum Cable	<b>GCA131.1P</b>	—	—	GCA136.1P	GCA132.1P

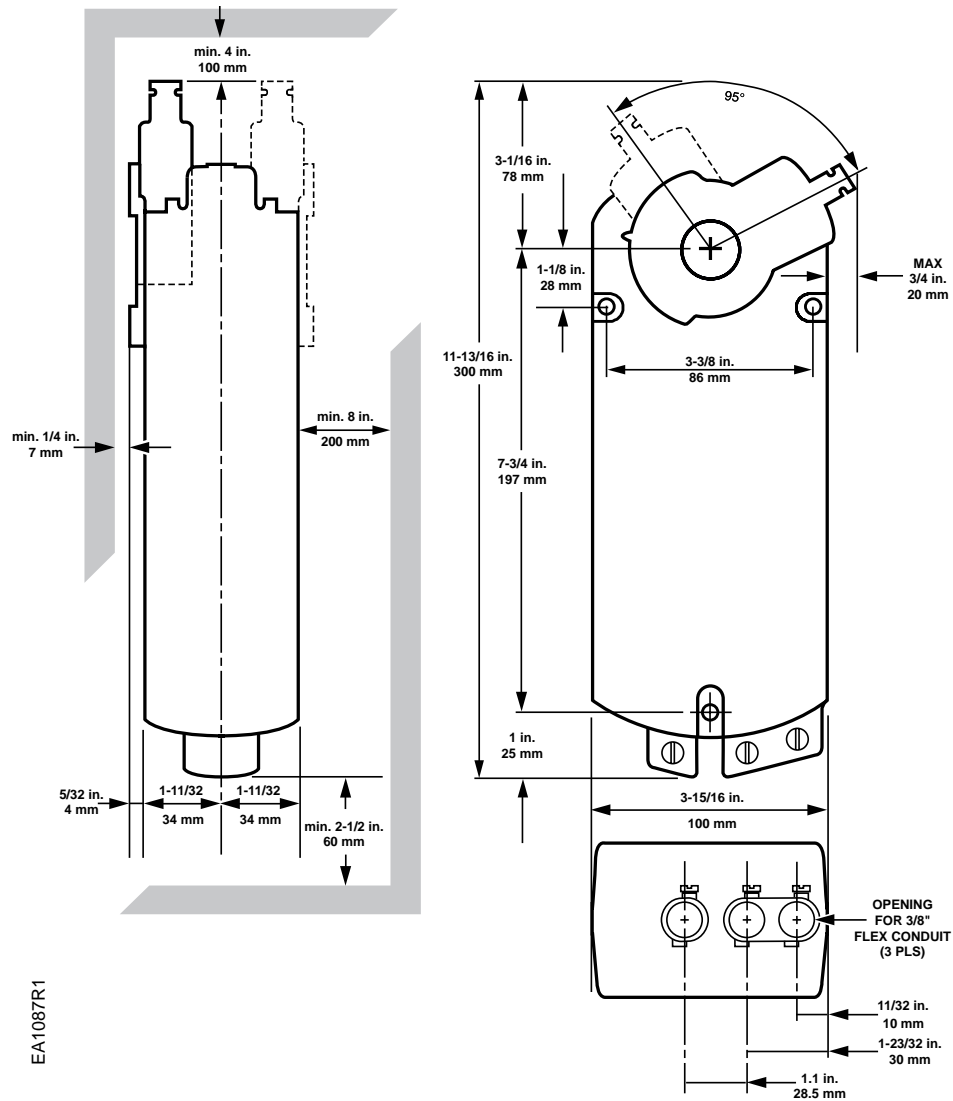
**Ordering Note** Bulk packages contain 8 actuators.



**SIEMENS**

# GCA Series Dimensions

## GCA/GIB/GBB Series OpenAir Damper Actuator



E-13

Damper Actuators

Accessories & Service Kits

E-49

## Rotary, Electronic Damper Actuators Fail Safe and Fail-In-Place

NEW!



**53 lb.-in. Torque**  
 2-position Control  
 Floating Control  
 0-10/2-10 Vdc Modulating Voltage Control  
 (0) 4-20 mA Modulating Current Control



Indoor  
Environmental  
Quality



GNP/GAP Series Spring Return and Non-Spring Return Electronic Damper Actuator.

### Description

Designed for control of critical environments the OpenAir direct-coupled fail safe/fail-in-place electronic actuators are available in modulating, two-position, and floating control of laboratory fume hoods, supply and exhaust units.

### Features

- Fast operation, 2 seconds runtime
- One model performs all control signals:
  - 2-position
  - Floating
  - Modulating (0 (2) to 10 Vdc and 4 (0) to 20 mA)
- 24 Vac/dc compatible
- Selectable fail-safe position (fail open or closed)
- Feedback standard on all models
- Highly accurate positioning
- Self centering
- Unique self-centering shaft coupling
- Assembled in the U.S.A.
- Plenum rated
- UL and cUL listed, CE certified
- Manual Override
- Precabled

### Options

- Available with dual, independently adjustable auxiliary switches

### Applications

Used in laboratory fume hoods, constant or variable air volume installations for the control of supply and exhaust air terminals; 53 lb-in (6 Nm) torque.

Models designed for applications that require the damper to return to a fail-safe position when there is a power failure; or models for fail-in-place.

E-15

Damper Actuators

## GNP/GAP Series Specifications

**Operating Voltage (1-2)** .....24 Vac/dc ±20%

**Frequency** .....50 to 60 Hz

**Power Consumption**

GNP19x

Running .....20 VA/13W

Holding .....8 VA/5W

GAP19x

Running .....28 VA/19W

Holding .....8 VA/5W

**Control Signal Y/Y1 (Wires 8-2)**

Modulating Input Signal

Voltage Input Signal .....0 to 10 Vdc (Max. 35 Vdc)  
or 2 to 10 Vdc (Max. 35 Vdc)

Input Resistance.....>100K ohms

Floating Input Signal .....0 or 24 Vac/dc Clockwise

**Control Signal Y2 (Wires 7-2)**

Floating Input Signal.....0 or 24 Vac/dc Clockwise

**Position Output Signal (Wires 9-2)**

Voltage-Output .....0 to 10 Vdc

Maximum Output Current DC.....± 1mA

**Equipment Rating**.....Class 2, in Accordance with  
UL/CSA Class III per EN 60730

**Dual Auxiliary Switches**

Contact Loading .....6 A resistive, 2A inductive

Voltage (No Mixed Operation 24 Vac/230 Vac) .....24 to 250 Vac

Switch Range .....5° to 90°

Step Increments .....5°

**Feedback Signal (Wires 9-2)**

Position Output Signal.....0 to 10 Vdc

Maximum Output Current.....DC ± 1mA

**Torque**

Running Torque.....53 lb-in (6 Nm)

Maximum Torque.....142 lb-in (16 Nm)

**Runtime for 90° Operating with Motor**.....< 2 seconds

Spring return on power loss (for GNP19x only).....2 seconds

**Nominal Angle Of Rotation**.....90°

**Maximum Angular Rotation**.....95°

**Temperature**

Operation.....-0°F to 122°F (-18°C to 50°C)

Storage and Transport.....-26°F to 158°F (-32°C to 70°C)

**Humidity** .....95% RH, Non-condensing

**Shaft Size** .....1/4 to 3/4-inch (6.4 to 20.5 mm) dia. ●  
1/4 to 1/2-inch (6.4 to 13 mm) square ■

**Minimum Shaft Length**.....3/4-inch (20 mm)

**Housing Enclosure**.....NEMA 1 IP54 according to EN 60 529\*

**Material**.....Die-cast Aluminum Alloy

**Cable Length**.....3 Ft. (0.9 m)

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

**Dimensions** .....8-3/8" H x 3-1/4" W x 2-3/8" D  
212 mm H x 83 mm W x 60 mm D)

**Shipping Weight** .....3 lbs 6 oz

\*Limited positions; refer to OpenAir™ GNP/GAP Series Installation Instructions, 129-541.

