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 03/24/25

D(M)S-27 Series — 27 lb-in (3 Nm) Electric Actuator

IOM Manual

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D(M)S-27 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 - D(M)S-27 Series Actuator					
Type	Actuator Models	**DS24-27-(A)**	**DS24-27-T**	**DMS24-27-(A)**	**DSU20-27-(A)**
		Spring Return On/Off with optional Auxiliary Switches (-A)	Spring Return On/Off & Floating	Spring Return Modulating with optional Auxiliary Switches (-A)	Spring Return On/Off with optional Auxiliary Switches (-A)
	Torque	27 lb-in. (3 Nm)			
Electrical	Operating Voltage	24 VAC 19.2 to 28.8 V) at 50/60 Hz 24 VDC (21.6 to 28.8 V)			AC 100 to 240 V (85 to 264 V) at 50/60 Hz:
	Power Consumption	VAC - 5 VA Running, 1.6 VA Holding	VAC - 4.7 VA Running, 2.7 VA Holding		0.06 A Running, 0.02 A Holding
		VDC - 2.8 W Running, 0.8 W Holding	VDC - 1.8 W Running, 1 W Holding		
	Min. Transformer Size	6 VA per actuator			N/A
	Input Signal Adjustments	N/A	AC 19.2 to 28.8 V at 50/60 Hz or DC 24 V +20%/-10% Class 2 or SELV. Minimum Pulse Width: 500 m sec.	**Factory Setting -** DC 0 to 10 V, CW Rotation with Signal Increase Selectable DC 0 (2) to 10 V or 0 (4) to 20 mA with Field-Furnished 500 ohm 0.25 W Min. Resistor **Switch Selectable -** Direct or Reverse Action with Signal Increase	N/A
	Control Input Impedance	N/A	4,700 Ohms	100k Ohms, Current Input: 500 Ohms with Field Furnished 500 Ohm Resistor	N/A
	Feedback Signal	N/A		DC 0 (2) to 10 V for Desired Rotation Range up to 95°. Corresponds to Rotation Limits, 0.5 mA at 10 V Maximum	N/A
	Auxiliary Switch Rating	(-A) Models) One Single -Pole, Double-Throw (SPDT), double-insulated switch with silver contacts: AC 24 V, 50 VA pilot duty AC 120 V, 5.8 A Resistive, 1/4 hp, 275 VA pilot duty AC 240 V, 5.0 A Resistive, 1/4 hp, 275 VA pilot duty	N/A	(-A) Models) One Single -Pole, Double-Throw (SPDT), double-insulated switch with silver contacts: AC 24 V, 50 VA pilot duty AC 120 V, 5.8 A Resistive, 1/4 hp, 275 VA pilot duty AC 240 V, 5.0 A Resistive, 1/4 hp, 275 VA pilot duty	(-A) Models) One Single -Pole, Double-Throw (SPDT), Double-Insulated Switch with Silver Contacts: AC 24 V, 50 VA Pilot Duty AC 120 V, 5.8 A Resistive, 1/4 hp, 275 VA Pilot Duty AC 240 V, 5.0 A Resistive, 1/4 hp, 275 VA Pilot Duty
	Equipment Rating	Class 2 or Safety Extra-Low Voltage (SELV)			N/A
	Electrical Connection	48 in. UL 758 Type AWM Halogen-Free Cable with 18 AWG (0.85 mm^2) Conductors & 0.25 in. (6 mm) Ferrule Ends	**Without Aux Switches** 120 in. UL 444 Type CMP Plenum Rated Cable w/ 19 AWG (0.75 mm^2) Conductors & 0.25 in. (6 mm) Ferrule Ends **With Aux Switches** 48 in. UL 758 Type AWM Halogen-Free Cable w/ 18 AWG (0.85 mm^2) Conductors & 0.25 in. (6 mm) Ferrule Ends		48 in. UL 758 Type AWM Halogen-Free Cable with 18 AWG (0.85 mm^2) Conductors & 0.25 in. (6 mm) Ferrule Ends
	Conduit Connections	Integral 1/2 in. (13 mm) Threaded Conduit Connector(s)			

