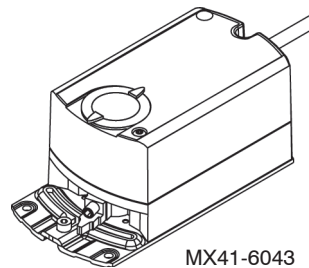


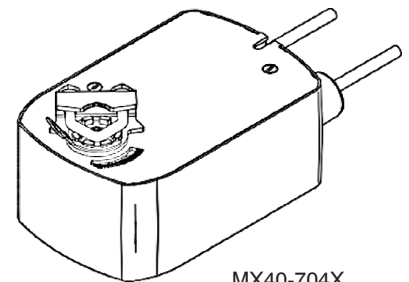
Applications

Direct-coupled SmartX Actuators are designed to accept two-position, floating, or proportional control from a DDC system or from a thermostat, for control of HVAC applications. The actuators are designed to be used in both damper and valve control applications. Typical applications include air handling units, unit ventilators, fan coil units, VAV terminals, control dampers, inlet guide vanes, and linked valve assemblies.

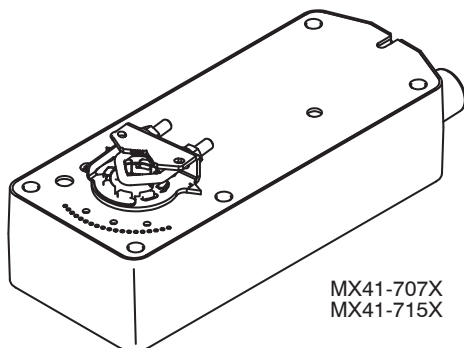
Use the following guide to select actuators for damper applications. Refer to the Applicable Literature table for valve literature.



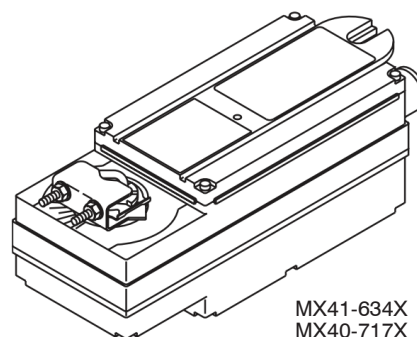
MX41-6043
MX41-6083



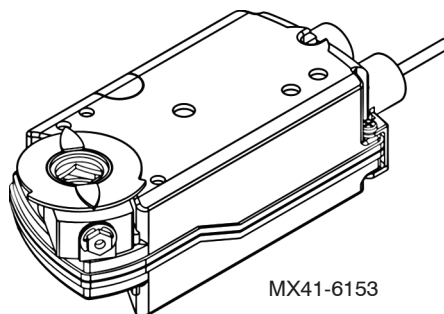
MX40-704X



MX41-707X
MX41-715X



MX41-634X
MX40-717X



MX41-6153

Applicable Literature

F-Number	Description	Audience	Purpose	
F-27211	MF41-6043/MS41-6043 Series, MF41-6083/ MS41-6083 Series Non-Spring Return Direct Coupled Actuator Installation Instructions	<ul style="list-style-type: none"> – Sales Personnel – Application Engineers – Installers – Service Personnel – Start-up Technicians 	<p>Describes the actuator's features, specifications, and possible applications. Provides step-by-step mounting instructions.</p>	
F-27212	MF41-6153, MS41-6153 Non-Spring Return Direct Coupled Actuator Installation Instructions			
F-27213	MF41-6043/MF41-6083 Series Non-Spring Return Rotary 24 Vac Three-Position Control Electronic Damper Actuators General Instructions			
F-27214	MS41-6043/MS41-6083 Series Non-Spring Return Rotary 24 Vac Modulating Control 0 to 10 Vdc Electronic Damper Actuators General Instructions			
F-27215	MF41-6153/MS41-6153 Series Non-Spring Return Rotary Electronic Damper Actuators General Instructions			
F-26744	MF41-6343 SmartX Series Non-Spring Return Direct Coupled Actuator General Instructions			
F-26745	MS41-634X SmartX Series Non-Spring Return Direct Coupled Actuator General Instructions			
F-26742	MA40-717X SmartX Series Spring Return Direct Coupled Actuator General Instructions			
F-26748	MS40-717X SmartX Series Spring Return Direct Coupled Actuator General Instructions			
F-26749	MF40-7173 SmartX Series Spring Return Direct Coupled Actuator General instructions			
F-26644	MF4X-7XX3, MF4X-7XX3-50X Schneider Electric SmartX Series Spring Return Direct Coupled Actuator General Instructions			
F-26642	MA4X-7XX3, MA4X-7XX3-50X, MA4X-7XXX, MA4X- 7XXX-50X SmartX Series Spring Return Direct Coupled Actuator General Instructions			
F-26645	MS4X-7XX3, MS4X-7XX3-50X SmartX Series Spring Return Direct Coupled Actuator General Instructions			
F-27160	MX4X-6XXX-220/-230 and MX4X-7XXX-220 Actuator/ Linkage Assemblies for 2-1/2" to 6" Globe Valves General Instructions	<ul style="list-style-type: none"> – Sales Personnel – Application Engineers – Installers – Service Personnel – Start-up Technicians 	<p>Describes the valve assemblies' features, specifications, and possible applications. Provides step-by-step mounting, installation, and checkout instructions.</p>	
F-26750	MA4X-XXXX-2XX, MF4X-XXXX-2XX, MS4X-XXXX-2XX Series Actuator/Linkage Assemblies for 1/2" to 2" Globe Valves General Instructions		<p>Describes the globe valve actuator/linkage assembly's features, specifications, and possible applications. Provides step-by-step mounting instructions.</p>	
F-27087	VX-2X13-5XX-9-XX Series, VB-2X13-500-9-XX Series Ball Valve Assemblies and Ball Valve Body/Linkage Assemblies Installation Instructions		<p>Describes the actuator/linkage/ball valve assemblies' features, specifications, and possible applications. Provides step-by-step mounting instructions.</p>	
F-26752	VX-7000 and VX-9000 Series, MX4X-6XXX and MX4X-7XXX Series, Linked Globe Valve Assemblies and Actuator/Linkage Assemblies with SmartX Actuators Selection Guide		<p>Provides features, specifications, mounting dimensions, and other criteria useful to the selection of linked globe valve assemblies and actuator/linkage assemblies with SmartX actuators.</p>	
F-27086	VX-2X13-5XX-9-XX Series Ball Valve Assemblies and VB-2X13-500-9-XX Series Ball Valve Body/Linkage Assemblies Selection Guide.		<p>Provides features, specifications, mounting dimensions, and other criteria useful to the selection of linked ball valve assemblies with SmartX actuators.</p>	
F-27216	MF41/MS41-6043 Series 24 Vac, 35 lb-in. Non-Spring Return, Direct-Coupled Electronic Damper Actuators Submittal Sheet		<ul style="list-style-type: none"> – Sales Personnel – Application Engineers 	<p>Describes features and specifications of the MX41-6043 series actuators.</p>

F-Number	Description	Audience	Purpose
F-27217	MF41/MS41-6083 Series 24 Vac, 70 lb-in., Non-Spring Return Direct-Coupled Electronic Damper Actuators Submittal Sheet	<ul style="list-style-type: none"> – Sales Personnel – Application Engineers 	Describes features and specifications of the MX41-6083 series actuators.
F-27218	MF41/MS41-6153 Series, 24 Vac, 133 lb-in., Non-Spring Return, Direct-Coupled Electronic Damper Actuators Submittal Sheet	<ul style="list-style-type: none"> – Sales Personnel – Application Engineers 	Describes features and specifications of the MX41-6153 series actuators.
F-26785	VX-2000, VX-7000, VB-2000, MX4X-7XXX, and MX40-6XXX Series Ball and Globe Linked Valve Assemblies, Valve/Linkage Assemblies, and Actuator/Linkage Assemblies Cross-Reference Guide	<ul style="list-style-type: none"> – Sales Personnel – Application Engineers 	Provides part number cross referencing of phased-out devices with the new Actuator/Linkage Assemblies, and Ball and Globe Linked Valve Assemblies.
F-11080	Valve Selection Chart Water	<ul style="list-style-type: none"> – Application Engineers – Installers – Service Personnel – Start-up Technicians 	Provides charts, equations, and diagrams to assist in the configuration of valve system applications. TOOL-150, valve sizing slide rule may be purchased separately.
F-11366	Valve Selection Chart Steam (two-way valves only)		
F-13755	CA-28 Control Valve Sizing		
F-26080	EN-205 Water System Guidelines		
			Describes Schneider Electric approved water treatment practices.

Product Warranty

SmartX actuators are covered by a five year warranty.

Using this Selection Guide

This selection guide contains the following sections:

Actuator Part Numbering System

This section explains the SmartX actuator part numbering system.

Actuator Selection Chart

Use this chart as a quick reference guide. Refer to Actuator Selection section for specifications data, as well as mounting dimensions.

Actuator Accessories Chart

Use this section to choose the appropriate accessories for the selected actuator.

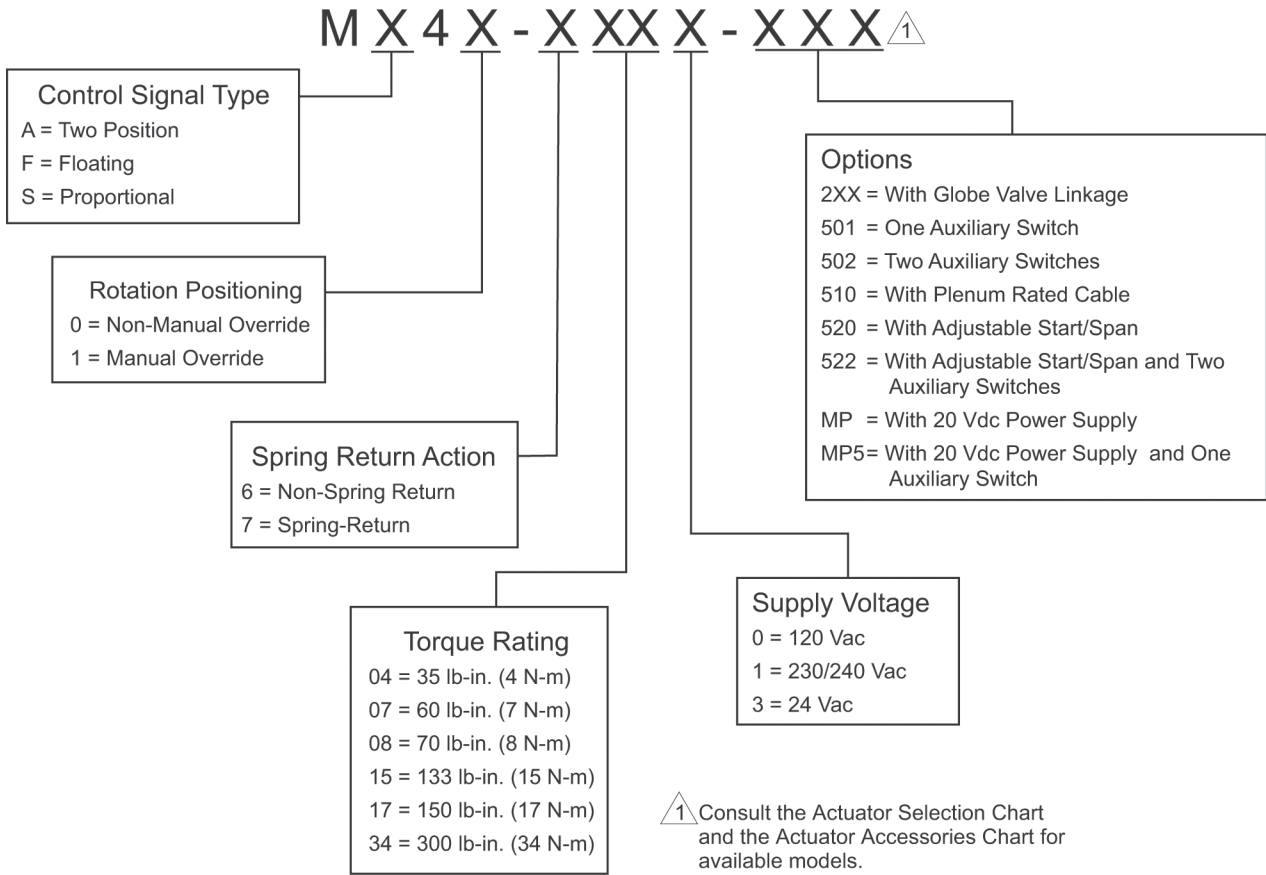
Actuator Specifications and Mounting Dimensions

Use this section to choose the appropriate actuator for the application. This section includes actuator specifications data, as well as mounting dimensions.

Damper Actuator Cross-Reference

Refer to this section for actuator replacement data.

Actuator Part Numbering System



SmartX Actuator Selection Chart

Spring-Return Actuators

Table-1 MX40-704X, MX4X-707X, and MX4X-715X Series Spring-Return Actuators.

