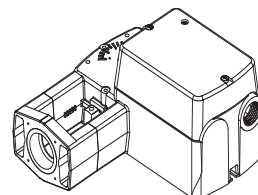


Spring Return DuraDrive® Two-Position Actuator

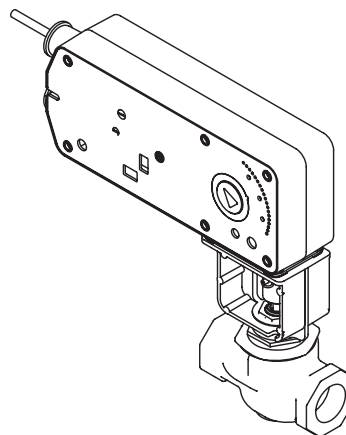
DuraDrive Linear Actuators are designed to mount directly onto two-way or three-way globe valves without the use of linkages. They provide linear travel to operate valves from 1/2 to 2 in. VB-7xxx valves and discontinued 1/2 to 1-1/4 in. VB-9xxx valves, 2-1/2 to 4 in. VB-9xxx valves and VB-8xxx 2-1/2 to 5 in. valves in chilled water, hot water and steam applications up to 366°F (186°C). Linear spring return actuators provide control of valves in HVAC systems.

Features:

- Two position models controlled by SPST controller.
- 105 lb_f (467 N) with 1/2 in. (13 mm) nominal linear stroke, 220 lb_f (979 N) with 5/8 in. (16 mm) or 1-1/16 (27 mm) linear stroke.
- 24 Vac, 120 Vac, and 230 Vac models.
- Rugged die-cast or polymer housings rated for up to NEMA 2/IP54.
- Polymer housing rated for plenum use.
- Overload protection throughout stroke.
- Automatically sets input span to match valve travel.
- Compact size to allow installation in limited space.
- Manual override to allow positioning of valve and preload.
- Spring return operation, stem up.
- Direct mount to valves without separate linkage.



Mx51-710x



Model Chart

Part No.	Control Action	Actuator Power Input							Linear Stroke Inches	Approximate Stroke Timing in Seconds @ 70°F (21°C)		Output Force Rating lb. (Newton)		Valve Size
		Voltage	Running					Holding						
			50 Hz		60 Hz		DC Amps	50/60 Hz						
			VA	W	VA	W		W						
MA51-7103-000	Two Position SPST	24 Vac ±20% 20-30 Vdc	5.3	4.1	5.3	4.1	0.15	1.2	1/2 in. nominal	44 ^a	19 ^a	105	215	1/2 to 2 in.
MA51-7103-100			5.3	4.1	5.3	4.1	0.15	1.2						
MA51-7100		120 Vac ±10% 50/60 Hz	7.9	6.2	7.9	6.2	N/A	2.1						
MA51-7101		230 Vac ±10% 50/60 Hz	7.4	5.4	7.4	5.4	N/A	2.1						

^a Timing was measured with the actuator mounted on a VB-7xxx valve.

MA51-7x0x Series, MA61-720x Series

Model Chart(Continued)

Part No.	Control Action	Actuator Power Input							Linear Stroke Inches	Approximate Stroke Timing in Seconds @ 70°F (21°C)		Output Force Rating lb. (Newton)		Valve Size
		Voltage	Running					Holding						
			50 Hz		60 Hz		DC Amps	50/60 Hz						
			VA	W	VA	W		W						
MA51-7203	2 Position	24 Vac ±20% 22-30 Vdc	9.8	7.5	9.7	7.5	.29	2.8	5/8	<100 ^a	<35 ^a	220 (979)	495 (2202)	1-1/4 to 2 ^b in.
MA51-7200		120 Vac ±10%	11.7	8.8	10.0	8.4	N/A	3.6/5.0						
MA51-7201		230 Vac ±10%	15.5	9.5	10.6	8.5	N/A	4.6/3.3						
MA61-7203		24 Vac ±20% 22-30 Vdc	9.8	7.5	9.7	7.5	.29	2.8	1-1/16	<190 ^a	<40 ^a			2-1/2 to 4 or 5 ^c in.
MA61-7200		120 Vac ±10%	11.7	8.8	10.0	8.4	N/A	3.6/5.0						
MA61-7201		230 Vac ±10%	15.5	9.5	10.6	8.5	N/A	4.6/3.3						

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

^b Current VB-7xxx Series valves and discontinued VB-9xxx Series valves (1-1/4 in. only).

