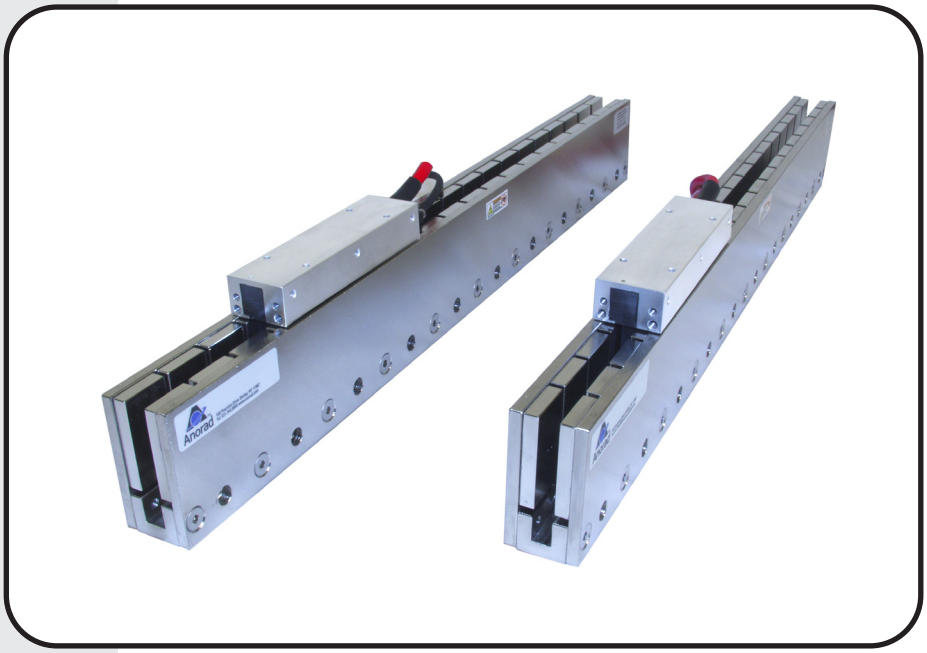
LZ Family of Linear Motors

Product Features

- High-performance, optimized design
- 30% higher force density as compared to standard ironless motors
- Zero-cogging
- Wide range of coil and magnet options
- Peak force range from 350 to 4000 Newtons
- Continuous force range from 70 to 900 Newtons
- Ideal for constant velocity scanning applications



LZ Family of Linear Motors

High-Performance Ironless Linear Motors

The Anorad LZ series of ironless linear servo motors represents the most advanced linear motor technology available. The LZ series are high-performance linear motors that have been optimized for extremely high force density and low weight. The LZ motors utilize the latest magnetic materials and are optimized by Finite Element Analysis (FEA) to achieve an extremely high force density.

The LZ series has forty-eight motors comprised of four magnet lengths and four coil lengths with each coil having three coil/magnet configurations. Additionally, each motor is offered in several winding configurations to accommodate most applications. All motors are offered with optional hall effect sensors and thermal sensors.

Anorad offers a complete line of linear servo motors, linear stages, gantries, drives and controls for a complete motion solution in the most performance demanding applications.

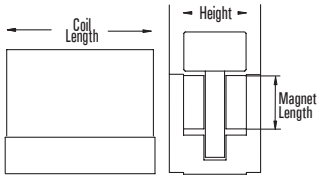
Product Profile

Rockwell Automation

LZ Family Configurations

Coil/Magnet Way Configuration Code	Description	Height	Active Coil Length				Active Magnet Length			
0	Standard Force	37.8 (1.49)	120 (4.72)	240 (9.45)	360 (14.17)	480 (18.90)	30 (1.18)	50 (1.97)	75 (2.95)	100 (3.94)
T	Medium Force	40.4 (1.59)	120 (4.72)	240 (9.45)	360 (14.17)	480 (18.90)	30 (1.18)	50 (1.97)	75 (2.95)	100 (3.94)
HT	High Force	51.3 (2.02)	120 (4.72)	240 (9.45)	360 (14.17)	480 (18.90)	30 (1.18)	50 (1.97)	75 (2.95)	100 (3.94)

Dimensions mm [in]



Advantages of Linear Motors

Unlimited Travel

Anorad motors do not have limitations on travel displacements. Since the stationary magnet assemblies can be easily joined together to form any length of motor, travel can be made as long as necessary. Since the same moving coil assembly could be used for any travel, there is no trade-off in performance as a function of travel. Screw driven systems, on the other hand, have critical speed limitations and higher inertia with added length. Speed limitations, high inertia, and low stiffness are major performance trade-offs with larger travels with other drive techniques.

Velocity

Anorad linear servo motors can be used in both very low and very high velocity applications, all with very high precision. They can precisely operate at velocities ranging from less than 1 µm/sec (0.00004"/sec) to more than 10 m/sec (400"/sec). Ball screws and lead screws have critical speed limitations. Belt drives exhibit lower stiffness. Rack-and-pinion drives typically have backlash and poor low velocity performance.

Acceleration

Anorad linear motors have a high ratio of peak force to motor inertia (about 30:1). Therefore, almost all the motor force can be used to accelerate the moving load and perform useful work. In typical screw-driven systems, a large portion of the motor torque is lost in overcoming the rotary inertia of the motor, coupling and screw.

Accuracy and Repeatability

With Anorad linear motors, the only limit to total system accuracy and repeatability is the sensing device and the bearings of the positioning system. In rotary driven systems there are additional factors which effect these performance variables, including backlash, hysteresis, lost motion and jitter.

Smoothness Of Motion

Brushless linear servo motors can provide extremely smooth motion, since they have no contacting surfaces to cause jitter. Ultimate smooth motion is achieved with Anorad's sinusoidal-commutated non-ferrous motors. By contrast, ball screws are not as smooth due to the vibrating nature of the balls entering and exiting the ball nut raceways, which is easily observed in sub-micron systems. Belt and rack-and-pinion drives also have contacting mechanisms which are susceptible to friction and backlash caused vibrations.

Stiffness

Anorad linear servo motors have very high stiffness, typically higher than a stage's bearings and structural members. With ball screws and rack-and-pinion drives, the couplings, ball nut, and pinions are the highest contributors to low stiffness of a stage. Low stiffness reduces frequency response and increases settling times.

Maintenance and Life Expectancy

Anorad brushless linear servo motors have no contact between the two working members. Therefore, they have an extremely long, virtually maintenance-free life. The non-contact design eliminates lubrication and periodic adjustment to compensate for wear. Rotary driven mechanisms require regular lubrication and occasional replacement due to wear.

Cleanroom and Vacuum Applications

Since the coil assembly and the magnet assembly of linear servo motors do not make contact, they are ideally suited for clean room and vacuum applications. Anorad manufactures linear motors specifically for 10^{-7} torr and high vacuum applications, using special material and manufacturing processes. Anorad is the world leader in vacuum preparation, cleaning, and materials selection fo these critical applications.

Motor Definitions

Continuous Force (FcTmax)
The force produced by continuous current (I_{cTmax}), all the phases sharing the load, provided the coil is secured through an adequate thermal heatsink as specified. This scenario produces a coil temperature equal to the T_{max} rating for the motor.

Peak Force (Fp)
The force produced by peak current (Ip). Ip assumes a 4% duty cycle with a maximum on time of 1 second.

Motor Constant (Km)
This is a figure of merit for motor efficiency. It is the ratio of the continuous force (three phases) FcTmax to the square root of the motor power losses in the 3 phases.

Thermal Resistance (R_{th})
The equivalent thermal resistance of the motor, determined by the ratio of coil temperature rise (for example 110°C for LZ series) to the total power motor losses in the three phases. We assume the motor is mounted on a heat sink of at least the size specified in this catalog, with ambient temperature below 20°C and with a stroke of at least twice the coil length.

Max Power Dissipation (PcTmax)
The continuous power losses of the motor when the RMS current in the coil is IcTmax and the ambient temperature below 20°C.

Maximum Applied Bus Voltage (V_{DC})
This is the maximum allowable Bus DC voltage that can be applied to the coil.

Electrical Cycle Length (Ec)
This is the length of the electrical cycle and corresponds to twice the magnet length (North to North).

Electrical Time Constant (τ_e)
The time it takes for a step current input to the coil to reach 63% of its final value by overcoming the resistance and the inductance of the coil.

Maximum Coil Temperature (Tmax)
The maximum rated service temperature of the coil = 130°C. However, good practice is to limit the RMS current to no more than 80% of the rated continuous current (IcTmax).

Magnetic Track Mass (Mm)
The mass of the magnetic track per unit of length.

Force Constant (Kf)
The ratio between the motor continuous force (FcTmax) to the motor continuous current (IcTmax). For these motors, the force constant does not change as a function of current.

Back EMF Constant p-p (Ke)
The ratio between the back emf voltage in volt peak to the motor speed.

Peak Current (Ip)
The magnitude of the 3 phase sinusoidal currents that need to be applied to the motor to develop the motor peak force (Fp).

Continuous Current (IcTmax)
The continuous current corresponding to the continuous Force. This is a sinusoidal current which can be expressed either in Amp 0-peak or in Amp rms.

Resistance p-p @ 20°C (R_{20})
This is the cold coil resistance measured phase to phase (line to line) at 20°C.

Inductance p-p (L)
This is the coil inductance measured phase to phase (line to line).

Magnetic Attraction (Fa)
The magnetic attraction force exerted between the coil assembly and its magnet assembly, measured at the nominal air gap.

Coil Mass (Mc)
The mass of the coil including the standard cable length.

Rockwell Automation

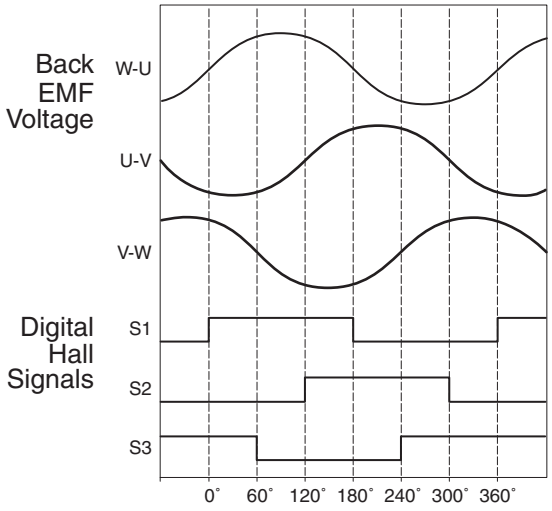
Specifications LZ-030-0-XXX

Performance Parameters	Symbol	Units	LZ-030-0-120				LZ-030-0-240				LZ-030-0-360				LZ-030-0-480			
Continuous Force [1,5,6,7]	F_{cTmax}	N (lb_f)	70 (16)				139 (31)				209 (47)				278 (63)			
Peak Force [2]	F_p	N (lb_f)	348 (78)				695 (156)				1043 (234)				1390 (313)			
Motor Constant [1]	K_M	$N/\sqrt{W}$ ($lb_f/\sqrt{W}$)	8.7 (2.0)				12.3 (2.8)				15.1 (3.4)				17.4 (3.9)			
Thermal Resistance	R_{th}	°C/W	1.73				0.86				0.58				0.43			
Max Power Dissipation	P_{cTmax}	W	64				127				191				255			
Maximum Applied Bus Voltage [8]	V_{DC}	Volts	325				325				325				325			
Electrical Cycle Length	E_c	mm	60				60				60				60			
Electrical Time Constant	τ_e	msec	1.6				1.6				1.6				1.6			
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 [1]	K_F	N/A_{pk} (lb_f/A_{pk})	21.0 (4.7)	N/A	12.1 (2.7)	N/A	21.0 (4.7)	42.0 (9.4)	12.1 (2.7)	24.3 (5.5)	21.0 (4.7)	63.0 (14.2)	N/A	36.4 (8.2)	21.0 (4.7)	42.0 (9.4)	N/A	24.3 (5.5)
Back EMF Constant p-p [3,4]	K_e	V_p/m/s (V_p/in/s)	24.8 (0.6)	N/A	14.3 (0.4)	N/A	24.8 (0.6)	49.6 (1.3)	14.3 (0.4)	28.6 (0.7)	24.8 (0.6)	74.4 (1.9)	N/A	43.0 (1.1)	24.8 (0.6)	49.6 (1.3)	N/A	28.6 (0.7)
Peak Current [2,4]	I_p	A_{pk} (A_{rms})	16.5 (11.7)	N/A	28.7 (20.3)	N/A	33.1 (23.4)	16.5 (11.7)	57.3 (40.5)	28.7 (20.3)	49.6 (35.1)	16.5 (11.7)	N/A	28.7 (20.3)	66.2 (46.8)	33.1 (23.4)	N/A	57.3 (40.5)
Continuous Current [1,4,5,6]	I_{cTmax}	A_{pk} (A_{rms})	3.3 (2.3)	N/A	5.7 (4.1)	N/A	6.6 (4.7)	3.3 (2.3)	11.5 (8.1)	5.7 (4.1)	9.9 (7.0)	3.3 (2.3)	N/A	5.7 (4.1)	13.2 (9.4)	6.6 (4.7)	N/A	11.5 (8.1)
Resistance p-p [3] @20°C	R_{20}	ohm	5.41	N/A	1.80	N/A	2.70	10.82	0.90	3.61	1.80	16.23	N/A	5.41	1.35	5.41	N/A	1.80
Inductance p-p [3]	L	mH	8.43	N/A	2.81	N/A	4.22	16.86	1.41	5.62	2.81	25.29	N/A	8.43	2.11	8.43	N/A	2.81
Mechanical Parameters																		
Magnetic Attraction	F_a	N (lb_f)	0 (0)				0 (0)				0 (0)				0 (0)			
Coil Mass	M_c	kg (lb_m)	0.63 (1.38)				1.14 (2.51)				1.65 (3.64)				2.16 (4.76)			
Magnetic Channel Mass	M_n	kg/m (lb/in)	11.49 (0.64)				11.49 (0.64)				11.49 (0.64)				11.49 (0.64)			

Notes: Motor performance specifications are with sinusoidal commutation.

1. 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 774cm² (120in²), 240 coil 1160cm² (180in²), 360 coil 1680cm² (260 in²), 480 coil 2060cm² (320 in²).
2. Calculated at 4% duty cycle with a maximum on time of 1 second.
3. All winding parameters listed are measured line-to-line (phase-to-phase).
4. All currents and voltages are measured 0-peak of the sine wave unless noted rms.
5. Continuous force and current based on coil moving with all phases sharing the same load in sinusoidal commutation.
6. For stand still conditions multiply continuous force and continuous current by 0.9.
7. Coil mountings on either of the two narrow sides reduces continuous force by 10%.
8. 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



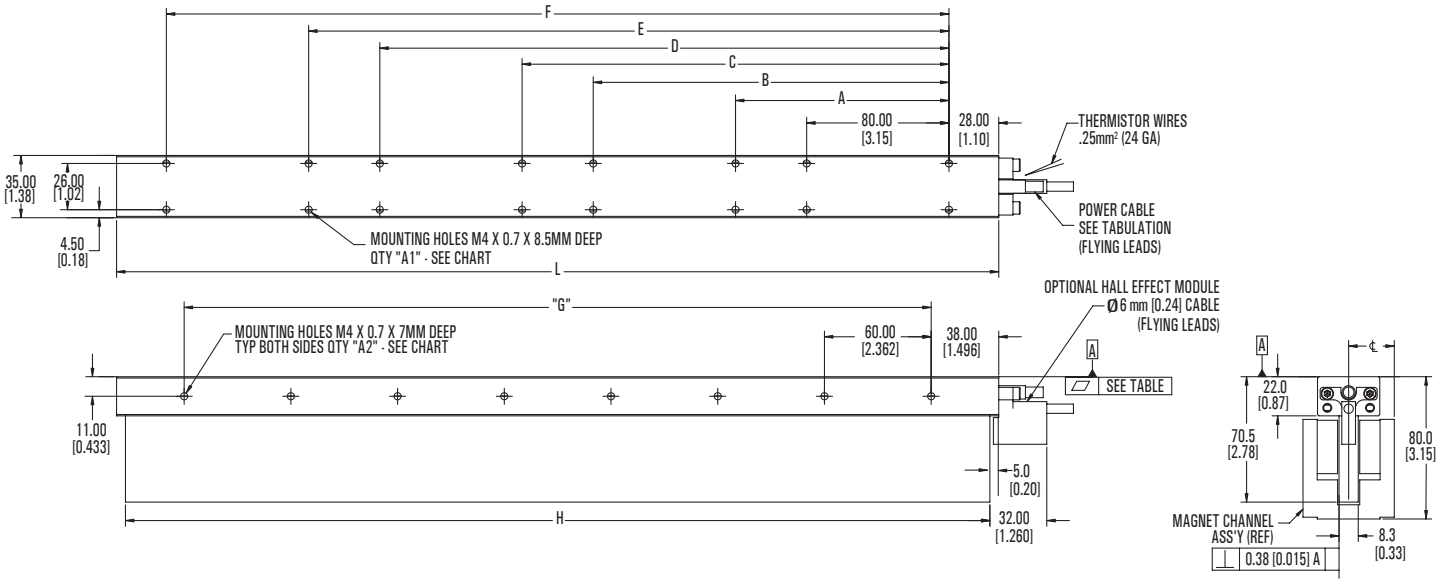
Note: Phasing direction is coil moving towards motor power cable

Dimensions mm [in]

Size	Winding Code	Power Cable Dia.	Gauge
030-120	D F	ϕ6.1 (.24)	0.75mm² (18)
030-240	D E F G	ϕ6.1 (.24)	0.75mm² (18)
030-360	D E G	ϕ6.1 (.24)	0.75mm² (18)
030-480	D E G	ϕ6.1 (.24)	0.75mm² (18)

