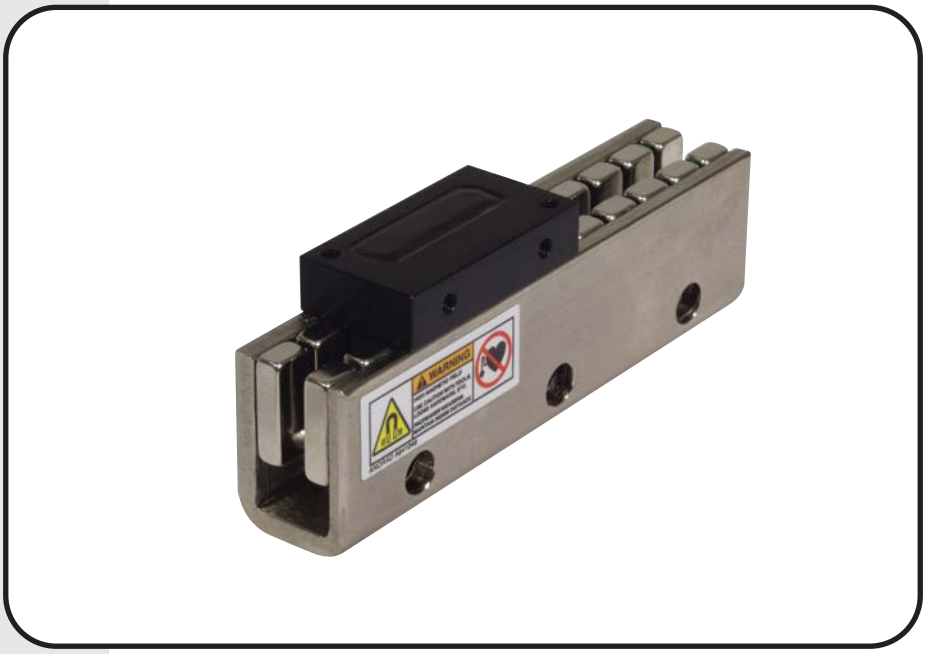
LEU-Micro Linear Motor

Product Features

- **Miniature, epoxy core design**
- **26 lbs. peak force**
- **No cogging, no magnetic attraction**
- **High acceleration**
- **Ideal for high precision/ smooth motion**



LEU-Micro Linear Motor

High Performance Miniature Ironless Linear Motor

Anorad's LEU Series of linear motors represents the smallest motors in our extensive linear motor portfolio. The LEU-Micro Series is an ironless core, brushless linear motor producing up to 26 lbs. (117 N) of peak force with an overall width of just 18mm.

The LEU-Micro motors are offered in two coil heights, the LEU-15 and the LEU-30, with a total of six coil sizes ranging in length from 35mm, 65mm, and 95mm long. The LEU-Micro's ironless core design provides ultra smooth motion since there are no iron winding laminations to produce cogging. The small coil and magnet track foot print makes the LEU-Micro readily adaptable for moving coil or moving magnet stage designs to reduce cable loading and cable wear.

The LEU-Micro's compact size makes it an ideal choice for high performance applications where space is limited. The LEU Series motor is ideal for high precision and compact stage applications such as miniature parts handling systems and precision pick and place machines. Anorad, the inventor of the brushless linear servo motor, continues to push the performance envelope for size, performance, and quality with over 25 years

