

Commercial Actuators



Electric

Commercial Electric Actuators

Applications for Building Automation, Temperature Controls, HVAC

Bray's wide variety of commercial electric actuator choices increases flexibility when choosing peripheral products for Building Automation Systems. We offer many different torque outputs and optional features to ensure you have the best actuator for the application. Jumper or DIP switch selectable features allow versatility in the field. The actuators are maintenance-free, which means fewer call backs after installation and start-up. In addition, our actuators are manufactured to ISO 9001 and Six Sigma Standards making them the highest quality on the market today.



All of our commercial electric actuators are applicable to Bray characterized ball valves, globe valves and butterfly valves, depending on the torque requirements of the valves. And all actuators are linkage free when applied to dampers ranging for small VAV box dampers all the way up to large outdoor air and return air dampers. For butterfly valves and large globe valves, tandem arrangements are also available, factory mounted, calibrated and synchronized for smooth and long lasting operation.

Options include:

- Metal or plastic housings
- Spring return or non spring return operation
- Auxiliary Switches (optional)
- Master/slave operation
- Weather Shields for outdoor use
- 24V and line voltage models
- On/off, Floating, or Modulating operation
- Analog feedback on all modulating models
- UL, CSA and CE listings
- 5-year warranty on selected models
- Flying lead or terminal strip electrical connections

Non Spring Return



D-35 & VA-35 Series - 35 in-lbs



DC-44 Series - 44 in-lbs



D-53 Series - 53 in-lbs



DC-88 Series - 88 in-lbs



D-70 Series - 70 in-lbs



D-140 Series - 140 in-lbs



D-210 Series - 210 in-lbs



D-280 Series - 280 in-lbs



DC-310 Series - 310 in-lbs

Spring Return



DS-27 & VA-27 Series - 27 in-lbs



DCS-62 Series - 62 in-lbs



DCS-140 Series - 140 in-lbs



DS-70 & VAS-70 Series - 70 in-lbs



DS-180 Series - 180 in-lbs



The D-35 and VA-35 Series Actuators are direct-mount, non-spring return electric valve actuators that operate on 24 VAC power. Use these synchronous motor-driven actuators to provide accurate positioning on the SoftTouch line of ball valves up to 1-1/2 in. (38 mm) in Heating, Ventilating, and Air Conditioning (HVAC) applications.

The D-35 and VA-35 Series Electric Non-Spring Return Actuators provide a running torque of 35 lb-in (4 Nm). The nominal travel time is 60 seconds at 60 Hz (72 seconds at 50 Hz) for 90° of rotation (non-adjustable models).

FEATURES

- Compact, lightweight design
- Manual Override
- Plenum cable or screw terminal connections
- 100,000 cycle rating
- Synchronous drive for constant rotation, independent of load

MODEL SELECTION

Feature	Model Number	D24-35-TP	DM24-35-P	D24-35-T-TS	DM24-35-TS
Floating Control		•		•	
Proportional Control			•		•
On/Off Control		•*		•*	
0-10 VDC Feedback			•		•
Plenum Cable Connections		•	•		
Terminal Block Connections				•	•

* Relay required

Feature	Model Number	VA24-35-P	VA24-35-PTO	VAM24-35-P
Floating Control		•	•	
Proportional Control				•
On/Off Control		•*	•	
0-10 VDC Feedback				•
Plenum Cable Connections		•	•	•
Time Out Feature			•	

* Relay required

Note: Intended for direct mounting on Bray ST2 ball valves

OPERATION

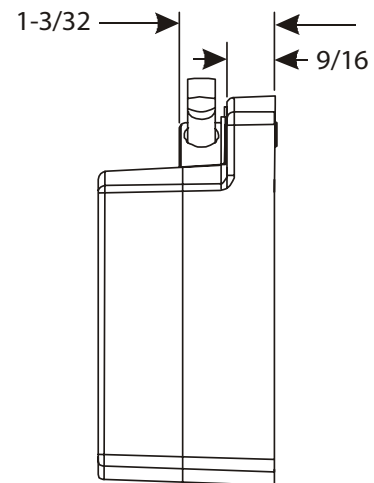
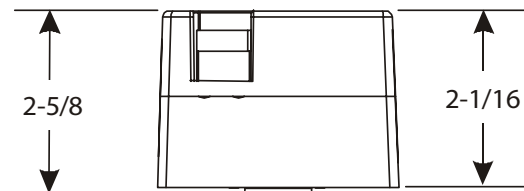
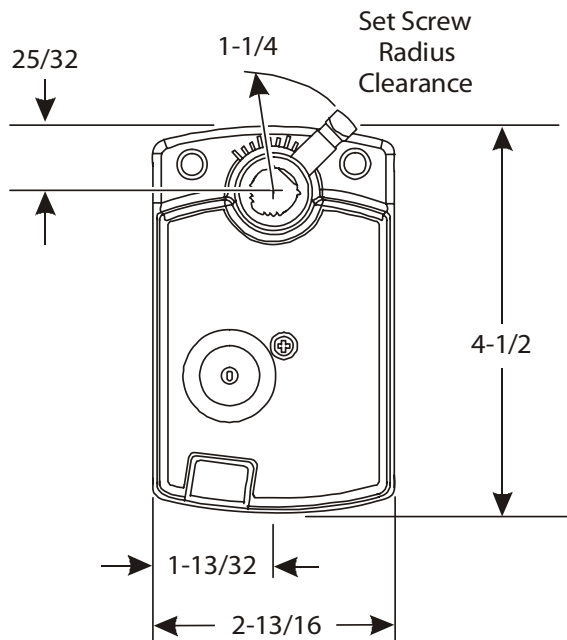
When combined with a controller, the D-35 or VA-35 Series Electric Non-Spring Return Actuator provides reliable, integrated ball valve control. A 24 VAC (floating models) or 0 (2) to 10 VDC or 0 (4) to 20mA (proportional models) input signal from the controller to electric actuator causes the motor to rotate in the proper direction, and moves the ball open or closed. When the controller stops sending the input signal, the electric actuator remains in place.

SPECIFICATIONS

Power Requirements	24 VAC +25%/-20% at 50/60 Hz, 2.1 VA Supply, Class 2 or Safety Extra-Low Voltage (SELV)	
Control Type	D24-35-T	Floating or On/Off Control
	DM24-35	Proportional Control
Input Signal	D24-35-T	AC 24 V +25%/-20% at 50/60 Hz, Class 2 or SELV
	DM24-35	DC 0 (2) to 10 V or 0 (4) to 20 mA with Field Furnished 500 Ω Resistor
Motor Input Impedance	D24-35-T	200 Ω Nominal
Control Input Impedance	DM24-35	Voltage Input: 200,000 Ω Current Input: 500 Ω with Field Furnished 500 Ω Resistor
Running Torque	35 lb-in (4 Nm)	
Travel Time	60 Seconds at 60 Hz (72 Seconds at 50 Hz) for 90° of Rotation	
Rotation Range	93° ±3°, CW or CCW	
Cycles	100,000 Full Stroke Cycles; 2,500,000 Repositions at Rated Running Torque	
Audible Noise Rating	35 dBA Nominal at 39-13/32 in. (1 m)	
Electrical Connections	(-P) Models	48 in. (1.2 m) 18 AWG UL CMP Plenum Cable with 1/4 in. (6 mm) Stripped Wire Leads DM24-35 includes Plenum Cable.
	(-TS) Models	M3 Screw Terminals
Enclosure	D24-35 Series	NEMA 2, IP42
Ambient Conditions	Operating	-4 to 140°F (-20 to 60°C); 90% RH Maximum, Noncondensing
	Storage	-20 to 150°F (-29 to 66°C); 90% RH Maximum, Noncondensing
Compliance	UL Listed, File E27734, CCN XAPX (United States) and XAPX7 (Canada)	
	Housing is Plenum Rated per CSA C22.2 No. 236/UL 1995, Heating and Cooling Equipment	
	CE Mark, EMC Directive 89/336/EEC	
Shipping Weight	1.25 lb (0.55 kg)	
Warranty	5 Years	

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.

DIMENSIONS

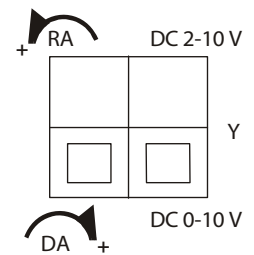
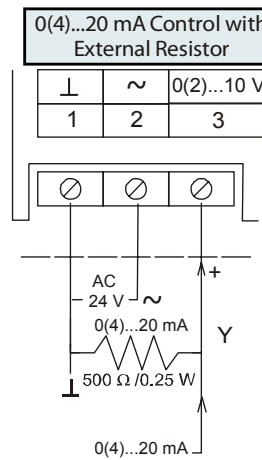
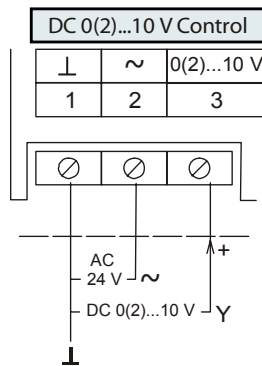
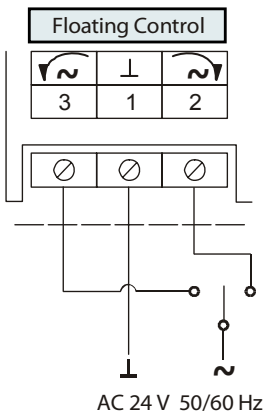


WIRING

Note: Use this D-35 or VA-35 Series Electric Non-Spring Return Actuator only to control equipment under normal operating conditions. Where failure or malfunction of the electric actuator could lead to personal injury or property damage to the controlled equipment or other property, additional precautions must be designed into the control system. Incorporate and maintain other devices such as supervisory or alarm systems or safety or limit controls intended to warn of, or protect against, failure or malfunction of the electric actuator.

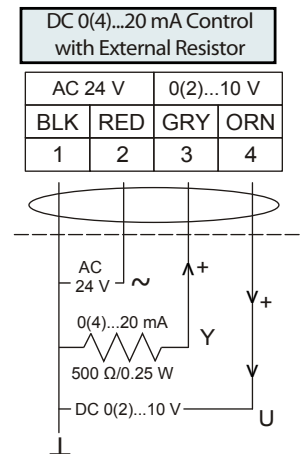
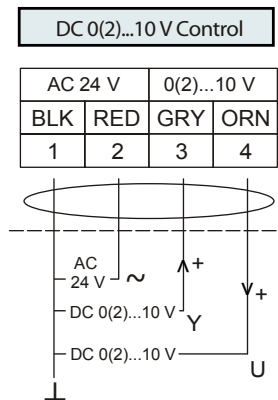
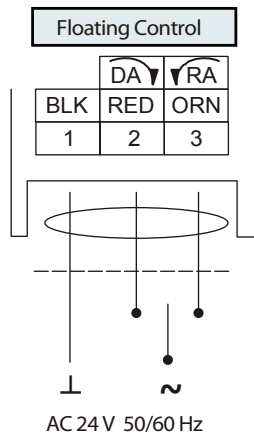
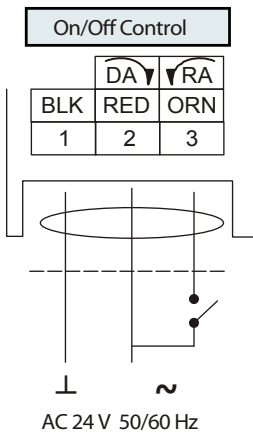
Note: Do not install or use the D-35 or VA-35 Series Electric Non-Spring Return Actuator in or near environments where corrosive substances or vapors could be present. Exposure of the electric actuator to corrosive environments may damage the internal components of the device, and will void the warranty.

TERMINAL BLOCK MODEL WIRING



D-35 Actuators are factory set for Direct Acting (DA) mode and for a 0 to 10 VDC input control signal.

PLENUM CABLE MODEL WIRING





FEATURES

- Compact, lightweight design
- Manual override
- Offset and slope adjustment models available
- UL, CSA approved; CE rated

APPLICATION OVERVIEW

These actuators are used in constant or variable air volume installations for control of HVAC dampers requiring up to 44 lb-in (5 Nm) or 88 lb-in (10 Nm).

These Bray direct coupled 24 VAC non-spring return rotary electric actuators are designed for Floating or Proportional control of valves and dampers.