Coil Assembly LZ-030-0-XXX

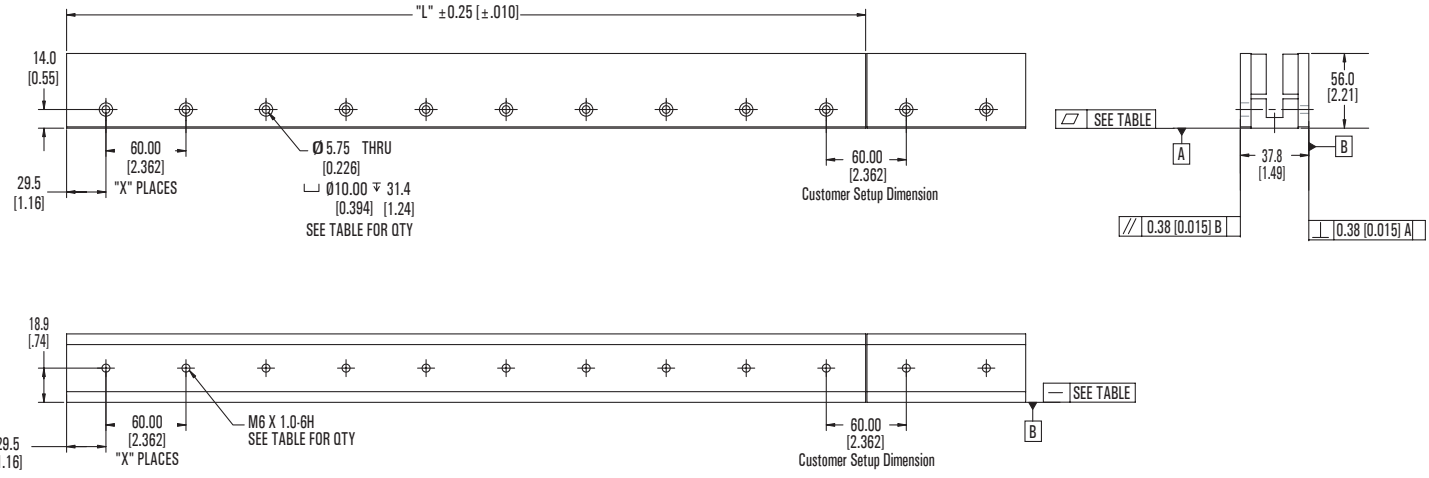
Dimensions mm [in]



Coil												
Size	L	A	B	C	D	E	F	G	H	A1 QTY	A2 QTY	Flatness -A-
030-120	136.00 (5.35)	---	---	---	---	---	---	60.00 (2.362)	126.0 (4.96)	4	3	0.25 (.010)
030-240	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)
030-360	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)
030-480	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-030-0-XXX



Tolerances

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

Rockwell Automation

Specifications LZ-030-T-XXX

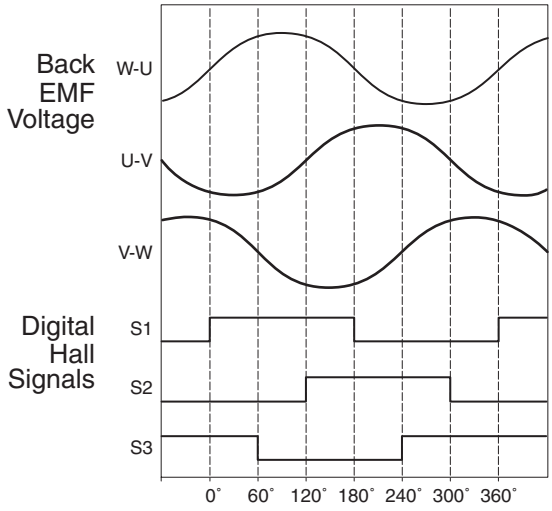
Performance Parameters	Symbol	Units	LZ-030-T-120				LZ-030-T-240				LZ-030-T-360				LZ-030-T-480			
Continuous Force [1,5,6,7]	F_{cTmax}	N (lb_f)	80 (18)				160 (36)				239 (54)				319 (72)			
Peak Force [2]	F_p	N (lb_f)	399 (90)				798 (179)				1197 (269)				1595 (359)			
Motor Constant [1]	K_M	$N/\sqrt{W}$ ($lb_f/\sqrt{W}$)	8.7 (2.0)				12.3 (2.8)				15.1 (3.4)				17.4 (3.9)			
Thermal Resistance	R_{th}	°C/W	1.31				0.65				0.44				0.33			
Max Power Dissipation	P_{cTmax}	W	84				168				252				336			
Maximum Applied Bus Voltage [8]	V_{DC}	Volts	325				325				325				325			
Electrical Cycle Length	E_c	mm	60				60				60				60			
Electrical Time Constant	τ_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 [1]	K_F	N/A_{pk} (lb_f/A_{pk})	24.1 (5.4)	N/A	13.9 (3.1)	N/A	24.1 (5.4)	48.2 (10.8)	13.9 (3.1)	27.8 (6.3)	24.1 (5.4)	72.3 (16.3)	N/A	41.8 (9.4)	24.1 (5.4)	48.2 (10.8)	N/A	27.8 (6.3)
Back EMF Constant p-p [3,4]	K_e	V_p/m/s (V_p/in/s)	28.5 (0.7)	N/A	16.4 (0.4)	N/A	28.5 (0.7)	56.9 (1.4)	16.4 (0.4)	32.9 (0.8)	28.5 (0.7)	85.4 (2.2)	N/A	49.3 (1.3)	28.5 (0.7)	56.9 (1.4)	N/A	32.9 (0.8)
Peak Current [2,4]	I_p	A_{pk} (A_{rms})	16.5 (11.7)	N/A	28.7 (20.3)	N/A	33.1 (23.4)	16.5 (11.7)	57.3 (40.5)	28.7 (20.3)	49.6 (35.1)	16.5 (11.7)	N/A	28.7 (20.3)	66.2 (46.8)	33.1 (23.4)	N/A	57.3 (40.5)
Continuous Current [1,4,5,6]	I_{cTmax}	A_{pk} (A_{rms})	3.3 (2.3)	N/A	5.7 (4.1)	N/A	6.6 (4.7)	3.3 (2.3)	11.5 (8.1)	5.7 (4.1)	9.9 (7.0)	3.3 (2.3)	N/A	5.7 (4.1)	13.2 (9.4)	6.6 (4.7)	N/A	11.5 (8.1)
Resistance p-p [3] @20°C	R_{20}	ohm	7.15	N/A	2.38	N/A	3.57	14.29	1.19	4.76	2.38	21.44	N/A	7.15	1.79	7.15	N/A	2.38
Inductance p-p [3]	L	mH	13.40	N/A	4.47	N/A	6.70	26.80	2.23	8.93	4.47	40.20	N/A	13.40	3.35	13.40	N/A	4.47
Mechanical Parameters																		
Magnetic Attraction	F_a	N (lb_f)	0 (0)				0 (0)				0 (0)				0 (0)			
Coil Mass	M_c	kg (lb_m)	0.74 (1.64)				1.37 (3.02)				2.00 (4.41)				2.63 (5.79)			
Magnetic Channel Mass	M_n	kg/m (lb/in)	11.66 (0.65)				11.66 (0.65)				11.66 (0.65)				11.66 (0.65)			

Notes: Motor performance specifications are with sinusoidal commutation.

1. Continuous forces, motor constant and currents listed are with coils at maximum temperature 130ºC, mounted to a heat sink that is equivalent to an aluminum slide 25.4mm (1.0") thick with the following areas: 120 coil 774cm² (120in²), 240 coil 1160cm² (180in²), 360 coil 1680cm² (260 in²), 480 coil 2060cm² (320 in²).
2. Calculated at 4% duty cycle with a maximum on time of 1 second.
3. All winding parameters listed are measured line-to-line (phase-to-phase).
4. All currents and voltages are measured 0-peak of the sine wave unless noted rms.
5. Continuous force and current based on coil moving with all phases sharing the same load in sinusoidal commutation.
6. For stand still conditions multiply continuous force and continuous current by 0.9.
7. Coil mountings on either of the two narrow sides reduces continuous force by 10%.
8. 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



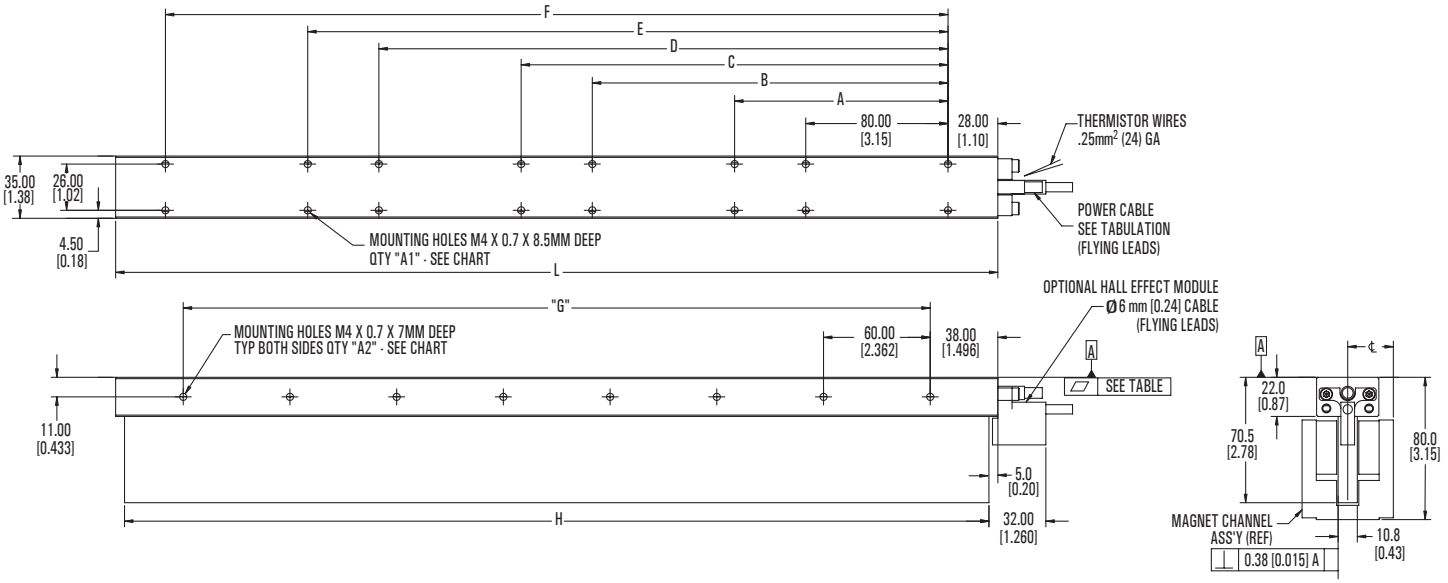
Note: Phasing direction is coil moving towards motor power cable

Dimensions mm [in]

Size	Winding Code	Power Cable Dia.	Gauge
030-120	D F	ϕ6.1 (.24)	0.75mm² (18)
030-240	D E F G	ϕ6.1 (.24)	0.75mm² (18)
030-360	D E G	ϕ6.1 (.24)	0.75mm² (18)
030-480	D E G	ϕ6.1 (.24)	0.75mm² (18)

Coil Assembly LZ-030-T-XXX

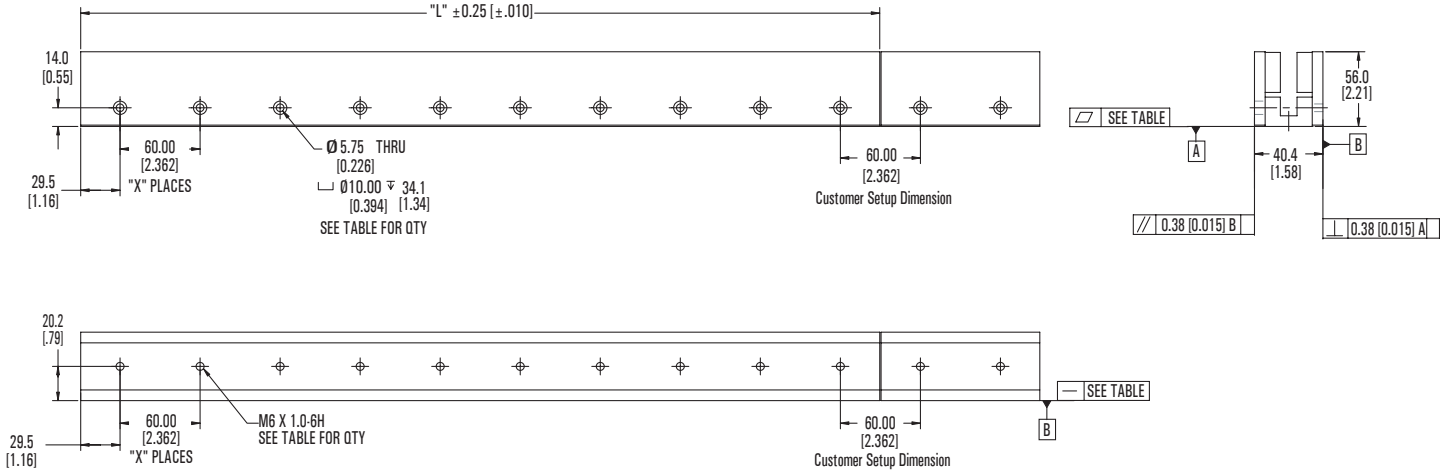
Dimensions mm [in]



Coil												
Size	L	A	B	C	D	E	F	G	H	A1 QTY	A2 QTY	Flatness -A-
030-120	136.00 (5.35)	---	---	---	---	---	---	60.00 (2.362)	126.0 (4.96)	4	3	0.25 (.010)
030-240	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)
030-360	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)
030-480	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-030-T-XXX



Tolerances

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

Rockwell Automation

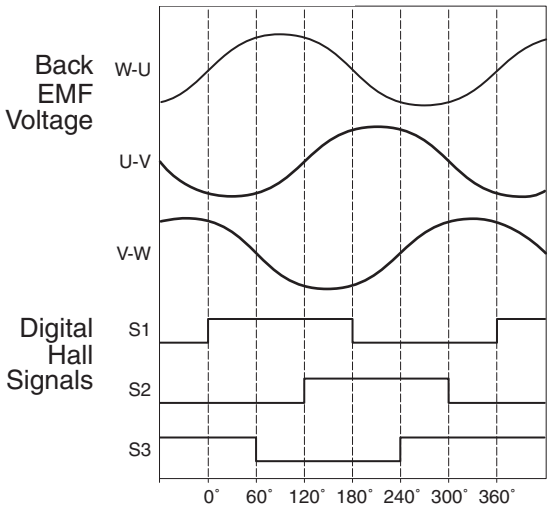
Specifications LZ-030-HT-XXX

Performance Parameters	Symbol	Units	LZ-030-HT-120				LZ-030-HT-240				LZ-030-HT-360				LZ-030-HT-480			
Continuous Force [1,5,6,7]	F_{cTmax}	N (lb_f)	88 (20)				175 (39)				263 (59)				351 (79)			
Peak Force [2]	F_p	N (lb_f)	439 (99)				877 (197)				1247 (280)				1755 (395)			
Motor Constant [1]	K_M	$N/\sqrt{W}$ ($lb_f/\sqrt{W}$)	9.6 (2.2)				13.5 (3.0)				16.6 (3.7)				19.1 (4.3)			
Thermal Resistance	R_{th}	°C/W	1.31				0.65				0.44				0.33			
Max Power Dissipation	P_{cTmax}	W	84				168				252				336			
Maximum Applied Bus Voltage [8]	V_{DC}	Volts	325				325				325				325			
Electrical Cycle Length	E_c	mm	60				60				60				60			
Electrical Time Constant	τ_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 [1]	K_F	N/A_{pk} (lb_f/A_{pk})	26.5 (6.0)	N/A	15.3 (3.4)	N/A	26.5 (6.0)	53.0 (11.9)	15.3 (3.4)	30.6 (6.9)	26.5 (6.0)	79.5 (17.9)	N/A	45.9 (10.3)	26.5 (6.0)	53.0 (11.9)	N/A	30.6 (6.9)
Back EMF Constant p-p [3,4]	K_e	V_p/m/s (V_p/in/s)	31.3 (0.8)	N/A	18.1 (0.5)	N/A	31.3 (0.8)	62.6 (1.6)	18.1 (0.5)	36.2 (0.9)	31.3 (0.8)	93.9 (2.4)	N/A	54.2 (1.4)	31.3 (0.8)	62.6 (1.6)	N/A	36.2 (0.9)
Peak Current [2,4]	I_p	A_{pk} (A_{rms})	16.5 (11.7)	N/A	28.7 (20.3)	N/A	33.1 (23.4)	16.5 (11.7)	57.3 (40.5)	28.7 (20.3)	47.0 (33.2)	15.7 (11.1)	N/A	27.1 (19.2)	66.2 (46.8)	33.1 (23.4)	N/A	57.3 (40.5)
Continuous Current [1,4,5,6]	I_{cTmax}	A_{pk} (A_{rms})	3.3 (2.3)	N/A	5.7 (4.1)	N/A	6.6 (4.7)	3.3 (2.3)	11.5 (8.1)	5.7 (4.1)	9.9 (7.0)	3.3 (2.3)	N/A	5.7 (4.1)	13.2 (9.4)	6.6 (4.7)	N/A	11.5 (8.1)
Resistance p-p [3] @20°C	R_{20}	ohm	7.15	N/A	2.38	N/A	3.57	14.29	1.19	4.76	2.38	21.44	N/A	7.15	1.79	7.15	N/A	2.38
Inductance p-p [3]	L	mH	13.40	N/A	4.47	N/A	6.70	26.80	2.23	8.93	4.47	40.20	N/A	13.40	3.35	13.40	N/A	4.47
Mechanical Parameters																		
Magnetic Attraction	F_a	N (lb_f)	0 (0)				0 (0)				0 (0)				0 (0)			
Coil Mass	M_c	kg (lb_m)	0.74 (1.64)				1.37 (3.02)				2.00 (4.41)				2.63 (5.79)			
Magnetic Channel Mass	M_n	kg/m (lb/in)	15.85 (0.89)				15.85 (0.89)				15.85 (0.89)				15.85 (0.89)			

Notes: Motor performance specifications are with sinusoidal commutation.

