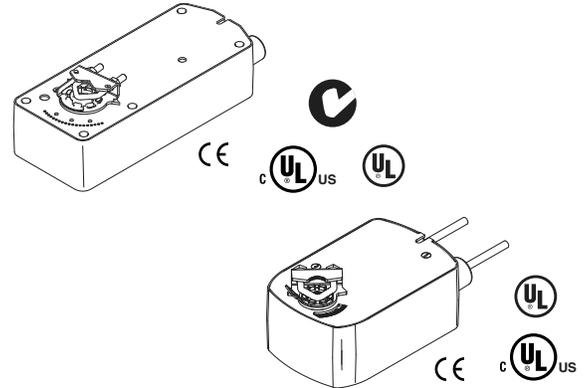


## Spring Return DuraDrive® Floating Actuator

For spring return applications that require floating control of dampers and valves in HVAC system.

Features:

- 35 lb.-in. (4 N-m), 60 lb.-in (7 N-m), 133 lb.-in (15 N-m).
- Direct mount to round or square damper shaft.
- Overload protection throughout rotation.
- True mechanical clockwise or counterclockwise spring return operation for positive close-off in airtight applications.
- Visual position indicator.
- Rotation limiting available.
- MF41-7xxx manual override models.



Model Chart																
Model No.	Shaft Size	Stroke	Actuator Power Input								SPDT Auxiliary Switches	Approximate Timing in Seconds @ 70°F (21°C) with No Load		Output Torque Rating lb.-in. (N-m)		Manual Override
			Voltage	Running				Holding		Powered		Spring Return	Min. <sup>a</sup>	Max. Stall		
				50 Hz		60 Hz		DC Amps	50 Hz						60 Hz	
				VA	W	VA	W									
MF40-7043 <sup>b</sup>	5/8" Dia. 1/2" Sq.	95° ± 5° maximum, adjustable from 40 to 95° with an integral mechanical stop.	24 Vac ± 20%	5.9	4.4	5.9	4.4	.17	2.9	2.9	No	<130	<25	35 (4)	120 (14)	No
MF40-7043-501 <sup>b</sup>				One <sup>c</sup>												
MF41-7073	3/4" Dia. 1/2" Sq.	95° ± 5° maximum, adjustable from 30 to 95° with AM-689 rotation limiter.	22 to 30 Vdc	6.2	4.8	6.2	4.8	.18	2.8	2.8	No	<195	<30	60 (7)	160 (18)	Yes
MF41-7073-502				Two <sup>d</sup>												
MF41-7153				No	<190	<30	133 (15)	300 (34)								
MF41-7153-502	Two <sup>d</sup>															

- <sup>a</sup> De-rating required for spring return actuators at low temperatures.
- <sup>b</sup> With plenum-rated cable.
- <sup>c</sup> One adjustable from 0 to 95° rotation (0 to 1 scale).
- <sup>d</sup> One adjustable from 25 to 85° rotation and one set to operate @ 5° fixed.

### Specifications

Inputs	
<b>Control signal</b>	Floating point control, 24 Vac.
<b>Power</b>	Refer to Model Chart.
<b>Connections</b>	<b>MF40-7073 and MF40-7153:</b> 3 ft. (0.9 m) long, appliance cable, 1/2 in. conduit connectors. For M20 metric conduit, use AM-756 adapter. <b>MF40-7043:</b> 3 ft. (91 cm) plenum-rated cables. 1/2 in. conduit connectors. For M20 metric conduit, use AM-756 adapter.