MODEL SELECTION

Tri-State			
Torque	Cabling	Standard	Dual Auxiliary Switches Only
44 lb-in (5 Nm)	Plenum Cable	DC24-44-TP	DC24-44-TAP
88 lb-in (10 Nm)	Plenum Cable	DC24-88-TP	DC24-88-TAP

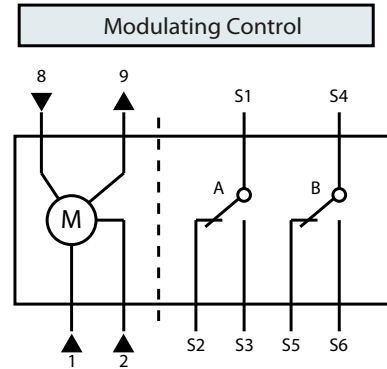
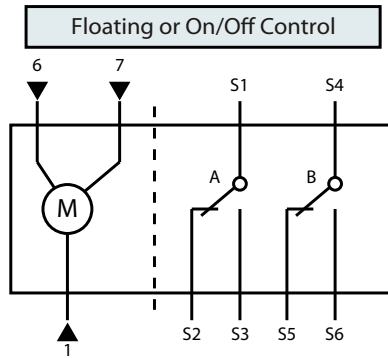
Modulating			
Torque	Cabling	Standard	Dual Auxiliary Switches Only
44 lb-in (5 Nm)	Plenum Cable	DCM24-44-P	DCM24-44-AP
88 lb-in (10 Nm)	Plenum Cable	DCM24-88-P	DCM24-88-AP

SPECIFICATIONS

Power Supply	Operating Voltage	24 VAC +20%, -15%	
	Frequency	50/60 Hz	
	Power Consumption	Tri-State: 2.3 VA Modulating: 3.3 VA	
Control Signal	Voltage Input	0 to 10 VDC	
	Input Resistance	100,000 Ω	
Feedback Signal	Voltage-Output	0 to 10 VDC	
	Max. Output Current	DC 1 mA	
Equipment	Rating	Class 2 According to UL, CSA Class III per EN60730	
	Dual auxiliary switch Contact Rating	4A Resistive, 2A Inductive	
	Voltage	24 VAC / 24 VDC	
	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°	
	Function	Torque	DC24-44 lb-in (5 Nm) DC24-88 lb-in (10 Nm)
		Runtime for 90° Opening or Closing	DC24-44 90 sec. at 60 Hz(108 sec.at 50Hz) DC24-88 125 sec. at 60 Hz(150 sec.at 50Hz)
		Nominal Angle of Rotation	90°
		Maximum Angular Rotation	95°
WARNING:	Mixed switch operation is not permitted. To the switching outputs of both auxiliary switches (A and B), only apply: UL/CSA: Class 2 voltage CE: Separated Extra-Low Voltage (SELV) or Protective Extra Low Voltage (PELV), according to HD384-4-41.		
Mounting	Shaft size	3/8 to 5/8 inch (9.5 to 16 mm) diameter, 1/4" to 1/2" square	
	Minimum Shaft Length	3/4 inch (19 mm)	
Housing	Enclosure	NEMA 2/IP54 according to EN60529	
	Material	Durable Plastic	
Ambient Conditions	Operation	-25 to 130°F (-32 to 55°C)	
	Storage and Transport	-40 to 158°F (-40 to 70°C)	
	Ambient Humidity (non-condensing)	95% R.H.	
Agency Approvals	UL873, CSA C22.2 No. 24-93 , CE		
CE conformity	In accordance with the directive set forth by the European Union for Electromagnetic Compatibility (EMC)	89/336/EEC	
	Emissions Standards	EN 50081-1	
	Immunity Standards	EN 50082-2	
Miscellaneous	Pre-cabled Connection	AWG 18 - Plenum Rated Cable	
	Cable Length	3 ft. (0.9 m)	
	Weight	1.06 lb. (0.48 kg)	

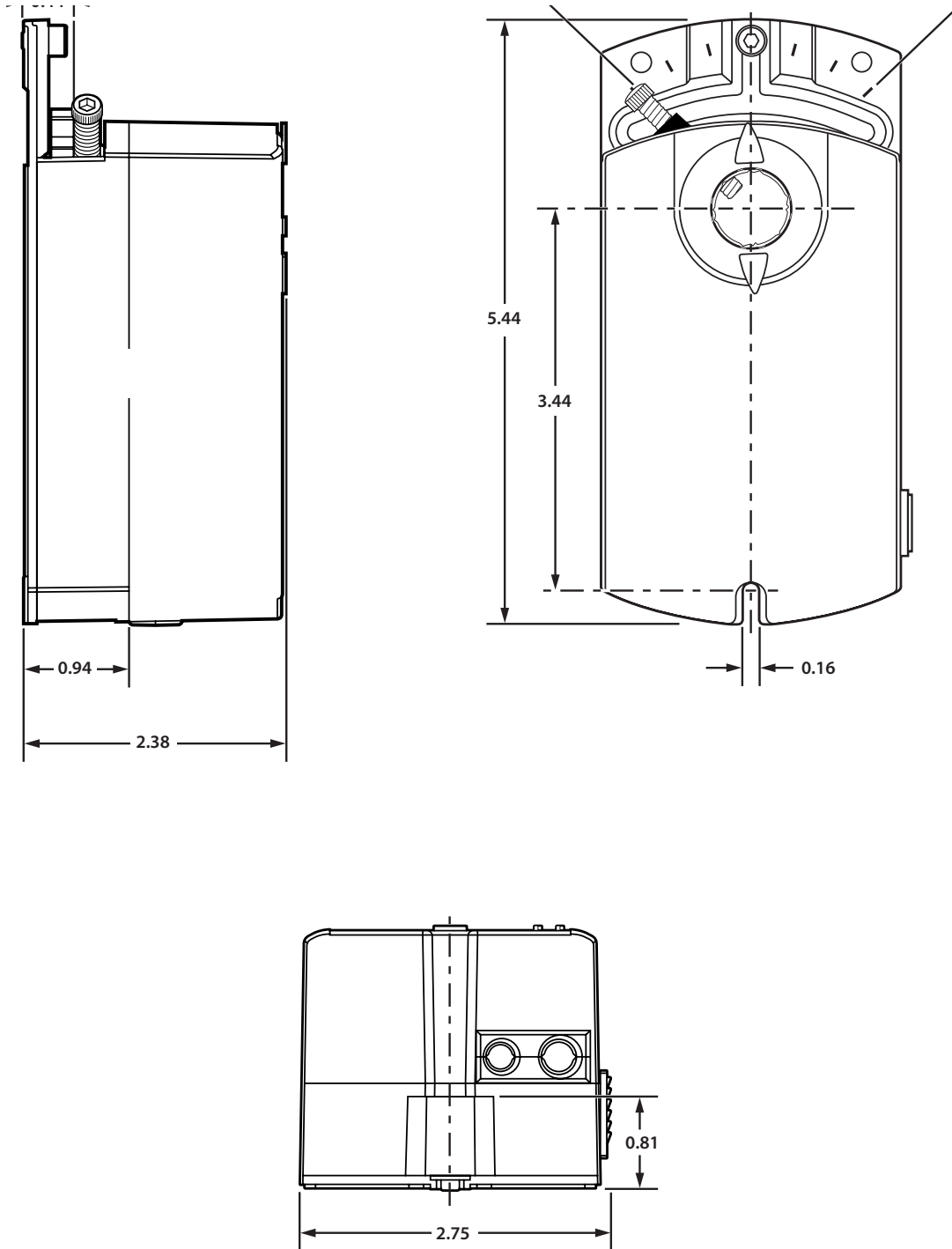
The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the nearest Bray office. Bray controls shall not be liable for damages resulting from misapplication or misuse of its products.

WIRING



Standard Symbol	Function	Terminal Designation	Color
1	Supply (SP)	G	Red
2	Neutral (SN)	G0	Black
6	Control Signal Clockwise	Y1	Violet
7	Control Signal Counterclockwise	Y2	Orange
8	0 to 10 V input signal	Y	Grey
9	Output for 0 to 10 VDC position indication	U	Pink
Factory-Installed Options			
S1	Switch A Common	Q11	Black
S2	Switch A - N.C.	Q12	Black
S3	Switch A - N.O.	Q14	Black
S4	Switch B Common	Q21	Black
S5	Switch B - N.C.	Q22	Black
S6	Switch B - N.O.	Q24	Black

DIMENSIONS



**D -53 Series
Features and Model Selection Chart**



The D-53 Series is a direct-mount line of motor actuators that operates on 24 VAC power and is available for use with incremental or proportional controllers. These non-spring return actuators are easily installed on variable air volume (VAV) boxes as well as Bray SoftTouch Series characterized ball valves.

The D-53 Series have a 53 lb-in (6 Nm) running torque. They have a nominal 90 second travel time for 90° of rotation at 60 Hz (108 seconds at 50 Hz).

The D-53 Series are available with integral auxiliary switches to perform switching functions at any angle within the selected rotation range. Proportional models feature 0 to 10 VDC position feedback.

MODEL SELECTION

Feature	Model Number	D24-53-T	D24-53-TA	DM24-53	DM24-53-A
Floating Control		•	•		
On/Off Control		•*	•*		
Proportional Control				•	•
0-10 VDC Feedback				•	•
2 Auxiliary Switches			•		•

* Relay required

FEATURES

BENEFITS

35 dBA Rating	Meets audible requirements for open ceilings
100,000-Cycle Rating	Extends actuator life due to improved technology
Direct Shaft Mount with Single-screw Coupler	Simplifies installation and provides 3-point shaft gripping. 3/8" to 1/2" Round Shaft or 3/8" Square Shaft.
Magnetic Clutch	Provides torque protection for the damper and actuator
Jumper-selectable Rotation Direction on Proportional Models	Simplifies installation
Adjustable Rotation Stops	Allow application versatility with 30 to 90° Clockwise (CW) or Counter-clockwise (CCW) rotation
1/2 in. NPT Threaded Conduit Openings	Allows the use of armored cable
Manual Gear Release	Simplifies setup and field adjustments
0 to 10 VDC Feedback on Proportional Models	Provides simple, closed-loop control with accurate position sensing

APPLICATION OVERVIEW

The D-53 Series is used to position dampers, such as in typical HVAC applications. It is also used to position the blades in a VAV box. Refer to the damper or VAV box manufacturer's information to select the proper timing for the actuator. Refer to the appropriate application note for specific wiring diagrams and information.

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.

SPECIFICATIONS

Product	D-53 Series Electric Motor Actuator
Power Requirements	On/Off or Floating: 20 to 30 VAC at 50/60 Hz; 2.5 VA supply, minimum; Class 2 Proportional: 20 to 30 VAC at 50/60 Hz; 3.2 VA supply, minimum; Class 2
Input Signal	On/Off or Floating: 20 to 30 VAC at 50/60 Hz Proportional: 0 to 10 VDC or 0 to 20 mA
Input Signal Adjustments	On/Off or Floating: CW and COM Terminals, CW rotation; CCW and COM Terminals, CCW rotation Proportional: Voltage Input or Current Input Jumper-selectable: 0 (2) to 10 VDC or 0 (4) to 20 mA Factory Setting: 0 to 10 VDC, CW rotation with signal increase Proportional: Action is Direct (CW) or Reverse (CCW) with signal increase (jumper-selectable).
Input Impedance	On/Off or Floating: 200 Ω, nominal Proportional: Voltage Input, 150,000 Ω; Current Input, 500 Ω
Feedback Signal	Proportional: 0 to 10 VDC or 2 to 10 VDC for 90° (1 mA at 10 VDC) (Corresponds to input signal span selection.)
Aux Switch Rating	(-A) Models -Two Single-Pole, Double-Throw (SPDT) switches rated at AC 24 V, 1.5 A inductive, 3.0 A resistive, 35 VA maximum per switch, Class 2
Electrical Connections	1/4 in. spade terminals (optional Pluggable Terminal Blocks)
Mechanical Connection	3/8 to 1/2 in. (10 to 12.7 mm) round shaft or 3/8 in. (10 mm) square shaft
Enclosure	NEMA 2, IP32
Mechanical Output	Running: 53 lb-in (6 Nm)
Cycles	100,000 full cycles, 2,500,000 repositions rated at 53 lb-in (6 Nm)
Audible Noise Rating	35 dBA maximum at 1 m
Rotation	Adjustable from 30 to 90°, CW or CCW
90 Degree Rotation Time	Nominal 60 seconds at 60 Hz Nominal 72 seconds at 50 Hz
Ambient Operating Conditions	-4 to 125°F (-20 to 52°C); 90% RH maximum, non-condensing
Ambient Storage Conditions	-40 to 176°F (-40 to 80°C); 90% RH maximum, non-condensing
Dimensions (H x W x D)	5.9 x 4.2 x 2.64 in. (150.1 x 106.5 x 67 mm)
Shipping Weight	2.4 lb (1.08 kg)
Agency Compliance	UL 873 Listed, File E27734, Guide XAPX CSA C22.2 No. 139, File LR85083, Class 3221 02 CE Mark, EMG Directive 89/336/EEC
Warranty	5 Years

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

OPERATION

WARNING: All D-53 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.

