RA Series

Electric Non-Spring Return Rotary-Motion Actuators

Features and Benefits

45 dBA Noise Rating
- 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

Magnetic Clutch
- Provides torque protection for the controlled device

Jumper-Selectable Direction of Rotation (Proportional Models only)
- Simplifies installation

Manual Gear Release
- Simplifies setup and field adjustments

0-10 VDC Feedback (Proportional Models only)
- Provides simple, closed-loop control with accurate position sensing

Adjustable Angle of Rotation with Mechanical End Stops from 30º to 90º at 10º Increments
- Allows application versatility requiring less than 90º rotation

Input Signal Interruption Protection (Proportional Models Only)
- Returns actuator to its full clockwise or full counter clockwise rotation when there is no input signal.

Automatic Stop at End of Rotation in each Direction (Proportional Models only)
- Avoid excessive wear or drive time on the motor

General

The RA Series electric non-spring return rotary-motion actuators are designed for use with 3-wire on-off/floating or proportional controllers. These non-spring 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.

These bi-directional actuators do not require a damper linkage and are easily installed on a damper with a round shaft of 13 mm (1/2”) in diameter or a square shaft of 10 mm (3/8”) for small actuators, or with a round shaft of 8 to 13 mm (5/16” to 1/2”) in diameter or a square shaft of 10 to 18 mm (3/8” to 11/16”) for medium and large actuators, and with an anti-rotation bracket. They may also be mounted to a ball valve or butterfly valve which comes with a direct-coupled mounting bracket and an extended valve shaft.

Rotation is mechanically limited to 95º by integral end-stops. The position of the actuator is marked from 0 to 90º on the gear box face plate. An anti-rotation bracket prevents lateral movement of the actuator. Pressing the spring-loaded gear release on the actuator cover disengages the gear train for manual repositioning of the shaft coupler. The actuator rotation is field adjustable from 30º to 90º at 10º increments.

Direct Action (DA) and Reverse Action (RA) Jumper Selection (Proportional Models Only)
DA is set for clockwise (CW) rotation and RA for counter clockwise (CCW) rotation.The factory setting is for DA. Can be changed in the field to RA by moving the jumper from DA to RA position on the PC board.

Feedback Signal (Proportional Models Only)
The RA Series actuators are provided with 0-10 VDC position feedback signal on all proportional models.

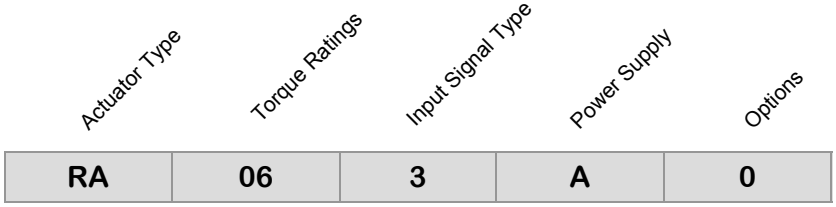
Optional Auxiliary Switches (On-Off/Floating Models Only)
The RA Series actuators are available with one or two built-in auxiliary switches as an option on all on-off/floating models that allow setting at any angle between 0º and 90º.

Input Signal Interruption Protection (Proportional Models Only)
When there is no input signal or input signal is open-circuited, the actuator will return to its full counter clockwise or clockwise rotation position, depending on the J4 jumper setting. 0º is set for full counter clockwise rotation and 95º is set for full clockwise rotation. The factory setting is 0º. Can be changed in the field to 95º by moving the jumper from 0º to 95º position on the PC board.

Ordering
To order, specify complete model number.

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

Figure 1: Actuator Model Number Selection Guide



Actuator Model Number Designations

Actuator Type

RA = RA Series non-spring return rotary-motion actuators

Torque Ratings

Small Size Actuators
02 = 2 Nm
04 = 4 Nm
06 = 6 Nm
08 = 8 Nm
Medium Size Actuators
10 = 10 Nm
15 = 15 Nm
Large Size Actuators
20 = 20 Nm
30 = 30 Nm

Input Signal Type

3 = Three-wire on-off or floating
4 = 0-10 VDC or 4-20 mA proportional

Power Supply

A = 24 V 50/60 Hz*
B = 120 V 50/60 Hz
U = 230 V 50/60 Hz
* Proportional input actuator available with 24 VAC power supply only