# MF40-7043 Series, MF41-7073 Series, MF41-7153 Series

## Specifications (Continued)

### Outputs

<b>Motor Type</b>	Brushless DC.
<b>Electrical</b>	<p>One auxiliary switch available with MF40-7043-501, SPDT 6A resistive @ 24 Vac, adjustable 0 to 95° (0 to 1 scale). UL Listed, switch meets VDC requirements for 6 (1.5)A, 24 Vac.</p> <p>Two auxiliary switch available with MF40-7153-501 or MF40-7073-502, SPDT 7A resistive @ 24 Vac, one fixed @ 5° and one adjustable 0 to 95°. UL Listed, switch meets VDC requirements for 6 (1.5)A, 24 Vac.</p> <p>Position feedback voltage "AO": 2 to 10 Vdc (maximum 0.5 mA) output signal for position feedback or operation of up to four slave actuators.</p> <p>Control mode: Switch provided for selection of direct acting or reverse acting control mode on proportional models.</p> <p>Timing: Refer to Model Chart.</p>
<b>Mechanical</b>	<p>Output torque rating: Refer to Model Chart.</p> <p>Position Indicator: <b>MF40-704X</b>: Visual indicator, 0 to 1 (0 is the spring return position). <b>MF40-707X, MF40-715X</b>: Pointer (-5 to 90°) and scale are provided for position indication (-5 is normal or spring return position).</p> <p>Stroke: Refer to Model Chart.</p>
<b>Environment</b>	
<b>Ambient Temperature limits</b>	<p>Shipping and storage: -40 to 160°F (-40 to 71°C).</p> <p>Operating: -22 to 140°F (-30 to 60°C).</p>
<b>Humidity</b>	5 to 95% RH, non-condensing.
<b>Locations</b>	<p><b>MF40-704X</b>: NEMA 2 (IEC 1P54).</p> <p><b>MF40-707X</b>: NEMA 1, NEMA 2 (IEC IP54) with conduit in the down position.</p> <p><b>MF40-715X</b>: NEMA 1, NEMA 2 (IEC IP54) with conduit in the down position.</p>
<b>Dimensions</b>	<p><b>MF40-7043</b>: 6-51/64 H x 4 W x 3-1/2 D in. (170 x 100 x 90 mm).</p> <p><b>MF41-7xxx</b>: 10-1/2 H x 4 W x 3-1/2 D in. (270 x 100 x 90 mm).</p>
<b>Agency Listings</b>	
<b>UL</b>	UL-873, Underwriters Laboratories Listed (File #9429 Category: Temperature-Indicating and Regulating Equipment).
<b>European Community</b>	EMC Directive (89/336/EEC). Low Voltage Directive (72/23/EEC).
<b>CSA</b>	Canadian Standards C22.2 No. 4-93.
<b>Australia</b>	This product meets requirements to bear the C-Tick mark according to the terms specified by the Communications Authority under the Radio Communications Act 1992.
<b>General Instructions</b>	Refer to F-26644.

## Accessories

Model No.	Description
<b>MF40-7043, MF40-7073, MF40-7153</b>	
AM-673 <sup>a</sup>	Mounting bracket.
AM-674	Weather shield.
AM-675	Weather shield base.
AM-676	Universal shaft extension, approximately 9-1/2 in. long (242 mm) for use on 3/8 to 11/16 in. (10 to 17 mm) round shafts, 3/8 to 9/16 in. square shafts. (AM-753 clamps required).
AM-756	Metric conduit adaptor M20 x 1.5 to 1/2 in. NPT (two per package).
AM-714	Weather shield.
<b>MF40-7073, MF40-7153</b>	
AM-671 <sup>abcd</sup>	Mounting bracket.
AM-672 <sup>abcd</sup>	Mounting bracket.
AM-686	Position indicator.
AM-687	V-clamp.
AM-689	Rotation limiter.
AM-690	Crank arm.
AM-691	Crank arm.
AM-692	V-bolt.
AM-693 <sup>ef</sup>	Crank arm kit.
AV-602	Valve linkage for VB-7xxx 1 to 2 in.
AV-607	Valve linkage VB-9xxx 2-1/2 to 4 in.
<b>MF40-7043</b>	
AM-709	Position indicator and stroke limiter.
AM-710	V-clamp.
AM-711	Crank arm adaptor kit.
AM-712 <sup>e</sup>	Crank arm adaptor kit.
AM-713 <sup>e</sup>	Bracket.
AM-715 <sup>e</sup>	Crank arm adaptor kit.
AV-605	Valve linkage for VB-7xxx.

<sup>a</sup> Drill appropriate mounting holes where needed.

<sup>b</sup> AM-693 crank arm kit required.

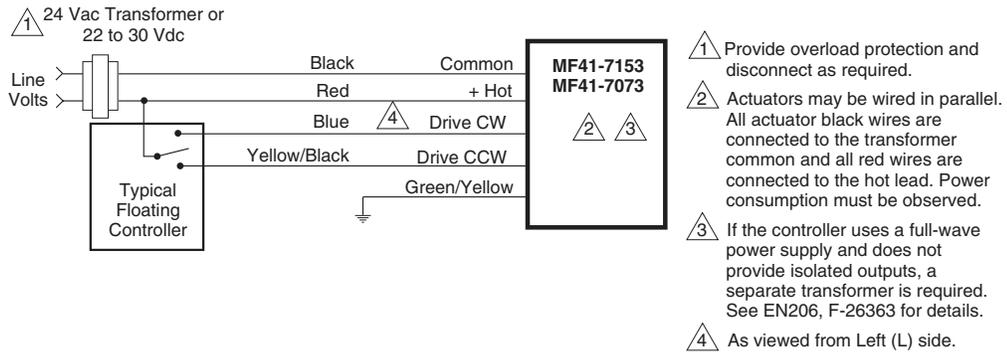
<sup>c</sup> Cannot be used with Mx40-634x or Mx40-717x series actuators.

<sup>d</sup> The large "C"-shaped clamps included in AM-693 crank arm kit are required for mounting the actuator. Drill appropriate mounting holes where needed.