The D-53 Series provides a 53 lb-in (6 Nm) running torque and a minimum stall torque of 55 lb-in for floating or proportional control of VAV box dampers.

The D-53 Series mounts directly on the duct surface, round damper, or small rectangular damper with an anti-rotation bracket and two sheet metal screws (included). Additional linkages or couplers are not required.

A controller provides a control signal to the actuator depending upon the desired movement of the damper blade. This signal causes the motor to rotate in the proper direction and moves the damper blade open or closed.

Note: To avoid excessive wear or drive time on the motor, use a controller and/or software that provides a time-out function to remove the signal at the end of rotation (stall).

The actuator rotates at a nominal rate of 1° per second (90° in 90 seconds) at 60 Hz input. The actuator rotation is field adjustable from 30 to 90°. Actual rotation time for actuators, using less than 90° rotation, should be determined and that value used with the controller software. For example, 60 seconds would be used for 60° rotation.



The D-Series is a direct-mount line of electric actuators that operates on 24V AC or DC power and is available for use with floating, proportional, or resistive controllers. These bi-directional actuators do not require a damper linkage, and are easily installed on a round shaft up to a 3/4 in. (19 mm) diameter or a square shaft up to 5/8 in. (16 mm). They can also be mounted to valves using one of the Bray Valve Linkage Kits.

The D-Series Models deliver up to 280 lb-in (32 Nm) of torque. The angle of rotation is mechanically adjustable from 0 to 90° in 5-degree increments. Integral auxiliary switches are available to indicate end-stop position or to perform switching functions at any angle within the selected rotation range. Position feedback is available through switches, a potentiometer, or a 0 (2) to 10 VDC signal.

MODEL SELECTION

Feature	70 lb-in (8 Nm)				140 lb-in (16 Nm)				210 lb-in (24 Nm)				280 lb-in (32 Nm)			
	D24-70	D24-70-A	DM24-70	DM24-70-A	D24-140	D24-140-A	DM24-140	DM24-140-A	D24-210	D24-210-A	DM24-210	DM24-210-A	D24-280	D24-280-A	DM24-280	DM24-280-A
Floating Control	•	•			•	•			•	•			•	•		
On/Off Control	•	•			•	•			•	•			•	•		
Proportional Control			•	•			•	•			•	•			•	•
0-10 VDC Feedback			•	•			•	•			•	•			•	•
2 Auxiliary Switches		•		•		•		•		•		•		•		•

FEATURES

BENEFITS

Master/Slave Option on Proportional Models	Allows selectable rotation direction simplifying installation
Calibration Output on Proportional Models	Increases speed and accuracy of zero and span adjustments over the entire range without waiting for mechanical rotation
Four Torque Ratings: 70, 140, 210 and 280 lb-in (8, 16, 24 and 32 Nm)	Allows selection of torque rating most suitable for the application
Jumper-selectable Rotation Direction and Manual Gear Release	Simplifies installation, setup, and field adjustments
Electronic Stall Detection	Provides higher reliability by deactivating the motor when a stall condition is detected
Output Position Feedback	Provides simple, closed-loop control with accurate position sensing (standard on proportional and resistive models, optional on floating models)
NPT Threaded Housing	Meets electrical code requirements

APPLICATION OVERVIEW

Note: This device is not designed or intended to be used in or near environments where explosive vapors or gases could be present, or environments where substances corrosive to the device’s internal components could be present.

D-Series actuators are designed to position air dampers and valves in HVAC systems. Applications include:

- positioning return air or exhaust dampers
- controlling face and bypass dampers
- positioning blades for variable volume fans
- positioning valves used with a Bray Valve Linkage

Refer to the manufacturer’s information to properly size the damper, valve, and/or actuator. Spring return actuators, such as Bray DS Series Models are recommended for use with outdoor air dampers in cold climates.

OPERATION

Note: All D-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. D-Series actuators operate on 24 VAC at 50/60 Hz or 24 VDC. These compact actuators use a DC motor with stall detection circuitry that operates throughout the entire stroke. The proportional and resistive actuators employ noise filtering techniques on the control signal to eliminate response to spurious noise.

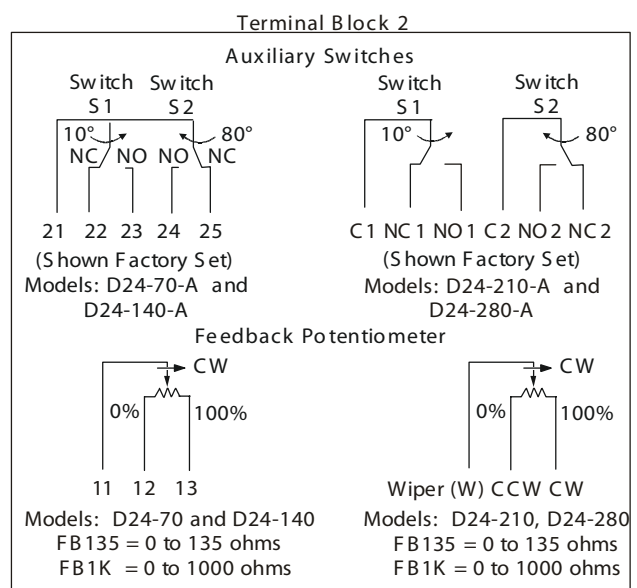
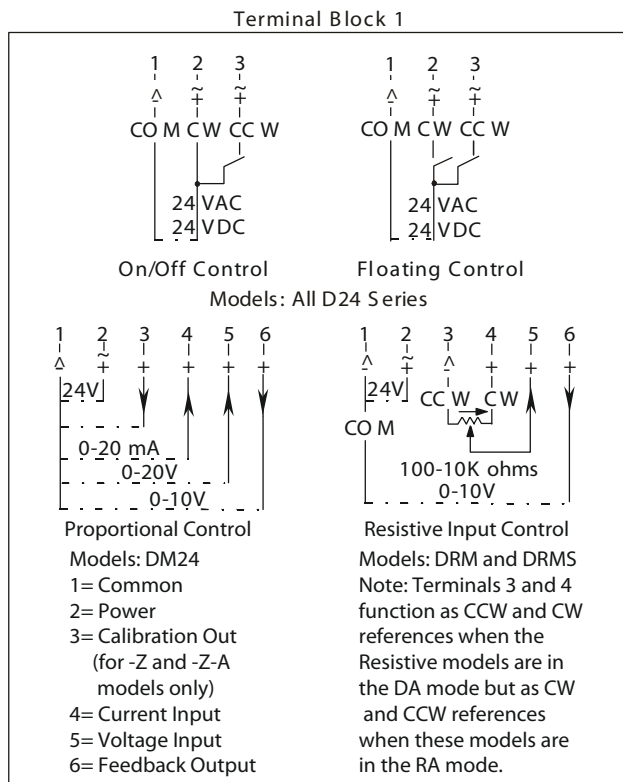
Rotation is limited to 93° by integral end-stops. The position of the actuator is visually indicated from 0 to 90° on the cover. An anti-rotation bracket prevents lateral movement of the actuator. The actuator has a manual override for hand positioning the coupler.

SPECIFICATIONS

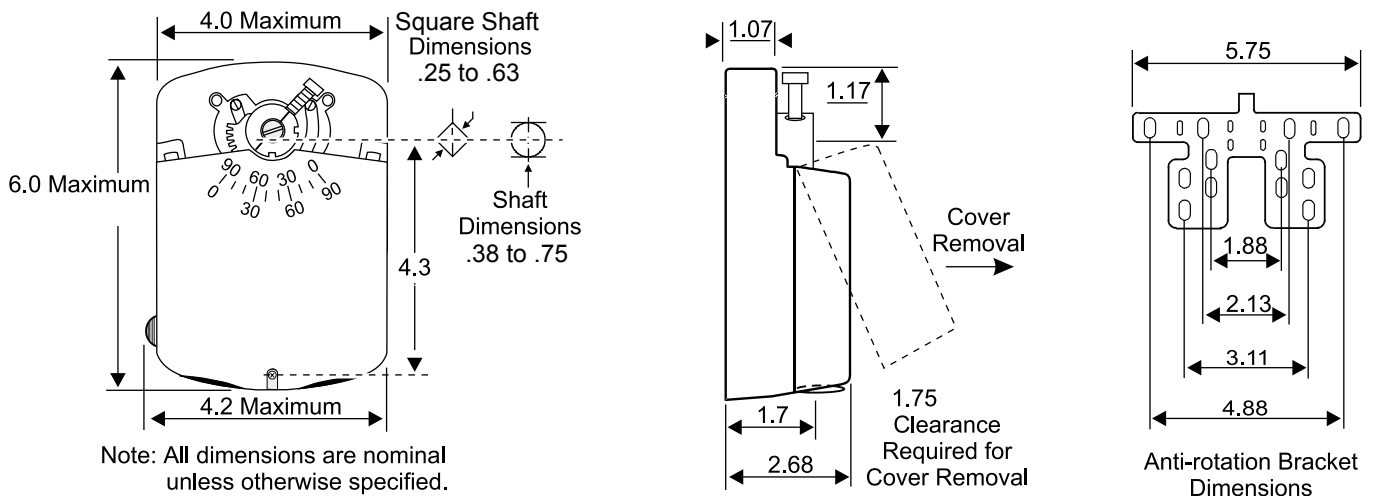
Power Requirements	On/Off and Floating:	20 to 30 VAC at 50/60 Hz or 24 VDC ±10%; 6.5 VA supply, minimum; Class 2
	Proportional and Resistive:	20 to 30 VAC at 50/60 Hz or 24 VDC ±10%; 7.5 VA supply, minimum; Class 2
Input Signal	On/Off and Floating:	24 VAC at 50/60 Hz or 24 VDC
	Proportional:	0(2) to 10 VDC, 0(2) to 20 VDC or 0 (4) to 20 mA
	Floating Factory Setting:	Terminals 1 and 2, CW rotation; Terminals 1 and 3, CCW rotation
Input Signal Adjustments	Proportional (Voltage Input or Current Input):	Jumper selectable, Fixed: 0 (2) to 10 VDC or 0 (4) to 20 mA
		Adjustable: Zero, 0 to 6 VDC, 0 to 12 VDC or 0 to 12 mA Span, 0 to 10 VDC, 4 to 20 VDC or 4 to 20 mA
Input Impedance	Floating	400 Ω
	Proportional	Voltage Input, 205,000 Ω for 0 (2) to 10V and 410,000 Ω for 0 (4) to 20V Current Input, 500 Ω
Feedback Signal	Floating:	1,000 Ω or 135 Ω (models with feedback potentiometer)
	Proportional	0 to 10 VDC or 2 to 10 VDC for 90° (1 mA at 10 VDC)
Switch Contact Rating	Two SPDT (Single-Pole, Double-Throw) rated at 24 VAC 1.5A inductive, 3A resistive, 35 VA max. per switch, Class 2	
Mechanical Output	D24-70	70 lb-in (8 Nm)
	D24-140	140 lb-in (16 Nm)
	D24-210	210 lb-in (24 Nm)
	D24-280	280 lb-in (32 Nm)
Audible Noise Rating	45 dBA at 1 m	
Rotation Range	Adjustable from 0 to 90° in 5° increments, mechanically limited to 93°	
Rotation Timing	D24-70	30 sec. at 50% rated load, 25 to 50 sec. for 0 to 70 lb-in (0 to 8 Nm)
	D24-140	80 sec. at 50% rated load, 70 to 115 sec. for 0 to 140 lb-in (0 to 16 Nm)
	D24-210	130 sec. at 50% rated load, 115 to 175 sec. for 0 to 210 lb-in (0 to 24 Nm)
	D24-280	140 sec. at 50% rated load, 115 to 205 sec. for 0 to 280 lb-in (0 to 32 N·m)
Cycle Life	60,000 full stroke cycles	
Electrical Connection	Screw terminals for 22 to 14 AWG (insert a maximum of two 18, 20, or 22 AWG per terminal.)	
Mechanical Connection	3/8 to 3/4 in. (10 to 20 mm) diameter round shaft 3/8 to 5/8 in. (10 to 16 mm) square shaft	
Enclosure	NEMA 2, IP42	
Ambient Conditions	Operating	-4 to 122°F (-20 to 50°C); 0 to 95% RH, non-condensing
	Storage	-40 to 186°F (-40 to 86°C); 0 to 95% RH, non-condensing
Dimensions (H x W x D)	7.09 x 3.94 x 2.54 in. (180 x 100 x 64.5 mm)	
Shipping Weight	2.9 lb (1.3 kg)	
Agency Compliance	UL Listed, File E27734, CCN XAPX CSA Certified, File LR85083, Class 322102 CE Mark, EMC Directive 89/336/EEC	
Warranty	5 Years	

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

WIRING



DIMENSIONS



Dimensions are in inches



TYPICAL SPECIFICATIONS

Non-spring return damper actuators shall be the direct-coupled type that requires no connecting linkages. The non-spring return actuators shall have a self-centering damper shaft coupling that assures concentric alignment of the actuator's output coupling with the damper shaft and be capable of direct mounting to a shaft up to a 1-inch diameter.