Actuator Type	Part Numbers		Power Input								SPDT Auxiliary Switches	Approximate Timing in Seconds @ 70 °F (21 °C) with No Load		Output Torque Rating lb.-in. (N-m)		
			Voltage	Running				Holding		Powered		Spring Return	Min.	Max. Stall		
				50 Hz		60 Hz		50 Hz	60 Hz							
				VA	W	VA	W	DC Amps	W						W	
Two-Position	MA40-7043	(page 17)	24 Vac ± 20% 22-30 Vdc	4.4	2.9	4.4	2.9	0.11	0.8	0.8	No	<50	<26	35 (4)	150 (17)	
	MA40-7043-501			One												
	MA40-7040		(page 17)	120 Vac ± 10%	6.4	3.8	4.3	3.4	—	1.6	1.2	No	<50			<26
	MA40-7040-501				One ^b											
	MA40-7041			230 Vac ± 10%	5.8	4.1	4.6	3.9	—	1.5	1.2	No	<50			<26
	MA40-7041-501				One ^b											
Floating	MF40-7043	(page 17)	24 Vac ± 20% 22-30 Vdc	5.9	4.4	5.9	4.4	0.17	2.9	2.9	No	<130	<25			
	MF40-7043-501 ^c			One ^b												
Proportional	MS40-7043 ^c	(page 17)	24 Vac ± 20% 22-30 Vdc	5.6	4.2	5.6	4.2	0.15	2.4	2.4	No	<130	<25			
	MS40-7043-501 ^c			One ^b												
	MS40-7043-MP		24 Vac 22-30 Vd	6.6	5.0	6.6	5.0	0.17	3.2	3.2	No	<130	<25			
	MS40-7043-MP5			One ^b												
Two-Position	MA41-7073	(page 19)	24 Vac ± 20% 22-30 Vdc	4.8	3.2	4.8	3.2	0.13	0.8	0.8	No	<80	<40	60 (7)	250 (28)	
	MA41-7073-502 ^d			Two												
	MA41-7070 ^d		120 Vac ± 10%	10.7	4.2	5.6	3.6	—	2.0	1.2	No					
	MA41-7070-502 ^d			Two ^e												
	MA41-7071 ^d		230 Vac ± 10%	17.0	5.1	8.0	4.0	—	2.7	1.4	No					
	MA41-7071-502 ^d			Two ^e												
Floating	MF41-7073 ^d	(page 19)	24 Vac ± 20% 22-30 Vdc	6.2	4.8	6.2	4.8	0.18	2.8	2.8	No	<195	<30			
	MF41-7073-502 ^d			Two ^e												
Proportional	MS41-7073 ^d	(page 19)	24 Vac ± 20% 22-30 Vdc	5.8	4.6	5.8	4.6	0.17	2.3	2.3	No	<195	<30			
	MS41-7073-502 ^d			Two ^e												

^a De-rating required for spring return actuators at low temperatures.

^b One adjustable from 15 to 95° rotation (MIN to 1 scale).

^c With plenum-rated cable.

^d Equipped with manual override.

^e One adjustable from 25° to 85° rotation and one set to operate @ 5° fixed.

Table-1 MX40-704X, MX4X-707X, and MX4X-715X Series Spring-Return Actuators.

Actuator Type	Part Numbers	Power Input								SPDT Auxiliary Switches	Approximate Timing in Seconds @ 70 °F (21 °C) with No Load		Output Torque Rating lb.-in. (N-m)	
		Voltage	Running				Holding		Powered		Spring Return	Min. ^a	Max. Stall	
			50 Hz		60 Hz		DC Amps	50 Hz						60 Hz
			VA	W	VA	W								
Two-Position	MA41-7153 ^d	24 Vac ± 20% 22-30 Vdc	9.8	7.5	9.7	7.5	0.29	2.8	2.8	<190	<30	133 (15)	350 (40)	
	MA41-7153-502 ^d													Two ^e
	MA41-7150 ^d	120 Vac ± 10%	11.7	8.8	10.0	8.4	—	3.6	5.0					No
	MA41-7150-502 ^d													Two ^e
	MA41-7151 ^d	230 Vac ± 10%	15.5	9.5	10.6	8.5	—	4.6	3.3					No
	MA41-7151-502 ^d													Two ^e
Floating	MF41-7153 ^d	24 Vac ± 20% 22-30 Vdc	9.8	7.7	9.7	7.7	0.30	3.3	3.3	No				
	MF41-7153-502 ^d									Two ^e				
Proportional	MS41-7153 ^d	24 Vac ± 20% 22-30 Vdc	9.8	7.4	9.7	7.4	0.28	2.9	2.9	No				
	MS41-7153-502 ^d									Two ^e				

^aDe-rating required for spring return actuators at low temperatures.
^bOne adjustable from 15 to 95° rotation (MIN to 1 scale).
^cWith plenum-rated cable.
^dEquipped with manual override.
^eOne adjustable from 25° to 85° rotation and one set to operate @ 5° fixed.

Table-2 MX40-717X Series Spring-Return Actuators.

Part Numbers		Power Input @ 50/60 Hz				SPDT Auxiliary Switches	Approximate Timing in Seconds @ 70 °F (21 °C) with No Load		Output Torque Rating lb.-in. (N-m)	
		Voltage	Running Watts	VA			Powered	Spring Return	Min. ^a	Max. Stall
				Running	Holding					
MA40-7173	(page 23)	24 Vac ± 20%	5.3	7.4	5.1	No	162	72	150 (17)	545 (61.8)
		22-30 Vdc	5.0	5.0	3.0	No				
MA40-7170		120 Vac ± 10%	6.2	8.4	6.6	No				
MA40-7171		240 Vac ± 10%	6.5	9.8	8.5	No				
MF40-7173		24 Vac ± 20%	5.8	8.1	5.3	No	147	65		
		22-30 Vdc	5.7	5.7	3.6	No				
MS40-7173		24 Vac ± 20%	5.5	7.8	4.7	No				
		22-30 Vdc	5.0	5.6	2.5	No				
MS40-7170		120 Vac ± 10%	6.4	8.5	5.2	No				
MS40-7171		240 Vac ± 10%	7.2	10.8	9.0	No				

De-rating required for spring return actuators at low temperatures.

Non-Spring Return Actuators

Table-3 Non-Spring Return Actuators.

Part Numbers	Power Input @ 50/60 Hz				SPDT Auxiliary Switches ^a	Approximate Timing in Seconds @ 70 °F (21 °C) with No Load	Actuator Output Torque Rating (Minimum) lb.-in. (N-m)
	Voltage	Watts	VA				
			Running	Holding			
MF41-6043	24 Vac +20/-15%	2.0	2.3	—	No	90 @ 60 Hz 108 @ 50 Hz	35 (4)
MF41-6043-502 ^b		2.0	2.3	—	2		
MF41-6043-510 ^b		2.0	2.3	—	No		
MS41-6043 ^b		3.0	3.3	1.2	No		
MS41-6043-502 ^{bc}		3.0	3.3	1.2	2		
MS41-6043-520 ^b		3.0	3.3	1.2	No		
MS41-6043-522 ^b		3.0	3.3	1.2	2		
MF41-6083 ^b	24 Vac +20/-15%	2.0	2.3	—	No	125 @ 60 Hz 150 @ 50 Hz	70 (8) ^g
MF41-6083-502 ^{bc}		2.0	2.3	—	2		
MF41-6083-510 ^b		2.0	2.3	—	No		
MS41-6083 ^b		3.0	3.3	1.2	No		
MS41-6083-502 ^{bc}		3.0	3.3	1.2	No		
MS41-6083-520 ^{be}		3.0	3.3	1.2	No		
MS41-6083-522 ^{bf}		3.0	3.3	1.2	2		
MF41-6153	24 Vac +20/-15%	3.0	3.0	—	No	162	133 (15) ^h
MS41-6153		4.0	5.0	1.2	No		
MF41-6343	24 Vac ± 20%	3.9	5.7	4.1	No	148	300 (34)
	22-30 Vdc	4.1	4.1	3.0			
MS41-6343	24 Vac ± 20%	3.6	5.6	4.0	No		
	22-30 Vdc	3.4	3.4	2.2			
MS41-6340	120 Vac ±10%	4.7	7.5	6.2			
MS41-6341	240 Vac ±10%	5.0	9.0	8.1			

^aAuxiliary switch ratings are as follows:

	Auxiliary Switch Ratings	
	MX41-6043, MX41-6083	MX41-6153
AC Rating	24 Vac, 4 A resistive, 2 A inductive	24 Vac, 6 A resistive, 2 A inductive
DC Rating	12 to 30 Vdc, DC 2 A	

^bEquipped with plenum-rated cable.

^cEquipped with two built-in auxiliary switches.

^dEquipped with 1k W feedback potentiometer.

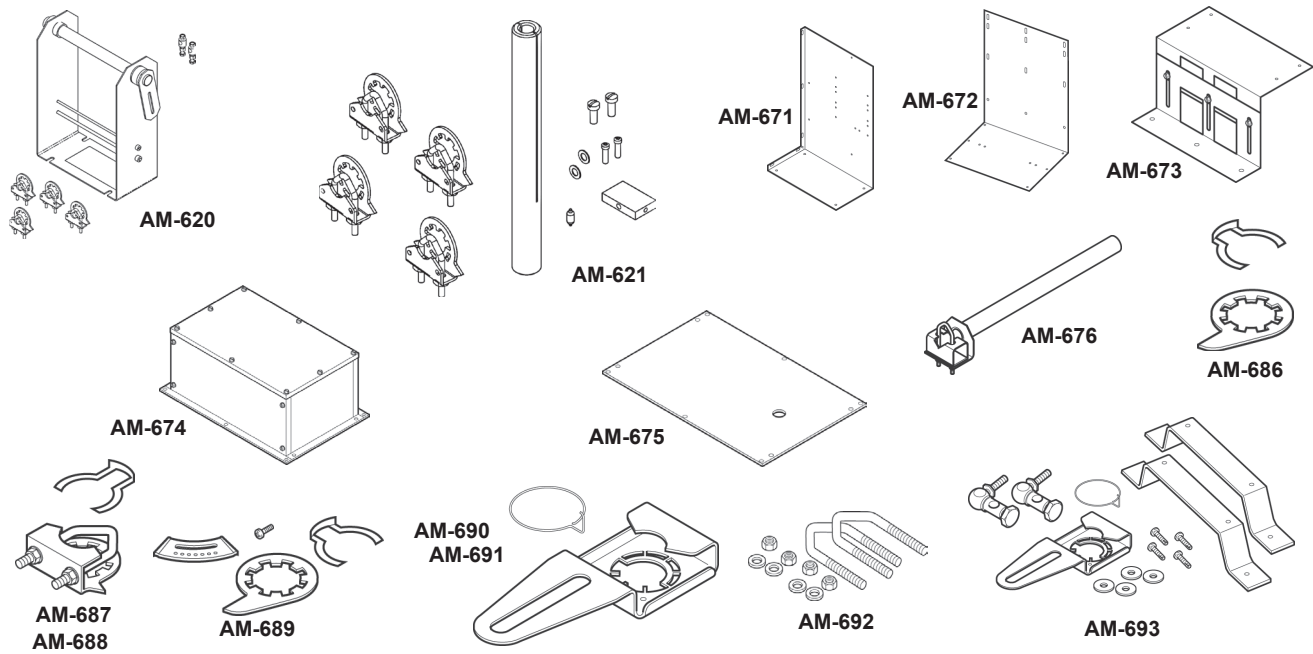
^eEquipped with adjustable start/span.

^fEquipped with adjustable start/span and two auxiliary switches.

^gMinimum voltage at high temperatures: 24 Vac, +20%, -10% at 90 to 130 °F ambient.

^hMinimum voltage at high temperatures: 24 Vac, +20%, -5% (MF models) and 24 Vac, +20%, -10% (MS models) at 85 to 130 °F ambient.

Actuator Accessories Chart



Part Numbers	Description	Spring Return Actuators							Non-Spring Return Actuators							General Instructions Document	
		MA40-704X Series MF40-7043	MS40-7043	MA4X-707X Series MF4X-7073 Series	MS4X-7073 Series	MA4X-715X Series MF4X-7153 Series	MS4X-7153	MA40-717X Series MF40-7173	MS40-717x Series	MF41-6043 MS41-6043	MF41-6083	MS41-6083	MF41-6153	MS41-6153	MF41-6343		MS41-634X Series
AM-620	Actuator Remote Mount					X	X	X	X				X	X	X	X	-
AM-621	Round Shaft Extension					X	X	X	X				X	X	X	X	-
AM-671 ^{abcd}	Mounting Bracket	X	X	X	X	X	X										F-25096
AM-672 ^{abcd}		X	X	X	X	X	X										
AM-673 ^c		X	X	X	X	X	X										
AM-674	Weather Shield & Base	X	X	X	X	X	X	X	X						X	X	F-25097
AM-675		X	X	X	X	X	X										
AM-676	Shaft Extension	X	X	X	X	X	X	X	X						X	X	F-25098
AM-686	Position Indicator			X	X	X	X										
AM-687 ^e	V-clamp			X	X	X	X										
AM-688	Replacement Universal Clamp			X	X	X	X										
AM-689	Rotation Limiter			X	X	X	X										
AM-690	Crank Arm			X	X	X	X										
AM-691					X	X	X	X									
AM-692 ^f	V-bolt			X	X	X	X										
AM-693 ^{gh}	Crank Arm Kit			X	X	X	X										

^aAM-693 crank arm kit required.

^bCannot be used with MX41-634X or MX40-717X series actuators.

^cDrill appropriate mounting holes where needed.

