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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 inside back cover 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



E-2

Selection Guide

Application	Electronic										Pneumatic*		
	Spring Return					Non-spring Return					Spring Return		
	GQD 5 ft ²	GMA 16 ft ²	GCA 40 ft ²	GND 12 ft ²	GGD 36 ft ²	GDE 11 ft ²	GLB 22 ft ²	GEB 32 ft ²	GBB 55 ft ²	GIB 77 ft ²	No. 3 12 ft ²	No. 4 16 ft ²	No. 6 24 ft ²
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				•	•						•••	•••	•••

Square footage is approximate, based on 4 lb-in./ft²

*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 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

Easily Replaces:

- Belimo TF Series



20 lb.-in.

- 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 Electric 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
- 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.

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Damper Actuators

GQD Series Specifications

Operating Voltage		24 Vac/dc ±20%	Shaft Size	3/8 to 1/2-in. (8 to 13.4 mm) round/square	● ■
		120 Vac ±15%	Min. Shaft Length	1-in. (25.4 mm)	
Frequency		50/60 Hz	Conduit Connection	(GQD221.1U only) 1/2" NPT	
Power Consumption			Housing Enclosure	NEMA 1	
24 Vac/24 Vdc	running	GQD121.1P	6.5 VA (4.5W)	Material	Plenum rated rugged plastic
		GQD131.1P	4 VA (2.5W)		
		GQD151.1P	4.5 VA (3W)		
	holding	GQD121.1P	4 VA (2.5W)		
		GQD131.1P	3 VA (1.5W)		
		GQD151.1P	3.5 VA (2W)		
120 Vac	running	GQD221.1U	10 VA	Ambient Temperature	
	holding		7 VA		
				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)

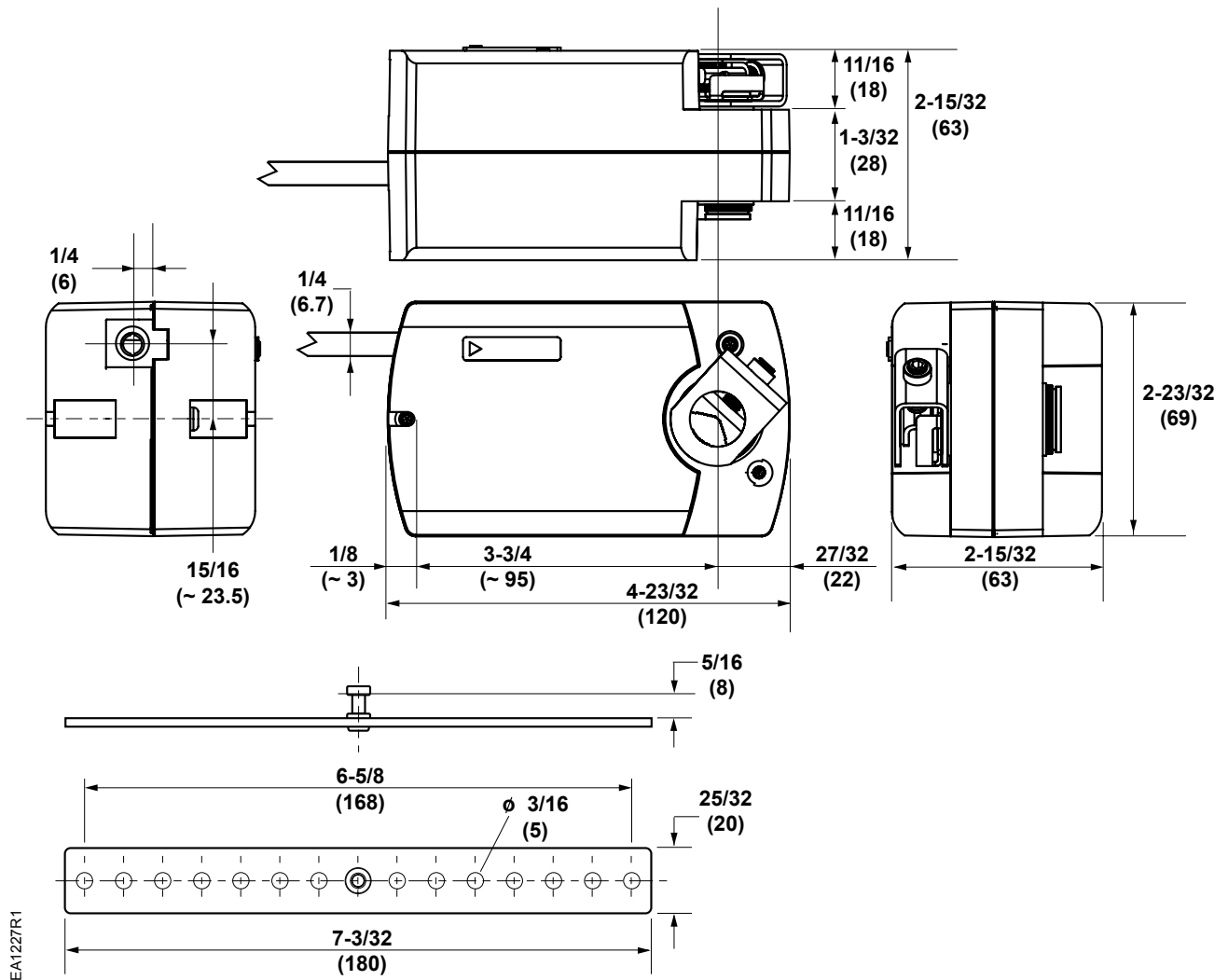
GQD Series Product Ordering

Control Signal	Cabling	Part No.
2-position (Open/Closed), 24 Vac/dc	Plenum Cable	GQD121.1P
	Plenum Cable/Bulk	GQD121.1P/B
2-position (Open/Closed), 120 Vac	Standard Cable	GQD221.1U
	Standard Cable/Bulk	GQD221.1U/B
Floating, 24 Vac/dc	Plenum Cable	GQD131.1P
	Plenum Cable/Bulk	GQD131.1P/B
2 to 10 Vdc/10 to 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.

