Bray Commercial Division
13788 West Road, Suite 200A
Houston, Texas 77041

BCDSales@Bray.com
Phone: 1-888-412-2729
www.braycommercialdivision.com
 01/14/25

DC(M)-310 Series — 310 lb-in (35 Nm) Electric Actuator

IOM Manual

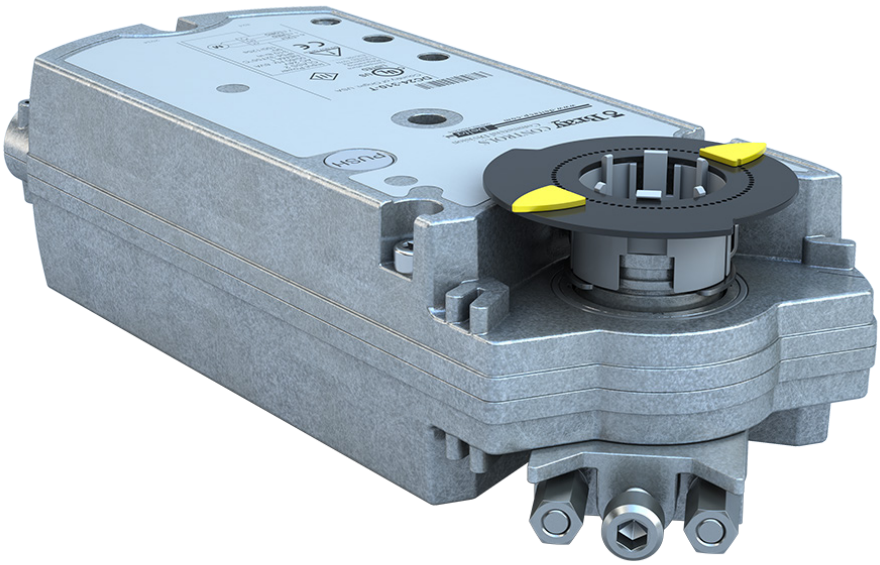


Table of Contents

DC(M)-310 Series - Installation, Operation and Maintenance Manual

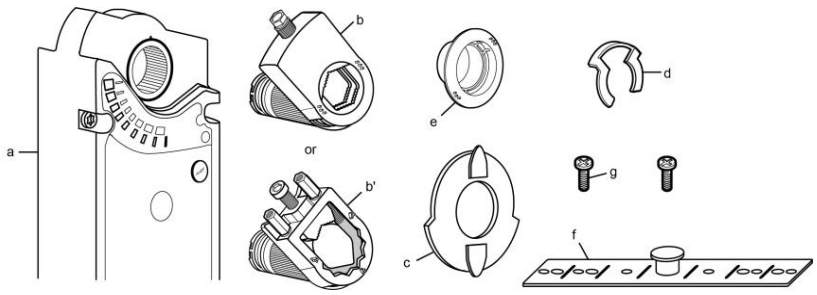
**FOR MORE INFORMATION ON THIS PRODUCT
AND OTHER BRAY PRODUCTS
PLEASE VISIT OUR WEBSITE – www.braycommercialdivision.com**

