

Damper Actuators **Non-Spring Return** **On/Off • Floating • Modulating**



Application

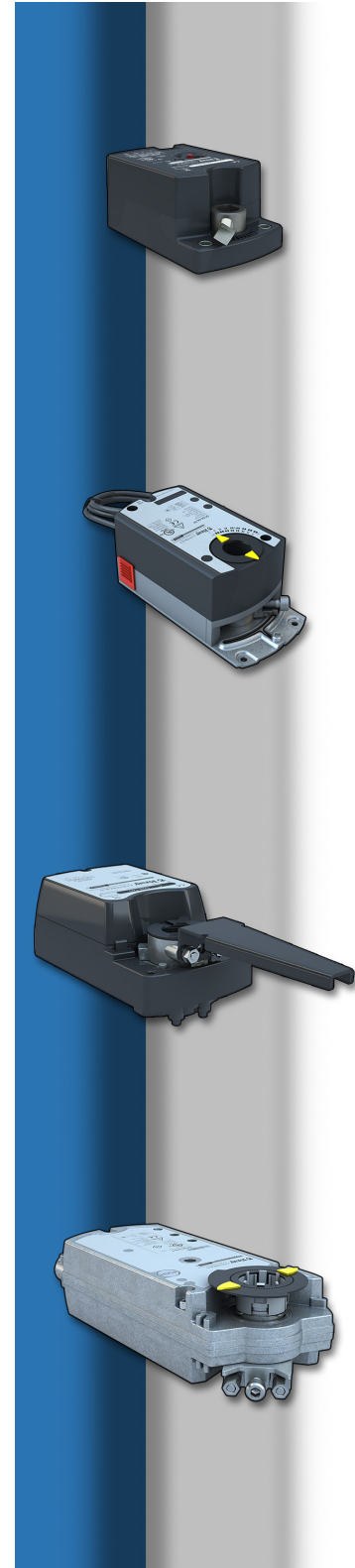
Bray's wide variety of damper electric actuator choices increases flexibility when choosing peripheral products for Building Automation Systems.

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 damper electric 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.

Options include:

- Non spring return operation
- Auxiliary switches (optional)
- 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 Damper Actuators - D24-35 Series



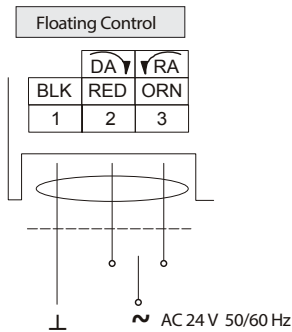
Technical Specifications - D24-35 Series Actuator				
Type	Actuator Models	D24-35-TP	D24-35-T-TS	DM24-35
		Non-Spring Return - Floating & On/Off (relay required)		DM24-35-T-TS
Electrical	Torque	35 lb-in. (4 Nm)		
	Operating Voltage	24 VAC +25%/-20% at 50/60 Hz		
	Power Consumption	2.1 VA		2.9 VA
	Input Signal	24 VAC +25%/-20% at 50/60 Hz		0(2) to 10 VDC or 0(4) to 20 mA with field-furnished 500 ohm resistor
	Input Impedance	N/A		200k Ohms
	Equipment Rating	Class 2 or Safety Extra-Low Voltage (SELV)		
	Feedback Signal	N/A		0 to 10 VDC or 2 to 10 VDC for 90° (10 VDC at 1 mA), Corresponds to input signal span selection
	Electrical Connection	36 in. (0.9 m) UL 444 Type CMP Plenum Rated cable with 19 AWG (0.75 mm ²) conductors and 1/4 in. (6 mm) ferrule ends	Exposed Terminal Block - M3 Terminal Screws	36 in. (0.9 m) UL 444 Type CMP Plenum Rated cable with 19 AWG (0.75 mm ²) conductors and 1/4 in. (6 mm) ferrule ends
Operation	Manual Override	External Push Button		
	Runtime for 90° of Rotation	60 Seconds at 60 Hz / 72 Seconds at 50 Hz for 90° rotation		
	Rotation Range	93° ±3°, CW or CCW		
	Cycle Life	100,000 Full Stroke Cycles; 2,500,000 repositions at rated running torque		
	Mechanical Connections	Round Shafts - Up to 1/2 in. (13 mm) Square Shafts - Up to 3/8 in. (10 mm)		
Environmental	Enclosure	NEMA 2 (IP42)	NEMA 2 (IP40)	NEMA 2 (IP42)
	Ambient Conditions (Non-Condensing)	Operating — -4 to 140°F (-20 to 60°C); 90% RH Max. Storage — -20 to 150°F (-29 to 66°C); 90% RH Max.		
	Audible Noise Rating	35 dBA Nominal at 39-13/32 in. (1 meter)		
	Dimensions	5.16 x 2.81 x 2.06 in. (131 x 71 x 52 mm)		
Conditions	Weight	1.0 lb (0.5 kg)		
	Agency Certifications	United States/Canada - United States UL Listed, File E27734, CCN XAPX (United States) and XAPX7 (Canada) Actuator Housing is Plenum Rated per CSA C22.2 No. 236/UL 1995, Heating and Cooling Equipment		
		Europe - CE Mark - Product is in compliance with the essential requirements and other relevant provisions of the EMC Directive 2004/108/EC and the Low Voltage Directive 2006/95/EC		
		Australia/New Zealand - C-Tick Mark Australia/NZ Emissions Compliant		
	Warranty	5 Years limited from time of shipment.		

