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 12/19/24

DC(M)-88 Series — 88 lb-in (10 Nm) Electric Actuator

IOM Manual

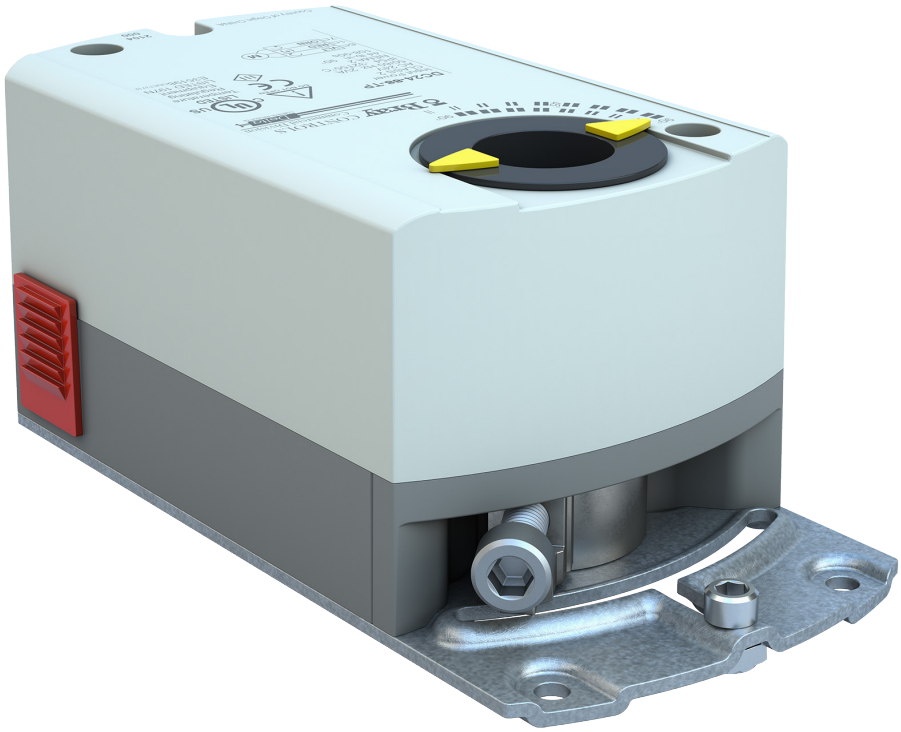


Table of Contents

DC(M)-88 Series - Installation, Operation and Maintenance Manual

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

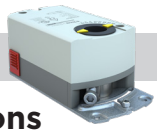
Technical Specifications - DC(M)-88 Series Actuator					
Type	Actuator Models	DC24-88-TP	DC24-88-TAP	DCM24-88-P	DCM24-88-AP
		Non-Spring Return Floating Plenum Cable	Non-Spring Return 2-Position/Floating Plenum Cable Auxiliary Switches	Non-Spring Return Modulating Plenum Cable	Non-Spring Return Modulating Plenum Cable Auxiliary Switches
	Torque	88 lb-in. (10 Nm)			
Electrical	Operating Voltage	24 VAC +-20%	24 VAC/DC +-20%		
	Power Consumption	1.3 VA, 0.8W		1.5 VA, 1W	
	Operational Protection	N/A	Timeout/Overload Protection		
	Control Signal	Floating	2-Position/Floating	0(2)-10V	
	Input Impedance	N/A		>100k Ohms	
	Feedback Signal	N/A		0(2)-10V (Maximum Output Current DC 1mA)	
	Auxiliary Switch Rating	N/A	4A Resistive, 2A Inductive	N/A	4A Resistive, 2A Inductive
	Switch Range (Switch A)	N/A	0 to 90° with 5° Intervals (Recommended Range Usage 0 to 45°) Factory Setting 5°	N/A	0 to 90° with 5° Intervals (Recommended Range Usage 0 to 45°) Factory Setting 5°
	Switch Range (Switch B)	N/A	0 to 90° with 5° Intervals (Recommended Rang Usage 45 to 90°) Factory Setting 85°	N/A	0 to 90° with 5° Intervals (Recommended Rang Usage 45 to 90°) Factory Setting 85°
	Switching Hysteresis	N/A	2°	N/A	2°
	Equipment Rating	Class 2 per UL/CSA	Class 2 per UL/CSA,Class III per EN60730		
	Electrical Connection	3 ft. (0.9 m) Pre-cabled - AWG 18 - Plenum Rated Cable			
Operation	Manual Override	Manual Operation by Selecting Override Knob when Power is off			