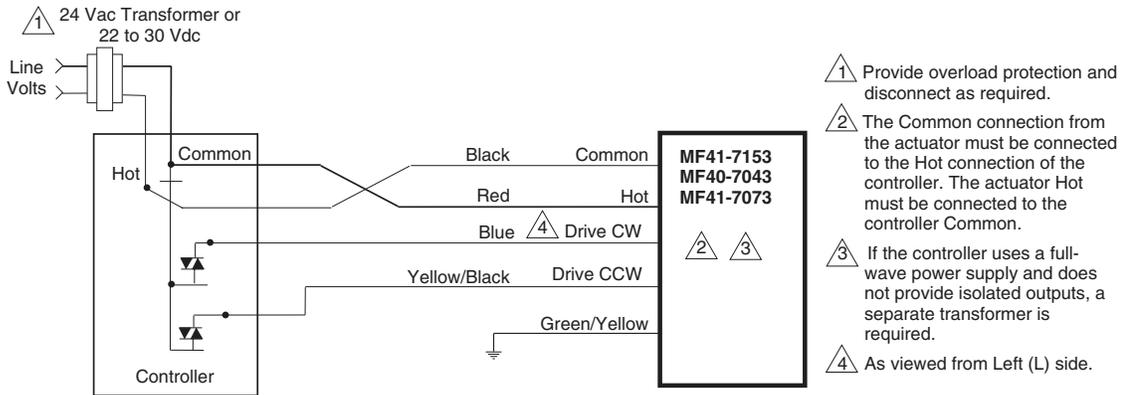
<sup>e</sup> Use the self-tapping screws and flat washers provided in kit to mount actuator.

<sup>f</sup> AM-692 V-bolt kit required.

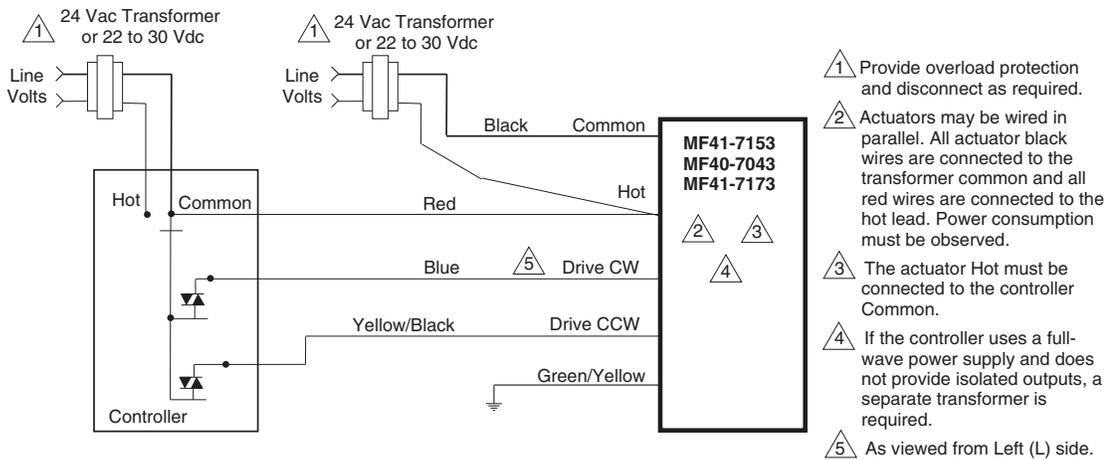
## Typical Applications



**Figure 1 Typical Wiring Diagram For Floating Actuator.**



**Figure 2 Typical Wiring Diagram with Triac Sink.**



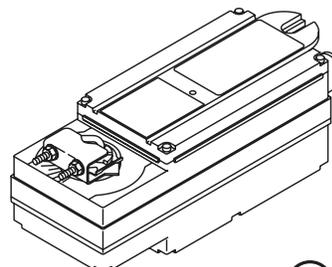
**Figure 3 Typical Wiring Diagram with Triac Sink and Separate Transformers.**

# Spring Return DuraDrive® Floating Actuator

For spring return applications that require floating control of dampers and valves in HVAC system.

Features:

- 150 lb.-in. (17 N-m) rated torque.
- Direct mount to round or square damper shaft.
- Overload protection throughout rotation.
- True mechanical clockwise or counterclockwise spring return operation for positive close-off in tight seal damper applications.
- Visual position indicator.
- Oil immersed gear train provides continuous lubrication.
- NEMA 4 housing (IEC IP56).
- Automatic current sensing motor control provides extended reliability and repeatable timing.



Model Chart										
Damper Actuators										
Model No.	Damper Shaft Size <sup>a</sup>	Actuator Power Input				SPDT Auxiliary Switches	Approximate Timing in Seconds @ 70°F (21°C) with No Load		Output Torque Rating lb.-in. (N-m)	
		Voltage	Watts	VA			Powered	Spring Return	Minimum <sup>b</sup>	Maximum Stall
				Running	Holding					
MF40-7173	3/8 to 1/2 in. round or square	24 Vac ± 20%	5.5	10	4.3	No	<145	150 (17)	450 (51)	

<sup>a</sup> Optional AM-753 damper shaft mounting clamps for 5/8 in. square or 3/4 to 1 in. round shafts.

