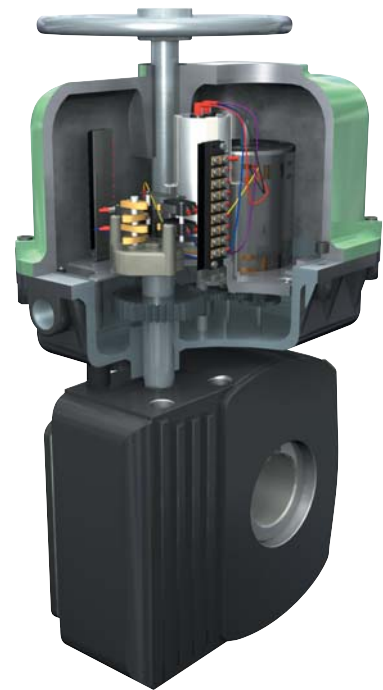


## MAR 1600, 4000



NEMA 4/6/7 Enclosure
Approvals
<p><b>A. C. Models Only</b></p> <p>Canadian Standards Association</p> <p>CSA NRTL/C—Enclosure 4 and 6</p> <p>CSA NRTL/C—Class I, Divisions 1 &amp; 2, Groups C &amp; D</p> <p>CSA NRTL/C—Class II, Divisions 1 &amp; 2, Groups E, F &amp; G</p> <p>CSA NRTL/C—Approved to UL standard No. 429, Electrically Operated Valves</p> <p>CSA NRTL/C—Approved to UL Standard No. 1203, Electrical Equipment for use in Explosion - proof And Dust - Ignition - proof Hazardous (Classified) Locations</p>

Models	
MAR1600, MAR4000	
Typical Application	
<p>For on/off and modulating control of:</p> <ul style="list-style-type: none"> <li>• Part turn ball, butterfly or plug valves</li> <li>• Multi-turn valve types</li> <li>• Rotary dampers</li> <li>• Rotating equipment</li> </ul>	
	Temperature Range
<p>Standard: -40°F to +150°F -40°C to +65°C</p> <p>Optional: -60°F to +150°F -50°C to +65°C</p> <p>Optional: Compliance to NFPA 130, capable of operation after exposure to ambient temperature of 482°F (250°C) for a minimum of 1 hour or a maximum of 3 hours.</p>	
	Voltage
<p>115 VAC, 1 Phase, 50/60 Hz. 230 VAC, 1 Phase, 50/60 Hz. 220 VAC, 3 Phase, 60 Hz. 440 VAC, 3 Phase, 60 Hz.</p>	
	Torque Range
<p>21,000 &amp; 48,000 inch pounds (2,373 &amp; 5,424 newton meters)</p>	
	Speed Range
<p>70 &amp; 170 seconds for 90° revolution</p>	
Standard Features	
<p><b>AC (Single or Three Phase)Voltages</b> 4 – SPDT Switches, PTC Heater</p> <p><b>DC Voltages</b> 2 – SPDT (High Current) Switches</p>	

## 115 & 230 VAC, 1 Phase, 50/60 Hz.

MAR

Model	Output Torque Inch Pounds (N.m)	Type	Speed of Operation 60 Hz. (50 Hz.)	Duty Cycle Rating 115 Vac, 1Ph., 50/60 Hz.	Duty Cycle Rating 230 Vac, 1Ph., 50/60 Hz.	Current Ratings 115 VAC		Current Ratings 230 VAC	
						N.L.A.*	L.R.A.*	N.L.A.*	L.R.A.*
MAR100-16	1,500 (169)	Part Turn	16 seconds/90° (19 seconds/90°)	100% (2)	50% (2)	.55	1.55	.25	.85
MAR100-30	1,800 (203)	Part Turn	30 seconds/90° (35 seconds/90°)	100% (2)	50% (2)	.50	.60	.30	.35
MAR100-60	2500 (282)	Part Turn	60 seconds/90° (70 seconds/90°)	100% (2)	50% (2)	.35	.55	.20	.35
MAR120-1.25	1,500 (169)	Part Turn	1.25 seconds/90° (2 seconds/90°)	25% (1)	25% (1)	3.30	7.40	1.30	3.60
MAR120-1.25 MT	1,500 (169)	Multi-Turn	12 RPM (10 RPM)	25% (2)	25% (2)	3.30	7.40	1.30	3.60
MAR160-8	1,920 (217)	Part Turn	8 seconds/90° (9 seconds/90°)	50% (1)	50% (1)	.75	1.65	.70	1.05
MAR160-16	2,000 (226)	Part Turn	16 seconds/90° (19 seconds/90°)	75% (2)	50% (2)	.60	1.60	.35	.90
MAR160-30	2,500 (282)	Part Turn	30 seconds/90° (35 seconds/90°)	75% (2)	50% (2)	.65	.70	.45	.50
MAR160-60	2,800 (316)	Part Turn	60 seconds/90° (70 seconds/90°)	100% (2)	50% (2)	.50	.60	.30	.35
MAR250-3	3,500 (395)	Part Turn	3 seconds/90° (4 seconds/90°)	25% (1)	50% (1)	3.30	7.40	.90	3.40
MAR250-3MT	3,500 (395)	Multi-Turn	5 RPM (4 RPM)	25% (2)	50% (2)	3.30	7.40	.90	3.40
MAR250-8	3,000 (339)	Part Turn	8 seconds/90° (9 seconds/90°)	40% (1)	50% (1)	1.60	2.20	1.00	1.25
MAR250-16	4,000 (452)	Part Turn	16 seconds/90° (19 seconds/90°)	50% (2)	50% (2)	1.10	1.80	.70	1.05
MAR250-30	5,000 (565)	Part Turn	30 seconds/90° (35 seconds/90°)	50% (2)	50% (2)	.75	1.65	.50	.95
MAR250-60	5,000 (565)	Part Turn	60 seconds/90° (70 seconds/90°)	75% (2)	50% (2)	.65	.70	.30	.35
MAR800-12	7,500 (847)	Part Turn	12 seconds/90° (14 seconds/90°)	25% (1)	25% (1)	3.30	7.40	.90	3.40
MAR800-30	10,000 (1,130)	Part Turn	30 seconds/90° (35 seconds/90°)	40% (2)	50% (2)	1.60	2.20	1.00	1.20
MAR800-60	10,000 (1,130)	Part Turn	60 seconds/90° (70 seconds/90°)	75% (2)	50% (2)	.55	1.55	.50	.95
MAR1600-70	21,000 (2,373)	Part Turn	70 seconds/90° (82 seconds/90°)	25% (2)	50% (2)	3.30	7.40	.90	3.40
MAR 4000-170	48,000 (5,424)	Part Turn	170 seconds/90° (200 seconds/90°)	25% (2)	50% (2)	3.30	7.40	.90	3.40