	Runtime for 90° of Rotation	125 seconds	150 seconds		
	Rotation Range	Nominal Angle of Rotation 90°, mechanically limited to 95°			
	Cycle Life	60,000 cycles at rated load	100,000 full strokes/ 5 million repositions		
	Mechanical Connections	**Round Shafts** - 3/8 to 5/8 in. (8 to 16 mm) diameter **Square Shafts** - 1/4 to 1/2 in. (6 to 12.7 mm) **Hex Shafts** - 9/16 in. (15 mm) **Minimum Shaft Length** - 3/4 in. (20 mm)			
Environmental	Enclosure	NEMA 2, IP54 according to EN60529			
	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	35 dBA at 1 m			
	Dimensions	6.6" L × 2.8" W × 2.4" D (166.7mm L × 71mm W × 61mm D)			
	Weight	1.35 lb (0.61 kg)			
Conditions	Agency Certifications	UL listed to UL873-cUL certified to Canadian Standard C22.2 No. 24-93, CE In accordance with the directive set forth by the European Union for Electromagnetic Compatibility (EMC) 2004/108/EC - Emissions Standards EN61000-6-3 – Immunity Standards EN61000-6-2 For DC24-88-TP	UL listed to UL60730-cUL certified to Canadian Standard C22.2 No. 24-93, These devices were approved for installation in plenum areas by Underwriters Laboratories, Inc., per UL 1995 CE listed with EN60730-1, EN60730-2-14		
	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.

Mixed switch operation is not permitted. To the switching outputs of both auxiliary switches (A and B), only apply: UL/CSA: Class 2 voltage.



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

WARNING
Personal injury/loss of life may occur if you do not follow a procedure as specified.

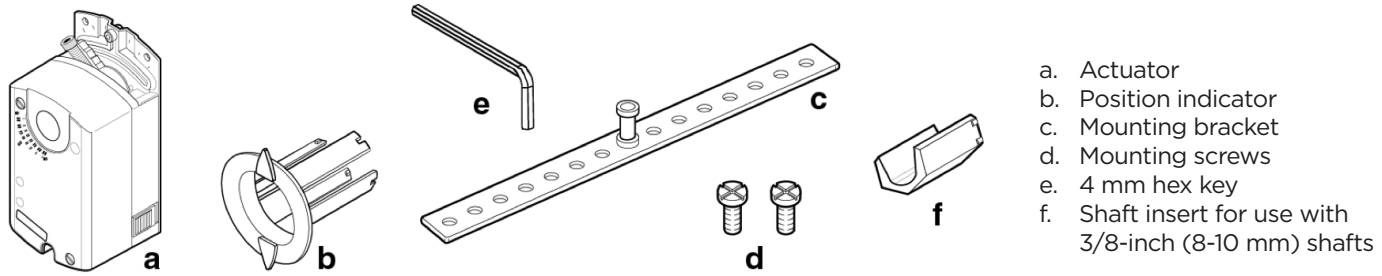
CAUTION
Equipment damage or loss of data may occur if you do not follow a procedure as specified.

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.