E-16

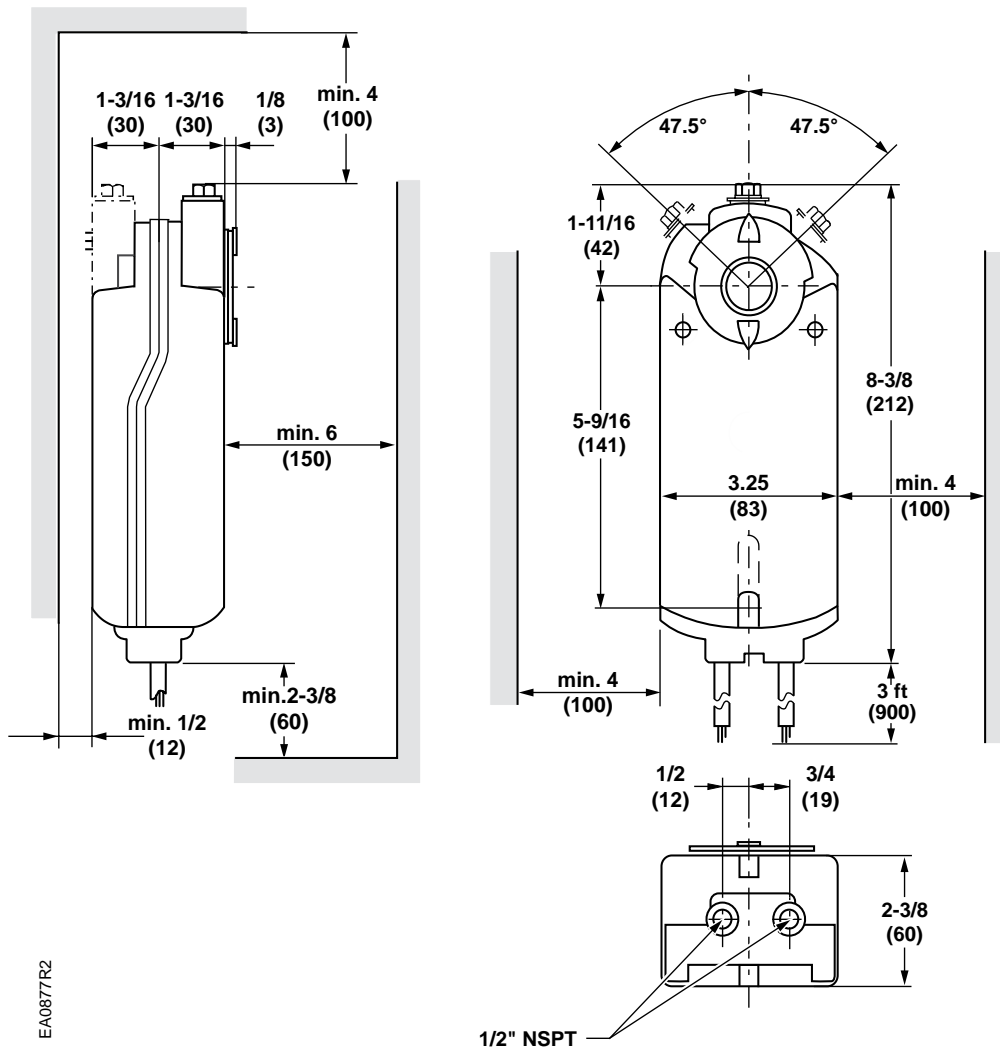
Damper Actuators

## GNP/GAP Series Product Ordering

Input Signal	Standard Model w/Plenum Cable	Dual Adjustable Auxiliary Switches
<b>Fail Safe</b> 2P, Floating, 0-10 Vdc, 2-10 Vdc, 4-20 mA	<b>GNP191.1P</b>	<b>GNP196.1P</b>
<b>Fail-in-place</b> 2P, Floating, 0-10 Vdc, 2-10 Vdc, 4-20 mA	<b>GAP191.1P</b>	<b>GAP196.1P</b>

# GNP/GAP Series Dimensions

## GNP/GAP Series Rotary, Electronic Damper Actuators



E-17

Damper Actuators



## Electronic Damper Actuator Non-spring Return

### Easily Replaces:

- Belimo LM Series



### 44 lb.-in. Torque

24 Vac, Floating Control  
0 to 10 Vdc, Modulating Control



GDE Series Non-spring Return  
Electronic Damper Actuator.

### Description

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

### Features

- Compact design
- Easy-to-see position indicator
- 0 to 10 V or floating 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
- Modulating actuators contain built-in feedback

### Options

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

### 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-19

Damper Actuators

# GDE Series Specifications

**Operating Voltage** .....24 Vac

**Frequency** .....50/60 Hz

**Power Consumption** .....2 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-20

Damper Actuators

## GDE Series Product Ordering

Input Signal	Part No.					Pre-Cabled	No Cables
	Standard	With Potentiometer	Slope/Offset Adjustable	Dual Aux. Switches & Slope/Offset Adjustable	Dual Aux. Switches Only		
0 to 10 Vdc	GDE161.1P	—	GDE163.1P	GDE164.1P	GDE166.1P	Plenum	—
	GDE161.1P/B (24 pk)	—	—	—	—	6 ft Plenum	—
	GDE161.1Q	—	—	—	—	—	Post Header AMP
	GDE161.1N	—	—	—	—	—	Terminal Strip
	GDE161.1N/B (24 pk)	—	—	—	—	—	—
	GDE161.1T	—	—	—	—	—	—
Floating	GDE161.1T/B (24 pk)	—	—	—	—	—	—
	GDE131.1U	—	—	—	—	Standard	—
	GDE131.1U/B (24 pk)	—	—	—	—	—	—
	GDE131.1P	GDE132.1P	—	—	GDE136.1P	Plenum	—
	GDE131.1P/B (24 pk)	—	—	—	—	6 ft Plenum	—
	GDE131.1Q	—	—	—	—	—	Post Header AMP
	GDE131.1Q/B (12 pk)	—	—	—	—	—	Terminal Strip
	GDE131.1N	—	—	—	—	—	—
GDE131.1N/B (24 pk)	—	—	—	—	—	—	
GDE131.1T	—	—	—	—	—	—	
GDE131.1T/B (24 pk)	—	—	—	—	—	—	



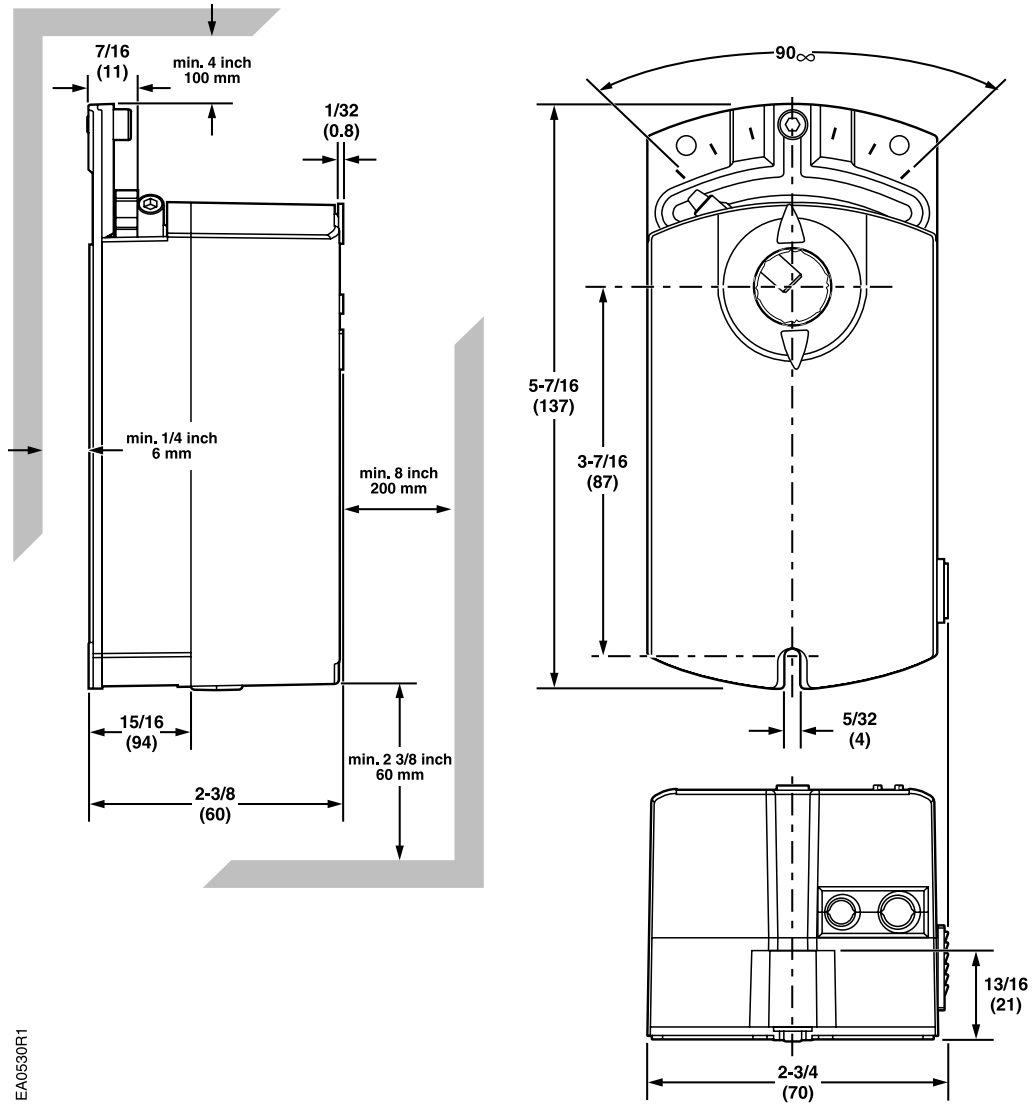
Cables compatible with the GDE131.1N and GDE161.1N sold separately on page E-53.



**SIEMENS**

# GDE Series Dimensions

## GDE/GLB Series OpenAir Electronic Damper Actuator



EA0530R1

Dimensions shown in inches (mm).

## Electronic Damper Actuator Non-spring Return

### Easily Replaces:

- Belimo NM Series



Indoor  
Environmental  
Quality

### 88 lb.-in. Torque

24 Vac, Floating Control  
0 to 10 Vdc, Modulating Control



GLB Series Non-spring Return  
Electronic Damper Actuator.

### Description

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

### Features

- Compact design
- Easy-to-see position indicator
- 0 to 10 V or floating 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
- Modulating actuators contain built-in feedback

### Options

- Independently adjustable dual auxiliary switches
- Adjustable start/span
- Potentiometer on floating control

### 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.

E-23

Damper Actuators



## Electronic Damper Actuator Non-Spring Return

### Easily Replaces:

- Belimo NM Series

### 132 lb.-in. Torque

24 Vac, Floating 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 floating control of building HVAC dampers.

### Features

- Integral 1/2-inch conduit connector
- Unique self-centering shaft coupling
- All metal housing
- Manual override
- DIP switches GEB16x.1x
  - Direction of rotation
  - Adaptation of rotational angle range
  - Selection of 0 to 10 or 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
- Assembled in the U.S.A.