Dimensions

QGD Series Open Air Spring Return Electric Damper Actuator



Dimensions shown in inches (mm).

Powerful and flexible selection

Siemens damper actuators ship ready to install, with built-in, time-saving features, such as:

- No special programming or tools are required for installation.
- Standardized wiring that makes installation and system integration easy and painless.
- Unlike other brands, Siemens damper actuators attach securely to the damper's shaft with the patented self-centering shaft adapter, so there's no risk of slipping or loosening that can lead to expensive contractor callbacks.
- Brushless motor technology helps ensure a long product life.

And, each actuator is tested before leaving the factory which means the product will operate correctly right out of the box.



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, Floating 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 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

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 Specifications

Operating Voltage

GMA12x, GMA13x, GMA16x, GMA15x 24 Vac $\pm 20\%$; 24 Vdc $\pm 15\%$
GMA22x 120 Vac $\pm 10\%$

Frequency 50/60 Hz

Power Consumption 24 Vac/dc

Running 5 VA/3.5W

Holding 4 VA/3W

Equipment Rating Class 2, in accordance with UL/CSA

Control Signal

Input Signal (wires 8-2) GMA16x

Voltage Input

GMA16x 0 to 10 Vdc (max. 35 Vdc)

GMA15x 2 to 10 Vdc (max. 35 Vdc)

Input Resistance >100K Ohms

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 6 A resistive

AC 2A General Purpose

DC Rating 12 to 30 Vdc

DC 2 A

Position Feedback 0 to 1000 Ohm <10 mA

Feedback Signal Position output signal (wires 9-2) GMA16x.xx/
GMA15x.xx

Voltage Output

GMA16x 0 to 10 Vdc

GMA15x 2 to 10 Vdc

Max. Output Current (both) +1 mA, -0.5 mA

Running Torque 62 lb.-in. (7 Nm)

Spring Return Torque 62 lb.-in. (7 Nm)

Max. Torque 186 lb.-in. (21 Nm)

Runtime for 90° operating with motor 90 sec.

Closing on power loss 15 sec. typical

(60 sec. Max. at -25°F)

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) min. length

Temperature

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

Storage -25 to +158°F (-32 to +70°C)

Humidity 95% RH, non-condensing

Agency Approvals UL listed UL60730 (Replacing UL873)

C-UL certified to Canadian Standard

C22.2 No. 24-93

CE

Housing

Enclosure NEMA 1

Material Die-cast Aluminum Alloy

Gear Lubrication Silicone free

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

Life Cycle Designed for over 60,000 full strokes
at rated torque and temperature

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 2.86 lbs. (1.3 kg)

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Damper Actuators

GMA 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
Modulating, 0 to 10 Vdc, 24 Vac/dc	Plenum Cable	GMA161.1P	GMA163.1P	—	GMA166.1P	—
	Standard	GMA161.1U	GMA163.1U	GMA164.1U	GMA166.1U	—
Modulating, 24 Vac/dc 2 to 10 Vdc/10 to 2 Vdc (Signal inversion)	Plenum Cable	GMA151.1P	—	—	GMA156.1P	—
	Standard	GMA151.1U	—	—	GMA156.1U	—
2-position, 24 Vac/Vdc	Plenum Cable	GMA121.1P	—	—	GMA126.1P	—
	Plenum Cable/Bulk	GMA121.1P/B	—	—	—	—
	Standard	GMA121.1U	—	—	GMA126.1U	—
	Standard/Bulk	GMA121.1U/B	—	—	—	—
2-position, 120 Vac	Standard	GMA221.1U	—	—	GMA226.1U	—
	Standard/Bulk	GMA221.1U/B	—	—	—	—
Floating, 24 Vac/Vdc	Plenum Cable	GMA131.1P	—	—	—	—
	Standard	GMA131.1U	—	—	GMA136.1U	GMA132.1U

Ordering Note Bulk packages contain 10 actuators.