Qualified Personnel

A qualified person in terms of this document is one who is familiar with the installation, commissioning and operation of the device and who has appropriate qualifications,
such as:

- Is trained in the operation and maintenance of electric equipment and systems in accordance with established safety practices.
- Is trained or authorized to energize, de-energize, ground, tag and lock electrical circuits and equipment in accordance with established safety practices.
- Is trained in the proper use and care of personal protective equipment (PPE) in accordance with established safety practices.
- Is trained in first aid.
- In cases where the device is installed in a potentially explosive (hazardous) location – is trained in the operation, commissioning, operation and maintenance of equipment in hazardous locations.



a. Actuator
b. Position indicator
c. Mounting bracket
d. Mounting screws
e. 4 mm hex key
f. Shaft insert for use with 3/8-inch (8-10 mm) shafts

Figure 1. Parts of the DC(M)-88 Series Enhanced Rotary Actuator.

Product Description

The DC(M)-88 Series Actuators are Non-Spring Return Electric Actuators that operate on AC 24V power, floating control, direct-coupled, actuators.

Required Tools

- 4 mm hex key (included)
- 4 mm (5/32-inch) drill bit and drill
- Small flat-blade screwdriver
- Marker or pencil

Instructions

NOTE: Place the actuator on the damper shaft so that the front of the actuator is accessible. The label is on the front side.

1. Determine whether the damper blades will rotate clockwise or counterclockwise to open. See Figure 12 and Figure 13.

2. If the blades will rotate counterclockwise, slide the manual override switch to manual, and move the adjustment lever to the right. Return the switch to automatic. See Figure 9.

Estimated Installation Time

30 Minutes

WARNING
Do Not Open the Actuator

Mounting and Installation

Mounting Orientation
UL NEMA Type 2 and IP54 approved in all positions except as shown below:

Figure 2. Unapproved Position for UL NEMA Type 2 and IP54.

NOTE:
The DC(M)-88 Series Enhanced actuator comes with a factory-installed 1/2-inch shaft guide. If the shaft size is 1/2-inch, proceed with Figure 6.

When using a 3/8-inch shaft: Remove factory-installed 1/2-inch guide. See Figure 3

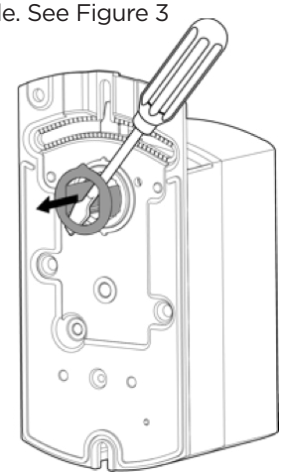


Figure 3. Removing 1/2-inch Ø Shaft Guide for 3/8-in or 5/8-in Shaft.

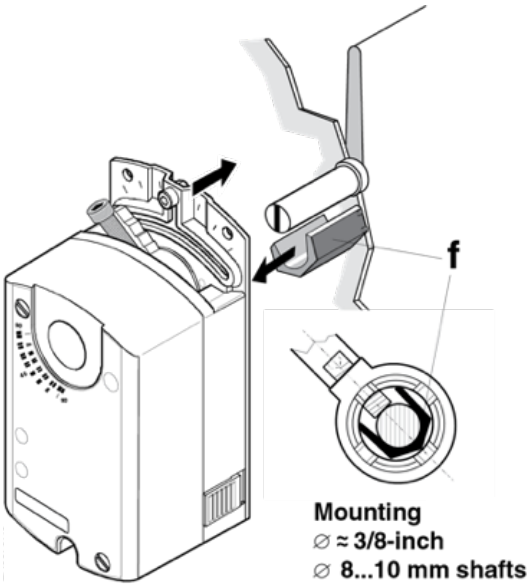


Figure 4. 3/8-inch Ø Shaft, See Figure 1 Item f.