Technical Specifications - D(M)S-27 Series Actuator - Continued					
Type	Actuator Models	**DS24-27-(A)**	**DS24-27-T**	**DMS24-27-(A)**	**DSU20-27-(A)**
		Spring Return On/Off with optional Auxiliary Switches (-A)	Spring Return On/Off & Floating	Spring Return Modulating with optional Auxiliary Switches (-A)	Spring Return On/Off with optional Auxiliary Switches (-A)
Operation	Spring Return	Direction is Selectable with Mounting Position of Actuator: Actuator Side A is away from damper or valve: CCW Spring Return Actuator Side B is away from damper or valve: CW Spring Return			
	Rotation Range	Maximum Full Stroke: 95° - (Adjustable Stop: 35 to 95° Maximum Position (Modulating Only))			
	Electric Stall Detection	Protects from overload at all angles of rotation			
	Runtime for 90° of Rotation	Power On (Running) 53 to 71 Seconds for 0 to 27 lb·in. (3 N·m) Load, at Room Temperature 60 Seconds Nominal at Full Rated Load (0.25 rpm) Power Off (Returning) 19 to 23 Seconds for 0 to 27 lb·in. (3 N·m) Load, at Room Temperature 22 Seconds Nominal at Full Rated Load 28 Seconds Maximum with 27 lb·in. (3 N·m) Load at -22°F (-30°C))	Power On (Running) 150 Seconds Constant for 0 to 27 lb·in. (3 N·m) Load, at All Operating Conditions Power Off (Returning) 12 to 17 Seconds for 0 to 27 lb·in. (3 N·m) Load, at Room Temperature 16 Seconds Nominal at Full Rated Load 22 Seconds Maximum with 27 lb·in. (3 N·m) Load at -22°F (-30°C)	Power On (Running) 24 to 28 Seconds for 0 to 27 lb·in. (3 N·m) Load, at Room Temperature 27 Seconds Nominal at Full Rated Load (0.5 rpm) Power Off (Returning) 19 to 23 Seconds for 0 to 27 lb·in. (3 N·m) Load, at Room Temperature 22 Seconds Nominal at Full Rated Load 28 Seconds Maximum with 27 lb·in. (3 N·m) Load at -22°F (-30°C)
	Cycle Life	60,000 Full Stroke Cycles with 27 lb·in. (3 N·m) Load, 1,500,000 Repositions with 27 lb·in. (3 N·m) Load			
	Mechanical Connections	**Round Shafts** - 1/4 in. to 1/2 in. (6 to 12 mm) **Square Shafts** - 1/4 in. to 5/16 in. (6 to 8 mm)			
Environmental	Enclosure	NEMA 2 (IP54) for all mounting orientations			
	Ambient Conditions (Non-Condensing)	**Operating —** -22 to 140°F (-30 to 60°C); 90% RH Maximum, Noncondensing **Storage —** -40 to 185°F (-40 to 85°C); 95% RH Maximum, Noncondensing			
	Audible Noise Rating	**Running —** <36 dBA at 27 lb·in. (3 N·m) Load, at a Distance of 39-13/32 in. (1 m) **Holding —** <20 dBA at a Distance of 39-13/32 in. (1 m) **Returning —** <51 dBA at 27 lb·in. (3 N·m) Load, at a Distance of 39-13/32 in. (1 m)	**Running —** <28 dBA at 27 lb·in. (3 N·m) Load, at a Distance of 39-13/32 in. (1 m) **Holding —** <20 dBA at a Distance of 39-13/32 in. (1 m) **Returning —** <56 dBA at 27 lb·in. (3 N·m) Load, at a Distance of 39-13/32 in. (1 m)	**Running —** <45 dBA at 27 lb·in. (3 N·m) Load, at a Distance of 39-13/32 in. (1 m) **Holding —** <20 dBA at a Distance of 39-13/32 in. (1 m) **Returning —** <51 dBA at 27 lb·in. (3 N·m) Load, at a Distance of 39-13/32 in. (1 m)
	Dimensions	6.38 in. x 3.23 in. x 2.26 in. (162 mm x 82 mm x 57.5 mm)			
	Weight	2.0 lb. (2.4 lb w/ Aux. Switches)			
Conditions	Agency Certifications	UL Listed, CCN XAPX, File E27734; to UL 60730-1A: 2003-08, Ed. 3.1, Automatic Electrical Controls for Household and Similar Use; and UL 60730-2-14: Ed. 1, Part 2, Particular Requirements for Electric Actuators. UL Listed, CCN XAPX7, File E27734; to UL 60730-1:02-CAN/CSA: July 2002, 3rd Ed., Automatic Electrical Controls for Household and Similar Use; and CSA C22.2 No. 24-93 Temperature Indicating and Regulating Equipment CE Mark – This product is in compliance with the essential requirements and other rele nt provisions of the EMC Directive 2004/108/EC and Low Voltage Directive 2006/95/EC. C-Tick Mark, Australia/NZ Emissions Compliant			
	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.