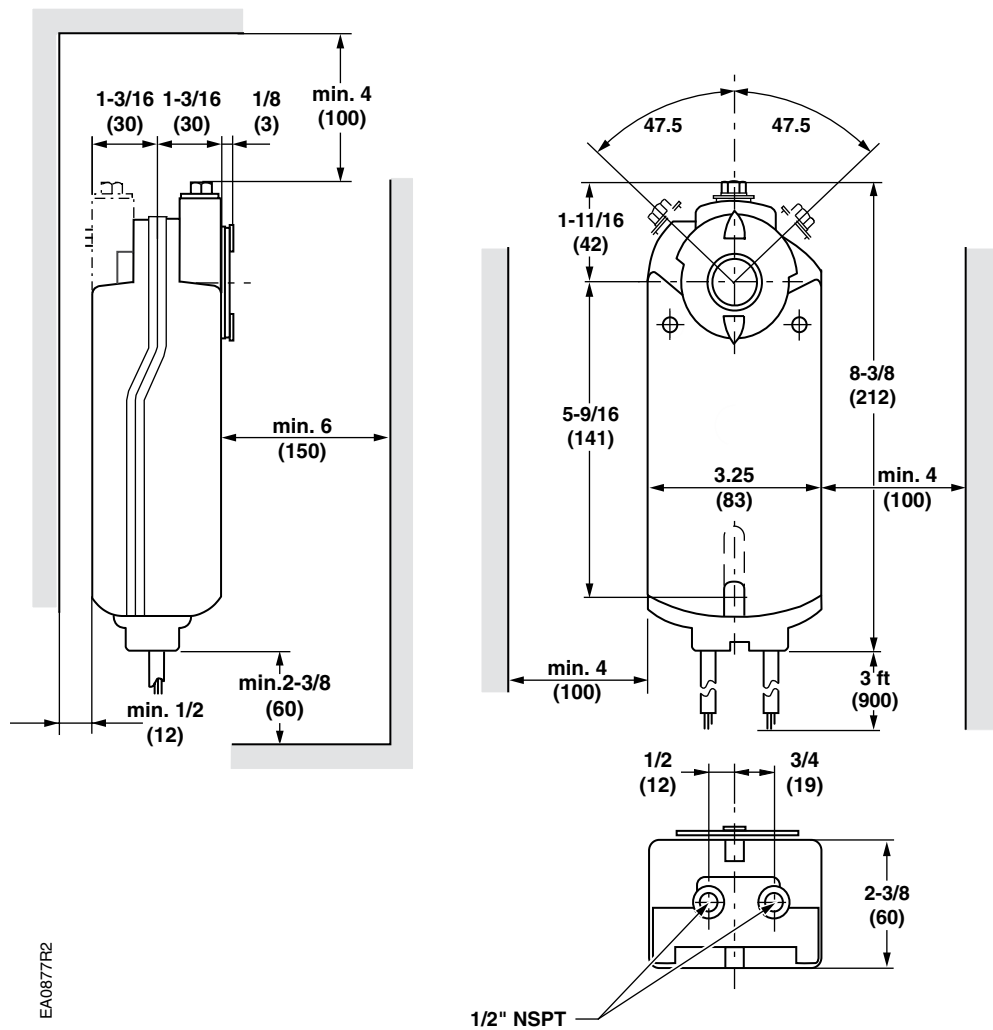


Part No. in black box

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GMA/GEB Series OpenAir Damper Actuator



EA0877R2

Dimensions shown in inches (mm).

Go Green!

With the growing interest in maximizing energy savings in buildings, we've developed icons to help you identify products that can help contribute to achieving LEED credits.

Look for these icons throughout this catalog:



Sustainable
Sites



Water
Efficiency



Energy &
Atmosphere



Materials &
Resources



Indoor
Environmental
Quality



Innovation in
Design/Operations

For more information about these icons, turn to page 4.

GCA Series

Spring Return Electric Damper Actuator

Easily Replaces:

- Belimo AF Series



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 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, 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.

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Damper Actuators

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
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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

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.

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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	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	GCA151.1U	—	—	GCA156.1U	—
	Plenum Cable	GCA151.1P	—	—	GCA156.1P	—
2-position, 24 Vac/dc	Standard	GCA121.1U	—	—	GCA126.1U	—
	Standard/Bulk	GCA121.1U/B	—	—	—	—
	Plenum Cable	GCA121.1P	—	—	GCA126.1P	—
2-position, 120 Vac	Standard	GCA221.1U	—	—	GCA226.1U	—
	Standard/Bulk	GCA221.1U/B	—	—	—	—
Floating, 24 Vac/dc	Standard	GCA131.1U	—	—	GCA136.1U	GCA132.1U
	Plenum Cable	GCA131.1P	—	—	GCA136.1P	GCA132.1P

Ordering Note Bulk packages contain 8 actuators.

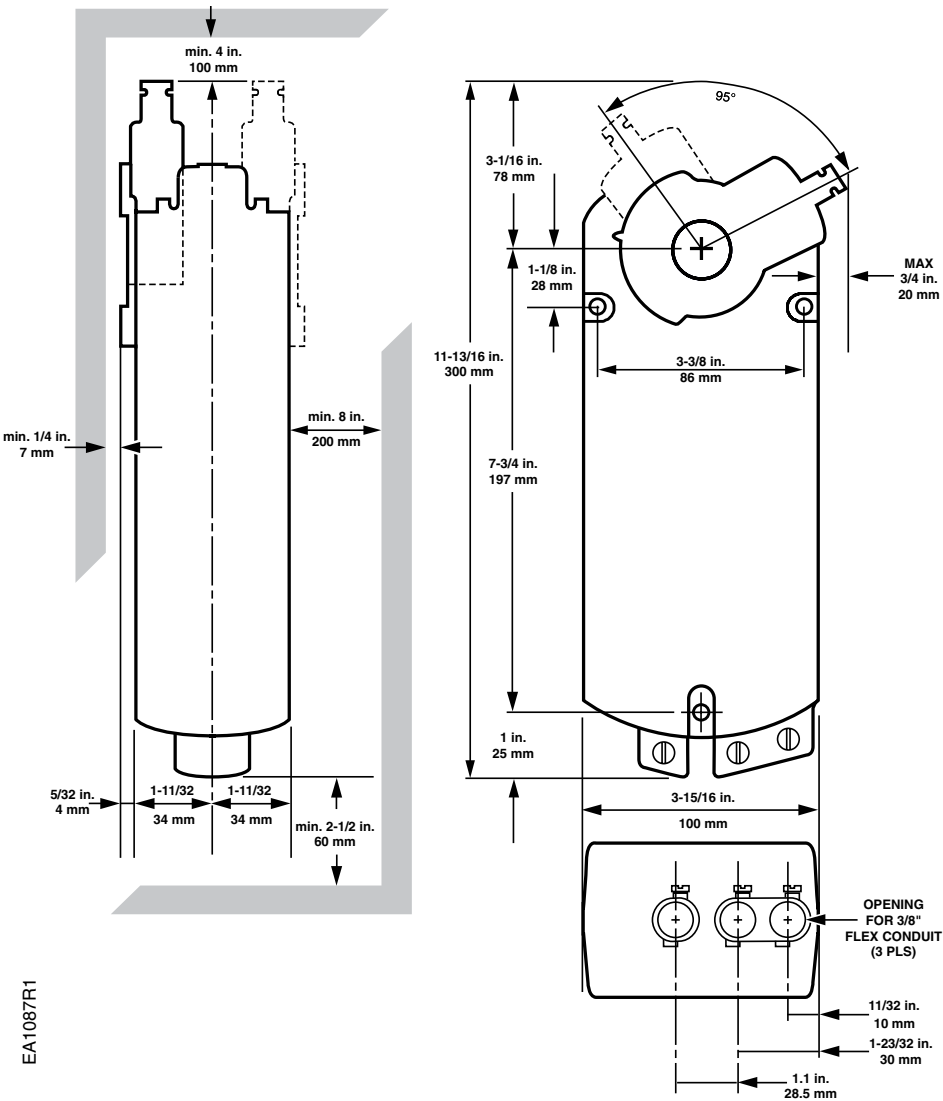


Part No. in black box

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GCA/GIB/GBB Series OpenAir Damper Actuator