1. A 3/8-inch shaft adapter is provided in actuator package.
2. Hold the shaft insert so that the raised tabs are inserted last when placing the insert into the back of the actuator.
3. Proceed to Figure 6

When using a 5/8-inch shaft:

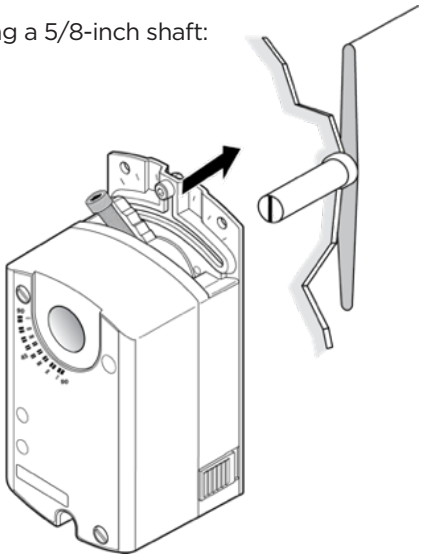


Figure 5. 5/8-inch Ø Shaft.

1. Remove factory-installed 1/2-inch guide. See Figure 3.
2. Mount actuator to shaft per Figure 6.

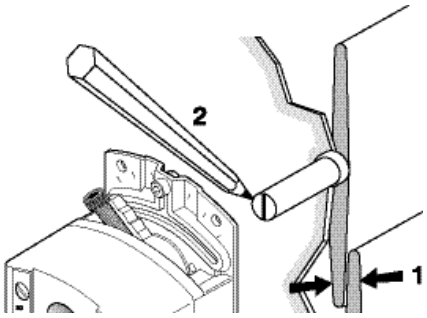


Figure 6. Mounting Actuator to Damper Shaft.

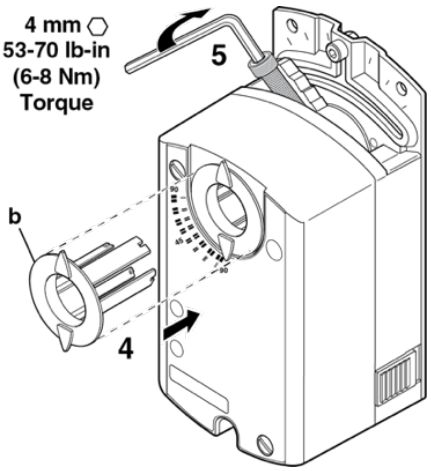
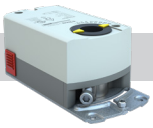


Figure 7. Installing the Position Indicator (b).



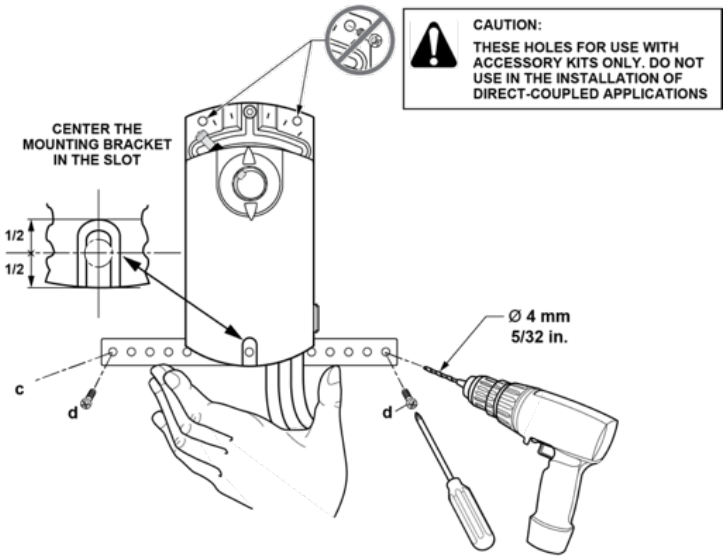


Figure 8. Attaching the Mounting Bracket.

Manual Override

To move the damper blades and lock the position with no power present, do the following:

1. Slide the red manual override knob toward the back of the actuator. See Figure 9.
2. Make adjustments to the damper position.
3. Slide the red manual override knob toward the front of the actuator.