^c Current VB-9xxx Series valves (2-1/2 to 4 in.), current VB-8xxx (2-1/2 to 5 in.) Series valves, and discontinued VB-9xxx (1-1/2 to 2 in.) Series valves.

Specifications

Inputs

Control signal	On-off spring return, SPST control contacts or Triacs (500 mA rated).
Power	24 Vac ± 20%, Class 2, 22 to 30 Vdc, 120 Vac ± 10%, 230 Vac ± 10%, 50/60 Hz. All 24 Vac circuits are Class 2. All circuits 30 Vac and above are Class 1.
Connections	Models with -0xx have 3 ft. (91 cm) appliance wire connections. Models with -1xx have 3 ft. (91 cm) plenum wire connections. Enclosure accepts 1/2 in. (13 mm) conduit connectors. For M20 Metric connector, use AM-756 adaptor.

Outputs

Mechanical	Motor Type: Brushless DC.
	Linear Stroke: MA51-720x: 5/8 in. (16 mm). MA61-720x: 1-1/16 in. (27 mm). MA51-710x: 1/2 in. (13 mm) nominal.
	Approximate Stroke Timing: See Model Chart.
	Manual Override: Allows positioning of valve and preload using manual crank.

Environment

MA51-7x0x Series, MA61-720x Series

Ambient temperature limits

Shipping and Storage: -40 to 160°F (-40 to 71°C).

Operating: MA51-720x/MA61-720x: 0 to 140°F (-18 to 60°C). MA51-710x: -22 to 140°F (-30 to 60°C).

Temperature Restrictions: For maximum ambient 140°F (60°C) the maximum allowable fluid temperature should not exceed valve rating. See F-27252 Selection Guide for specific ratings.

Actuator	Max. Allowable Ambient @ Max. Fluid Temperatures	Valve Body
MA51-720x	140°F (60°C) @ 281°F (138°C)	VB-721x, 722x
	120°F (49°C) @ 300°F (149°C)	VB-73xx
	100°F (38°C) @ 340°F (171°C)	VB-725x, 726x
	90°F (32°C) @ 366°F (186°C)	VB-727x, 728x
MA61-720x	140°F (60°C) @ 300°F (149°C)	2-1/2 to 4 in. VB-931x
MA61-720x	140°F (60°C) @ 281°F (138°C)	2-1/2 to 4 in. VB-92xx, 2-1/2 to 5 in. VB-8xxx

Humidity **MAx1-72xx:** 15 to 95% RH, non-condensing. **MA51-710x:** 5 to 95% RH, non-condensing.

Locations NEMA 1. NEMA 2 (enclosure is air plenum rated), UL Type 2 (IEC IP54) with customer supplied water tight conduit connections.

Specifications (Continued)

Dimensions **MA51-71xx:** 6-5/16 H x 6-49/64 W x 3-1/2 D in. (160 x 170 x 89 mm).
MA51-72xx: 7 H x 9-1/4 W x 2-33/64 D in. (178 x 235 x 64 mm).
MA61-720x: 9-1/2 H x 11-1/8 W x 2-33/64 D in. (241 x 283 x 64 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).

Australia 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.

General Instructions Refer to F-27169 and F-27120.

MA51-7x0x Series, MA61-720x Series

Valve Size Chart.

Valve Body Part Number	P Code	Size inches	Close-Off Pressure PSI ^a			Required Retrofit Kit
			MA51-710x	MA51-720x	MA61-720x	
VB-721X-000-4-P VB-7253-000-4-P VB-7273-000-4-P	1, 2,3 or 4	1/2	250			
	5 or 6	3/4	200			
	7 or 8	1	150			
	9	1-1/4	90	150		
	10	1-1/2	60	100		
	11	2	32	65		
VB-722X-000-4-P VB-7263-000-4-P VB-7283-000-4-P	1,2,3 or 4	1/2	250			
	5 or 6	3/4	200			
	7 or 8	1	90			
	9	1-1/4	60	150		
	10	1-1/2	35	100		
	11	2	20	65		
VB-731X-000-4-P	2 or 4	1/2	250			
	6	3/4	200			
	7 or 8	1	90			
	9	1-1/4	60	150		
	10	1-1/2	35	100		
	11	2	20	65		
VB-732X-000-4-P	4	1/2	250			
	6	3/4	250			
	7 or 8	1	250			
	9	1-1/4	250	250		
	10	1-1/2	250	250		
	11	2	250	250		
VB-8213-000-5-P VB-8223-000-5-P	12	2-1/2			125	
	13	3			125	
	14	4			125	
	15	5			125	
VB-8303-000-5-P	12	2-1/2			35	
	13	3			35	
	14	4			35	
	15	5			35	
VB-921X-000-4-P VB-9253-000-4-P VB-9273-000-4-P	1,2,3 or 4	1/2	250			
	5 or 6	3/4	200			
	7 or 8	1	150			
	9	1-1/4	90	150		
	10	1-1/2			100	AM-733 or AM-734 ^b
	11	2			65	AM-733 or AM-734 ^b
VB-922X-000-4-P VB-9263-000-4-P VB-9283-000-4-P	1, 2, 3, or 4	1/2	250			
	5 or 6	3/4	200			
	7 or 8	1	90			
	9	1-1/4	60	150		
	10	1-1/2			100	AM-733 or AM-734 ^b
	11	2			65	AM-733 or AM-734 ^b