1. Continuous forces, motor constant and currents listed are with coils at maximum temperature 130ºC, mounted to a heat sink that is equivalent to an aluminum slide 25.4mm (1.0") thick with the following areas: 120 coil 774cm² (120in²), 240 coil 1160cm² (180in²), 360 coil 1680cm² (260 in²), 480 coil 2060cm² (320 in²).
2. Calculated at 4% duty cycle with a maximum on time of 1 second.
3. All winding parameters listed are measured line-to-line (phase-to-phase).
4. All currents and voltages are measured 0-peak of the sine wave unless noted rms.
5. Continuous force and current based on coil moving with all phases sharing the same load in sinusoidal commutation.
6. For stand still conditions multiply continuous force and continuous current by 0.9.
7. Coil mountings on either of the two narrow sides reduces continuous force by 10%.
8. 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



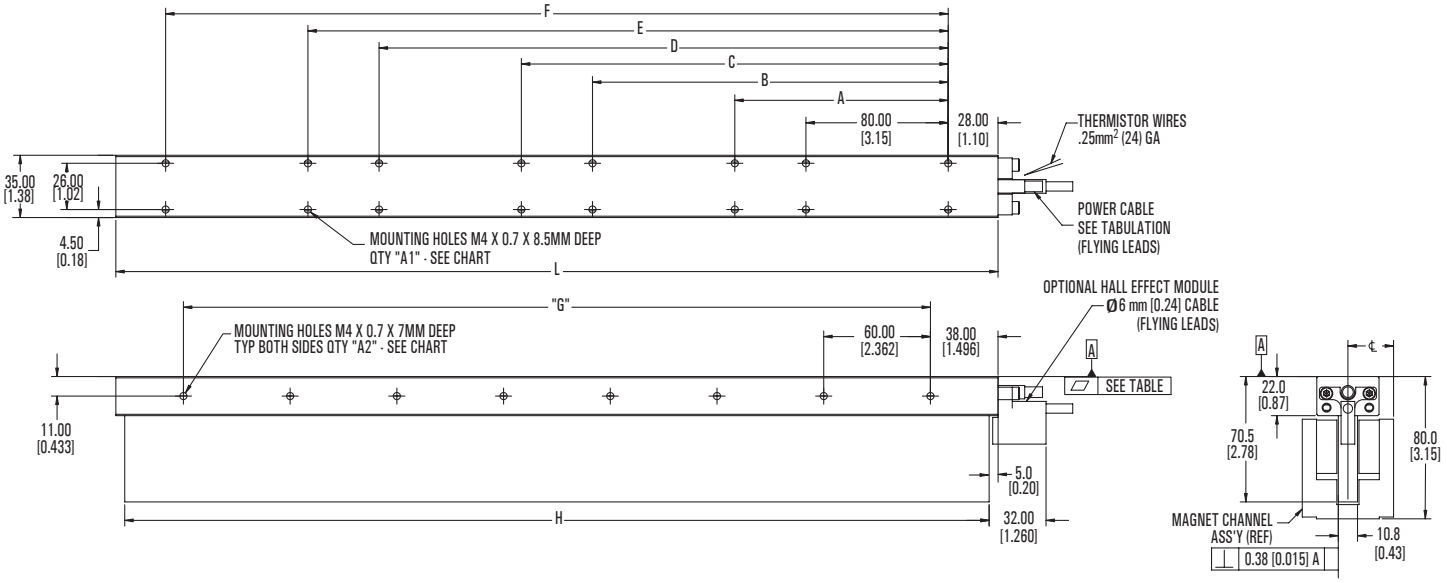
Note: Phasing direction is coil moving towards motor power cable

Dimensions mm [in]

Size	Winding Code	Power Cable Dia.	Gauge
030-120	D F	ϕ6.1 (.24)	0.75mm² (18)
030-240	D E F G	ϕ6.1 (.24)	0.75mm² (18)
030-360	D E G	ϕ6.1 (.24)	0.75mm² (18)
030-480	D E G	ϕ6.1 (.24)	0.75mm² (18)

Coil Assembly LZ-030-HT-XXX

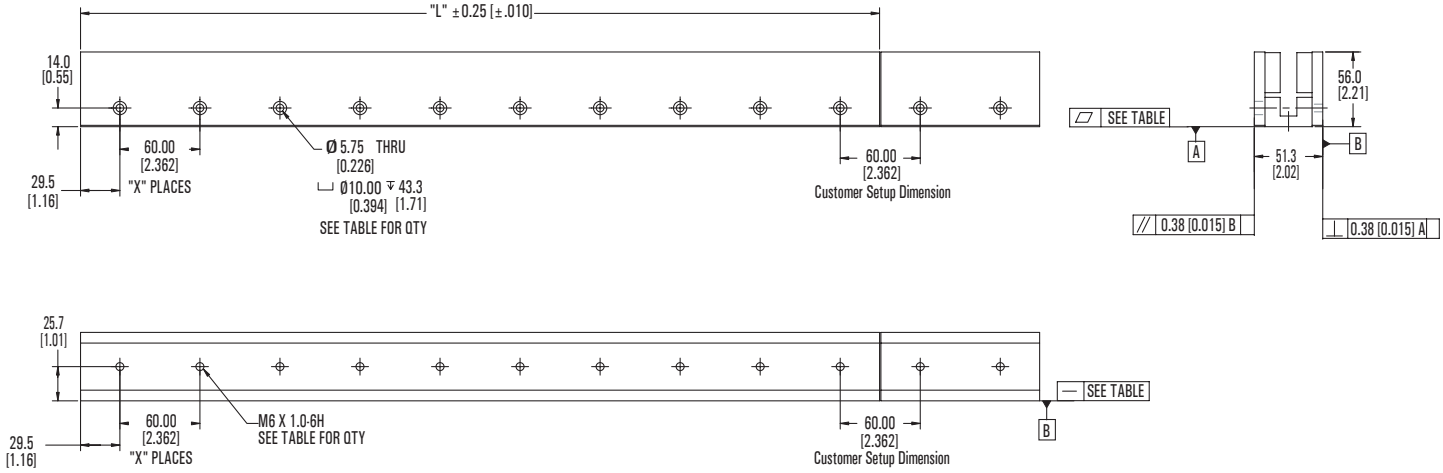
Dimensions mm [in]



Coil												
Size	L	A	B	C	D	E	F	G	H	A1 QTY	A2 QTY	Flatness -A-
030-120	136.00 (5.35)	---	---	---	---	---	---	60.00 (2.362)	126.0 (4.96)	4	3	0.25 (.010)
030-240	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)
030-360	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)
030-480	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-030-HT-XXX



Tolerances

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

Rockwell Automation

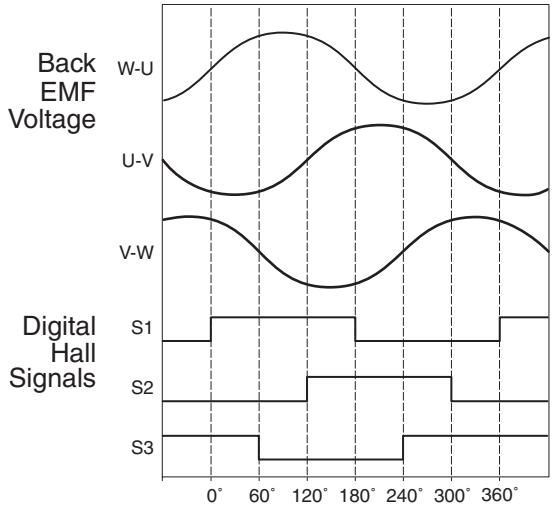
Specifications LZ-050-0-XXX

Performance Parameters	Symbol	Units	LZ-050-0-120				LZ-050-0-240				LZ-050-0-360				LZ-050-0-480			
Continuous Force [1,5,6,7]	F_{cTmax}	N (lb_f)	106 (24)				212 (48)				317 (71)				423 (95)			
Peak Force [2]	F_p	N (lb_f)	529 (119)				1058 (238)				1587 (357)				2116 (476)			
Motor Constant [1]	K_M	$N/\sqrt{W}$ ($lb_f/\sqrt{W}$)	12.7 (2.8)				17.9 (4.0)				21.9 (4.9)				25.3 (5.7)			
Thermal Resistance	R_{th}	°C/W	1.58				0.79				0.53				0.39			
Max Power Dissipation	P_{cTmax}	W	70				139				209				279			
Maximum Applied Bus Voltage [8]	V_{DC}	Volts	325				325				325				325			
Electrical Cycle Length	E_c	mm	60				60				60				60			
Electrical Time Constant	τ_e	msec	1.6				1.6				1.6				1.6			
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 [1]	K_F	N/A_{pk} (lb_f/A_{pk})	35.0 (7.9)	N/A	20.2 (4.5)	N/A	35.0 (7.9)	70.0 (15.7)	20.2 (4.5)	40.4 (9.1)	35.0 (7.9)	105.0 (23.6)	20.2 (4.5)	60.6 (13.6)	35.0 (7.9)	70.0 (15.7)	N/A	40.4 (9.1)
Back EMF Constant p-p [3,4]	K_e	V_p/m/s (V_p/in/s)	41.3 (1.1)	N/A	23.9 (0.6)	N/A	41.3 (1.1)	82.7 (2.1)	23.9 (0.6)	47.7 (1.2)	41.3 (1.1)	124.0 (3.2)	23.9 (0.6)	71.6 (1.8)	41.3 (1.1)	82.7 (2.1)	N/A	47.7 (1.2)
Peak Current [2,4]	I_p	A_{pk} (A_{rms})	15.1 (10.7)	N/A	26.2 (18.5)	N/A	30.2 (21.4)	15.1 (10.7)	52.3 (37.0)	26.2 (18.5)	45.3 (32.0)	15.1 (10.7)	78.5 (55.5)	26.2 (18.5)	60.4 (42.7)	30.2 (21.4)	N/A	52.3 (37.0)
Continuous Current [1,4,5,6]	I_{cTmax}	A_{pk} (A_{rms})	3.0 (2.1)	N/A	5.2 (3.7)	N/A	6.0 (4.3)	3.0 (2.1)	10.5 (7.4)	5.2 (3.7)	9.1 (6.4)	3.0 (2.1)	15.7 (11.1)	5.2 (3.7)	12.1 (8.5)	6.0 (4.3)	N/A)	10.5 (7.4)
Resistance p-p [3] @20°C	R_{20}	ohm	7.11	N/A	2.37	N/A	3.56	14.22	1.19	4.74	2.37	21.33	0.79	7.11	1.78	7.11	N/A	2.37
Inductance p-p [3]	L	mH	11.08	N/A	3.69	N/A	5.54	22.16	1.85	7.39	3.69	33.25	1.23	11.08	2.77	11.08	N/A	3.69
Mechanical Parameters																		
Magnetic Attraction	F_a	N (lb_f)	0 (0)				0 (0)				0 (0)				0 (0)			
Coil Mass	M_c	kg (lb_m)	0.75 (1.66)				1.39 (3.07)				2.03 (4.47)				2.67 (5.88)			
Magnetic Channel Mass	M_n	kg/m (lb/in)	15.59 (0.87)				15.59 (0.87)				15.59 (0.87)				15.59 (0.87)			

Notes: Motor performance specifications are with sinusoidal commutation.

1. 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 774cm² (120in²), 240 coil 1160cm² (180in²), 360 coil 1680cm² (260 in²), 480 coil 2060cm² (320 in²).
2. Calculated at 4% duty cycle with a maximum on time of 1 second.
3. All winding parameters listed are measured line-to-line (phase-to-phase).
4. All currents and voltages are measured 0-peak of the sine wave unless noted rms.
5. Continuous force and current based on coil moving with all phases sharing the same load in sinusoidal commutation.
6. For stand still conditions multiply continuous force and continuous current by 0.9.
7. Coil mountings on either of the two narrow sides reduces continuous force by 10%.
8. 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



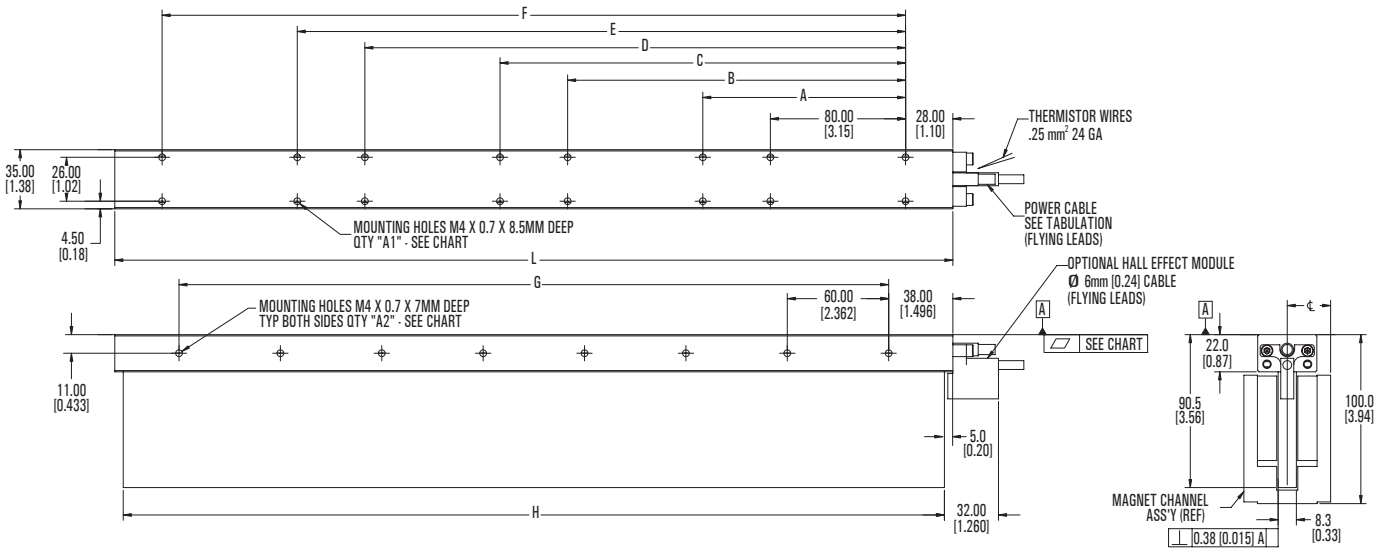
Note: Phasing direction is coil moving towards motor power cable

Dimensions mm [in]

Size	Winding Code	Power Cable Dia.	Gauge
050-120	D F	ϕ6.1 (.24)	0.75mm² (18)
050-240	D E F G	ϕ6.1 (.24)	0.75mm² (18)
050-360	D E F G	ϕ6.1 (.24)	0.75mm² (18)
050-480	D E G	ϕ6.1 (.24)	0.75mm² (18)

Coil Assembly LZ-050-0-XXX

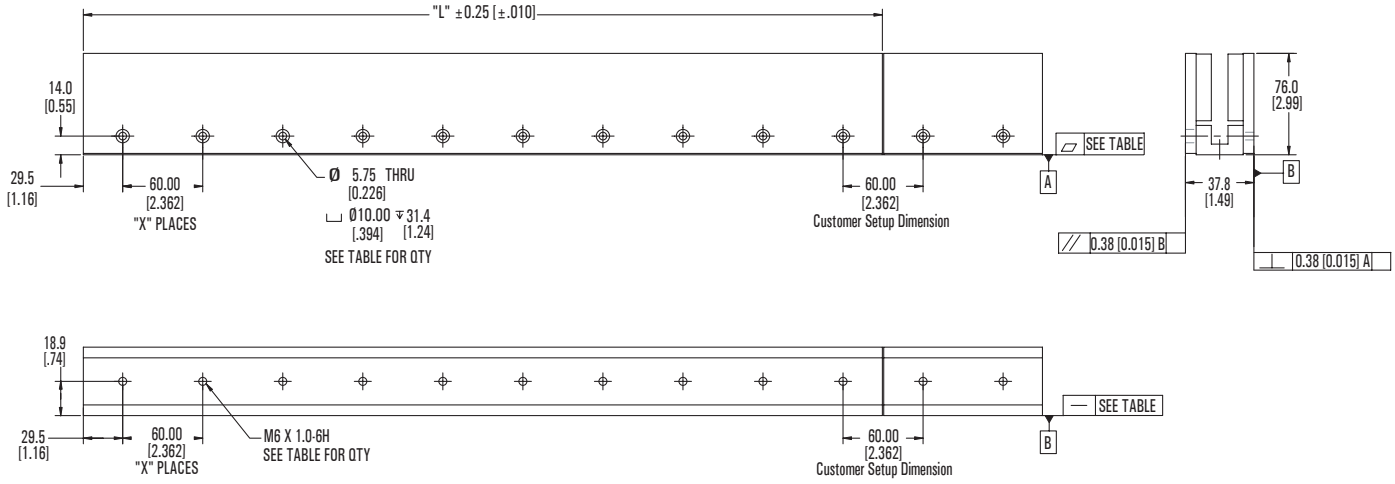
Dimensions mm [in]