Options

0 = No option
2 = With one auxiliary switch (floating models only)
3 = With two auxiliary switches (floating models only)

Specifications

Product Model Numbers	See Figure 1: Actuator Model Number Selection Guide
Power Supply	3-wire on-off or floating: 24, 120 or 230 V 50/60 Hz ±10% Proportional: 24 V 50/60 Hz ±10% only
Power Consumption	Proportional (VA) / 3-wire on-off or floating (VA) 2 Nm: 4 / 3 or 5* 4 Nm: 4 / 3 or 5* 6 Nm: 4 / 3 or 5* 8 Nm: 4 / 3 or 5* 10 Nm: 5 / 4 or 8.5* 15 Nm: 5 / 4 or 8.5* 20 Nm: 5 / 4 or 8.5* 30 Nm: 5 / 4 or 8.5* * 3 and 4 VA for 24 VAC models and 5 and 8.5 VA for 230 VAC models
Input Signal	3-wire on-off or floating: 24, 120 or 230 V 50/60 Hz ±10% Proportional: 0-10 VDC or 4-20 mA
Input Signal Impedance	3-wire on-off or floating: 250 Ω, nominal Proportional: 100,000 Ω of voltage input; 500 Ω of current input
Feedback Signal	Proportional models only: 0-10 VDC for 90º span
Auxiliary Switch Contact Ratings	3-wire on-off or floating models only: Two SPDT rated at 24 VAC 1.5 A inductive, 3 A resistive per switch
Electrical Connection	Non-removable terminal block, wire size 1mm^2 or 18 AWG solid copper recommended
Mechanical Connection	Small size actuators: 13 mm (1/2”) round shaft or 10 mm (3/8”) square shaft Medium and large size actuators: 8 to 13 mm (5/16” to 1/2”) round shaft or 10 to 18 mm (3/8” to 11/16”) square shaft
Protection Class	IP42
Cycles of Operation	At least 60,000
Torque Ratings	2, 4, 6, 8, 10. 15, 20 or 30 Nm
Rotation Range	30-90º in 10º increments, mechanically limited to 95º; factory set at 90º
90º Rotation Time	2 Nm: Nominal 110 s at 50 Hz or 92 s at 60 Hz 4 Nm: Nominal 110 s at 50 Hz or 92 s at 60 Hz 6 Nm: Nominal 110 s at 50 Hz or 92 s at 60 Hz 8 Nm: Nominal 160 s at 50 Hz or 133 s at 60 Hz 10 Nm: Nominal 66 s at 50 Hz or 55 s at 60 Hz 15 Nm: Nominal 90 s at 50 Hz or 75 s at 60 Hz 20 Nm: Nominal 110 s at 50 Hz or 92 s at 60 Hz 30 Nm: Nominal 143 s at 50 Hz or 119 s at 60 Hz
Audible Noise Rating	45 dBA
Ambient Conditions	Operating: -20 to 50ºC (-4 to 122ºF); 0-95% RH, non-condensing Storage: -40 to 86ºC (-40 to 186ºF); 0-95% RH, non-condensing
Agency Approval	CSA approved
Dimensions	See Figure 2: Dimensions and Shipping Weights
Shipping Weights	0.78 kg for actuators of 2, 4, 6 or 8 Nm; For actuators of 10, 15, 20 or 30 Nm, see Figure 2: Dimensions and Shipping Weights

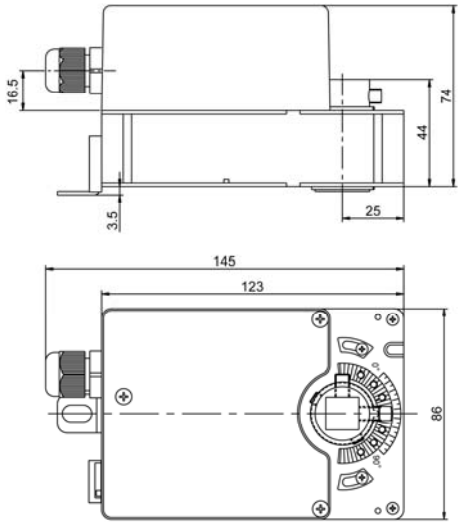
The performance specifications above are nominal and subject to tolerances and application variables of generally acceptable industry standards. The manufacturer shall not be liable for damages resulting from misapplication or misuse of its products.