Technical Specifications - DC(M)24-310 Series Actuator			
Type	Actuator Models	**DC24-310-T(-A)**	**DCM24-310-T(-A)**
		Non-Spring Return - Floating, Time Out Features with optional Auxiliary Switches (-A)	Non-Spring Return - Modulating with optional Auxiliary Switches (-A)
	Torque	310 lb-in. (35 Nm)	
Electrical	Operating Voltage	24 VAC ±20% at 50/60 Hz	
	Power Consumption	7 VA, 7W	8 VA, 8W
	Control Signal	N/A	0 to 10 VDC
	Control Impedance	N/A	100k Ohm
	Input Signal	N/A	**Y (wires 8-2)** DC 0...10 V (Max. permissible input voltage DC 35 V)
	Feedback	Contact Bray	0 to 10 VDC
	Positioning Signal	N/A	DC 0...35 V at Offset Uo = 0...5 V and Span ΔU = 2...30 V
	Feedback Signal	N/A	DC 0 to 10 VDC
	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 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°	
	Stall Protection	Yes	
	Electrical Connection	3 ft. (0.9 m) Pre-cabled - AWG 18	
	Equipment Rating	Class 2 According to UL, CSA - Class III per EN60730	
Operation	Manual Override	External Push Button	
	Runtime for 90° of Rotation	90 seconds, constant for all operating conditions	
	Rotation Timing	150 sec. at 50 Hz (125 sec. at 60Hz)	
	Rotation Range	Nominal Angle of Rotation 90°, mechanically limited to 95° ± 2°	
	Cycle Life	Designed for 60,000 full stroke cycles	
	Mechanical Connections	**Round Shafts** - 3/8 to 1 in. (9.5 to 25.4 mm) diameter **Square Shafts** - 1/4 to 5/8 in. (6 to 18 mm) **Minimum Shaft Length** - 3/4 (20 mm)	
Environmental	Enclosure	IP54 as per EN 60 529	
	Ambient Conditions (Non-Condensing)	**Operating —** -25 to 130°F (-32 to 55°C); 0 to 95% RH, non-condensing **Storage —** -40 to 158°F (-40 to 70°C); 0 to 95% RH, non-condensing	
	Audible Noise Rating	<45 dBA at 1 m	
	Dimensions	(L) 11.8 x (W) 3.9 x (H) 2.9 in. (300 x 100 x 67.5 mm)	
	Weight	4.4 lb (2 kg)	
Conditions	Agency Certifications	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	
	Warranty	5 Years limited from time of shipment.	

Warning - These 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.

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).

Disclaimer - 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.



Actuator Parts
a. Actuator
b. Self-centering shaft adapter
b[1]. Oversized shaft adapter
c. Position indicator
d. Shaft adapter locking clip
e. Position indicator adapter
f. Mounting bracket
g. Mounting screws

FIGURE 1 - Actuator Parts

Safety Instructions - Definition of Terms Read, Follow and Save these instructions

WARNING
Personal injury or loss of life may occur if you do not follow the procedures as specified.

CAUTION
Equipment damage or loss of data may occur if you do not follow procedure as specified.

NOTICE
Used without the safety alert symbol indicates a potential situation which, if not avoided, may result in an undesirable result or state, including property damage.

Required Tools:
- 10 mm (13/32-inch) open-end wrench
- 6 mm (1/4-inch) open-end wrench for oversized shaft adapter
- Drill and 4 mm (5/32-inch) drill bit
- Phillips screwdriver
- Marker or pencil
- Adjustable pliers

Additional for oversized shaft adapter:
- 10 mm (13/32-inch) socket wrench
- 6 mm hex key

Estimated Installation Time:
30 minutes

Prerequisite:
The actuator is shipped from the factory with a 5° pre-load to ensure tight close-off of the damper. To release the pre-load, press the PUSH button before mounting the actuator.

Mounting Positions:

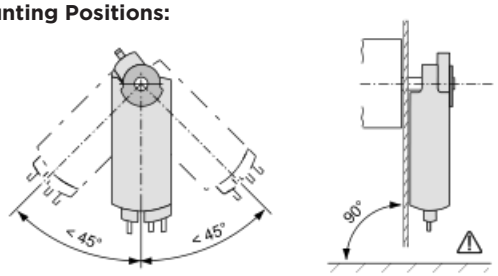


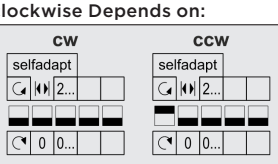
FIGURE 2 - Acceptable IP54 Mounting Positions

WARNING
Do not open the actuator.

1. Place the actuator on the shaft with the front of the actuator accessible. The label and the manual override button are on the front side.

2. Determine the rotation of the shaft. Set the direction of rotation arrow to match the rotation (DCM24-310 Series) or wiring diagram (DC24-310 Series). See Table 1.

TABLE 1 - Setting Rotation

Control Type	DC24-310 Series 2-Position/3-Position	DCM24-310 SeriesModulating
		Clockwise or Counterclockwise Depends on:
Rotation	The Type of Control See Wire Diagram – direction determined by wiring	• in the event of power loss. • the positioning signal 
	The actuator remains in the respective position with no power applied.	The actuator remains in the deployed position: • if the positioning signal is maintained at a constant value; • in the event of power loss.
Position indication Mechanical	Rotation angle position indication using a position indicator	
Position indication Electrical	–	Position indicator: Output voltage U = DC 0/2...10 V is generated proportionally to rotation angle. The direction of rotation (inverted or non-inverted) for output voltage U is based on the DIP switch position.
Self-adaptation of rotation angle range	–	The actuator automatically determines the mechanical end positions of the rotation angle range. The characteristic function (Uo, ΔU) is mapped to the calculated rotation angle range. Power must be applied for the function of DIP switch 2 (self-adaptation) to be operational.