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Damper Actuators

Find what you need online

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- Print out product information for submittals
- Link to technical documentation
- Download installation instructions
- Create an account for online ordering

www.usa.siemens.com/hvac/buildingtechnologiesonlineordering



GDE Series

Non-spring Return Electric Damper Actuator

Easily Replaces:

- Belimo LM Series



44 lb.-in. torque

24 Vac, Floating 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 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

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

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)

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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	—	—	—	—	—	—
	GDE161.1T/B (24 pk)	—	—	—	—	—	—
Floating	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)	—	—	—	—	—	—



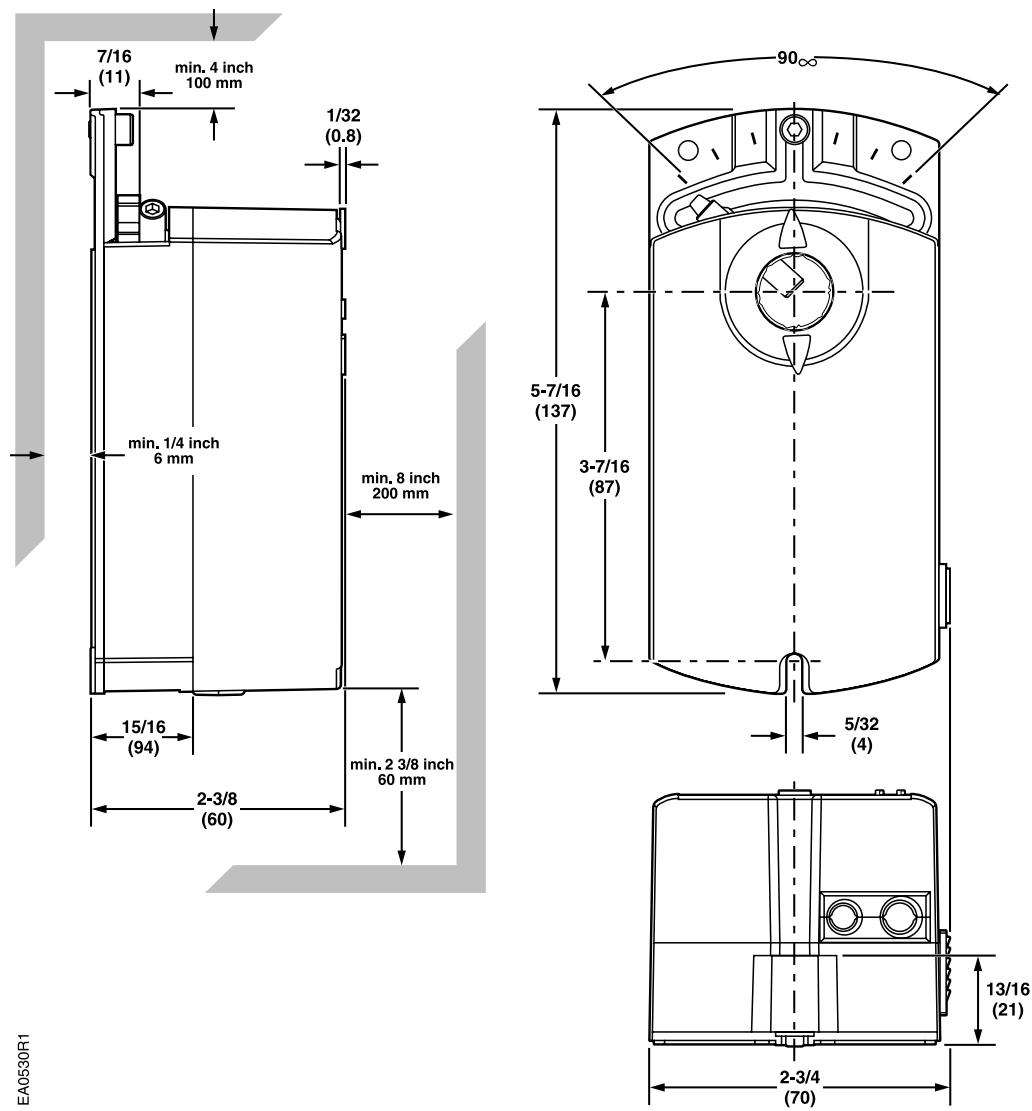
Cables compatible with the GDE131.1N and GDE161.1N sold separately on page E-49.



Part No. in black box Ships same day when requested through Rapid Response™ shipping. See inside back cover for details.

SIEMENS

GDE/GLB Series OpenAir Electric Damper Actuator



Dimensions shown in inches (mm).

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GLB Series

Non-spring Return Electric Damper Actuator

Easily Replaces:

- Belimo NM Series



88 lb.-in. torque

24 Vac, Floating 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 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

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.

E-19

Damper Actuators

GLB Series Specifications

Operating Voltage	24 Vac
Frequency	50 to 60 Hz
Power Consumption	3.3 VA (modulating) 2.3 VA (floating)
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	
GLB132.1P	0 to 1000 Ohm <10 mA

Function	
Torque	88 lb.-in. (10 Nm)
at 50 Hz	150 sec.
at 60 Hz	125 sec.
Nominal Angle of Rotation	90°
Max. Angular Rotation	95°
Shaft Dimensions	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 2
Material	Plenum Rated Rugged Plastic
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	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)

Refer to page E-17 for Dimensions.