### Options

- Dual independently adjustable auxiliary switches
- Adjustable offset/span
- Floating control models available with feedback potentiometer

### 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-25

Damper Actuators

# GEB Series Specifications

**Power Supply** .....24 Vac

**Operating Voltage** ..... 24 Vac ±20%

**Frequency** .....50/60 Hz

**Runtime for 90°** ..... 125 seconds (60 Hz)  
150 seconds (50 Hz)

**Power Consumption GEB16x.1x**

Running .....5 VA/4W

Holding ..... 1 VA

**Power Consumption GEB13 x.1x**

Running .....3 VA/3W

Holding ..... 1 VA

**Equipment Rating (24 Vac)** .....Class 2 per UL/CSA

**Control Signal**

Input Signal (wires 8-2) .....GEB16x.xx

Voltage Input .....0 to 10 Vdc or 2 to 10 Vdc (max. 35 Vdc)

Input Resistance ..... >100K Ohms

**Feedback Signal** ..... Position output signal (wires 9-2)GEB16x.xx

Voltage Output ..... 0 to 10 Vdc

Max. Output Current ..... ±1 mA

**Control Signal Adjustment**

Offset (Start Point)..... 0 to 5 Vdc

Factory Setting ..... 0 V

Span ..... 2 to 30 Vdc

Factory Setting ..... 30 V

**Dual Auxiliary Switch**

Contact Rating

AC Rating .....24 to 250 Vac  
AC 6A Resistive  
AC 2A General Purpose

DC Rating ..... 12 to 30 Vdc  
DC 2A

Plenum Cable.....4A resistive, 2A, 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°

Recommended Range..... 45 to 90°

Switching Hysteresis ..... 2°

**Position Feedback**

GEB132.1U ..... 0 to 1000 Ohm <10 mA

**Torque**

Running Torque.....132 lb.-in. (16 Nm)

Spring Return Torque .....132 lb.-in. (16 Nm)

Max. Torque.....>265 lb.-in. (30 Nm)

**Nominal Angle of Rotation** ..... 90°, 95° max.

**Shaft Dimensions** ..... 1/4 to 3/4-in. (6 to 20.5 mm) Dia. ●  
1/4 to 1/2-in. (6 to 13 mm) Sq. ■

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

**Temperature**

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

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

**Humidity** .....95% RH, non-condensing

**Pre-cabled Connection** ..... 18 AWG, 3 ft. (0.9 m) long

**Housing**

Enclosure ..... NEMA 1

Material..... Die-cast Aluminum alloy

Gear Lubrication ..... Silicone free

**Agency Certifications** ..... UL60730, (Replaces UL873)  
cUL C22.2 No. 24-93  
CE

**Dimensions** ..... 8.38" H x 3.25" W x 2.67" D  
(212 mm H x 83 mm W x 68 mm D)

**Shipping Weight** ..... 2.2 lbs. (1.0 kg)

E-26

Damper Actuators

Refer to page E-9 for Dimensions.

## GEB Series Product Ordering

Input Signal	Cabling	Part No.			
		Standard	Dual Aux. Switches & Offset/Span Only	Position Feedback Only	Dual Aux. Switches Only
Modulating, 0 to 10 Vdc	Plenum Cable	GEB161.1P	—	—	—
	Standard	GEB161.1U	GEB164.1U	—	—
Floating, 24 Vac	Plenum Cable	GEB131.1P	—	—	—
	Standard	GEB131.1U	—	GEB132.1U	GEB136.1U

Accessories & Service Kits E-49

## Rotary Electronic Damper Actuator Non-spring Return

### Easily Replaces:

- Belimo SM/AM Series



Indoor  
Environmental  
Quality

### 221 lb.-in. Torque

0 to 10 Vdc, Modulating Control  
Floating Control



GBB Series Non-spring Return  
Electronic Damper Actuator.

### Description

Designed for control of building HVAC dampers, the OpenAir GBB Series Direct-coupled 24 Vac Non-spring Return Electronic Damper Actuators are available in 0 to 10 Vdc and floating 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
- Modulating actuators contain built-in feedback

### Options

- Independently adjustable dual auxiliary switches
- Adjustable offset and span
- Potentiometer built in for floating controls

### 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-27

Damper Actuators



## GBB Series Specifications

**Operating Voltage** ..... 24 Vac ± 20%

**Frequency** ..... 50 to 60 Hz

**Power Consumption**

0 to 10 Vdc ..... 8 VA

Floating ..... 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.

Refer to page E-13 for Dimensions.

## GBB Series Product Ordering

Input Signal	Cabling	Part No.				
		Standard	Span/Offset Adjustable	Dual Aux. Switches & Span/Offset Adjustable	Dual Aux. Switches Only	Position Feedback
0 to 10 Vdc	Standard	GBB161.1U	GBB163.1U	GBB164.1U	GBB166.1U	—
	Plenum Cable	GBB161.1P	GBB163.1P	GBB164.1P	GBB166.1P	—
Floating	Standard	GBB131.1U	—	—	GBB136.1U	GBB132.1U
	Plenum Cable	GBB131.1P	—	—	GBB136.1P	GBB132.1P

Accessories & Service Kits

E-49

## Electronic Damper Actuator Non-spring Return

### Easily Replaces:

- Belimo GM Series



Indoor  
Environmental  
Quality

### 310 lb.-in. Torque

0 to 10 Vdc, Modulating Control  
Floating Control



GIB Series Non-spring Return  
Electronic Damper Actuator.

### Description

The OpenAir GIB Series Direct-coupled 24 Vac Non-spring Return Electronic Actuators are designed for modulating and floating 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
- Modulating actuators contain built-in feedback

### Options

- Independently adjustable dual auxiliary switches
- Adjustable offset and span
- Potentiometer built in for floating control

### 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.

# GIB Series Specifications

**Operating Voltage (1–2)** ..... 24 Vac ±20%

**Frequency** ..... 50/60 Hz

**Power Consumption**

0 to 10 Vdc ..... 8 VA

Floating ..... 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.

Refer to page E-13 for Dimensions.

## GIB Series Product Ordering

Input Signal	Cabling	Part No.				
		Standard	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	—
Floating	Standard	GIB131.1U	—	—	GIB136.1U	GIB132.1U
	Plenum Cable	GIB131.1P	—	—	GIB136.1P	GIB132.1P

### Accessories & Service Kits

E-49

## Electronic Damper Actuator

Designed for UL Listed Fire/Smoke and Smoke Control Dampers



N474

### 53 lb.-in. Torque

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

- Manual override
- 24 Vac/dc, 120 Vac and 230 Vac models available
- Reversible fail-safe spring return
- All metal housing
- Pre-cabled Teflon® insulated lead wires
- Fifteen-second operation at rated torque, temperature and voltage
- Assembled in the U.S.A.

### Options

- 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)

### Applications

The GND Series Spring Return Electronic Actuator is used for the control of dampers requiring up to 53 lb-in (6 Nm) 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-31

Damper Actuators

## GND Series Specifications

<b>Operating Voltage</b> .....	24 Vac ±20%
	24 Vdc +20%, -10%
	120 Vac ±10%
	230 Vac ±10%
<b>Frequency</b> .....	50/60 Hz
<b>Power Consumption</b> .....	24 Vac/dc
Running .....	20 VA/12W
Holding .....	8 VA/6W
<b>Power Consumption</b> .....	120 Vac/230 Vac
<b>Running and Holding</b> .....	20 VA/9VA
<b>Torque</b>	
Running Torque .....	53 lb.-in. (6 Nm) (minimum)
Stall Torque (minimum) .....	160 lb.-in. (18 Nm)
Runtime for 90° .....	15 sec. nominal
Closing (on power loss) with Spring Return .....	15 sec. Max.
Nominal Angle of Rotation .....	95°
<b>Life Expectancy</b> .....	Minimum 35,000 full stroke cycles
<b>Mounting</b>	
Damper Shaft Size .....	0.5" (12.7 mm) round
Damper Shaft Length, Minimum .....	1.4" (36 mm)
<b>Housing</b>	
Enclosure .....	NEMA 1
Material .....	Die-cast Aluminum Alloy

<b>Temperature</b>	
Operation .....	0 to 140°F (-18 to +60°C) One time 350°F (177°C)
Storage and Transport .....	-40 to +158°F (-40 to +70°C)
Humidity .....	Max. 95% RH, non-condensing
Teflon Cable .....	400°F (200°C)
<b>Agency Certification</b> .....	UL873 cUL C22.2 No. 24-93 AS/NZS 2064 1/2:1997
	Conforms to CE requirements for the EMC and low voltage directives
	Australian Electromagnetic Compatibility (EMC) per AS/NZS 4251.1/2:1999 (C-tick)
<b>Pre-cabled Connection</b> .....	18 AWG, 3 ft. (0.9 m) 3/8" (0.5mm) flexible conduit connector
<b>Dimensions</b> .....	9" H X 3.25" W X 3" D (229 mm H X 83 mm W X 76 mm D)
<b>Shipping Weight</b> .....	4 lb. (1.8 kg)

\*Refer to the Installation Instructions for acceptable mounting positions.

E-32

Damper Actuators

## GND Series Product Ordering

Description	Cabling	Part No.		
		24 Vac/dc	120 Vac	230 Vac
2-position	Standard	<b>GND121.1U</b>	<b>GND221.1U</b>	<b>GND321.1U</b>
	EFL	<b>GND121.1U/F</b>	<b>GND221.1U/F</b>	<b>GND321.1U/F</b>
2-position with aux. switches	Standard	<b>GND126.1U</b>	<b>GND226.1U</b>	<b>GND326.1U</b>
	EFL	<b>GND126.1U/F</b>	<b>GND226.1U/F</b>	<b>GND326.1U/F</b>

### Ordering Note

- EFL Electronic Fusible Links must be ordered separately (see table below).
- All products are available in bulk packages of 10. Add /B to part number to order a bulk pack.