Coil												
Size	**L**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**A1 QTY**	**A2 QTY**	**Flatness -A-**
050-120	136.00 (5.35)	---	---	---	---	---	---	60.00 (2.362)	126.0 (4.96)	4	3	0.25 (.010)
050-240	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)
050-360	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)
050-480	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-050-0-XXX



Tolerances

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

Rockwell Automation

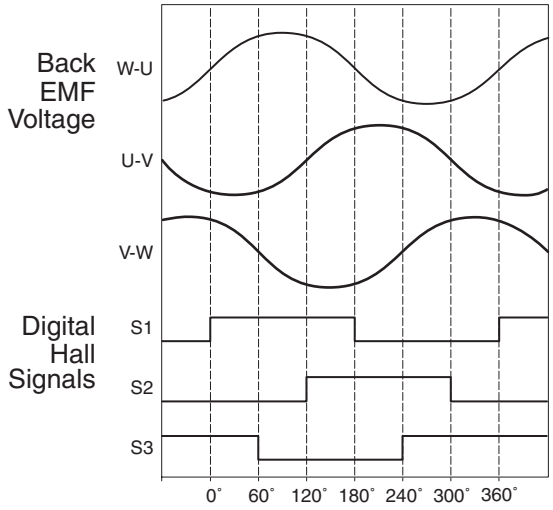
Specifications LZ-050-T-XXX

Performance Parameters	Symbol	Units	LZ-050-T-120				LZ-050-T-240				LZ-050-T-360				LZ-050-T-480			
Continuous Force [1,5,6,7]	F_{cTmax}	N (lb_f)	121 (27)				243 (55)				364 (82)				486 (109)			
Peak Force [2]	F_p	N (lb_f)	607 (136)				1214 (273)				1821 (409)				2428 (546)			
Motor Constant [1]	K_M	$N/\sqrt{W}$ ($lb_f/\sqrt{W}$)	12.6 (2.8)				17.9 (4.0)				21.9 (4.9)				25.3 (5.7)			
Thermal Resistance	R_{th}	°C/W	1.19				0.60				0.40				0.30			
Max Power Dissipation	P_{cTmax}	W	92				185				277				369			
Maximum Applied Bus Voltage [8]	V_{DC}	Volts	325				325				325				325			
Electrical Cycle Length	E_c	mm	60				60				60				60			
Electrical Time Constant	τ_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 [1]	K_F	N/A_{pk} (lb_f/A_{pk})	40.2 (9.0)	N/A	23.2 (5.2)	N/A	40.2 (9.0)	80.4 (18.1)	23.2 (5.2)	46.4 (10.4)	40.2 (9.0)	120.5 (27.1)	23.2 (5.2)	69.6 (15.6)	40.2 (9.0)	80.4 (18.1)	N/A	46.4 (10.4)
Back EMF Constant p-p [3,4]	K_e	V_p/m/s (V_p/in/s)	47.4 (1.2)	N/A	27.4 (0.7)	N/A	47.4 (1.2)	94.9 (2.4)	27.4 (0.7)	54.8 (1.4)	47.4 (1.2)	142.3 (3.6)	27.4 (0.7)	82.2 (2.1)	47.4 (1.2)	94.9 (2.4)	N/A	54.8 (1.4)
Peak Current [2,4]	I_p	A_{pk} (A_{rms})	15.1 (10.7)	N/A	26.2 (18.5)	N/A	30.2 (21.4)	15.1 (10.7)	52.3 (37.0)	26.2 (18.5)	45.3 (32.0)	15.1 (10.7)	78.5 (55.5)	26.2 (18.5)	60.4 (42.7)	30.2 (21.4)	N/A	52.3 (37.0)
Continuous Current [1,4,5,6]	I_{cTmax}	A_{pk} (A_{rms})	3.0 (2.1)	N/A	5.2 (3.7)	N/A	6.0 (4.3)	3.0 (2.1)	10.5 (7.4)	5.2 (3.7)	9.1 (6.4)	3.0 (2.1)	15.7 (11.1)	5.2 (3.7)	12.1 (8.5)	6.0 (4.3)	N/A	10.5 (7.4)
Resistance p-p [3] @20°C	R_{20}	ohm	9.42	N/A	3.14	N/A	4.71	18.83	1.57	6.28	3.14	28.25	1.05	9.42	2.35	9.42	N/A	3.14
Inductance p-p [3]	L	mH	18	N/A	6	N/A	9	35.31	3	11.77	5.88	52.96	1.96	17.65	4.41	17.65	N/A	5.88
Mechanical Parameters																		
Magnetic Attraction	F_a	N (lb_f)	0 (0)				0 (0)				0 (0)				0 (0)			
Coil Mass	M_c	kg (lb_m)	0.91 (2.01)				1.71 (3.77)				2.50 (5.52)				3.30 (7.28)			
Magnetic Channel Mass	M_n	kg/m (lb/in)	15.77 (0.88)				15.77 (0.88)				15.77 (0.88)				15.77 (0.88)			

Notes: Motor performance specifications are with sinusoidal commutation.

1. Continuous forces, motor constant and currents listed are with coils at maximum temperature 130ºC, mounted to a heat sink that is equivalent to an aluminum slide 25.4mm (1.0") thick with the following areas: 120 coil 774cm² (120in²), 240 coil 1160cm² (180in²), 360 coil 1680cm² (260 in²), 480 coil 2060cm² (320 in²).
2. Calculated at 4% duty cycle with a maximum on time of 1 second.
3. All winding parameters listed are measured line-to-line (phase-to-phase).
4. All currents and voltages are measured 0-peak of the sine wave unless noted rms.
5. Continuous force and current based on coil moving with all phases sharing the same load in sinusoidal commutation.
6. For stand still conditions multiply continuous force and continuous current by 0.9.
7. Coil mountings on either of the two narrow sides reduces continuous force by 10%.
8. 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



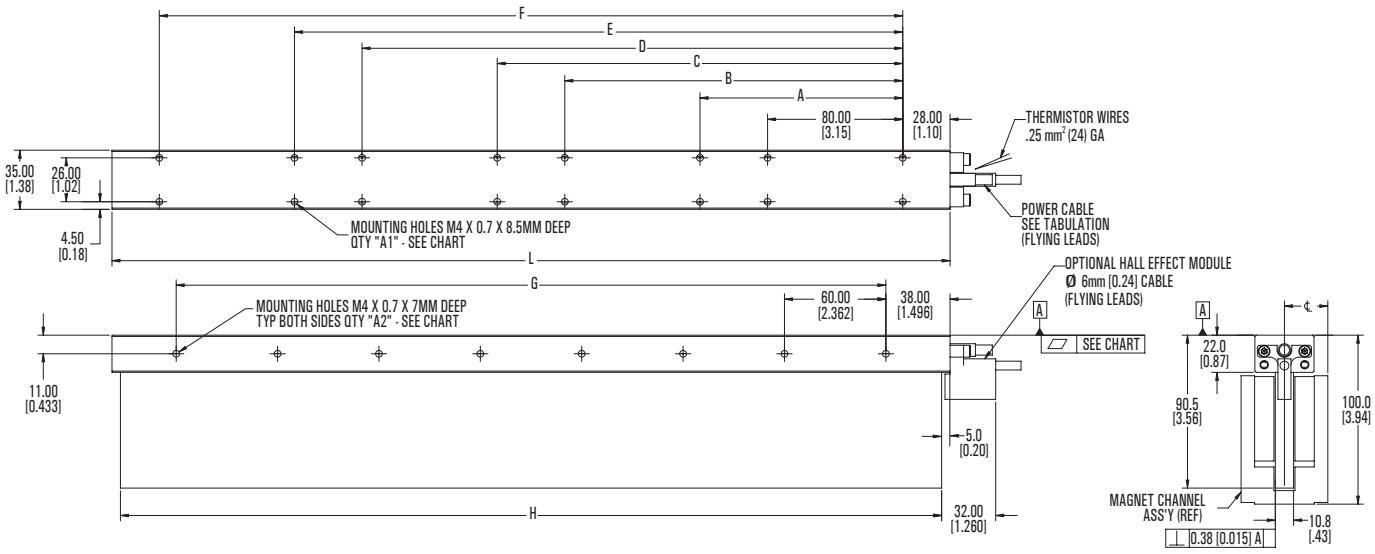
Note: Phasing direction is coil moving towards motor power cable

Dimensions mm [in]

Size	Winding Code	Power Cable Dia.	Gauge
050-120	D F	ϕ6.1 (.24)	0.75mm² (18)
050-240	D E F G	ϕ6.1 (.24)	0.75mm² (18)
050-360	D E F G	ϕ6.1 (.24)	0.75mm² (18)
050-480	D E G	ϕ6.1 (.24)	0.75mm² (18)

Coil Assembly LZ-050-T-XXX

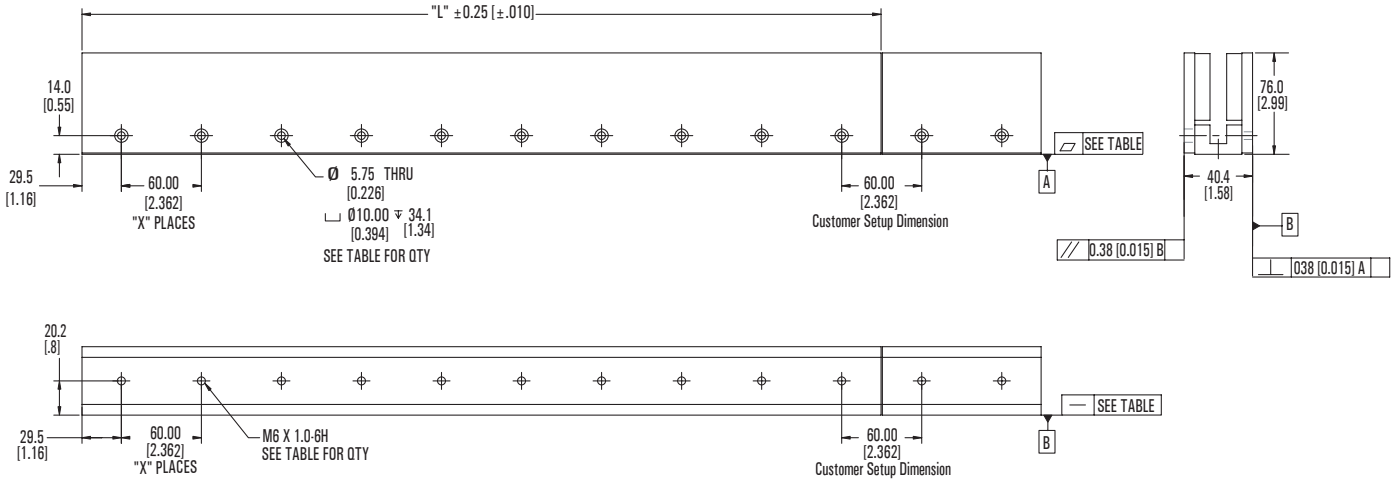
Dimensions mm [in]



Coil												
Size	L	A	B	C	D	E	F	G	H	A1 QTY	A2 QTY	Flatness -A-
050-120	136.00 (5.35)	---	---	---	---	---	---	60.00 (2.362)	126.0 (4.96)	4	3	0.25 (.010)
050-240	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)
050-360	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)
050-480	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-050-T-XXX



Tolerances

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

Rockwell Automation

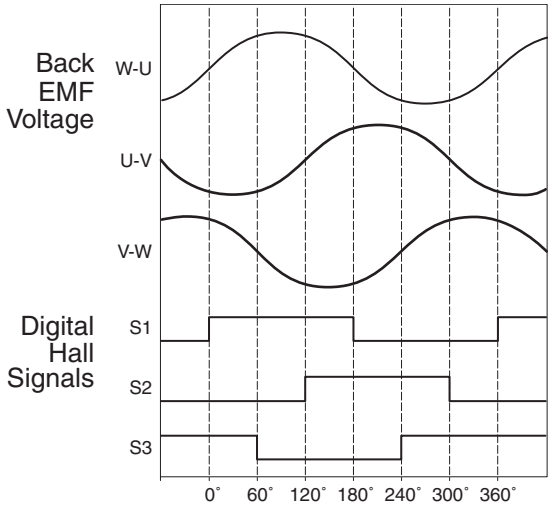
Specifications LZ-050-HT-XXX

Performance Parameters	Symbol	Units	LZ-050-HT-120				LZ-050-HT-240				LZ-050-HT-360				LZ-050-HT-480			
Continuous Force [1,5,6,7]	F_{cTmax}	N (lb_f)	134 (30)				267 (60)				401 (90)				534 (120)			
Peak Force [2]	F_p	N (lb_f)	668 (150)				1335 (300)				2003 (450)				2671 (600)			
Motor Constant [1]	K_M	$N/\sqrt{W}$ ($lb_f/\sqrt{W}$)	13.9 (3.1)				19.7 (4.4)				24.1 (5.4)				27.8 (6.2)			
Thermal Resistance	R_{th}	°C/W	1.19				0.60				0.40				0.30			
Max Power Dissipation	P_{cTmax}	W	92				185				277				369			
Maximum Applied Bus Voltage [8]	V_{DC}	Volts	325				325				325				325			
Electrical Cycle Length	E_c	mm	60				60				60				60			
Electrical Time Constant	τ_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 [1]	K_F	N/A_{pk} (lb_f/A_{pk})	44.2 (9.9)	N/A	25.5 (5.7)	N/A	44.2 (9.9)	88.4 (19.9)	25.5 (5.7)	51.0 (11.5)	44.2 (9.9)	132.6 (29.8)	25.5 (5.7)	76.5 (17.2)	44.2 (9.9)	88.4 (19.9)	N/A	51.0 (11.5)
Back EMF Constant p-p [3,4]	K_e	V_p/m/s (V_p/in/s)	52.2 (1.3)	N/A	30.1 (0.8)	N/A	52.2 (1.3)	104.4 (2.7)	30.1 (0.8)	60.3 (1.5)	52.2 (1.3)	156.6 (4.0)	30.1 (0.8)	90.4 (2.3)	52.2 (1.3)	104.4 (2.7)	N/A	60.3 (1.5)
Peak Current [2,4]	I_p	A_{pk} (A_{rms})	15.1 (10.7)	N/A	26.2 (18.5)	N/A	30.2 (21.4)	15.1 (10.7)	52.3 (37.0)	26.2 (18.5)	45.3 (32.0)	15.1 (10.7)	78.5 (55.5)	26.2 (18.5)	60.4 (42.7)	30.2 (21.4)	N/A	52.3 (37.0)
Continuous Current [1,4,5,6]	I_{cTmax}	A_{pk} (A_{rms})	3.0 (2.1)	N/A	5.2 (3.7)	N/A	6.0 (4.3)	3.0 (2.1)	10.5 (7.4)	5.2 (3.7)	9.1 (6.4)	3.0 (2.1)	15.7 (11.1)	5.2 (3.7)	12.1 (8.5)	6.0 (4.3)	N/A	10.5 (7.4)
Resistance p-p [3] @20°C	R_{20}	ohm	9.42	N/A	3.14	N/A	4.71	18.83	1.57	6.28	3.14	28.25	1.05	9.42	2.35	9.42	N/A	3.14
Inductance p-p [3]	L	mH	17.65	N/A	5.88	N/A	8.83	35.31	2.94	11.77	5.88	52.96	1.96	17.65	4.41	17.65	N/A	5.88
Mechanical Parameters																		
Magnetic Attraction	F_a	N (lb_f)	0 (0)				0 (0)				0 (0)				0 (0)			
Coil Mass	M_c	kg (lb_m)	0.91 (2.01)				1.71 (3.77)				2.50 (5.52)				3.30 (7.28)			
Magnetic Channel Mass	M_n	kg/m (lb/in)	21.52 (1.21)				21.52 (1.21)				21.52 (1.21)				21.52 (1.21)			

Notes: Motor performance specifications are with sinusoidal commutation.

