



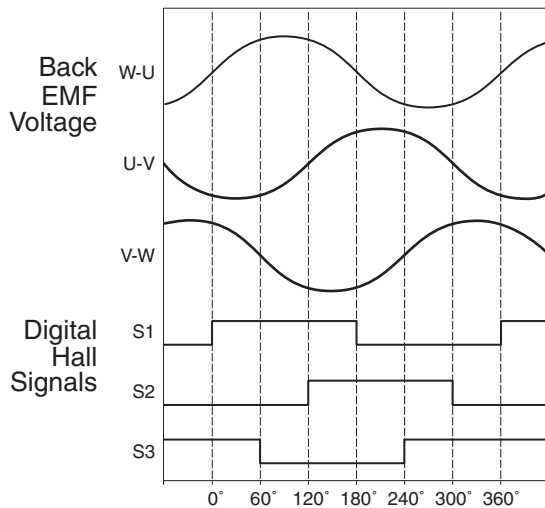
## Specifications LZ-100-T-XXX

| Performance Parameters                   | Symbol      | Units  | LZ-100-T-120    |     |                |     | LZ-100-T-240    |                 |                |                | LZ-100-T-360    |                 |                |                 | LZ-100-T-480    |                 |     |                |
|--|-------------|--|-----------------|-----|----------------|-----|-----------------|-----------------|----------------|----------------|-----------------|-----------------|----------------|-----------------|-----------------|-----------------|-----|----------------|
| Continuous Force <sup>1,5,6,7</sup>      | $F_{cTmax}$ | N<br>(lbf)   | 197<br>(44)     |     |                |     | 393<br>(88)     |                 |                |                | 590<br>(133)    |                 |                |                 | 786<br>(177)    |                 |     |                |
| Peak Force <sup>2</sup>                  | $F_p$       | N<br>(lbf)   | 983<br>(221)    |     |                |     | 1965<br>(442)   |                 |                |                | 2948<br>(663)   |                 |                |                 | 3931<br>(884)   |                 |     |                |
| Motor Constant <sup>1</sup>              | $K_M$       | $\frac{N}{\sqrt{W}}$<br>( $\frac{lbf}{\sqrt{W}}$ ) | 20.0<br>(4.5)   |     |                |     | 28.2<br>(6.3)   |                 |                |                | 34.6<br>(7.8)   |                 |                |                 | 39.9<br>(9.0)   |                 |     |                |
| Thermal Resistance                       | $R_{th}$    | °C/W   | 1.13            |     |                |     | 0.57            |                 |                |                | 0.38            |                 |                |                 | 0.28            |                 |     |                |
| Max Power Dissipation                    | $P_{cTmax}$ | W  | 97              |     |                |     | 194             |                 |                |                | 291             |                 |                |                 | 388             |                 |     |                |
| Maximum Applied Bus Voltage <sup>8</sup> | $V_{DC}$    | Volts  | 325             |     |                |     | 325             |                 |                |                | 325             |                 |                |                 | 325             |                 |     |                |
| Electrical Cycle Length                  | $E_c$       | mm   | 60              |     |                |     | 60              |                 |                |                | 60              |                 |                |                 | 60              |                 |     |                |
| Electrical Time Constant                 | $\tau_e$    | msec   | 1.9             |     |                |     | 1.9             |                 |                |                | 1.9             |                 |                |                 | 1.9             |                 |     |                |
| Maximum Coil Temperature                 | $T_{max}$   | °C   | 130             |     |                |     | 130             |                 |                |                | 130             |                 |                |                 | 130             |                 |     |                |
| Winding Type                             |             |  | D               | E   | F              | G   | D               | E               | F              | G              | D               | E               | F              | G               | D               | E               | F   | G              |
| Force Constant <sup>1</sup>              | $K_F$       | $\frac{N/A_{pk}}{(lbf/A_{pk})}$                    | 80.4<br>(18.1)  | N/A | 46.4<br>(10.4) | N/A | 80.4<br>(18.1)  | 160.7<br>(36.1) | 46.4<br>(10.4) | 92.8<br>(20.9) | 80.4<br>(18.1)  | 241.1<br>(54.2) | 46.4<br>(10.4) | 139.2<br>(31.3) | 80.4<br>(18.1)  | 160.7<br>(36.1) | N/A | 92.8<br>(20.9) |
