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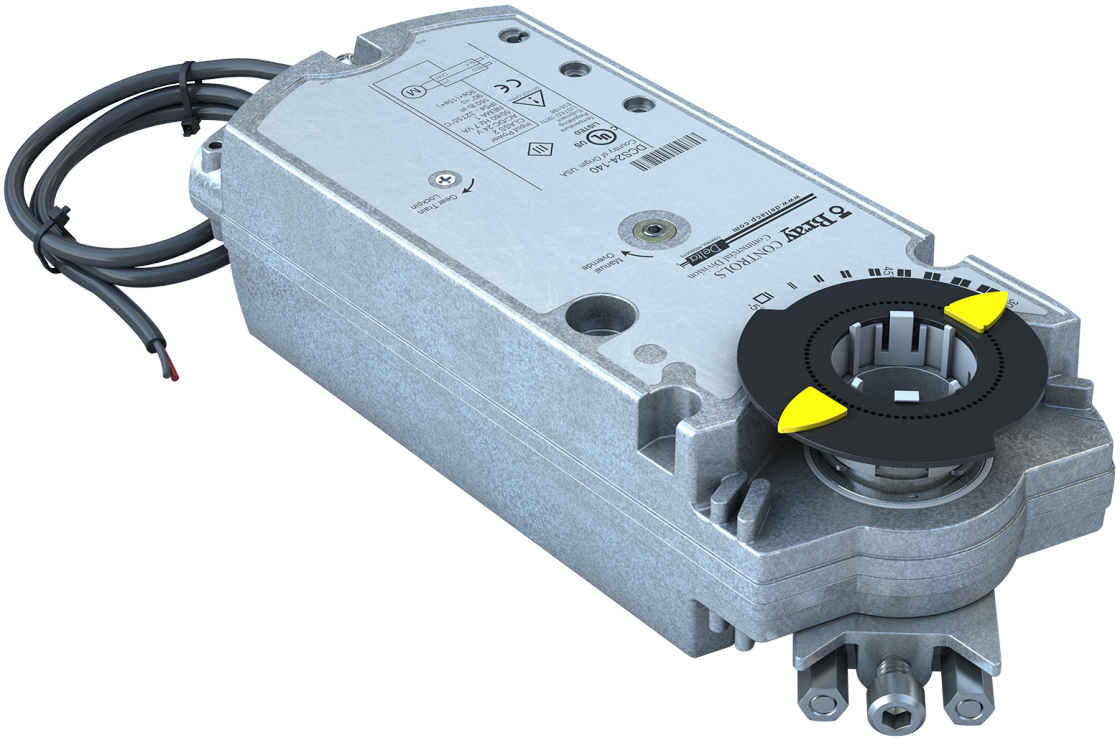
 11/10/24

DC(M)S-140 Series — 160 lb-in (18 Nm) Electric Actuator

IOM Manual



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DC(M)S-140 Series - Installation, Operation and Maintenance Manual

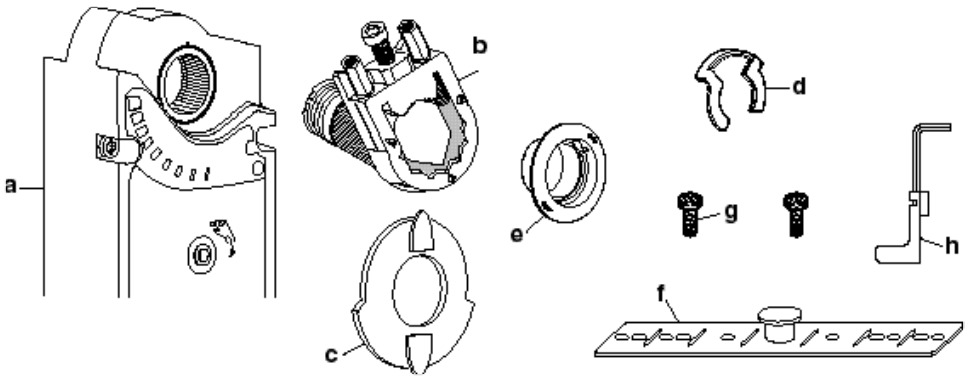
**FOR MORE INFORMATION ON THIS PRODUCT
AND OTHER BRAY PRODUCTS
PLEASE VISIT OUR WEBSITE – www.braycommercialdivision.com**

