



## Non-Spring Return Electronic Actuators

### 24 VAC Two-Position or Tri-State (Floating) Control (132, 221 & 310 in-lb) EN132C2(-S), EN221C2-S & EN310C2(-S)



#### Description

The EN132C2(-S), EN221C2(-S) and EN310C2(-S) direct coupled 24 VAC non-spring return (NSR) rotary electronic actuators are designed for tri-state (floating) or two-position control of building HVAC dampers and valves.

#### Features

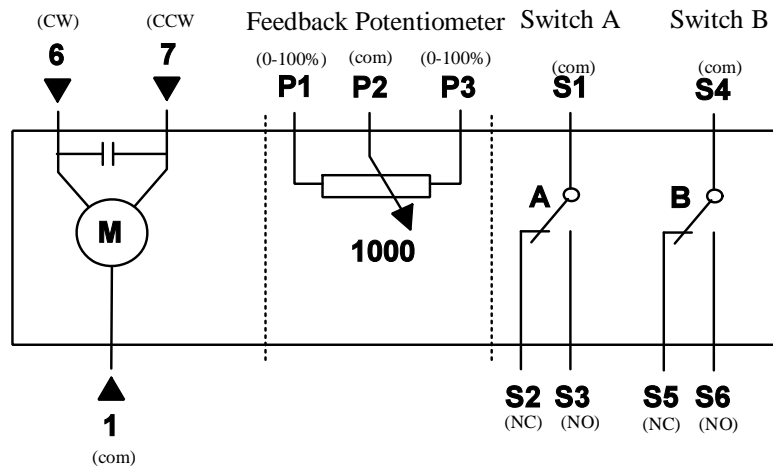
- Unique self-centering shaft coupling
- All metal housing
- Manual override
- Independently adjustable dual auxiliary switches available
- UL, cUL listed; CE certified

#### Application

These actuators are used in constant or variable air volume installations for the control of return air, mixed air, exhaust, and face and bypass dampers or control valves requiring up to 132 in-lb (15 N-m), 221 in-lb (25 N-m) or 310 in-lb (35 N-m) of torque.

#### Wiring

See Note 1



#### Tri-State Control:

If the damper or valve turns counterclockwise (CCW) to open, reverse the 6 and 7 wires at the controller.

#### Two Position Control:

##### EN132C2 Only

Connect wire 1 to common, connect wire 6 to common in order to drive clockwise. To drive counterclockwise, add wire 7 to wire 6 on the common.

Actuator Part Number Table					
Torque	Input Signal	Cabling	24 VAC Operating Voltage		
			Standard	With Dual Auxiliary Switches	Potentiometer Feedback
132 in-lb (15 N-m)	Tri-state or Two-Position	Standard or Plenum Cable	EN132C2	EN132C2-S	EN132C2-P
221 in-lb (25 N-m)	Tri-state or Two-Position*	Plenum Cable	EN221C2	EN221C2-S	—
310 in-lb (35 N-m)	Tri-state or Two-Position*	Plenum Cable	EN310C2	EN310C2-S	—

#### Notes:

1 Do not ground switched legs (6 & 7)

\* Form C Relay required.



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Technical Data	EN132C2(-S)(-P)	EN221C2(-S)	EN310C2(-S)
Power supply	24 VAC ±20%, 50/60 Hz		
Power consumption	running: 3 VA / 3 W; holding: 1 VA	running: 7 VA	running: 7 VA
Transformer sizing	class 2, in accordance with UL/CSA		
Electrical connection	3 ft, 18 GA	3 ft, 18 AWG plenum cable	
Overload protection	electronic throughout 0° to 95° rotation		
Potentiometer (-P)	0-1000 Ω (<10 mA)	—	
Angle of rotation	mechanically limited to 95°		
Minimum torque	132 in-lb (15 N-m), <360 in-lb (40 N-m) max.	221 in-lb (25 N-m)	310 in-lb (35 N-m)
Direction of rotation	reversible with dip switch		
Position indication	visual indicator, -5° to 90° (-5° is spring return position)		
Manual override	push down button		
Shaft size	1/4" to 3/4" (6.4 mm to 20.5 mm) min. diameter 1/4" to 1/2" (6.4 mm to 13 mm) square	standard: 3/8" to 1" (8 mm to 25.6 mm) diameter 1/4" to 5/8" (6.4 mm to 18 mm) square oversize: 1.05" (26.6 mm) max. special adapter	
Minimum shaft length	3/4" (20 mm)		
Auxiliary switches (-S option)	AC: 24 VAC to 250 VAC 6A resistive 2A general purpose use DC: 12 VDC to 30 VDC 2A	AC: 24 VAC 4A resistive 2A general purpose use DC: 12 VDC to 30 VDC 2A	
Switch range (-S option)* – Switch A	0° to 90° with 5° intervals 0° to 45° 5° 2°		
– Recommended range usage			
– Factory setting			
– Switching hysteresis			
Switch range (-S option)* – Switch B	0° to 90° with 5° intervals 45° to 90° 85° 2°		
– Recommended range usage			
– Factory setting			
– Switching hysteresis			
Running time for 90°	125 secs 60 Hz, 150 secs 50 Hz		
Humidity	95% RH noncondensing		
Ambient temperature	-25°F to 130°F (-32°C to 55°C)		
Storage temperature	-40°F to 158°F (-40°C to 70°C)		
Housing type**	NEMA type 1/IP40 according to EN60529		
Housing material	Die cast aluminum alloy		
Gear lubrication	Silicone free		
Agency ratings	UL 873 or UL 60730 listed, CE-UL certified to CSA C22.2 No. 24-93		
CE conformity***	Electromagnetic Compatibility (EMC): 89/336/EEC Emissions standards: EN50081-1 Low voltage directive 7		
	Immunity standards: EN61000-6-2 except EN132C2-NP (EN50082-1)	Immunity standards: EN50082-2	
Noise level	max 40 dBA	max 45 dBA	
Servicing	maintenance free		
Quality standard	ISO 9002		
Weight	2.2 lbs (1.0 kg)	4.4 lbs (2.0 kg)	