| Back EMF Constant p-p <sup>3,4</sup>     | $K_e$       | $\frac{V_p/m/s}{(V_p/in/s)}$                       | 94.9<br>(2.4)   | N/A | 54.8<br>(1.4)  | N/A | 94.9<br>(2.4)   | 189.8<br>(4.8)  | 54.8<br>(1.4)  | 109.6<br>(2.8) | 94.9<br>(2.4)   | 284.6<br>(7.2)  | 54.8<br>(1.4)  | 164.3<br>(4.2)  | 94.9<br>(2.4)   | 189.8<br>(4.8)  | N/A | 109.6<br>(2.8) |
| Peak Current <sup>2,4</sup>              | $I_p$       | $A_{pk}$<br>( $A_{rms}$ )                          | 12.2<br>(8.6)   | N/A | 21.2<br>(15.0) | N/A | 24.5<br>(17.3)  | 12.2<br>(8.6)   | 42.4<br>(30.0) | 21.2<br>(15.0) | 36.7<br>(25.9)  | 12.2<br>(8.6)   | 63.5<br>(44.9) | 21.2<br>(15.0)  | 48.9<br>(34.6)  | 24.5<br>(17.3)  | N/A | 42.4<br>(30.0) |
| Continuous Current <sup>1,4,5,6</sup>    | $I_{cTmax}$ | $A_{pk}$<br>( $A_{rms}$ )                          | 2.4<br>(1.7)    | N/A | 4.2<br>(3.0)   | N/A | 4.9<br>(3.5)    | 2.4<br>(1.7)    | 8.5<br>(6.0)   | 4.2<br>(3.0)   | 7.3<br>(5.2)    | 2.4<br>(1.7)    | 12.7<br>(9.0)  | 4.2<br>(3.0)    | 9.8<br>(6.9)    | 4.9<br>(3.5)    | N/A | 8.5<br>(6.0)   |
| Resistance p-p <sup>3</sup> @20°C        | $R_{20}$    | ohm  | 15.08           | N/A | 5.03           | N/A | 7.54            | 30.17           | 2.51           | 10.06          | 5.03            | 45.25           | 1.68           | 15.08           | 3.77            | 15.08           | N/A | 5.03           |
| Inductance p-p <sup>3</sup>              | $L$         | mH   | 28.28           | N/A | 9.43           | N/A | 14.14           | 56.57           | 4.71           | 18.86          | 9.43            | 84.85           | 3.14           | 28.28           | 7.07            | 28.28           | N/A | 9.43           |
| <b>Mechanical Parameters</b>             |             |  |                 |     |                |     |                 |                 |                |                |                 |                 |                |                 |                 |                 |     |                |
| Magnetic Attraction                      | $F_a$       | N<br>(lbf)   | 0<br>(0)        |     |                |     | 0<br>(0)        |                 |                |                | 0<br>(0)        |                 |                |                 | 0<br>(0)        |                 |     |                |
| Coil Mass                                | $M_c$       | kg<br>(lbf <sub>m</sub> )                          | 1.35<br>(2.97)  |     |                |     | 2.58<br>(5.69)  |                 |                |                | 3.81<br>(8.41)  |                 |                |                 | 5.04<br>(11.12) |                 |     |                |
| Magnetic Channel Mass                    | $M_n$       | kg/m<br>(lbf/in)                                   | 30.27<br>(1.69) |     |                |     | 30.27<br>(1.69) |                 |                |                | 30.27<br>(1.69) |                 |                |                 | 30.27<br>(1.69) |                 |     |                |

**Notes:** Motor performance specifications are with sinusoidal commutation.

- Continuous forces, motor constant and currents listed are with coils at maximum temperature 130°C, mounted to a heat sink that is equivalent to an aluminum slide 25.4mm (1.0") thick with the following areas: 120 coil 774cm<sup>2</sup> (120in<sup>2</sup>), 240 coil 1160cm<sup>2</sup> (180in<sup>2</sup>), 360 coil 1680cm<sup>2</sup> (260 in<sup>2</sup>), 480 coil 2060cm<sup>2</sup> (320 in<sup>2</sup>).
- Calculated at 4% duty cycle with a maximum on time of 1 second.
- All winding parameters listed are measured line-to-line (phase-to-phase).
- All currents and voltages are measured 0-peak of the sine wave unless noted rms.
- Continuous force and current based on coil moving with all phases sharing the same load in sinusoidal commutation.
- For stand still conditions multiply continuous force and continuous current by 0.9.
- Coil mountings on either of the two narrow sides reduces continuous force by 10%.
- Maximum cable length 10 meters. Please consult factory concerning applications requiring longer cables  
All specifications are ±10%. Phase-to-phase inductance is ±30%.