3. See Figure 3 and Figure 4 for clockwise-to-open (CW) installation. See Figure 5 and Figure 6 for counterclockwise-to-open (CCW) installation.

For Tandem Applications:

- The direction of rotation switches must be set identically on both actuators according to the clockwise or counterclockwise rotation of the shaft. The factory setting is clockwise.
- Minimum shaft length is 4 inches (100 mm).

CAUTION
Do not use more than two actuators in tandem applications.

NOTE
Tandem mounting requires an ASK73.2U bracket.

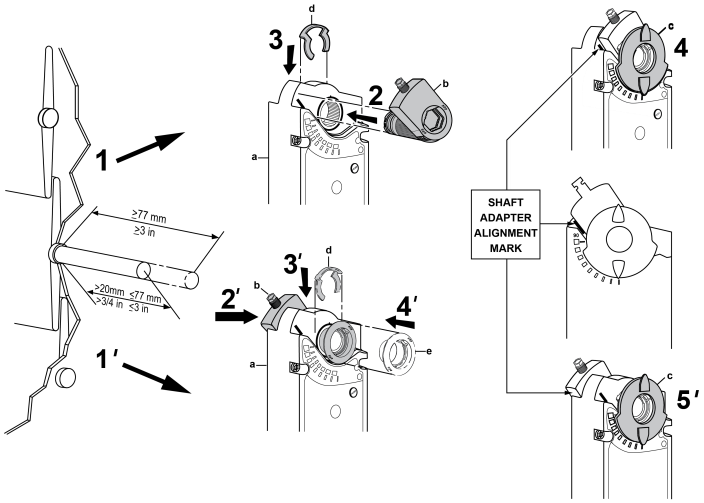


FIGURE 3 - Shaft Adapter Placement for Clockwise Rotation on Short and Long Shafts.

NOTE
Place the shaft adapter next to the alignment mark keeping the mark visible.

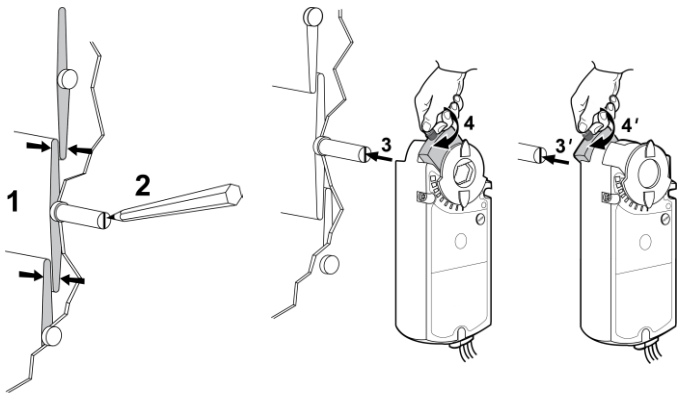


FIGURE 4 - Mount the Actuator to the Shaft. Go to Figure 9 to Complete the Mounting.

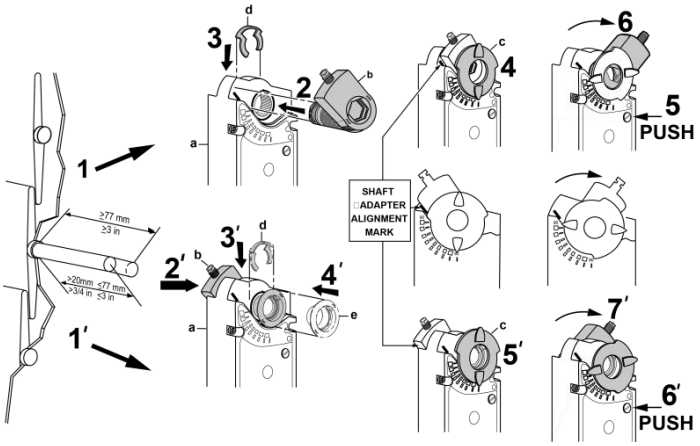


FIGURE 5 - Shaft Adapter Placement for Counterclockwise Rotation on Short and Long Shafts.