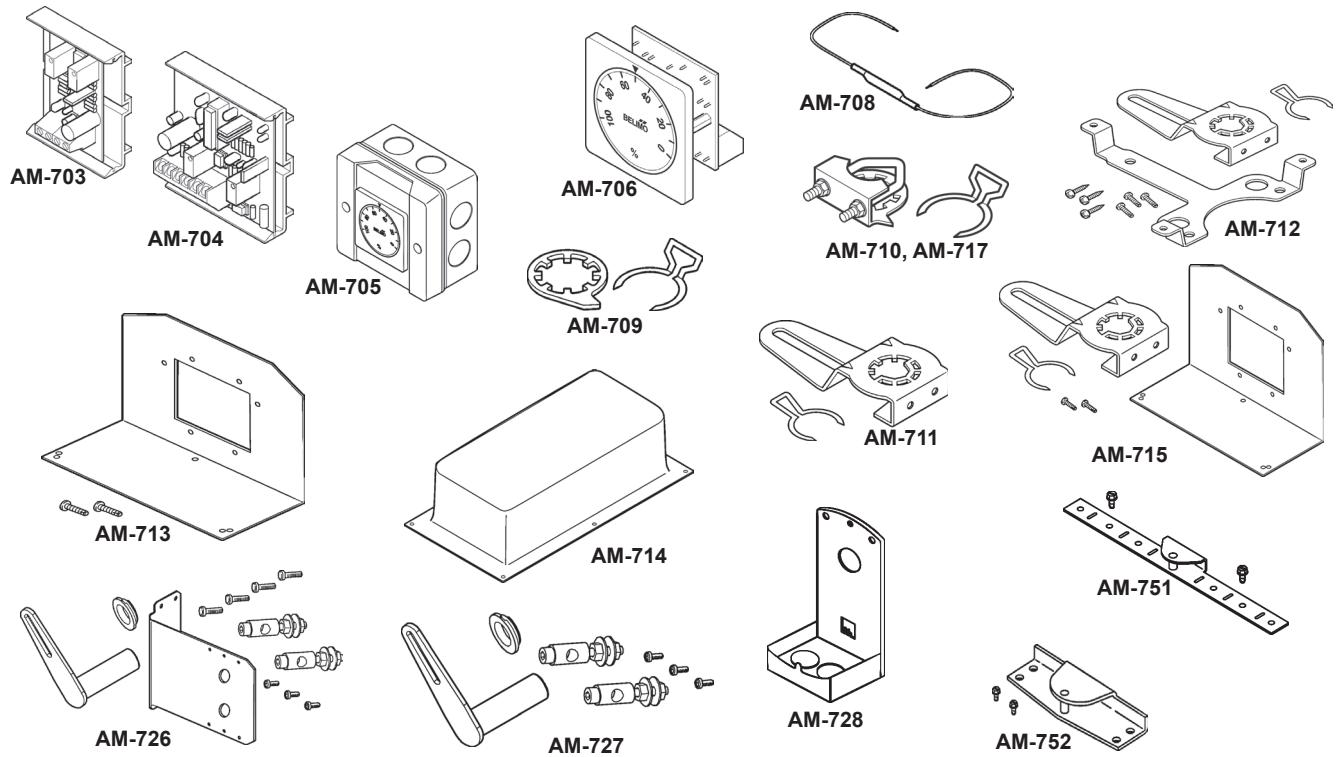
^dThe large "C"-shaped clamps included in AM-693 crank arm kit are required for mounting the actuator. Drill appropriate mounting holes where needed.

^eFor shafts to 1.05" diameter or 5/8" square.

^fFor shafts to 3/4" and 1.05" diameter (with AM-690 and AM-691, respectively).

^gUse the self-tapping screws and flat washers provided in kit to mount actuator.

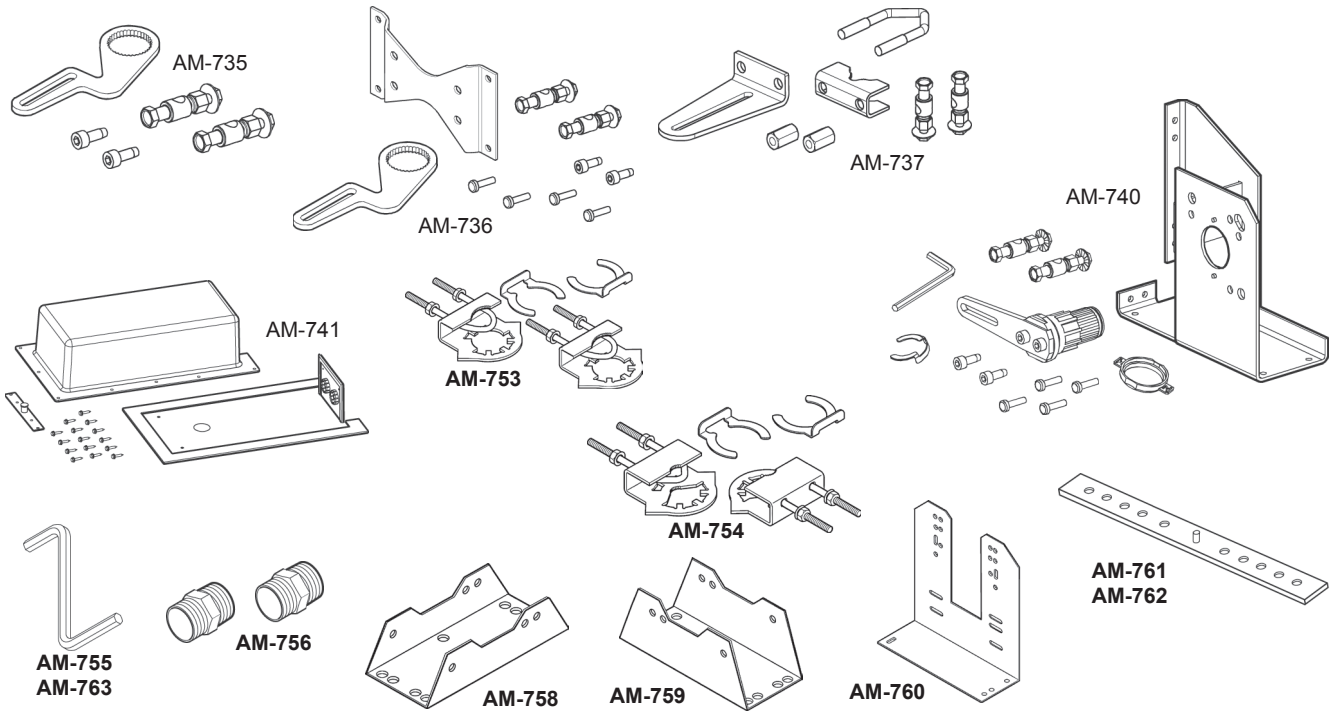
^hAM-692 V-bolt kit required.



Part Numbers	Description	Spring Return Actuators								Non-Spring Return Actuators							General Instructions Document
		MA40-704X Series MF40-7043	MS40-7043	MA4X-707X Series MF4X-7073 Series	MS4X-7073 Series	MA4X-715X Series MF4X-7153 Series	MS4X-7153 Series	MA40-717X Series MF40-7173	MS40-7173	MF41-6043	MS41-6043	MF41-6083	MS41-6083	MF41-6153	MS41-6153	MF41-6343	
AM-703	Span Adjustment		X		X		X	X				X		X		X	F-26895
AM-704	Modulation Interface		X		X		X	X				X		X		X	F-26895
AM-705	Positioner		X		X		X	X		X		X		X		X	F-26895
AM-706			X		X		X	X		X		X		X		X	F-26895
AM-708	500 Ω Resistor		X		X		X			X		X		X			F-26896
AM-709	Position Indicator & Stroke Limiter	X	X														F-26896
AM-710 ^a	V-clamp	X	X														F-26896
AM-711	Crank Arm Adaptor Kit	X	X														F-26896
AM-712			X	X													F-26896
AM-713	Bracket	X	X														F-26896
AM-714	Weather Shield	X	X	X	X	X	X										F-25097
AM-715	Crank Arm Adaptor Kit	X	X														F-26896
AM-717	Replacement Universal Clamp	X	X														F-26896
AM-726	Crank Arm Adaptor								X	X	X	X					F-26802
AM-727									X	X	X	X					F-26802
AM-728 ^b		Conduit Adaptor								X	X	X	X				
AM-751	Anti-rotation Bracket							X	X						X	X	F-26898
AM-752								X	X						X	X	F-26898

^aFor shafts up to 3/4" diameter round or up to 1/2" square.

^bCannot be used when creating a linked valve/actuator assembly.



Part Numbers	Description	Spring Return Actuators								Non-Spring Return Actuators						General Instructions Document
		MA40-704X Series MF40-7043	MS40-7043	MA4X-707X Series MF4X-7073 Series	MS4X-7073 Series	MA4X-715X Series MF4X-7153 Series	MS4X-7153 Series	MA40-717X Series MF40-7173	MS40-7173	MF41-6043 MS41-6043	MF41-6083	MS41-6083	MF41-6153	MS41-6153	MF41-6343	
AM-735	Crank Arm Kit											X	X			F-27246
AM-736	Crank Arm Kit with Bracket											X	X			F-27247
AM-737	Universal Crank Arm ^a											X	X			F-27248
AM-740	Replacement Kit											X	X			F-27249
AM-741	Weather Shield								X	X	X	X	X			F-27250
AM-753 ^b	Mounting Clamp						X	X						X	X	F-26898
AM-754 ^c							X	X						X	X	
AM-755	Manual Override Crank													X	X	
AM-756	Metric Conduit Adaptor	X	X	X	X	X	X	X	X					X	X	F-26899
AM-758	Short "U" Mounting Bracket			X	X	X	X									F-25096
AM-759	Tall "U" Mounting Bracket			X	X	X	X									
AM-760	Slotted "L" Mounting Bracket			X	X	X	X									
AM-761	7-inch Anti-Rotation Bracket	X	X													F-26986
AM-762	9-inch Anti-Rotation Bracket	X	X	X	X	X	X	X	X					X	X	F-25098
AM-763	Manual Override Crank			X ^d	X ^d	X ^d	X ^d									F-25098
TF-711-02	Sealtight Conduit Connector						X	X						X	X	—
TF-713-02							X	X						X	X	—
TF-5521	Pipe Plug						X	X						X	X	—

^aFor Honeywell Floor Mount Mod Motor.

^bFor shafts 3/4" round and 5/8" square.

^cFor shafts 3/8" to 1/2" round and square.

^dOnly used on MX41-707X-XXX, MX41-715X-XXX.

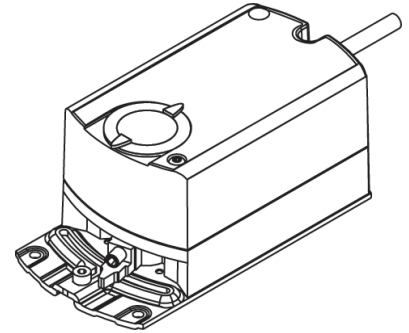
Actuator Specifications and Mounting Dimensions

MF41-6043 and MS41-6043 Actuators

For non-spring return applications requiring floating or proportional modulation control of dampers and valves in HVAC systems.

Features:

- Direct mount to round, square, or hexagonal damper shaft
- Rated at 44 lb-in. (5 N-m) torque, minimum
- Does not require any limit switches
- Manual override allows positioning for installation and manual operation
- MF41-6043 provides floating point control (3-position)
- MS41-6043 provides proportional control compatible with 0 to 10 Vdc
- 5-year warranty



Actuator Specifications

Inputs

Control Signal	MF41-6043 — Floating three-position control, 24 Vac.
	MS41-6043 — Proportional, 0 to 10 Vdc; input resistance 100 kΩ.

Power Requirements All 24 Vac circuits are Class 2.

Part Numbers	Power Input @ 50/60 Hz			
	Voltage	Running VA	Holding VA	Watts
MF41-6043	24 Vac +20/-15%	2.3	—	2.0
MS41-6043	24 Vac +20/-15%	3.3	1.2	3.0

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

Motor Type Synchronous

Outputs

Electrical
AC Rating: 24 Vac, 4 A resistive, 2 A inductive
DC Rating: 12 to 30 Vdc, DC 2 A
Timing: 90 sec. at 60 Hz, 108 sec. at 50 Hz

Mechanical
Output torque rating: 44 lb-in. (5 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. Set for 5° preload at the factory.
Position indicator: Adjustable pointer is provided for position indication. See the Note in “Switch Range.”
Output shaft setscrew: tightening torque 55 to 60 lb-in. (6.3 to 6.8 N-m).
Nominal Damper Area: Actuator sizing should be done in accordance with damper manufacturer’s specifications

Environment

Temperature Limits
Shipping and storage: -40 to 158 °F (-40 to 70 °C) ambient.
Operating: -25 to 130 °F (-32 to 55 °C) ambient.

Humidity 5 to 95% RH, non-condensing.

Locations NEMA Type 2.

Agency Listings

UL UL-873, Underwriters Laboratories.
European Community EMC Directive (89/336/EEC). Emissions (EN50081-1). Immunity (EN50081-2).
cUL Canadian Standards C22.2 No. 24-93.