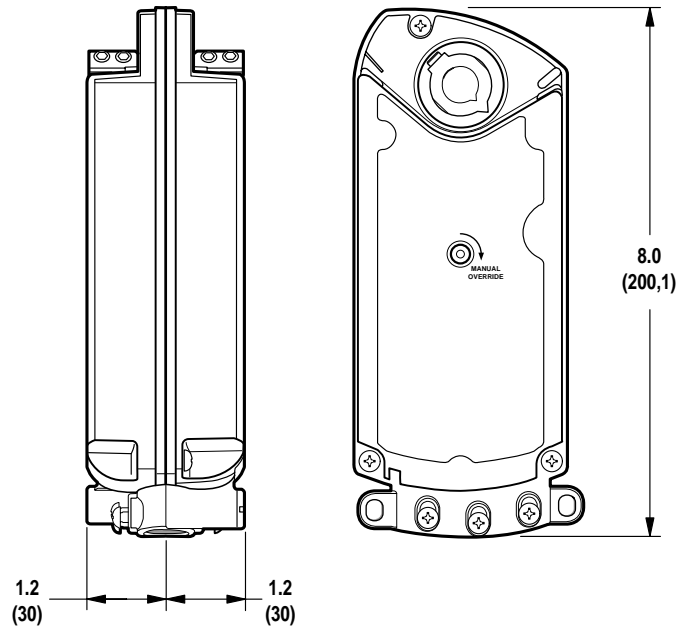


## Electronic Fusible Links

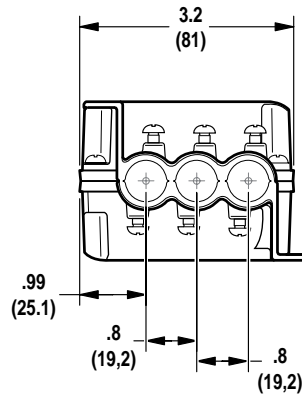
Temperature Range	Part No.
165°F (74°C)	<b>ASK79.165</b>
212°F (100°C)	<b>ASK79.212</b>
250°F (121°C)	<b>ASK79.250</b>
350°F (177°C)	<b>ASK79.350</b>

# GND Series Dimensions

## GND Series OpenAir Damper Actuator



EA1148R1



Dimensions shown in inches (mm).

E-34

## Damper Actuators

### More torque, less energy consumption.

Siemens damper actuators ship ready to install, with built-in time and cost-saving features such as a patented self-centering shaft adapter, standardized wiring, and brushless motor technology.

With torques ranging from 20 to 310 lb.-in., this powerful and flexible line-up delivers out-of-the-box performance and long-lasting reliability for all types of HVAC applications.



**SIEMENS**

## Electronic 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
- Manual override
- 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
- Assembled in the U.S.A

### Options

- Optional built-in Auxiliary Switches: fixed switch points at 5° and 85° rotation

### Applications

The GGD Series Spring Return Actuator is used for the control of dampers requiring up to 142 lb.-in. (16 Nm) 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-35

Damper Actuators



# GGD Series Specifications

**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)

E-36

## GGD Series Product Ordering

Description	Shaft Adapter	Part No.		
		24 Vac	115 Vac	230 Vac
Standard	Self-centering	GGD121.1U	<b>GGD221.1U</b>	GGD321.1U
Standard/Bulk	Self-centering	GGD121.1U/B	GGD221.1U/B	GGD321.1U/B
Auxiliary Switches 5° and 85°	Self-centering	GGD126.1U	GGD226.1U	GGD326.1U
Standard	Oversized	GGD121.3U	GGD221.3U	GGD321.3U

**Ordering Note** Bulk packages contain 8 actuators.



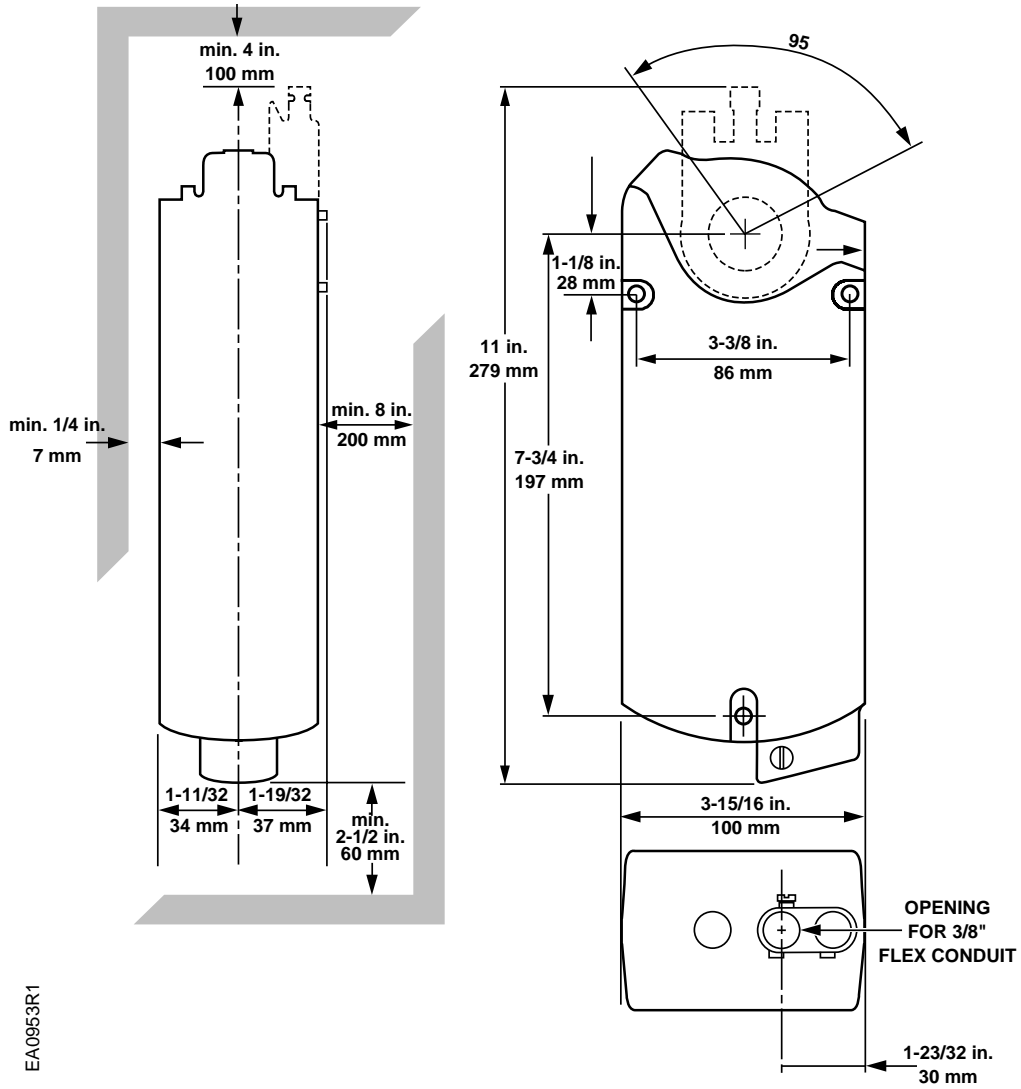
Damper Actuators

**Accessories & Service Kits** E-49



# GGD Series Dimensions

## GGD Series OpenAir Damper Actuator



E-37

Damper Actuators

# OpenAir Part No. Nomenclature

<b>Global Actuator Program</b>		<b>G</b>	<b>B</b>	<b>B</b>	<b>1</b>	<b>6</b>	<b>1</b>	<b>.</b>	<b>1</b>	<b>U</b>
<b>Type</b>	Laboratory Fail In Place 53 Lb-IN	<b>A</b>								
	Non Spring Return 221 Lb-IN	<b>B</b>								
	Spring Return 160 Lb-IN	<b>C</b>								
	Non Spring Return 44 Lb-IN	<b>D</b>								
	Non Spring Return 132 Lb-IN	<b>E</b>								
	Fire And Smoke 142 Lb-IN	<b>G</b>								
	Non Spring Return 310 Lb-IN	<b>I</b>								
	Non Spring Return 88 Lb-IN	<b>L</b>								
	Spring Return 62 Lb-IN	<b>M</b>								
	Fire And Smoke Or Laboratory Fail Safe 53 Lb-IN	<b>N</b>								
	Spring Return 20 Lb-IN	<b>Q</b>								
<b>Running Time</b>	90 Sec. At 50/60 Hz	<b>A</b>								
	150(125) Sec At 50/60 Hz	<b>B</b>								
	15 Sec/30 Sec. At 50/60 Hz	<b>D</b>								
	108(90) Sec. At 50/60 Hz	<b>E</b>								
	2 Sec. At 50/60 Hz	<b>P</b>								
<b>Voltage</b>	24 VAC/DC SR/ 24VAC NSR	<b>1</b>								
	120 Vac	<b>2</b>								
	230 Vac	<b>3</b>								
<b>Functionality</b>	2Pt	<b>2</b>								
	Floating	<b>3</b>								
	Modulating 0-10Vdc/2-10Vdc/Signal Inversion	<b>5</b>								
	Modulating 0-10Vdc	<b>6</b>								
	2Pt, Floating ,0-10Vdc, 2-10Vdc,4-20Ma,And 0-20Ma	<b>9</b>								
<b>Optional Features</b>	Standard Version	<b>1</b>								
	Potentiometer 1KΩ	<b>2</b>								
	Signal Adjustable	<b>3</b>								
	Switches+Signal Adjustable	<b>4</b>								
	Switches	<b>6</b>								
<b>Action</b>	Rotary self-cent. Shaft adapter	<b>1</b>								
	Linear	<b>2</b>								
<b>Cabling</b>	Universal Appliance Cable	<b>U</b>								
	Plenum Cable	<b>P</b>								