Actuators shall provide stall protection throughout the full range of rotation. All non-spring return actuators shall be capable of both clockwise and counterclockwise operation. All actuators shall hold position in the event of a power failure. All actuators shall return to the 0 position in the event only the control signal is lost. All actuators shall provide a means of manually positioning the output coupling in the absence of power.

Dual independently adjustable auxiliary switches must be integral to the actuator. All actuators must be pre-cabled and provide an easily readable high contrast yellow on black position indicator. All actuators shall be UL873, CE and CSA22.2 listed and manufactured under ISO 9002 and ISO 14000 procedures.

Actuators shall be designed for a minimum of 60,000 full stroke cycles at the actuators rated torque and temperatures.

These Bray direct coupled 24 VAC non-spring return rotary electric actuators are designed for 3 position or modulating control of building HVAC valves and dampers.

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 310 lb-in (35 Nm) torque.

FEATURES

- Brushless DC motor technology
- Unique self-centering shaft coupling
- All metal housing
- Manual override
- Offset and span adjustment models available
- Independently adjustable dual auxiliary switches available

MODEL SELECTION

Feature	310 lb-in (35 Nm)			
	Model Number DC24-310-T	DC24-310-TA	DCM24-310	DCM24-310-A
Modulating			•	•
On/Off	•*	•*		
Tri-State	•	•		
0 - 10 VDC Input Signal			•	•
Dual Auxiliary Switches		•		•
Feedback			•	•

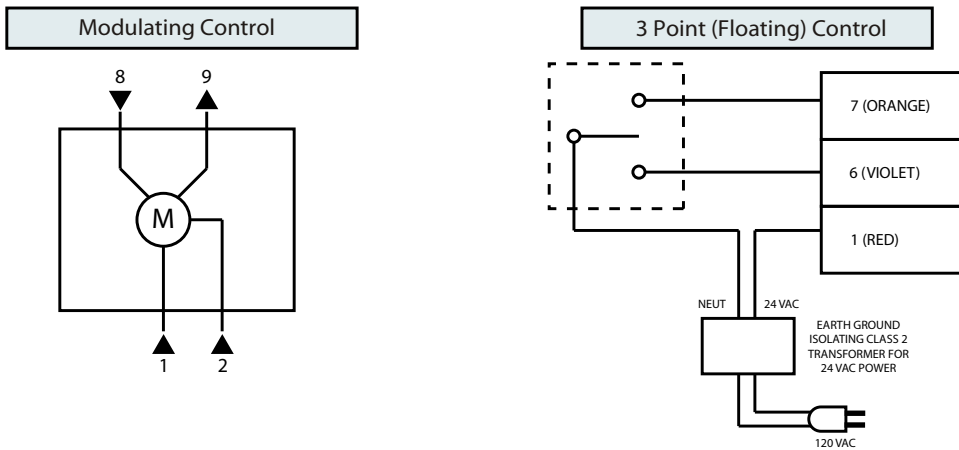
*Relay required

SPECIFICATIONS

Power Supply	Operating Voltage	24 VAC, 20%±		
	Frequency	50/60 Hz		
	Power Consumption	DC-310 Series (Floating 7VA, 7W) (Modulating 8VA, 8W)		
Equipment Rating	Operating Voltage	Class 2, in accordance with UL/CSA		
Control Signal (Modulating Only)	Voltage	Input	0 to 10 VDC	
		Resistance	100,000 Ω	
Auxiliary Features	Feedback Potentiometer	0 to 1,000 Ohms, <10 mA		
	Dual Auxiliary Switch	Standard Cable	AC, 6 A resistive, AC 2 A General Purpose	
		Voltage	Standard Cable	24 to 250 VAC
	Switch Range	Switch A	0 - 90° with 5° intervals	
		Recommended Usage	0 - 45°	
		Switch B	0 - 90° with 5° intervals	
		Recommended Usage	45 - 90°	
Factory Setting	Switch A 5°, Switch B 85°			
Function	Running Torque	DC-310 Series	310 lb-in (35 Nm)	
	90° Run Time	150 seconds, 125 seconds at 60 Hz		
	Nominal Angle of Rotation	90°		
	Maximum Angular Rotation	95°		
Mounting	Shaft Size	3/8 to 1 inch (9.5 to 25.4 mm)		
		1/4 to 5/8 inch (6.4 to 15.9 mm)		
	Minimum Shaft Length	3/4 inch (19 mm)		
Housing	Enclosure	NEMA 2 in vertical position to 90° to the left and right of vertical		
	Material	Die Cast Aluminum Alloy		
Conditions	Ambient Temperature	Operation	-25 to 130°F (-32 to 55°C)	
		Storage and Transport	-40 to 158°F (-40 to 70°C)	
Miscellaneous	Ambient Humidity	95% R.H.		
	Cable Length	3 ft. (0.9 m)		
	Weight	4.4 lb (2 kg)		
	Noise Level	<45 dBA		
	Agency Approvals	UL listed to UL873 cUL certified to Canadian Standard C22.2 No. 24-93 CE conformity: Electromagnetic compatibility 2004/108/EC Low-voltage directive 2006/95/EC		

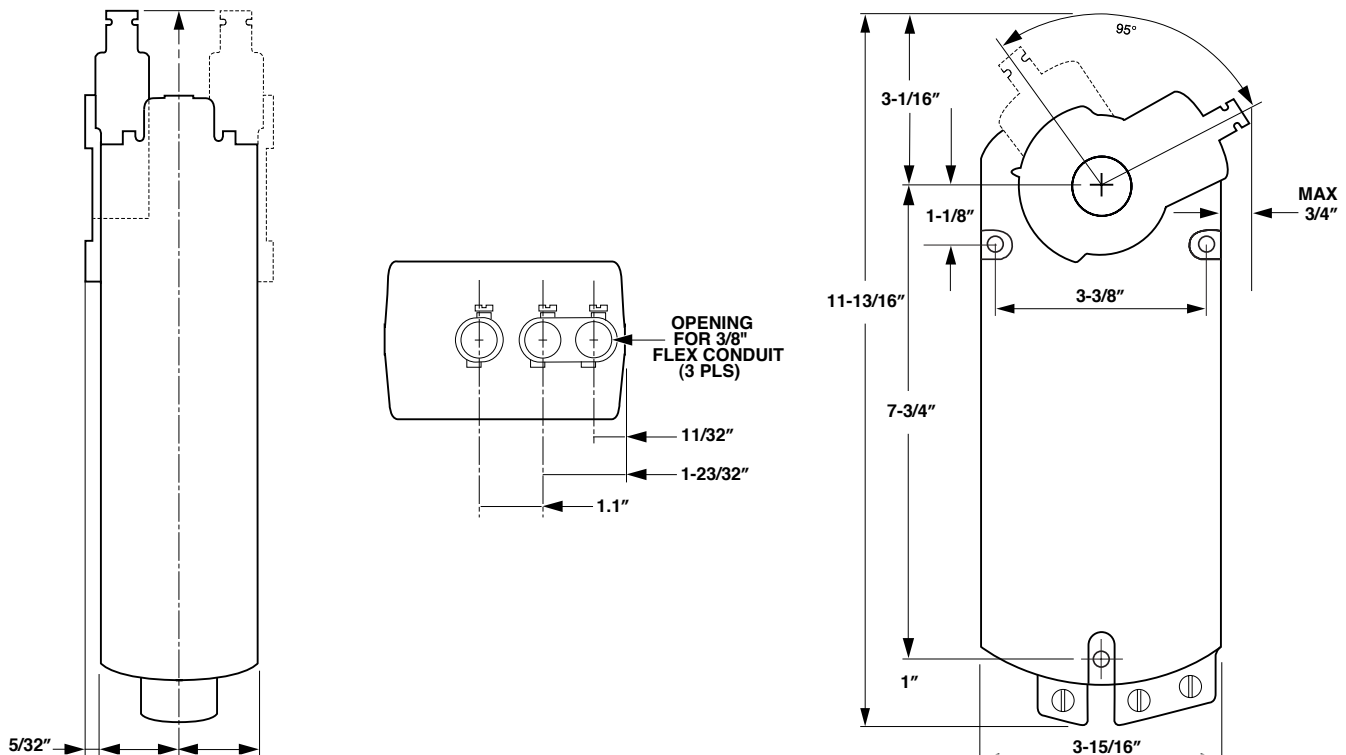
The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the nearest Bray office. Bray controls shall not be liable for damages resulting from misapplication or misuse of its products.

WIRING



Symbol	Function	Terminal Designations	Color
1	Supply	G	Red
2	Neutral	G0	Black
6	Control Signal Clockwise	Y1	Violet
7	Control Signal Counterclockwise	Y2	Orange
8	0 - 10 VDC Input Signal	Y	Gray
9	Output for 0 - 10 VDC Position Indication	U	Pink

DIMENSIONS





The DS-27 and VAS-27 Series Actuators are direct-mount, spring return electric valve actuators that operate on 24, 110, and 220 VAC or 24 VDC power. Use these synchronous motor-driven actuators to provide accurate positioning on the Bray characterized ball valves and ATi valves up to 1" and smaller dampers requiring up to 27 lb.in. of torque.

FEATURES

- Direct-coupled design
- Reversible mounting for spring return to clockwise or counterclockwise direction
- Electronic stall detection
- Override control (proportional models)
- 60,000 cycle rating (full stroke)
- Optional integrated auxiliary switch
- Plenum rated models available

OPERATION

These actuators do not require a damper linkage. Actuators can be mounted directly to a damper or valve shaft from 1/4 to 1/2 in. (6 to 12 mm) diameter with a universal clamp. An optional line voltage auxiliary switch indicates an end-stop position or performs switching functions within the selected rotation range.

DS-27 and VAS-27 Series Actuators provide 95° of rotation. A graduated scale from -5° to 90° and a position indicator provide visual indication of stroke. When power fails during service, the mechanical spring return system provides rated torque to the connected equipment, returning it to the normal position.