Non-Spring Return Damper Actuators - D24-35 Series Wiring



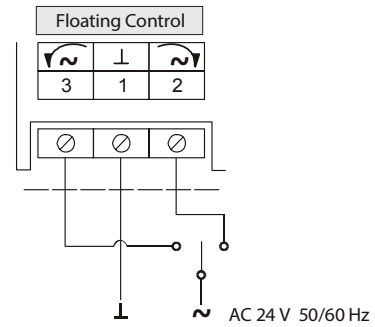
D24-35-TP

PLENUM CABLE



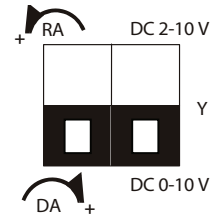
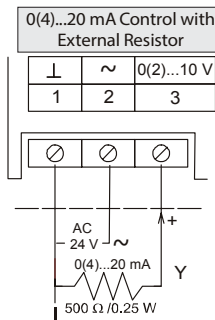
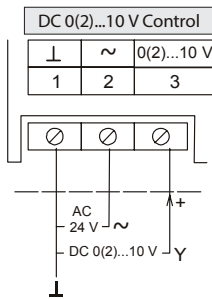
D24-35-T-TS

TERMINAL BLOCK



DM24-35

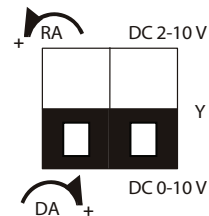
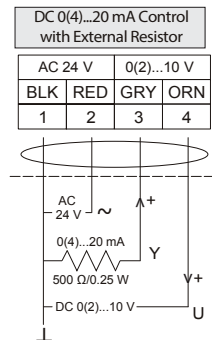
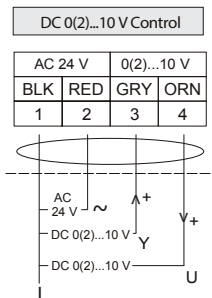
PLENUM CABLE



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

DM24-35-T-TS

TERMINAL BLOCK



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

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).

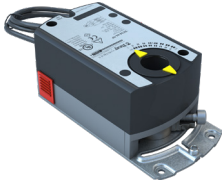
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Non-Spring Return Damper Actuators - DC(M)24-44-88 Series