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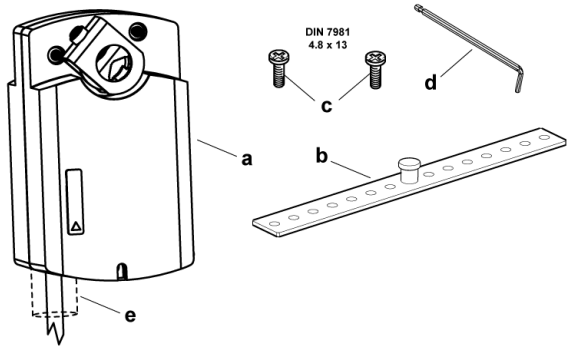


a. Actuator
b. Mounting bracket
c. Mounting screws
d. 3 mm hex key
e. Conduit Adapter
(except for DCS24-20-AP)

Figure 1.

Hints/Warnings	Conseils/Mise en garde	Indicaciones/Consejos
Store these instructions with the actuator or with the plant documentation.	Cette notice est à conserver avec le servomoteur ou avec la documentation de l'installation.	Conserve estas instrucciones con el actuador o con la documentación de la instalación!
Warning	Avertissement !	Precaución
Do not open the actuator !	**Ne pas ouvrir le servomoteur !**	**No abra el accionador !**
Only authorized personnel are to connect actuators.	Le branchement des servomoteurs ne doit être effectué que par un personnel qualifié.	Sólo el personal autorizado puede conectar los actuadores.
Do not expose the actuator's connecting cables to water or lay the cables in water.	**Les câbles de raccordement du servomoteur ne doivent en aucun cas entrer en contact avec l'eau.**	**No exponer los cables de conexión del actuador al agua ni dejarlos en contacto con ésta.**
Device of protection class II (protective insulation)	Classe d'isolation II (isolation de protection)	Equipo con tipo de protección II (aislamiento protegido)
Device of protection class III (protective insulation)	Classe d'isolation III (isolation de protection)	Equipo con tipo de protección III (aislamiento protegido)
Wiring and commissioning, see *Technical Instructions 155-760*.	Câblage et mise en service: se référer aux instructions techniques du servomoteur, document n°155-760.	Cableado y puesta en marcha Ver la documentación técnica 155-760 del actuador.