Product Profile

Rockwell Automation

Specifications

Parameter	Symbol	Units	LEU-15-1		LEU-15-2		LEU-15-3		LEU-30-1		LEU-30-2		LEU-30-3	
Cooling Method			**NC**		**NC**		**NC**		**NC**		**NC**		**NC**	
Continuous Force [1, 5]	F_{cTmax}	N (lb_f)	7.5 (1.7)		14.9 (3.4)		22.4 (5.0)		13.1 (2.9)		26.1 (5.9)		39.2 (8.8)	
Peak Force [2]	F_p	N (lb_f)	22 (5.0)		45 (10.0)		67 (15.1)		39 (8.8)		78 (17.6)		117 (26.4)	
Motor Constant [1]	K_m	$N/\sqrt{w}$ ($lb_f/\sqrt{w}$)	1.7 (0.39)		2.4 (0.55)		3.0 (0.67)		2.7 (0.61)		3.8 (0.86)		4.7 (1.06)	
Thermal Resistance	R_{th}	°C/W	5.34		2.67		1.78		4.32		2.16		1.44	
Max Power Dissipation	P_{cTmax}	W	19		37		56		23		46		69	
Max Applied Bus Voltage [6]	V_{DC}	Volts	160		160		160		160		160		160	
Electrical Cycle Length	E_c	mm	15		15		15		15		15		15	
Electrical Time Constant	τ_e	msec	0.12		0.12		0.12		0.12		0.12		0.12	
Max Coil Temp	T_{max}	°C	125		125		125		125		125		125	
Max Coil Temp			**D**	**E**	**D**	**E**	**D**	**E**	**D**	**E**	**D**	**E**	**D**	**E**
Force Constant [1]	K_F	N/A_{pk} (lb_f/A_{pk})	2.7 (0.6)	6.64 (1.49)	5.3 (1.2)	8.48 (1.91)	8.0 (1.8)	12.66 (2.85)	5.3 (1.2)	10.69 (2.4)	10.7 (2.4)	16.97 (3.81)	16.0 (3.6)	N/A
Back EMF Constant p-p [3, 4]	K_e	V_p/m/s (V_p/in/s)	3.1 (0.08)	7.84 (0.2)	6.3 (0.16)	10.02 (0.25)	9.4 (0.24)	14.95 (0.38)	6.3 (0.16)	12.63 (0.32)	12.6 (0.32)	20.04 (0.51)	18.9 (0.48)	N/A
Peak Current [1, 4]	I_p	A_{pk} (A_{rms})	8.4 (5.9)	3.3 (2.3)	8.4 (5.9)	5.3 (3.7)	8.4 (5.9)	5.3 (3.7)	7.3 (5.2)	3.7 (2.6)	7.3 (5.2)	4.6 (3.3)	7.3 (5.2)	N/A
Continuous Current [1, 4, 5]	I_{cTmax}	A_{pk} (A_{rms})	2.8 (2.0)	1.12 (0.8)	2.8 (2.0)	1.78 (1.3)	2.8 (2.0)	1.78 (1.3)	2.4 (1.7)	1.2 (0.85)	2.4 (1.7)	1.51 (1.1)	2.4 (1.7)	N/A
Resistance [3] **@20°C**	R_{25}	ohm	2.19	13.98	4.37	11.06	6.56	16.59	3.53	14.20	7.06	17.85	10.59	N/A
Inductance p-p [3]	L	mH	0.25	1.63	0.51	1.28	0.76	1.93	0.43	1.74	0.86	2.19	1.29	N/A
Mechanical Parameters														
Magnetic Attraction	F_a	N (lb_f)	0 (0)		0 (0)		0 (0)		0 (0)		0 (0)		0 (0)	
Coil Mass	M_c	kg (lb_m)	0.022 (0.049)		0.044 (0.097)		0.066 (0.146)		0.030 (0.066)		0.060 (0.132)		0.090 (0.198)	
Magnetic Track Mass	M_n	kg/m (lb/in)	2.32 (0.13)		2.32 (0.13)		2.32 (0.13)		3.87 (0.22)		3.87 (0.22)		3.87 (0.22)	

Notes:

Motor performance specifications are with sinusoidal commutation.

All specifications are ±10%. Phase-to-phase inductance is ±30%.

1 Continuous forces, motor constant and currents listed are with coils at maximum temperature 125°C, mounted to a 12.7 mm (0.5") aluminum heat sink thickness whose area equals 3 times the coil area, with the heat sink at 20°C ambient.

2 Max on time 1 sec, assuming correct rms Force and Current, consult Anorad.

3 All winding parameters listed are measured line-to-line (phase-to-phase).

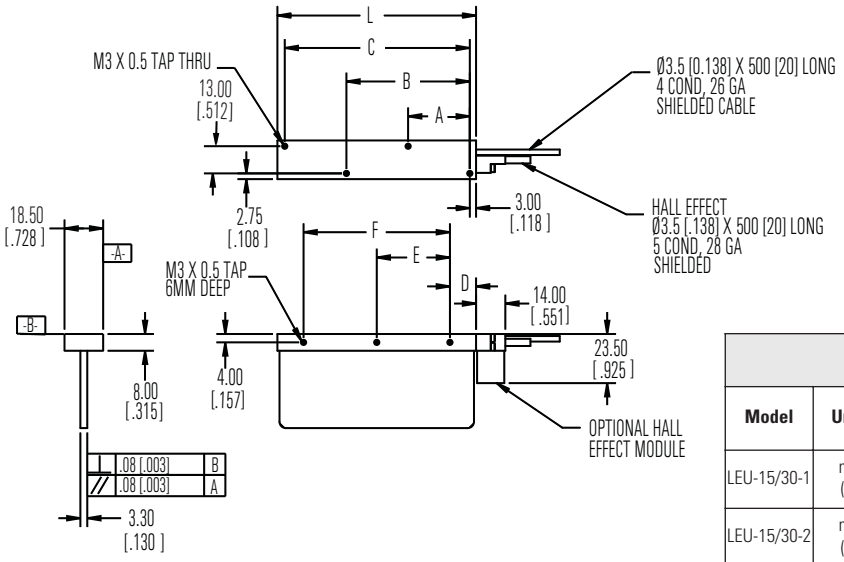
4 All currents and voltages listed are measured 0-peak of the sine wave unless noted rms.