<sup>b</sup> De-rating required for spring return actuators at low temperatures.

### Valve Actuator plus Linkages.

Model No. <sup>a</sup>	Linkage (included)	Voltage 50/60 Hz	Running		Holding VA	SPDT Aux. Switches
			W	VA		
MF40-7173-200	AV-602	24 Vac ± 20%	5.5	10	4.3	No
MF40-7173-220	AV-607					
MF40-7173-230	AV-609					

<sup>a</sup> Refer to Valve Catalog, F-27384, for correct applications.

### Specifications

#### Inputs

<b>Control signal</b>	SPDT Floating point control, Triacs (500 mA rated), or 2 SPST contacts.
<b>Power</b>	Refer to Model Chart.
<b>Connections</b>	1/2 in. conduit ports for separation of Class 1 and Class 2 circuits. Power: Appliance cable.

**Specifications (Continued)****Outputs**

<b>Motor Type</b>	Brushless DC.
	Direction of rotation: CW or CCW rotation is available through reverse mounting.
<b>Mechanical</b>	Dual shaft clamp: Direct coupled using a through hole output hub.
	Stroke: Electronically limited to $93^{\circ} \pm 1^{\circ}$ .
<b>Environment</b>	
<b>Ambient Temperature limits</b>	Shipping and storage: -40 to 160°F (-40 to 71°C). Operating: -25 to 140°F (-32 to 60°C).
<b>Humidity</b>	5 to 95% RH, non-condensing.
<b>Locations</b>	NEMA 1, NEMA 4 (IEC IP56) with customer supplied water tight connector.
<b>Dimensions</b>	10-27/32 H x 4 W x 4 D in. (280 x 100 x 100 mm).
<b>Agency Listings</b>	
<b>UL</b>	UL-873, Underwriters Laboratories Listed (File #9429 Category: Temperature-Indicating and Regulating Equipment.)
<b>European Community</b>	EMC Directive (89/336/EEC). Low Voltage Directive (72/23/EEC).
<b>CUL</b>	Canadian Standards C22.2 No. 4-93.
<b>Australia</b>	This product meets requirements to bear the C-Tick mark according to the terms specified by the Communications Authority under the Radio Communications Act 1992.
<b>General Instructions</b>	Refer to F-26749.

**Accessories**

<b>Model No.</b>	<b>Description</b>
AM-674	Weather shield.
AM-676	Universal shaft extension, approximately 9-1/2 in. long (242 mm) for use on 3/8 to 1 1/16 in. (10 to 17 mm) round shafts, 3/8 to 9/16 in. square shafts. (AM-753 clamps required).
AM-751	Standard anti-rotation bracket 9 in. long x 1 3/16 in. wide (229 x 21 mm), included with actuator.
AM-752	Optional anti-rotation bracket 4 in. long x 1-11/16 in. wide (102 x 43 mm), for narrow spaces.
AM-753	Damper shaft mounting clamps for 5/8 in. square shaft, 3/4 in. and 1 in. round shafts (two per package).
AM-754	Standard universal mounting clamps for 3/8 to 1/2 in. (10 to 13 mm) round and square shafts, two included with actuator.
AM-756	Metric conduit adaptor M20 x 1.5 to 1/2 in. NPT (two per package).
AV-602	Valve linkage for VB-7xxx 1-1/2 to 2 in.
AV-607	Valve linkage for VB-9xxx 2-1/2 to 4 in.

Typical Applications

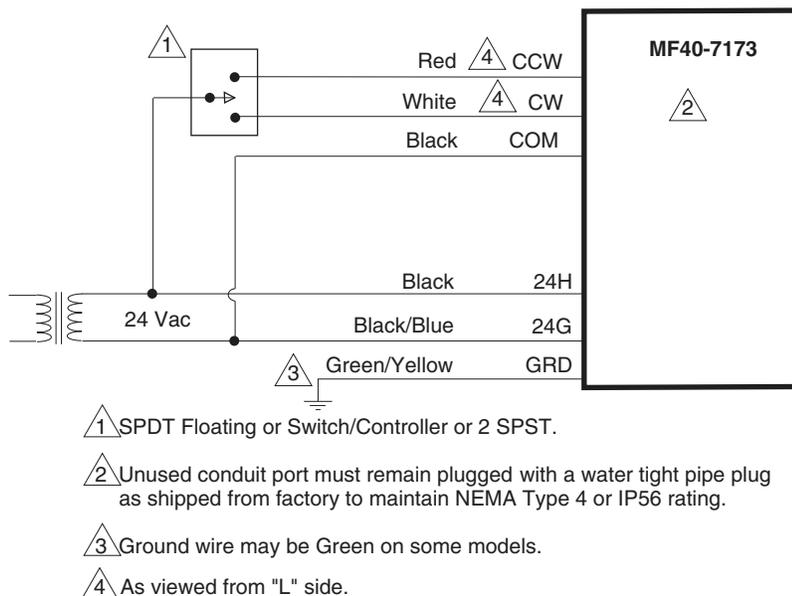


Figure 1 Typical SPDT Controller Wiring Diagram.