E-38

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-39

Damper Actuators

Nominal Spring Rating	Max. Thrust lb. (N)				Gradual Operation	Torque Rating lb.-in (Nm)		
	Full Stroke Forward			Spring Return (No Stroke) 0 psi (0 kPa)		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. 3 Pneumatic Specifications

<b>Effective Diaphragm Area</b> .....	8 in. <sup>2</sup> (51.5 cm <sup>2</sup> )
<b>Stroke</b> .....	2-3/8-in. (60 mm)
<b>Max. Air Pressure</b> .....	30 psi (210 kPa)
<b>Nominal Spring Ranges</b> .....	3 to 7 psi (21 to 50 kPa)
	5 to 10 psi (35 to 69 kPa)
	8 to 13 psi (55 to 90 kPa)

<b>Ambient Temperature Range</b>	
Operating.....	35 to +140°F (2 to 60°C)
Storage.....	-20 to +140°F (-29 to +60°C)

<b>Materials</b>	
Housing (totally enclosed) .....	Aluminum
Stem .....	Plated Steel
Diaphragm .....	Ozone-resistant EPT rubber
Spring .....	Steel
Bearing .....	Delrin

**Air Connection** ..... 1/8" NPT Female with a straight dual barb fitting for 1/4" (6 mm) OD tubing

**Type of Mounting** ..... Front, bracket, pivot, extended shaft

**Shipping Weight (Actuator only)** ..... 1.3 lb. (0.58 kg)

## No. 3 Pneumatic Product Ordering

Description	Mounting Style	Part No.		
		Nominal Spring Range		
		3-7 psi (21-48 kPa)	5-10 psi (35-69 kPa)	8-13 psi (55-90 kPa)
Actuator	Front	331-4310	331-4510	331-4810
Actuator, Bracket	Fixed	331-4313	331-4513	331-4813
Actuator, Bracket, Clevis	Fixed	331-4314	331-4514	331-4814
Actuator, Integral Pivot	Pivot	331-4312	331-4512	331-4812
Actuator, Integral Pivot with pivot post. Mounted on plate for extended shaft with Shaft Clevis and Crank for 3/8" (10 mm), 7/16" (11 mm), 1/2" (13 mm) diameter shaft.	Extended Shaft	331-4311	331-4511	331-4811
Actuator, Integral Pivot with pivot post. Mounted on plate for extended shaft with Clevis and Crank for 3/8" (10 mm), 7/16" (11 mm), 1/2" (13 mm) diameter shaft.	Extended Shaft Kit with Positioning Relay	—	—	332-4811
Actuator, Bracket, ball joint connector	Fixed	331-4331	331-4531	331-4831
Actuator, Bracket, ball joint connector with Positioning Relay	Fixed			332-4831

**If inoperative, replace the entire actuator.**

### Ordering Note

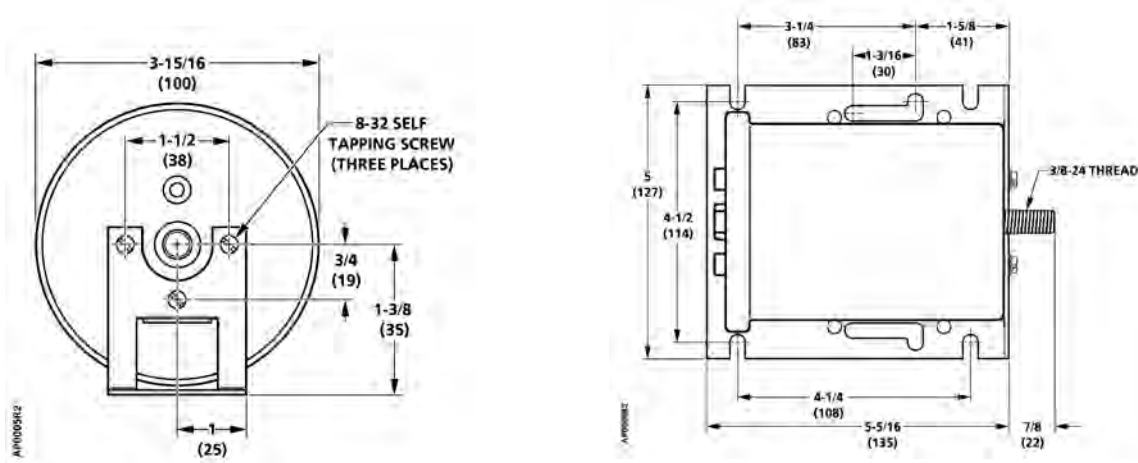
\* When the actuator is ordered with Extended Shaft Mounting, the mounting plate, pivot post and hardware, clevis, damper crank, rocker arm and all screws/nuts are included. Order other frame mounting accessories as required if not supplied by damper manufacturer.



## Accessories & Service Kits

E-49

## No. 3 Pneumatic Dimensions



Dimensions shown in inches (mm).

E-40

Damper Actuators



**SIEMENS**

## 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.

E-41

Damper Actuators

Nominal Spring Rating	Max. 121 Thrust lb. (N)				Torque Rating lb.-in (Nm)			
	Full Stroke Forward			Spring Return (No Stroke) 0 psi (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)	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. 4 Pneumatic Specifications

Effective Diaphragm Area .....	11 in. <sup>2</sup> (71 cm <sup>2</sup> )
Stroke .....	4-in. (102 mm)
Stroke (hesitation models) .....	3-in. (76 mm)
Max. Air Pressure .....	30 psi (207 kPa)
Nominal Spring Ranges .....	3 to 7 psi (21 to 48 kPa) 3 to 13 psi (21 to 90 kPa) 5 to 10 psi (35 to 69 kPa) 8 to 13 psi (55 to 90 kPa)
Nominal Spring Range (hesitation model) .....	2 to 3, 8 to 13 psi (14 to 21, 55 to 90 kPa)
Temperature Range	
Operating.....	35 to 140°F (2 to 60°C)
Storage.....	-20 to +140°F (-29 to +60°C)

<b>Materials</b>	
Housing (totally enclosed) .....	Steel, electro-coated epoxy
Shaft .....	Stainless Steel
Diaphragm .....	EDPM Rubber
Spring .....	Steel
Bearing .....	Delrin
<b>Air Connection</b> .....	1/8" NPT Female with a dual barb elbow fitting for 1/4" (6 mm) OD tubing
<b>Type of Mounting</b> .....	Front, bracket, pivot; universal (extended shaft or frame mount)
<b>Shipping Weight (Actuator only)</b> .....	3.66 lb. (1.66 kg)

## No. 4 Pneumatic Product Ordering

Description	Mounting Style	Part No.				
		Nominal Spring Range				
		3-7 psi (21-90 kPa)	3-13 psi (21-90 kPa)	5-10 psi (35-69 kPa)	8-13 psi (55-90 kPa)	2-3, 8-13 psi (14-21, 55-90 kPa) Hesitation Model
Actuator, Mounting Screws (Non-pivot)	Front	331-2910	—	331-2917	331-2963	—
Actuator, Bracket (Non-pivot) 3" stroke for unit ventilator	Fixed	331-2911	—	331-2934	331-2966	331-2927
Actuator, bracket (Non-pivot) 2-3/8" stroke for unit ventilator	Fixed	—	—	—	—	331-2974
Actuator, Mounting Plate, Ball Joint Conn.	Fixed	331-3015	331-3018	331-3016	331-3017	331-3019
Actuator, Mounting Plate, Ball Joint Conn. with Relay	Fixed	—	—	—	332-3017	—
Actuator, Integral Pivot	Pivot	331-2904*	331-2905*	331-2906*	331-2961*	331-2909*
Actuator, Integral Pivot, Clevis and Clevis Pin for use with frame mounting accessory	Pivot	331-2929	331-2930	331-2931	331-2968	—
Actuator, Integral Pivot with pivot post. Mounted on plate for extended shaft with Clevis and Crank for 3/8" (9.5 mm), 7/16" (11 mm), 1/2" (13 mm) diameter shaft. Parts for frame mounting (blade drive) included with kit.	Universal Kit	331-3000	331-3001	331-3002	331-2973*	331-3004
Actuator, Integral Pivot with pivot post and Positioning Relay. Mounted on plate for extended shaft with Clevis and Crank for 3/8" (10 mm), 7/16" (11 mm), 1/2" (13 mm) diameter shaft. Parts for frame mounting (blade drive) included with kit.	Universal Kit with Positioning Relay	—	—	—	332-2973	—

### Ordering Note

(1.) When the actuator is ordered with universal mounting, mounting plate, pivot post and hardware, clevis, damper crank, rocker arm, and all screws/nuts are included. Order other frame mounting accessories as required if not supplied by manufacturer. (2.) \*UL Component Recognized for Fire/Smoke Applications. (3.) Siemens No. 4 Pneumatic Damper Actuator contains a diaphragm with EDPM rubber.



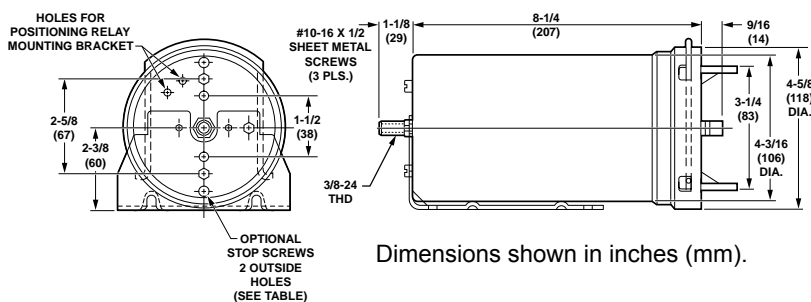
E-42

Damper Actuators

## Accessories & Service Kits

E-49

## No. 4 Pneumatic Dimensions



Dimensions shown in inches (mm).