Adapter Mounting	Positions de montage	Posición de montaje

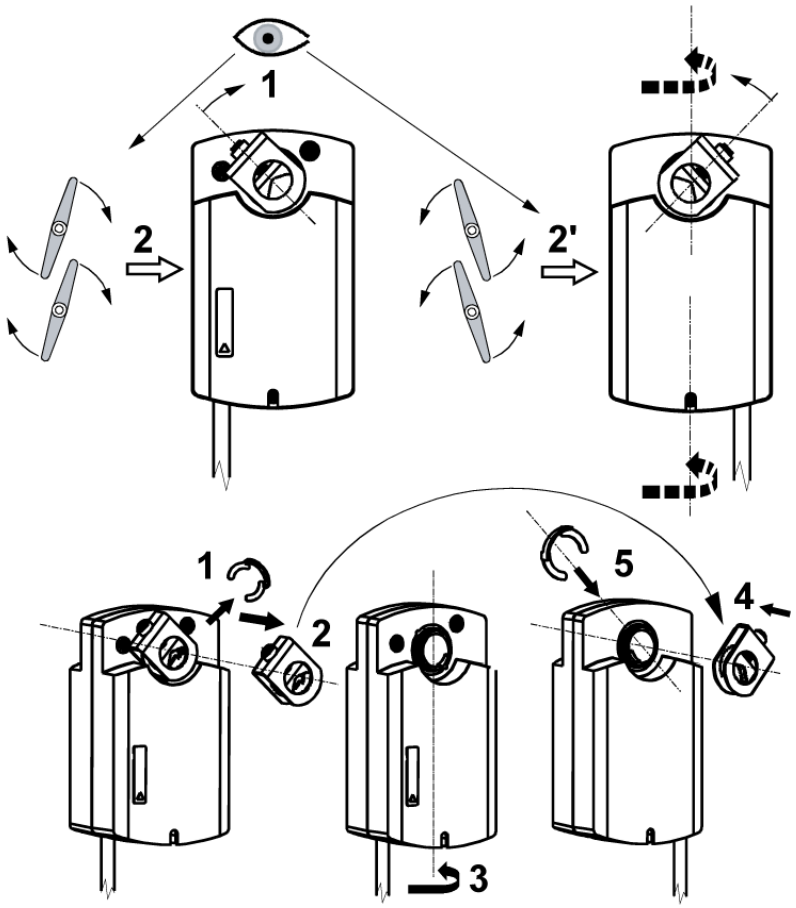


Figure 2.

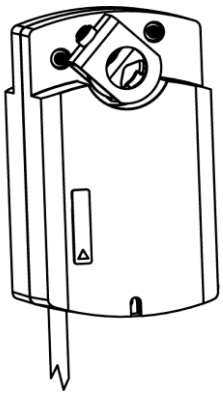


Figure 3. NEMA 1 IP40 in All Positions.