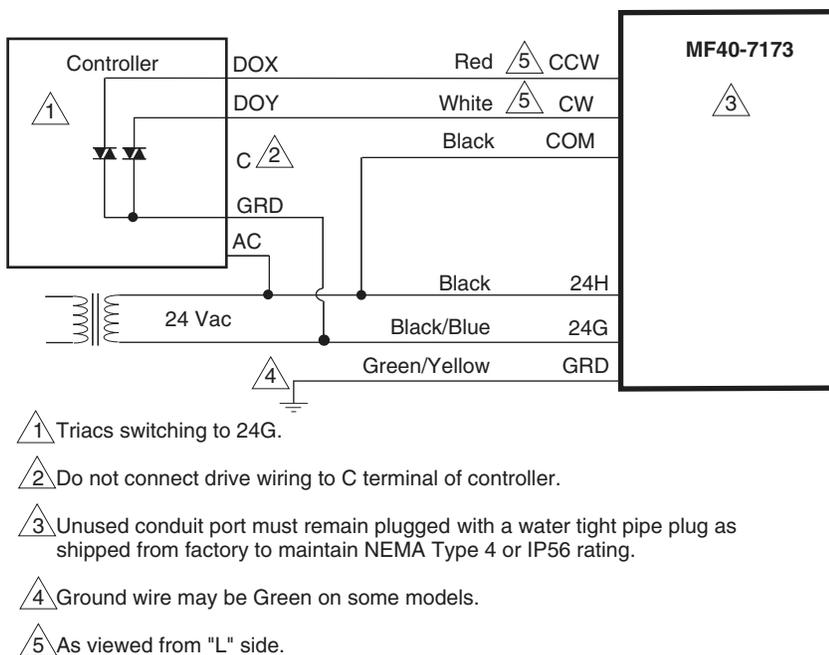


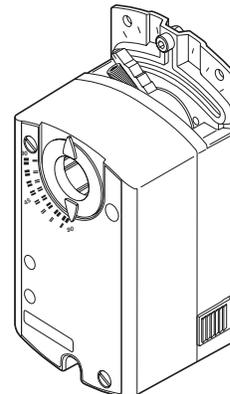
Figure 2 Typical Triacs Switching to 24G Wiring Diagram of Actuator.

# Non-Spring Return DuraDrive® Floating Actuator

The DuraDrive direct coupled 24 Vac non-spring return rotary electric actuators are designed for three-position (floating) control of dampers.

Features:

- Compact, lightweight design.
- Manual override.
- Factory pre-positioned at 5° from 0 to assure damper or valve close-off.
- Plenum cabling.
- Feedback potentiometer models available.
- cUL and UL listed; plenum versions also CE certified.
- Independently adjustable dual auxiliary switches available.



Model Chart								
Damper Actuators.								
Model No.	Shaft Size	Actuator Power Input		With Potentiometer	SPDT Auxiliary Switches	Approximate Timing in Seconds @ 70°F (21°C) with No Load		Output Torque Rating lb.-in. (N-m) Minimum
		Voltage	VA Running			50 Hz	60 HZ	
MF41-6043	3/8 to 5/8 in. dia.	24 VAC	2.3	No	No	108	90	35 (4)
MF41-6043-510				Yes	No			
MF41-6043-502				No	Two			
MF41-6083	1/4 to 1/2 in. sq.	+20%-15%	2.3	No	No	150	125	70 (8)
MF41-6083-510				Yes	No			
MF41-6083-502				No	Two			

### Valve Actuator plus Linkages.

Model No. <sup>a</sup>	Linkage (included)	Voltage 50/60 Hz	Running VA	SPDT Aux. Switches
MF41-6043-200	AV-603	24 Vac + 20% -15%	2.3	No
MF41-6043-202				Yes
MF41-6083-200				No
MF41-6083-202				Yes

<sup>a</sup> Refer to Valve Catalog, F-27384, for correct applications.

### Specifications

#### Inputs

**Control signal** Floating three position control, 24 Vac.

**Power** 24 Vac +20/-15% 50/60 Hz. Power Consumption: 2.3 VA  
MF41-6083: 24 Vac +20/-10% at 90 to 130°F (32 to 55°C) ambient.

**Connections** 3 ft. (0.9 m) long, 18 AWG leads, plenum-rated.

#### Outputs

**MF41-60xx-510:** Feedback potentiometer: 0 to 1000Ω < 10 mA.

**MF41-60xx-502:** Auxiliary switch contact rating, AC rating: 24 Vac, 4A Resistive, 2A Inductive. DC Rating: 12 to 30 Vdc, DC 2A.