MODEL SELECTION

Feature	Model Number	DS24-27	DS24-27-T	DMS24-27	DS24-27-A	DS24-27-TA	DMS24-27-A	DSU20-27	DSU20-27-A
On/Off Control		•	•		•	•		•	•
Floating Control			•			•			
Proportional Control				•			•		
Auxiliary Switch					•	•	•		•
Feedback				•			•		
120/240VAC								•	•
24VAC/DC		•	•	•	•	•	•		

Feature	Model Number	VAS24-27	VAS24-27-T	VAMS24-27	VAS24-27-A	VAS24-27-TA	VAM S24-27-A	VASU20-27	VASU20-27-A
On/Off Control		•	•		•	•		•	•
Floating Control			•			•			
Proportional Control				•			•		
Auxiliary Switch					•	•	•		•
Feedback				•			•		
120/240VAC								•	•
24VAC/DC		•	•	•	•	•	•		

Note: Intended for direct mounting on Bray ST2 ball valves

SPECIFICATIONS

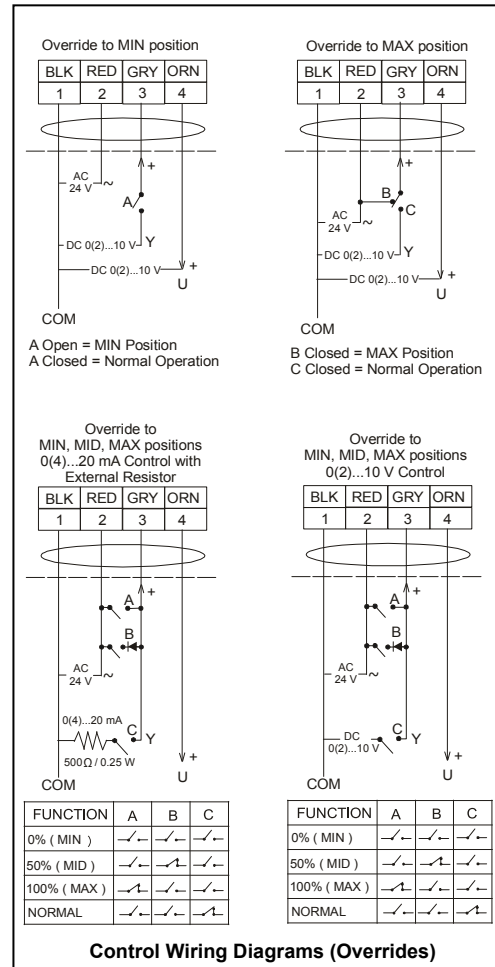
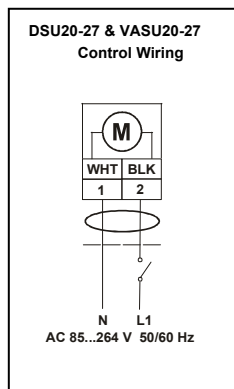
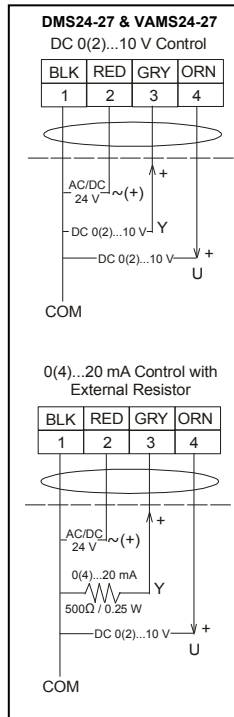
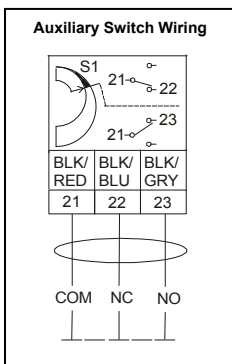
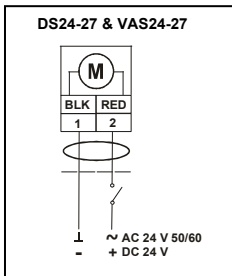
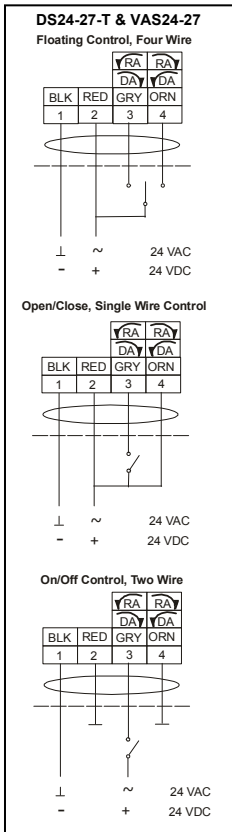
Power Requirements	All 24V Models	24 VAC $\pm 20\%$ at 50/60 Hz, 5 VA Running/2.7 VA Holding , Class 2 or SELV 24 VDC +20%/-10%, 2.8 W Running/0.8 W Holding, Class 2 or SELV	
	Line Voltage Models	100 to 240 VAC at 50/60 Hz, 0.07 A Running/0.02 A Holding	
Auxiliary Switch Rating	One SPDT, Double Insulated Switch with Silver Contacts AC 24V, 50 VA Pilot Duty AC 120V, 5.8 A Resistive, 1/4 HP, 275 VA Pilot Duty AC 240V, 5.0 A Resistive, 1/4 HP, 275 VA Pilot Duty		
Spring Return	Direction is Selectable with Mounting Position of Actuator: Actuator Side A is away from damper or valve: CCW Spring Return Actuator Side B is away from damper or valve: CW Spring Return		
Rotation Range	Maximum Full Stroke: 95° Adjustable Stop: 35 to 95° Maximum Position		
Rotation Time for 90°	Power On	All 24V Models	90 Seconds
		Line Voltage Models	27 seconds
	Power Off (Spring-Driven)	All 24V Models	16 seconds
		Line Voltage Models	22 seconds
Life Cycles	60,000 Full stroke cycles (1,500,000 repositions) at full working load		
Mechanical Connections	Round Shafts	1/4 in. to 1/2 in. (6 to 12 mm)	
	Square Shafts	1/4 in. to 5/16 in. (6 to 8 mm)	
Electrical Connections	48 in. plenum rated leads with 1/2" NPT conduit connector - (see model selection chart)		
Audible Noise	Motor On	< 37 dba at 40 in. (1m)	
	Motor Holding	< 20 dba at 40 in. (1m)	
	Spring Returning	< 56 dba at 40 in. (1m)	
Ambient Conditions	Operating: -22° to 140° F (-30° to 60° C) 90% RH max. non condensing		
	Storage: -40° to 185° F (-40° to 85° C) 95% RH max. non condensing		
Control Input Impedance (Modulating Models)	Voltage	100,000 Ohm	
	Current	500 Ohm with field-furnished 500 Ohm resistor	
Enclosure Rating	NEMA 2 (IP54) for all mounting orientations		
Compliance	UL Listed, CCN XAPX, File E27734; to UL 60730-1A: 2003-08, Ed. 3.1, Automatic Electrical Controls for Household and Similar Use; and UL 60730-2-14: Ed. 1, Part 2, Particular Requirements for Electric Actuators.		
Shipping Weight	Without Aux. Switch	2.0 lb (0.9 kg)	
	With Aux. Switch	2.4 lb (1.1 kg)	
Warranty	5 Years		

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

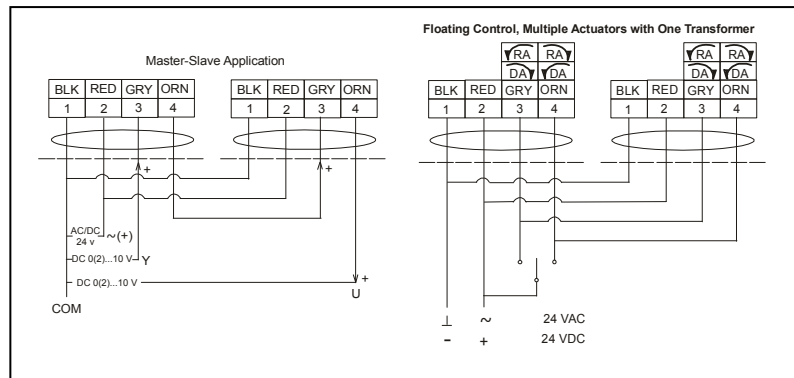
WIRING

Note: Use this DS-27 and VAS-27 Series Electric Spring Return Actuator only to control equipment under normal operating conditions. Where failure or malfunction of the electric actuator could lead to personal injury or property damage to the controlled equipment or other property, additional precautions must be designed into the control system. Incorporate and maintain other devices such as supervisory or alarm systems or safety or limit controls intended to warn of, or protect against, failure or malfunction of the electric actuator.

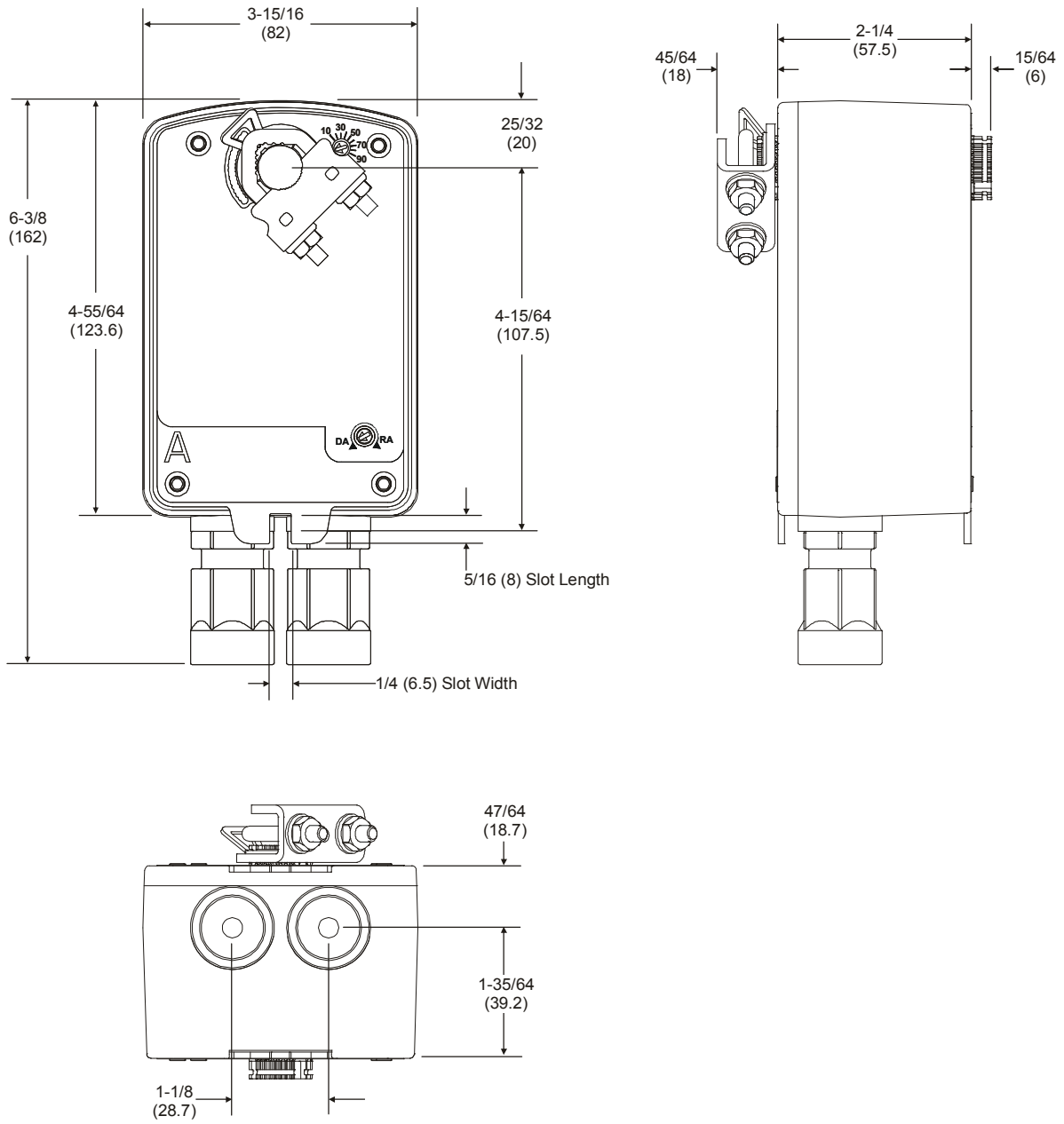
Note: Do not install or use the DS-27 and VAS-27 Series Electric Spring Return Actuator in or near environments where corrosive substances or vapors could be present. Exposure of the electric actuator to corrosive environments may damage the internal components of the device, and will void the warranty.



IMPORTANT: Do not install multiple DS-27 or VAS24-27 Series Actuators connected to the same mechanical load. Master-Slave application of DS-27 or VAS24-27 Series Actuators requires that each actuator be connected to independent loads.



DIMENSIONS





The DCS-62 Series is a direct-mount, spring return line of electric actuators that operates on 24 VAC or VDC power and is available for use with floating, on/off, or proportional controllers. A 120 VAC on/off model is also available.

These bi-directional actuators do not require a damper linkage, and are easily installed on a round shaft up to 3/4 in. (20.5 mm) diameter or a square shaft up to 1/2 in. (13 mm). They are also offered on the Bray SoftTouch Series characterized ball valves.

The DCS-62 Series deliver 62 lb-in (7 Nm) of torque. The angle of rotation is mechanically adjustable.