**SIEMENS**

## 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-43

Damper Actuators

Nominal Spring Rating	Max. Thrust lb. (N)				Spring Return (No Stroke) 0 psi (0 kPa)	Gradual Operation	Torque Rating lb.-in (Nm)		
	Full Stroke Forward			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 Specifications

Effective Diaphragm Area .....	17.9 in. <sup>2</sup> (115 cm <sup>2</sup> )
Stroke .....	4-in. (102 mm)
Max. Air Pressure .....	30 psi (207 kPa)
Nominal Spring Ranges .....	3 to 8 psi (21 to 55 kPa) 3 to 13 psi (21 to 90 kPa) 8 to 13 psi (55 to 90 kPa)
Temperature Range	
Operating.....	-20 to +200°F (-29 to +93°C)
Storage.....	-20 to +200°F (-29 to +93°C)

<b>Materials</b>	
Housing .....	Aluminum
Stem .....	Type 416 Stainless Steel
Diaphragm .....	Silicone Rubber
Spring .....	Steel
Bearing .....	Bronze Oilite
<b>Air Connection</b> .....	1/8" NPT Female
<b>Type of Mounting</b> .....	Pivot; Universal (extended shaft or frame mount)
<b>Shipping Weight (Actuator only)</b> .....	9.0 lb. (4.08 kg)

## No. 6 Pneumatic Product Ordering

Description	Mounting Style	Part No.		
		Nominal Spring Range		
		3-8 psi (21-55 kPa)	3-13 psi (21-90 kPa)	8-13 psi (55-90 kPa)
Actuator, Integral Pivot	Pivot	331-2793	331-2794	331-3060
Actuator, Integral Pivot and Forward Travel Stops	Pivot	—	—	331-2988
Actuator with Clevis	Pivot <sup>1</sup>	331-2857	331-2858	331-2856
Actuator with Clevis and Positioning Relay	Pivot <sup>1</sup>	—	—	332-2856
Actuator, Integral Pivot with pivot post. Mounted on plate for extended shaft mounting with Clevis and Crank for 3/8" (10 mm), 7/16" (11 mm) or 1/2" (13 mm) diameter shaft.	Extended Shaft	331-3012	331-3013	331-3011*
Actuator, Integral Pivot with pivot post. Mounted on plate for extended shaft mounting with Clevis and Crank for 3/8" (10 mm), 7/16" (11 mm) or 1/2" (13 mm) diameter shaft.	Extended Shaft Kit with Positioning Relay	—	—	332-3011
Actuator, Extended Temperature Range Model	Pivot	—	—	331-3060*

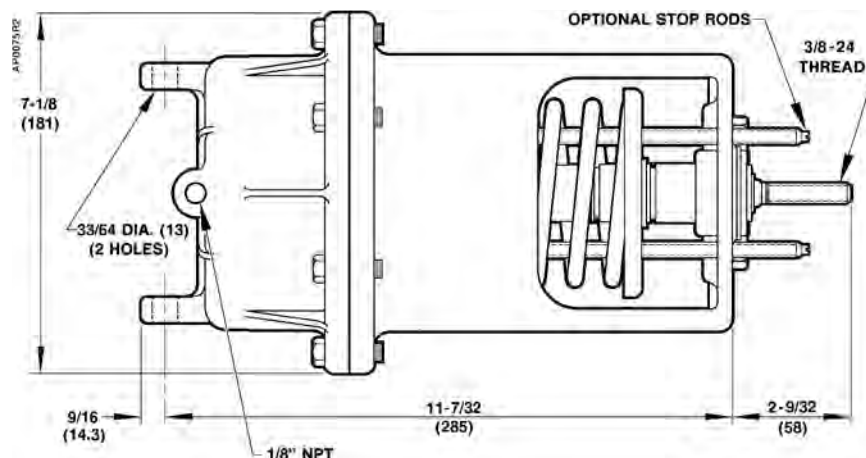
### Ordering Notes

- Also order frame mounting kit accessories.
- When the actuator is ordered with universal mounting, mounting plate, pivot post and hardware, clevis, damper crank, rocker arm and all screws/nuts are included. Order other frame mounting accessories as required if not supplied by damper manufacturer.
- \* UL component recognized.
- Siemens No. 6 Pneumatic Damper Actuator contains a diaphragm with silicone rubber. For HVAC applications where products containing silicone are unacceptable, contact your Siemens representative for damper actuators with a silicone-free diaphragm.

## Accessories & Service Kits

E-49

## No. 6 Pneumatic Dimensions



Dimensions shown in inches (mm).

## 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 Versus Rotation

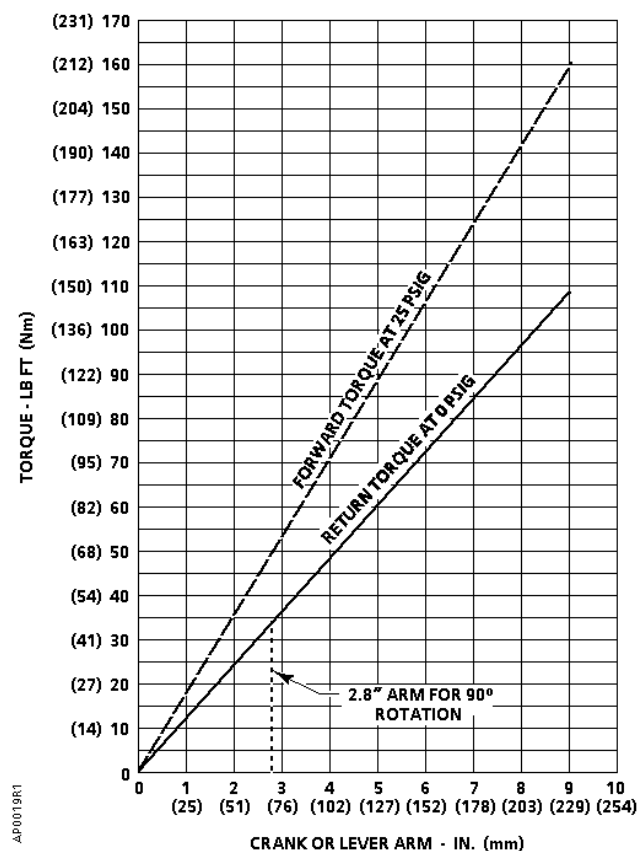
If the damper rotation is other than 90°, use the Arm Length vs. Rotation Chart and the Thrust and Torque Ratings to determine the actuator assembly torque rating. Then divide the actuator assembly torque rating by the damper torque rating per unit of area for job conditions to determine the damper area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

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°

### 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



## No. 6 Tandem Mounting Specifications

Effective Diaphragm Area .....	35.8 in. <sup>2</sup> (230 cm <sup>2</sup> )
Stroke .....	4-in. (102 mm)
Max. Air Pressure .....	30 psi (207 kPa)
Spring Start Point (Adjustable) .....	3 to 10 psi (21 to 69 kPa)
Spring Span (Adjustable) .....	3 to 12 psi (21 to 83 kPa)
<b>Spring Range</b>	
Factory Setting .....	8 to 13 psi (55 to 90 kPa)
<b>Temperature Range</b>	
Operating .....	-20 to +200°F (-29 to +93°C)
Storage .....	-20 to +200°F (-29 to +93°C)

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

## No. 6 Tandem Mounting Product Ordering

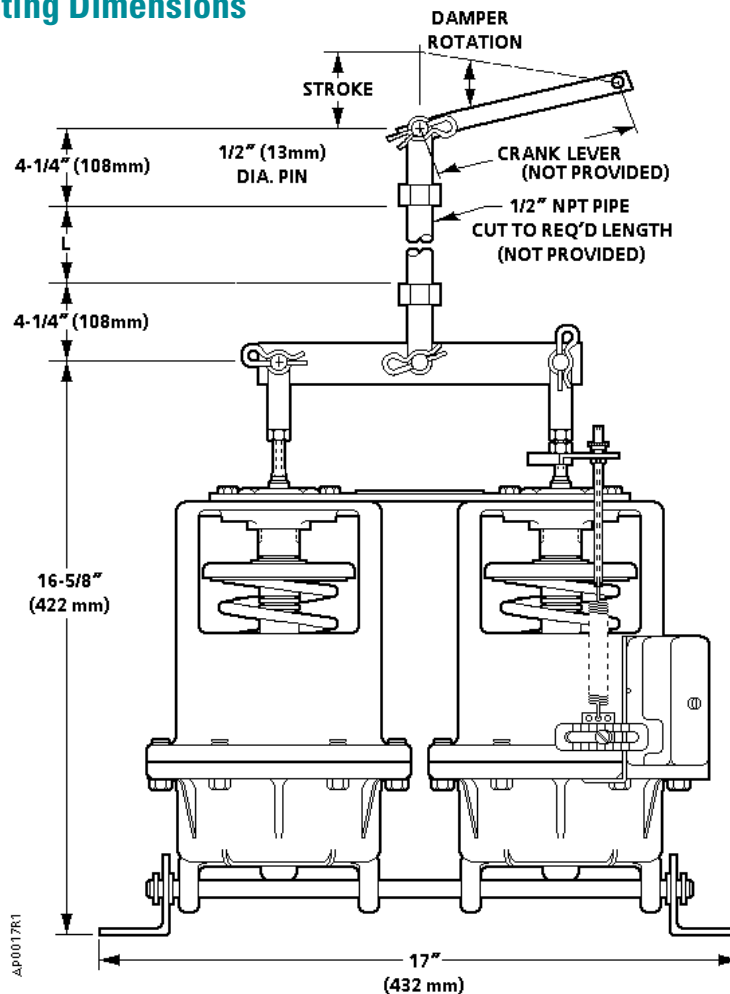
Description	Part No.
Damper Actuator with Tandem Mounting	331-3070

### Accessories & Service Kits

E-49

E-46

## No. 6 Tandem Mounting Dimensions



Dimensions shown in inches (mm).

