

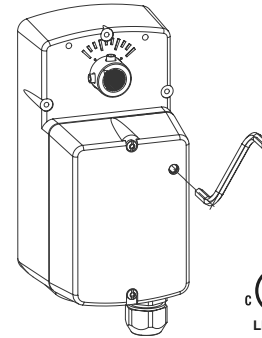
Non-Spring Return EconoDrive™ Proportional Actuator

EconoDrive overshaft actuators are designed to provide an economical and reliable solution for many overshaft damper and ball valve requirements. All products accommodate shaft sizes up to 1/2 in. (13 mm) in diameter.

Non-spring return models provide either 35 in-lb (4 N-m) or 70 in-lb (8 N-m) in proportional control.

Features:

- Proportional models controlled by 0 to 3 Vdc, 6 to 9 Vdc, 0 to 10 Vdc, 2 to 10 Vdc or 4 to 20 mAdc. Control function direct/reverse action is jumper selectable.
- Non-spring return models supply 35 in-lb (4 N-m) or 70 in-lb (8 N-m) of torque.
- Polymer housing rated for NEMA 2/IP54.
- Overload protection throughout stroke.
- Automatically adjust the input span to match the damper/valve travel.
- Compact size to allow installation in limited space.
- Manual override to allow positioning of dampers and valves.
- Directly mounts to 1/2 to 3 in. ball valves.
- Polymer housing rated for plenum use.



Model Chart										
Model No.	Torque in-lb (N-m)	Control Signal	Voltage	Wiring System	Actuator Power Input				Approximate Timing ^a in Seconds @ 70°F (21°C)	
					Running			Holding		
					50/60 Hz		DC Amps	50/60 Hz		
					VA	W		W		
MS4D-6043-100	35 (4)	2 to 10 Vdc Proportional	24 VAC +/-20% or 20-30 Vdc	Plenum Cable	4.2	2.2	0.08	1.2	85	
MS4D-6043-120		0 to 3 Vdc Proportional		Plenum Cable						
MS4D-6043-130		6 to 9 Vdc Proportional		Plenum Cable						
MS4D-6043-150		0 to 10 Vdc Proportional		Plenum Cable						
MS4D-6043-160		4 to 20 mAdc Proportional		Plenum Cable						
MS4D-6083-100	70 (8)	2 to 10 Vdc Proportional		Plenum Cable	5.2	2.7	0.10	1.4		85
MS4D-6083-120		0 to 3 Vdc Proportional		Plenum Cable						
MS4D-6083-130		6 to 9 Vdc Proportional		Plenum Cable						
MS4D-6083-150		0 to 10 Vdc Proportional		Plenum Cable						
MS4D-6083-160		4 to 20 mAdc Proportional		Plenum Cable						

^a Timing was measured with no load applied to actuator.

MS4D-60x3 Series

Specifications

Inputs	
Control signal	See Model Chart for actuator models and control types.
Power	See Model Chart. All 24 Vac circuits are Class 2. Half wave device.
Connections	10 ft. plenum cables, enclosure accepts 1/2 in. (13 mm) conduit connector. For M20 Metric conduit, use AM-756 adapter.
Outputs	
Electrical	Position Feedback Voltage: For voltage ranges, the feedback signal is the same range as the input signal. The 4 to 20 mA current range has a 2 to 10 Vdc feedback signal. The feedback signal can supply to 0.5 mA to operate up to four additional slave actuators.
	Timing: See Model Chart.
Mechanical	Travel: 93° nominal.
	Manual Override: Allows positioning of damper or valve using manual crank.
	RA/DA Jumper: Permits reverse acting/direct acting control.
Environment	
Ambient temperature limits	Shipping and Storage: -40 to 160°F (-40 to 71°C). Operating: -22 to 140°F (-30 to 60°C).
Humidity	15 to 95% RH, non-condensing.
Locations	NEMA 1, NEMA 2, UL Type 2 (IEC IP54) with customer supplied water tight conduit connectors. Enclosure is air plenum rated.
Dimensions	7-7/8 H x 3-1/2 W x 3-1/2 D in. (200 x 89 x 89 mm).
Agency Listings	
UL 873	Underwriters Laboratories (File #E9429 Category Temperature-Indicating and Regulating Equipment).
CUL	UL Listed for use in Canada by Underwriters Laboratories. Canadian Standards C22.2 No. 24-93.
European Community	EMC Directive (89/336/EEC), Low Voltage Directive (72/23/EEC). This product fits in Installation Category (Overvoltage Category) II per EN 61010-1.
Australia	This product meets requirements to bear the C-Tick Mark according to the terms specified by the Communications Authority under the Radiocommunications Act 1992.
General Instructions	Refer to F-27170.

Accessories

Model No.	Description
AM-703	Input rescaling module, adjust signals to 2-10 Vac, zero and span adjust.
AM-704	Interface, pulse width modulation (PWM).
AM-705	Positioner (NEMA 4 housing).
AM-706	Min and/or manual positioner for flush panel mount.
AM-708	500 Ω resistor to convert 4 to 20 mA to 2 to 10 Vdc control signal.
AM-714	Weathershield Kit.
AM-756	Metric conduit adapter M20 x 1.5 to 1/2 in. NPT.
AM-771	Crank arm and bracket kit.
AM-772	Bracket for reverse mounting.