Actuator Specifications

Accessories

AM-726	Rotary-to-Linear Bracket
AM-727	Rotary-to-Linear Crank Arm
AM-728	Conduit Adapter
AM-741	Weather Shield Kit

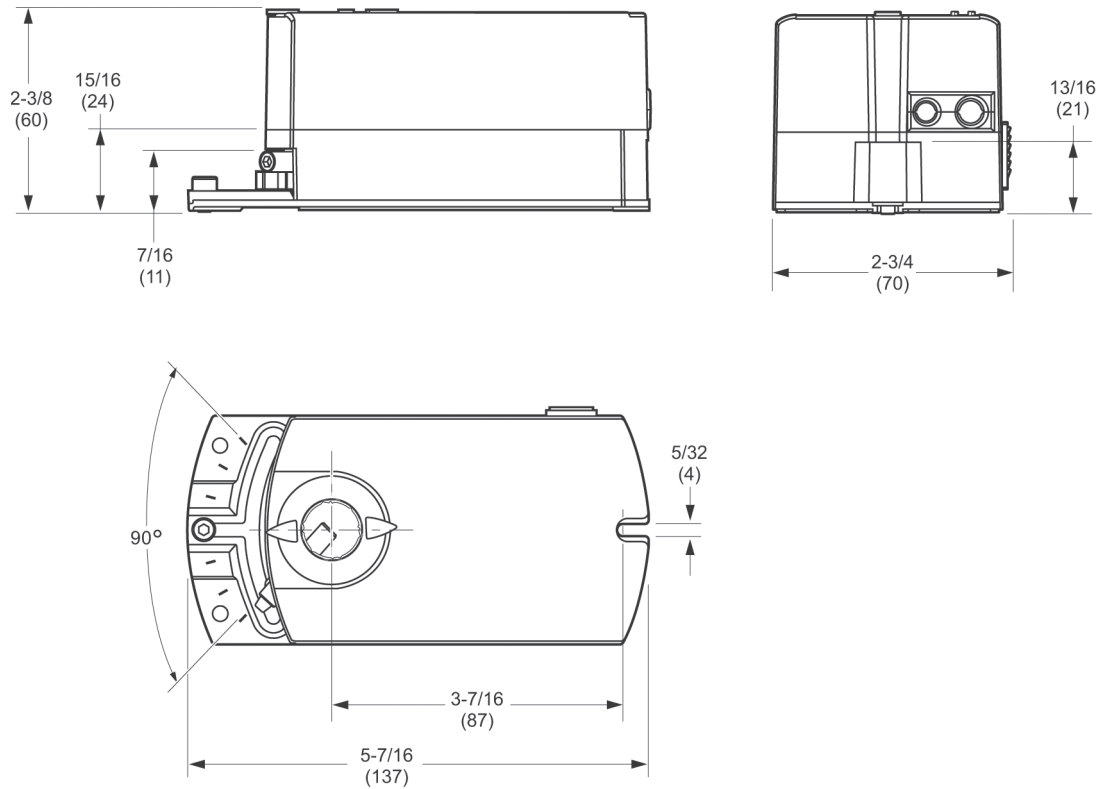


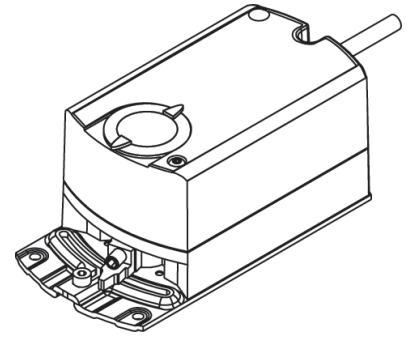
Figure-1 MF41-6043 and MS41-6043 Mounting Dimensions.

MF41-6083 and MS41-6083 Actuators

For non-spring return applications requiring floating or proportional modulation control of dampers and valves in HVAC systems.

Features:

- Direct mount to round, square, or hexagonal damper shaft
- Rated at 88 lb-in. (10 N-m) torque, minimum
- Does not require any limit switches
- Manual override allows positioning for installation and manual operation
- MF41-6083 provides floating point control (3-position)
- MS41-6083 provides proportional control compatible with 0 to 10 Vdc
- Models available with: independently adjustable dual auxiliary switches; adjustable start point (offset) and span
- 5-year warranty



Actuator Specifications

Inputs

Control Signal	MF41-6083 — Floating three-position control, 24 Vac.
	MS41-6083 — Proportional, 0 to 10 Vdc; input resistance 100 kΩ. Control signal adjustment available with MS41-6083-520 and MS41-6083-522: Start point (offset) — Between 0 and 5 Vdc (factory setting = 0 Vdc) Span — 2 to 30 Vdc

Power Requirements All 24 Vac circuits are Class 2.

Part Numbers	Power Input @ 50/60 Hz			
	Voltage	Running VA	Holding VA	Watts
MF41-6083	24 Vac +20/-15%	2.3	—	2.0
MS41-6083	24 Vac +20/-15%	3.3	1.2	3.0

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

Motor Type Synchronous

Outputs

Electrical	Position output signal — Feedback potentiometer available with MF41-6083-510: 0 to 1000Ω < 10 mA
	Output voltage: 0 to 10 Vdc
	Maximum output current: 1 mA
	Dual auxiliary switches available with MF41-6083-502, MS41-6083-502, MF41-6083-522, and MS41-6083-522.
	AC Rating: 24 Vac, 4 A resistive, 2 A inductive
	DC Rating: 12 to 30 Vdc, DC 2 A
	Switching hysteresis: 2°
Switch Range: Switch A — 0 to 90° range in 5° intervals Recommended range usage — 0 to 45° Factory setting — 5° Switch B — 0 to 90° range in 5° intervals Recommended range usage — 45 to 90° Factory setting — 85°	
	Timing: 125 sec. at 60 Hz, 150 sec. at 50 Hz

Actuator Specifications

Mechanical

Output torque rating: 88 lb-in. (10 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. Set for 5° preload at the factory.

Position indicator: Adjustable pointer is provided for position indication. See the Note in "Switch Range."

Output shaft setscrew: tightening torque 55 to 60 lb-in. (6.3 to 6.8 N-m).

Nominal Damper Area: Actuator sizing should be done in accordance with damper manufacturer's specifications

Environment

Temperature Limits

Shipping and storage: -40 to 158 °F (-40 to 70 °C) ambient.

Operating: -25 to 130 °F (-32 to 55 °C) ambient.

Humidity

5 to 95% RH, non-condensing.

Locations

NEMA Type 2.

Agency Listings

UL

UL-873, Underwriters Laboratories.

European Community

EMC Directive (89/336/EEC). Emissions (EN50081-1). Immunity (EN50081-2).

cUL

Canadian Standards C22.2 No. 24-93.

Accessories

AM-726

Rotary-to-Linear Bracket

AM-727

Rotary-to-Linear Crank Arm

AM-728

Conduit Adapter

AM-741

Weather Shield Kit

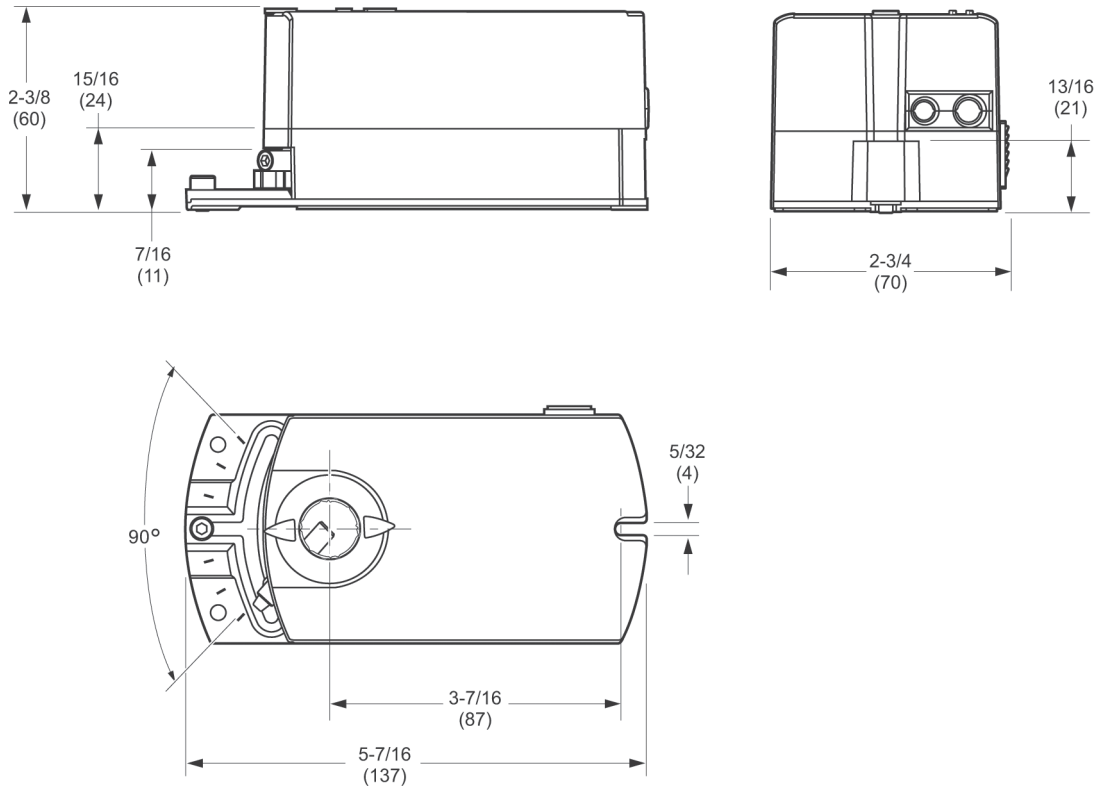


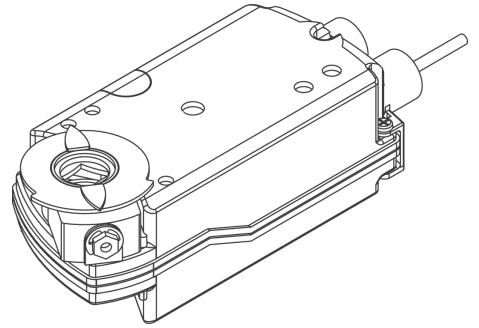
Figure-2 MF41-6083 and MS41-6083 Mounting Dimensions.

MF41-6153 and MS41-6153 Actuators

For non-spring return applications requiring floating or proportional modulation control of dampers and valves in HVAC systems.

Features:

- Direct mount to round or square damper shaft
- 133 lb-in (15 N-m) torque rating
- Does not require any limit switches
- Manual override to allow positioning for installation and manual operation
- MF41-6153 provides floating point control (drive open-hold-drive closed)
- MS41-6153 provides proportional control compatible with 0 to 10 Vdc or 0 to 20 mA_{dc}
- 5-year warranty



Actuator Specifications

Inputs

Control Signal

MF41-6153 — Three position.

MS41-6153 — Proportional, 0 to 10 Vdc, input resistance 100 kΩ.

Power Requirements

All 24 Vac circuits are Class 2.

Part Numbers	Power Input @ 50/60 Hz			
	Voltage	Running VA	Holding VA	Watts
MF41-6153	24 Vac +20/-15%	3.0	—	3.0
MS41-6153	24 Vac +20/-15%	5.0	1.2	4.0

Connections

3 ft. (91 cm) long plenum-rated cables, 18 AWG color coded leads.

Motor Type

Synchronous.

Outputs

Electrical

Timing: Approx. 125 sec. at 60 Hz; 150 sec. at 50 Hz.

Dual Auxiliary Switch Ratings

AC Rating 24 Vac, AC 6A resistive, AC 2A inductive.

DC Rating 12 to 30 Vdc, DC 2A.

Switch Ranges

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°.

Switch Hysteresis 2°.

Mechanical

Output torque rating: 133 lb-in (15 N-m).

Stroke: Angle of rotation is limited to a nominal 90° (maximum 95°), field adjustable to limit travel on either end of stroke. Set for 5° preload at the factory.

Position indicator: Adjustable pointer is provided for position indication.

Damper Shaft Clamp: Direct coupled using a through hole output hub.

Shaft Sizes: 1/4" to 3/4" (6.4 mm to 20.5 mm) diameter round
1/4" to 1/2" (6.4 mm to 13 mm) square

Minimum Shaft Length: 3/4" (20 mm)

Nominal Damper Area: Actuator sizing should be done in accordance with damper manufacturer's specifications.

Weight: 2.2 lb (1 kg)

Actuator Specifications

Environment

Temperature Limits

Shipping and storage: -40 to 158 °F (-40 to 70 °C) ambient.

Operating: -25 to 130 °F (32 to 55 °C)

Humidity

5 to 95% RH, non-condensing.

Locations

NEMA 1 (IEC IP54).

Agency Listings (Actuator)

UL

UL-873, Underwriters Laboratories.

European Community

EMC Directive (89/336/EEC). Immunity (EN61000-6-2). Emission (EN 50081-1).

cUL

Canadian Standards C22.2 No. 24-93.