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.

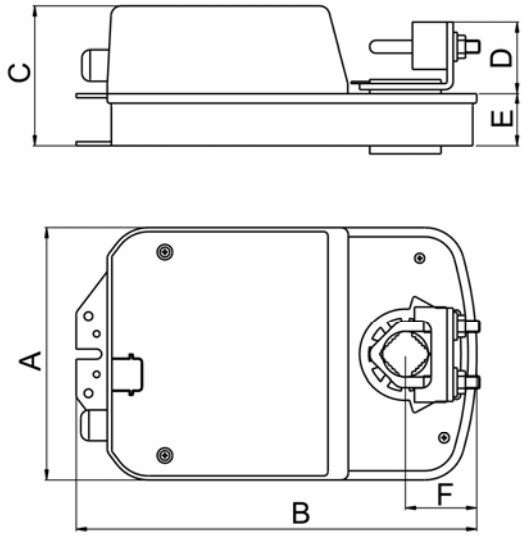
WARNING: All RA Series actuators are designed for use only in conjunction with operating controls. Where an operating control failure would result in personal injury and/or loss of property, it is the responsibility of the installer to add safety devices or alarm systems that protect against, and/or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

Figure 2: Dimensions and Shipping Weights

For Actuators of 2, 4, 6 or 8 Nm



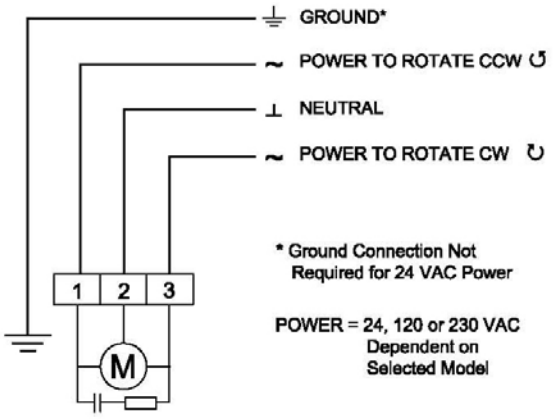
For Actuators of 10, 15, 20 and 30 Nm



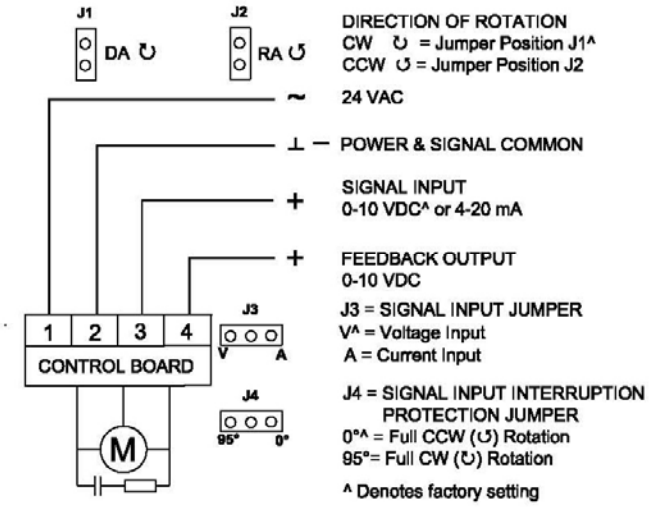
Torque Rating	A		B		C		D		E		F		Weight	
	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Lb.	kg
10 Nm	4-1/4	108	6-7/8	174	2-3/4	70	1-1/2	39	1	26	1-1/4	31	0.61	1.35
15 Nm	4-1/4	108	6-7/8	174	2-3/4	70	1-1/2	39	1	26	1-1/4	31	0.61	1.35
20 Nm	4-7/8	124	7-3/4	196	2-3/4	70	1-1/2	39	1	26	1-3/8	35	0.78	1.72
30 Nm	4-7/8	124	7-3/4	196	2-3/4	70	1-1/2	39	1	26	1-3/8	35	0.78	1.72

Figure 3: Wiring Diagrams

For 3-Wire On-Off/Floating Actuators



For Proportional Actuators



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