Shaft Mounting	Montage sur l'axe des volets	Montaje sobre el eje

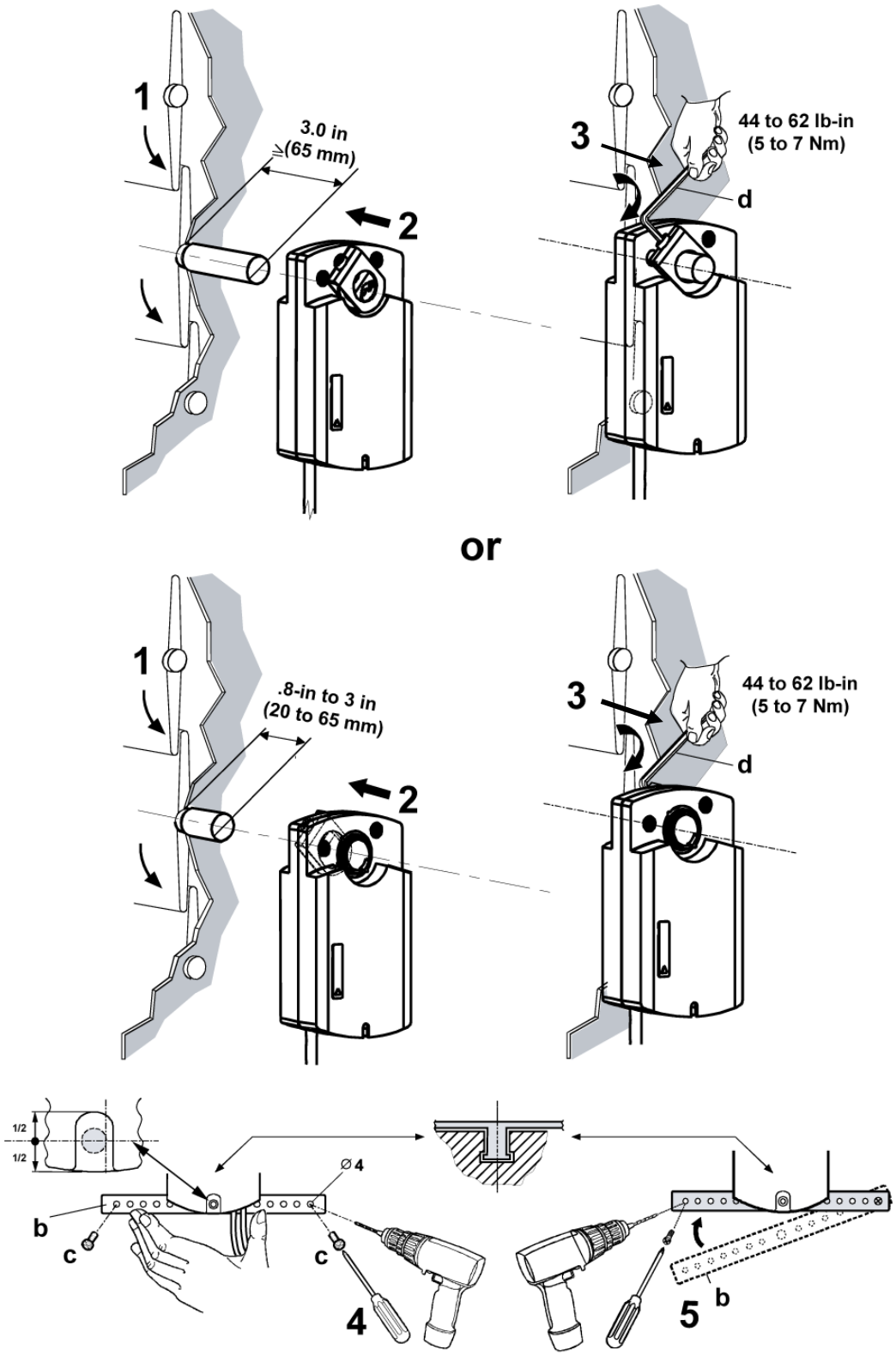
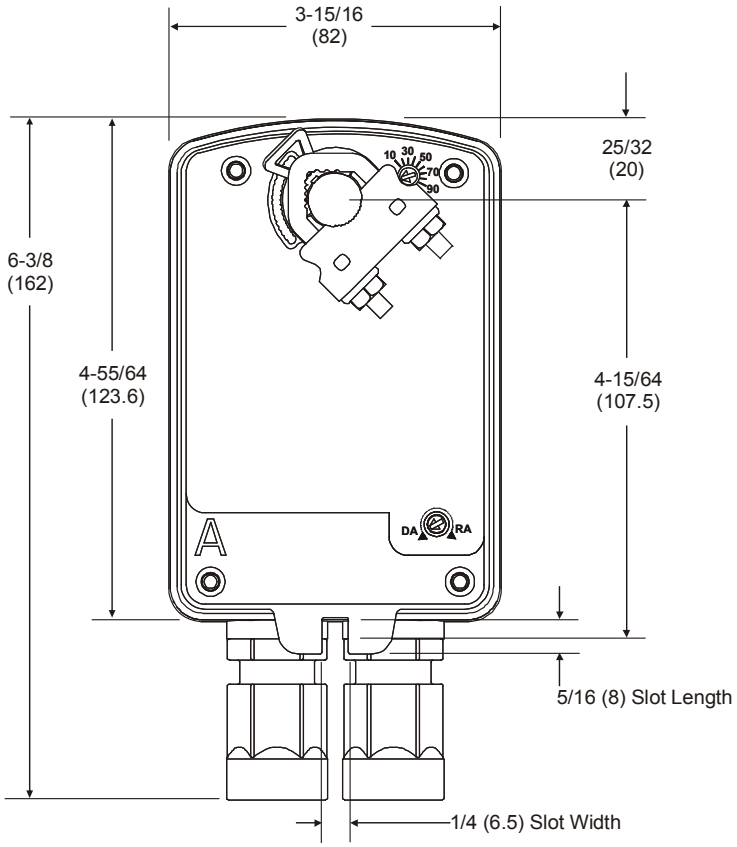
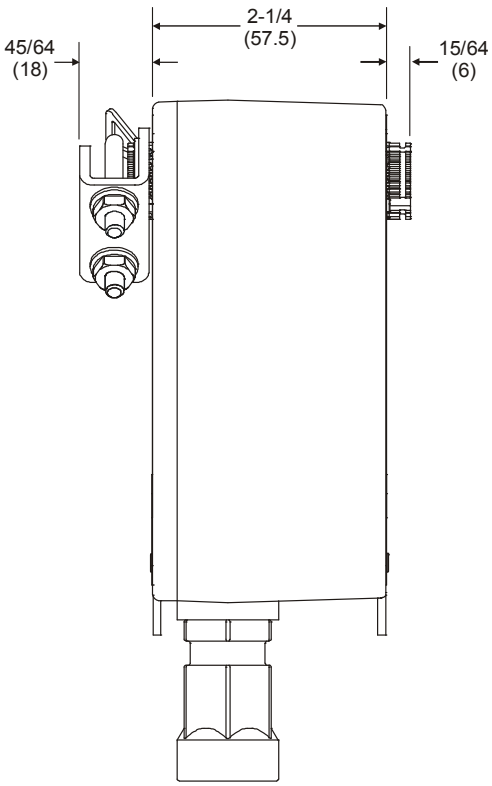