NOTE
Place the shaft adapter next to the alignment mark keeping the mark visible.

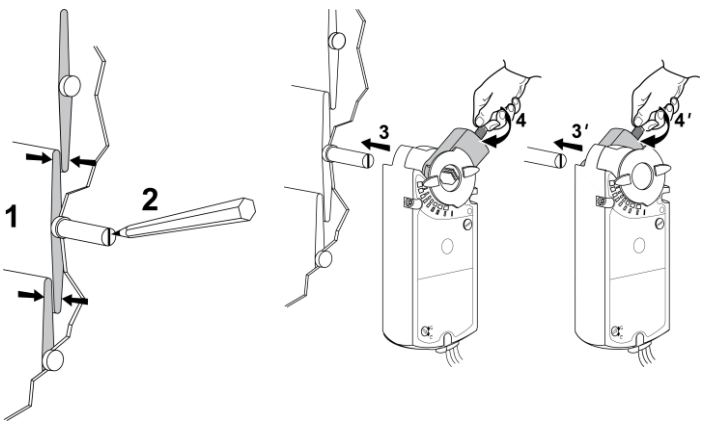


FIGURE 6 - Mount the Actuator to the Shaft.

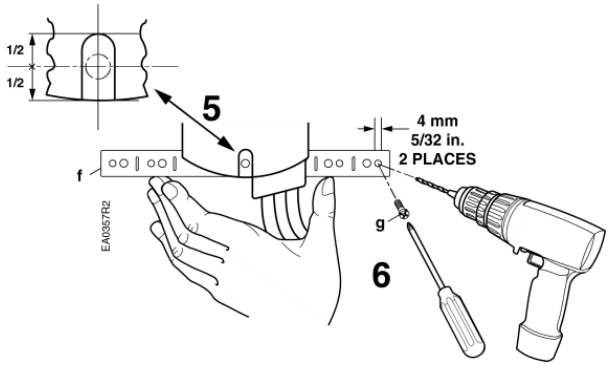


FIGURE 7 - Attach the Mounting Bracket.

NOTE
With an oversized shaft adapter (b'), tighten the middle screw so that the shaft is in the center of the shaft adapter opening.

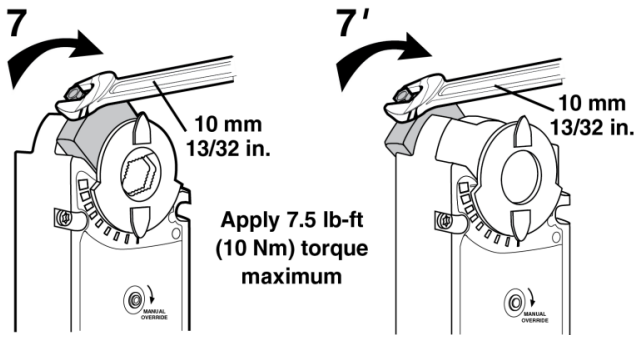


FIGURE 8 - Fasten the Shaft Adapter to the Shaft.

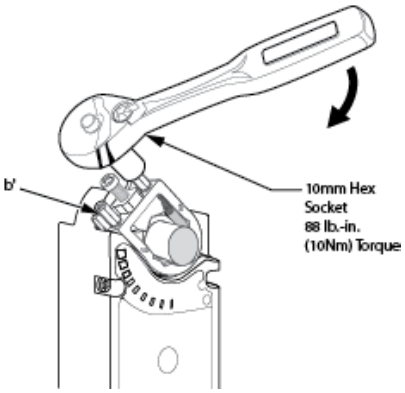


FIGURE 9 - Oversized Shaft Adapter Example.

Manual Override

To move the damper blades without power present, do the following:

1. Hold down the PUSH button.
2. Make adjustments to the damper position.
3. Release the PUSH button.

NOTE
If there is no load, the actuator will hold the new position. If load conditions exist, the actuator might not be able to hold.

Once power is restored, the actuator returns to automated control.