5 Continuous forces and currents are based on coil moving with all phases sharing the same load in sinusoidal commutation.

6 Recommended amplifier maximum input voltage of 115 VAC.

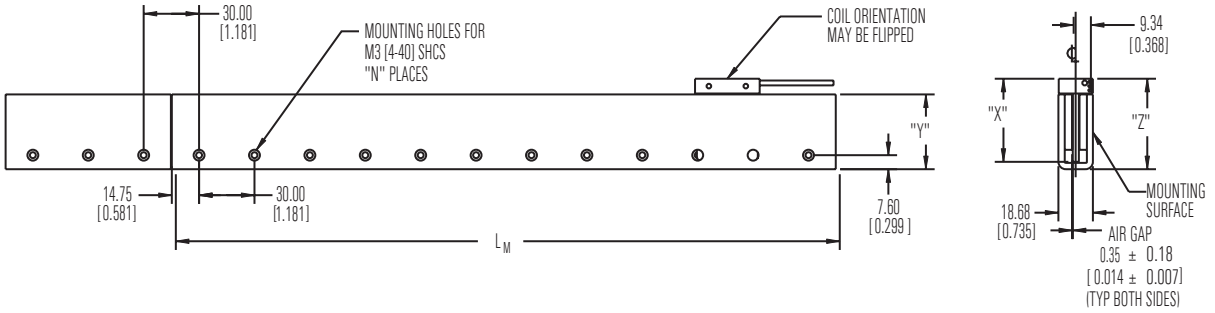
Coil Assembly

Dimensions mm [in]



Coil Dimensions								
Model	**Units**	**L**	**A**	**B**	**C**	**D**	**E**	**F**
LEU-15/30-1	mm (in)	35.00 (1.378)	29.00 (1.142)			7.50 (0.295)	20.00 (0.787)	
LEU-15/30-2	mm (in)	65.00 (2.559)	29.50 (1.161)	59.00 (2.323)		12.50 (0.492)	40.00 (1.575)	
LEU-15/30-3	mm (in)	95.00 (3.740)	29.50 (1.161)	59.00 (2.323)	88.50 (3.484)	12.50 (0.492)	35.00 (1.378)	70.00 (2.756)

Magnet Channel



Magnet Channel Dimensions			
Size	**Units**	**L_M**	**N**
60	mm (in)	59.50 (2.343)	2
90	mm (in)	89.50 (3.523)	3
150	mm (in)	149.50 (5.886)	5
300	mm (in)	299.50 (11.791)	10

Travel Vs. Magnet Channel Length				
Magnet Channel (mm)	**Units**	**LEU-15/30-1**	**LEU-15/30-2**	**LEU-15/30-3**
		Travel (mm)		
60	mm (in)	25.00 (0.984)		
90	mm (in)	55.00 (2.165)	25.00 (0.984)	
150	mm (in)	115.00 (4.527)	85.00 (3.346)	55.00 (2.165)
300	mm (in)	265.00 (10.433)	235.00 (9.252)	205.00 (8.070)

Coil/Magnet Channel Height Dimensions				
Model	**Units**	**X**	**Y**	**Z**
LEU-15-1/2/3	mm (in)	30.00 (1.181)	25.50 (1.004)	34.00 (1.339)
LEU-30-1/2/3	mm (in)	45.00 (1.772)	40.50 (1.594)	49.00 (1.929)

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Ordering Information

Coil Only

Model	Frame Size	Coil Length	Winding Type	Cooling	Thermisitor	Hall Feedback	Special Configuration
LEU -	15	- 1	- D	- NC	- NT	- T	-

15
30

1 = 35mm
2 = 65mm
3 = 95mm

D = Standard

NC = No Cooling (Standard)

NT = No Thermitor (Standard)

T = Trapezoidal Hall Effect
NH = No Hall (Standard)

Blank = Standard

Magnet Track Only

Model	Frame Size	Magnet Track Length	Special Configuration
LEU -	15	- 60	-

15
30

60 = 60mm
90 = 90mm
150 = 150mm
300 = 300mm

Cable Coding		
	Color	Function
Motor Leads (Standard)	RED	ØU (A)
	WHT	ØV (B)
	BLK	ØW (C)
	GRN/YEL	GND
Trapezoidal Hall Effect (Optional)	RED	V+
	WHT	S1
	GRN	S2
	YEL	S3
	BLK	VRTN

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

If you have special requirements or need any additional information, please contact us at:

www.anorad.com **www.rockwellautomation.com**

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