GLB Series Product Ordering

Input Signal	Cabling	Part No.				
		Standard	Span/Offset Adjustable	Dual Aux. Switches & Span/Offset Adjustable	Dual Aux. Switches Only	Potentiometer
Floating, 24 Vac	3' Plenum Cable	GLB131.1P	—	—	GLB136.1P	GLB132.1P
	6' Plenum Cable	GLB131.1Q	—	—	—	—
0 to 10 Vdc	3' Plenum Cable	GLB161.1P	GLB163.1P	GLB164.1P	GLB166.1P	—
	6' Plenum Cable	GLB161.1Q	—	—	—	—



Accessories & Service Kits

E-45



Part No. in black box Ships same day when requested through Rapid Response™ shipping. See inside back cover for details.

SIEMENS

GEB Series

Non-Spring Return Electric Damper Actuator

Easily Replaces:

- Belimo NM Series

132 lb.-in.

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
- 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

GEB Series Specifications

Power Supply	24 Vac
Operating Voltage	24 Vac $\pm 20\%$
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	24 to 250 Vac
AC Rating	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)

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	GEB132.1U

Accessories & Service Kits

E-45

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
Floating 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 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

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-23

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-45

GIB Series

Non-spring Return Electric Damper Actuator

Easily Replaces:

- Belimo GM Series



310 lb.-in.

0 to 10 Vdc, Modulating Control
Floating 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 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

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.

E-25

Damper Actuators

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-45

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 (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-27

Damper Actuators

GND Series Specifications

Operating Voltage	24 Vac ±20%
	24 Vdc +20%, -10%
	120 Vac ±10%
	230 Vac ±10%
Frequency	50/60 Hz
Power Consumption	24 Vac/dc
Running	20 VA/12W
Holding	8 VA/6W
Power Consumption	120 Vac/230 Vac
Running and Holding	20 VA/9VA
Torque	
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°
Life Expectancy	Minimum 35,000 full stroke cycles
Mounting	
Damper Shaft Size	0.5" (12.7 mm) round
Damper Shaft Length, Minimum	1.4" (36 mm)
Housing	
Enclosure	NEMA 1
Material	Die-cast Aluminum Alloy

Temperature	
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)
Agency Certification	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)
Pre-cabled Connection	18 AWG, 3 ft. (0.9 m)
	3/8" (0.5mm) flexible conduit connector
Dimensions	9" H X 3.25" W X 3" D
	(229 mm H X 83 mm W X 76 mm D)
Shipping Weight	0.4 lb. (1.8 kg)

*Refer to the Installation Instructions for acceptable mounting positions.

E-28

Damper Actuators

GND Series Product Ordering

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

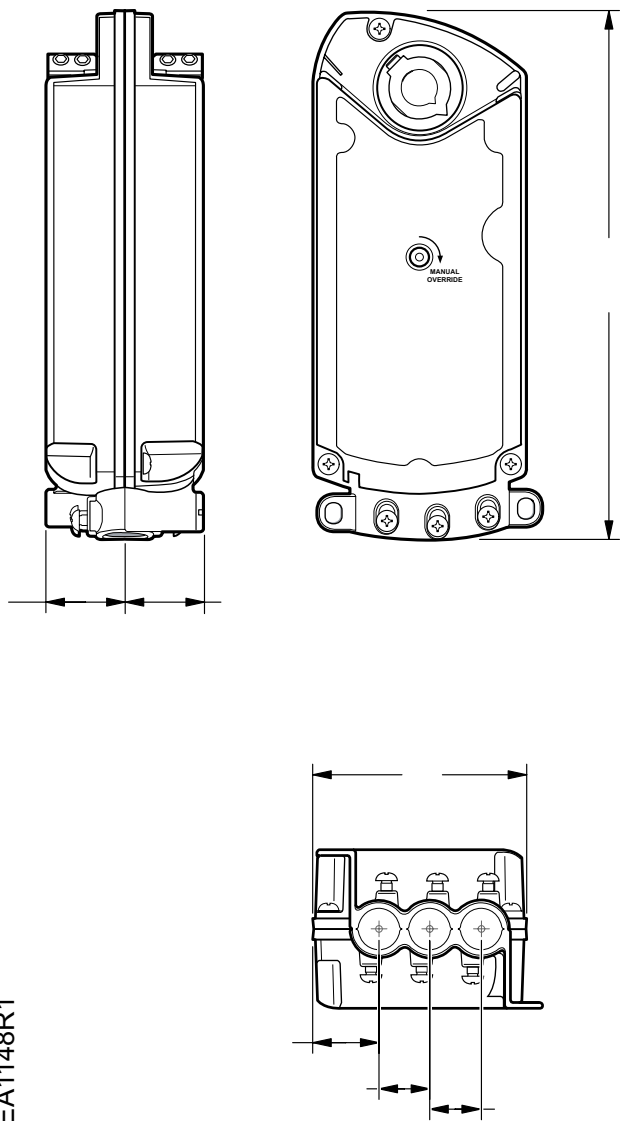
Ordering Note

- 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)	ASK79.165
212°F (100°C)	ASK79.212
250°F (121°C)	ASK79.250
350°F (177°C)	ASK79.350

GND Series OpenAir Damper Actuator



EA1148R1

Dimensions shown in inches (mm).

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*Only available for continental United States; Not available on online or faxed orders.



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. (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-31

Damper Actuators

GGD Series Specifications

Operating Voltage 24 Vac $\pm 20\%$
115 Vac $\pm 15\%$
230 Vac $\pm 10\%$

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-32

Damper Actuators

GGD Series Product Ordering

Description	Shaft Adapter	Part No.		
		24 Vac	115 Vac	230 Vac
Standard	Self-centering	GGD121.1U	GGD221.1U	GGD321.1U
Standard/Bulk	Self-centering	GGD121.1U/B	GGD221.1U/B	GGD321.1U/B
Standard	Oversized	GGD121.3U	GGD221.3U	GGD321.3U

Ordering Note Bulk packages contain 8 actuators.