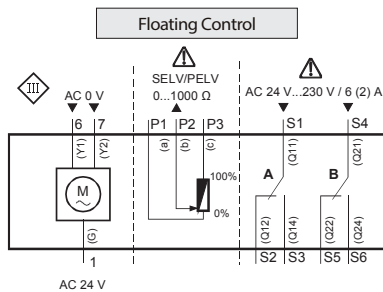
Technical Specifications - DC24-(44,88) Series Actuator					
Type	Actuator Models	DC24-(44,88)-TP	DC24-(44,88)-TAP	DCM24-(44,88)-P	DCM24-(44,88)-AP
		Non-Spring Return Floating - Plenum Cable	Non-Spring Return Floating - Plenum Cable - Auxillary Switches (-A)	Non-Spring Return Modulating - Plenum Cable	Non-Spring Return Modulating - Plenum Cable Auxillary Switches (-A)
	Torque	(DC(M)24-44), 44 lb-in. (5 Nm) (DC(M)24-88), 88 lb-in. (10 Nm)			
Electrical	Operating Voltage	24 VAC +20%, -15% at 50/60 Hz			
	Power Consumption	2.3 VA, 1W		3.3 VA, 2W	
	Control Signal	0 to 10 VDC			
	Input Signal	Floating 24 VAC at 50/60 Hz or 24 VDC		N/A	
	Input Signal Adjustments	Factory Setting - 0 to 10 VDC, 0 to 20 mA, CW rotation with signal increase		N/A	
		Jumper Selectable - 0 (2) to 10 VDC, 0 (4) to 20 VDC, or 0 (4) to 20 mA. Action is jumper selectable Direct (CW) or Reverse (CCW) with signal increase.		N/A	
	Input Impedance	N/A		100k Ohms	
	Feedback Signal	N/A		0 to 10 VDC (Maximum Output Current DC 1mA)	
	Auxillary 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	24 VAC - Class 2 per UL/CSA			
	Electrical Connection	3 ft. (0.9 m) Pre-cabled - AWG 18 - Plenum Rated Cable			
	Operation	Manual Override	External Push Button		
Runtime for 90° of Rotation		(DC(M)24-44), 90 sec. at 60 Hz (108 sec. at 50Hz) (DC(M)24-88), 125 sec. at 60 Hz (150 sec. at 50Hz)			
Rotation Range		Nominal Angle of Rotation 90°, mechanically limited to 95°			
Cycle Life		60,000 cycles at rated load		50,000 cycles at rated load	
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 12.8 mm) Minimum Shaft Length - 1-5/32 (30 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	(L) 5.4 x (W) 2.8 x (H) 2.4 in. (137 x 68 x 60mm)			
	Weight	1.06 lb (.48 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			
	Warranty	5 Years limited from time of shipment.			

Non-Spring Return Damper Actuators - DC(M)24-44-88 Series Wiring

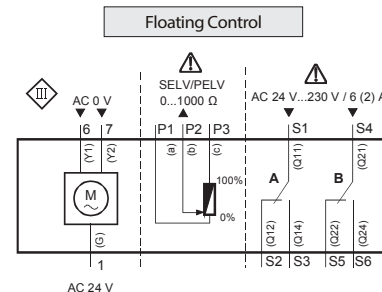


KEY				
Cable			Function	
No.	Code	Color		
1	G	Red (RD)	AC 24 V Supply (SP)	
2	G0	Black (BK)	Neutral (SN)	
6	Y1	Violet (VT)	Control Signal Clockwise AC 0 V	
7	Y2	Orange (OG)	Control Signal AC 0 V Counterclockwise	
8	Y	Gray (GY)	Control signal DC 0..10 V, 0..35 V	
9	U	Pink (PK)	Position indication DC 0..10 V	
Auxiliary Switch - Factory Installed				
S1	Q11	Gray/Red (GY RD)	Switch A Input	
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 Input	
S5	Q22	Black/Blue (BK BU)	Switch B - N.C.	
S6	Q24	Black/Pink (BK PK)	Switch B - N.O.	

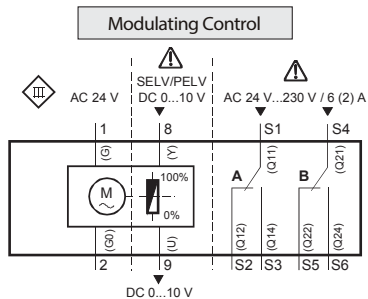
DC24-(44,88)-TP PLENUM CABLE



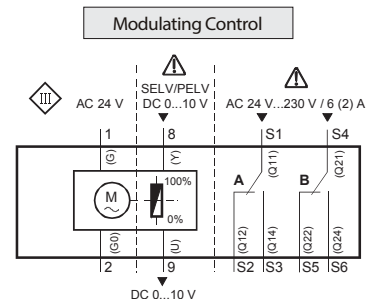
DC24-(44,88)-TAP PLENUM CABLE



DCM24-(44,88)-P PLENUM CABLE



DCM24-(44,88)-AP PLENUM CABLE



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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).