Damper Actuators

## 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

- Maximum 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.

E-47

Damper Actuators

## Large Capacity Pneumatic Actuator Specifications

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.<sup>2</sup> (126 cm<sup>2</sup>)  
 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 psi (172 kPa) air supply ..... 130 lb.-ft. (176 Nm)  
 Spring Start Point (adjustable) ..... 3 to 10 psi (21 to 69 kPa)  
 Mounting ..... Pivot  
 Air Connection ..... 1/8" NPT  
 Shipping Weight ..... 35.0 lb. (16.0 kg)

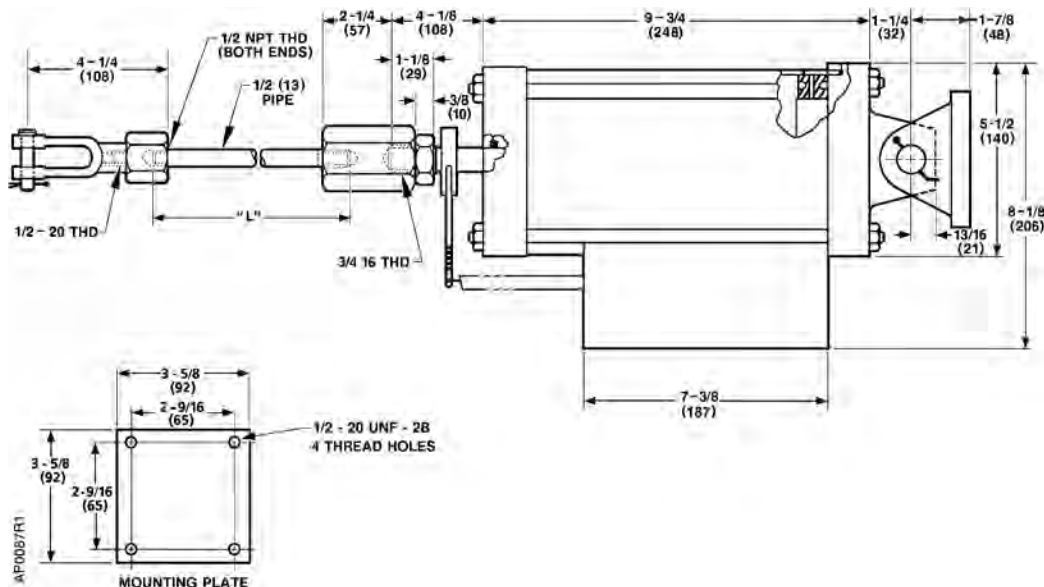
## Large Capacity Pneumatic Actuator Product Ordering

Description	Part No.
Large Capacity Pneumatic Actuator	331-2882

### Accessories & Service Kits

E-49

## Dimensions



Dimensions shown in inches (mm).

E-48

Damper Actuators

## Table of Contents

PRODUCT	PAGE #
<b>OpenAir Electric Damper Actuators</b>	
Tools	E-50
Damper Shaft Cranks	E-50
Mounting Hardware	E-51
Damper Push Rods	E-51
Anti-rotation Brackets	E-52
Shaft Adapters	E-52
Position Indicators	E-52
Conduit Adapters	E-53
Weathershields/Heaters	E-53
Aux. Switch Kits	E-53
Restrictor Kit	E-53
Cable	E-53
<b>Pneumatic Nos. 3, 4 &amp; 6 Damper Actuators</b>	
Damper Shaft Cranks	E-54
Linkage Kits	E-54
Mounting Hardware	E-55
Shaft Extensions/Adapters	E-56
Positioning Relays/Kits	E-57
Flange Bearing	E-58
Pivot Posts	E-58
Forward Stroke Stop Kits	E-58
Replacement Diaphragms	E-58
Service Kits	E-58



Refer to Valve Accessories & Service Kits, D-222, for Rack & Pinion Linkage.

## Accessories & Service Kits

	Description	Series			Quantity	Part No.
		GDE GLB	GEB GMA	GCA GIB GGB		
<b>OpenAir</b>						
	<b>Actuator Commissioning Tool.</b> A portable instrument for exercising, calibrating, and testing resistive, proportional (voltage/current), incremental (floating), and On/Off actuators.	•	•	•	1	985-047
	<b>Adjustment Tool.</b>		•		1	985-098P10
	<b>Hex Key.</b>	•			Pkg. of 24	985-054P24
	<b>Crank Arm Kit.</b> Allows a direct-coupled actuator to provide an auxiliary linear drive; can be used to simultaneously drive a set of opposing or adjacent dampers with a single actuator		•	•	1 1	ASK71.13 ASK71.3
	<b>Crank Arm Kit with Bracket.</b> For use in applications where the actuator can be rigidly surface-mounted and a linear stroke output is required.		•	•	1 1	ASK71.14 ASK71.4
	<b>Rotary to Linear Kit.</b>	•			1	ASK71.5
	<b>Rotary to Linear Kit with Universal Mounting Bracket.</b>	•			1	ASK71.6
	<b>Universal Crank Arm.</b> For linear applications requiring connection to damper shaft when ball joint connection is not possible. • Shaft sizes 3/8 to 1".	•	•	•	1	ASK71.9






E-50

Damper Actuators














**SIEMENS**

## Accessories & Service Kits

	Description	Series			Quantity	Part No.
		GDE GLB	GEB GMA	GCA GIB GBB		
<b>OpenAir</b>						
	<b>Tandem Mount Bracket.</b> Provides an extended anti-rotation pin which allows dual mounting of 2-position, floating and GCA15 actuators, and all GIB actuators.			•	1	ASK73.1
	<b>Tandem Mount Bracket.</b> For dual mounting of modulating (0 to 10 V) GCA16X actuators.			•	1	ASK73.2U
	<b>Floor Mount Kit.</b> For airstream applications and where a foot-mounted actuator can be used. Ideal replacement of a Honeywell MOD motor. Includes crank arm, Teflon support-bearing ring, and mounting fasteners.			•	1	ASK71.1U
	<b>Frame Mount Kit.</b> For direct mounting to damper frame. Includes a crank arm to generate a linear stroke, a Teflon support-bearing ring to minimize side-loading on the actuator's output bearing, and other mounting fasteners.			•	1	ASK71.2U
	<b>Combined Foot/Frame Mount Kit.</b>		•		1	ASK71.11
	<b>Damper Push Rods.</b> 5/16" (8 mm) dia.	•	•	•		
	• 12" (30 cm) Length				1	338-041
	• 15" (38 cm) Length				1	338-042
	• 18" (46 cm) Length				1	338-043
	• 24" (61 cm) Length				1	338-044
	• 36" (91 cm) Length				1	338-045
	• 48" (122 cm) Length				1	338-046



## Accessories & Service Kits

	Description	Series			Quantity	Part No.
		GDE GLB	GEB GMA	GCA GIB GBB		
<b>OpenAir</b>						
	<b>Anti-rotation Bracket.</b>	•			Pkg. of 24	985-055P24
	• Mounting Screws	•			Pkg. of 48	985-053P48
	<b>Anti-rotation Bracket.</b>			•	1	985-006
	<b>Anti-rotation Bracket.</b>		•			985-092
	<b>Standard Shaft Adapter.</b> Replacement for a standard self-centering shaft adapter.			•	1	985-004
	• up to a 1" (25 mm) D • up to 3/4" (20 mm) D		•		1	985-093
	<b>Over-sized Shaft Adapter.</b> Accepts up to 1.05" (27 mm) diameter shaft and can be used for jackshafts that are slightly oversized. <i>Note: When used with a GIB, accepts shaft diameters from 3/4 to 1-1/20" (19 to 27 mm).</i>			•	1	ASK74.1U
	<b>Replacement Shaft Adapter Clip.</b>		•	•	Pkg. of 20 Pkg. of 20	985-242P20 985-241P20
	<b>5/8 to 3/4" (10 mm to 19 mm) Actuator Shaft Insert.</b> For use with GIB and Over-sized Shaft Adapter, ASK74.1U.			•	Pkg. of 20	985-052P20
	<b>3/8" (8 to 10 mm) Actuator Shaft Insert.</b>	•			Pkg. of 10	ASK78.3U
	<b>1/2" (13 mm) Shaft Guide.</b> Note: This part is factory-installed with all GDE/GLB damper actuators.	•			Pkg. of 25	985-101P25
	<b>Standard Position Indicators.</b>	•	•	•	Pkg. of 10 Pkg. of 10 Pkg. of 10	985-051P10 985-094P10 985-003
	<b>1/2" (13 mm) Conduit Adapters.</b>	•			1	ASK76.1U
		•			Pkg. of 20	ASK76.1UP20
	<b>1/2" (13 mm) Conduit Adapters.</b>			•	Pkg. of 20	985-008P20
	<b>1/2" (13 mm) Conduit Adapter—Male.</b>			•	Pkg. of 25	985-035P25