\* (N.L.A.) — No Load Ampere (L.R.A.) — Locked Rotor Ampere (1) — Open/Close Service (2) — Open/Close or Modulating Service

### Duty Cycle

The percentage of time the electric motor is energized vs. the time it is at rest, in reversing duty and with the actuator running at it's rated load - maximum published torque.

### Isolation Relays

To operate multiple actuators in parallel from a single signal requires isolating relays in the field wiring. Consult factory.

### Standard Modulating Duty Rating

- 12 motor starts (corrections) per minute.
- At the rated duty cycle for that model.
- With the speed of operation a minimum of 15 seconds for 90° or slower.
- With positioning accuracy of (+/-) 1% of total span.

**Note** — Multi-turn models are available with the following number of turns: 1.4, 5, 8, 13, 18, 26 or 50. Must be specified when the order is placed.

**220 & 440 VAC, 3 Phase, 60 Hz.**

MAR	Model	Output Torque Inch Pounds (N.m)	Type	Speed of Operation 60 Hz. (50 Hz.)	Duty Cycle Rating 220 Vac, 3Ph., 60 Hz.	Duty Cycle Rating 440 Vac, 3Ph., 60 Hz.	Current Ratings 220 VAC		Current Ratings 440 VAC	
							N.L.A.*	L.R.A.*	N.L.A.*	L.R.A.*
							MAR100-16	1,500 (169)	Part Turn	16 seconds/90° (19 seconds/90°)
MAR120-1.25	1,500 (169)	Part Turn	1.25 seconds/90° (2 seconds/90°)	25%	25%	1.60	3.50	.82	1.80	
MAR120-1.25 MT	1,500 (169)	Multi-Turn	12 RPM (10 RPM)	25%	25%	1.60	3.50	.82	1.80	
MAR160-8	1,920 (217)	Part Turn	8 seconds/90° (9 seconds/90°)	25%	25%	.34	1.20	.15	.75	
MAR160-16	2,000 (226)	Part Turn	16 seconds/90° (19 seconds/90°)	25%	25%	.34	1.20	.15	.75	
MAR250-3	3,500 (316)	Part Turn	3 seconds/90° (4 seconds/90°)	25%	25%	1.60	3.50	.82	1.80	
MAR250-3MT	3,500 (316)	Multi-Turn	5 RPM (4 RPM)	25%	25%	1.60	3.50	.82	1.80	
MAR250-16	4,000 (452)	Part Turn	16 seconds/90° (19 seconds/90°)	25%	25%	.34	1.20	.15	.75	
MAR250-30	5,000 (565)	Part Turn	30 seconds/90° (35 seconds/90°)	25%	25%	.34	1.20	.15	.75	
MAR250-60	5,000 (565)	Part Turn	60 seconds/90° (70 seconds/90°)	25%	25%	.34	1.20	.15	.75	
MAR800-12	7,500 (847)	Part Turn	12 seconds/90° (14 seconds/90°)	25%	25%	1.60	3.50	.82	1.80	
MAR800-30	10,000 (1,130)	Part Turn	30 seconds/90° (35 seconds/90°)	25%	25%	.34	1.20	.15	.75	
MAR800-60	10,000 (1,130)	Part Turn	60 seconds/90° (70 seconds/90°)	25%	25%	.34	1.20	.15	.75	
MAR 1600-70	21,000 (2,373)	Part Turn	70 seconds/90° (80 seconds/90°)	25%	25%	1.60	3.50	.82	1.80	
MAR 4000-170	48,000 (5,424)	Part Turn	170 seconds/90° (200 seconds/90°)	25%	25%	1.60	3.50	.82	1.80	

**Note** — Multi-turn models are available with the following number of turns: 1.4, 5, 8, 13, 18, 26 or 50. Must be specified when the order is placed.

\* (N.L.A.) — No Load Ampere (L.R.A.) — Locked Rotor Ampere (1) — Open/Close Service (2) — Open/Close or Modulating Service

**Duty Cycle**

The percentage of time the electric motor is energized vs. the time it is at rest, in reversing duty and with the actuator running at it's rated load - maximum published torque.

**Note** — Multi-turn models are available with the following number of turns: 1.4, 5, 8, 13, 18, 26 or 50. Must be specified when the order is placed.

**Standard Modulating Duty Rating**

- 12 motor starts (corrections) per minute.
- At the rated duty cycle for that model.
- With the speed of operation a minimum of 15 seconds for 90° or slower.
- With positioning accuracy of (+/-) 1% of total span.

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