^a Note: Maximum valve differential operating pressures MUST be observed. Please consult our Valve Products Catalog F-27384 to assure the operating differential for your application is followed.

^b Use AM-733 with valves with date codes after 9404. Use AM-734 with valves with date codes before 9404.

Valve Compatibility Table, Continued..

Valve Body Part Number	P Code	Size inches	Close-Off Pressure PSI ^a			Required Retrofit Kit
			MA51-710x	MA51-720x	MA61-720x	
VB-931X-000-4-P	2 or 4	1/2	250			
	6	3/4	200			
	7 or 8	1	90			
	9	1-1/4	60	150		
	10	1-1/2			65	AM-733 or AM-734 ^b
	11	2			65	AM-733 or AM-734 ^b
VB-9323-000-4-P	2 or 4	1/2	250			
	6	3/4	250			
	7 or 8	1	250			
	9	1-1/4	250	250		
	10	1-1/2			250	AM-733 or AM-734 ^b
	11	2			250	AM-733 or AM-734 ^b
VB-92X3-000-X-P VB-9313-000-X-P	12	2-1/2			33	
	13	3			22	
	14	4			12	

^a Note: Maximum valve differential operating pressures MUST be observed. Please consult our Valve Products Catalog F-27384 to assure the operating differential for your application is followed.

Accessories

Model No.	Description
MA51-72xx, MA61-72xx	
AM-731	Mounting kit - Mx51 - 720x (included with actuator).
AM-732	Mounting kit - Mx61 - 720x (included with actuator).
AM-733	Retrofit kit - discontinued VB-9xxx 1-1/2 to 2 in. valves after 9404 date code.
AM-734	Retrofit kit 1 - discontinued VB-9xxx - 1/2 to 2 in. valves prior to 9404 date code.
AM-756	Metric conduit adapter M20 x 1.5 to 1/2 in. NPT.
AM-763	1/8 in. Hex crank for manual override.
MA51-710x	
AM-756	Metric conduit adapter M20 x 1.5 to 1/2 in NPT.
AM-770	Replacement valve linkage parts kit.
AM-764	Linkage kit for damper applications.

Typical Applications

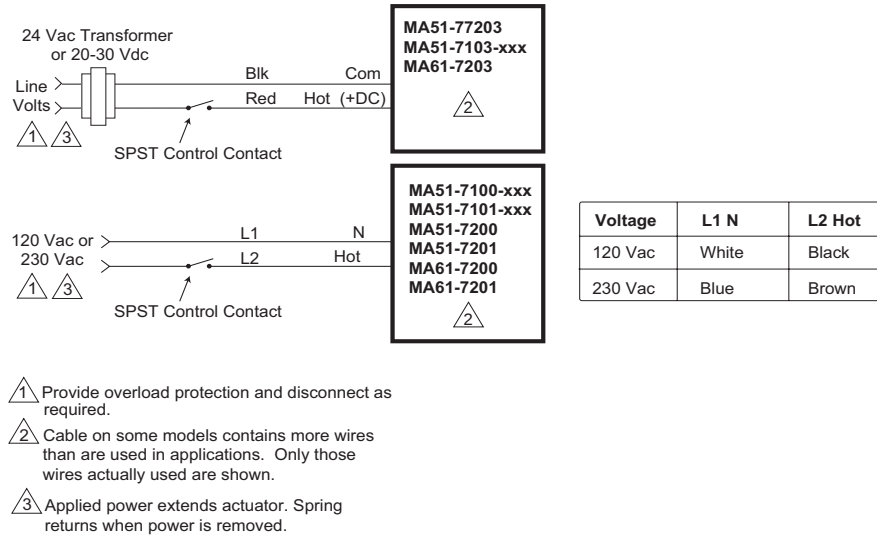


Figure 1 Typical Wiring Diagrams for Two Position Actuators.