Typical Applications

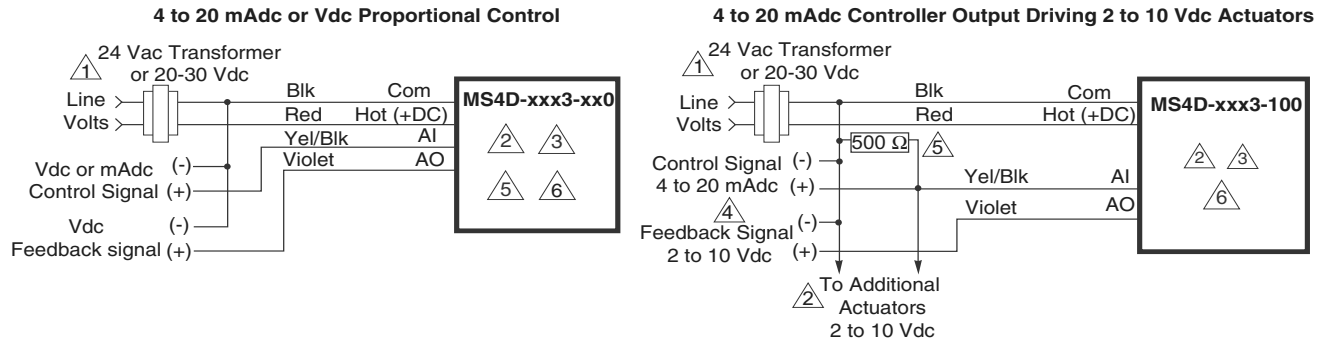


Figure 1 Typical Wiring Diagrams for Proportional Control 24 Vac Basic Models.

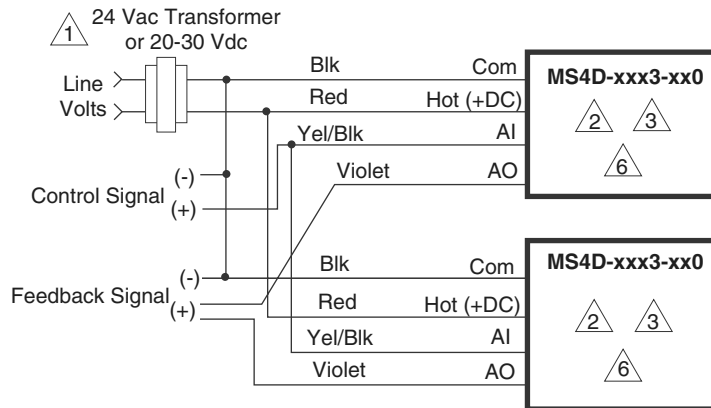


Figure 2 Typical Wiring Diagrams for Proportional Control 24 Vac Models Wired in Parallel.

- 1 Provide overload protection and disconnect as required.
- 2 Actuators may be wired in parallel. All actuator black wires are connected to the transformer Common and all red wires are connected to the Hot lead. Power consumption must be observed.
- 3 If the controller uses a full-wave power supply and does not provide isolated outputs, a separate transformer is required.
- 4 A field-supplied 500 ohm resistor (AM-708) is required for this application.
- 5 On MS4D-xxx3-x60 (4-20 mAdc) models a 500 resistor is incorporated in the product. Do not use an external resistor.
- 6 Cable on some models contains more wires than are used in applications. Only those wires actually used are shown.

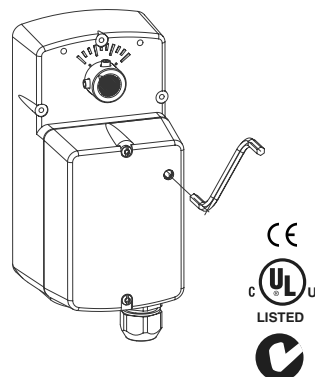
Spring Return EconoDrive™ Proportional Actuator

EconoDrive overshaft actuators are designed to provide an economical and reliable solution for many overshaft damper and ball valve requirements. All products accommodate shaft sizes up to 1/2 in. (13 mm) in diameter.

Spring return models provide 30 in-lb (3.4 N-m) of torque.

Features:

- Controlled by 0 to 3 Vdc, 6 to 9 Vdc, 0 to 10 Vdc, 2 to 10 Vdc or 4 to 20 mAdc. Control function direct/reverse action is jumper selectable.
- 30 in-lb (3.4 N-m) of torque.
- Polymer housing rated for NEMA 2/IP54.
- Overload protection throughout stroke.
- Proportional models automatically adjust the input span to match the damper/valve travel.
- Compact size to allow installation in limited space.
- Manual override to allow positioning of dampers and valves.
- Directly mounts to 1/2 to 3 in. ball valves.
- Polymer housing rated for plenum use.