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

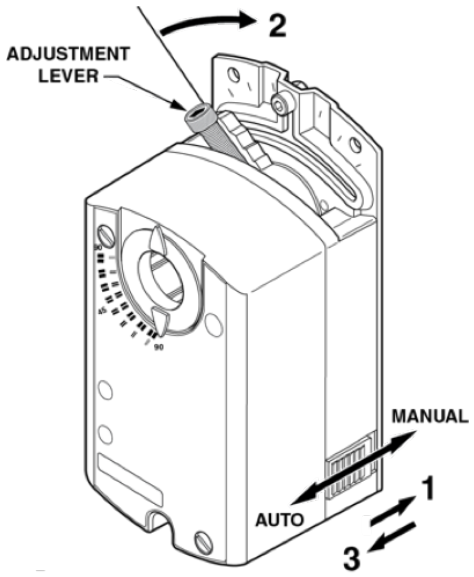


Figure 9. Manual Override.

Dual Auxiliary Switch Setting

For DC24-88-TAP & DCM24-88-AP Series

Factory setting: A = 5° B = 85°

Use a flat-blade screwdriver to adjust the A switch. The long arm of the † points to the setting. Manually turn the red ring of the B switch. The narrower tab on the ring points to the setting. See Figure 10.

The auxiliary switch setting shafts rotate with the actuator.

NOTE: The scale is valid only when the actuator is in the 0 position on clockwise motion.

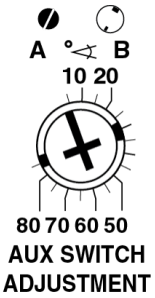


Figure 10. Auxiliary Switch Setting Dial.

Mechanical Range Adjustment

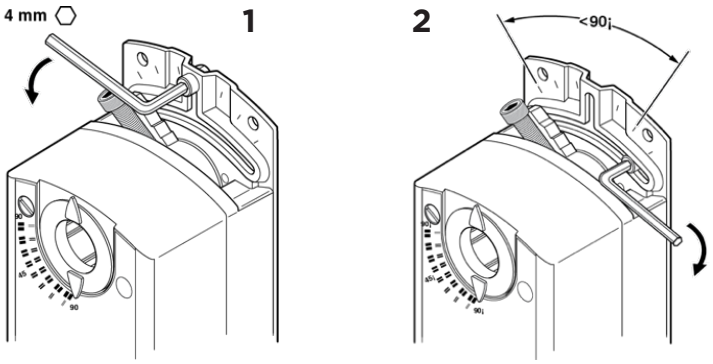


Figure 11. Moving the Mechanical Range Stop.

1. Loosen the stop set screw.
2. Move it along the track to the desired position, and fasten it in place using maximum 26 to 44 lb-in (3 to 5 Nm) torque.

Changing Rotation Direction

DIP Switch Settings

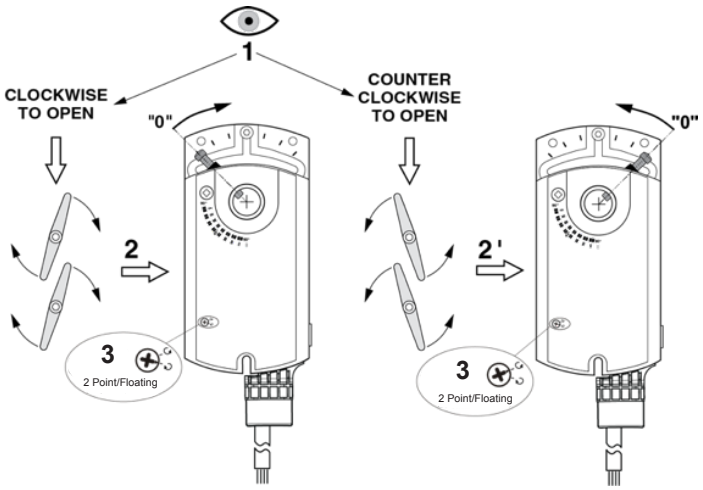


Figure 12. Setting the Direction of Rotation, 2-Position/Floating.