Technical Specifications - DCS-140 Series Actuator				
Type	Actuator Models	DCS24-140-(A)	DCMS24-140-(A)	DCS120-140-(A)
		Spring Return On/Off Opt. Auxiliary Switches **(-A)**	Spring Return Modulating Opt. Auxiliary Switches **(-A)**	Spring Return On/Off Opt. Auxiliary Switches **(-A)**
	Torque	160 lb-in. (18 Nm)		
Electrical	Operating Voltage	24 VAC ±20%; 24...48 24 VDC ±10% at 50/60 Hz		120 VAC ±10% at 50/60 Hz
	Power Consumption	Running: 7 VA/5W Holding: 5 VA/3W		Running: 8 VA Holding: 6 VA
	Control Input Signal	N/A	0 to 10 VDC or 2 to 10 VDC (max. 35 VDC)	N/A
	Control Input Impedance	N/A	>100K Ohms	N/A
	Feedback Signal	N/A	0 to 10 VDC Max. output current +1 mA, -.5 mA	N/A
	Auxiliary Switch Rating (-A Models Only)	**AC Rating** 24 VAC to 250 VAC; AC 6 A Resistive, AC 2A FLA, 12 LRA **DC Rating** 12 VDC to 30 VDC: DC 2A		**AC Rating** AC 6 A Resistive, AC 2A FLA, 12 LRA
	Switching Hysteresis (-A Models Only)	2°		
	Equipment Rating	Class 2 per UL/CSA		N/A
	Electrical Connection	36 in. (.9 m) Standard Cable with 18 AWG (0.75 mm2) Wire Leads		
	Conduit Connections	Integral Connectors for 3/8 in. Flex		
Operation	Manual Override	Hex Head Screw		
	Spring Return	Direction is Selectable with Mounting Position of Actuator		
	Rotation Range	Nominal angle of rotation 90°; Maximum angular rotation 95°		
	Runtime for 90° of Rotation	Power On (Running) 90 Seconds Power Off (Returning) 15 Seconds		
	Cycle Life	60,000 Full stroke cycles (1,500,000 repositions)		
	Mechanical Connections	**Round Shafts** - 3/8-in to 1-in (8 to 25.6 mm) **Square Shafts** - 1/4-in to 3/4-in (6 to 18 mm)		
Environmental	Enclosure	NEMA 2, IP54 per EN 60 529 - in vertical to horizontal 90°		
	Ambient Conditions (Non-Condensing)	**Operating —** -25°F to 130°F (-32°C to 55°C); 95% RH Maximum, Noncondensing **Storage —** -40°F to 158°F (-40°C to 70°C); 95% RH Maximum, Noncondensing		
	Audible Noise Rating	45 dBA		
	Dimensions	11-13/16" (L) x 4-3/4" (W) x 2-7/8" (H)		
	Weight	4.85 lb (2.2 kg)		
Conditions	Agency Certifications	UL listed to UL60730 (to replace UL873) cUL certified to Canadian Standard C22.2 No. 24-93		
	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.



a. Actuator
b. U-bolt shaft adapter
c. Position indicator
d. Shaft adapter locking clip
e. Position indicator adapter
f. Mounting bracket
g. Mounting screws
h. 3 mm hex wrench

Figure 1. Parts of the DCS24-140 Series Actuator.

Product Description

These installation instructions describe the steps for direct coupled mounting of the DCS/DCMS... spring return electronic damper actuator.

Warning/Caution Notations

WARNING:	⚠	Personal injury or 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.