FEATURES & BENEFITS

Small Footprint	• Fits in the tightest damper and valve applications
On/off, 3-wire Floating, or Proportional Inputs	• Provides the right actuator for any applications
Reversible Mounting Design	• Provides Clockwise (CW) or Counterclockwise (CCW) return-to-normal positioning if a power loss occurs
Built-in Overload Protection	• Increases actuator life by deactivating the actuator motor when an overload is detected
Self Centering Coupler	• Assures concentricity and smooth stroke throughout the travel of actuator
1/2 in. Conduit Connector with Standard or Plenum-rated Leads	• Meets local code requirements for wiring and allows easy field wiring on retrofit jobs
High Visibility Position Indicator	• Simplifies field check-out and control loop diagnostics
All Metal Housing	• Resists damage due to rough field handling

MODEL SELECTION

Feature	Model Number	DCS24-62-P	DCS24-62-A	DCS24-62-T	DCS24-62-TA	DCMS24-62-P	DCMS24-62-A	DCS120-62	DCS120-62
On/Off Control		•	•	•	•			•	•
Floating Control				•	•				
0 - 10 VDC Proportional Control						•	•		
24 VAC/DC		•	•	•	•	•	•		
120 VAC								•	•
Standard Cable			•	•	•		•	•	•
Plenum-Rated Cable		•				•			
2 Auxiliary Switches			•				•		

APPLICATION OVERVIEW

These actuators are designed to position air dampers and valves in HVAC systems. Applications include:

- Positioning return air, exhaust, or outdoor air dampers
 - Controlling face and bypass dampers
 - Positioning valves when used with the Bray SoftTouch Series Characterized Ball Valve
 - Positioning VAV terminal unit dampers.
- Refer to the manufacturer's information to properly size the damper, valve, and/or actuator.

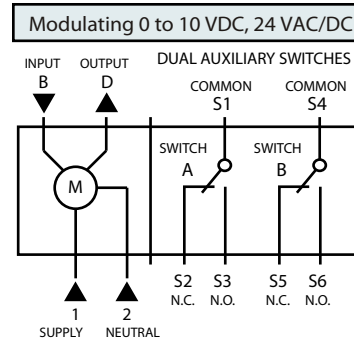
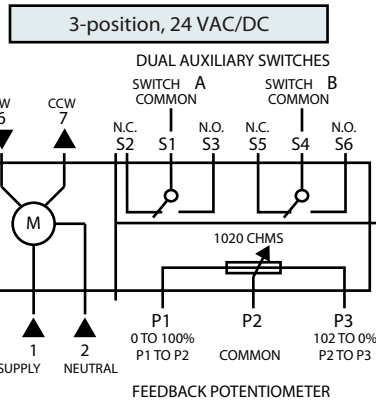
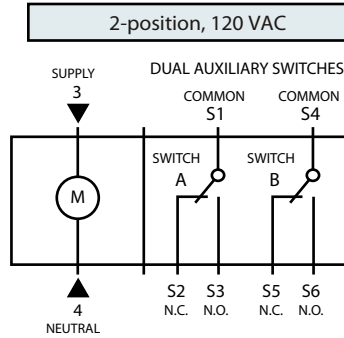
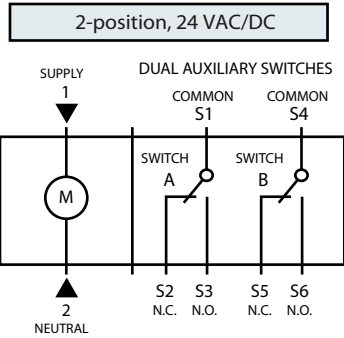
CAUTION: This device is not designed or intended to be used in or near environments where explosive vapors or gases could be present or environments where substances corrosive to the device's internal components could be present.

SPECIFICATIONS

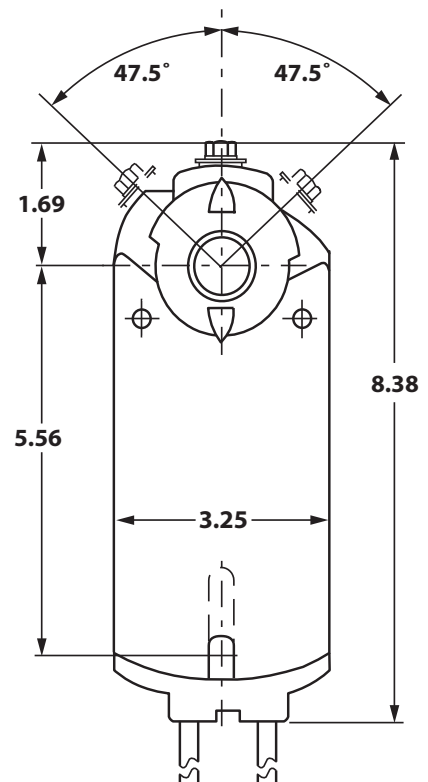
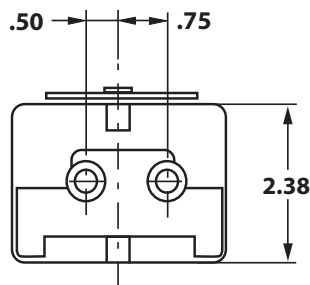
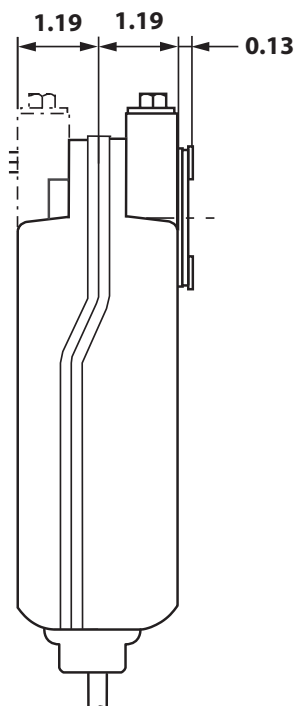
Power Requirements	24 VAC \pm 20%, at 50/60 Hz	Running: 5 VA/3.5 W
	120 VAC	Holding: 4 VA/3 W
Input Signal	Floating (-T Models)	Running and Holding: 7 VA/5 W
	On/Off (DCS-24 Models)	20 to 30 VAC at 50/60 Hz or 24 VDC \pm 10%
	On/Off (DCS120 Models)	20 to 30 VAC at 50/60 Hz or 24 VDC \pm 10%
	Proportional Models (DCMS Models)	120 VAC \pm 10%, at 50/60 Hz
Input Impedance	Proportional	0 to 10 VDC
Feedback Signal	Proportional	> 100,000 Ω
Spring Return	Direction is selectable with the mounting position of the actuator.	
Mechanical Output	Running Torque: 62 lb-in (7 Nm)	
Rotation Range	90° Nominal, mechanically limited to 95°; Adjustable in 5° from 0 to 90°	
Rotation Timing	Operating with motor: 90 seconds	
	Spring Return	15 seconds typical, 60 seconds max. at -25°F (-32°C)
Electrical Connections	Standard	Models: 3 ft. (.9 m) cable with 18 AWG wire leads
	Plenum	-P Models: Same as above with plenum-rated jacket
	All Models	1/2" NPT provision for conduit connector
Shaft Connection	1/4 to 3/4 in. (6.4 to 19 mm) diameter round shaft	
	1/4 to 1/2 in. (6.4 to 13 mm) square shaft	
	3/4 in. (19 mm) minimum shaft engagement	
Enclosure	Die cast aluminum alloy, NEMA 1	
Ambient Conditions	Operating	-25 to 130°F (-32 to 55°C); 10 to 95% RH, non-condensing
	Storage	-40 to 158°F (-40 to 70°C)
Dimensions (H x W x D)	8-3/8 in. H x 3-1/4 in. W x 2-3/4 in. D (212 x 83 x 66 mm)	
Shipping Weight	2.9 lb (1.3 kg)	
Agency Compliance	UL 60730 Listed (to replace UL 873)	
	C-UL C22.2 No. 24-93	
	CE Directive	

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.

WIRING



DIMENSIONS



Commercial Electric Actuators



DS24-70 & VAS-70 Series

The DS24-70 Series Electric Spring Return Actuators provide control of valves and dampers in Heating, Ventilating, and Air Conditioning (HVAC) systems. All actuators in this series provide 70 lb-in (8 N-m) rated torque. A mechanical spring return system provides rated torque with and without power applied to the actuator. The series includes the following control options:

- On/Off, 24V, 120 VAC power
- On/Off and Floating Point, 24 V power
- Proportional, 24 V power, for 0(2) to 10 VDC or 0(4) to 20 mA Control Signal with field installed 500 Ω resistor.

The VAS series actuators are configured for direct mounting to ST2 ball valves and do not require a clamp. Optional line voltage auxiliary switches indicate an end-stop position or perform switching functions within the selected rotation range.

MODEL SELECTION

Feature	Model Number	DS24-70-T	DS24-70-TA	DS120-70	DS120-70-A	DS24-70	DS24-70-A	DMS24-70	DMS24-70-A
On/Off Control		•	•	•	•	•	•		
Floating Control		•	•						
0(2) - 10 VDC Proportional Control								•	•
24 VAC/DC		•	•			•	•	•	•
120 VAC/DC				•	•				
Auxiliary Switches			•		•		•		•

Feature	Model Number	VAS24-70-T	VAS24-70-TA	VAS120-70	VAS120-70-A	VAS24-70	VAS24-70-A	VAMS24-70	VAMS24-70-A
On/Off Control		•	•	•	•	•	•		
Floating Control		•	•						
0(2) - 10 VDC Proportional Control								•	•
24 VAC/DC		•	•			•	•	•	•
120 VAC/DC				•	•				
Auxiliary Switches			•		•		•		•

Note: Intended for direct mounting on Bray ST2 ball valves

FEATURES

BENEFITS

- | | |
|---|--|
| <ul style="list-style-type: none"> • Electronic Stall Detection | <ul style="list-style-type: none"> • Protects from overload at all angles of rotation. Power consumption is reduced in holding mode. The actuator may be stalled anywhere in its rotation range without the need for mechanical end switches. |
| <ul style="list-style-type: none"> • Microprocessor-controlled Brushless DC Motor (Floating and Proportional models) | <ul style="list-style-type: none"> • Provides constant run-time independent of torque. |
| <ul style="list-style-type: none"> • External Mode Selection Switch (Floating and Proportional models) | <ul style="list-style-type: none"> • Permits calibration, input signal range selection, and control logic reversal for Proportional Control. |
| <ul style="list-style-type: none"> • Locking Manual Override with Auto Release and Crank Storage | <ul style="list-style-type: none"> • Allows manual positioning of the actuator hub with automatic return to normal operation when power and control signal are restored. |
| <ul style="list-style-type: none"> • Integral Cables with Colored and Numbered Conductors | <ul style="list-style-type: none"> • Simplify installation and field wiring. |
| <ul style="list-style-type: none"> • Five Year Warranty | <ul style="list-style-type: none"> • Low risk. |

