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DC(M)-44 Series – 44 lb-in (5 Nm) Electric Actuator

IOM Manual



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Те	Technical Specifications - DC(M)-44 Series Actuator								
		DC24-44-TP DC24-44-TAP DC24-44-TPTO DCM24-44-P DCM24-44-AI							
Type	Actuator Models	Non-Spring Return Floating* Plenum Cable	Non-Spring Return Floating* Plenum Cable Auxiliary Switches	Non-Spring Return Non-Spring Return 2-Position/Floating Modulating Plenum Cable Plenum Cable		Non-Spring Return Modulating Plenum Cable Auxiliary Switches			
	Torque			44 lb-in. (5 Nm)					
	Operating Voltage	24 VAC +20%, -	15% at 50/60 Hz		24 VAC/DC +-20%				
	Power Consumption	2.3	VA	1.1 VA, 0.7W	1.3 VA, 0.9W				
	Operational Protection	N	/A	Tir	imeout/Overload Protection				
	Control Signal	Floa	ating	2-Position/Floating	0(2)-10V				
	Input Impedance		N/A		>100k Ohms				
	Feedback Signal		N/A		0(2)-10V (Maximum Output Current D				
Electrical	Auxiliary Switch Rating	N/A	4A Resistive, 2A Inductive	N/A N/A		4A Resistive, 2A Inductive			
	Switch Range (Switch A)	N/A	0 to 90° with 5° Intervals (Recom- mended Range Usage 0 to 45°) Factory Setting 5°	N/A	N/A	0 to 90° with 5° Intervals (Recom- mended Range Usage 0 to 45°) Factory Setting 5°			
	Switch Range (Switch B)	N/A	0 to 90° with 5° Intervals (Recom- mended Rang Usage 45 to 90°) Factory Setting 85°	N/A	N/A	0 to 90° with 5° Intervals (Recom- mended Rang Usage 45 to 90°) Factory Setting 85°			
	Switching Hysteresis	N/A	2°	N,	1/A 2°				
	Equipment Rating	Class 2 per UL/CSA,	Class III per EN60730	Class 2 according to UL, cUL; Class III per EN60730					
	Electrical Connection		3 ft. (0.9 m) Pre-cabled - AWG 18 - Plenum Rated Cable						
	Manual Override	Manual Operation by Selecting Override Knob when Power is off							
c	Runtime for 90° of Rotation	90 sec. at 60 Hz ((108 sec. at 50 Hz)	90 sec.					
atio	Rotation Range		Nominal Angle of	ally limited to 95°					
per	Cycle Life	60,000 full strokes/ 1.5 million repositions 100,000 full strokes/ 5 million repositions							
0	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)							
	Enclosure	NEMA 2, IP54 according to EN60529							
ental	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							
muc	Audible Noise Rating	35 dBA at 1 m							
Envire	Dimensions		(137)	m D)					
	Weight	1.06 lb (0.48 kg)	1.35 lb (0.61 kg)					
Conditions	Agency Certifications	UL listed to UL873-cU Standard C22. In accordance with th the European Union Compatibility (EN Emissions Standa Immunity Standa	L certified to Canadian 2 No. 24-93, CE e directive set forth by for Electromagnetic 4C) 2004/108/EC ards EN61000-6-3 ards EN61000-6-2	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.							

* Not eligible for SPST control

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.



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.



Product Description

The DC(M)44 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



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)-44 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



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 DC24-44-TAP & DCM24-44-AP Series

Factory setting: $A = 5^{\circ}$ $B = 85^{\circ}$

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 O 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.
- 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 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

- To use the entire O(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.

DC(M)-44 Series - Installation, Operation & Maintenance Manual Continued

WARNING

(PELV) per HD384-4-41.

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.

Wiring Diagrams

1 (24 VAC)

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





2-POSITION/FLOATING CONTROL								
Standard Symbol	Function	Terminal Designa- tion	Color					
1	Supply (SP)	G	Red					
6	Control Signal clockwise	Y1	Violet					
7	Control Signal Counterclockwise	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					
	DC24-44-TPTO On	у						
P1	Feedback Potentiometer 0 to 100% P1 - P2 (0 to 5,000 ohms)	A	Black					
P2	Feedback Potentiometer Common	в	Black					
P3	Feedback Potentiometer 100 to 0% P3 - P2 (5,000 to 0 ohms)	с	Black					



Output for 0(2)-10V 9 υ Pink position indication Factory-Installed Options **S**1 Switch A - Common Gray/Red Q11 S2 Switch A - N.C. Q12 Gray/Blue Switch A - N.O. Q14 Gray/Pink S3 **S4** Switch B – Common Q21 Black/Red Switch B - N.C. Black/Blue **S**5 Q22 56 Switch B - N.O Q24 Black/Pink

Overcurrent protection for supply lines is maximum 10A.

Installations requiring $C \in$ Conformance

All wiring for CE rated actuators must only be separated

extra low voltage (SELV) or protective extra low voltage

Use safety-isolating transformers (Class III transformer)

per EN 61558. They must be rated for 100% duty cycle.

2

(24 VAC/DC)





Retrofit Wiring

Modulating Control (0-10V)	Bray DC(M)-44 Series		Siemens GDE Series GLB Series		Belimo LMB Series NMB Series		Honeywell MN7505 Series MN7510 Series		Johnson M9104 Series M9109 Series	
Function	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 Siemens DC-44 Series GDE Series GLB Series		Belimo Hor LMB Series MN75 NMB Series MN75		Hone MN750 MN7510	eywell Johnson 15 Series M9104 Series 0 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