Switching Hysteresis: 2°

# MF41-60xx Series

## Specifications (Continued)

### Environment

<b>Ambient temperature limits</b>	Shipping and Storage: -40 to 158°F (-40 to 70°C). Operating: -25 to 130°F (-32 to 55°C).
<b>Humidity</b>	5 to 95% RH, non-condensing.
<b>Locations</b>	NEMA 2, IP54 to EN60529.
<b>Dimensions</b>	5-7/16 H x 2-3/4 W x 2-3/8 D in. (140 x 70x 60 mm).
<b>Agency Listings</b>	
<b>UL</b>	UL-873, Underwriters Laboratories.
<b>European Community</b>	EMC Directive (89/336/EEC). Emissions (EN50081-1). Immunity (EN50082-2).
<b>CUL</b>	Canadian Standards C22.2 No. 24-93.
<b>General Instructions</b>	Refer to F-27213.

## Accessories

Model No.	Description
AM-726	Rotary to linear bracket.
AM-727	Rotary to linear crank arm adaptor
AM-728	Conduit adaptor.
AM-729	3/8 in. shaft adaptor.
AV-603	Valve linkage for VB-7xxx 1/2 to 2 in.

## Typical Applications

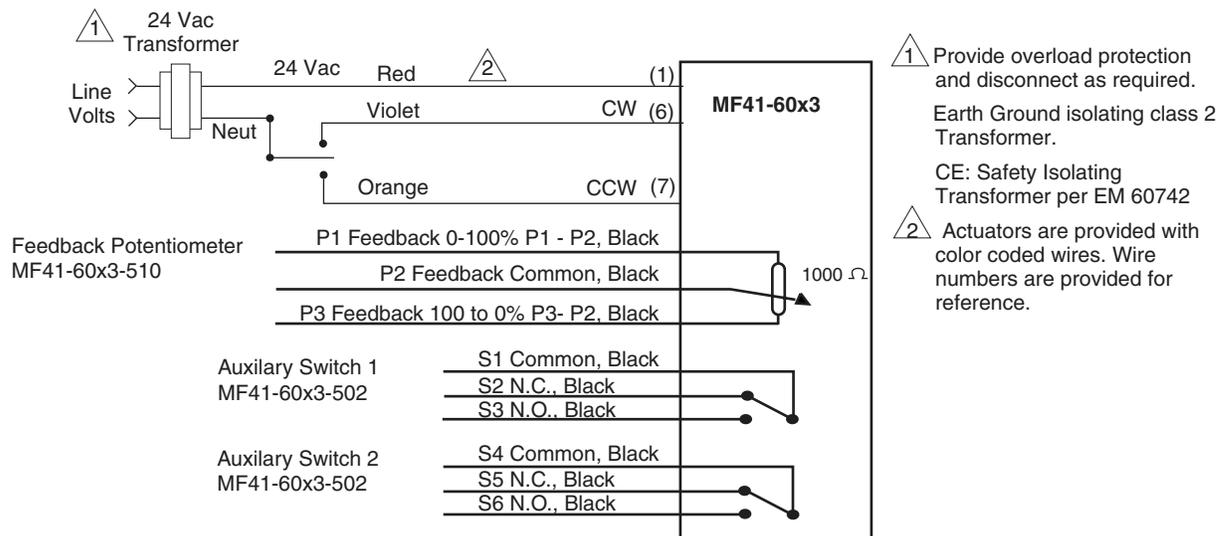


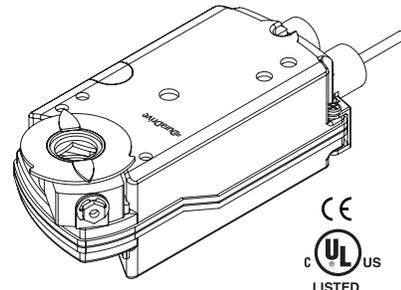
Figure 1 Typical Wiring Diagram for MF41-60x3-2xx Floating Actuators.

# Non-Spring Return DuraDrive® Three Position Actuator

The DuraDrive direct-coupled, 24 Vac, non-spring return electronic actuator is designed for three-position control of building HVAC dampers.

Features:

- Synchronous motor technology with stall protection.
- Unique self-centering shaft coupling.
- Manual override.
- 133 lb-in (15 Nm) torque.
- Factory pre-positioned at 5° from 0 to assure damper or valve close-off.
- Mechanical range adjustment capabilities.
- Offset and span adjustment models available.
- Built-in 1/2-inch conduit connection.



Model Chart									
Damper Actuators.									
Model No.	Shaft Size	Motor Type	Power Input @ 50/60 Hz			SPDT Auxiliary Switches	Approximate Timing in Seconds @ 70°F (21°C) with No Load		Output Torque Rating lb-in (Nm)
			Voltage	Running			50 Hz	60 Hz	
				VA	W				
MF41-6153	1/4 to 3/4 in. dia. 1/4 to 1/2 in.sq.	Synchronous	24 Vac + 20% - 15%	3	3	No	150	125	133 lb-in (15 Nm)

Valve Actuator plus Linkages.

