

Ultimag® Series

Ultimag	Type	Preferred Products	Page
	4EM	199172-027	16
	5EM	199173-025	19
	6EM	199174-023	22

4EM

Ultimag® Series Rotary Actuators

Ultimag

4EM

Dimensions (mm)	∅ 41 x 26
Duty cycle	continuous or intermittent
Operation	Quiet, shock-free operation; true rotary motion with no axial displacement
Life	Field proven over 100 million cycles
Power (W)	14.5–145
Supply (V)	3.2–115 VDC
Power	Low power consumption; moderate torque output
Functional Advantages	Fast energising time and extremely high speed cycle rates; on/off or proportional mode operation



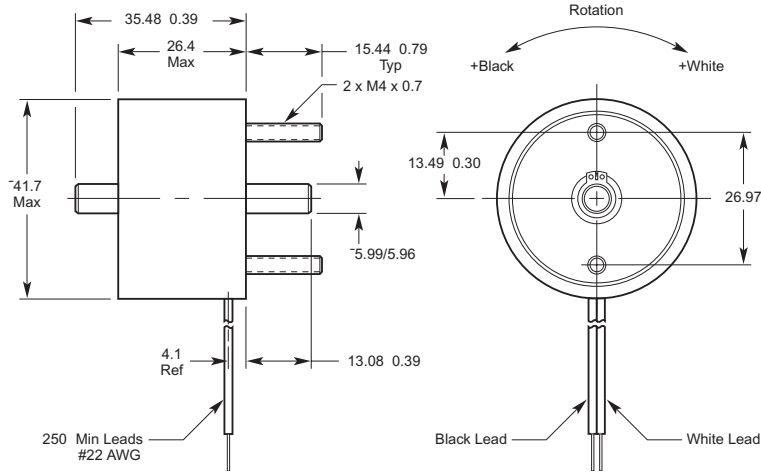
Technical Data

Dielectric Strength	1000 VRMS (23 awg) (wire diameter); 1200 VRMS (24–33 awg) (wire diameter)
Recommended Minimum Heat Sink	Maximum watts dissipated by the Ultimag are based on an unrestricted flow of air at 20°C, with the Ultimag mounted on the equivalent of an aluminium plate measuring 159 x 159 x 3.2 mm
Stroke	+/- 22.5°
Thermal Resistance	7.6° C/watt with heatsink; 15.0° C/watt without heatsink
Rotor Inertia	8.43 x 10 ⁻⁷ (kgm ²)
Peak Torque Rating (Tp)	0.32 Nm
Power Input	145 watts (stalled at Tp; 25°C; Pp)
Number of Phases	1
Static Friction (Tf)	7 mNm
-3dB Closed Loop	78 Hz
Maximum Winding	180° C
Number of Poles	6

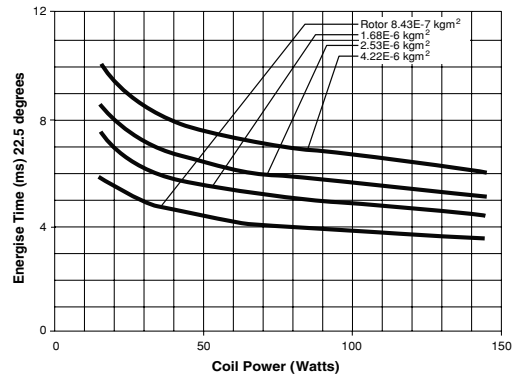
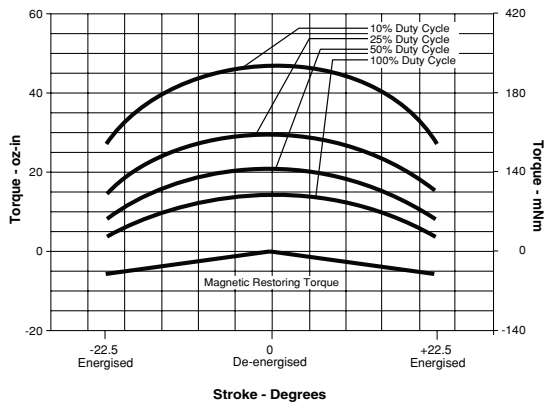
Preferred Range

Type	Size	Nominal voltage	Duty Cycle	Nominal power	Net starting torque	max. "On time"
199172-027	∅ 41 X 26 mm	12.9 VDC	50%	29 W @20°C	0.14 Nm	40 sec