1. 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 774cm² (120in²), 240 coil 1160cm² (180in²), 360 coil 1680cm² (260 in²), 480 coil 2060cm² (320 in²).
2. Calculated at 4% duty cycle with a maximum on time of 1 second.
3. All winding parameters listed are measured line-to-line (phase-to-phase).
4. All currents and voltages are measured 0-peak of the sine wave unless noted rms.
5. Continuous force and current based on coil moving with all phases sharing the same load in sinusoidal commutation.
6. For stand still conditions multiply continuous force and continuous current by 0.9.
7. Coil mountings on either of the two narrow sides reduces continuous force by 10%.
8. 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



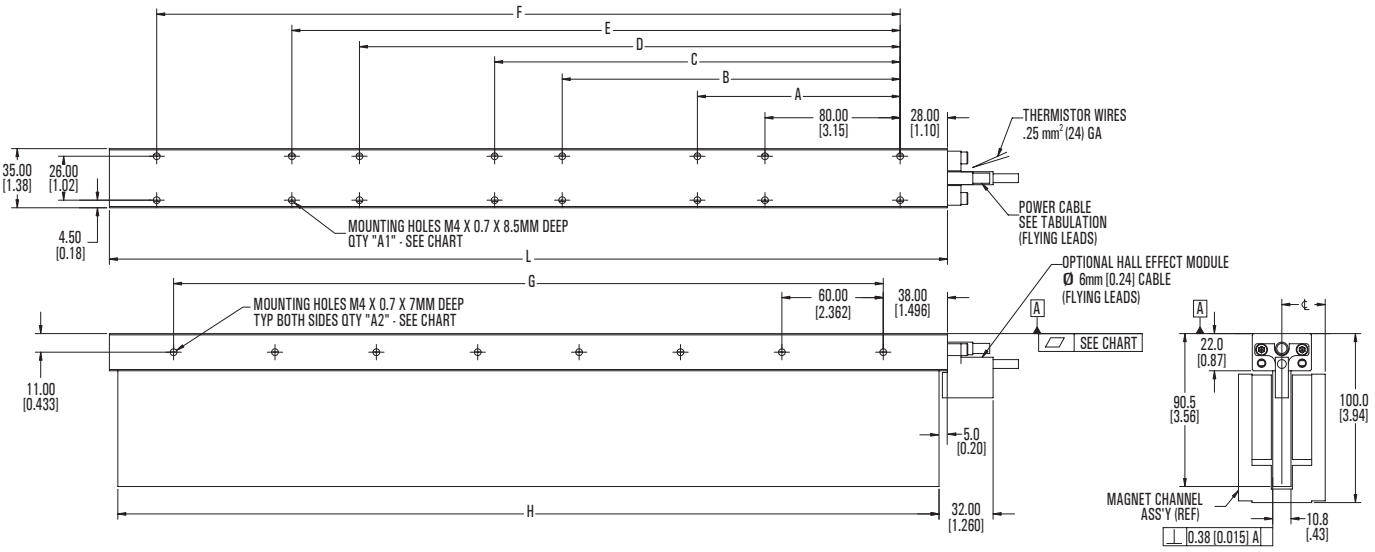
Note: Phasing direction is coil moving towards motor power cable

Dimensions mm [in]

Size	Winding Code	Power Cable Dia.	Gauge
050-120	D F	ϕ6.1 (.24)	0.75mm² (18)
050-240	D E F G	ϕ6.1 (.24)	0.75mm² (18)
050-360	D E F G	ϕ6.1 (.24)	0.75mm² (18)
050-480	D E G	ϕ6.1 (.24)	0.75mm² (18)

Coil Assembly LZ-050-HT-XXX

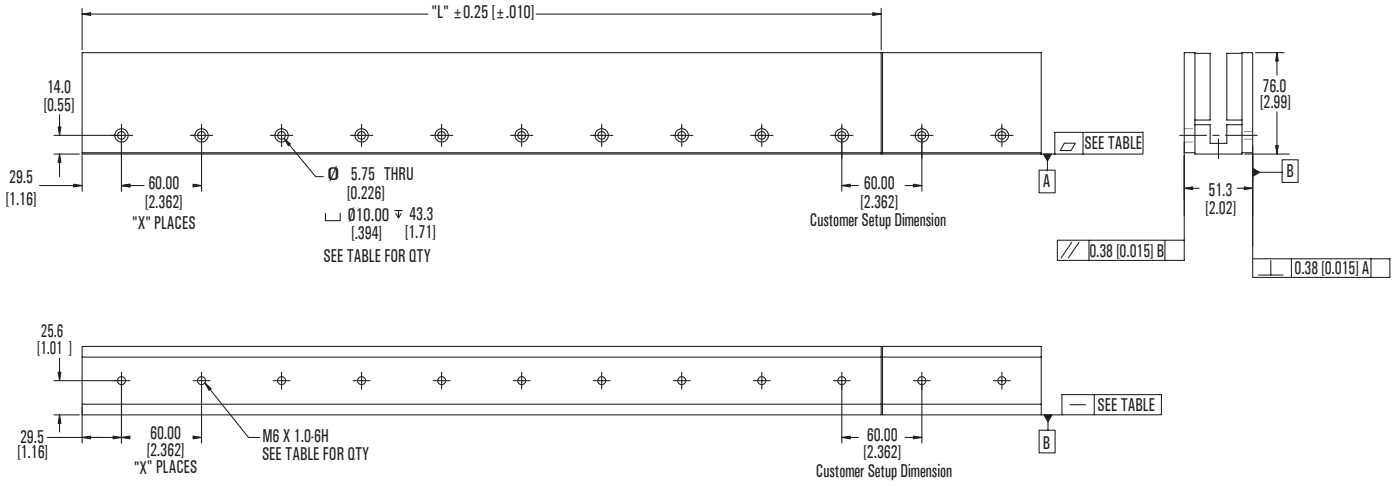
Dimensions mm [in]



Coil												
Size	L	A	B	C	D	E	F	G	H	A1 QTY	A2 QTY	Flatness -A-
050-120	136.00 (5.35)	---	---	---	---	---	---	60.00 (2.362)	126.0 (4.96)	4	3	0.25 (.010)
050-240	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)
050-360	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)
050-480	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-050-HT-XXX



Tolerances

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

Rockwell Automation

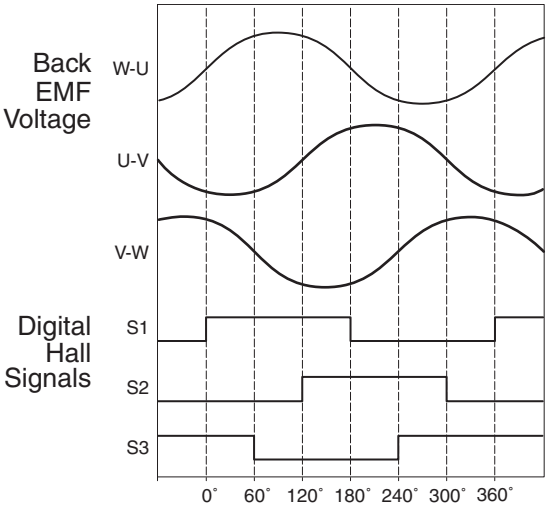
Specifications LZ-075-0-XXX

Performance Parameters	Symbol	Units	LZ-075-0-120				LZ-075-0-240				LZ-075-0-360				LZ-075-0-480			
Continuous Force [1,5,6,7]	F_{cTmax}	N (lb_f)	144 (32)				287 (65)				431 (97)				574 (129)			
Peak Force [2]	F_p	N (lb_f)	718 (161)				1436 (323)				2153 (484)				2871 (645)			
Motor Constant [1]	K_M	$N/\sqrt{W}$ ($lb_f/\sqrt{W}$)	16.7 (3.7)				23.6 (5.3)				28.9 (6.5)				33.3 (7.5)			
Thermal Resistance	R_{th}	°C/W	1.48				0.74				0.49				0.37			
Max Power Dissipation	P_{cTmax}	W	74				148				222				297			
Maximum Applied Bus Voltage [8]	V_{DC}	Volts	325				325				325				325			
Electrical Cycle Length	E_c	mm	60				60				60				60			
Electrical Time Constant	τ_e	msec	1.6				1.6				1.6				1.6			
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 [1]	K_F	N/A_{pk} (lb_f/A_{pk})	52.5 (11.8)	N/A	30.3 (6.8)	N/A	52.5 (11.8)	105.0 (23.6)	30.3 (6.8)	60.6 (13.6)	52.5 (11.8)	157.5 (35.4)	30.3 (6.8)	91.0 (20.4)	52.5 (11.8)	105.0 (23.6)	N/A	60.6 (13.6)
Back EMF Constant p-p [3,4]	K_e	V_p/m/s (V_p/in/s)	62.0 (1.6)	N/A	35.8 (0.9)	N/A	62.0 (1.6)	124.0 (3.2)	35.8 (0.9)	71.6 (1.8)	62.0 (1.6)	186.0 (4.7)	35.8 (0.9)	107.4 (2.7)	62.0 (1.6)	124.0 (3.2)	N/A	71.6 (1.8)
Peak Current [2,4]	I_p	A_{pk} (A_{rms})	13.7 (9.7)	N/A	23.7 (16.7)	N/A	27.3 (19.3)	13.7 (9.7)	47.3 (33.5)	23.7 (16.7)	41.0 (29.0)	13.7 (9.7)	71.0 (50.2)	23.7 (16.7)	54.7 (38.7)	27.3 (19.3)	N/A	47.3 (33.5)
Continuous Current [1,4,5,6]	I_{cTmax}	A_{pk} (A_{rms})	2.7 (1.9)	N/A	4.7 (3.3)	N/A	5.5 (3.9)	2.7 (1.9)	9.5 (6.7)	4.7 (3.3)	8.2 (5.8)	2.7 (1.9)	14.2 (10.0)	4.7 (3.3)	10.9 (7.7)	5.5 (3.9)	N/A	9.5 (6.7)
Resistance p-p [3] @20°C	R_{20}	ohm	9.24	N/A	3.08	N/A	4.62	18.48	1.54	6.16	3.08	27.72	1.03	9.24	2.31	9.24	N/A	3.08
Inductance p-p [3]	L	mH	14.40	N/A	4.80	N/A	7.20	28.79	2.40	9.60	4.80	43.19	1.60	14.40	3.60	14.40	N/A	4.80
Mechanical Parameters																		
Magnetic Attraction	F_a	N (lb_f)	0 (0)				0 (0)				0 (0)				0 (0)			
Coil Mass	M_c	kg (lb_m)	0.92 (2.02)				1.72 (3.79)				2.52 (5.55)				3.32 (7.32)			
Magnetic Channel Mass	M_n	kg/m (lb/in)	24.25 (1.36)				24.25 (1.36)				24.25 (1.36)				24.25 (1.36)			

Notes: Motor performance specifications are with sinusoidal commutation.

1. Continuous forces, motor constant and currents listed are with coils at maximum temperature 130ºC, mounted to a heat sink that is equivalent to an aluminum slide 25.4mm (1.0") thick with the following areas: 120 coil 774cm² (120in²), 240 coil 1160cm² (180in²), 360 coil 1680cm² (260 in²), 480 coil 2060cm² (320 in²).
2. Calculated at 4% duty cycle with a maximum on time of 1 second.
3. All winding parameters listed are measured line-to-line (phase-to-phase).
4. All currents and voltages are measured 0-peak of the sine wave unless noted rms.
5. Continuous force and current based on coil moving with all phases sharing the same load in sinusoidal commutation.
6. For stand still conditions multiply continuous force and continuous current by 0.9.
7. Coil mountings on either of the two narrow sides reduces continuous force by 10%.
8. 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



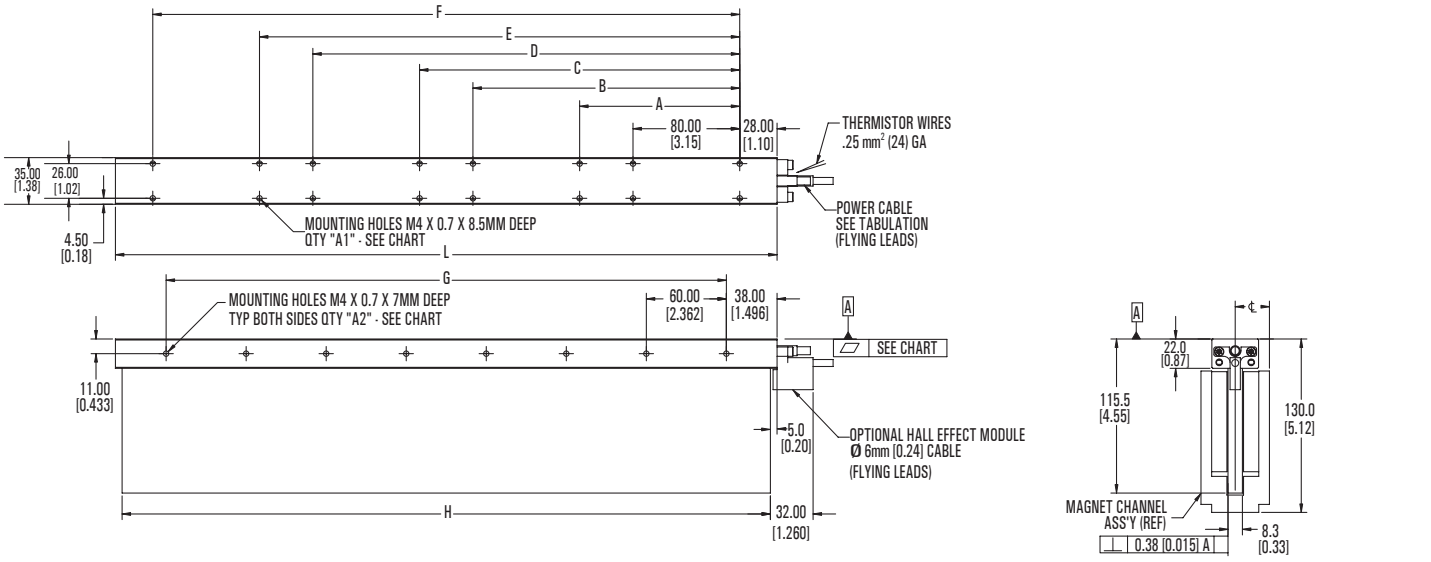
Note: Phasing direction is coil moving towards motor power cable

Dimensions mm [in]

Size	Winding Code	Power Cable Dia.	Gauge
075-120	D F	ϕ6.1 (.24)	0.75mm² (18)
075-240	D E F G	ϕ6.1 (.24)	0.75mm² (18)
075-360	D E F G	ϕ6.1 (.24)	0.75mm² (18)
075-480	D E G	ϕ6.1 (.24)	0.75mm² (18)

Coil Assembly LZ-075-0-XXX

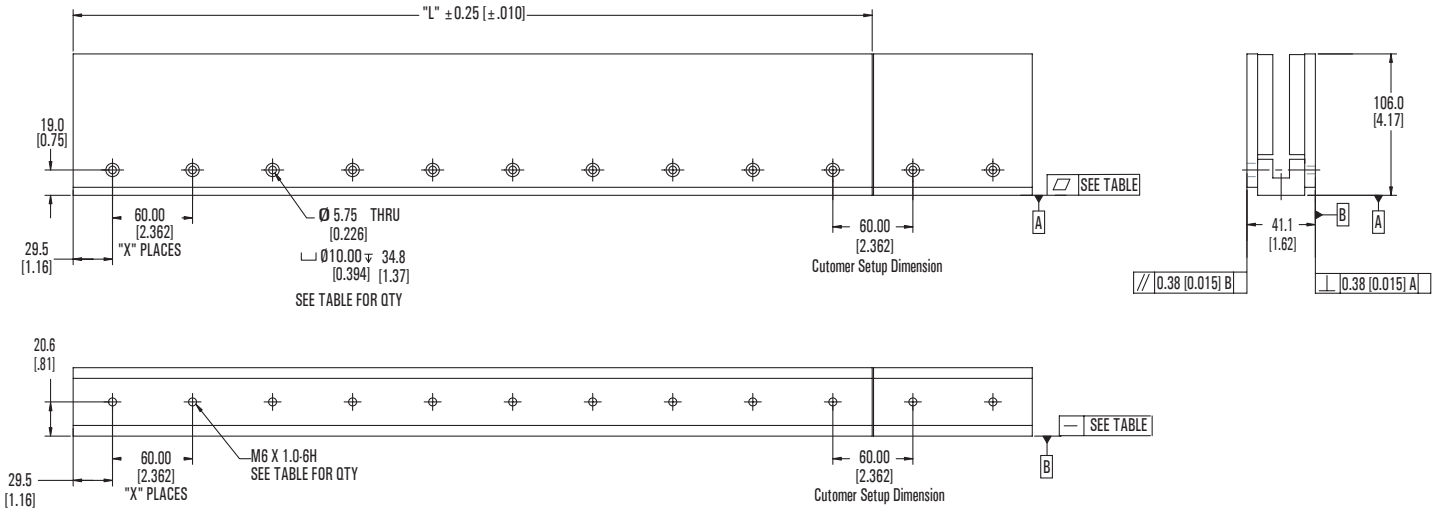
Dimensions mm [in]



Coil												
Size	L	A	B	C	D	E	F	G	H	A1 QTY	A2 QTY	Flatness -A-
075-120	136.00 (5.35)	---	---	---	---	---	---	60.00 (2.362)	126.0 (4.96)	4	3	0.25 (.010)
075-240	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)
075-360	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)
075-480	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-075-0-XXX