**Notes:**

! \* SWITCH WARNING: Apply only main voltage or only safety extra-low voltage (SELV) to switching outputs of auxiliary switches A and B. Mixed operation is not permissible.

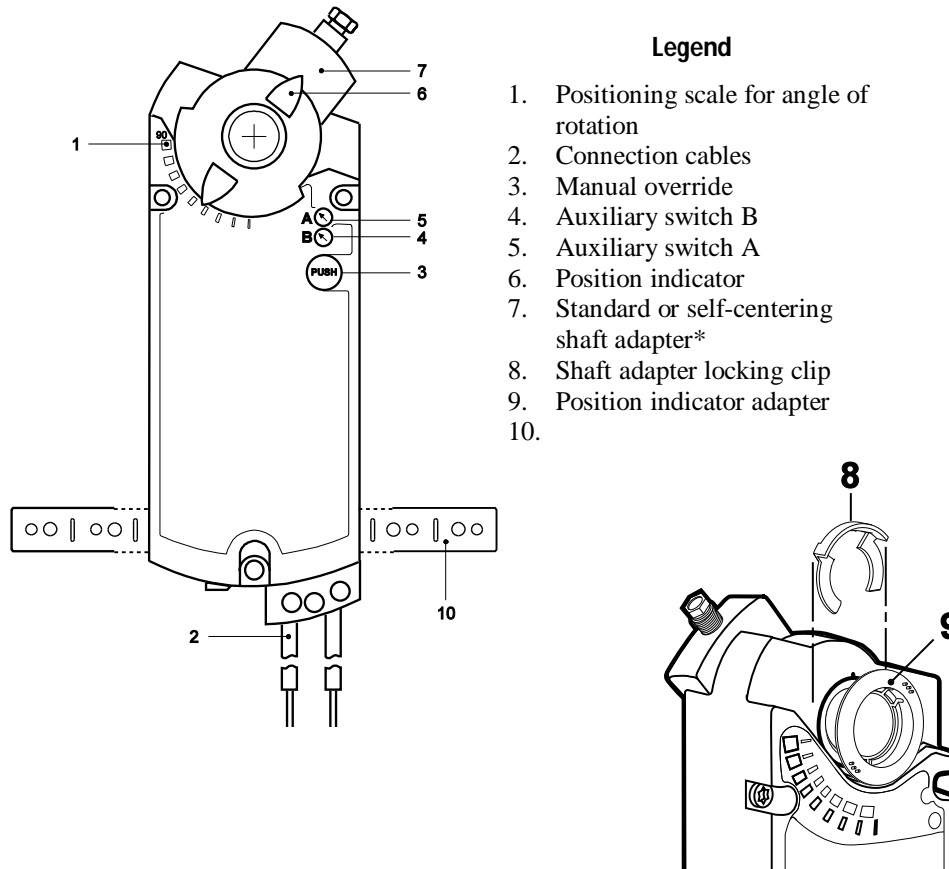
\*\* DEI has optional NEMA 4/4X type housings for these actuators. Call DEI for information.

! \*\*\* CE WARNING: All wiring of these actuators must be safety extra-low voltage (SELV/PELV) in accordance with EN60730.



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### **Actuator Components**



### **Operation**

A floating control signal controls the actuator. The actuator's angle of rotation is proportional to the length of time the signal is applied. A 24 VAC control signal to wires 1 and 6 (G-Y1) causes the actuator coupling to rotate clockwise. A 24 VAC control signal to wires 1 and 7 (G-Y2) causes the actuator coupling to rotate counterclockwise.

If you want to reverse the direction of rotation, the wires 6 and 7 (Y1 and Y2) may be interchanged. Reverse the position indicator so that the counterclockwise 0 to 90 scale is visible. For complete wiring info, refer to technical bulletin.

In the event of a power failure, or with no control voltage, the actuator holds its current position.

In the event of a blockage in the damper or valve, the actuator is overload protected over the full range to prevent damage to the actuator.

### **Life expectancy**

An improperly tuned control loop will cause excessive repositioning that will shorten the life of the actuator.

**WARNING:** Apply only line voltage or only Class 2 voltage to the switching outputs of both auxiliary switches A and B. Mixed operation is not permissible. See *Wiring* for details.

### **Note:**

\* Self-centering shaft adapter shown.