

## CRA Series

### Electric Capacitor-Return Rotary-Motion Actuators

#### Features and Benefits

##### Noise Rating

- Maximum 55 dBA when running
- Meets audible requirements for open ceiling

##### At least 60,000 Cycles of Operation

- Extends actuator life due to improved technology

##### Direct Shaft Mount

- Simplifies installation in any convenient orientation

##### Fail-safe Operation

- On power shutdown, built-in capacitor returns controlled device to normal position
- Provides torque protection for the controlled device without limit switches

##### Proportional Models Only

##### Switch-Selectable Direction of Rotation

- Simplifies installation

##### 0-10 VDC Feedback

- Provides simple, closed-loop control with accurate position sensing

##### Automatic Stop at End of Rotation in Each Direction

- Avoid excessive wear or drive time on the motor

##### Angle of Rotation with Mechanical End Stops from 30° to 90° at 10° Increments

- Allows application versatility requiring less than 90° rotation

##### Optional Auxiliary Switches (On-Off Models Only)

- 2xSPDT switches available

#### General

The CRA Series electric capacitor-return rotary-motion actuators are designed for use with 2-wire on-off, 3-wire floating or 2-wire proportional controllers. These capacitor-return actuators are used to position dampers, ball valves and butterfly valves in typical HVAC control applications. They are also used to position the blades in a VAV box.

A controller provides a control signal, causes the actuator motor to rotate in the proper direction and moves the damper blade or valve open or



closed. To avoid unnecessary excessive wear or drive time on the motor, a controller that provides a time-out function to remove the signal at the end of rotation is recommended.

The CRA Series actuators are electric capacitor-return rotary-motion actuators for 2-wire on-off, 3-wire floating or 2-wire proportional control actions. The 2-wire on-off and 3-wire floating actuators are available with 24, 120 or 230 V 50/60 Hz power supply while proportional actuators are available with 24 V 50/60 Hz power supply only.

A built-in capacitor in the actuator is charged up when power is turned on. The capacitor will discharge and return the actuator to its original position when power is interrupted.

These bi-directional actuators do not require a damper linkage and are easily installed on a damper with:

<u>Round Shaft (<math>\Phi</math>)</u>	<u>Square Shaft</u>
10 to 16 mm (3/8" to 5/8")	8 to 11 mm (5/16" to 7/16")

They may also be mounted to a ball valve or butterfly valve which comes with a direct-couple mounting bracket and an extended valve shaft.

Rotation is mechanically limited to 95° by integral end-stops. The position of the actuator is marked from 0 to 90° on the gear box faceplate. An anti-rotation bracket prevents lateral movement of the actuator. The actuator rotation angle can be set from 30° to 90° at 5° increments. Standard factory setting is 90°.

**Direction of Rotation Switch position Selection  
(Proportional Models Only)**

CW is set for clockwise rotation with 0(2) VDC input at fully-closed position and CCW for counter clockwise rotation with 0(2) VDC input at fully-open position. The factory setting is for CW. Can be changed in the field to CCW by moving the switch from CW to CCW position on the actuator enclosure.

**Feedback Signal  
(Proportional Models Only)**

The CRA Series actuators are provided with 0-10 VDC position feedback signal on all proportional models.

**Optional Auxiliary Switches  
(On-Off Models Only)**

The CRA Series actuators are available with two

built-in auxiliary switches as an option on all on-off models that allow position indication at end-of-travel positions.

**Ordering**

To order, specify complete model number. For proportional models, factory setting is for 0(2)-10 VDC input. If 4-20 mA input is required, specify when ordering.

**Replacement and Repair**

Field repairs must not be made and no field replacement parts are available.

Figure 1: Actuator Model Number Selection Guide

Actuator Type	Torque Ratings	Input Signal Type	Voltage Options	Other Options
CRA	2	2	U	0
Actuator Model Number Designations				
<b>Actuator Type</b> CRA = CRA Series capacitor-return rotary-motion actuators		<b>Voltage Options</b> For 2-wire on-off and 3-wire floating actuators: A = 24 V 50/60 Hz B = 120 V 50/60 Hz U = 220 V 50/60 Hz For 2-wire proportional actuators: A = 24 V 50/60 Hz (only supply voltage available)		
<b>Torque Ratings</b> 2 = 2 Nm 4 = 4 Nm 6 = 6 Nm 8 = 8 Nm		<b>Other Options</b> 0 = No options 3 = With 2 x SPDT end-of-travel position indication switches 4 = with 2 x SPDT end-of-travel limit switches Note: Options 3 and 4 are applicable to 2-wire on-off models only.  <b>Example:</b> CRA84A0, proportional type, 8 Nm, 0(2)-10 VDC input, 24 VAC power, no options		
<b>Input Signal Type</b> 2 = 2-wire on-off 3 = 3-wire floating 4 = 2-wire proportional				