E-52

Damper Actuators









**SIEMENS**

## Accessories & Service Kits

	Description	Series			Quantity	Part No.
		GDE GLB	GEB GMA	GCA GIB GBB		
<b>OpenAir</b>						
	<b>NEMA 3R Rated Weathershield.</b> Includes cover, base plate with factory-installed gasketing, 15TEK self-drilling screws, and anti-rotation (mounting) bracket. Knockouts for connection of 1/2" conduit also included; NEMA 3R rated.		•	•	1 1	<b>ASK75.3U</b> <b>ASK75.1U</b>
	<b>NEMA 3R Rated Heater and Weathershield.</b> Includes weathershield listed above and heater assembly for operation in temps as low as -58°F; NEMA 3R rated.		•	•	1 1	<b>985-107</b> <b>985-106</b>
	<b>Heater Assembly.</b> Includes replacement heater assembly.		•	•	1 1	<b>985-108</b> <b>985-105</b>
	<b>External Auxiliary Switch Kit.</b> Includes dual switch package rated to 250 Vac, mounting screws and adapter rings. Mounts to the actuator, not damper shaft.		•	•	1	<b>ASC77.2U</b>
	<b>500 Ohm Restrictor Kit.</b> Converts 4-20 mA signal to 2 to 10 Vdc	•	•	•	1	<b>985-124</b>
 	<b>Floating Input Cable, 3 ft.</b> For use with GDE131.1N only	•			Pkg. of 12	<b>985-131</b>
	<b>0 to 10 Vdc Input Cable, 3 ft.</b> For use with GDE161.1N only	•			Pkg. of 12	<b>985-133</b>
	<b>Daisy Chain Cable, 12 ft.</b> For use with GDE131.1N and GDE161.1N only	•			Pkg. of 12	<b>985-134</b>
	<b>Daisy Chain Cable, 25 ft.</b> For use with GDE131.1N and GDE161.1N only	•			Pkg. of 12	<b>985-135</b>

## Accessories & Service Kits





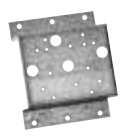

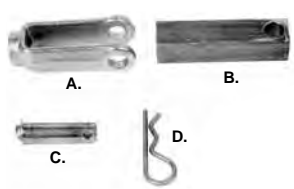


	Description	Pneumatic			Quantity	Part No.
		No. 3	No. 4	No. 6		
<b>Pneumatic Nos. 3, 4 &amp; 6</b>						
	<b>Damper Shaft Crank.</b> Adjustable radius, 3/4" (19 mm) to 4-5/8" (117 mm), for 3/8" (10 mm) diameter dampershaft.	•			1	331-805
	<b>Damper Shaft Crank.</b> Selectable radius, 45°, 60°, and 90° angular rotation, for 3/8" (10 mm) to 1/2" (13 mm) diameter damper shaft.	•	•		1	331-941
	• 1/2"				1	333-182
	• 5/8"				1	333-183
	• 3/4"				1	333-181
	<b>Cast Iron Crank and Set Screws.</b> For 1/2" (6 mm) OD shaft.			•	1	333-078
	<b>Linkage Kit.</b> 4" (102 mm) link and crank.	•	•	•	1	331-958
	<b>Linkage Kit.</b> 4" (102 mm) rod, ball joint and crank.	•	•	•	1	331-947
	<b>No. 3 Pivot Post Kit.</b>	•			1	331-657

E-54







Damper Actuators

E-3

## Accessories & Service Kits

	Description	Pneumatic			Quantity	Part No.
		No. 3	No. 4	No. 6		
<b>Pneumatic Nos. 3, 4 &amp; 6</b>						
	<b>Linkage Kit.</b>		•		1	331-671
	<b>No. 3 Pivot Post Kit.</b> For extended shaft mounting plate.	•			1	331-006
	• E-ring				2	
	• Lockwasher				2	
	• Nut				2	
	<b>Frame Mounting Lug Kit.</b>	•	•	•	1	331-004
	• Screw				2	
	• Nut				2	
	<b>Extended Shaft Mounting Plate.</b> May also require pivot post, clevis, crank and miscellaneous mounting hardware. 3" (76 mm) W x 10-1/2" (267 mm) L.	•			1	331-033
	<b>Offset Mounting Bracket.</b> For mounting the universal mounting lug, pivot post, clevis, crank, and miscellaneous mounting hardware.	•	•		1	333-176
	<b>Frame Mounting Lug Kit.</b> For use with Universal Mounting plate (field or manufacturer welded onto damper frame).		•	•	1	331-005
	• Screws				3	
	<b>Clevis.</b> For frame mounting	•	•	•		
	• Forging Clevis (A)				1	331-653
	• Brass Clevis (B)				1	333-207
	• Clevis Pin (C)				1	331-293
	• Hitch Pin (D)				1	331-807
	<b>Universal Mounting Plate.</b> May also require frame mounting lug, pivot post, clevis, crank and miscellaneous mounting hardware.					
	• 3/4" (20 mm)		•	•	1	331-623
	• 1" (25 mm)		•	•	1	331-623A
	<b>Actuator Mounting Bracket.</b>	•	•		1	331-916

## Accessories & Service Kits










	Description	Pneumatic			Quantity	Part No.
		No. 3	No. 4	No. 6		
<b>Pneumatic Nos. 3, 4 &amp; 6</b>						
	<b>Pivot Mounting Kit.</b> Pivot mounting bracket and screws included (3).	•			1	333-148
	<b>Right Angle Mounting Plate.</b> For mounting actuator to floor. <i>Order separately.</i>		•	•	1	333-208
	<b>Remote Mounting Kit.</b> For use with actuator/clevis assembly. Allows connection to damper shaft when damper shaft and actuator pivot post are mounted on different planes. Field fabricated 3/8" (10 mm) diameter push rod not included. Cut to length as needed.		•	•	1	331-618
	<b>Actuator Shaft Extension Kit.</b> Includes push rod, 1/4"-28 ball joint connector, coupling and screws.	•	•		1	331-674
	<b>Actuator Shaft Extension Kit.</b> Includes shaft/clevis adapter (2 required), clevis adapter rod and nuts.  Field-assembled actuator shaft extension kit with field fabricated 1/2" NPT threaded pipe (not provided).  Threaded female adapters are 1/2"-14 NPT and 3/8"-24 UNS threads.		•	•	1	333-030
	<b>Long Actuator Shaft Extension Rod.</b> 10-1/8" (257 mm)		•	•	1	331-434A

E-56

Damper Actuators

E-3



## Accessories & Service Kits

	Description	Pneumatic			Quantity	Part No.
		No. 3	No. 4	No. 6		
<b>Pneumatic Nos. 3, 4 &amp; 6</b>						
	<b>Damper Shaft Extension.</b> 1/2" (13 mm) diameter damper shaft extension rod. Rod is 2-1/4" (57 mm) long.	•	•	•	1	<b>331-631</b> 
	<b>Damper Shaft Extension.</b> 1/2" (13 mm) diameter damper shaft extension rod. Rod is 9" (229 mm) long.	•	•	•	1	<b>333-043-03</b>
	<b>Adapter.</b> For 3/8" (10 mm) diameter damper shafts. Use with 333-042, Shaft Extension.	•	•	•	1	<b>331-632</b>
	<b>Long Shaft Extension.</b> For a 1/2" (13 mm) hollow damper shaft.		•		1	<b>333-184</b>
	<b>Shaft Extension.</b> 1" (25 mm) diameter shaft extension 11-5/8" (295 mm) long for Ruskin dampers. Includes 1" (25 mm) diameter crank and 2 roll pins for assembly.		•	•	1	<b>333-194</b>
	<b>Positioning Relay.</b>	•	•	•	1	<b>147-2000</b>
	<b>Positioning Relay Actuator Mounting Kit.</b> Can also be factory-assembled to extended shaft mounted actuators. If using cast iron crank, it must be replaced with a <b>331-941</b> crank. (mfg. after 1/93)	•			1	<b>147-104</b>
	<b>Positioning Relay Mounting Kit.</b>		•		1	<b>147-314</b>

E-57

Damper Actuators

## Accessories & Service Kits

	Description	Pneumatic			Quantity	Part No.
		No. 3	No. 4	No. 6		
<b>Pneumatic Nos. 3, 4 &amp; 6</b>						
	<b>Positioning Relay Mounting Kit.</b>			•	1	147-276
	<b>Flange Bearing.</b> 1/2" (13 mm) damper shaft bearing for universal mounting plate, 331-623		•	•	1	331-862
	<b>Steel Pivot Post.</b> For service replacement only (short length).		•	•	1	331-547
	<b>Steel Pivot Post.</b> For additional clearance (long length) for actuator. Includes steel pivot post lockwasher, nuts (2), and E-rings (2).		•	•	1	333-045
	<b>Actuator Forward Stroke Stop Kit.</b> Adjustable 3" (76 mm) to 4" (102 mm) Field-assembled.		•		1	331-938
	<b>Actuator Forward Stroke Stop Kit.</b> Adjustable 2-3/8" (60 mm) to 4" (102 mm) Field-assembled.		•		1	331-939
	<b>Travel Stop Kit.</b> For field assembly. Reduce travel from 4" (102 mm) down to 2-29/32"(73 mm). For Model 3 only.			•	1	333-197
	<b>No. 4 Cast Aluminum Housing, Standard.</b> Discontinued Part Nos. to 331-2885		•		Pkg. of 5	333-072
	<b>No. 4 Diaphragm for High Ambient Temperature.</b> (Up to 400°F)		•		Pkg. of 5	333-071
	<b>No. 6 Standard Replacement Diaphragm.</b>			•	Pkg. of 5	333-572
	<b>O-Ring Seal Kit.</b> LC Motor only	•	•	•	1	333-056

E-58

Damper Actuators

F-3

# Notes

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

E-64

Damper Actuators

## More torque, less energy consumption.

Siemens damper actuators ship ready to install, with built-in time and cost-saving features such as a patented self-centering shaft adapter, standardized wiring, and brushless motor technology.

With torques ranging from 20 to 310 lb.-in., this powerful and flexible line-up delivers out-of-the-box performance and long-lasting reliability for all types of HVAC applications.