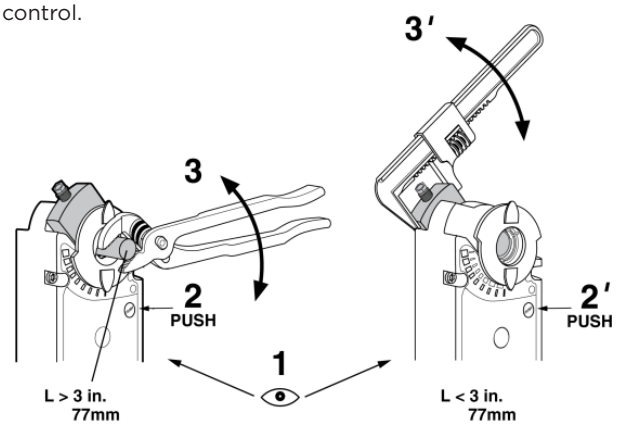


FIGURE 10- Manual Override for Long and Short Shafts.

Mechanical Range Adjustment

The angular rotation is adjustable between 0° and 90° at 5-degree intervals.

1. Loosen the shaft adapter from the damper shaft and remove the actuator from the damper shaft.

2. Remove the clip and shaft adapter from the actuator. See Figure 11.

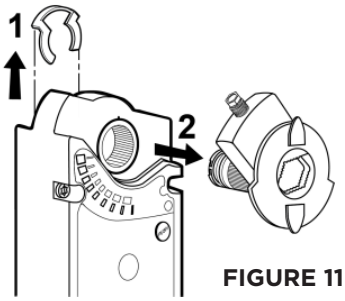


FIGURE 11

3. Return the actuator gear train to the "0" position using the steps which follow for the clockwise or counterclockwise damper shaft rotation.

Clockwise-to-Open:

a. Insert the shaft adapter to the right as close as possible to the raised stop. Figure 12.

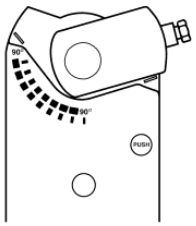


FIGURE 12

b. Hold down the PUSH button and rotate the shaft adapter to ..... the left until it stops. Figure 13.

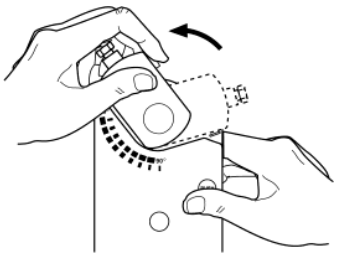


FIGURE 13

c. Release the PUSH button.

d. If the shaft adapter is not resting against the left raised stop, ... remove the adapter and insert it against the left stop.

e. Place the position indicator to the 0 position on the outside ..... scale. Figure 14.

Counterclockwise-to-open:

a. Insert the shaft adapter to the left as close as possible to the raised stop.

b. Hold down the **PUSH** button and rotate the shaft adapter to the right until it stops.

c. Release the **PUSH** button.

d. If the shaft adapter is not resting against the right raised stop, remove the adapter and insert it against the right stop.

e. Place the position indicator to "**0**" on the inside scale.

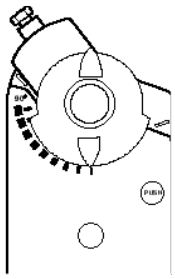


FIGURE 14

4. Determine the angle of rotation for the shaft. Subtract that amount from 90°.

5. Remove the shaft adapter and insert it with the position indicator pointing to mark on the scale calculated in the previous step. Figure 15.

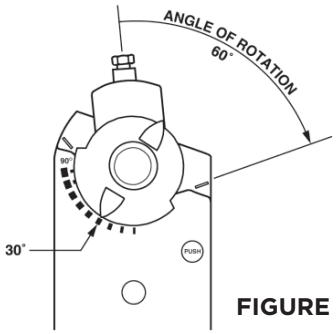


FIGURE 15

6. Attach the clip.

7. Rotate the shaft to its **0** position.

8. Return the actuator to the shaft and tighten the shaft adapter to the shaft.

Wiring

- All wiring must conform to NEC and local codes and regulations.
- Use earth ground isolating step-down Class 2 transformers. Do not use auto transformers.

- The maximum rating for a Class 2 step-down transformer is 100 VA. Determine the supply transformer rating by summing the total VA of all actuators and components used. It is recommended that no more than 10 actuators are powered by one transformer.

