Ultimag® Size 6EM

Part Number: 199174-0XX

Specifications

Dielectric Strength	1000 VRMS (23 awg); 1200 VRMS (24-33 awg)
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 31.43 cm square x 0.32 cm thick
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)	7 mNm
–3dB Closed Loop	12.8 Hz
Maximum Winding	180°C
Number of Poles	6
Weight:	0.73 kg
Dimensions:	Ø58.72 mm x 40.6 mm L (See page B10)

Performance

Maximum Duty Cycle	100%	50%	25%	10%
Maximum ON Time (sec) when pulsed continuously[1]	∞	40	15	5
Maximum ON Time (sec) for single pulse[2]	∞	143	47	11
Typical Energise Time (msec)[3]	17	12	10.5	8.5
Watts (@ 20°C)	32	64	128	320
Ampere Turns (@ 20°C)	980	1386	1960	3100

Coil Data

awg (0XX)[4]	Resistance (@20°C)	# Turns[5]	VDC (Nom)	VDC (Nom)	VDC (Nom)	VDC (Nom)
23	2.65	267	9.2	13.0	18.4	29.1
24	5.02	396	12.7	17.9	25.4	40.1
25	7.03	444	15.0	21.2	30.0	47.4
26	12.60	625	20.1	28.4	40.2	63.5
27	17.60	700	23.8	33.6	47.5	75.1
28	29.90	936	30.9	43.7	61.9	97.8
29	49.50	1225	39.8	56.3	80.0	126.0
30	79.70	1560	51.0	71.4	101.0	160.0
31	126.50	1962	64.0	90.0	127.0	201.0
32	198.30	2440	80.0	112.6	159.0	252.0
33	306.20	2992	99.0	140.0	198.0	313.0

How to Order

Add the coil awg number (0XX) to the part number (for example: to order a 25% duty cycle rated at 25.4 VDC, specify 199174-024).
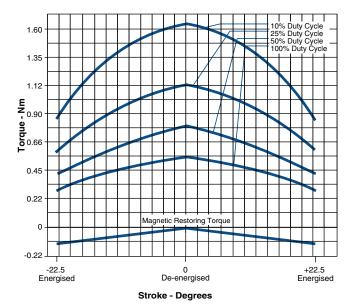
Please see www.ledex.com (click on Stock Products tab) for our list of stock products available through our distributors.

[1] Continuously pulsed at stated watts and duty cycle

[2] Single pulse at stated watts (with coil at ambient room temperature 20°C)

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

[4] Other coil awg sizes available — please consult factory
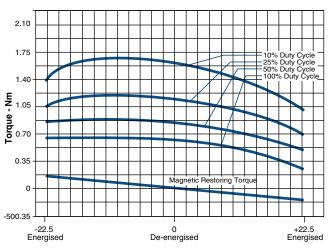
[5] Reference number of turns

WARNING: Exposed Magnet may affect pacemakers. In the event a product unit's magnet is exposed due to product disassembly, Pacemaker Wearers should distance themselves 3 metres from exposed magnet.

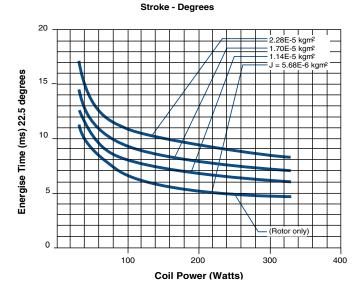All specifications subject to change without notice.

Ultimag® Size 6EM

Graph 1 shows three position operation. In any mode, the armature seeks centre of stroke at zero power. Applying a positive or negative voltage causes the shaft to rotate clockwise or counter clockwise. When power is removed, the restoring torque is applied to the load, or alternatively, the shaft can be driven to centre under power.