Tolerances

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

Rockwell Automation

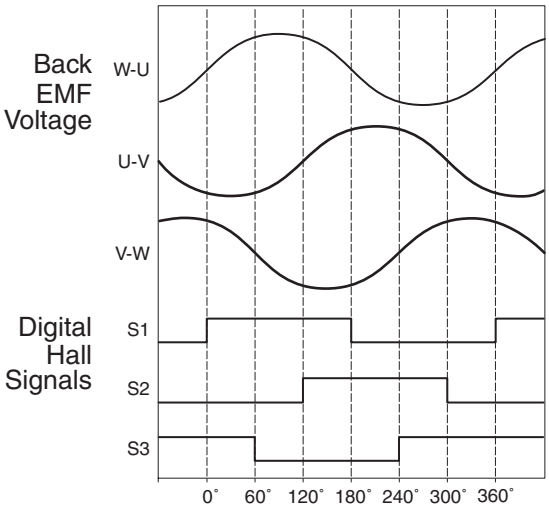
Specifications LZ-075-T-XXX

Performance Parameters	Symbol	Units	LZ-075-T-120				LZ-075-T-240				LZ-075-T-360				LZ-075-T-480			
Continuous Force [1,5,6,7]	F_{cTmax}	N (lb_f)	165 (37)				329 (74)				494 (111)				659 (148)			
Peak Force [2]	F_p	N (lb_f)	824 (185)				1647 (370)				2471 (556)				3295 (741)			
Motor Constant [1]	K_M	$N/\sqrt{W}$ ($lb_f/\sqrt{W}$)	16.6 (3.7)				23.5 (5.3)				28.8 (6.5)				33.2 (7.5)			
Thermal Resistance	R_{th}	°C/W	1.12				0.56				0.37				0.28			
Max Power Dissipation	P_{cTmax}	W	98				197				295				393			
Maximum Applied Bus Voltage [8]	V_{DC}	Volts	325				325				325				325			
Electrical Cycle Length	E_c	mm	60				60				60				60			
Electrical Time Constant	τ_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 [1]	K_F	N/A_{pk} (lb_f/A_{pk})	60.3 (13.5)	N/A	34.8 (7.8)	N/A	60.3 (13.5)	120.5 (27.1)	34.8 (7.8)	69.6 (15.6)	60.3 (13.5)	180.8 (40.6)	34.8 (7.8)	104.4 (23.5)	60.3 (13.5)	120.5 (27.1)	N/A	69.6 (15.6)
Back EMF Constant p-p [3,4]	K_e	V_p/m/s (V_p/in/s)	71.2 (1.8)	N/A	41.1 (1.0)	N/A	71.2 (1.8)	142.3 (3.6)	41.1 (1.0)	82.2 (2.1)	71.2 (1.8)	213.5 (5.4)	41.1 (1.0)	123.3 (3.1)	71.2 (1.8)	142.3 (3.6)	N/A	82.2 (2.1)
Peak Current [2,4]	I_p	A_{pk} (A_{rms})	13.7 (9.7)	N/A	23.7 (16.7)	N/A	27.3 (19.3)	13.7 (9.7)	47.3 (33.5)	23.7 (16.7)	41.0 (29.0)	13.7 (9.7)	71.0 (50.2)	23.7 (16.7)	54.7 (38.7)	27.3 (19.3)	N/A	47.3 (33.5)
Continuous Current [1,4,5,6]	I_{cTmax}	A_{pk} (A_{rms})	2.7 (1.9)	N/A	4.7 (3.3)	N/A	5.5 (3.9)	2.7 (1.9)	9.5 (6.7)	4.7 (3.3)	8.2 (5.8)	2.7 (1.9)	14.2 (10.0)	4.7 (3.3)	10.9 (7.7)	5.5 (3.9)	N/A)	9.5 (6.7)
Resistance p-p [3] @20°C	R_{20}	ohm	12.25	N/A	4.08	N/A	6.12	24.50	2.04	8.17	4.08	36.75	1.36	12.25	3.06	12.25	N/A	4.08
Inductance p-p [3]	L	mH	22.97	N/A	7.66	N/A	11.48	45.94	3.83	15.31	7.66	68.91	2.55	22.97	5.74	22.97	N/A	7.66
Mechanical Parameters																		
Magnetic Attraction	F_a	N (lb_f)	0 (0)				0 (0)				0 (0)				0 (0)			
Coil Mass	M_c	kg (lb_m)	1.13 (2.49)				2.14 (4.72)				3.15 (6.95)				4.16 (9.18)			
Magnetic Channel Mass	M_n	kg/m (lb/in)	24.51 (1.37)				24.51 (1.37)				24.51 (1.37)				24.51 (1.37)			

Notes: Motor performance specifications are with sinusoidal commutation.

1. 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 774cm² (120in²), 240 coil 1160cm² (180in²), 360 coil 1680cm² (260 in²), 480 coil 2060cm² (320 in²).
2. Calculated at 4% duty cycle with a maximum on time of 1 second.
3. All winding parameters listed are measured line-to-line (phase-to-phase).
4. All currents and voltages are measured 0-peak of the sine wave unless noted rms.
5. Continuous force and current based on coil moving with all phases sharing the same load in sinusoidal commutation.
6. For stand still conditions multiply continuous force and continuous current by 0.9.
7. Coil mountings on either of the two narrow sides reduces continuous force by 10%.
8. 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



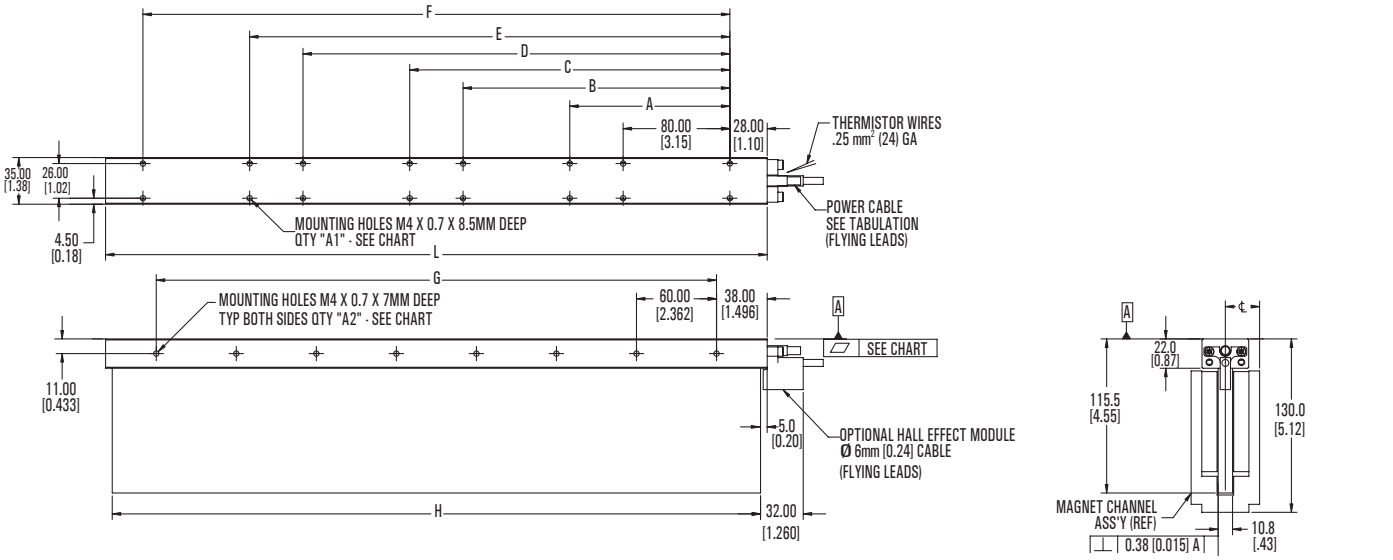
Note: Phasing direction is coil moving towards motor power cable

Dimensions mm [in]

Size	Winding Code	Power Cable Dia.	Gauge
075-120	D F	ϕ6.1 (.24)	0.75mm² (18)
075-240	D E F G	ϕ6.1 (.24)	0.75mm² (18)
075-360	D E F G	ϕ6.1 (.24)	0.75mm² (18)
075-480	D E G	ϕ6.1 (.24)	0.75mm² (18)

Coil Assembly LZ-075-T-XXX

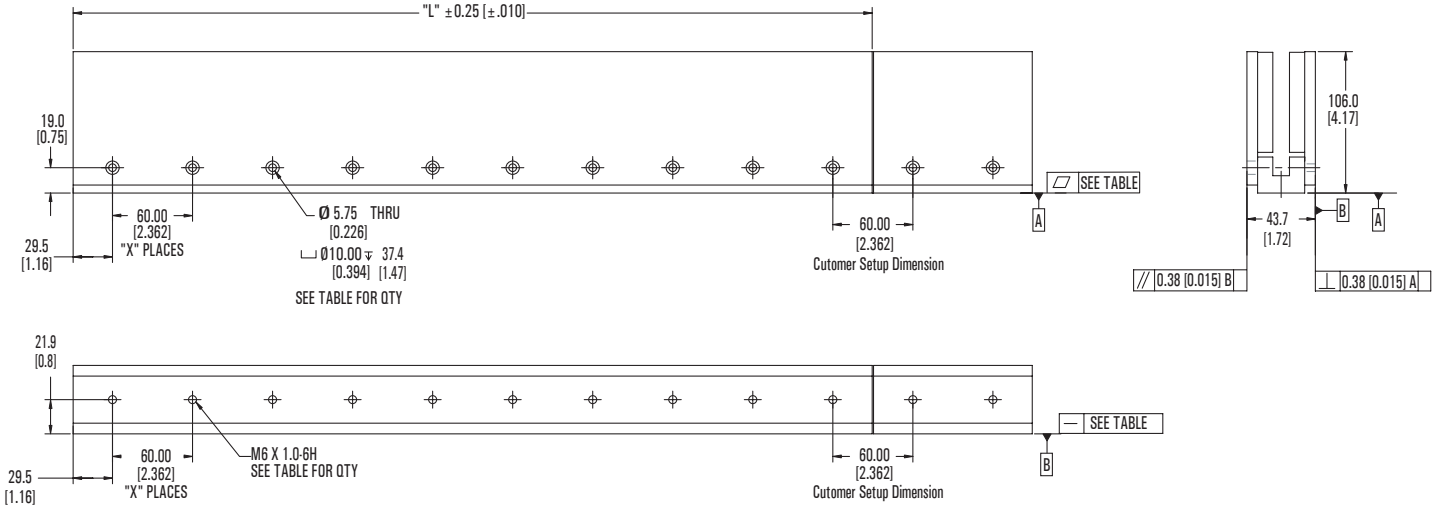
Dimensions mm [in]



Coil												
Size	L	A	B	C	D	E	F	G	H	A1 QTY	A2 QTY	Flatness -A-
075-120	136.00 (5.35)	---	---	---	---	---	---	60.00 (2.362)	126.0 (4.96)	4	3	0.25 (.010)
075-240	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)
075-360	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)
075-480	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-075-T-XXX



Tolerances

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

Rockwell Automation

Specifications LZ-075-HT-XXX

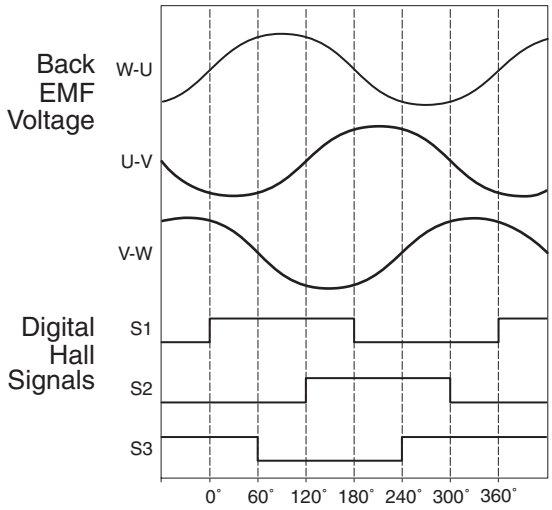
Performance Parameters	Symbol	Units	LZ-075-HT-120				LZ-075-HT-240				LZ-075-HT-360				LZ-075-HT-480			
Continuous Force [1,5,6,7]	F_{cTmax}	N (lb_f)	181 (41)				362 (81)				544 (122)				725 (163)			
Peak Force [2]	F_p	N (lb_f)	906 (204)				1812 (407)				2718 (611)				3624 (815)			
Motor Constant [1]	K_M	$N/\sqrt{W}$ ($lb_f/\sqrt{W}$)	18.3 (4.1)				25.8 (5.8)				31.7 (7.1)				36.5 (8.2)			
Thermal Resistance	R_{th}	°C/W	1.12				0.56				0.37				0.28			
Max Power Dissipation	P_{cTmax}	W	98				197				295				393			
Maximum Applied Bus Voltage [8]	V_{DC}	Volts	325				325				325				325			
Electrical Cycle Length	E_c	mm	60				60				60				60			
Electrical Time Constant	τ_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 [1]	K_F	N/A_{pk} (lb_f/A_{pk})	66.3 (14.9)	N/A	38.3 (8.6)	N/A	66.3 (14.9)	132.6 (29.8)	38.3 (8.6)	76.5 (17.2)	66.3 (14.9)	198.9 (44.7)	38.3 (8.6)	114.8 (25.8)	66.3 (14.9)	132.6 (29.8)	N/A	76.5 (17.2)
Back EMF Constant p-p [3,4]	K_e	V_p/m/s (V_p/in/s)	78.3 (2.0)	N/A	45.2 (1.1)	N/A	78.3 (2.0)	156.6 (4.0)	45.2 (1.1)	90.4 (2.3)	78.3 (2.0)	234.8 (6.0)	45.2 (1.1)	135.6 (3.4)	78.3 (2.0)	156.6 (4.0)	N/A	90.4 (2.3)
Peak Current [2,4]	I_p	A_{pk} (A_{rms})	13.7 (9.7)	N/A	23.7 (16.7)	N/A	27.3 (19.3)	13.7 (9.7)	47.3 (33.5)	23.7 (16.7)	41.0 (29.0)	13.7 (9.7)	71.0 (50.2)	23.7 (16.7)	54.7 (38.7)	27.3 (19.3)	N/A	47.3 (33.5)
Continuous Current [1,4,5,6]	I_{cTmax}	A_{pk} (A_{rms})	2.7 (1.9)	N/A	4.7 (3.3)	N/A	5.5 (3.9)	2.7 (1.9)	9.5 (6.7)	4.7 (3.3)	8.2 (5.8)	2.7 (1.9)	14.2 (10.0)	4.7 (3.3)	10.9 (7.7)	5.5 (3.9)	N/A	9.5 (6.7)
Resistance p-p [3] @20°C	R_{20}	ohm	12.25	N/A	4.08	N/A	6.12	24.50	2.04	8.17	4.08	36.75	1.36	12.25	3.06	12.25	N/A	4.08
Inductance p-p [3]	L	mH	22.97	N/A	7.66	N/A	11.48	45.94	3.83	15.31	7.66	68.91	2.55	22.97	5.74	22.97	N/A	7.66
Mechanical Parameters																		
Magnetic Attraction	F_a	N (lb_f)	0 (0)				0 (0)				0 (0)				0 (0)			
Coil Mass	M_c	kg (lb_m)	1.13 (2.49)				2.14 (4.72)				3.15 (6.95)				4.16 (9.18)			
Magnetic Channel Mass	M_n	kg/m (lb/in)	29.96 (1.68)				29.96 (1.68)				29.96 (1.68)				29.96 (1.68)			

Notes: Motor performance specifications are with sinusoidal commutation.

1. Continuous forces, motor constant and currents listed are with coils at maximum temperature 130ºC, mounted to a heat sink that is equivalent to an aluminum slide 25.4mm (1.0") thick with the following areas: 120 coil 774cm² (120in²), 240 coil 1160cm² (180in²), 360 coil 1680cm² (260 in²), 480 coil 2060cm² (320 in²).
2. Calculated at 4% duty cycle with a maximum on time of 1 second.
3. All winding parameters listed are measured line-to-line (phase-to-phase).
4. All currents and voltages are measured 0-peak of the sine wave unless noted rms.
5. Continuous force and current based on coil moving with all phases sharing the same load in sinusoidal commutation.
6. For stand still conditions multiply continuous force and continuous current by 0.9.
7. Coil mountings on either of the two narrow sides reduces continuous force by 10%.
8. 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



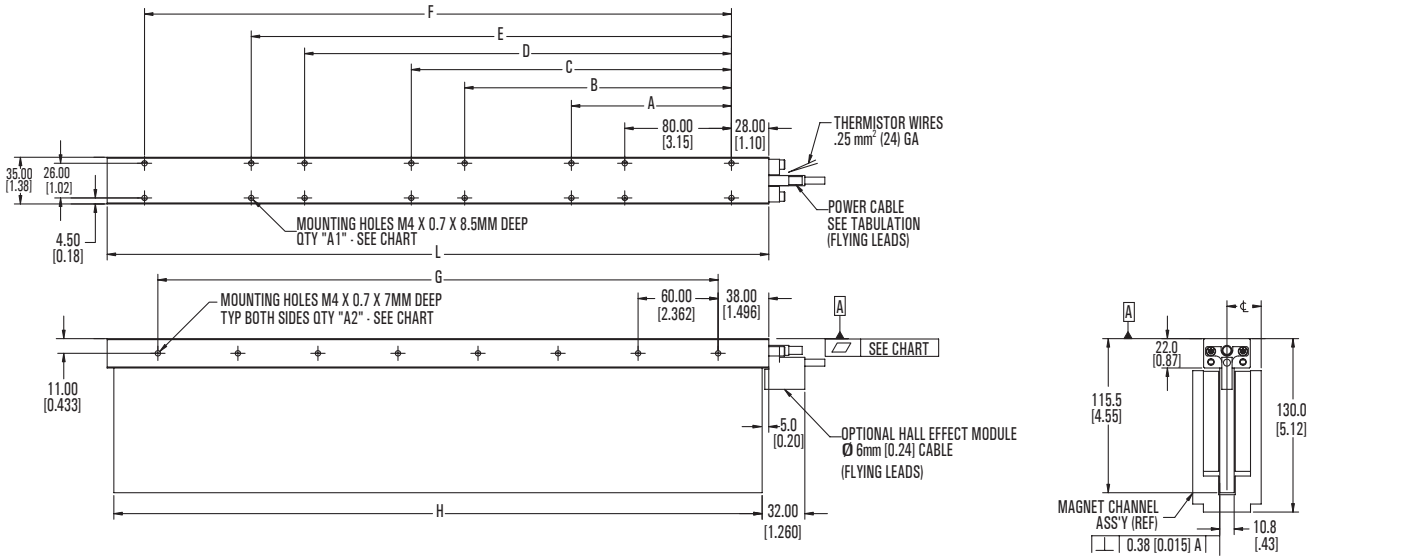
Note: Phasing direction is coil moving towards motor power cable

Dimensions mm [in]

Size	Winding Code	Power Cable Dia.	Gauge
075-120	D F	ϕ6.1 (.24)	0.75mm² (18)
075-240	D E F G	ϕ6.1 (.24)	0.75mm² (18)
075-360	D E F G	ϕ6.1 (.24)	0.75mm² (18)
075-480	D E G	ϕ6.1 (.24)	0.75mm² (18)