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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.

Non-Spring Return Damper Actuators - D24-70, 140, 210, 280 Series

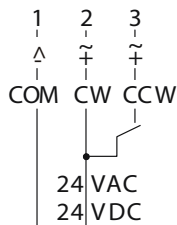


Technical Specifications - D24-70, 140, 210, 280 Series Actuator					
Type	Actuator Models	D24-70-(A)	D24-140-(A)	D24-210-(A)	D24-280-(A)
		Non-Spring Return - On/Off or Floating with optional Auxillary Switches (-A)			
	Torque	70 lb-in. (8 Nm)	140 lb-in. (16 Nm)	210 lb-in. (24 Nm)	280 lb-in. (32 Nm)
Electrical	Operating Voltage	24 VAC (20 to 30 V) at 50/60 Hz or VDC 24 V ±10%;		24 VAC (20 to 30 V) at 50/60 Hz or VDC 24 V ±10%;	
	Power Consumption	6.5 VA supply minimum			7.5 VA supply minimum
	Input Signal	24 VAC +25%/-20% at 50/60 Hz, or DC 24 V			
	Input Signal Adjustments	Factory Setting, Terminals 1 and 2, CW rotation; Terminals 1 and 3, CCW rotation			
	Auxillary Switch Rating	Auxillary Switches (-A) - Two Single-Pole, Double-Throw (SPDT) switches rated at 24 VAC 1.5 A inductive, 3.0 A resistive, 35 VA maximum per switch, Class 2			
	Equipment Rating	Class 2 or Safety Extra-Low Voltage (SELV)			
	Electrical Connection	Screw terminals for 22 to 14 AWG; maximum of two 18, 20, or 22 AWG per terminal			1/4 in. spade terminals with pluggable 3-terminal blocks
Operation	Manual Override	External Push Button			
	Time Out Feature	Electronic stall detection ensures higher reliability by deactivating the actuator motor when a stall condition is detected			
	Runtime for 90° of Rotation	30 seconds at 50% rated load, 25 to 50 seconds for 0 to 70 lb-in (0 to 8 N-m)	80 seconds at 50% rated load, 70 to 115 seconds for 0 to 140 lb-in (0 to 16 N-m)	130 seconds at 50% rated load, 115 to 175 seconds for 0 to 210 lb-in (0 to 24 N-m)	140 seconds at 50% rated load, 115 to 205 seconds for 0 to 280 lb-in (0 to 32 N-m)
	Rotation Range	0 to 90° in 5-degree increments, mechanically limited to 93° Rotation range is adjusted by repositioning the output hub			
	Cycle Life	60,000 cycles at rated load			
	Mechanical Connections	Round Shafts - 3/8 to 3/4 in. (10 to 20 mm) diameter Square Shafts - 3/8 to 5/8 in. (10 to 16 mm), 1 in. (25.4 mm) diameter jackshaft with M9000-154 coupler			
Environmental	Enclosure	NEMA 2 (IP42)			
	Ambient Conditions (Non-Condensing)	Operating — -4 to 122°F (-20 to 50°C); 95% RH Max. Storage — -20 to 186°F (-29 to 86°C); 95% RH Max.			
	Audible Noise Rating	45 dBA at 39-13/32 in. (1 meter)			
	Dimensions	7.09 x 3.94 x 2.54 in. (180 x 100 x 64.5 mm)			
	Weight	2.9 lb (1.3 kg)			
Conditions	Agency Certifications	United States/Canada – UL 873 Listed, File E27734, CCN XAPX			
		Canada – CSA C22.2 No. 139 Certified, File LR85083, Class 3221 02			
		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.			
		Australia/New Zealand – C-Tick Mark Australia/NZ Emissions Compliant			
	Warranty	5 Years limited from time of shipment.			