Model No. <sup>a</sup>	Linkage (included)	Voltage 50/60 Hz	Running		SPDT Aux. Switches
			W	VA	
MF41-6153-200	AV-605	24 Vac ± 20%	3	3	No
MF41-6153-220	AV-607				

<sup>a</sup> Refer to Valve Catalog, F-27384, for correct applications.

Specifications	
<b>Inputs</b>	
<b>Control signal</b>	Floating three position control, 24 Vac.
<b>Power</b>	All 24 Vac circuits are Class 2. 24 Vac +20/-15% @ 50/60 Hz. Running VA: 3 @ 3 W.
<b>Connections</b>	3 ft. (0.9 m) long, 18 AWG leads.
<b>Electrical</b>	Timing: 150 seconds @ 50 Hz; 125 seconds @ 60 Hz.
<b>Mechanical</b>	Output torque rating: 133 lb-in. (15 N-m).
	Stroke: Normal angle of rotation is 90°, limited to a maximum of 95°. Field adjustable to limit travel on either end of stroke.
	Position indicator: Adjustable pointer is provided for position indication.

# MF41-6153 Series

## Specifications (Continued)

Environment	
<b>Ambient temperature limits</b>	Operation: -25 to 130°F (-32 to 55°C) Storage: -40 to 158°F (-40 to 70°C).
<b>Humidity</b>	5 to 95% RH, non-condensing.
<b>Locations</b>	NEMA Type 1, IP54 According to EN 60 529.
Dimensions	
	8-3/8 H x 3-1/4 W x 2-2/3 D in. (210 x 80 x 70 mm).
Agency Listings	
<b>UL</b>	UL-873, Underwriters Laboratories.
<b>European Community</b>	EMC Directive (89/336/EEC). Emissions (EN50081-1). Immunity (EN61000-6-2).
<b>CUL</b>	Canadian Standards C22.2 No. 24-93.
General Instructions	
	Refer to F-27215.

## Accessories

Model No.	Description
AV-605	Valve linkage for VB-7xxx 1-1/2 to 2 in.
AV-607	Valve linkage for VB-9xxx 2-1/2 to 4 in.

## Typical Applications



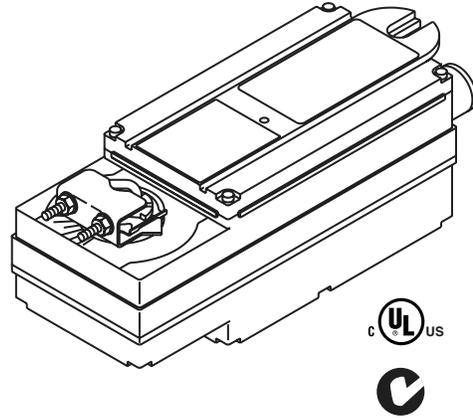
Figure 1 Typical Wiring Diagram for MF41-6153 Floating Actuators.

# Non-Spring Return DuraDrive® Floating Actuator

For non-spring return applications that require floating control of dampers and valves in HVAC systems.

## Features:

- Direct mount to round or square damper shaft.
- 300 lb.-in. (34 N-m) torque rating.
- Overload protection throughout rotation.
- Oil immersed gear train provides continuous lubrication.
- NEMA 4 housing (IEC IP56).
- Manual override to allow positioning for installation and manual operation.
- Provide floating point control (drive open-hold-drive closed).



## Model Chart

### Damper Actuators.

Model No.	Damper Shaft Size <sup>a</sup>	Actuator Power Input				SPDT Auxiliary Switches	Approximate Timing in Seconds @ 70°F (21°C) with No Load	Output Torque Rating lb.-in. (N-m)	
		Voltage 5-/60 Hz	Watts	VA				Minimum	Maximum Stall
				Running	Holding				
				VA	W				
MF41-6343	3/8 to 1/2 in. round or square	24 Vac ± 20%	3.8	7.1	3.6	No	<145	300 (34)	600 (68)

<sup>a</sup> Optional AM-753 damper shaft mounting clamps for 5/8 in. square or 3/4 to 1 in. round shafts.

### Valve Actuator plus Linkages.

Model No. <sup>a</sup>	Linkage (included)	Voltage 50/60 Hz	Running		Holding VA	SPDT Aux. Switches
			W	VA		
MF41-6343-230	AV-609	24 Vac ± 20%	3.8	7.1	3.6	No

<sup>a</sup> Refer to Valve Catalog, F-27384, for correct applications.

## Specifications

### Inputs

<b>Control signal</b>	SPDT floating control input, triacs (500 mA rated) or 2 SPST contacts.
<b>Power</b>	Refer to Model Chart. All 24 Vac circuits are Class 2.
<b>Connections</b>	24 in. (61 cm) appliance cables. Conduit connector for M20 metric conduit use AM-756 adapter.