Coil Assembly LZ-075-HT-XXX

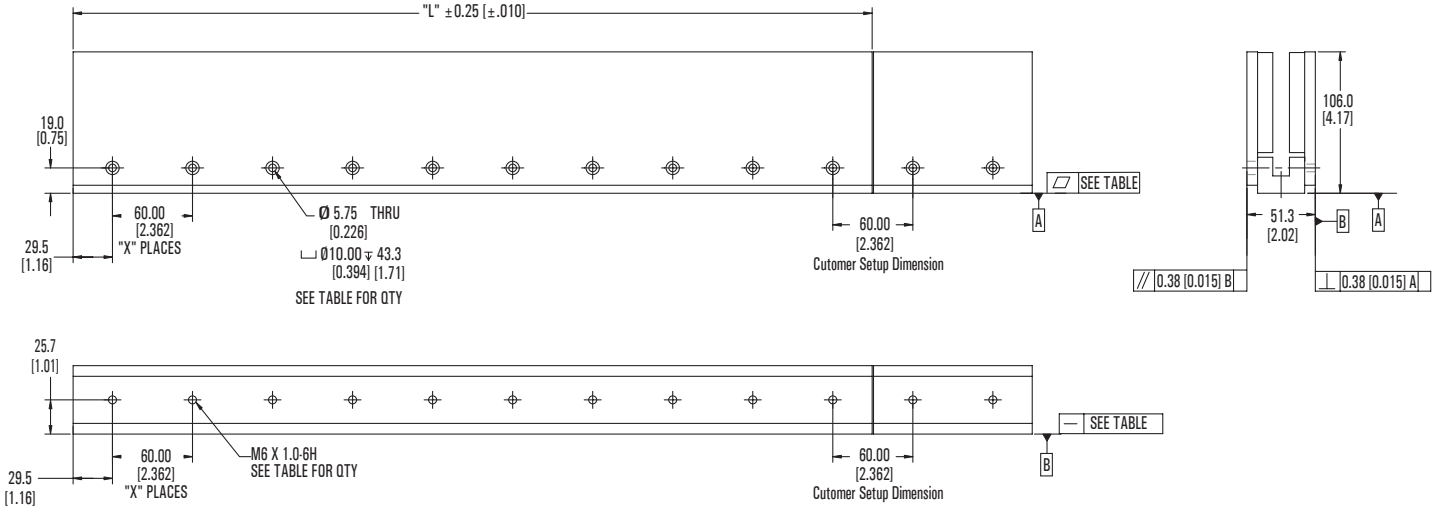
Dimensions mm [in]



Coil												
Size	L	A	B	C	D	E	F	G	H	A1 QTY	A2 QTY	Flatness -A-
075-120	136.00 (5.35)	---	---	---	---	---	---	60.00 (2.362)	126.0 (4.96)	4	3	0.25 (.010)
075-240	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)
075-360	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)
075-480	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-075-HT-XXX



Tolerances

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

Rockwell Automation

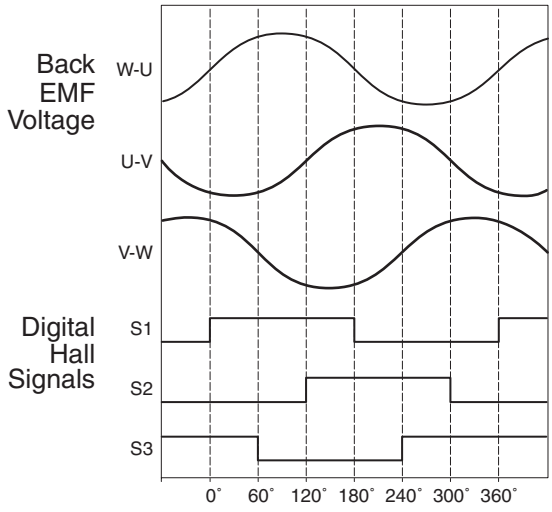
Specifications LZ-100-0-XXX

Performance Parameters	Symbol	Units	LZ-100-0-120				LZ-100-0-240				LZ-100-0-360				LZ-100-0-480			
Continuous Force [1,5,6,7]	F_{cTmax}	N (lb_f)	171 (39)				343 (77)				514 (116)				685 (154)			
Peak Force [2]	F_p	N (lb_f)	856 (193)				1713 (385)				2569 (578)				3425 (770)			
Motor Constant [1]	K_M	$N/\sqrt{W}$ ($lb_f/\sqrt{W}$)	20.0 (4.5)				28.3 (6.4)				34.7 (7.8)				40.1 (9.0)			
Thermal Resistance	R_{th}	°C/W	1.51				0.75				0.50				0.38			
Max Power Dissipation	P_{cTmax}	W	73				146				219				292			
Maximum Applied Bus Voltage [8]	V_{DC}	Volts	325				325				325				325			
Electrical Cycle Length	E_c	mm	60				60				60				60			
Electrical Time Constant	τ_e	msec	1.6				1.6				1.6				1.6			
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 [1]	K_F	N/A_{pk} (lb_f/A_{pk})	70.0 (15.7)	N/A	40.4 (9.1)	N/A	70.0 (15.7)	140.0 (31.5)	40.4 (9.1)	80.8 (18.2)	70.0 (15.7)	210.0 (47.2)	40.4 (9.1)	121.3 (27.3)	70.0 (15.7)	140.0 (31.5)	N/A	80.8 (18.2)
Back EMF Constant p-p [3,4]	K_e	V_p/m/s (V_p/in/s)	82.7 (2.1)	N/A	47.7 (1.2)	N/A	82.7 (2.1)	165.4 (4.2)	47.7 (1.2)	95.5 (2.4)	82.7 (2.1)	248.0 (6.3)	47.7 (1.2)	143.2 (3.6)	82.7 (2.1)	165.4 (4.2)	N/A	95.5 (2.4)
Peak Current [2,4]	I_p	A_{pk} (A_{rms})	12.2 (8.6)	N/A	21.2 (15.0)	N/A	24.5 (17.3)	12.2 (8.6)	42.4 (30.0)	21.2 (15.0)	36.7 (25.9)	12.2 (8.6)	63.5 (44.9)	21.2 (15.0)	48.9 (34.6)	24.5 (17.3)	N/A	42.4 (30.0)
Continuous Current [1,4,5,6]	I_{cTmax}	A_{pk} (A_{rms})	2.4 (1.7)	N/A	4.2 (3.0)	N/A	4.9 (3.5)	2.4 (1.7)	8.5 (6.0)	4.2 (3.0)	7.3 (5.2)	2.4 (1.7)	12.7 (9.0)	4.2 (3.0)	9.8 (6.9)	4.9 (3.5)	N/A	8.5 (6.0)
Resistance p-p [3] @20°C	R_{20}	ohm	11.37	N/A	3.79	N/A	5.68	22.73	1.89	7.58	3.79	34.10	1.26	11.37	2.84	11.37	N/A	3.79
Inductance p-p [3]	L	mH	17.71	N/A	5.90	N/A	8.86	35.42	2.95	11.81	5.90	53.14	1.97	17.71	4.43	17.71	N/A	5.90
Mechanical Parameters																		
Magnetic Attraction	F_a	N (lb_f)	0 (0)				0 (0)				0 (0)				0 (0)			
Coil Mass	M_c	kg (lb_m)	1.08 (2.38)				2.05 (4.51)				3.01 (6.64)				3.98 (8.77)			
Magnetic Channel Mass	M_n	kg/m (lb/in)	30.02 (1.68)				30.02 (1.68)				30.02 (1.68)				30.02 (1.68)			

Notes: Motor performance specifications are with sinusoidal commutation.

1. 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 774cm² (120in²), 240 coil 1160cm² (180in²), 360 coil 1680cm² (260 in²), 480 coil 2060cm² (320 in²).
2. Calculated at 4% duty cycle with a maximum on time of 1 second.
3. All winding parameters listed are measured line-to-line (phase-to-phase).
4. All currents and voltages are measured 0-peak of the sine wave unless noted rms.
5. Continuous force and current based on coil moving with all phases sharing the same load in sinusoidal commutation.
6. For stand still conditions multiply continuous force and continuous current by 0.9.
7. Coil mountings on either of the two narrow sides reduces continuous force by 10%.
8. 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



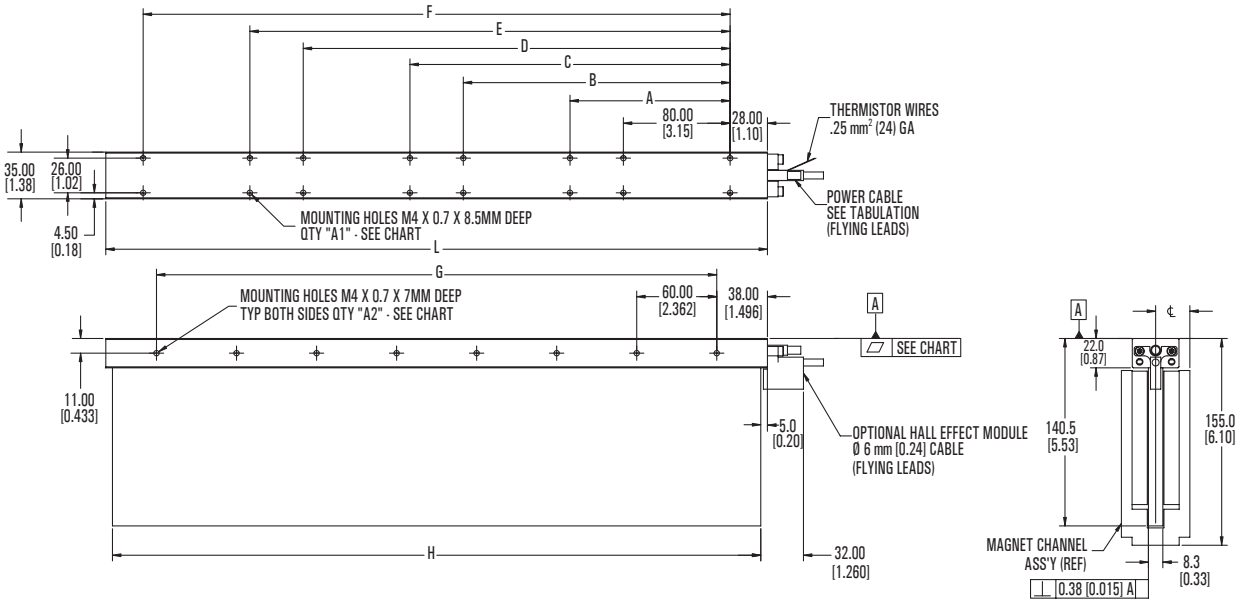
Note: Phasing direction is coil moving towards motor power cable

Dimensions mm [in]

Size	Winding Code	Power Cable Dia.	Gauge
100-120	D F	ϕ6.1 (.24)	0.75mm² (18)
100-240	D E F G	ϕ6.1 (.24)	0.75mm² (18)
100-360	D E F G	ϕ6.1 (.24)	0.75mm² (18)
100-480	D E G	ϕ6.1 (.24)	0.75mm² (18)

Coil Assembly LZ-100-0-XXX

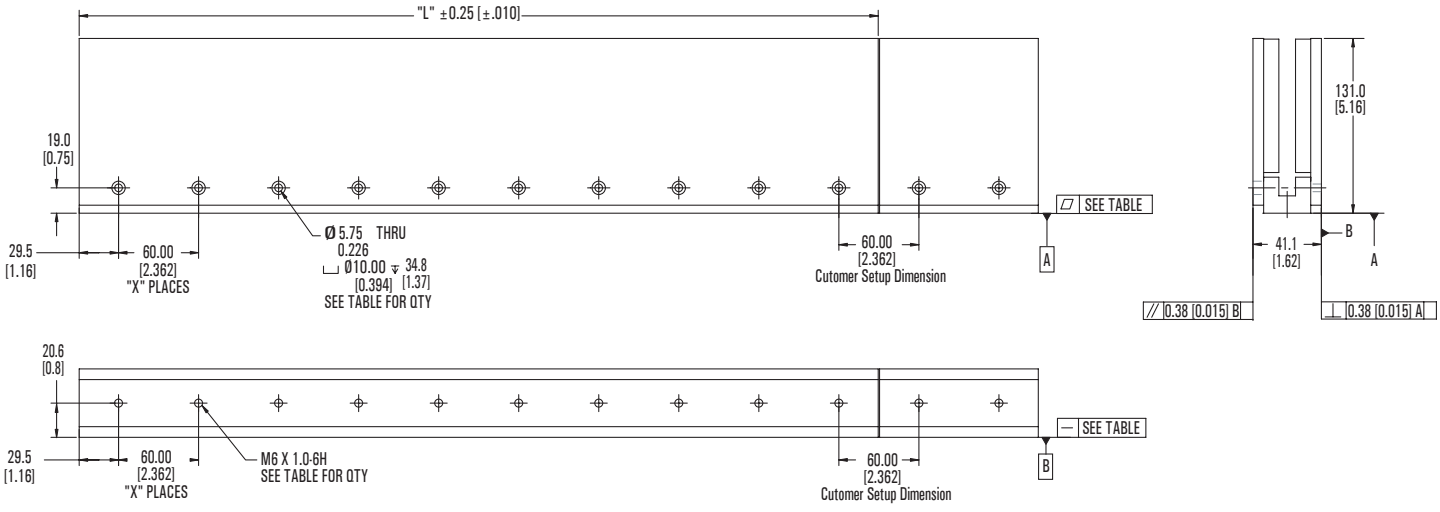
Dimensions mm [in]



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-100-0-XXX



Tolerances

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

Rockwell Automation

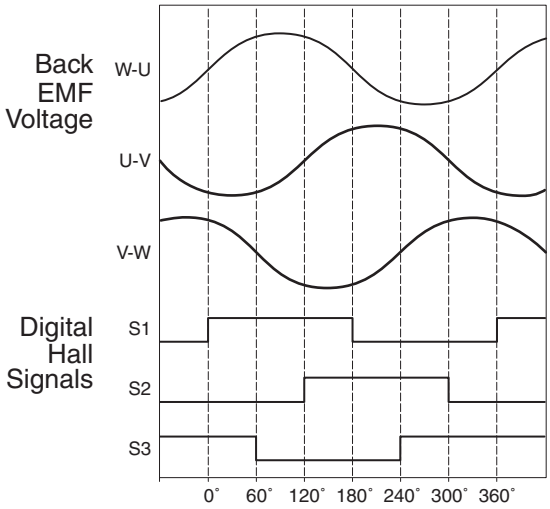
Specifications LZ-100-T-XXX

Performance Parameters	Symbol	Units	LZ-100-T-120				LZ-100-T-240				LZ-100-T-360				LZ-100-T-480			
Continuous Force [1,5,6,7]	F_{cTmax}	N (lb_f)	197 (44)				393 (88)				590 (133)				786 (177)			
Peak Force [2]	F_p	N (lb_f)	983 (221)				1965 (442)				2948 (663)				3931 (884)			
Motor Constant [1]	K_M	$N/\sqrt{W}$ ($lb_f/\sqrt{W}$)	20.0 (4.5)				28.2 (6.3)				34.6 (7.8)				39.9 (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 [8]	V_{DC}	Volts	325				325				325				325			
Electrical Cycle Length	E_c	mm	60				60				60				60			
Electrical Time Constant	τ_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 [1]	K_F	N/A_{pk} (lb_f/A_{pk})	80.4 (18.1)	N/A	46.4 (10.4)	N/A	80.4 (18.1)	160.7 (36.1)	46.4 (10.4)	92.8 (20.9)	80.4 (18.1)	241.1 (54.2)	46.4 (10.4)	139.2 (31.3)	80.4 (18.1)	160.7 (36.1)	N/A	92.8 (20.9)
Back EMF Constant p-p [3,4]	K_e	V_p/m/s (V_p/in/s)	94.9 (2.4)	N/A	54.8 (1.4)	N/A	94.9 (2.4)	189.8 (4.8)	54.8 (1.4)	109.6 (2.8)	94.9 (2.4)	284.6 (7.2)	54.8 (1.4)	164.3 (4.2)	94.9 (2.4)	189.8 (4.8)	N/A	109.6 (2.8)
Peak Current [2,4]	I_p	A_{pk} (A_{rms})	12.2 (8.6)	N/A	21.2 (15.0)	N/A	24.5 (17.3)	12.2 (8.6)	42.4 (30.0)	21.2 (15.0)	36.7 (25.9)	12.2 (8.6)	63.5 (44.9)	21.2 (15.0)	48.9 (34.6)	24.5 (17.3)	N/A	42.4 (30.0)
Continuous Current [1,4,5,6]	I_{cTmax}	A_{pk} (A_{rms})	2.4 (1.7)	N/A	4.2 (3.0)	N/A	4.9 (3.5)	2.4 (1.7)	8.5 (6.0)	4.2 (3.0)	7.3 (5.2)	2.4 (1.7)	12.7 (9.0)	4.2 (3.0)	9.8 (6.9)	4.9 (3.5)	N/A	8.5 (6.0)
Resistance p-p [3] @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 [3]	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
Mechanical Parameters																		
Magnetic Attraction	F_a	N (lb_f)	0 (0)				0 (0)				0 (0)				0 (0)			
Coil Mass	M_c	kg (lb_m)	1.35 (2.97)				2.58 (5.69)				3.81 (8.41)				5.04 (11.12)			
Magnetic Channel Mass	M_n	kg/m (lb/in)	30.27 (1.69)				30.27 (1.69)				30.27 (1.69)				30.27 (1.69)			

Notes: Motor performance specifications are with sinusoidal commutation.