Model Chart										
Part No.	Rotation	Control Signal	Voltage	Wiring System	Actuator Power Input				Approximate Timing ^a in Sec. @ 70°F (21°C)	
					Running		Holding		Powered	Spring Return (CCW)
					50/60 Hz		DC Amps	50/60 Hz		
					VA	W		W		
MS4D-7033-100	CCW	2 to 10 Vdc Proportional	24 VAC ± 20% or 20-30 Vdc	Plenum Cable	6.1	3.4	0.12	1.4	85	21
MS4D-7033-120		0 to 3 Vdc Proportional								
MS4D-7033-130		6 to 9 Vdc Proportional								
MS4D-7033-150		0 to 10 Vdc Proportional								
MS4D-7033-160		4 to 20 mAdc Proportional								
MS4D-8033-100	CW	2 to 10 Vdc Proportional								
MS4D-8033-120		0 to 3 Vdc Proportional								
MS4D-8033-130		6 to 9 Vdc Proportional								
MS4D-8033-150		0 to 10 Vdc Proportional								
MS4D-8033-160		4 to 20 mAdc Proportional								

^a Timing was measured with no load applied to actuator.

Specifications

Inputs

Control signal	See Model Chart for actuator models and control types.
Power	See Model Chart. All 24 Vac circuits are Class 2. Half wave device.
Connections	10 ft. plenum cables, enclosure accepts 1/2 in. (13 mm) conduit connector. For M20 Metric conduit, use AM-756 adapter.

Outputs

Electrical	Position Feedback Voltage: For voltage ranges, the feedback signal is the same range as the input signal. The 4 to 20 mA current range has a 2 to 10 Vdc feedback signal. The feedback signal can supply up to 0.5 mA to operate up to four additional slave actuators.
Mechanical	Timing: See Model Chart.
	Travel: 93° nominal.
	Manual Override: Allows positioning of damper or valve using manual crank. RA/DA Jumper: Permits reverse acting/direct acting control.

Environment

Ambient temperature limits	Shipping and Storage: -40 to 160°F (-40 to 71°C). Operating: -22 to 140°F (-30 to 60°C).
Humidity	15 to 95% RH, non-condensing.
Locations	NEMA 1, NEMA 2, UL Type 2 (IEC IP54) with customer supplied water tight conduit connectors. Enclosure is air plenum rated..
Dimensions	7-7/8 H x 3-1/2 W x 3-1/2 D in. (200 x 89 x 89 mm).

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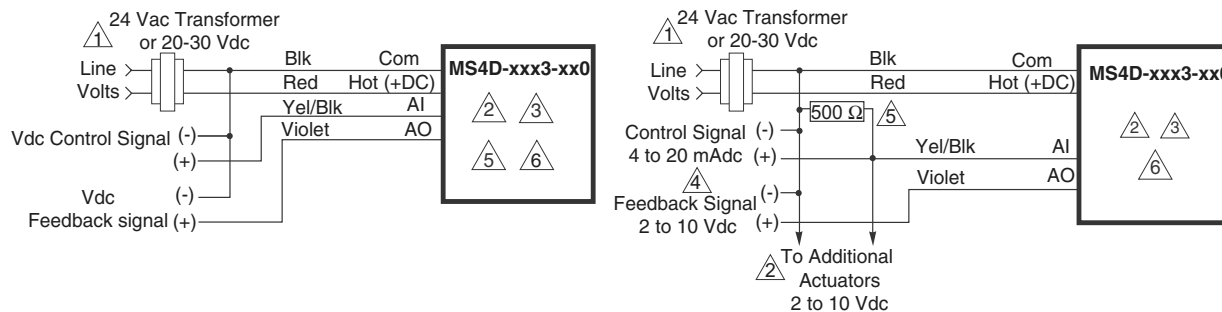


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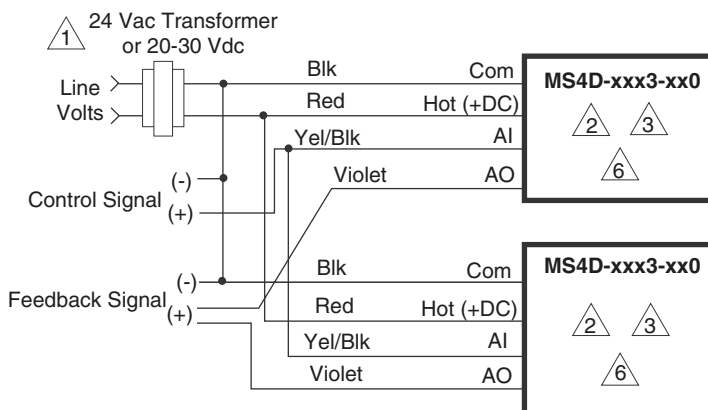


Figure 2 Typical Wiring Diagrams for Proportional Control 24 Vac Models Wired In Parallel.

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- 2 Actuators may be wired in parallel. All actuator black wires are connected to the transformer Common and all red wires are connected to the Hot lead. Power consumption must be observed.
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