Accessories & Service Kits

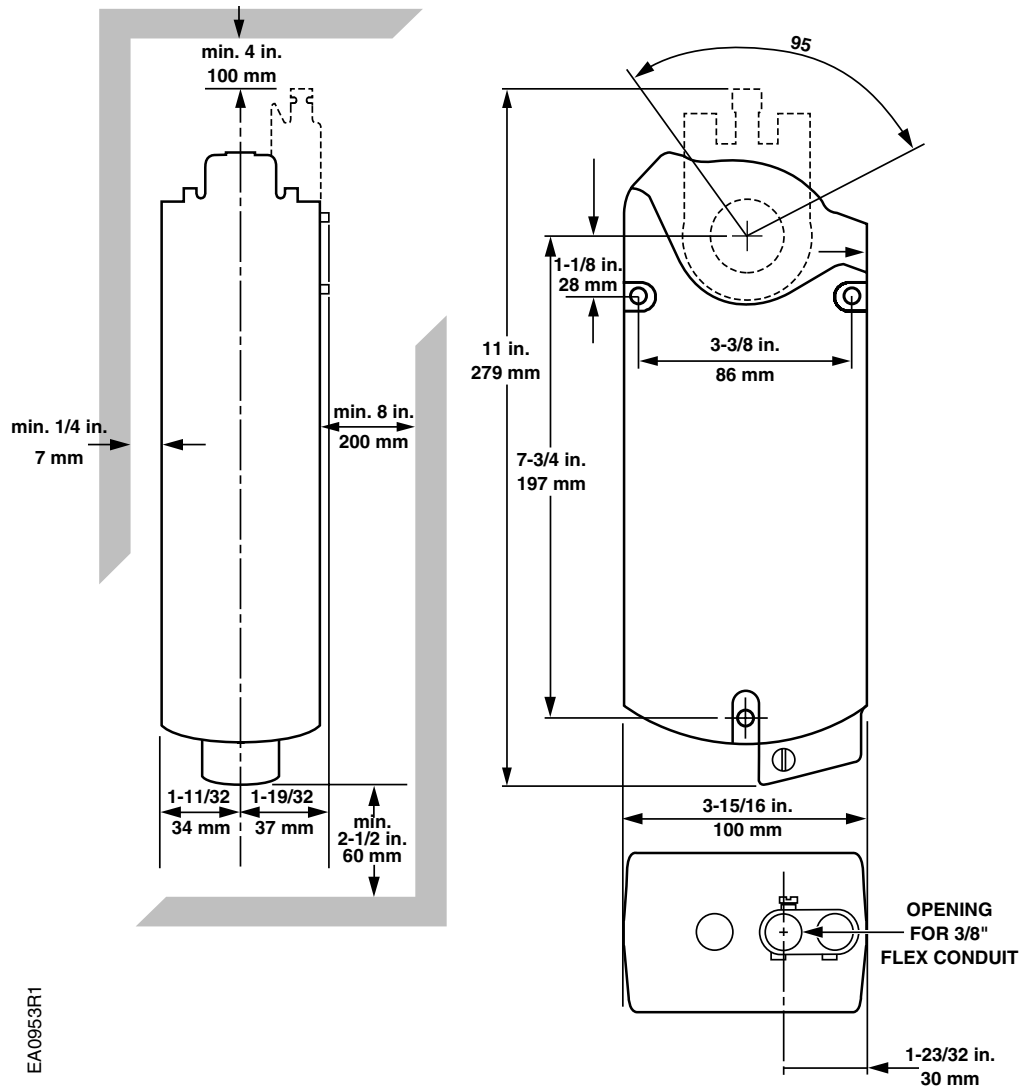
E-45



Part No. in black box Ships same day when requested through Rapid Response™ shipping. See inside back cover for details.

SIEMENS

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										
	2 Position	2								
	Floating	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								

* Switches N/A on Fire and Smoke actuators

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.

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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

Effective Diaphragm Area	8 in. ² (51.5 cm ²)
Stroke	2-3/8-in. (60 mm)
Max. Air Pressure	30 psi (210 kPa)
Nominal Spring Ranges	3 to 7 psi (21 to 50 kPa) 5 to 10 psi (35 to 69 kPa) 8 to 13 psi (55 to 90 kPa)
Ambient Temperature Range	
Operating.....	35 to +140°F (2 to 60°C)
Storage.....	-20 to +140°F (-29 to +60°C)

Materials	
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

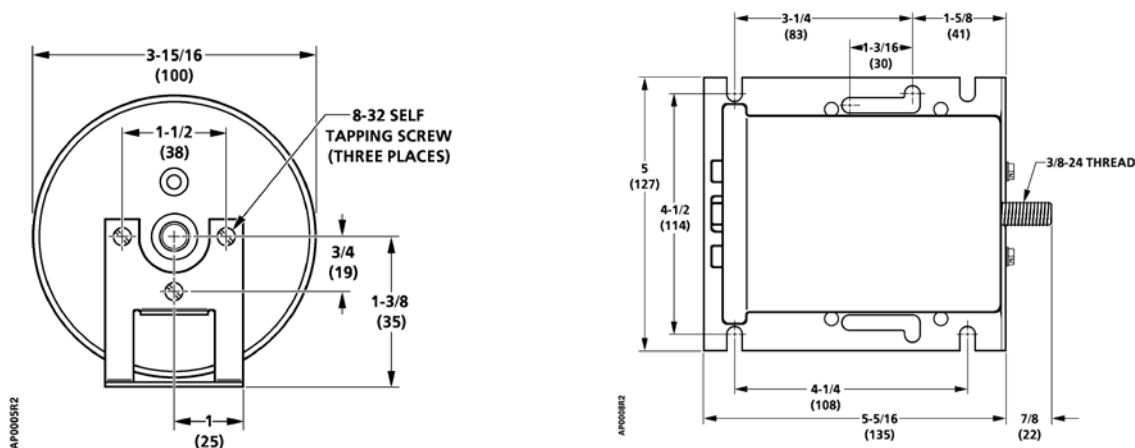
- * When the actuator is ordered with Extended Shaft Mounting, the mounting plate, pivot post and hardware, clevis, damper crank, rocker arm and all screws/nuts are included. Order other frame mounting accessories as required if not supplied by damper manufacturer.



