

**BCA Series**  
**Electric Actuators**  
**Spring Return**



These Bray direct-coupled spring return rotary electric actuators are designed for on/off, tri-state, or modulating control of building HVAC valves and dampers.

**FEATURES**

- Brushless DC motor technology with stall protection
- Bi-directional fail-safe spring return
- Unique self-centering shaft coupling
- All metal housing
- Access to all functions from either side of the actuator
- Manual override
- 5° preload as shipped from factory
- Offset and span adjustment models available
- Models with independently adjustable dual auxiliary switches available

**APPLICATION OVERVIEW**

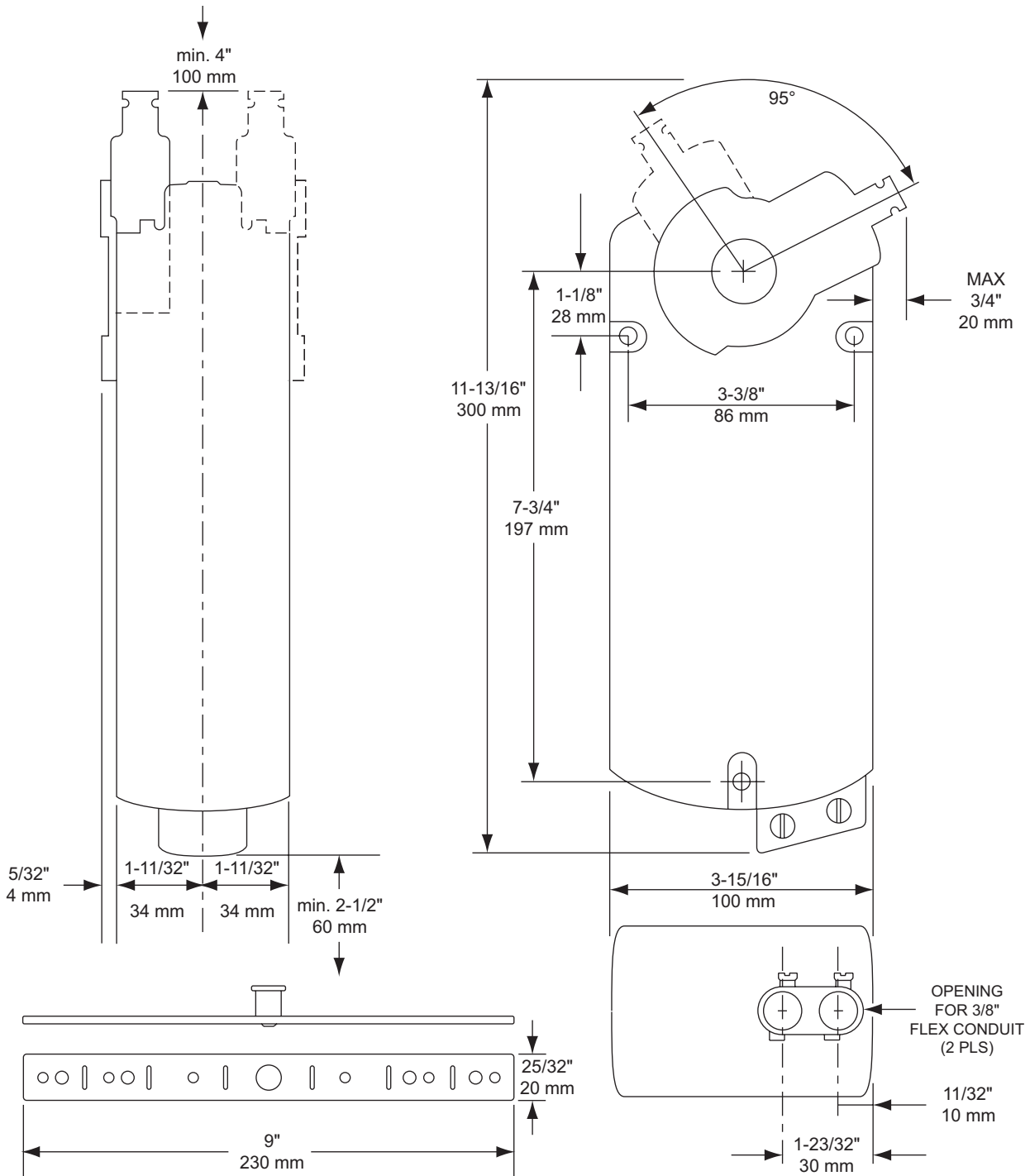
These actuators are used in constant or variable air volume installations for the control of return air, mixed air, exhaust, and face and bypass dampers requiring up to 141 lb-in (16 Nm) torque. They are designed for applications that require the damper to return to a fail-safe position when there is a power failure.

**MODEL INFORMATION**

	BCA121.1U	BCA121.1P	BCA126.1U	BCA126.1P	BCA131.1U	BCA151.1U	BCA151.1P	BCA156.1U	BCA156.1P	BCA161.1U	BCA161.1P	BCA163.1U	BCA163.1P	BCA164.1U	BCA164.1P	BCA166.1U	BCA166.1P	BCA221.1U	BCA226.1U
24 VAC	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
115 VAC																		•	•
Standard Cable	•		•		•	•		•		•		•		•		•		•	•
Plenum Cable		•		•			•		•		•		•		•		•		
0 - 10 VDC Input Signal										•	•	•	•	•	•	•	•		
2 - 10 VDC Input Signal						•	•	•	•										
Dual Auxiliary Switches			•	•				•	•					•	•	•	•		•
Span/Offset Adjustable												•	•	•	•				•