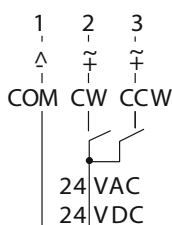
D24-70, 140, 210, 280

TERMINAL BLOCK

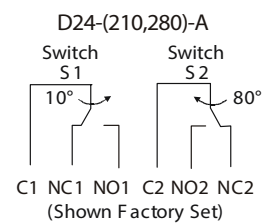
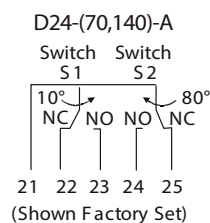
On/Off



Floating Control



Auxillary Switches



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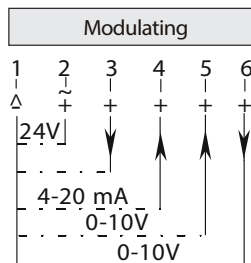
Non-Spring Return Damper Actuators - DM24-70, 140, 210, 280 Series



Technical Specifications - DM24-70, 140, 210, 280 Series Actuator					
Type	Actuator Models	DM24-70-(A)	DM24-140-(A)	DM24-210-(A)	DM24-280-(A)
		Non-Spring Return - Modulating with optional Auxillary Switches (-A)			
Electrical	Torque	70 lb-in. (8 Nm)	140 lb-in. (16 Nm)	210 lb-in. (24 Nm)	280 lb-in. (32 Nm)
	Operating Voltage	24 VAC (20 to 30 V) at 50/60 Hz or VDC 24 V ±10%;		24 VAC (20 to 30 V) at 50/60 Hz or VDC 24 V ±10%;	
	Power Consumption	6.5 VA supply minimum		7.5 VA supply minimum	
	Input Signal	DC 0 (2) to 10 V, DC 0 (4) to 20 V, or DC 0 (4) to 20 mA			
	Input Signal Adjustments	Factory Setting - 0 to 10 VDC, 0 to 20 mA, CW rotation with signal increase			
		Jumper Selectable - 0 (2) to 10 VDC, 0 (4) to 20 VDC, or 0 (4) to 20 mA Action is jumper selectable Direct (CW) or Reverse (CCW) with signal increase.			
	Input Impedance	Voltage Input - 205,000 ohms for 0 (2) to 10 V and 410,000 ohms for 0 (4) to 20 V Current Input - 500 Ohms			
	Feedback Signal	0 to 10 VDC or 2 to 10 VDC for 90° (10 VDC at 1 mA) Corresponds to input signal span selection.			
	Auxillary Switch Rating	Auxillary Switches (-A) - Two Single-Pole, Double-Throw (SPDT) switches rated at 24 VAC 1.5 A inductive, 3.0 A resistive, 35 VA maximum per switch, Class 2			
	Equipment Rating	Class 2 or Safety Extra-Low Voltage (SELV)			
Electrical Connection	Screw terminals for 22 to 14 AWG; maximum of two 18, 20, or 22 AWG per terminal		1/4 in. spade terminals with pluggable 3-terminal blocks		
Operation	Manual Override	External Push Button			
	Time Out Feature	Electronic stall detection ensures higher reliability by deactivating the actuator motor when a stall condition is detected			
	Runtime for 90° of Rotation	30 seconds at 50% rated load, 25 to 50 seconds for 0 to 70 lb-in (0 to 8 N-m)	80 seconds at 50% rated load, 70 to 115 seconds for 0 to 140 lb-in (0 to 16 N-m)	130 seconds at 50% rated load, 115 to 175 seconds for 0 to 210 lb-in (0 to 24 N-m)	140 seconds at 50% rated load, 115 to 205 seconds for 0 to 280 lb-in (0 to 32 N-m)
	Rotation Range	0 to 90° in 5-degree increments, mechanically limited to 93° Rotation range is adjusted by repositioning the output hub			
	Cycle Life	60,000 cycles at rated load			30,000 cycles at rated load
	Mechanical Connections	Round Shafts - 3/8 to 3/4 in. (10 to 20 mm) diameter Square Shafts - 3/8 to 5/8 in. (10 to 16 mm), 1 in. (25.4 mm) diameter jackshaft with M9000-154 coupler			
Environmental	Enclosure	NEMA 2 (IP42)			
	Ambient Conditions (Non-Condensing)	Operating — -4 to 122°F (-20 to 50°C); 95% RH Max. Storage — -20 to 186°F (-29 to 86°C); 95% RH Max.			
	Audible Noise Rating	45 dBA at 39-13/32 in. (1 meter)			
	Dimensions	7.09 x 3.94 x 2.54 in. (180 x 100 x 64.5 mm)			
Conditions	Weight	2.9 lb (1.3 kg)			
	Agency Certifications	United States/Canada - UL 873 Listed, File E27734, CCN XAPX			
		Canada - CSA C22.2 No. 139 Certified, File LR85083, Class 3221 02			
		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.			
Warranty	5 Years limited from time of shipment.				