Dimensions



Performance chart



Ordering Reference

Type 199172-(OXX)

Performance		100%	50%	25%	10%	
Maximum Duty Cycle		∞	40	15	4	
Maximum ON Time when pulsed continuously ¹	sec					
Typical Energise Time	msec ²	6	5	4.5	3.5	
Net Starting Torque	Nm	0.10	0.14	0.21	0.33	
Net Ending Torque	Nm	0.02	0.06	0.10	0.19	
Watts	@ 20°C	14.5	29	58	145	
Ampere Turns	@ 20°C	510	721	1020	1613	
Coil Data		# Turns ⁴	VDC (Nom)	VDC (Nom)	VDC (Nom)	VDC (Nom)
awg (OXX) ³	Resistance (@20°C)					
023	0.71	104	3.2	4.5	6.4	10.1
024	1.54	174	4.7	6.7	9.4	14.9
025	2.15	195	5.6	7.9	11.2	17.6
026	3.01	219	6.6	9.3	13.2	20.9
027	5.78	328	9.2	12.9	18.3	28.9
028	8.09	368	10.8	15.3	21.7	34.3
029	14.40	515	14.5	20.4	28.9	45.7
030	20.11	575	18.9	24.2	37.7	59.6
031	34.40	774	22.3	31.6	44.6	71.0
032	56.60	1008	28.7	40.5	57.0	91.0
033	91.40	1288	36.0	51.5	73.0	115.0

¹ Continuously pulsed at stated watts and duty cycle

² Typical energise time based on no load condition. Times shown are for half of full rotary stroke starting at centre-off position.

³ Other coil awg (wire diameter) sizes available — please enquire

⁴ Reference number of turns

5EM

Ultimag® Series Rotary Actuators

Ultimag

5EM

Dimensions (mm)	∅ 49 x 31
Duty cycle	continuous or intermittent
Operation	Quiet, shock-free operation; true rotary motion with no axial displacement
Life	100 M cycles
Power (W)	42–210
Supply (V)	6.6–168 VDC
Power	Low power consumption; moderate torque output
Functional Advantages	Fast energising time and extremely high speed cycle rates; on/off or proportional mode operation



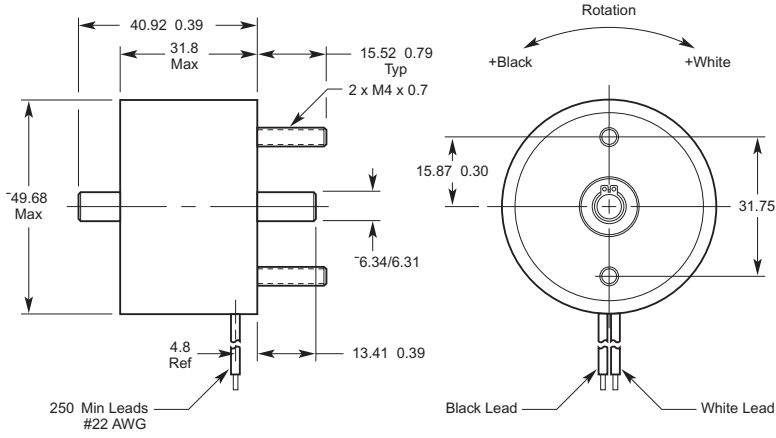
Technical Data

Dielectric Strength	1000 VRMS (23 awg) (wire diameter); 1200 VRMS (24-33 awg) (wire diameter)
Recommended Minimum Heat Sink	Maximum watts dissipated by the Ultimag are based on an unrestricted flow of air at 20°C, with the Ultimag mounted on the equivalent of an aluminium plate measuring 191 x 191 x 3.2 mm
Stroke	+/- 22.5°
Thermal Resistance	5.36°C/watt with heatsink; 12.9°C/watt without heatsink
Rotor Inertia	3.085 x 10 ⁻⁶ (kgm ²)
Peak Torque Rating (Tp)	0.7 Nm
Power Input	210 watts (stalled at Tp; 25°C; Pp)
Number of Phases	1
Static Friction (Tf)	7mNm
-3dB Closed Loop	66.5 Hz
Maximum Winding	180° C
Number of Poles	6