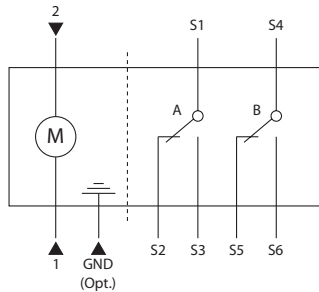
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**DIMENSIONS**

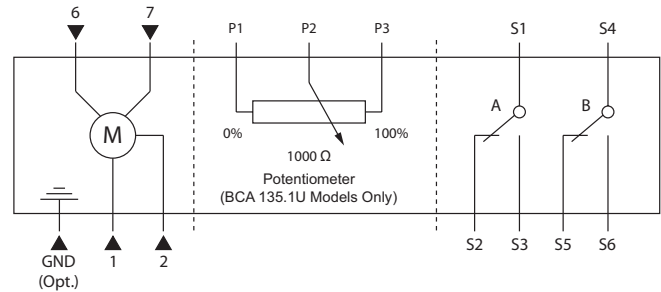


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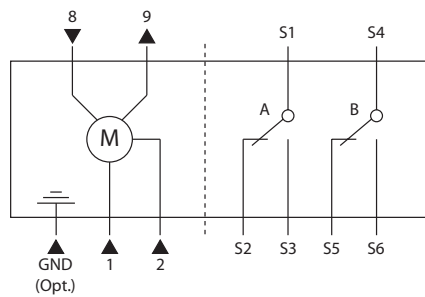
**WIRING DIAGRAMS**



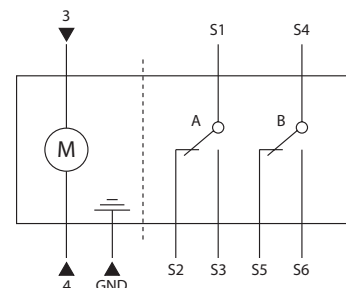
**BCA12X Models**



**BCA13X Models**



**BCA16X Models**



**BCA22X Models**

Symbol	Function	Color	
		Standard	Plenum
1	Supply (SP)	Red	
2	Neutral (SN)	Black	
3	Line	Black	N/A
4	Neutral	Black	N/A
6	Control Signal Clockwise	Violet	
7	Control Signal Counterclockwise	Orange	
8	0 to 10 V input signal	Grey	
9	Output for 0 to 10 VDC position indication	Pink	
GND	Ground	Green/Yellow	
<b>Factory-Installed Options</b>			
S1	Switch A Common	Grey/Red	
S2	Switch A - N.C.	Grey/Blue	
S3	Switch A - N.O.	Grey/Pink	
S4	Switch B Common	Black/Red	
S5	Switch B - N.C.	Black/Blue	
S6	Switch B - N.O.	Black/Pink	
P1	Feedback Potentiometer 0 to 100% P1 - P2	White/Red	Black
P2	Feedback Potentiometer Common	White/Red	Black
P3	Feedback Potentiometer 100 to 0% P3 - P2	White/Red	Black

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**SPECIFICATIONS**

	Operating Voltage	24 VAC +20%, -15% (115 VAC +20%, -15% on 22X Models)		
	Frequency	50/60 Hz		
Power	Power Consumption	On/Off	8 VA Running, 3 VA Holding	
		Tri-State	8 VA Running, 5 VA Holding	
		Modulating	9 VA Running, 5 VA Holding	
	Input signal (If applicable)	Voltage Input	0 to 10 VDC (35 VDC max.)	
		Voltage Input Resistance	100,000 $\Omega$	
	Position Output Signal	Voltage Output	0 - 10 VDC	
Max. Output Current		DC $\pm$ 1 mA		
	Equipment rating	Class 2		
	Pre-cabled connection	AWG 18		
Auxiliary Features	Control Signal Adjustment	Offset (start point)	0 - 5 VDC	
		Factory Setting	0V	
		Span	2 - 30 VDC	
	Dual Auxiliary Switches	Contact Rating	6 A Resistive, 2 A Inductive	
		Voltage	24 to 230 VAC	
		Switch A	Range	0 to 90° (5° intervals)
			Recommended Range	0 to 45°
		Switch B	Factory Setting	5°
			Range	0 to 90° (5° intervals)
		Recommended Range	45 to 90°	
Factory setting	85°			
	Switching Hysteresis	2°		
Function	Running Torque	141 in-lb (16 Nm)		
	Spring Return Torque	141 in-lb (16 Nm)		
	Maximum Torque	< 360 in-lb (40 Nm)		
	Runtime for 90°	Operating with Motor	90 Seconds	
		Spring Return	15 Seconds Typical (30 seconds max.)	
	Nominal Angle of Rotation	90°		
	Maximum Angular Rotation	95°		
Noise Level	<45 dBA (running)			
Mounting	Shaft Size	Round	3/8 - 1 inch (9.5 - 25.4 mm)	
		Square	1/4 - 5/8 inch (6.4 - 15.9 mm)	
	Minimum Shaft Length	3/4 inch (19 mm)		
Housing	Enclosure	NEMA 1		
	Material	Die Cast Aluminum Alloy		
Conditions	Ambient Temperature	Operation	-25 to 130°F (-32 to 55°C)	
		Storage and Transport	-25 to 158°F (-32 to 70°C)	
	Ambient humidity	95% R.H.		
	Cable length	3ft. (0.9 m)		
Misc.	Agency approvals	UL873		
		CSA C22.2 No. 24-93		
	Weight	4.85 lb. (2.2 kg)		

The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the nearest Bray office. Bray controls shall not be liable for damages resulting from misapplication or misuse of its products.

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 **Bray** CONTROLS  
 Commercial Division

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