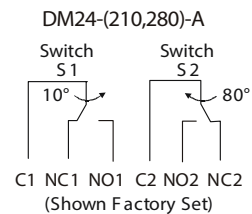
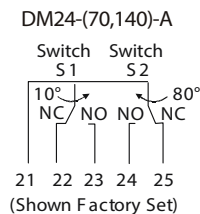
DM24-70, 140, 210, 280

TERMINAL BLOCK



- 1= Common
- 2= Power
- 3= Not Used
- 4= Current Input
- 5= Voltage Input
- 6= Feedback Output

Auxillary Switches

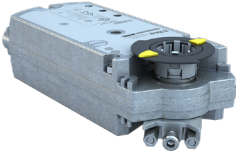


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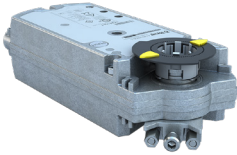
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Non-Spring Return Damper Actuators - DC-310 Series



Technical Specifications - DC24-310 Series Actuator			
Type	Actuator Models	DC24-310-T(-A)	DCM24-310-T(-A)
		Non-Spring Return - Floating, Time Out Features with optional Auxillary Switches (-A)	Non-Spring Return - Modulating with optional Auxillary Switches (-A)
Electrical	Torque	310 lb-in. (35 Nm)	
	Operating Voltage	24 VAC $\pm 20\%$ 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 Potentiometer	0 to 1,000 Ohms, <10 mA	N/A
	Positioning Signal	N/A	DC 0...35 V at Offset $U_0 = 0...5$ V and Span $\Delta U = 2...30$ V
	Feedback Signal	N/A	DC 0 (2) to 10 V
	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°	
	Time Out	Auto shutoff feature to prevent excessive wear or drive time on the motor	N/A
Operation	Electrical Connection	3 ft. (0.9 m) Pre-cabled - AWG 18	
	Equipment Rating	Class 2 According to UL, CSA - Class III per EN60730	
	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° $\pm$ 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.	

Non-Spring Return Damper Actuators - DC-310 Series Wiring



KEY

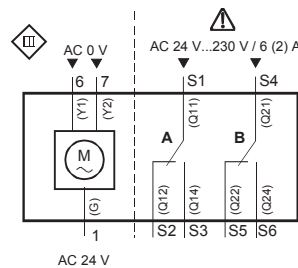
Cable			Function
No.	Code	Color	
1	G	Red (RD)	AC 24 V Supply (SP)
2	G0	Black (BK)	Neutral (SN)
6	Y1	Violet (VT)	Control Signal Clockwise AC 0 V
7	Y2	Orange (OG)	Control Signal AC 0 V Counterclockwise
8	Y	Gray (GY)	Control signal DC 0..10 V, 0..35 V
9	U	Pink (PK)	Position indication DC 0..10 V

Auxiliary Switch - Factory Installed			
S1	Q11	Gray/Red (GY RD)	Switch A Input
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 Input
S5	Q22	Black/Blue (BK BU)	Switch B - N.C.
S6	Q24	Black/Pink (BK PK)	Switch B - N.O.

DC24-310-T(-A)

STANDARD CABLE

Floating Control

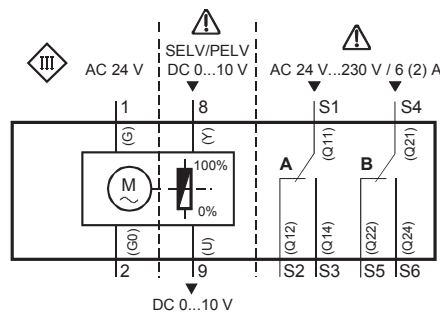


AC 24 V

DCM24-310-T(-A)

STANDARD CABLE

Modulating Control



DC 0...10 V

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.

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