Accessories

AM-735

Crank Arm Kit

AM-736

Crank Arm Kit with Bracket

AM-737

Universal Crank Arm for Honeywell Floor Mount Mod Motor

AM-740

Replacement Kit

AM-741

Weather Shield Kit

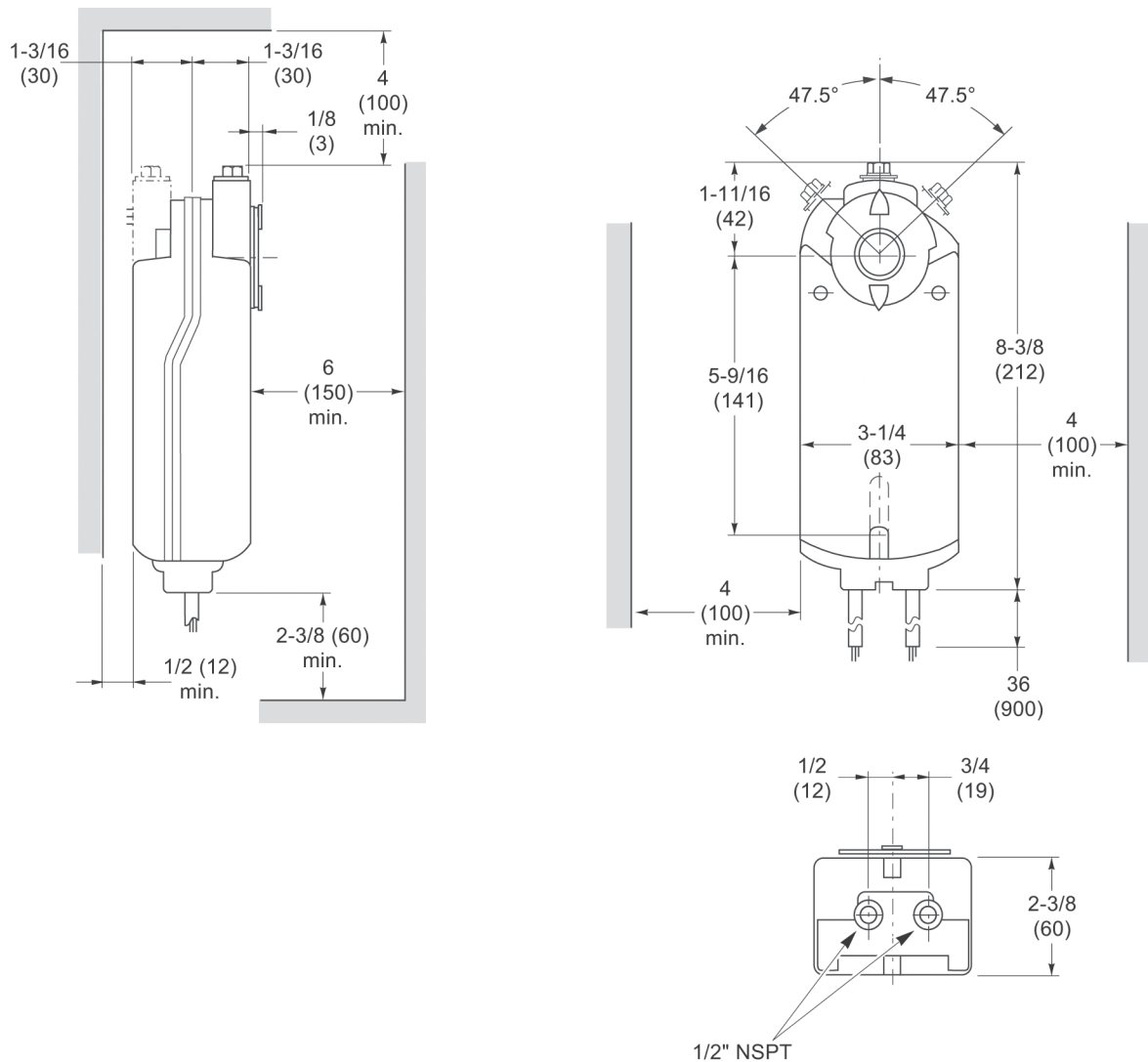


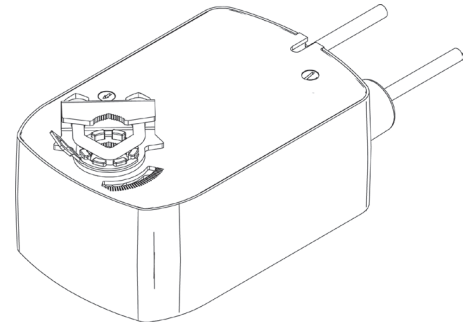
Figure-3 MF41-6153 and MS41-6153 Mounting Dimensions.

MA40-704X, MF40-7043, and MS40-7043 Series Actuators

For spring return applications requiring floating, two-position, or proportional modulation control of dampers and valves in HVAC systems.

Features:

- Direct mount to round or square damper shaft
- 35 lb-in (4 N-m) torque rating
- Overload protection throughout rotation
- Optional built-in auxiliary switches
- True mechanical clockwise or counterclockwise spring return operation for reliable, positive close-off in airtight applications
- Visual position indicator
- Direct acting or reverse acting control mode available on proportional models
- Rotation limiting available
- Rugged die-cast housing for NEMA 2/IP54 rating
- 5-year warranty



Actuator Specifications

Inputs

Control Signal	<p>MA40-704X and MA40-704X-501 — On-off. SPST control contacts or Triacs (500 mA rated).</p> <p>MF40-7043 and MF40-7043-501 — Floating point control, 24Vac.</p> <p>MS40-7043 and MS40-7043-501 — Spring return, proportional, 2 to 10 Vdc or 4 to 20 mAdc with a 500 Ω resistor.</p>
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Power Requirements All 24 Vac circuits are Class 2. All circuits 30 Vac and above are Class 1.

Part Numbers	Voltage 50/60 Hz	Running					Holding	
		50 Hz		60 Hz		DC Amps	50 Hz	60 Hz
		VA	W	VA	W		W	W
MA40-7043 and MA40-7043-501	24 Vac ± 20% 22-30 Vdc	4.4	2.9	4.4	2.9	0.11	0.8	0.8
MS40-7043 and MS40-7043-501	24 Vac ± 20% 22-30 Vdc	5.6	4.2	5.6	4.2	0.15	2.4	2.4
MS40-7043-MP MS40-7043-MP5	24 Vac ± 20% 22-30 Vdc	6.6	5.0	6.6	5.0	0.17	3.2	3.2
MF40-7043 and MF40-7043-501	24 Vac ± 20% 22-30 Vdc	5.9	4.4	5.9	4.4	0.17	2.9	2.9
MA40-7040 and MA40-7040-501	120 Vac ± 10%	6.4	3.8	4.3	3.4	—	1.6	1.2
MA40-7041 and MA40-7041-501	230 Vac ± 10%	5.8	4.1	4.6	3.9	—	1.5	1.2

Connections	<p>MA40-704X and MA40-704X-501 — 3 ft. (91 cm) long, appliance cables, 1/2 in. conduit connector. For M20 Metric conduit, use AM-756 adaptor.</p> <p>MF40-7043 and MF40-7043-501, MS40-7043 and MS40-7043-501 — 3 ft. (91 cm) long, plenum-rated cables, 1/2 in. conduit connector. For M20 Metric conduit, use AM-756 adaptor.</p>
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Motor Type	<p>Brush—MA40-704X.</p> <p>Brushless DC—MF40-7043, MS40-7043.</p>
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Outputs

Electrical	<p>Control Mode: Switch provided for selection of direct acting or reverse acting control mode on proportional models.</p> <p>Timing: Approximate timing for MA40-704X series is 50 seconds. Approximate timing for MF40-7043 series or M40-7043 series is 130 seconds.</p>
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Actuator Specifications

Electrical (continued)

One auxiliary switch available with MX40-7043-501 and MS40-7043-MP5, SPDT 6A resistive @ 24 Vac, adjustable 0 to 95° (0 to 1 scale). Switch meets VDE requirements for 6 (1.5)A, 24 Vac.

One auxiliary switch available with MA40-7040-501 or MA40-7041-501, SPDT 6A resistive @ 250 Vac, adjustable 15 to 95° (MIN to 1 scale). Switch meets VDE requirements for 6 (1.5)A, 250 Vac.

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.

Mechanical

Output Torque Rating: 35 lb-in. (4 N-m) minimum, 150 lb-in. (17 N-m) maximum.

Stroke: Rotation is limited to 95° ± 5° maximum, adjustable from 40 to 95° with a mechanical stop.

Position Indicator: Visual indicator, 0 to 1 (0 is the spring-return position).

Direction of Rotation: CW or CCW rotation is available through reversible mounting.

Damper Shaft Clamp: Direct coupled using a through hole output hub.

Damper Shaft Size: Up to 5/8" in diameter and 1/2" square. With AM-710, up to 3/4" in diameter and 1/2" square.

Nominal Damper Area: Actuator sizing should be done in accordance with damper manufacturer's specifications.

Environment

Temperature Limits

Shipping and storage: -40 to 160 °F (-40 to 71 °C) ambient.
Operating: -22 to 140 °F (-30 to 60 °C).

Humidity

5 to 95% RH, non-condensing.

Locations

NEMA 2 (IEC IP54).

Agency Listings

UL

UL 873, Underwriters Laboratories (File #9429 Category Temperature-Indicating and Regulating Equipment).

cUL

Canadian Standards C22.2 No. 24.

European Community

EMC Directive (89/336/EEC). Low Voltage Directive (72/23/EEC).

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.

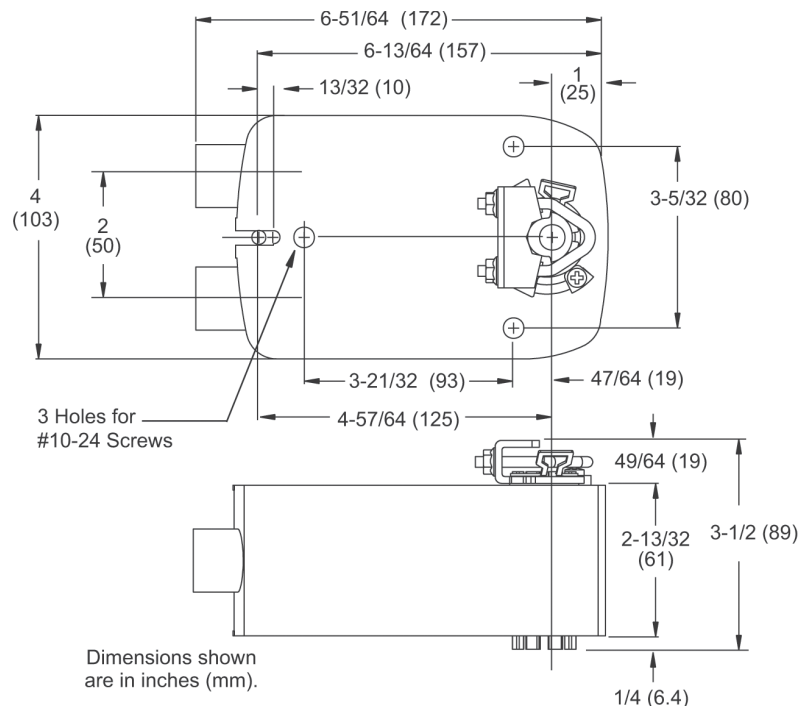


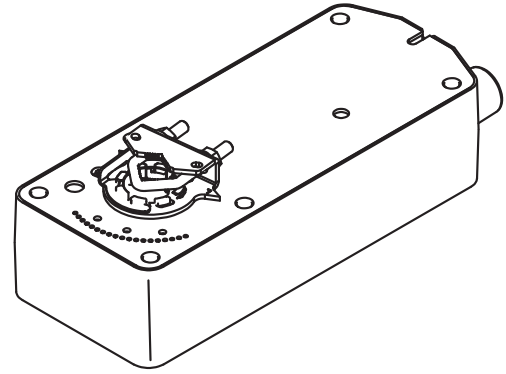
Figure-4 MX40-704X Series Mounting Dimensions.

MA41-707X, MF41-7073, and MS41-7073 Series Actuators

For spring return applications requiring floating, two-position, or proportional modulation control of dampers and valves in HVAC systems.

Features:

- Direct mount to round or square damper shaft
- 60 lb-in (7 N-m) torque rating
- Overload protection throughout rotation
- Optional built-in auxiliary switches
- Provides true mechanical clockwise or counterclockwise spring return operation for reliable positive close-off in airtight applications
- Visual position indication
- Direct acting or reverse acting control mode available on proportional models
- Rotation limiting available
- Rugged die-cast housing for NEMA 2/IP54 rating
- Manual override
- 5-year warranty



Actuator Specifications

Inputs

Control Signal	MA41-707X and MA41-707X-502 — On-off. SPST control contacts or Triacs (500 mA rated). MF41-7073 and MF41-7073-502 — Floating point control, 24Vac. MS41-7073 and MS41-7073-502 — Spring return, proportional, 2 to 10 Vdc or 4 to 20 mAdc with a 500 Ω resistor.
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Power Requirements All 24 Vac circuits are Class 2. All circuits 30 Vac and above are Class 1.

Part Numbers	Voltage 50/60 Hz	Running					Holding	
		50 Hz		60 Hz		DC Amps	50 Hz	60 Hz
		VA	W	VA	W		W	W
MA41-7073 and MA41-7073-502	24 Vac ± 20% 22-30 Vdc	4.8	3.2	4.8	3.2	0.13	0.8	0.8
MS41-7073 and MS41-7073-502	24 Vac ± 20% 22-30 Vdc	5.8	4.6	5.8	4.6	0.17	2.3	2.3
MF41-7073 and MF41-7073-502	24 Vac ± 20% 22-30 Vdc	6.2	4.8	6.2	4.8	0.18	2.8	2.8
MA41-7070 and MA41-7070-502	120 Vac ± 10%	10.7	4.2	5.6	3.6	—	2.0	1.2
MA41-7071 and MA41-7071-502	230 Vac ± 10%	17.0	5.1	8.0	4.0	—	2.7	1.4

Connections 3 ft. (91 cm) long, appliance cables, 1/2 in. conduit connectors. For M20 Metric conduit, use AM-756 adaptor.

Motor Type Brush—MA41-707X.
Brushless DC—MF41-7073, MS41-7073.