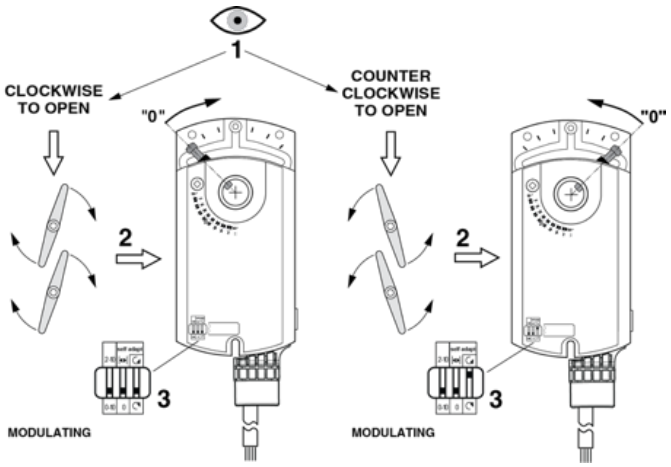
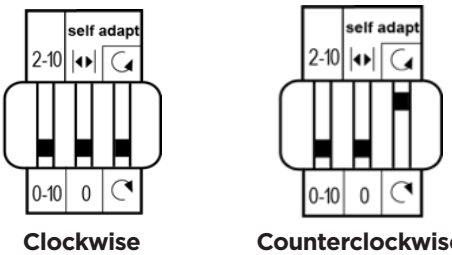


Figure 13. Setting the Direction of Rotation, Modulating Actuator.



Clockwise **Counterclockwise**

Figure 14. Rotation Direction, Modulating Actuator.

NOTE: For DIP switch setting options, see the Technical Instructions listed in References.

Mechanical Range Limitation and Self–adapt Feature

1. To use the entire 0(2) to 10V input signal to con trol the adjusted range, raise the tab located on the lower left-hand side of the actuator and locate the DIP switches. See Figure 15.

2. Set the self-adapt DIP switch (middle) to ◀▶ (ON).

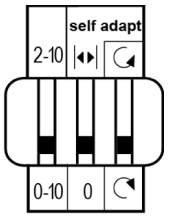


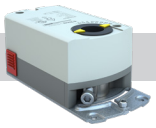
Figure 15. Self-adapt Switch in OFF Position (Factory Setting).

3. Close the tab over the DIP switches.

For example, if you set the locking screw at 70° and turn the self-adapt switch ON, a 5V input signal will drive the damper to 35° (50% of its adjusted range).

CAUTION

When turning the self-adaptive feature on, or after software reset with the feature on, the actuator will enter a five-minute calibration cycle as the actuator adjusts to the rotation limits of the system. The software reset happens after power on, or may be caused by electrostatic discharge (ESD) at levels of 2 kV and above.



Wiring

All wiring must conform to NEC and local codes and regulations.

Use earth ground isolating step-down Class 2 transformers. Do not use autotransformers.

Determine the supply transformer rating by summing total VA of all actuators used. It is recommended that one transformer power no more than 10 actuators.

WARNING
Installations requiring CE Conformance

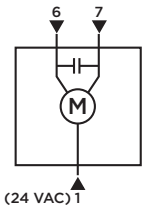
- All wiring for CE rated actuators must only be separated extra low voltage (SELV) or protective extra low voltage (PELV) per HD384-4-41.
- Use safety-isolating transformers (Class III transformer) per EN 61558. They must be rated for 100% duty cycle.
- Overcurrent protection for supply lines is maximum 10A.

Wiring Diagrams

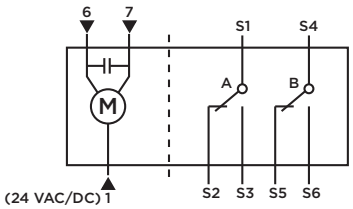
CAUTION
Do not wire different types of actuators (such as Floating & Modulating) in parallel.