Accessories & Service Kits

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No. 3 Pneumatic Dimensions



Dimensions shown in inches (mm).



Part No. in black box Ships same day when requested through Rapid Response™ shipping. See inside back cover for details.

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.

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. ² (71 cm ²)
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)

Materials	
Housing (totally enclosed)	Steel, electro-coated epoxy
Shaft	Stainless Steel
Diaphragm	EDPM Rubber
Spring	Steel
Bearing	Delrin
Air Connection	1/8" NPT Female with a dual barb elbow fitting for 1/4" (6 mm) OD tubing
Type of Mounting	Front, bracket, pivot; universal (extended shaft or frame mount)
Shipping Weight (Actuator only)	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	—	—	—	332-3107	—
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

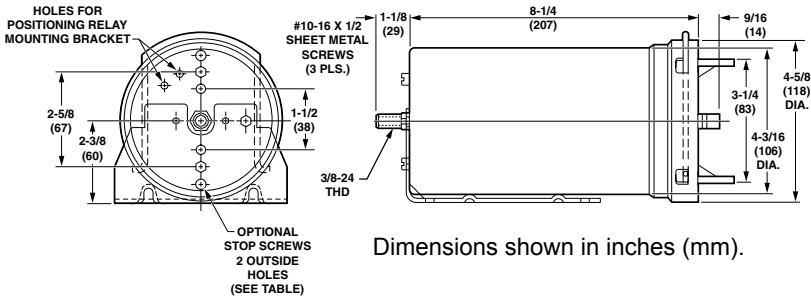
(1.) When the actuator is ordered with universal mounting, mounting plate, pivot post and hardware, clevis, damper crank, rocker arm, and all screws/nuts are included. Order other frame mounting accessories as required if not supplied by manufacturer. (2.) *UL Component Recognized for Fire/Smoke Applications.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



Accessories & Service Kits

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No. 4 Pneumatic Dimensions



Dimensions shown in inches (mm).



Part No. in black box

Ships same day when requested through Rapid Response™ shipping. See inside back cover for details.

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.

Nominal Spring Rating	Max. 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 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. ² (115 cm ²)
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)

Materials	
Housing	Aluminum
Stem	Type 416 Stainless Steel
Diaphragm	Silicone Rubber
Spring	Steel
Bearing	Bronze Oilite
Air Connection	1/8" NPT Female
Type of Mounting	Pivot; Universal (extended shaft or frame mount)
Shipping Weight (Actuator only)	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 ¹	331-2857	331-2858	331-2856
Actuator with Clevis and Positioning Relay	Pivot ¹	—	—	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*

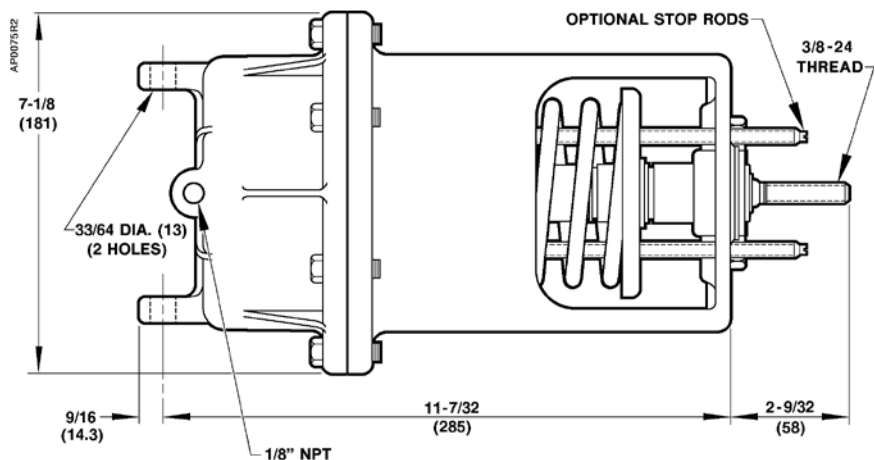
Ordering Notes

- 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

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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

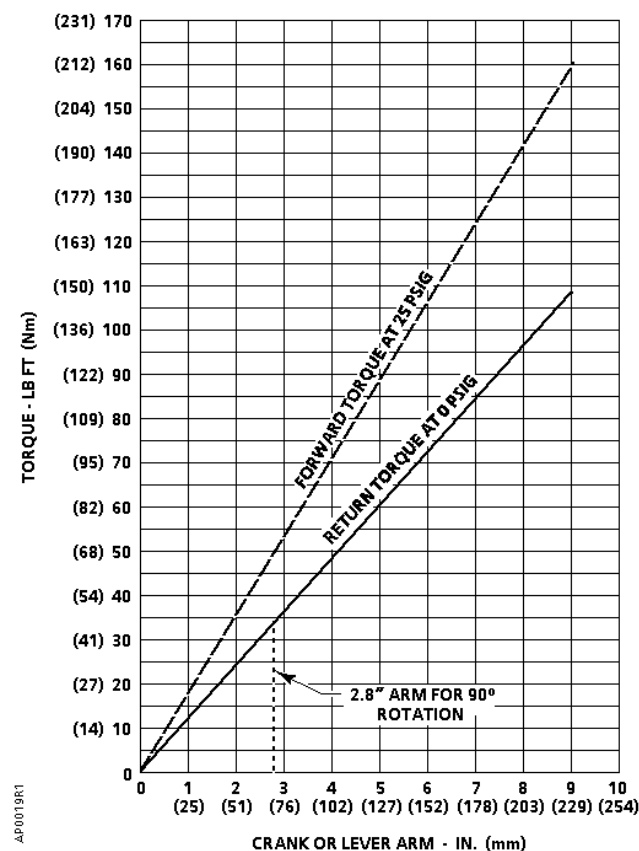
If the damper rotation is other than 90°, use the Arm Length vs. Rotation Chart and the Thrust and Torque Ratings to determine the actuator assembly torque rating. Then divide the actuator assembly torque rating by the damper torque rating per unit of area for job conditions to determine the damper area 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