Outputs

Electrical **Control Mode:** Switch provided for selection of direct acting or reverse acting control mode on proportional models.

Timing: Approximate timing for MA41-707X series is 80 seconds. Approximate timing for MF41-7073 series or MS41-7073 series is 195 seconds.

Two auxiliary switches available with MX41-7071-502 or MX41-7070-502, SPDT 7A resistive @ 250 Vac, one fixed @ 5° and one adjustable 25 to 85°. Switch meets VDE requirements for 7 (2.5)A, 250 Vac.

Actuator Specifications

Electrical (continued) Two auxiliary switches available with MX41-7073-502, SPDT 7A resistive @ 24 Vac, one fixed @ 5° and one adjustable 25 to 85°. Switches meet VDE requirements for 6 (1.5)A, 24 Vac.

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.

Mechanical

Output Torque Rating: 60 lb-in. (7 N-m) minimum, 250 lb-in. (28 N-m) maximum.

Stroke: Rotation is limited to 95° ± 5° maximum, adjustable from 30 to 95° with AM-689 rotation limiter.

Position Indicator: Pointer and (-5 to 90°) scale are provided for position indication (-5° is the normal, or spring-return, position).

Direction of Rotation: CW or CCW rotation is available through reversible mounting.

Damper Shaft Clamp: Direct coupled using a through hole output hub.

Damper Shaft Size: Up to 3/4" in diameter and 1/2" square. With AM-687, up to 1.05" in diameter and 5/8" square.

Nominal Damper Area: Actuator sizing should be done in accordance with damper manufacturer's specifications.

Manual Override: For MX41-707X manual override rotation is adjustable from -5° to 85° by using manual override crank.

Environment

Temperature Limits **Shipping and storage:** -40 to 160 °F (-40 to 71 °C) ambient.

Operating: -22 to 140 °F (-30 to 60 °C).

Humidity 5 to 95% RH, non-condensing.

Locations NEMA 1, NEMA 2 (IEC IP54) with conduit connector in the down position.

Agency Listings

UL UL 873, Underwriters Laboratories (File #9429 Category Temperature-Indicating and Regulating Equipment).

cUL Canadian Standards C22.2 No. 24.

European Community EMC Directive (89/336/EEC). Low Voltage Directive (72/23/EEC).

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.

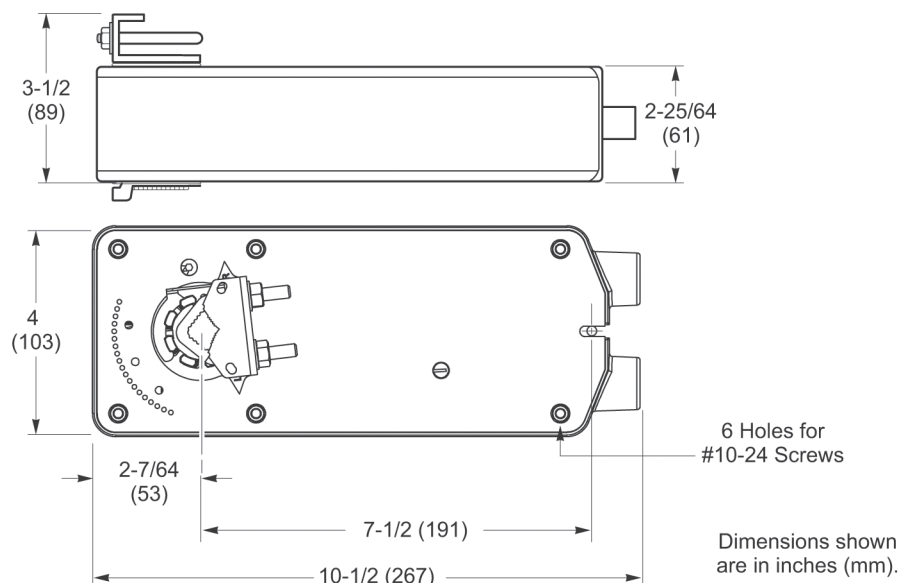


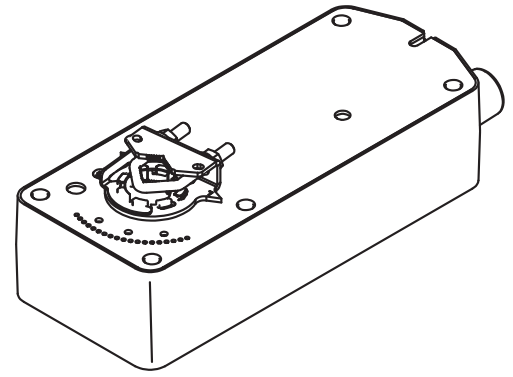
Figure-5 MX41-707X Series Mounting Dimensions.

MA41-715X, MF41-7153, and MS41-7153 Series Actuators

For spring return applications requiring floating, two-position, or proportional modulation control of dampers and valves in HVAC systems.

Features:

- Direct mount to round or square damper shaft
- 133 lb-in (15 N-m) torque rating
- Overload protection throughout rotation
- Optional built-in auxiliary switches
- True mechanical clockwise or counterclockwise spring return operation for reliable positive close-off in airtight applications
- Visual position indicator
- Direct acting or reverse acting control mode available on proportional models
- Rotation limiting available
- Rugged die-cast housings for NEMA 2/IP54
- Manual override
- 5-year warranty



Actuator Specifications

Inputs

Control Signal	MA41-715X and MA41-715X-502 — On-off. SPST control contacts or Triacs (500 mA rated). MF41-7153 and MF41-7153-502 — Floating point control 24 Vac. MS41-7153 and MS41-7153-502 — Proportional, 2 to 10 Vdc or 4 to 20 mAdc with a 500 Ω resistor.
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Power Requirements

All 24 Vac circuits are Class 2. All circuits 30 Vac and above are Class 1.

Part Numbers	Voltage 50/60 Hz	Running					Holding	
		50 Hz		60 Hz		DC Amps	50 Hz	60 Hz
		VA	W	VA	W		W	W
MA41-7153 and MA41-7153-502	24 Vac ± 20% 22-30 Vdc	9.8	7.5	9.7	7.5	0.29	2.8	2.8
MS41-7153 and MS41-7153-502	24 Vac ± 20% 22-30 Vdc	9.8	7.4	9.7	7.4	0.28	2.9	2.9
MF41-7153 and MF41-7153-502	24 Vac ± 20% 22-30 Vdc	9.8	7.7	9.7	7.7	0.30	3.3	3.3
MA41-7150 and MA41-7150-502	120 Vac ± 10%	11.7	8.8	10.0	8.4	—	3.6	5.0
MA41-7151 and MA41-7151-502	230 Vac ± 10%	15.5	9.5	10.6	8.5	—	4.6	3.3

Connections

3 ft. (91 cm) long, appliance cable, 1/2 in. conduit connectors. For M20 Metric conduit, use AM-756 adaptor.

Motor Type

Brushless DC—MA41-715X, MF41-7153, MS41-7153.

Outputs

Electrical

Control Mode: Switch provided for selection of direct acting or reverse acting control mode on proportional models.

Timing: Approximate timing is 190 seconds.

Two auxiliary switches available with MA41-7151-502 or MF41-7150-502, SPDT 7A resistive @ 250 Vac, one fixed @ 5° and one adjustable 25 to 85°. Switch meets VDE requirements for 7 (2.5)A, 250 Vac.

Actuator Specifications

Electrical (continued)	Two auxiliary switches available with MX41-7153-502, SPDT 7A resistive @ 24 Vac, one fixed @ 5° and one adjustable 25 to 85°. Switches meet VDE requirements for 6 (1.5)A, 24 Vac.
	Position Feedback Voltage, 2 to 10 Vdc (maximum 0.5 mA) output signal for position feedback or operation of up to four slave actuators.
Mechanical	Output Torque Rating: 133 lb-in. (15 N-m) minimum, 350 lb-in. (40 N-m) maximum.
	Stroke: Rotation is limited to 95° ± 5° maximum, adjustable from 30 to 95° with AM-689 rotation limiter.
	Position Indicator: Pointer and (-5 to 90°) scale are provided for position indication (-5° is the normal, or spring-return, position).
	Direction of Rotation: CW or CCW rotation is available through reversible mounting.
	Damper Shaft Clamp: Direct coupled using a through hole output hub.
	Damper Shaft Size: Up to 3/4" in diameter and 1/2" square. With AM-687, up to 1.05" in diameter and 5/8" square.
	Nominal Damper Area: Actuator sizing should be done in accordance with damper manufacturer's specifications.
	Manual Override: For MX41-715X rotation is adjustable from -5° to 85° by using manual override crank.
Environment	
Temperature Limits	Shipping and storage: -40 to 160 °F (-40 to 71 °C) ambient. Operating: -22 to 140 °F (-30 to 60 °C).
Humidity	5 to 95% RH, non-condensing.
Locations	NEMA 1. NEMA 2 (IEC IP54) with conduit connector in the down position.
Agency Listings	
UL	UL 873, Underwriters Laboratories (File #9429 Category Temperature-Indicating and Regulating Equipment).
cUL	Canadian Standards C22.2 No. 24.
European Community	EMC Directive (89/336/EEC). Low Voltage Directive (72/23/EEC).
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.

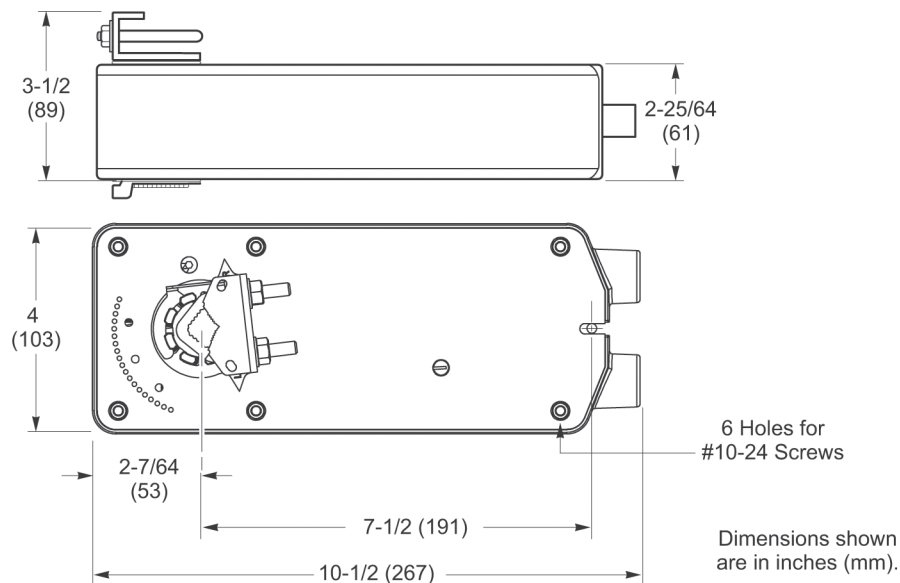


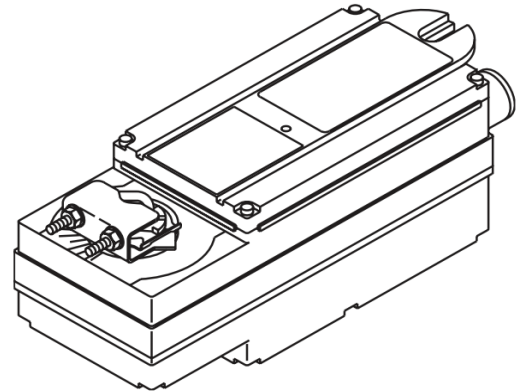
Figure-6 MX41-715X Series Mounting Dimensions.

MA40-717X, MF40-7173, and MS40-717X Series Actuators

For spring return applications requiring floating, two-position, or proportional modulation control of dampers and valves in HVAC systems.

Features:

- Direct mount to round or square damper shaft
- 150 lb-in (17 N-m) torque rating
- Overload protection throughout rotation
- Oil immersed gear train provides continuous lubrication
- NEMA 4 housing (IEC IP56)
- Automatic current sensing motor control provides extended reliability and repeatable timing
- Provides true mechanical clockwise or counterclockwise spring return operation for reliable positive close-off in airtight applications
- MA40-717X models provide on-off control
- MF40-7173 models provide floating point control (drive open-hold-drive closed)
- MS40-717X models provide proportional control compatible with 2 to 10 Vdc or 4 to 20 mAdc with the addition of a 500 ohm resistor (not included)
- 5-year warranty
- Can be double mounted (gang mounting) to accommodate high torque application requirements (2 to 4 actuators)
- MS40-717x models provide position feedback signal



Actuator Specifications

Inputs

Control Signal

MA40-717X — Two wire, SPST or Triacs.

MF40-7173 — SPDT floating control output, Triacs (500 mA rated), or 2 SPST contacts.

MS40-717X — proportional, 2 to 10 Vdc or 4 to 20 mAdc with the addition of a 500 ohm resistor (not included).

Power Requirements

All 24 Vac and 22-30 Vdc circuits are Class 2. All circuits 30 Vac and above are Class 1.