Expected Installation Time

30 minutes

Required Tools

10 mm (13/32-in.) open end wrench
Drill
4 mm (5/32-in.) drill bit
3 mm hex wrench (provided)
6 mm hex wrench
Phillips screwdriver
Marker or pencil

Prerequisites

NOTE: The actuator is shipped from the factory with 5° preload on the spring. When power is applied to the actuator, the preload is released.

⚠ **WARNING:**

Do not open the actuator.

Installation

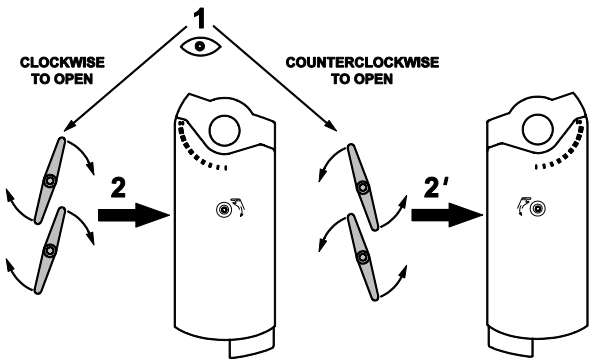


Figure 2. Actuator Mounting Orientation.

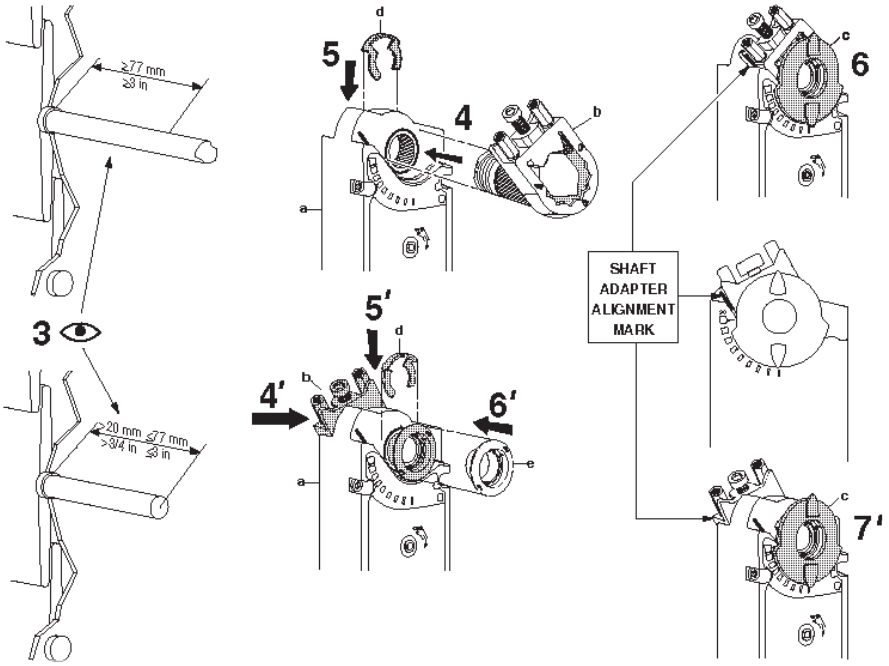


Figure 3. Shaft Length and Proper Shaft Adapter Location.

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

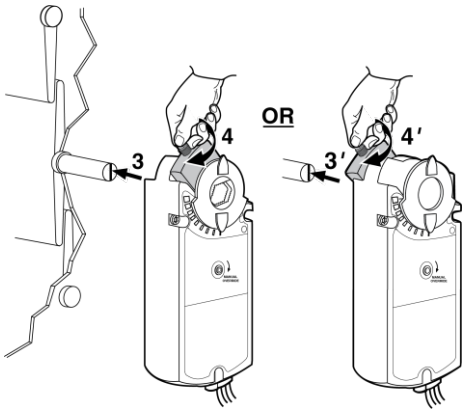


Figure 4. With the Damper Blades in the Desired "0" Position, Place the Actuator on the Shaft.