### Motor Phasing Diagram



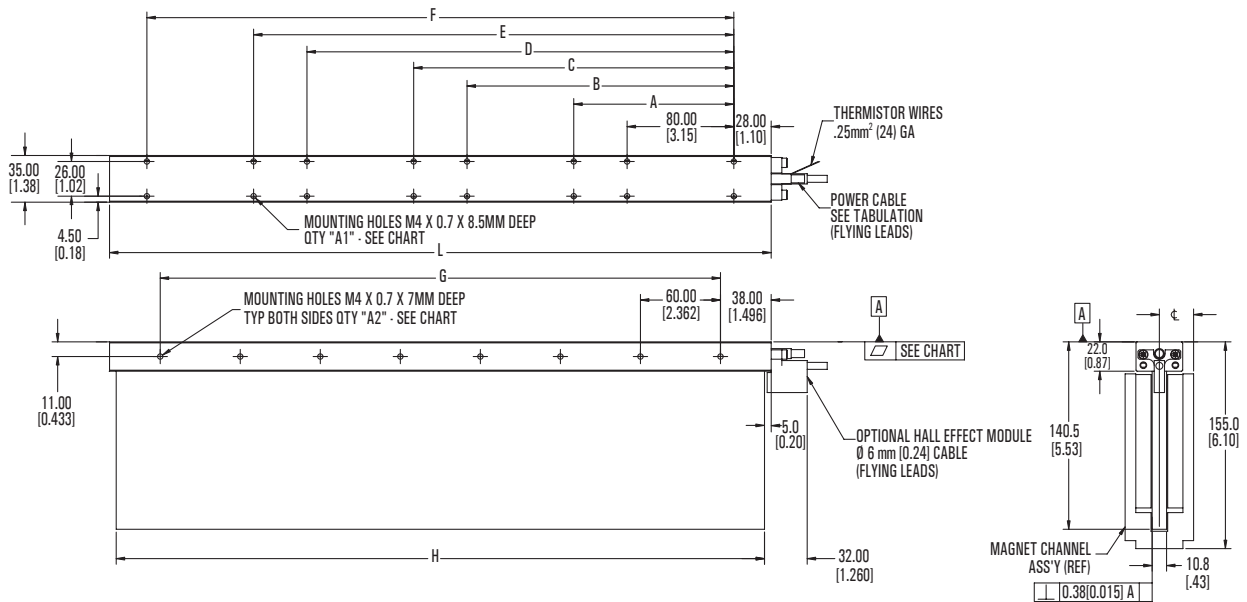
Note: Phasing direction is coil moving towards motor power cable

### Dimensions mm [in]

| Size    | Winding Code     | Power Cable Dia. | Gauge                    |
|---------|------------------|------------------|--------------------------|
| 100-120 | D<br>F           | φ6.1 (.24)       | 0.75mm <sup>2</sup> (18) |
| 100-240 | D<br>E<br>F<br>G | φ6.1 (.24)       | 0.75mm <sup>2</sup> (18) |
| 100-360 | D<br>E<br>F<br>G | φ6.1 (.24)       | 0.75mm <sup>2</sup> (18) |
| 100-480 | D<br>E<br>G      | φ6.1 (.24)       | 0.75mm <sup>2</sup> (18) |