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Damper Actuators

No. 6 Tandem Mounting Specifications

Effective Diaphragm Area	35.8 in. ² (230 cm ²)
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)
Spring Range	
Factory Setting	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)

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)

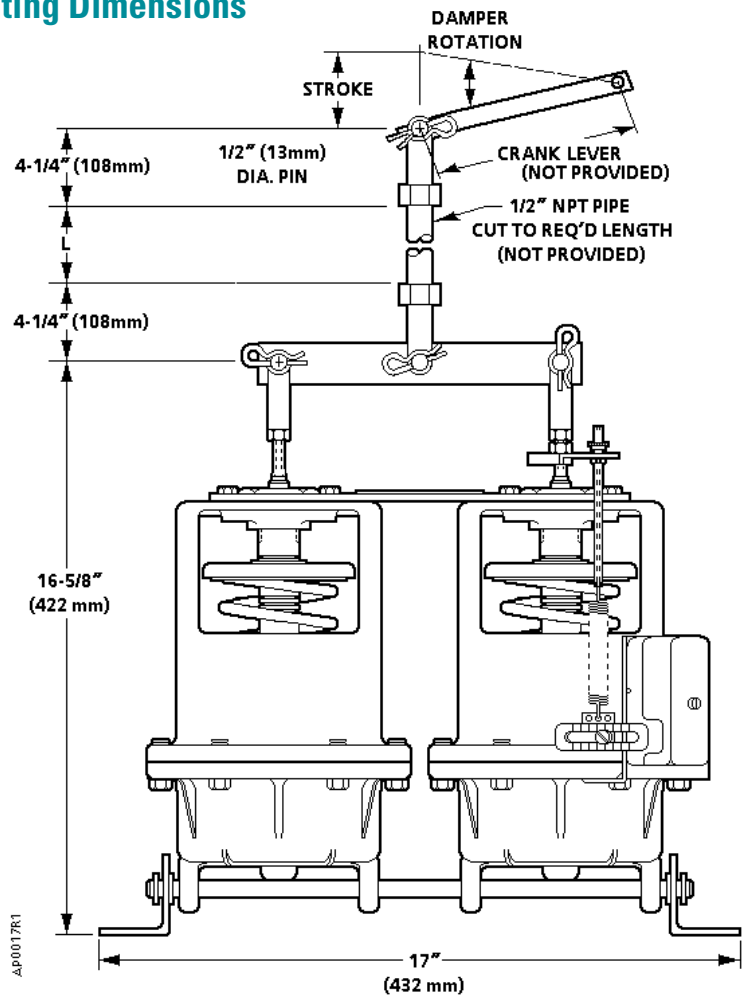
No. 6 Tandem Mounting Product Ordering

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

Accessories & Service Kits

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No. 6 Tandem Mounting Dimensions



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

- 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.

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Damper Actuators

Large Capacity Pneumatic Actuator Specifications

Air Supply Pressure	25 psi (172 kPa)	Response	0.5 psi (3.4 kPa)
Max. Pressure	30 psi (207 kPa)	Torque Rating (90° rotation) with 25 psi (172 kPa) air supply	130 lb.-ft. (176 Nm)
Temperature Range		Spring Start Point (adjustable)	3 to 10 psi (21 to 69 kPa)
Operating	50 to 140°F (10 to 60°C)	Mounting	Pivot
Storage	-20 to +160°F (-29 to +71°C)	Air Connection	1/8" NPT
Effective Piston Area	19.6 in. ² (126 cm ²)	Shipping Weight	35.0 lb. (16.0 kg)
Stroke	7-in. (18 cm)		
Span (adjustable)	3 to 12 psi (21 to 83 kPa)		

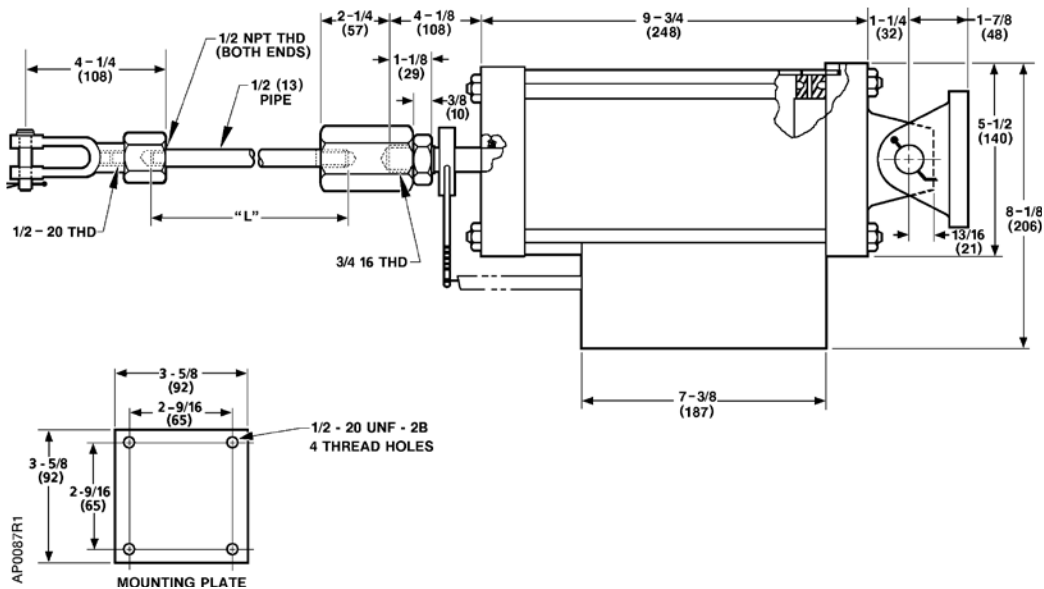
Large Capacity Pneumatic Actuator Product Ordering

Description	Part No.
Large Capacity Pneumatic Actuator	331-2882

Accessories & Service Kits

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Dimensions



Dimensions shown in inches (mm).