Part Numbers	Power Input @ 50/60 Hz			
	Voltage	Running VA	Holding VA	Watts
MA40-7173	24 Vac ±20%	7.4	5.1	5.3
	22-30 Vdc	5.0	3.0	5.0
MS40-7173	24 Vac ±20%	7.8	4.7	5.5
	22-30 Vdc	5.6	2.5	5.0
MF40-7173	24 Vac ±20%	8.1	5.3	5.8
	22-30 Vdc	5.7	3.6	5.7
MA40-7170	120 Vac ±10%	8.4	6.6	6.2
MS40-7170	120 Vac ±10%	8.5	5.2	6.4
MA40-7171	240 Vac ±10%	9.8	8.5	6.5
MS40-7171	240 Vac ±10%	10.8	9.0	7.2

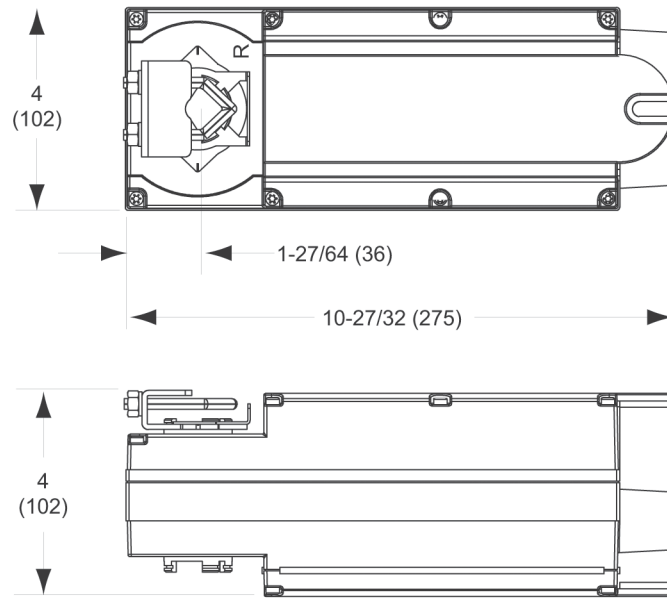
Impedance

2 to 10 Vdc, 121KΩ. 4 to 20 mAdc, 500Ω (user supplied) (MS40-717X models only).

Connections

Actuator Specifications

Class 1:	24 inch (61 cm) long appliance cables, 18 AWG color coded leads. 1/2 in. conduit connector. For M20 Metric conduit, use AM-756 adaptor.
Class 2 Power and Control:	36 inch (91 cm) Long, 22 AWG color coded appliance cable pigtail leads. 1/2 in. conduit connector. For M20 Metric conduit, use AM-756 adaptor.
Motor Type	Brushless DC
Outputs	
Electrical	Stroke: Electronically limited to $92^{\circ} \pm 1^{\circ}$ (MS). MF-MA Mechanically limited To $101^{\circ} \pm 1^{\circ}$. Timing: Approximate timing is 147 sec. (MS); 162 sec. for MF and MA models.
Mechanical	Output Torque Rating: 150 lb-in. (17 N-m) minimum, 545 lb-in. (61.8 N-m) maximum. Position Indicator: Pointer and scale are provided for position indication (0° is the normal, or spring-return, position). Direction of Rotation: CW or CCW rotation is available through reversible mounting. Damper Shaft Clamp: Direct coupled using a through hole output hub. Damper Shaft Size: Up to 3/4" in diameter, 1/2" square. With AM-687, up to 1.05" in diameter and 5/8" square. Nominal Damper Area: Actuator sizing should be done in accordance with damper manufacturer's specifications.
Environment	
Temperature Limits	Shipping and storage: -40 to 160 °F (-40 to 71 °C) ambient. Operating: -25 to 140 °F (-32 to 60 °C).
Humidity	5 to 95% RH, non-condensing.
Locations	NEMA 1 (IEC IP10). NEMA 4 (IEC IP 56) with customer supplied water tight conduit connectors.
Agency Listings	
UL	UL 873, Underwriters Laboratories (File #9429 Category Temperature-Indicating and Regulating Equipment).
European Community	EMC Directive (2004/108/EC). Low Voltage Directive (72/23/EEC).
cUL	Canadian Standards C22.2 No. 24-93.
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.



Dimensions shown
are in inches (mm).

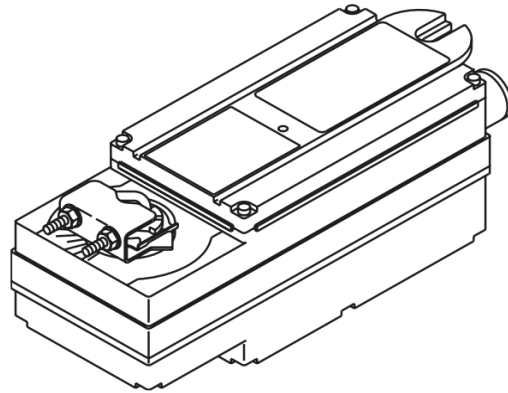
Figure-7 MX40-717X Series Mounting Dimensions.

MF41-6343 and MS41-634X Series Actuators

For non-spring return applications requiring floating or proportional modulation 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
- Automatic current sensing motor control provides extended reliability and repeatable timing
- MF41-6343 models provide floating point control (drive open-hold-drive closed)
- MS41-634X models provide proportional control compatible with 2 to 10 Vdc or 4 to 20 mA dc with the addition of a 500 ohm resistor (not included)
- 5-year warranty
- Can be double-mounted (gang mounted) to accommodate high torque application requirements (2 to 4 actuators)
- MS41-634x models provide position feedback signal



Actuator Specifications

Inputs

Control Signal **MF41-6343** — SPDT floating control output, Triacs (500 mA rated), or 2 SPST contacts.
MS41-634X — proportional, 2 to 10 Vdc or 4 to 20 mA dc with the addition of a 500 ohm resistor (not included).

Power Requirements All 24 Vac and 22-30 Vdc circuits are Class 2. All circuits 30 Vac and above are Class 1.

Part Numbers	Power Input @ 50/60 Hz			
	Voltage	Running VA	Holding VA	Watts
MS41-6343	24 Vac ±20%	5.6	4.0	3.6
	22-30 Vdc	3.4	2.2	3.4
MS41-6340	120 Vac ±10%	7.5	6.2	4.7
MS41-6341	240 Vac ±10%	9.0	8.1	5.0
MF41-6343	24 Vac ±20%	5.7	4.1	3.9
	22-30 Vdc	4.1	3.0	4.1

Connections

Class 1: 24 inch (61 cm) long appliance cables, 1/2 in. conduit connector. For M20 Metric conduit, use AM-756 adaptor.

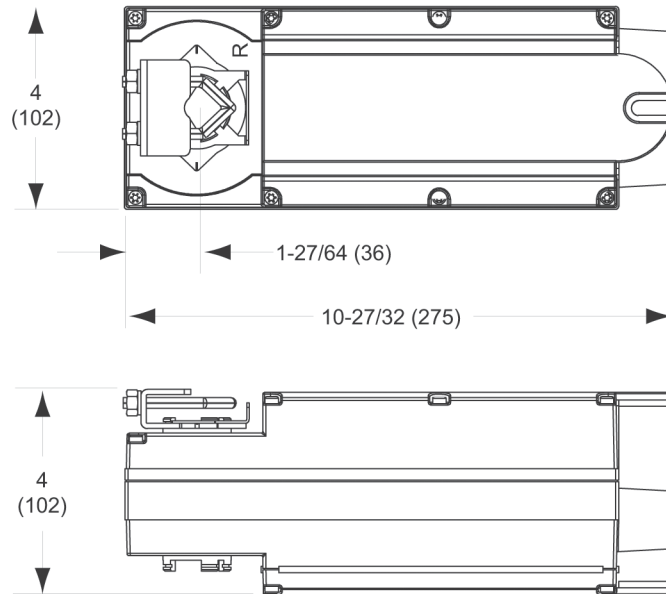
Class 2 Power and Control: 36 inch (91 cm) long, 22 AWG color coded appliance cable pigtail leads. 1/2 in. conduit connector. For M20 Metric conduit, use AM-756 adaptor.

Motor Type Brushless DC

Outputs

Actuator Specifications

Electrical	<p>Stroke: Electronically limited to $92^{\circ} \pm 1^{\circ}$ (MS). MF Mechanically limited To $101^{\circ} \pm 1^{\circ}$.</p> <p>Timing: Approximate timing is 148 sec. (MS) and 162 sec. for MF models.</p>
Mechanical	<p>Output torque rating: 300 lb-in. (34 N-m) minimum, 650 lb-in. (73.7 N-m) maximum.</p> <p>Position indicator: Pointer and scale are provided for position indication).</p> <p>Direction of rotation: CW or CCW rotation is available through reversible mounting.</p> <p>Damper Shaft Clamp: Direct coupled using a through hole output hub.</p> <p>Damper Shaft Size: 3/8" to 1/2" round and 3/8" to 1/2" square. With AM-754, up to 1.05" in diameter and 5/8" square.</p> <p>Nominal Damper Area: Actuator sizing should be done in accordance with damper manufacturer's specifications.</p> <p>Manual Override: Activated by the manual override crank.</p>
Environment	
Temperature Limits	<p>Shipping and storage: -40 to 160 °F (-40 to 71 °C) ambient. Operating: -25 to 140 °F (-32 to 60 °C).</p>
Humidity	5 to 95% RH, non-condensing.
Locations	NEMA 1 (IEC IP10). NEMA 4 (IEC IP56) with customer supplied water tight conduit connectors.
Agency Listings	
UL	UL 873, Underwriters Laboratories (File #9429 Category Temperature-Indicating and Regulating Equipment).
European Community	EMC Directive (2004/108/EC). Low Voltage Directive (72/23/EEC).
cUL	Canadian Standards C22.2 No. 24-93.
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.



Dimensions shown
are in inches (mm).

Figure-8 MX41-634X Series Mounting Dimensions.

Damper Actuator Cross Reference

Schneider Electric assumes no responsibility for guaranteeing the acceptability of any suggested replacement in this section. The emphasis has been placed on providing a replacement actuator of the same specifications wherever possible. The user must determine the acceptability of the substitution by reviewing the actuator specifications.

The cross reference tables list Direct-Coupled Actuators which may replace obsolete SEC and Belimo devices, as well as older TAC devices. The tables list two-position, floating, and proportional actuators. The devices to be replaced are listed alphanumerically in the left-hand column, with the suggested replacement in the center column. The replacement actuators in this list represent what we believe are equivalent units.

SEC to Current Actuators

SEC P/N	Current P/N	Description
—	MA40-7041	230 Vac 35 lb-in. (4 N-m) (2-position)
—	MA40-7041-501	230 Vac 35 lb-in. (4 N-m) w/aux switch (2-position)
—	MA41-7071	230 Vac 60 lb-in. (7 N-m) (2-position) w/manual override
—	MA41-7071-502	230 Vac 60 lb-in. (7 N-m) w/aux switch (2-position) w/manual override
—	MA40-7170	120 Vac 150 lb-in. (17 N-m) (17 N-m) (2-position)
—	MA40-7171	240 Vac 150 lb-in. (17 N-m) (2-position)
—	MA40-7173	24 Vac or 22-30 Vdc 150 lb-in. (17 N-m) (2-position)
—	MF41-7073	24 Vac or 22-30 Vdc 60 lb-in. (7 N-m) (floating) w/manual override
—	MF41-7073-502	24 Vac or 22-30 Vdc 60 lb-in. (7 N-m) w/aux switch (floating) w/manual override
—	MF41-7153	24 Vac or 22-30 Vdc 133 lb-in. (15 N-m) (floating) w/manual override
—	MF41-7153-502	24 Vac or 22-30 Vdc 133 lb-in. (15 N-m) w/aux switch (floating) w/manual override
—	MF40-7173	24 Vac or 22-30 Vdc 150 lb-in. (17 N-m) (floating)
—	MS41-7073-502	24 Vac or 22-30 Vdc 60 lb-in. (7 N-m) w/aux switch (proportional) w/manual override
—	MS41-7153-502	24 Vac or 22-30 Vdc 133 lb-in. (15 N-m) w/aux switch (proportional) w/manual override
—	MS40-7170	120 Vac 150 lb-in. (17 N-m) (proportional)
—	MS40-7171	240 Vac 150 lb-in. (17 N-m) (proportional)
—	MS40-7173	24 Vac or 22-30 Vdc 150 lb-in. (17 N-m) (proportional)
—	MS41-6340	120 Vac 300 lb-in. (34 N-m) NSR (proportional)
—	MS41-6341	240 Vac 300 lb-in. (34 N-m) NSR (proportional)
MA-7101	MA40-7040	120 Vac 35 lb-in. (4 N-m) (2-position)
MA-7101-500	MA40-7040-501	120 Vac 35 lb-in. (4 N-m) w/aux switch (2-position)
MA-7103	MA40-7043	24 Vac or 22-30 Vdc 35 lb-in. (4 N-m) (2-position)
MA-7103-500	MA40-7043-501	24 Vac or 22-30 Vdc 35 lb-in. (4 N-m) w/aux switch (2-position)
MA-7201	MA41-7070	120 Vac 60 lb-in. (7 N-m) (2-position) w/manual override
MA-7201-500	MA41-7070-502	120 Vac 60 lb-in. (7 N-m) w/aux switch (2-position) w/manual override
MA-7203	MA41-7073	24 Vac or 22-30 Vdc 60 lb-in. (7 N-m) (2-position) w/manual override
MA-7203-500	MA41-7073-502	24 Vac or 22-30 Vdc 60 lb-in. (7 N-m) w/aux switch (2-position) w/manual override
MA-7501	MA41-7150	120 Vac 133 lb-in. (15 N-m) (2-position) w/manual override
MA-7501-502	MA41-7150-502	120 Vac 133 lb-in. (15 N-m) w/aux switch (2-position) w/manual override
MA-7503	MA41-7153	24 Vac or 22-30 Vdc 133 lb-in. (15 N-m) (2-position) w/manual override
MA-7503-502	MA41-7153-502	24 Vac or 22-30 Vdc 133 lb-in. (15 N-m) w/aux switch (2-position) w/manual override
MA-7505	MA41-7151	230 Vac 133 lb-in. (15 N-m) (2-position) w/manual override
MA-7505-502	MA41-7151-502	230 Vac 133 lb-in. (15 N-m) w/aux switch (2-position) w/manual override
MF-6103	MF41-6043	24 Vac 35 lb-in. (4 N-m) NSR (floating)
	MF41-6043-502	24 Vac 35 lb-in. (4 N-m) NSR (floating), w/two aux switches
	MF41-6043-510	24 Vac 35 lb-in. (4 N-m) NSR (floating), feedback potentiometer
MF-6203	MF41-6083	24 Vac 70 lb-in. (8 N-m) spdt NSR (floating)
	MF41-6083-502	24 Vac 70 lb-in. (8 N-m) NSR (floating), w/two aux switches
	MF41-6083-510	24 Vac 70 lb-in. (8 N-m) NSR (floating), feedback potentiometer
MF-6633	MF41-6153	24 Vac 133 lb-in. (15 N-m) spdt NSR (floating)
MF-6733	MF41-6343	24 Vac or 33-30 Vdc 300 lb-in. (34 N-m) spdt NSR (floating)
MF-7103	MF40-7043	24 Vac or 22-30 Vdc 35 lb-in. (4 N-m) (floating)
MF-7103-500	MF40-7043-501	24 Vac or 22-30 Vdc 35 lb-in. (4 N-m) w/aux switch (floating)