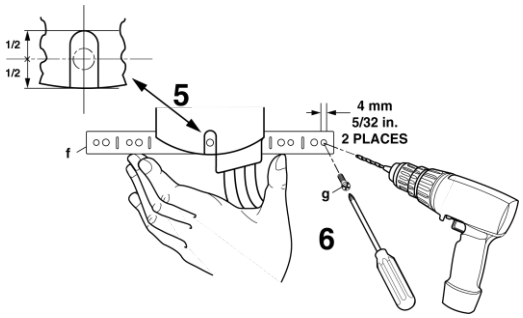


Figure 5. Fasten the Mounting Bracket.

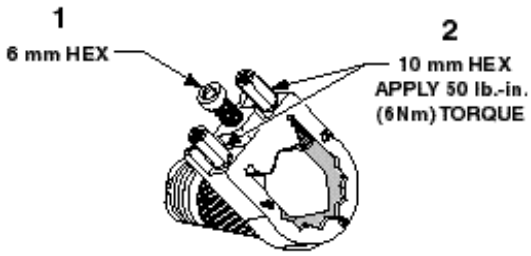
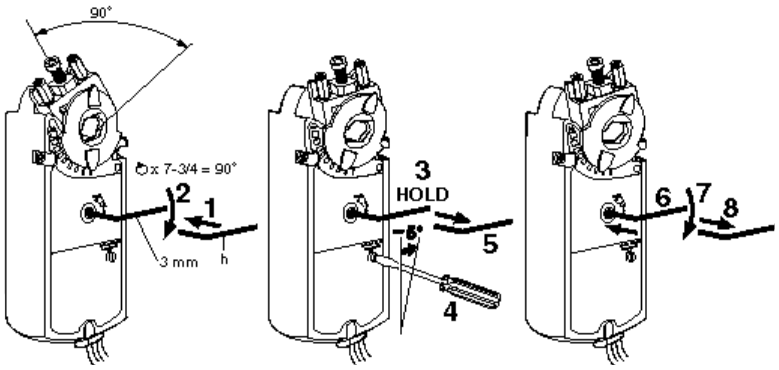


Figure 6. Fasten the Shaft Adapter to the Damper Shaft.

NOTE: Tighten the inside bolt before the two outside bolts.

Manual Override



Rotating
Turn the key in the direction of the arrow on the hand symbol.

Locking in place

Releasing when power is absent

Figure 7. Manual Override.

CAUTION:

When you lock the gear train lock pin, be careful to turn only about five degrees until you hear a light click or meet slight resistance. Turning too far will strip the head of the lock pin.

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

Mechanical Range Adjustment

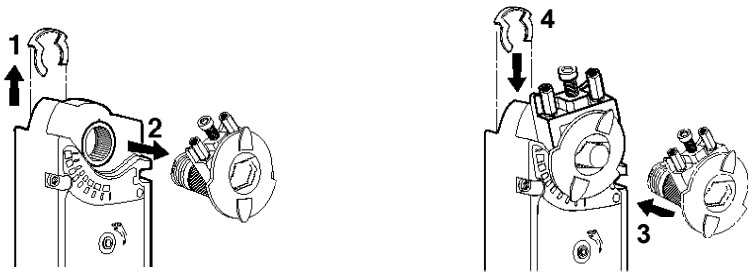


Figure 8. The Angular Rotation is Adjustable between 0° and 90° at 5 degree Intervals.

Tandem Mounting

Wiring for DCMS24-140 and DCMS24-140-A When Used in Tandem (Master/Slave) Applications

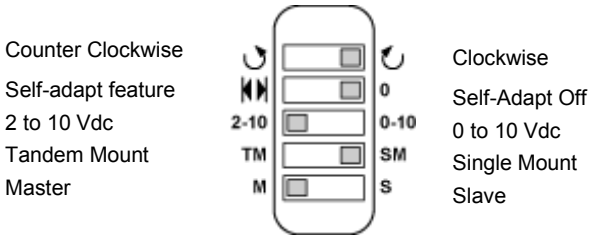


Figure 9. Tandem Application DIP Switches.