## Specifications

Product model numbers	See Figure 1: Actuator Model Number Selection Guide	
Power supply	2-wire on-off and 3-wire floating: 24, 120 or 230 50/60 Hz, $\pm 10\%$ 2-wire proportional: 24 V 50/60 Hz, $\pm 10\%$ only	
Power consumption	2 Nm	14
	4 Nm	14
	6 Nm	14.5
	8 Nm	15
Input signal	2-wire on-off and 3-wire floating: 24, 120 or 230 V 50/60 Hz 2-wire proportional: 0(2)-10 VDC. If 4-20 mA is required, must be specified when ordering.	
Input signal impedance	2-wire proportional: 200,000 $\Omega$ for voltage input; 500 $\Omega$ for current input	
Feedback signal	Proportional models only: 0-10 VDC for 90° span	
Auxiliary switches (2-wire on-off models only)	Settings: S1 at 10° S2 adjustable from 10° to 90°	
Electrical connection	Contact ratings: 2xSPDT at 250 VAC 3 A inductive, 3 A resistive per switch 500 mm long cable with color-coded wires	
Mechanical connection	10 to 16 mm (3/8" to 5/8") round shaft or 8 to 11 mm (5/16" to 7/16") square shaft	
Protection class	IP54	
Cycles of operation	At least 60,000	
Torque ratings	2, 4, 6, or 8 Nm	
Rotation range	30-90° in 5° increments, mechanically limited to 95°; factory set at 95°	
Actuator motor type	Bi-directional brushed DC motor	
Running times	For on-off actuators Initialization: 15 s; Stroke: 20 s; Return: 20 s For proportional actuators Initialization: 120 s; Stroke: 70 s; Return: 95 s	
Audible Noise Rating	Maximum 55 dBA when running	
Ambient Conditions	Operating: -5 to 50°C (23 to 122°F); 0-95% RH, non-condensing Storage: -30 to 70°C (-22 to 158°F); 0-95% RH, non-condensing	
Agency Approval	CSA certified	
Dimensions	See Figure 2: Dimensions and Shipping Weights	
Shipping Weights	1.5 kg for actuators of 2, 4, 6 or 8 Nm;	

*The performance specifications above are nominal and subject to tolerances and application variables of generally acceptable industry standards.  
The Manufacturer shall not be liable for damages resulting from misapplication or misuse of its products.*

**CAUTION:** Equipment Damage Hazard. Do not install the actuator in atmospheres where explosive or corrosive vapors or escaping gases are present. This could result in damage to the unit.

**WARNING:** All RCA Series actuators are designed for use only in conjunction with operating controls. Where an operating control failure would result in personal injury and/or loss of property, it is the responsibility of the installer to add safety devices or alarm systems that protect against, and/or warn of, control failure.

### Switch Location of Direction of Rotation (Proportional Models Only)



Figure 2: Dimensions

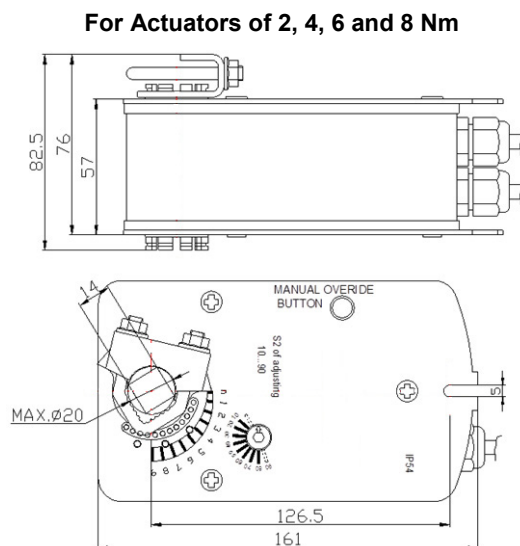
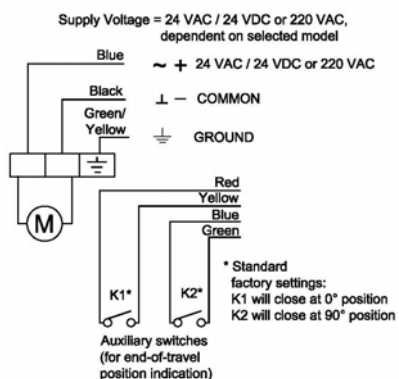
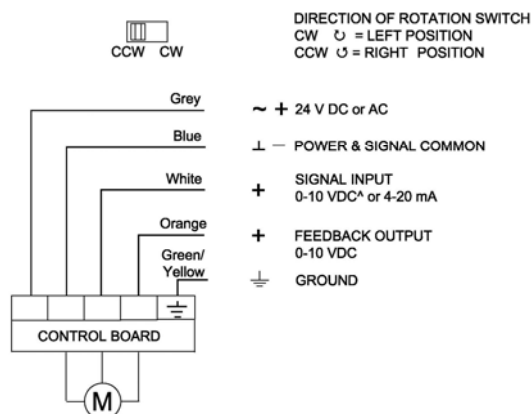


Figure 3: Wiring Diagrams

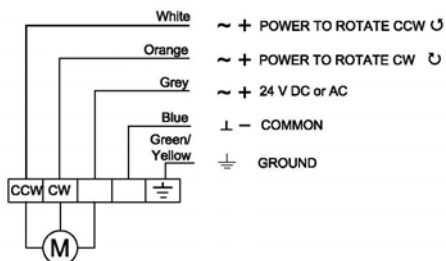
#### For 2-Wire On-Off Actuators



#### For 2-wire Proportional Actuators



#### For 3-Wire Floating Actuators



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