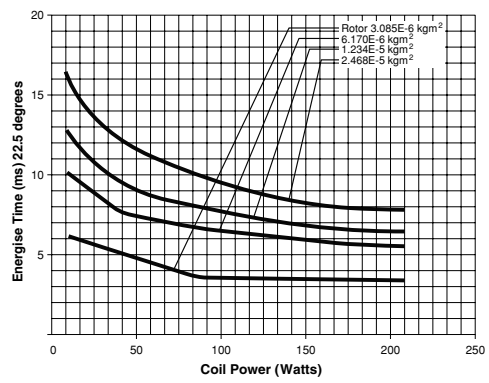
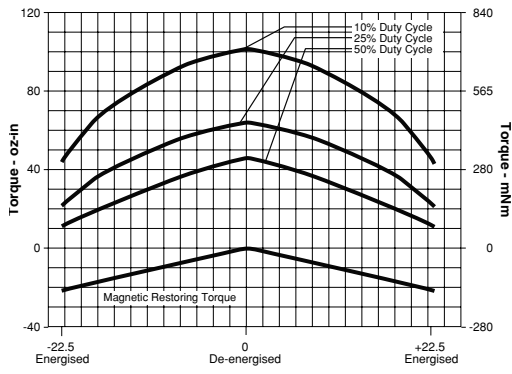
Preferred Range

Type	Size	Nominal voltage	Duty Cycle	Nominal power	Net starting torque	max. "On time"
199173-025	∅ 49 X 31 mm	11.5 VDC	50%	42 W @20°C	0.33 Nm	40 sec

Dimensions



Performance chart



Ordering Reference

Type 199173-(0XX)

Performance		50%	25%	10%	
Maximum Duty Cycle*		40	15	4	
Maximum ON Time when pulsed continuously ¹	sec	40	15	4	
Typical Energise Time	msec ²	5.5	4.5	4.0	
Net Starting Torque	Nm	0.33	0.45	0.72	
Net Ending Torque	Nm	0.11	0.23	0.45	
Watts	@ 20°C	42	84	210	
Ampere Turns	@ 20°C	878	1242	1964	
Coil Data		# Turns ⁴	VDC (Nom)	VDC (Nom)	VDC (Nom)
awg (0XX) ³	Resistance (@20°C)				
23	1.05	128	6.6	9.4	14.8
24	2.24	213	9.7	13.7	21.7
25	3.16	240	11.5	16.3	25.8
26	4.45	270	13.7	19.3	30.6
27	8.50	404	18.9	26.7	42.2
28	11.90	452	22.3	31.6	50.0
29	21.10	630	29.7	42.1	67.0
30	29.50	705	35.2	49.8	78.7
31	50.30	948	45.9	65.0	103.0
32	82.70	1232	58.9	83.0	132.0
33	134.00	1576	74.9	106.0	168.0

¹ Continuously pulsed at stated watts and duty cycle

² Typical energise time based on no load condition. Times shown are for half of full rotary stroke starting at centre-off position.

³ Other coil awg (wire diameter) sizes available — please enquire

⁴ Reference number of turns

6EM

Ultimag® Series Rotary Actuators

Ultimag

6EM

Dimensions (mm)	Ø 59 x 41
Duty cycle	continuous or intermittent
Operation	Quiet, shock-free operation; true rotary motion with no axial displacement
Life	100 M cycles
Power (W)	32–320
Supply (V)	9.2–313 VDC
Power	Low power consumption; moderate torque output
Functional Advantages	Fast energising time and extremely high speed cycle rates; on/off or proportional mode operation