- After setting the 4th DIP switch for TM (tandem mount) on all actuators used in the tandem application, one actuator must be identified as the Master by selecting the **M** on the 5th DIP switch.
- The rest of the actuators used in the application should have the **S** (Slave) set on the 5th DIP switch.
- Connect all the 2 (black) Neutral wires and connect them to the power supply.
- Connect all the 1 (red) Supply wires and connect them to the power supply.
- The Output Signal 9 (pink) wire identified as the Master actuator, needs to be connected to all the Control Signal Wires 8 (gray) of the slave actuators used in the tandem application.

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.
- Each wire has the standard symbol printed on it. Refer to the respective tables.

Modulating Control

WARNING:

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

- Standard cable (250 Vac/24 Vdc)
  - UL/cUL: line voltage, or
  - UL/cUL: Class 2 voltage.

NOTE: Either all six outputs of the dual auxiliary switches must be connected to line voltage or all six outputs must be connected to Class 2 voltage.

- Plenum cable (24V)
  - UL/cUL: Class 2 voltage.

Table 1. Modulating Control 24 Vac/Vdc.

Standard Symbol	Function	Terminal Designation	Color	
			Standard	Plenum
1	Supply	(+)	Red	Red
2	Common	COM	Black	Black
8	2 to 10 Vdc/ 0 to 10 Vdc input signal	Y	Gray	Gray
9	Output for 2 to 10 Vdc/0 to 10 Vdc position indication	U	Pink	Pink
Factory-Installed Options				
S1	Switch A Common	S1	Gray/red	Gray/red
S2	Switch A NC	S2	Gray/blue	Gray/blue
S3	Switch A NO	S3	Gray/pink	Gray/pink
S4	Switch B Common	S4	Black/red	Black/red
S5	Switch B NC	S5	Black/blue	Black/blue
S6	Switch B NO	S6	Black/pink	Black/pink

Wiring, Continued

Tandem Control

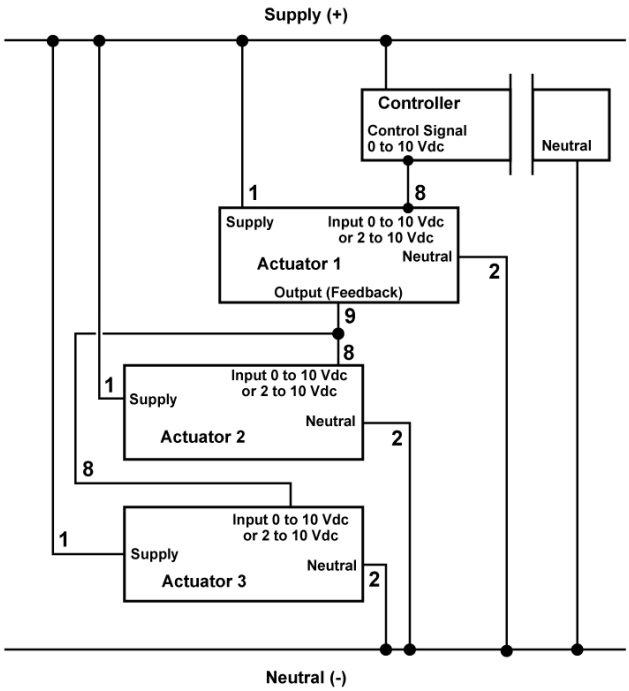


Figure 10. DCMS24-140 (0 to 10 Vdc or 2 to 10 Vdc) for Tandem Application (Master/Slave).