Graph 1 (Torque - Nm vs Stroke - Degrees):
- Y-axis: Torque - Nm, values 1.60, 1.35, 1.12, 0.90, 0.66, 0.45, 0.22, 0, -0.22
- X-axis: Stroke - Degrees; -22.5 Energised, 0 De-energised, +22.5 Energised
- Curves: 10% Duty Cycle, 25% Duty Cycle, 50% Duty Cycle, 100% Duty Cycle
- Magnetic Restoring Torque

Graph 2 shows operation end-to-end. Note the high starting torque for high starting acceleration or for stopping the load by means of reverse voltage at the end of the stroke. If the device is used in a full stroke application, the load can be externally latched, detented, or biased to either end of stroke.

Graph 2 (Torque - Nm vs Stroke - Degrees):
- Y-axis: Torque - Nm, values 2.10, 1.75, 1.40, 1.05, 0.70, 0.35, 0, -0.35
- X-axis: Stroke - Degrees; -22.5 Energised, 0 De-energised, +22.5 Energised
- Curves: 10% Duty Cycle, 25% Duty Cycle, 50% Duty Cycle, 100% Duty Cycle
- Magnetic Restoring Torque

Graph 3 shows how speed varies with load. Each curve represents a different inertial load, which is a multiple of the armature inertia.

Calculate the inertia of your system, then use this chart to determine Ultimag speed in your application. Inertia determination of simple shapes is shown in most engineering handbooks; complex shapes are calculated in solid modeling software or are measured empirically. This graph represents half of the full rotary stroke starting at the centre-off position.
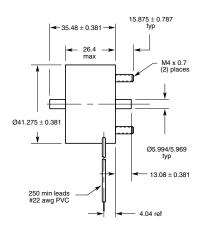
Graph 3 (Energise Time (ms) 22.5 degrees vs Coil Power (Watts)):
- Y-axis: Energise Time (ms) 22.5 degrees, values 0, 5, 10, 15, 20
- X-axis: Coil Power (Watts), values 100, 200, 300, 400
- Curves: $2.28E-5$ kgm², $1.70E-5$ kgm², $1.14E-5$ kgm², $J = 5.68E-6$ kgm²
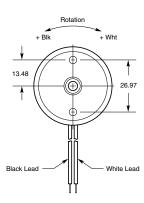- (Rotor only)

Torque values for reference only.

All specifications subject to change without notice.

Ultimag® Dimensions

mm

4EM

- 35.48 ± 0.381
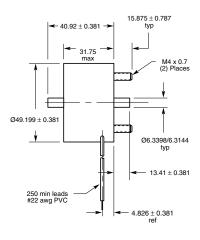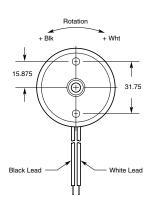- 26.4 max
- 15.875 ± 0.787 typ
- M4 x 0.7 (2) places
- Ø41.275 ± 0.381
- Ø5.994/5.969 typ
- 13.08 ± 0.381
- 250 min leads #22 awg PVC
- 4.04 ref

Rotation
+ Blk   + Wht
- 13.48
- 26.97
- Black Lead
- White Lead

5EM

- 40.92 ± 0.381
- 31.75 max
- 15.875 ± 0.787 typ
- M4 x 0.7 (2) Places
- Ø49.199 ± 0.381
- Ø6.3398/6.3144 typ
- 13.41 ± 0.381
- 250 min leads #22 awg PVC
- 4.826 ± 0.381 ref

Rotation
+ Blk   + Wht
- 15.875
- 31.75
- Black Lead
- White Lead

6EM

- 52.91 ± 0.635
- 40.64 max
- 19.05 ± 0.787
- M5 x 0.8 (20 Places)
- Ø58.7 ± 0.381
- Ø7.927/7.902) typ
- 17.6 ± 0.381
- 250 min leads #22 awg PVC
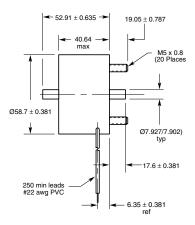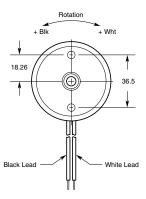- 6.35 ± 0.381 ref

Rotation
+ Blk   + Wht
- 18.26
- 36.5
- Black Lead
- White Lead

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