SPECIFICATIONS

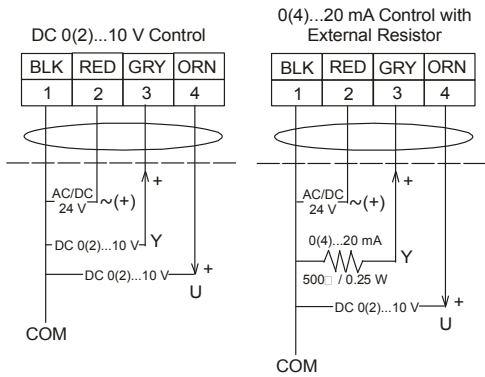
Power Requirements	Modulating Models	AC 24 V (AC 19.2 V to 28.8 V) at 50/60 Hz: Class 2 (North America) or (SELV) (Europe), 7.9 VA Running, 5.5 VA Holding Position DC 24 V (DC 21.6 V to 28.8 V): Class 2 (North America) or SELV (Europe), 3.5 W Running, 1.9 W Holding Position Minimum Transformer Size: 8 VA per Actuator
	Tri-State Models	
	24 VAC/DC On/Off Models	AC 24 V (AC 18 V to 30 V) at 50/60 Hz: Class 2 (North America) or (SELV) (Europe), 6.1 VA Running, 1.2 VA Holding Position DC 24 V (DC 21.6 V to 28.8 V): Class 2 (North America) or SELV (Europe), 3.5 W Running, 0.5 W Holding Position Minimum Transformer Size: 7 VA per Actuator
	120VAC Models	AC 120 V (AC 102 V to 132 V) at 60 Hz: 0.05 A Running, 0.03 A Holding Position
Input Signal / Adjustments	Modulating Models	Factory Set at DC 0 to 10 V, CW Rotation with Signal Increase; Selectable DC 0 (2) to 10 V or 0 (4) to 20 mA with Field-Furnished 500 Ω 0.25 W Minimum Resistor; Switch Selectable Direct or Reverse Action w/ Signal Increase
Input Signal	Tristate Models	AC 19.2 to 28.8 V at 50/60 Hz or DC 24 V +20%/-10%, Class 2 (North America) or SELV (Europe), Min. Pulse Width: 500 msec
Control Input Impedance	Tristate Models	3,000 ohm Control Inputs
	Modulating Models	Voltage Input: 100,000 ohm, Current Input: 500 ohm with Field Furnished 500 ohm Resistor
Feedback Signal	Modulating Models	DC 0 (2) to 10 V for Desired Rotation Range up to 95°, Corresponds to Rotation Limits, 0.5 mA at 10 V Maximum
Auxiliary Switch Rating	(-A) Models with Auxiliary Switches	Two Single-Pole, Double-Throw (SPDT), Double-Insulated Switches with Gold over Silver Contacts: AC 24 V, 50 VA Pilot Duty, - AC 120 V, 5.8 A Resistive, 1/4 hp, 275 VA Pilot Duty
Spring Return		Actuator Face Labeled A Is Away from Damper or Valve: CCW Spring Return Actuator Face Labeled B Is Away from Damper or Valve: CW Spring Return Direction Is Selectable with Mounting Position of Actuator:
Rated Torque Power		70 lb-in. (8 N-m) All Operating Temperatures, Power Stroke and Spring Stroke
Rotation Range		Maximum Full Stroke: 95° Adjustable Stop: 35° to 95° Maximum Position
Rotation Time for 90 Degrees of Travel for Proportional Models	Power On (Running)	150 Seconds Constant for 0 to 70 lb-in. (8 N-m) Load, at all Operating Conditions
	Power Off (Spring Returning)	17 to 25 Seconds for 0 to 70 lb-in. (8 N-m) Load, at Room Temperature 22 Seconds Nominal at Full Rated Load, 94 Seconds Maximum with 70 lb-in. (8 N-m) Load, at -40°F (-40°C)
Rotation Time for 90 Degrees of Travel for On/Off Models	Power On (Running)	Load, at All Operating Conditions 55 to 71 Sec. for 0 to 70 lb-in. (8 N-m), 60 Sec. Nominal at Full Rated Load (0.25 rpm)
	Power Off (Spring Returning)	13 to 26 Seconds for 0 to 70 lb-in. (8 N-m) Load, at Room Temperature 21 Seconds Nominal at Full Rated Load 39 Seconds Maximum with 70 lb-in. (8 N-m) Load at -4°F (-20°C) 108 Seconds Maximum with 53 lb-in. (6 N-m) Load at -40°F (-40°C)
Life Cycles		60,000 Full Stroke Cycles with 70 lb-in. (8 N-m) Load
Warranty		5 Year Warranty
Audible Noise Rating	Power On (Running)	<47 dBA at 70 lb-in. (8 N-m) Load, at a Distance of 39-13/32 in. (1 m)
	Power On (Holding)	<20 dBA at a Distance of 39-13/32 in. (1 m)
	Power Off (Spring Returning)	<52 dBA at 70 lb-in. (8 N-m) Load, at a Distance of 39-13/32 in. (1 m)
Electrical Connections	All Models	48 in. (1.2 m) UL 758 Type AWM Halogen Free Cable with 18 AWG (0.85 mm ²) Conductors and .25 in. (6 mm) Ferrule Ends
Conduit Connections		Integral Connectors for 3/8 in. (10 mm) Flexible Metal Conduit
Mechanical Connections	Round Shafts	Range of Sizes: 5/16 to 5/8 in. (8 to 16 mm)
	Square Shafts	Range of Sizes: 1/4 to 1/2 in. (6 to 12 mm)
Enclosure Rating		NEMA 2 (IP54) for all Mounting Directions
Ambient Conditions	Standard Operating	-40 to 140°F (-40 to 60°C); 90% RH Maximum, Noncondensing
	Storage	-40 to 185°F (-40 to 85°C); 95% RH Maximum, Noncondensing
Dimensions		6.33 x 3.90 x 2.26 in. (160.7 x 99 x 57.5 mm)
Compliance	United States	UL Listed, CCN XAPX, File E27734; to UL 60730-1A: 2003-08, Ed. 3.1, Automatic Electrical Controls for Household & Similar Use; and UL 60730-2-14: 2002-02, Ed. 1, Part 2, Particular Requirements for Electric Actuators.
	Canada	UL Listed, CCN XAPX7, File E27734; to UL 60730-1:02-CAN/CSA: July 2002, 3rd Ed., Automatic Electric al Controls for Household and Similar Use; and CSA C22.2 No. 24-93 Temperature Indicating and Regulating Equipment
	Europe	CE Mark -, declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive 2004/108/EC and Low Voltage Directive 2006/95/EC.
	Australia and New Zealand	C-Tick Mark, Australia/NZ Emissions Compliant (Models: All)
Shipping Weight		24VAC Models: 3.8 lb (1.7 kg), 120VAC Models: 4.15 lb (1.9 kg)



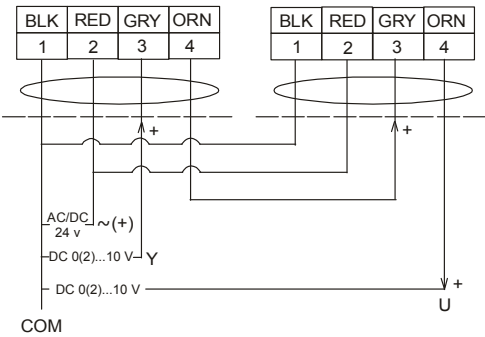
The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the nearest Bray office. Bray controls shall not be liable for damages resulting from misapplication or misuse of its products.

WIRING

**DMS24-70 & VAMS24-70 Series
Proportional Actuators**

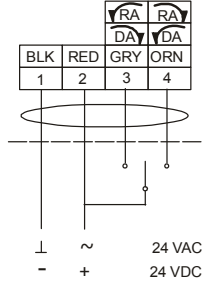


Master-Slave Application

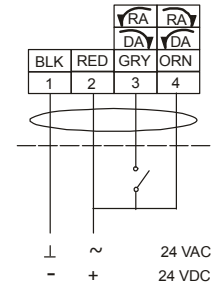


**DS24-70-T(A) & VAS24-70-T(A) Series
On/Off and Floating Control Actuators**

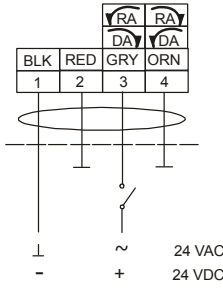
Floating Control, Four Wire



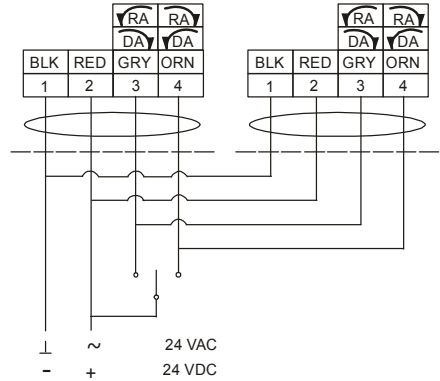
Open/Close, Single Wire Control



On/Off Control, Two Wire

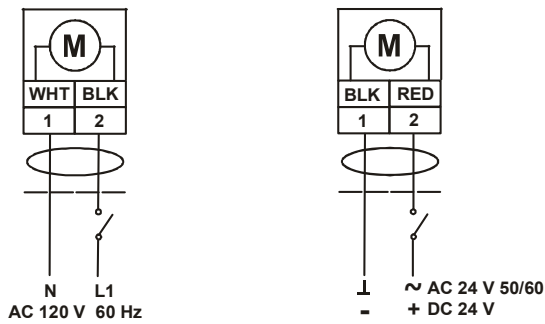


Floating Control, Multiple Actuators with One Transformer

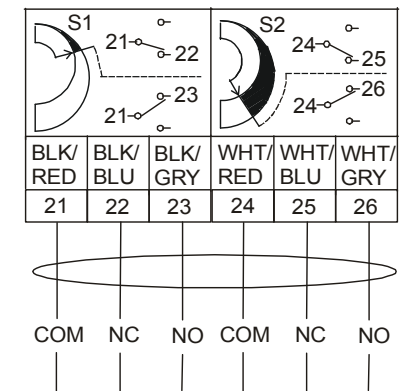


IMPORTANT: Do not install multiple DMS or VAMS Series Actuators connected to the same mechanical load. Master-slave application of DMS or VAMS Series Actuators requires that each actuator be connected to independent loads.

**DS24-70(A) & VAS24-70(A)
DS120-70(A) & VAS120-70(A)
Series On/Off Actuators**



(-A) Auxiliary Switches





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.

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 160 lb-in (18 Nm) torque.

FEATURES

- Brushless DC motor technology with stall protection
- Bi-directional 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

MODEL SELECTION

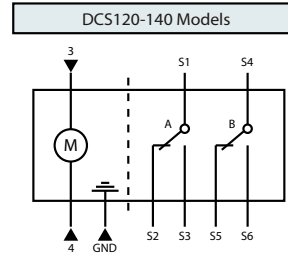
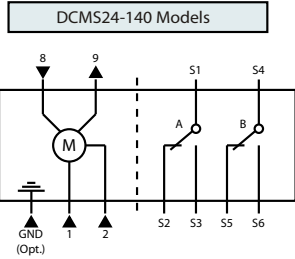
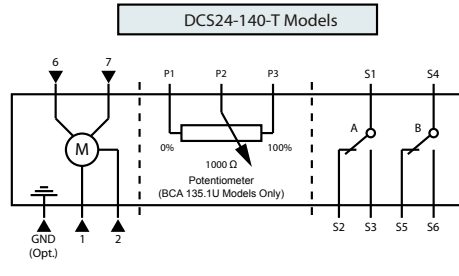
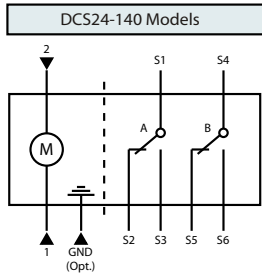
Feature	Model Number	DCS24-140	DCS24-140-A	DCS24-140-T	DCS24-140-TA	DCMS24-140	DCMS24-140-A	DCS120-140	DCS120-140-A
24 VAC		•	•	•	•	•	•		
120 VAC								•	•
On/Off Control		•	•			•		•	•
Floating Control				•	•				
Proportional Control						•	•		
0 - 10 VDC Input Signal						•	•		
Dual Auxiliary Switches			•		•		•		•

SPECIFICATIONS

	Operating Voltage	24 VAC ± 20%, 24 VDC ± 10%		
	Frequency	50/60 Hz		
Power	Power Consumption	On/Off	7 VA/5 W Running, 5 VA/3 W Holding	
		Tri-State	7 VA/5 W Running, 5 VA/3 W Holding	
		Modulating	7 VA/5 W Running, 5 VA/3 W Holding	
	Input signal (If applicable)	Voltage Input	0 to 10 VDC (35 VDC max.)	
		Voltage Input Resistance	>100,000 Ω	
Position Output Signal	Voltage Output	0 - 10 VDC		
	Max. Output Current	DC ± 1 mA		
	Equipment rating	Class 2, in accordance with UL/CSA		
	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 250 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	160 in-lb (18 Nm)		
	Spring Return Torque	160 in-lb (18 Nm)		
	Maximum Torque	< 360 in-lb (40 Nm)		
	Runtime for 90°	Operating with Motor	90 Seconds	
		Spring Return	15 Seconds Typical	
	Nominal Angle of Rotation	90°		
	Maximum Angular Rotation	95°		
Noise Level	<45 dBA (running)			
Mounting	Shaft Size	Round	3/8 - 1 inch (8.3 - 25.4 mm)	
		Square	1/4 - 5/8 inch (6.4 - 15.9 mm)	
	Minimum Shaft Length	3/4 inch (19 mm)		
	Enclosure	NEMA 2, IP54		
Housing	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	UL Listed to UL6n730 (to replace UL873)		
		CSA C22.2 No. 24-93, CE EMC 2004/108/EC		
	Weight	4.85 lb. (2.2 kg)		