Two-position Control

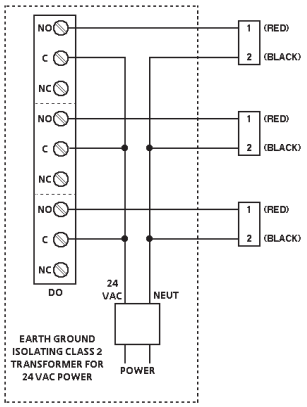


Figure 11. Two-position Control 24 Vac/Vdc.

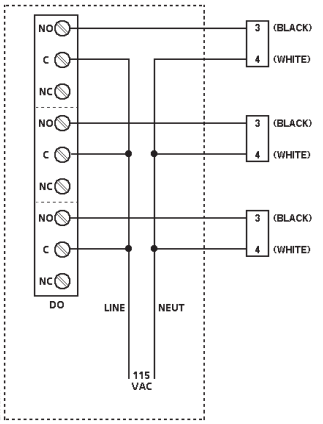


Figure 12. Two-position Control 120 Vac.

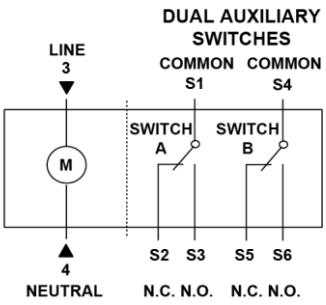


Table 2. Two-position Control 120 Vac.

Standard Symbol	Function	Terminal Designation	Color
3	Line	L	Black
4	Neutral	N	White
Factory-Installed Options			
S1	Switch A Common	S1	Gray/red
S2	Switch A NC	S2	Gray/blue
S3	Switch A NO	S3	Gray/pink
S4	Switch B Common	S4	Black/red
S5	Switch B NC	S5	Black/blue
S6	Switch B NO	S6	Black/pink

Two-position Control, Continued

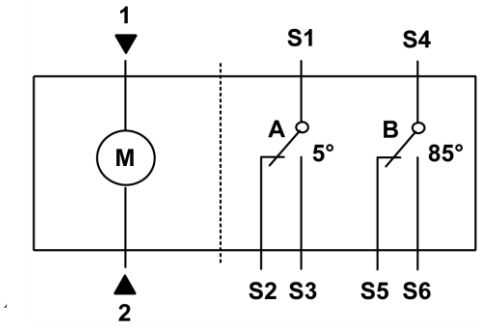
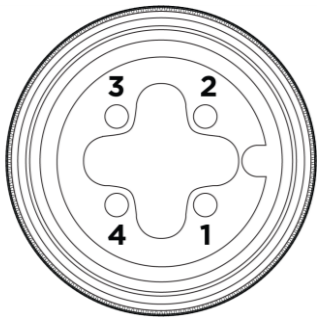


Table 3. Two-position Control 24 Vac/Vdc.

Standard Symbol	Function	Terminal Designation	Color	
			Standard	Plenum
1	Supply	(+)	Red	Red
2	Common	COM	Black	Black
Factory-Installed Option				
S1	Switch A Common	S1	Gray/red	Gray/red
S2	Switch A NC	S2	Gray/blue	Gray/blue
S3	Switch A NO	S3	Gray/pink	Gray/pink
S4	Switch B Common	S4	Black/red	Black/red
S5	Switch B NC	S5	Black/blue	Black/blue
S6	Switch B NO	S6	Black/pink	Black/pink

DCMS24-160-M12

ACTUATOR 24 Vac/Dc – 0(2) – 10 Vdc		
1	(+) Power	24 (Hot) Vac/dc
2	(+) Command	0(2) – 10 Vdc
3	(-) Power	0 (Neutral) Vac/dc
4	(+) Feedback	0(2) – 10 Vdc