SEC P/N	Current P/N	Description
MS-6103	MS41-6043	24 Vac 35 lb-in. (4 N-m) NSR (proportional)
	MS41-6043-502	24 Vac 35 lb-in. (4 N-m) NSR (proportional), w/two aux switches
	MS41-6043-520	24 Vac 35 lb-in. (4 N-m) NSR (proportional), adjustable start point (offset) and span
	MS41-6043-522	24 Vac 35 lb-in. (4 N-m) NSR (proportional), w/two aux switches, adjustable start point (offset) and span
MS-6233	MS41-6083	24 Vac 70 lb-in. (8 N-m) 2-10 Vdc/4-20 mAdc NSR (proportional)
	MS41-6083-502	24 Vac 70 lb-in. (8 N-m) NSR (proportional), w/two aux switches
	MS41-6083-520	24 Vac 70 lb-in. (8 N-m) NSR (proportional), adjustable start point (offset) and span
	MS41-6083-522	24 Vac 70 lb-in. (8 N-m) NSR (proportional), w/two aux switches, adjustable start point (offset) and span
MS-6633	MS41-6153	24 Vac 133 lb-in. (15 N-m) 2-10 Vdc/4-20 mAdc NSR (proportional)
	MS41-6153-502	24 Vac 133 lb-in. (15 N-m) NSR (proportional), w/two aux switches
MS-6733	MS41-6343	24 Vac or 22-30 Vdc 300 lb-in. (34 N-m) 2-10 Vdc/4-20 mAdc NSR (proportional)
MS-7103	MS40-7043	24 Vac or 22-30 Vdc 35 lb-in. (4 N-m) (proportional)
MS-7103-500	MS40-7043-501	24 Vac or 22-30 Vdc 35 lb-in. (4 N-m) w/aux switch (proportional)
MS-7203	MS41-7073	24 Vac or 22-30 Vdc 60 lb-in. (7 N-m) (proportional) w/manual override
MS-7433	MS41-7153	24 Vac or 22-30 Vdc 133 lb-in. (15 N-m) (proportional) w/manual override

TAC Old to Current

TAC Old	Current	Description
MF40-6043	MF41-6043	24 Vac 35 lb-in. (4 N-m) NSR (floating)
MF40-6043-510	MF41-6043-510	24 Vac 35 lb-in. (4 N-m) NSR (floating), feedback potentiometer
MF40-6043-520	MF41-6043-520	24 Vac 35 lb-in. (4 N-m) NSR (floating), adjustable start point (offset) and span
MF40-6043-522	MF41-6043-522	24 Vac 35 lb-in. (4 N-m) NSR (floating), w/ two aux. switches, adjustable start point (offset) & span
MF40-6083	MF41-6083	24 Vac 70 lb-in. (8 N-m) NSR (floating)
MF40-6153	MF41-6153	24 Vac 133 lb-in. (15 N-m) NSR (floating)
MF40-6343	MF41-6343	24 Vac or 22-30 Vdc 300 lb-in. (34 N-m) NSR (floating)
MS40-6043	MS41-6043	24 Vac 35 lb-in. (4 N-m) NSR (proportional)
MS40-6043-510	MS41-6043-510	24 Vac 35 lb-in. (4 N-m) NSR (proportional), feedback potentiometer
MS40-6043-520	MS41-6043-520	24 Vac 35 lb-in. (4 N-m) NSR (proportional), adjustable start point (offset) and span
MS40-6043-522	MS41-6043-522	24 Vac 35 lb-in. (4 N-m) NSR (proportional), w/ two aux. switches, adjustable start point (offset) & span
MS40-6083	MS41-6083	24 Vac 70 lb-in. (8 N-m) NSR (proportional)
MS40-6153	MS41-6153	24 Vac 133 lb-in. (15 N-m) NSR (proportional)
MS40-6343	MS41-6343	24 Vac or 22-30 Vdc 300 lb-in. (34 N-m) NSR (proportional)

Belimo to Current Actuators

Belimo P/N	Current P/N	Description
—	MA40-7170	120 Vac 150 lb-in. (17 N-m) (2-position)
—	MA40-7171	240 Vac 150 lb-in. (17 N-m) (2-position)
—	MA40-7173	24 Vac or 22-30 Vdc 150 lb-in. (17 N-m) (2-position)
—	MF40-7073	24 Vac or 22-30 Vdc 60 lb-in. (7 N-m) (floating)
—	MF41-7073	24 Vac or 22-30 Vdc 60 lb-in. (7 N-m) (floating) w/manual override
—	MF40-7073-502	24 Vac or 22-30 Vdc 60 lb-in. (7 N-m) w/aux switch (floating)
—	MF41-7073-502	24 Vac or 22-30 Vdc 60 lb-in. (7 N-m) w/aux switch (floating) w/manual override
—	MF40-7173	24 Vac or 22-30 Vdc 150 lb-in. (17 N-m) (floating)
—	MS41-7073-502	24 Vac or 22-30 Vdc 60 lb-in. (7 N-m) w/aux switch (proportional) w/manual override
—	MS40-7170	120 Vac 150 lb-in. (17 N-m) (proportional)
—	MS40-7171	240 Vac 150 lb-in. (17 N-m) (proportional)
—	MS40-7173	24 Vac or 22-30 Vdc 150 lb-in. (17 N-m) (proportional)
—	MS41-6340	120 Vac 300 lb-in. (34 N-m) NSR (proportional)
—	MS41-6341	240 Vac 300 lb-in. (34 N-m) NSR (proportional)
AF120	MA41-7150	120 Vac 133 lb-in. (15 N-m) (2-position) w/manual override
AF120-S	MA41-7150-502	120 Vac 133 lb-in. (15 N-m) w/aux switch (2-position) w/manual override
AF230	MA41-7151	230 Vac 133 lb-in. (15 N-m) (2-position) w/manual override
AF230-S	MA41-7151-502	230 Vac 133 lb-in. (15 N-m) w/aux switch (2-position) w/manual override
AF24	MA41-7153	24 Vac or 22-30 Vdc 133 lb-in. (15 N-m) (2-position) w/manual override
AF24-3	MF41-7153	24 Vac or 22-30 Vdc 133 lb-in. (15 N-m) (floating) w/manual override
AF24-S	MA41-7153-502	24 Vac or 22-30 Vdc 133 lb-in. (15 N-m) w/aux switch (2-position) w/manual override
AF24-3-S	MF41-7153-502	24 Vac or 22-30 Vdc 133 lb-in. (15 N-m) w/aux switch (floating) w/manual override
AF24-SR	MS41-7153	24 Vac or 22-30 Vdc 133 lb-in. (15 N-m) (proportional) w/manual override
AF24-SR-S	MS41-7153-502	24 Vac or 22-30 Vdc, 133 lb-in. (15 N-m) w/aux switch (proportional) w/manual override
AFR24-SR	—	24 Vdc or 22-30 Vdc, 133 lb-in. (15 N-m) (proportional)
AFR24-3	—	24 Vdc or 22-30 Vdc, 133 lb-in. (15 N-m) (floating)
AFR24-3-S	—	24 Vdc or 22-30 Vdc, 133 lb-in. (15 N-m) (floating)
AFR120	—	120 Vac, 133 lb-in. (15 N-m) (2-position)
AFR120-S	—	120 Vac, 133 lb-in. (15 N-m) (2-position), w/aux switch
AFR24	—	24 Vac or 22-30 Vdc, 133 lb-in. (15 N-m) (2-position)
AFR24-S	—	24 Vac or 22-30 Vdc, 133 lb-in. (15 N-m) (2-position), w/aux switch
GM24	MF41-6343	24 Vac or 22-30 Vdc 300 lb-in. (34 N-m) spdt NSR (floating)
GM24-SR	MS41-6343	24 Vac or 22-30 Vdc 300 lb-in. (34 N-m) 2 to 10 Vdc/4 to 20 mAdc NSR (proportional)
LF120	MA40-7040	120 Vac 35 lb-in. (4 N-m) (2-position)
LF120-S	MA40-7040-501	120 Vac 35 lb-in. (4 N-m) w/aux switch (2-position)
LF230	MA40-7041	230 Vac 35 lb-in. (4 N-m) (2-position)
LF230-S	MA40-7041-501	230 Vac 35 lb-in. (4 N-m) w/aux switch (2-position)
LF24	MA40-7043	24 Vac or 22-30 Vdc 35 lb-in. (4 N-m) (2-position)
LF24-3	MF40-7043	24 Vac or 22-30 Vdc 35 lb-in. (4 N-m) (floating)
LF24-S	MA40-7043-501	24 Vac or 22-30 Vdc 35 lb-in. (4 N-m) w/aux switch (2-position)
LF24-3-S	MF40-7043-501	24 Vac or 22-30 Vdc 35 lb-in. (4 N-m) w/aux switch (floating)
LF24-SR	MS40-7043	24 Vac or 22-30 Vdc 35 lb-in. (4 N-m) (proportional)
LF24-SR-S	MS40-7043-501	24 Vac or 22-30 Vdc 35 lb-in. (4 N-m) w/aux switch (proportional)
LM24	MF41-6043	24 Vac 35 lb-in. (4 N-m) NSR (floating)
LM24-10P	MF41-6043-510	24 Vac 35 lb-in. (4 N-m) NSR (floating), feedback potentiometer
LM24-S	MF41-6043-502	24 Vac 35 lb-in. (4 N-m) NSR (floating), w/two aux switches
LM24-SR	MS41-6043	24 Vac 35 lb-in. (4 N-m) NSR (proportional)
—	MS41-6043-520	24 Vac 35 lb-in. (4 N-m) NSR (proportional), adjustable start point (offset) and span
—	MS41-6043-522	24 Vac 35 lb-in. (4 N-m) NSR (proportional), w/two aux switches, adjustable start point (offset) and span
—	MS41-6043-502	24 Vac 35 lb-in. (4 N-m) NSR (proportional), w/two aux switches
NF120	—	120 Vac 60 lb-in. (7 N-m) (2-position)
NF120-S	—	120 Vac 60 lb-in. (7 N-m) w/aux switch (2-position)
NF230	—	230 Vac 60 lb-in. (7 N-m) (2-position)

Belimo P/N	Current P/N	Description
NF230-S	—	230 Vac 60 lb-in. (7 N-m) w/aux switch (2-position)
NF24	—	24 Vac or 22-30 Vdc 60 lb-in. (7 N-m) (2-position)
NF24-S	—	24 Vac or 22-30 Vdc 60 lb-in. (7 N-m) w/aux switch (2-position)
NF24-SR	—	24 Vac or 22-30 Vdc 60 lb-in. (7 N-m) (proportional)
NM24	MF41-6083	24 Vac 70 lb-in. (8 N-m) spdt NSR (floating)
	MF41-6083-502	24 Vac 70 lb-in. (8 N-m) NSR (floating), w/two aux switches
	MF41-6083-510	24 Vac 70 lb-in. (8 N-m) NSR (floating), feedback potentiometer
NM24-SR	MS41-6083	24 Vac 70 lb-in. (8 N-m) 2 to 10 Vdc/4 to 20 mAdc NSR (proportional)
	MS41-6083-502	24 Vac 70 lb-in. (8 N-m) NSR (proportional), w/two aux switches
	MS41-6083-520	24 Vac 70 lb-in. (8 N-m) NSR (proportional), adjustable start point (offset) and span
	MS41-6083-522	24 Vac 70 lb-in. (8 N-m) NSR (proportional), w/two aux switches, adjustable start point (offset) and span
SM24	MF41-6153	24 Vac 133 lb-in. (15 N-m) spdt NSR (floating)
SM24-SR	MS41-6153	24 Vac 133 lb-in. (15 N-m) 2 to 10 Vdc/4 to 20 mAdc NSR (proportional)
	MS41-6153-502	24 Vac 133 lb-in. (15 N-m) NSR (proportional), w/two aux switches