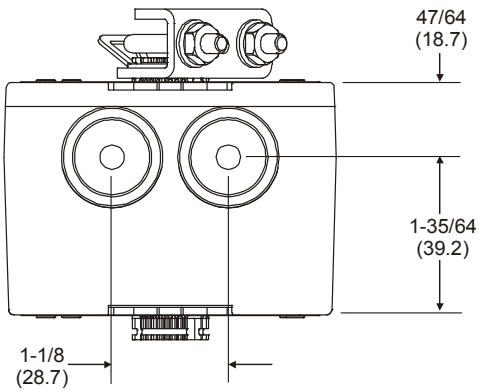
Figure 4.

Dimensions in Inches (Millimeters)	Dimensions en pouces (millimètres)	Dimensiones en las pulgadas (milímetros)

Dimensions





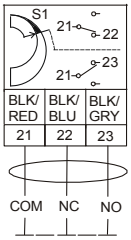


Wiring

-(A)

AUXILIARY SWITCH WIRING

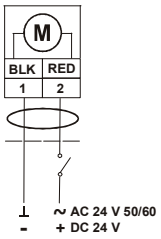
(-A) Auxiliary Switches



DS24-27-(A)

CABLE

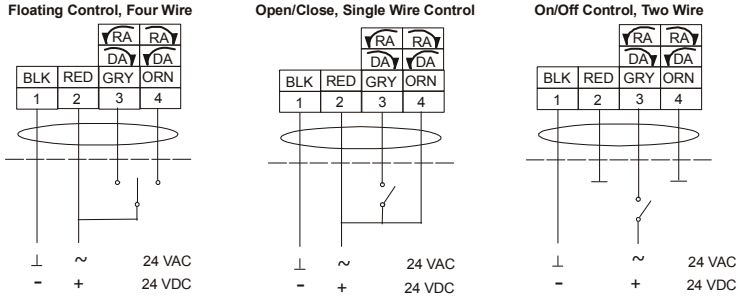
On/Off



DS24-27-T

CABLE

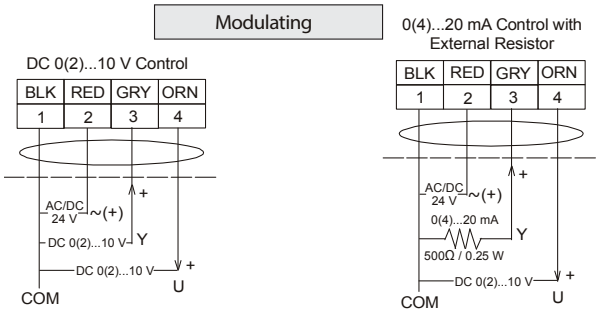
On/Off and Floating



DMS24-27-(A)

CABLE

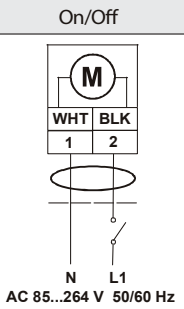
Modulating



DSU20-27-(A)

CABLE

On/Off



Important - Do not install multiple DS-27 Series actuators connected to the same mechanical load. Master-Slave application of DS-27 Series Actuators requires that each actuator be connected to independent loads.