WARNING

Do not parallel wire DC24-310 and DCM24 310 Series actuators with any other type of actuator, including DC24-310 and DCM24-310 Series actuators with date codes earlier than 501.

WARNING

Mixed switch operation is not permitted to the switching outputs of both auxiliary switches (A and B).

Either AC line voltage from the same phase must be applied to all six outputs of the dual auxiliary switches, or UL-Class 2 voltage must be applied to all six outputs.

NOTE

With plenum cables, only UL-Class 2 voltage is permitted.

Wiring

DC24-310-T(-A)

STANDARD CABLE

Floating Control

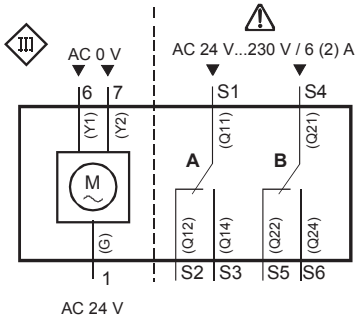


FIGURE 16

DCM24-310-T(-A)

STANDARD CABLE

Modulating Control

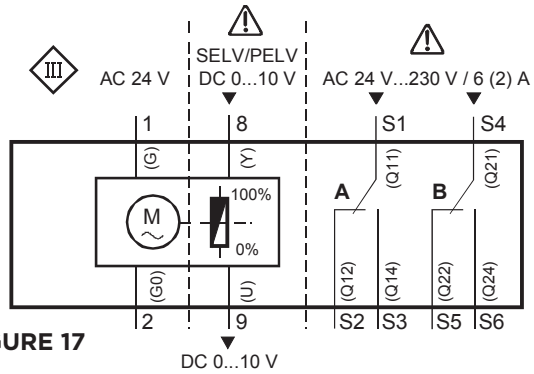


FIGURE 17

Table 2

KEY	Cable			Function
	No.	Code	Color	
	1	G	Red (RD)	AC 24 V Supply (SP)
	2	G0	Black (BK)	Neutral (SN)
	6	Y1	Violet (VT)	Control Signal Clockwise
	7	Y2	Orange (OG)	Control Signal Counterclockwise
	8	Y	Gray (GY)	0 to 10 VDC Input Signal
	9	U	Pink (PK)	Output for 0 to 10 VDC Position Indication
	P1	a	White/Red (WH RD)	Feedback 0 to 100% P1 – P2
	P2	b	White/Blue (WH BU)	Feedback Common
	P3	c	White/Pink (WH PK)	Feedback 100 to 0% P3 – P2

Auxiliary Switch - Factory Installed			
S1	Q11	Gray/Red (GY RD)	Switch A Common
S2	Q12	Gray/Blue (GY BU)	Switch A - N.C.
S3	Q14	Gray/Pink (GY PK)	Switch A - N.O.
S4	Q21	Black/Red (BK RD)	Switch B Common
S5	Q22	Black/Blue (BK BU)	Switch B - N.C.
S6	Q24	Black/Pink (BK PK)	Switch B - N.O.

Warning - These 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.

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).

Disclaimer - 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.

Retrofit Wiring

0(2)-10V	Bray DC-310 Series		Siemens GBB Series GIB Series		Belimo AMB Series GMB Series		Honeywell MN7220 Series MN7220 Series		Johnson M9124 Series M9132 Series	
Function	**Color**	**Number**	**Color**	**Number**	**Color**	**Number**	**Terminal Only**	**Number**	**Terminal Only**	**Number**
Supply 24V	Red	1	Red	1	Red	2		1		2
Common	Black	2	Black	2	Black	1		2		1
0(2) to 10 Vdc Input	Gray	8	Gray	8	White	3		3		3
0(2) to 10 Vdc Feedback 0-10V	Pink	9	Pink	9	Orange	5		5		4

Floating Control	Bray DC-310 Series		Siemens GBB Series GIB Series		Belimo AMB Series GMB Series		Honeywell MN6120 Series MN6134 Series		Johnson M9124 Series M9132 Series	
Function	**Color**	**Number**	**Color**	**Number**	**Color**	**Number**	**Terminal Only**	**Number**	**Terminal Only**	**Number**
Common	Red	1	Red	1	Black	1		2		1
24V CW	Violet	6	Violet	6	Red	2		3		2
24V CCW	Orange	7	Orange	7	White	3		4		3

Dimensions