### Outputs

<b>Motor Type</b>	Brushless DC.
<b>Mechanical</b>	Direction of rotation: CW or CCW rotation is available through reverse mounting. Dual shaft clamp: Direct coupled using a through hole output hub. 3/8 to 1/2 in. round or square shafts standard. Position indicator: Pointer and scale numbered from 0 to 95°. Stroke 93° ± 1°. See Accessories for larger shaft sizes.

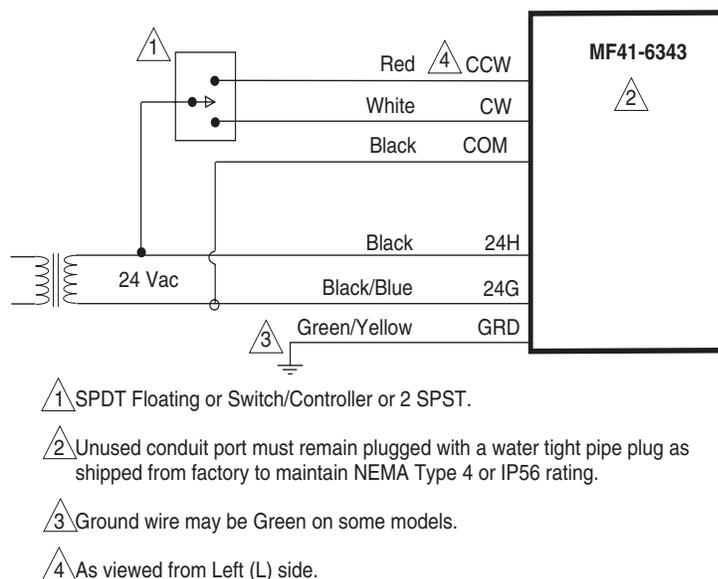
## Specifications (Continued)

Environment	
<b>Ambient Temperature limits</b>	Shipping and Storage: -40 to 160°F (-40 to 71°C). Operation: -25 to 140°F (-32 to 60°C).
<b>Humidity</b>	5 to 95% RH, non-condensing.
<b>Locations</b>	NEMA 1, NEMA 4 (IEC IP56) with customer supplied water tight connectors.
Agency Listings	
<b>UL</b>	UL-873, Underwriters Laboratories Listed (File #9429 Category: Temperature-Indicating and Regulating Equipment).
<b>European Community</b>	EMC Directive (89/336/EEC). Low Voltage Directive (72/23/EEC).
<b>CUL</b>	Canadian Standards C22.2 No. 4-93.
<b>Australia</b>	This product meets requirements to bear the C-Tick mark according to the terms specified by the Communications Authority under the Radio Communications Act 1992.
<b>General Instructions</b>	Refer to F-26744.

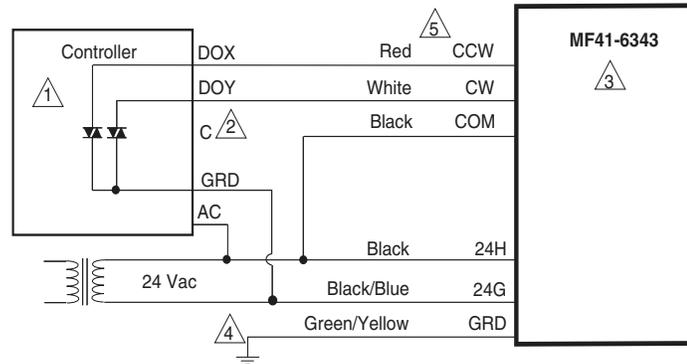
## Accessories

Model No.	Description
AM-674	Weather shield.
AM-676	Universal shaft extension, approximately 9-1/2 in. long (242 mm) for use on 3/8 to 11/16 in. (10 to 17 mm) round shafts, 3/8 to 9/16 in. square shafts. (AM-753 clamps required).
AM-751	Standard anti-rotation bracket 9 in. long x 13/16 in. wide (229 x 21 mm), included with actuator.
AM-752	Optional anti-rotation bracket 4 in. long x 1-11/16 in. wide (102 x 43 mm), for narrow spaces.
AM-753	Damper shaft mounting clamps for 5/8 in. square shaft, 3/4 in. and 1 in. round shafts (two per package).
AM-754	Standard universal mounting clamps for 3/8 to 1/2 in. (10 to 13 mm) round and square shafts, two included with actuator.
AM-755	Manual override crank.
AM-756	Metric conduit adaptor M20 x 1.5 to 1/2 in. NPT (two per package).
AV-609	Valve linkage for VB-9xxx 5 and 6 in.

## Typical Applications



**Figure 1 Typical SPDT Controller Wiring Diagram.**



- 1 Triacs switching to 24G.
- 2 Do not connect drive wiring to C terminal of controller.
- 3 Unused conduit port must remain plugged with a water tight pipe plug as shipped from factory to maintain NEMA Type 4 or IP56 rating.
- 4 Ground wire may be Green on some models.
- 5 As viewed from Left (L) side.

**Figure 2 Typical Triacs Switching to 24G Wiring Diagram of Actuator.**