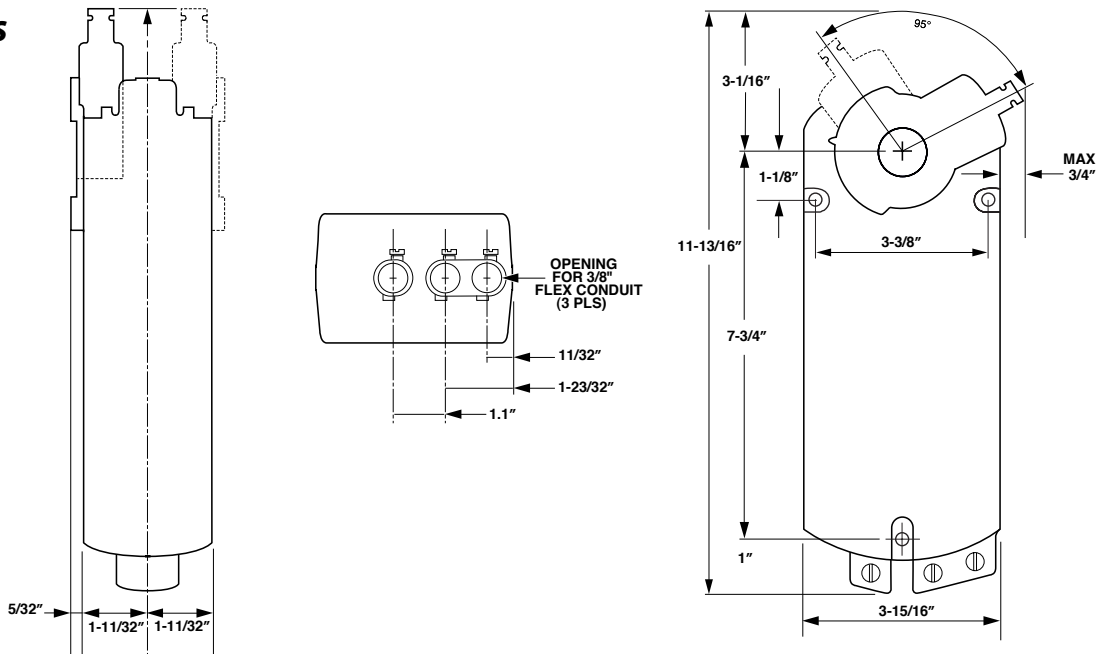
The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the nearest Bray office. Bray controls shall not be liable for damages resulting from misapplication or misuse of its products.

WIRING



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	
Factory-Installed Options			
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

DIMENSIONS





The DS/DMS Series is a direct-mount, spring return line of electric actuators that operates on 24/120/230 VAC or 24 VDC power and is available for use with on/off, floating, proportional, or resistive controllers. These bi-directional actuators do not require a damper linkage, and are easily installed on a round shaft up to 3/4 in. (19 mm) diameter or a square shaft up to 1/2 in. (13 mm). They can also be mounted to butterfly and ball valves using one of the Bray Valve Linkage Kits.

The DS/DMS Series delivers up to 177 lb-in (20 Nm) of torque. The angle of rotation is mechanically adjustable from 30 to 90°. Optional auxiliary switches are available to indicate end-stop position or to perform switching functions at any angle within the selected rotation range. Position feedback is available through switches, a potentiometer, or a 0 (2) to 10 VDC signal.

MODEL SELECTION

Feature	177 lb-in (20 Nm)										
	Model Number	DS230-180	DS230-180-A	DS120-180	DS120-180-A	DS24-180	DS24-180-A	DS24-180-T	DS24-180-TA	DMS24-180	DMS24-180-A
On/Off Control		•	•	•	•	•	•				
Floating Control								•	•		
Proportional Control										•	•
24 VAC/DC						•	•	•	•	•	•
120 VAC				•	•						
230 VAC	•	•									
0 to 10 VDC Feedback										•	•
2 Auxiliary Switches			•		•		•		•		•

FEATURES

BENEFITS

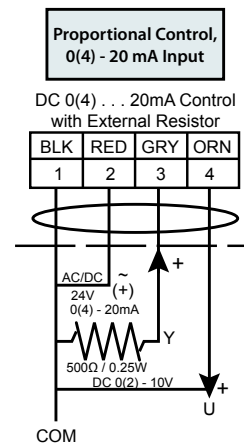
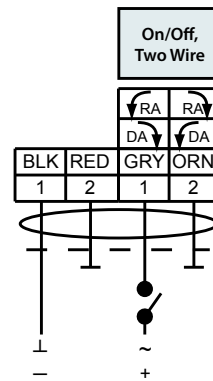
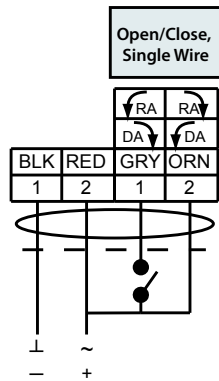
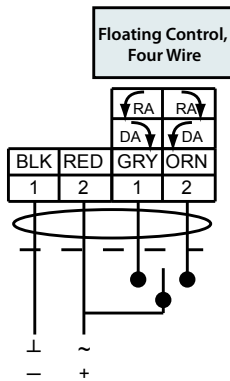
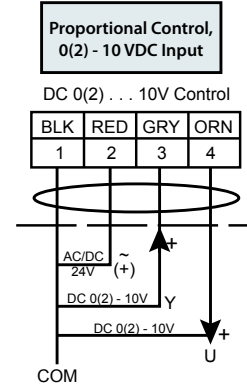
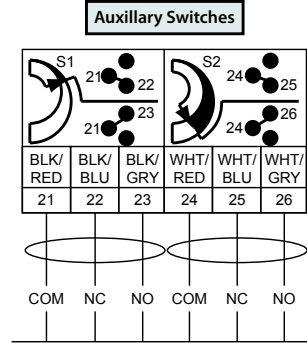
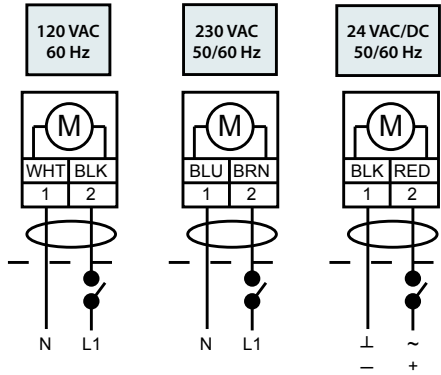
Bi-directional, Fail-safe Spring Return	Allows selectable rotation/spring return direction simplifying installation
Four Control Input Types	Meets the needs of most applications
Wide Range Resistive Input	Interfaces to 3-wire resistive controllers from 100 to 10,000 Ω
Zero and Span Adjustment on Proportional Models	Allows sequential operation of dampers from a single input signal of 0 (2) to 10 VDC or 0 (4) to 20 mA
On/Off Control	Provides simple, 2-wire control for low-cost applications
Electronic Stall Detection	Provides higher reliability by deactivating the actuator when a stall condition is detected
Output Position Feedback	Provides simple, closed-loop control with accurate position sensing (standard on proportional and resistive models, optional on floating models)
Calibration Output on Proportional Models	Increases speed and accuracy of zero and span adjustments over the entire range without waiting for mechanical rotation
Manual Override	Allows manual positioning when the actuator is not powered; simplifies setup and field adjustments
NPT Conduit Adaptor (Included)	Meets electrical code requirements

SPECIFICATIONS

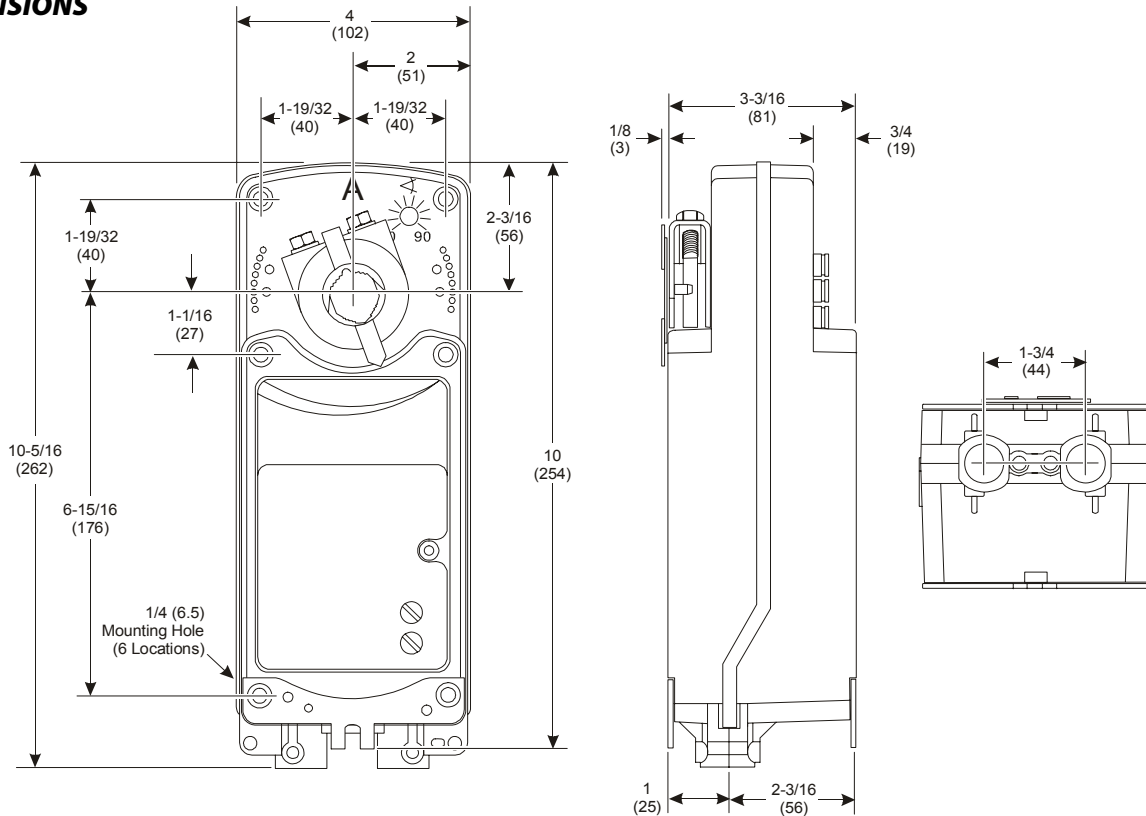
Power Requirements	On/Off	120 VAC at 60 Hz or 230 VAC at 50/60 Hz	
	Floating/Proportional	24 VAC \pm 20% at 50/60 Hz, Class 2 or 24 VDC \pm 10%, Class 2	
Transformer Sizing	DS24-180 Series	On/Off	14 VA minimum per Actuator
	DMS24-180 Series	Floating/Proportional	20 VA minimum per Actuator
Input Signal	Factory set 0 to 10 VDC, CW rotation with signal increase Selectable 0 to 10 VDC or 0 to 20 mA with optional 500 Ω , 0.25 W minimum resistor		
Input Impedance	Voltage	200,000 Ω	
	Current	500 Ω with field furnished 500 Ω resistor	
Feedback Signal	0 to 10 VDC for desired rotation range up to 90°; corresponds to rotation limits, 500 mA max.		
Auxiliary Switch Rating	2 single-pole, double-throw (SPDT), double-insulated switches with gold flash contacts: 24 VAC, 50 VA pilot duty; 120 VAC, 5.8 A resistive, 1/4 hp, 275 VA pilot duty 240 VAC, 5.0 A resistive, 1/4 hp, 275 VA pilot duty		
Running Torque	DS24-180 Series	177 lb-in (20 Nm)	
Rotation Range	Adjustable from 30 to 90° CW or CCW with optional adjustable stop kit, limited to 90°		
Life Cycles	60,000 Full stroke cycles		
Rotation Time (Power On)	On/Off	24 to 57 seconds, 35 seconds nominal at full-rated load	
	Floating/Proportional	150 seconds, independent of load	
Rotation Time (Spring Return)	On/Off	11 to 15 seconds at room temperature 35 seconds maximum at -22°F (-30°C) 130 seconds maximum at -40°F (-40°C)	
	Floating/Proportional	20 seconds for 177 lb-in (20 Nm) at room temperature	
Electrical Connections	48 in. (1.2 m) halogen-free cable with 18 AWG (0.75 mm ²) wire leads		
Mechanical Connections	1/2 to 3/4 in (12 to 19 mm) diameter round shafts		
	3/8 to 1/2 in (10, 12, and 14 mm) square shafts		
Enclosure	NEMA 2 (IP54) for all mounting orientations		
Ambient Conditions	Operating	-40 to 131°F (-40 to 55°C); 90% RH maximum, noncondensing	
	Storage	-85 to 185°F (-65 to 85°C); 95% RH maximum, noncondensing	
Weight	24 VAC models, 6.4 lb (2.9 kg); 120/230 VAC models, 7.6 lb (3.5 kg)		
Warranty	5 Years		

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

WIRING



DIMENSIONS



Commercial Electric Actuators