Wiring DC24-88 Series

DC24-88-TP
PLENUM CABLE
Floating Control

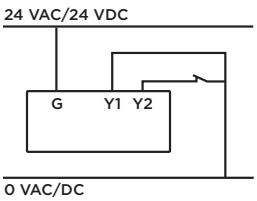


DC24-88-TAP
PLENUM CABLE
2-Position/Floating Control

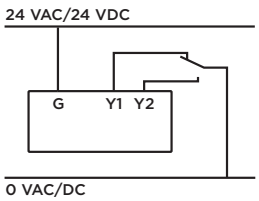


2-POSITION/FLOATING CONTROL			
Standard Symbol	**Function**	**Terminal Designation**	**Color**
1	Supply (SP)	G	Red
6	Control Signal clockwise	Y1	Violet
7	Control Signal Counterclockwise	Y2	Orange
Factory-Installed Options			
S1	Switch A Common	Q11	Gray/Red
S2	Switch A N.C.	Q12	Gray/Blue
S3	Switch A N.O.	Q14	Gray/Pink
S4	Switch B Common	Q21	Black/Red
S5	Switch B N.C.	Q22	Black/Blue
S6	Switch B N.O.	Q24	Black/Pink

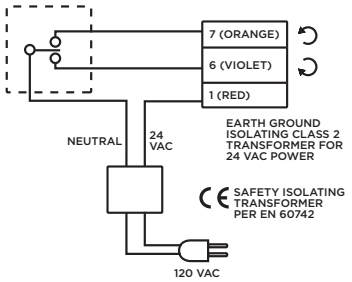
CONTROL METHOD



2-Position, SPST
(Single-Pole, Single-Throw)

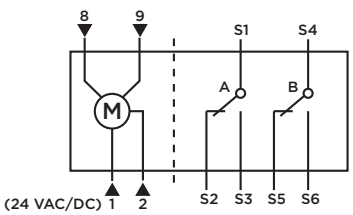


2-Position, SPDT
(Single-Pole, Double-Throw)



Floating Control
24 VAC/DC

DCM24-88-(A)P
PLENUM CABLE
Modulating



MODULATING CONTROL			
Standard Symbol	**Function**	**Terminal Designation**	**Color**
1	Supply (SP)	G	Red
2	Neutral (SN)	G0	Black
8	0(2) to 10V input signal	Y	Gray
9	Output for 0(2)-10V position indication	U	Pink
Factory-Installed Options			
S1	Switch A – Common	Q11	Gray/Red
S2	Switch A – N.C.	Q12	Gray/Blue
S3	Switch A – N.O.	Q14	Gray/Pink
S4	Switch B – Common	Q21	Black/Red
S5	Switch B – N.C.	Q22	Black/Blue
S6	Switch B – N.O.	Q24	Black/Pink

Retrofit Wiring

Modulating Control (0-10V) Function	Bray DC(M)-88 Series		Siemens GDE Series GLB Series		Belimo LMB Series NMB Series		Honeywell MN7505 Series MN7510 Series		Johnson M9104 Series M9109 Series	
	Color	Number	Color	Number	Color	Number	Color	Number	Color	Number
Supply (24V)	Red	1	Red	1	Red	2	Red	1	Red	2
Common	Black	2	Black	2	Black	1	Black	2	Black	1
0(2) to 10 VDC Input	Gray	8	Gray	8	White	3	Brown	3	Gray	3
0(2)-10V Feedback	Pink	9	Pink	9	Orange	5	Blue	5	Orange	4
Floating Control Function	Bray DC-88 Series		Siemens GDE Series GLB Series		Belimo LMB Series NMB Series		Honeywell MN7505 Series MN7510 Series		Johnson M9104 Series M9109 Series	
	Color	Number	Color	Number	Color	Number	Color	Number	Color	Number
Common	Red	1	Red	1	Black	1	Black	2	Black	1
24V CW	Violet	6	Violet	6	Red	2	Red	3	Red	2
24V CCW	Orange	2	Orange	7	White	3	White	4	Orange	3

Dimensions