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.

Table 1

Connecting	Standard Symbol	Function	Color	Color Symbol
24 Vac/dc Actuator	1	Supply (SP)	Red	RD
	2	System Neutral	Black	BK
	6	Control signal clockwise	Violet	VT
	7	Control signal counterclockwise	Orange	OG
	8	Input Signal: 2 to 10 Vdc or 10 to 2 Vdc (DCMS24-20)	Gray	GY
	9	Position Output: 2 to 10 Vdc or 10 to 2 Vdc- (DCMS24-20)	Pink	PK
120 Vac	3	Supply	Black	BK
	4	Neutral	White	WH
Auxiliary Switches	1	Switch A - Common	S1	Gray/red
	2	Switch A - N.O.	S2	Gray/blue
	3	Switch A - N.C.	S3	Gray/pink
	4	Switch B - Common	S4	Black/red
	5	Switch B - N.O.	S5	Black/blue
	6	Switch B - N.C.	S6	Black/pink

Table 2

Câbles de raccordement	Symbole Standard	Fonction	Couleur	Étiquette
Servomoteur 24 V~/-	1	Alimentation (SP)	Rouge	RD
	2	Neutre (SN)	Noir	BK
	6	Signal de commande – sens des aiguilles	Violet	VT
	7	Signal de commande – sens contraire des aiguilles	Orange	OG
	8	Señal de entrada 2 a 10V o 10 a 2V (DCMS24-20)	Gris	GY
	9	Sortie 2-10 V- ou 10 – 2 V- (DCMS24-20) pour indicateur de position	Rose	PK
Servomoteurs 120-	3	Secteur	Noir	BK
	4	Neutre	Blanc	WH
Auxiliary Switches	1	Switch A - Common	S1	Gris/rouge
	2	Switch A - N.O.	S2	Gris/bleu
	3	Switch A - N.C.	S3	Gris/rose
	4	Switch B - Common	S4	Noir/rouge
	5	Switch B - N.O.	S5	Noir/bleu
	6	Switch B - N.C.	S6	Noir/rose

Table 3

Conexión	Símbolo estándar	Función	Color	Jolor Abreviatura
Accionador 24V ca/cc	1	Suministro de corriente (SP)	Rojo	RD
	2	Sistema neutral	Negro	BK
	6	Señal de control-sentido de las agujas del rejol	Violeta	VT
	7	Señal de control - sentido contrario a las agujas del reloj	Naranja	OG
	8	Señal de entrada 2 a 10V o 10 a 2V (DCMS24-20)	Gris	GY
	9	Salida de 2 a 10V o 10 a 2V cc (DCMS24-20)) para indicador de posición	Rosado	PK
Accionador 120V ca	3	Línea	Negro	BK
	4	Neutro	Blanco	WH
Conmutadores Auxiliares	1	Switch A - Común	S1	Gris/rojo
	2	Switch A - N.O.	S2	Gris/azul
	3	Switch A - N.C.	S3	Gris/rosado
	4	Switch B - Común	S4	Negro/rojo
	5	Switch B - N.O.	S5	Negro/azul
	6	Switch B - N.C.	S6	Negro/rosado