1. Continuous forces, motor constant and currents listed are with coils at maximum temperature 130ºC, mounted to a heat sink that is equivalent to an aluminum slide 25.4mm (1.0") thick with the following areas: 120 coil 774cm² (120in²), 240 coil 1160cm² (180in²), 360 coil 1680cm² (260 in²), 480 coil 2060cm² (320 in²).
2. Calculated at 4% duty cycle with a maximum on time of 1 second.
3. All winding parameters listed are measured line-to-line (phase-to-phase).
4. All currents and voltages are measured 0-peak of the sine wave unless noted rms.
5. Continuous force and current based on coil moving with all phases sharing the same load in sinusoidal commutation.
6. For stand still conditions multiply continuous force and continuous current by 0.9.
7. Coil mountings on either of the two narrow sides reduces continuous force by 10%.
8. 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



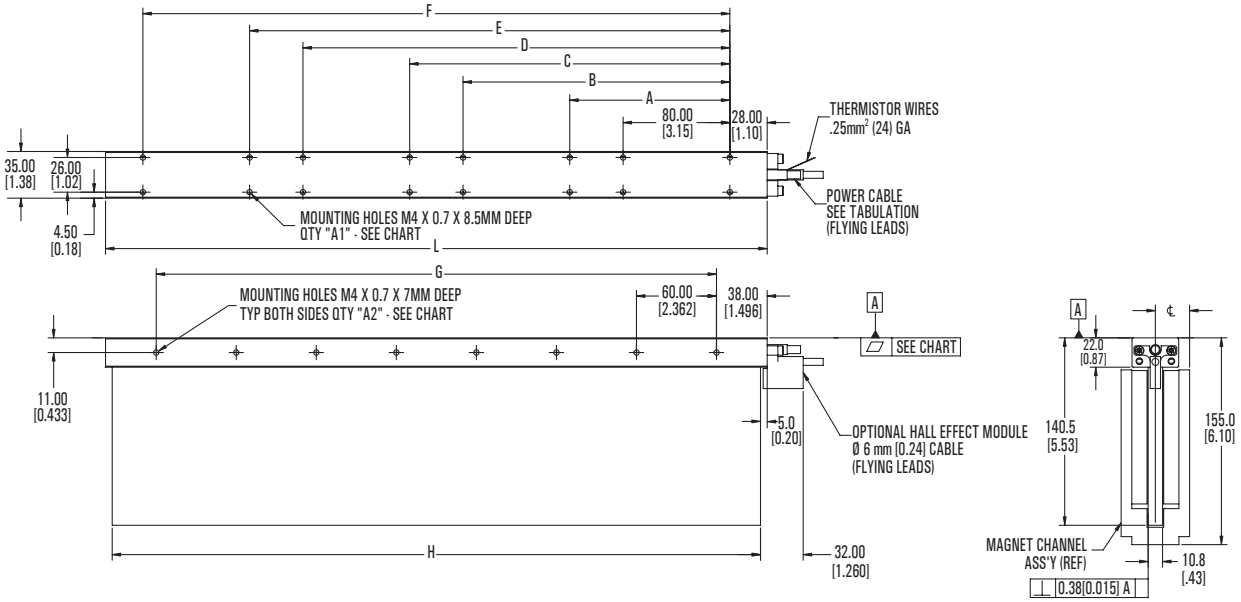
Note: Phasing direction is coil moving towards motor power cable

Dimensions mm [in]

Size	Winding Code	Power Cable Dia.	Gauge
100-120	D F	ϕ6.1 (.24)	0.75mm² (18)
100-240	D E F G	ϕ6.1 (.24)	0.75mm² (18)
100-360	D E F G	ϕ6.1 (.24)	0.75mm² (18)
100-480	D E G	ϕ6.1 (.24)	0.75mm² (18)

Coil Assembly LZ-100-T-XXX

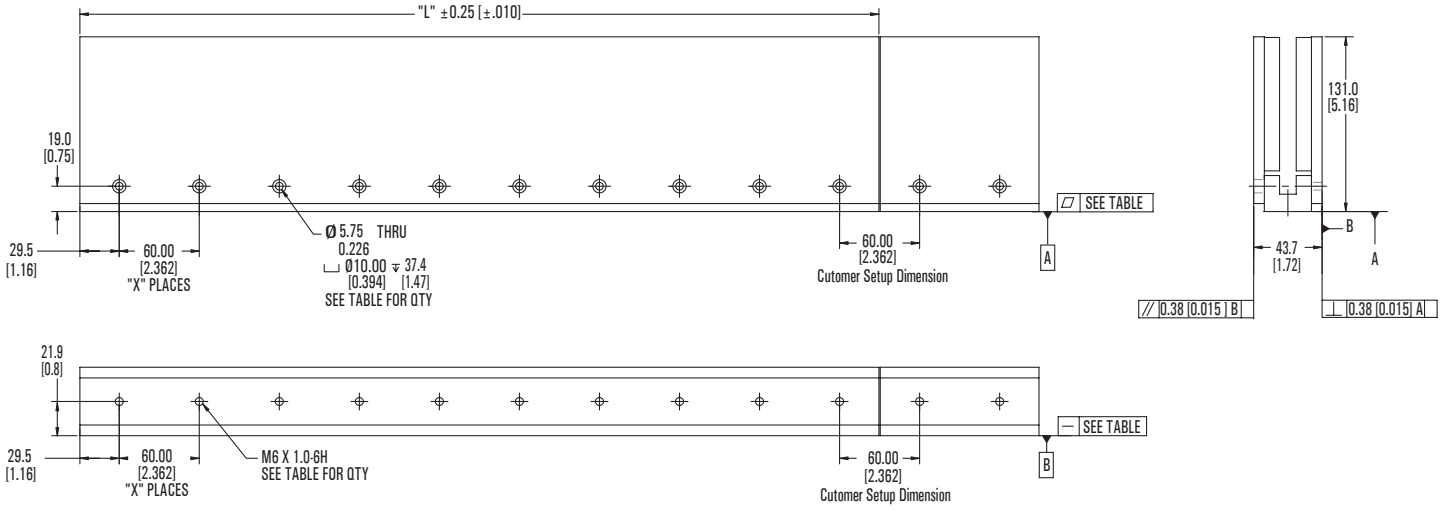
Dimensions mm [in]



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

Rockwell Automation

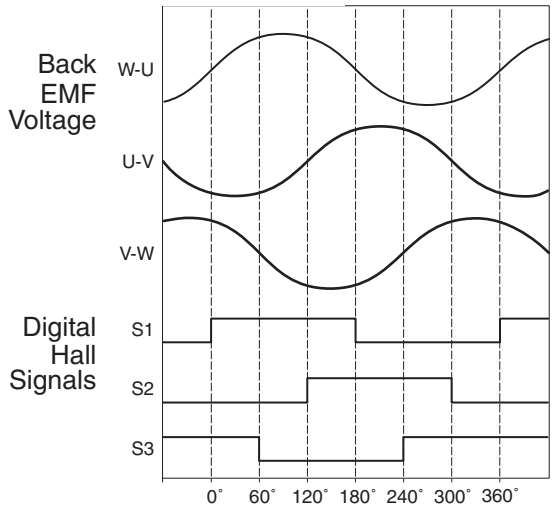
Specifications LZ-100-HT-XXX

Performance Parameters	Symbol	Units	LZ-100-HT-120				LZ-100-HT-240				LZ-100-HT-360				LZ-100-HT-480			
Continuous Force [1,5,6,7]	F_{cTmax}	N (lb_f)	216 (49)				432 (97)				649 (146)				865 (194)			
Peak Force [2]	F_p	N (lb_f)	1081 (243)				2162 (486)				3243 (729)				4324 (972)			
Motor Constant [1]	K_M	$N/\sqrt{W}$ ($lb_f/\sqrt{W}$)	22.0 (4.9)				31.1 (7.0)				38.0 (8.6)				43.9 (9.9)			
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 [8]	V_{DC}	Volts	325				325				325				325			
Electrical Cycle Length	E_c	mm	60				60				60				60			
Electrical Time Constant	τ_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 [1]	K_F	N/A_{pk} (lb_f/A_{pk})	88.4 (19.9)	N/A	51.0 (11.5)	N/A	88.4 (19.9)	176.8 (39.7)	51.0 (11.5)	102.1 (22.9)	88.4 (19.9)	265.2 (59.6)	51.0 (11.5)	153.1 (34.4)	88.4 (19.9)	176.8 (39.7)	N/A	102.1 (22.9)
Back EMF Constant p-p [3,4]	K_e	V_p/m/s (V_p/in/s)	104.4 (2.7)	N/A	60.3 (1.5)	N/A	104.4 (2.7)	208.7 (5.3)	60.3 (1.5)	120.5 (3.1)	104.4 (2.7)	313.1 (8.0)	60.3 (1.5)	180.8 (4.6)	104.4 (2.7)	208.7 (5.3)	N/A	120.5 (3.1)
Peak Current [2,4]	I_p	A_{pk} (A_{rms})	12.2 (8.6)	N/A	21.2 (15.0)	N/A	24.5 (17.3)	12.2 (8.6)	42.4 (30.0)	21.2 (15.0)	36.7 (25.9)	12.2 (8.6)	63.5 (44.9)	21.2 (15.0)	48.9 (34.6)	24.5 (17.3)	N/A)	42.4 (30.0)
Continuous Current [1,4,5,6]	I_{cTmax}	A_{pk} (A_{rms})	2.4 (1.7)	N/A	4.2 (3.0)	N/A	4.9 (3.5)	2.4 (1.7)	8.5 (6.0)	4.2 (3.0)	7.3 (5.2)	2.4 (1.7)	12.7 (9.0)	4.2 (3.0)	9.8 (6.9)	4.9 (3.5)	N/A	8.5 (6.0)
Resistance p-p [3] @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 [3]	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
Mechanical Parameters																		
Magnetic Attraction	F_a	N (lb_f)	0 (0)				0 (0)				0 (0)				0 (0)			
Coil Mass	M_c	kg (lb_m)	1.35 (2.97)				2.58 (5.69)				3.81 (8.41)				5.04 (11.12)			
Magnetic Channel Mass	M_n	kg/m (lb/in)	37.05 (2.07)				37.05 (2.07)				37.05 (2.07)				37.05 (2.07)			

Notes: Motor performance specifications are with sinusoidal commutation.

1. Continuous forces, motor constant and currents listed are with coils at maximum temperature 130ºC, mounted to a heat sink that is equivalent to an aluminum slide 25.4mm (1.0") thick with the following areas: 120 coil 774cm² (120in²), 240 coil 1160cm² (180in²), 360 coil 1680cm² (260 in²), 480 coil 2060cm² (320 in²).
2. Calculated at 4% duty cycle with a maximum on time of 1 second.
3. All winding parameters listed are measured line-to-line (phase-to-phase).
4. All currents and voltages are measured 0-peak of the sine wave unless noted rms.
5. Continuous force and current based on coil moving with all phases sharing the same load in sinusoidal commutation.
6. For stand still conditions multiply continuous force and continuous current by 0.9.
7. Coil mountings on either of the two narrow sides reduces continuous force by 10%.
8. 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 F	ϕ6.1 (.24)	0.75mm² (18)
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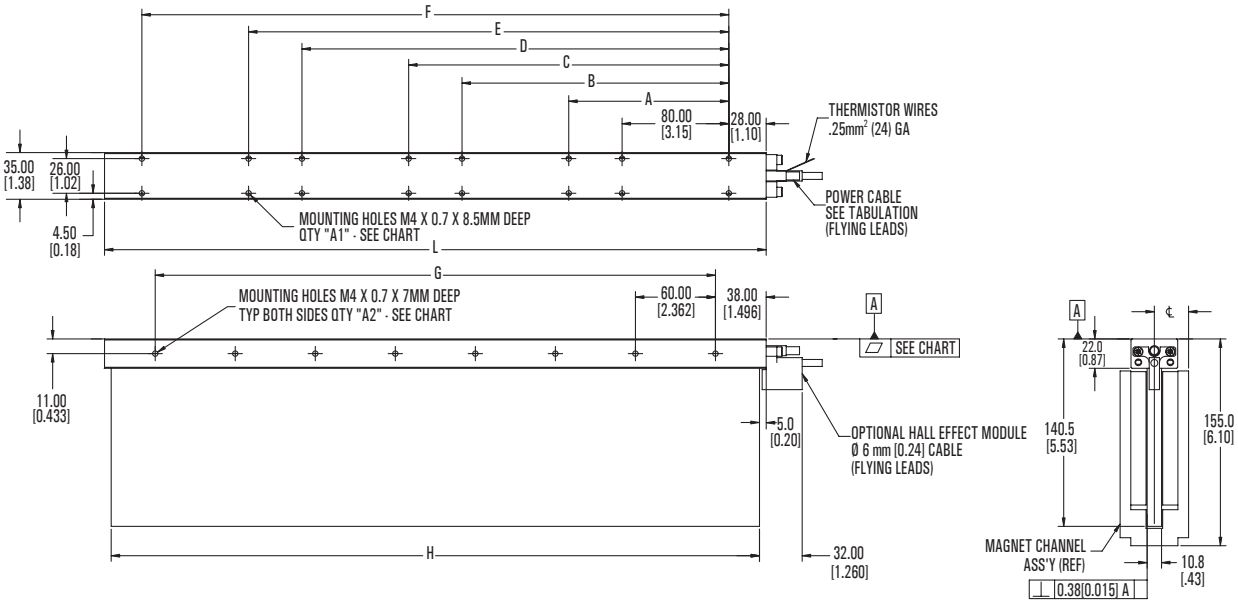
Coil Assembly LZ-100-HT-XXX

Dimensions mm [in]



Coil												
Size	**L**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**A1 QTY**	**A2 QTY**	**Flatness -A-**
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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)
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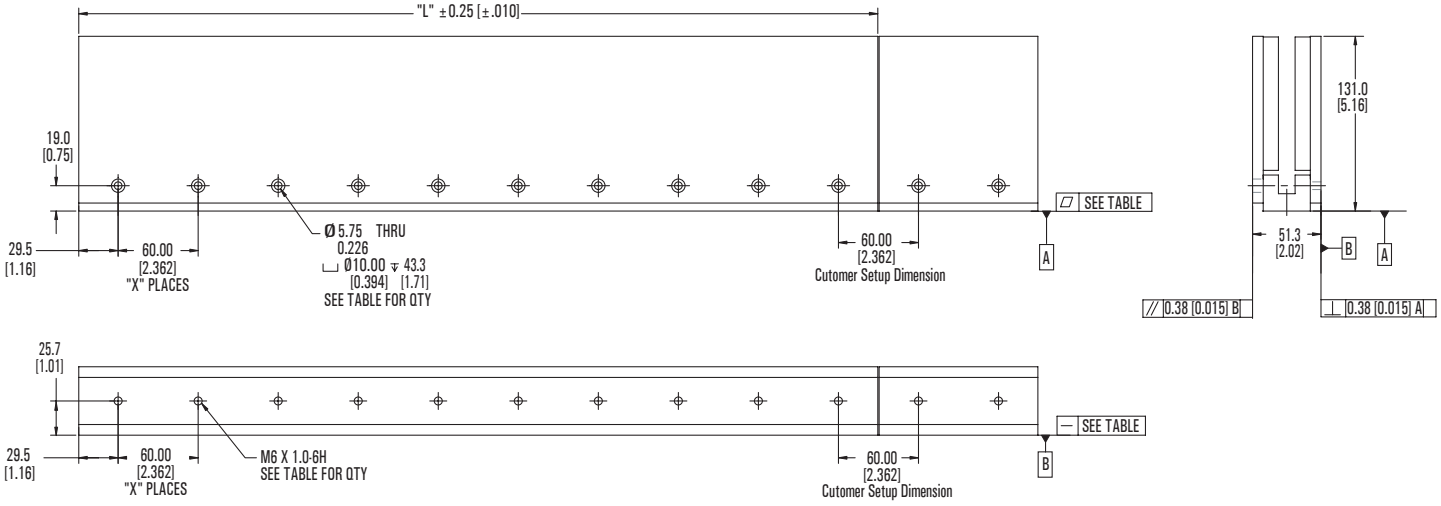
Magnet Channel LZM-100-HT-XXX



Tolerances

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

Rockwell Automation

Ordering Information (1 Coil and Magnet Channel Required)

Coil

Model	Magnet Length	Configuration	Coil Length	Winding Code	Cooling Option	Hall Feedback	Thermal Protection	Cable Length
LZ-	030-	T-	120-	D-	0-	T-	TR-	0

Magnet Length
030
050
075
100

Configuration
0 = Match to "O" Option Magnet Channel
T = Match to "T" Option Magnet Channel
HT = Match to "HT" Option Magnet Channel

Coil Length
120
240
360
480

Winding Code
D = Y Configuration
E = Y Configuration
F = Δ Configuration
G = Δ Configuration

Cooling Option
0 = No Cooling

Hall Feedback
0 = No Feedback
T = Trapezoidal Hall Effect

Thermal Protection
0 = None
TR = PTC Thermal Sensor

Cable Length
0 = 300 mm
1 = 600 mm
2 = 1000 mm

Magnet Channel

Model	Magnet Length	Configuration	Magnet Channel Length
LZM-	030-	T-	120

Magnet Length
030
050
075
100

Configuration
0 = Match to "O" Option Coil
T = Match to "T" Option Coil
HT = Match to "HT" Option Coil

Magnet Channel Length
120 = 120 mm
180 = 180 mm
240 = 240 mm
480 = 480 mm
600 = 600 mm

Cable Coding		
Motor Leads (Standard)	Color	Function
	RED	ØA (U)
	WHT	ØB (V)
	BLK	ØC (W)
	GRN/YEL	GND
Thermal Protection (Optional)		
	BLK	**TR** (130°C)
	BLK	**TR** (130°C)
Trapezoidal Hall Effect (Optional)		
	RED	V+
	WHT	S1
	BLU	S2
	ORN	S3
	BLK	VRTN

Note: V+ = 5-24 Vdc
Motor and Hall effect cables are shielded.

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