4-PIN M12 MALE END

Wiring, Continued

Three-position Control

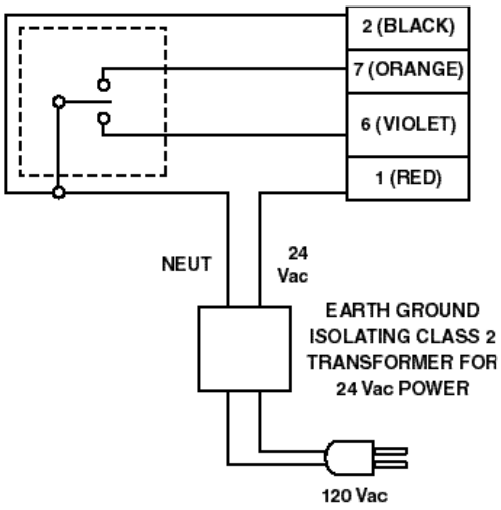


Figure 13. Three-position Control 24 Vac.

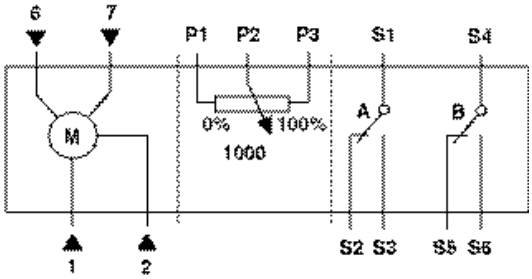


Table 4. Three-position Control 24 Vac.

Standard Symbol	Function	Terminal Designation	Color
1	Supply	(+)	Red
2	Common	COM	Black
6	Control signal clockwise	CW	Violet
7	Control signal counterclockwise	CCW	Orange
Factory Installed Options			
S1	Switch A Common	S1	Gray/red
S2	Switch A NC	S2	Gray/blue
S3	Switch A NO	S3	Gray/pink
S4	Switch B Common	S4	Black/red
S5	Switch B NC	S5	Black/blue
S6	Switch B NO	S6	Black/pink
P1	Feedback Potentiometer 0 to 100% P1 - P2	a	White/red
P2	Feedback Potentiometer Common	b	White/blue
P3	Feedback Potentiometer 100 to 0% P3 - P2	c	White/pink

Wiring

KEY

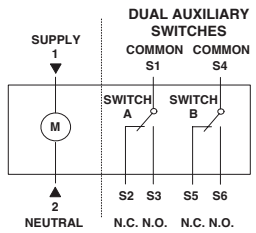
Cable		Function
No.	Color	
1	Red (RD)	System potential AC 24 V / DC 24...48 V
2	Black (BK)	System neutral
6	Violet (VT)	Pos. signal AC 0 V / AC 24 V / DC 24...48 V, "open"
7	Orange (OG)	Pos. signal AC 0 V / AC 24 V / DC 24...48 V, "close"
8	Gray (GY)	Pos. signal DC 0...10 V, 0...35 V
9	Pink (PK)	Position indication DC 0...10 V
3	Brown (BN)	Phase AC 120/230 V
4	Blue (BU)	Neutral conductor

Auxiliary Switch - Factory Installed			
S1	S1	Gray/Red (GY RD)	Switch A Input
S2	S2	Gray/Blue (GY BU)	Switch A - N.C.
S3	S3	Gray/Pink (GY PK)	Switch A - N.O.
S4	S4	Black/Red (BK RD)	Switch B Input
S5	S5	Black/Blue (BK BU)	Switch B - N.C.
S6	S6	Black/Pink (BK PK)	Switch B - N.O.

DCS24-140-(A)

STANDARD CABLE

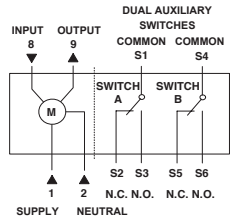
On/Off with Optional AUX Switches



DCMS24-140-(A)

STANDARD CABLE

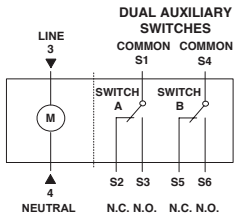
Modulating with Optional AUX Switches



DCS120-140-(A)

STANDARD CABLE

120 V On/Off with Optional AUX Switches



Dimensions