Retrofit Wiring

Modulating Control (2 to 10 VDC) Function	Bray DCMS24-20		Siemens GQD Series		Belimo TF Series		Honeywell MS7503 Series		Johnson M9203 Series	
	Color	Number	Color	Number	Color	Number	Terminal Only	Number	Color	Number
Supply (24V)	Red	1	Red	1	Red	2	-	1	Red	2
Common	Black	2	Black	2	Black	1	-	2	Black	1
0(2) to 10 VDC Input	Gray	8	Gray	8	White	3	-	3	Gray	3
0(2) to 10 VDC Feedback	Pink	9	Pink	9	Orange	5	-	5	Orange	4
2-Position Control (24 VAC/VDC) Function	Bray DCS24-20		Siemens GQD Series		Belimo TF Series		Honeywell MS8103 Series		Johnson M9203 Series	
	Color	Number	Color	Number	Color	Number	Terminal Only	Number	Color	Number
Supply (24V)	Red	1	Red	1	Red	2	-	1	Red	2
Common	Black	2	Black	2	Black	1	-	2	Black	1
2-Position Control (120 Vac) Function	Bray DCS120-20		Siemens GQD Series		Belimo TF Series		Honeywell MS4103 Series		Johnson M9203 Series	
	Color	Number	Color	Number	Color	Number	Terminal Only	Number	Color	Number
Line (120V)	Black	3	Black	3	Black	2	-	1	Black	2
Neutral	White	4	White	4	White	1	-	2	White	1

Postcâblage

Commande progressive (2…10 V-)	Bray DCMS24-20		Siemens Série GQD		Belimo Série TF		Honeywell Série MS7503		Johnson Série M9203	
	Couleur	Numéro	Couleur	Numéro	Couleur	Numéro	Terminal seulement	Numéro	Couleur	Numéro
Alimentation (24 V)	Rouge	1	Rouge	1	Rouge	2	-	1	Rouge	2
Commun	Noir	2	Noir	2	Noir	1	-	2	Noir	1
Entrée 0(2)…10 V-	Gris	8	Gris	8	Blanc	3	-	3	Blanc	3
Retroaction 0(2)…10 V-	Rose	9	Rose	9	Orange	5	-	5	Orange	4
Commande TOR (24 VAC/VDC)	Bray DCS24-20		Siemens Série GQD		Belimo Série TF		Honeywell Série MS8103		Johnson Série M9203	
	Couleur	Numéro	Couleur	Numéro	Color	Número	Terminal seulement	Número	Color	Número
Alimentation (24 V)	Rouge	1	Rouge	1	Rouge	2	-	1	Rouge	2
Commun	Noir	2	Noir	2	Noir	1	-	2	Noir	1
Commande TOR (120 VAC)	Bray DCS120-20		Siemens Série GQD		Belimo Série TF		Honeywell Série MS4103		Johnson Série M9203	
	Couleur	Numéro	Couleur	Numéro	Color	Número	Terminal seulement	Número	Color	Número
Alimentation (120 V)	Noir	3	Noir	3	Noir	2	-	1	Noir	2
Neutre	Blanc	4	Blanc	4	Blanc	1	-	2	Blanc	1

Alambrado de retrofit

Control modulador (2 to 10 VDC) Fonción	Bray DCMS24-20		Siemens GQD Serie		Belimo TF Serie		Honeywell MS7503 Serie		Johnson M9203 Serie	
	Color	Número	Color	Número	Color	Número	Terminal Solo	Número	Color	Número
Alimento (24V)	Rojo	1	Rojo	1	Rojo	2	-	1	Rojo	2
Común	Negro	2	Negro	2	Negro	1	-	2	Negro	1
0(2) to 10 VDC Entrada	Gris	8	Gris	8	Blanco	3	-	3	Gris	3
0(2) to 10 VDC Realimentacion	Rosado	9	Rosado	9	Naranja	5	-	5	Naranja	4
Control de 2 posiciones (24 VAC/VDC) Fonción	Bray DCS24-20		Siemens GQD Serie		Belimo TF Serie		Honeywell MS8103 Serie		Johnson M9203 Serie	
	Color	Número	Color	Número	Color	Número	Terminal Solo	Número	Color	Número
Alimento (24V)	Rojo	1	Rojo	1	Rojo	2	-	1	Rojo	2
Común	Negro	2	Negro	2	Negro	1	-	2	Negro	1
Control de 2 posiciones (120 VAC) Fonción	Bray DCS120-20		Siemens GQD Serie		Belimo TF Serie		Honeywell MS4103 Serie		Johnson M9203 Serie	
	Color	Número	Color	Número	Color	Número	Terminal Solo	Número	Color	Número
Linea (120V)	Negro	3	Negro	3	Negro	2	-	1	Negro	2
Neutro	Blanco	4	Blanco	4	Blanco	1	-	2	Blanco	1