Technical Data

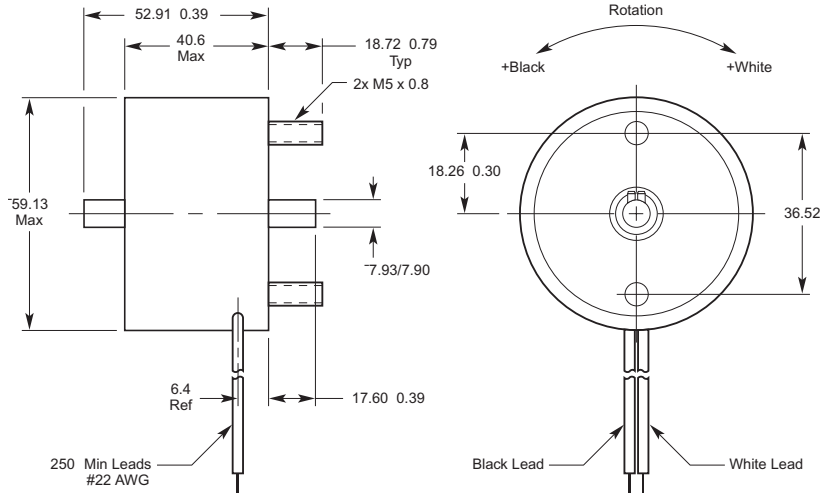
Dielectric Strength	1000 VRMS (23 awg) (wire diameter); 1200 VRMS (24-33 awg) (wire diameter)
Recommended Minimum Heat Sink	Maximum watts dissipated by the Ultimag are based on an unrestricted flow of air at 20°C, with the Ultimag mounted on the equivalent of an aluminium plate measuring 314,3 x 314,3 x 3,2 mm
Stroke	+/- 22,5°
Thermal Resistance	3.58° C/watt with heatsink; 8.52° C/watt without heatsink
Rotor Inertia	5.676 x 10 ⁻⁶ (kgm ²)
Peak Torque Rating (Tp)	1.6 Nm
Power Input	320 watts (stalled at Tp; 25°C; Pp)
Number of Phases	1
Static Friction (Tf)	7mNm
-3dB Closed Loop	12.8 Hz
Maximum Winding	180°C
Number of Poles	6

Preferred Range

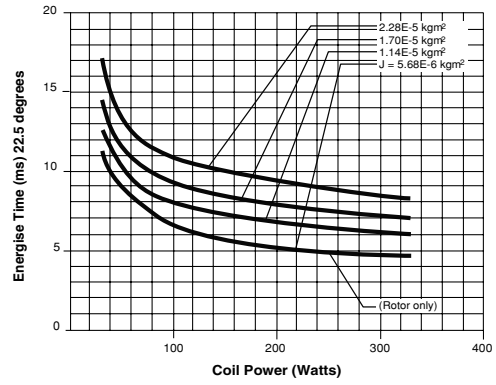
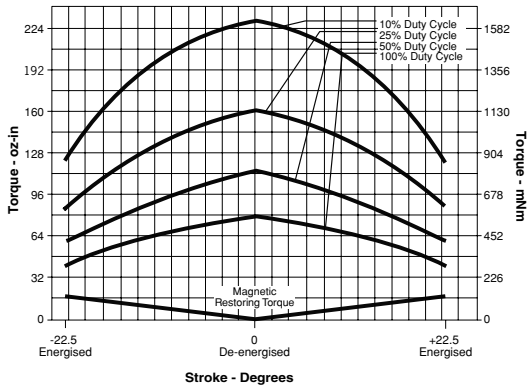
Type	Size	Nominal voltage	Duty Cycle	Nominal power	Net starting torque	max. "On time"
199174-023	Ø 59 X 41 mm	13 VDC	50%	64 W @20°C	0.70 Nm	40 sec

6EM

Dimensions



Performance chart



Ordering Reference

Type 199174-(0XX)

Performance		100%	50%	25%	10%	
Maximum Duty Cycle		∞	40	15	5	
Maximum ON Time when pulsed continuously ¹	sec					
Typical Energise Time	msec ²	17	12	10.5	8.5	
Net Starting Torque	Nm	0.58	0.70	1.15	1.61	
Net Ending Torque	Nm	0.29	0.44	0.58	0.84	
Watts	@ 20°C	32	64	128	320	
Ampere Turns	@ 20°C	980	1386	1960	3100	
Coil Data		# Turns ⁴	VDC (Nom)	VDC (Nom)	VDC (Nom)	VDC (Nom)
awg (0XX) ³	Resistance (@20°C)					
023	2.65	267	9.2	13.0	18.4	29.1
024	5.02	396	12.7	17.9	25.4	40.1
025	7.03	444	15.0	21.2	30.0	47.4
026	12.60	625	20.1	28.4	40.2	63.5
027	17.60	700	23.8	33.6	47.5	75.1
028	29.90	936	30.9	43.7	61.9	97.8
029	49.50	1225	39.8	56.3	80.0	126.0
030	79.70	1560	51.0	71.4	101.0	160.0
031	126.50	1962	64.0	90.0	127.0	201.0
032	198.30	2440	80.0	112.6	159.0	252.0
033	306.20	2992	99.0	140.0	198.0	313.0

¹ Continuously pulsed at stated watts and duty cycle
² Typical energise time based on no load condition. Times shown are for half of full rotary stroke starting at centre-off position.
³ Other coil awg (wire diameter) sizes available — please enquire
⁴ Reference number of turns