# Coil Assembly LZ-100-T-XXX

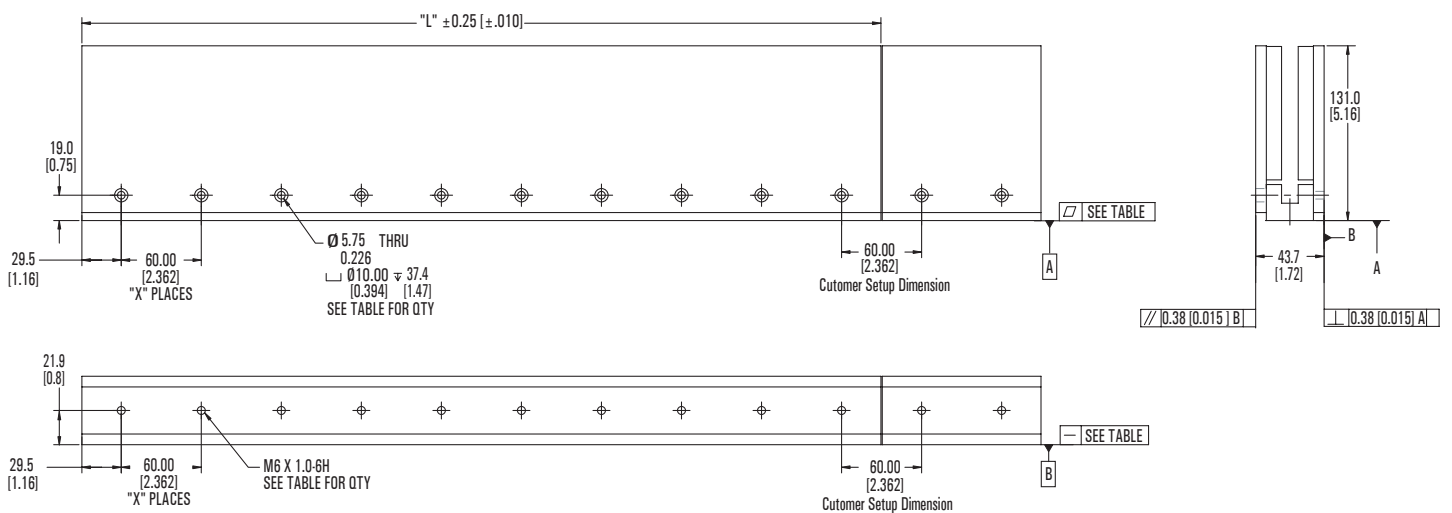
Dimensions mm [in]



| Coil    |                |                |                |                |                 |                 |                 |                 |               |        |        |             |
|---------|----------------|----------------|----------------|----------------|-----------------|-----------------|-----------------|-----------------|---------------|--------|--------|-------------|
| Size    | L              | A              | B              | C              | D               | E               | F               | G               | H             | A1 QTY | A2 QTY | Flatness A  |
| 100-120 | 136.00 (5.35)  | ---            | ---            | ---            | ---             | ---             | ---             | 60.00 (2.362)   | 126.0 (4.96)  | 4      | 3      | 0.25 (.010) |
| 100-240 | 256.00 (10.08) | 120.00 (4.724) | 200.00 (7.874) | ---            | ---             | ---             | ---             | 180.00 (7.087)  | 246.0 (9.69)  | 8      | 5      | 0.25 (.010) |
| 100-360 | 376.00 (14.80) | 120.00 (4.724) | 200.00 (7.874) | 240.00 (9.449) | 320.00 (12.598) | ---             | ---             | 300.00 (11.811) | 366.0 (14.41) | 12     | 7      | 0.38 (.015) |
| 100-480 | 496.00 (19.53) | 120.00 (4.724) | 200.00 (7.874) | 240.00 (9.449) | 320.00 (12.598) | 360.00 (14.173) | 440.00 (17.323) | 420.00 (16.535) | 486.0 (19.13) | 16     | 9      | 0.64 (.025) |

| Magnet Channel |               |   |          |             |             |
|----------------|---------------|---|----------|-------------|-------------|
| Size           | L             | X | Hole Qty | —           | ▤           |
| -120           | 119.0 (4.69)  | 1 | 2        | 0.13 (.005) | 0.13 (.005) |
| -180           | 179.0 (7.05)  | 2 | 3        | 0.13 (.005) | 0.13 (.005) |
| -240           | 239.0 (9.41)  | 3 | 4        | 0.13 (.005) | 0.13 (.005) |
| -480           | 479.0 (18.86) | 7 | 8        | 0.26 (.010) | 0.26 (.010) |
| -600           | 599.0 (23.58) | 9 | 10       | 0.26 (.010) | 0.26 (.010) |

# Magnet Channel LZM-100-T-XXX



Tolerances

| Metric    | English       |
|-----------|---------------|
| .x ± .25  | [.xx] ± .01   |
| .xx ± .13 | [.xxx] ± .005 |