

BLMH Series

Linear Motors

70% greater continuous output force in the same physical envelope than competitive models

Continuous forces up to 548.8 N (123.4 lb); peak forces to 2195 N (493.5 lb)

Special magnet options available for increased force output

114.1 mm high x 50.8 mm wide cross section



The BLMH series “U-channel” brushless linear servomotors offer over 70% greater continuous output force in the same physical envelope than similar models from other manufacturers. BLMH series motors feature a high-efficiency magnetic circuit design that provides continuous force ratings to 548.8 N (123.4 lb) and peak forces to 2195 N (493.5 lb). This extremely high level of performance can be enhanced with special magnet options that increase force further, thereby lowering heat generation.

BLMH series linear motors are direct drive and consist of a noncontact forcer coil assembly with Hall-effect devices, a thermal sensor, and “U-channel” magnet track. This design eliminates magnetic attraction to allow for extremely

smooth motion and very tight velocity and position control. In addition, backlash, windup, wear and maintenance issues associated with ball screws, belts, and rack and pinions are eliminated.

The BLMH series nonmagnetic forcer eliminates cogging and magnetic attraction to allow for extremely smooth motion and very tight velocity and position control. These linear motors are ideal for any application that requires high speeds with high loads. BLMH series linear motors are forgiving to align, easy to assemble, and keep the magnetic field well-contained. Magnet tracks are stackable for any travel length. They are also suited for industrial usage.

The BLMH can be driven using standard Aerotech brushless amplifiers and controllers to provide a complete, integrated system.



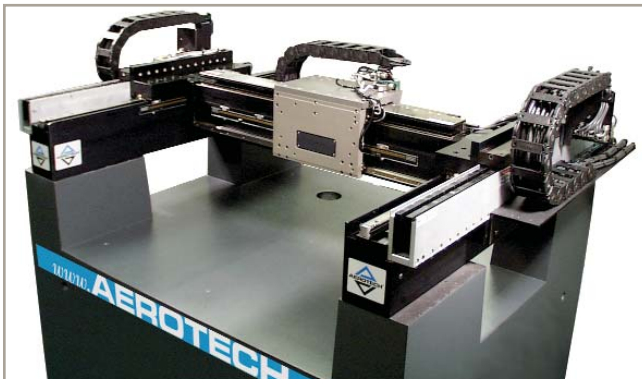
The BLMH is shown with Aerotech's linear motor line.

BLMH Series SPECIFICATIONS

Motor Model (assumes -S magnet track)	Units	BLMH-142		BLMH-202		BLMH-262		BLMH-322		BLMH-382	
Performance Specifications^(1,5)											
Continuous Force, 1.4 bar, 20 psi ⁽²⁾	N (lb)	270.7 (60.9)		351.2 (79.0)		437.1 (98.3)		489.2 (110.0)		548.8 (123.4)	
Continuous Force, No Air ⁽²⁾	N (lb)	150.0 (33.7)		194.2 (43.7)		266.2 (59.9)		303.2 (68.2)		357.9 (80.5)	
Peak Force ⁽³⁾	N (lb)	1082.7 (243.4)		1404.9 (315.9)		1748.6 (393.1)		1956.7 (439.9)		2195.0 (493.5)	
Electrical Specifications⁽⁵⁾											
Winding Designation		-A	-B (opt)	-A	-B (opt)	-A	-B (opt)	-A	-B (opt)	-A	-B (opt)
BEMF Constant (Line-Line)	V/m/s (V/in/s)	32.11 (0.82)	64.22 (1.63)	47.50 (1.21)	95.00 (2.41)	64.42 (1.64)	128.85 (3.27)	79.20 (2.01)	158.40 (4.02)	45.71 (1.16)	91.42 (2.32)
Continuous Current, 1.4 bar, 20 psi ⁽²⁾	Amp _{pk} (Amp _{rms})	9.69 (6.85)	4.85 (3.43)	8.50 (6.01)	4.25 (3.01)	7.80 (5.52)	3.90 (2.76)	7.10 (5.02)	3.55 (2.51)	13.80 (9.76)	6.90 (4.88)
Continuous Current, No Air ⁽²⁾	Amp _{pk} (Amp _{rms})	5.37 (3.80)	2.69 (1.90)	4.70 (3.32)	2.35 (1.66)	4.75 (3.36)	2.38 (1.68)	4.40 (3.11)	2.20 (1.56)	9.00 (6.36)	4.50 (3.18)
Peak Current, Stall ⁽³⁾	Amp _{pk} (Amp _{rms})	38.76 (27.41)	19.38 (13.70)	34.00 (24.04)	17.00 (12.02)	31.20 (22.06)	15.60 (11.03)	28.40 (20.08)	14.20 (10.04)	55.20 (39.03)	27.60 (19.52)
Force Constant, Sine Drive ^(4,8)	N/Amp _{pk} (lb/Amp _{pk})	27.93 (6.28)	55.87 (12.56)	41.32 (9.29)	82.64 (18.58)	56.04 (12.60)	112.09 (25.20)	68.90 (15.49)	137.80 (30.98)	39.77 (8.94)	79.53 (17.88)
	N/Amp _{rms} (lb/Amp _{rms})	39.50 (8.88)	79.01 (17.76)	58.44 (13.14)	116.88 (26.28)	79.26 (17.82)	158.52 (35.64)	97.44 (21.91)	194.88 (43.81)	56.24 (12.64)	112.47 (25.29)
Motor Constant ^(2,4)	N/√W (lb/√W)	14.17 (3.19)		17.20 (3.87)		20.24 (4.55)		22.29 (5.01)		23.19 (5.21)	
Resistance, 25°C, Line-Line	ohms	3.7	14.8	5.5	22.0	7.3	29.2	9.1	36.4	2.8	11.2
Inductance, Line-Line	mH	2.40	9.60	3.80	15.20	4.60	18.40	6.00	24.00	1.80	7.20
Thermal Resistance, 1.4 bar, 20 psi	°C/W	0.27		0.24		0.21		0.21		0.18	
Thermal Resistance, No Cooling	°C/W	0.89		0.78		0.58		0.54		0.42	
Maximum Bus Voltage	VDC	340		340		340		340		340	
Mechanical Specifications											
Air Flow, 20 psi	m ³ /s SCFM	2.5x10 ⁻³ 5.3		2.8x10 ⁻³ 5.9		2.8x10 ⁻³ 5.9		2.9x10 ⁻³ 6.2		2.7x10 ⁻³ 5.8	
Coil Weight	kg (lb)	1.10 (2.42)		1.60 (3.52)		2.10 (4.62)		2.60 (5.72)		3.10 (6.82)	
Coil Length	mm (in)	142.0 (5.59)		202.0 (7.95)		262.0 (10.31)		322.0 (12.68)		382.0 (15.04)	
Heat Sink	mm (in)	250x250x25 (10x10x1)		250x250x25 (10x10x1)		250x250x25 (10x10x1)		250x400x25 (10x16x1)		250x400x25 (10x16x1)	
Magnet Track Weight	kg/m (lb/ft)	23.30 (15.62)									
Magnetic Pole Pitch	mm (in)	30.00 (1.18)									

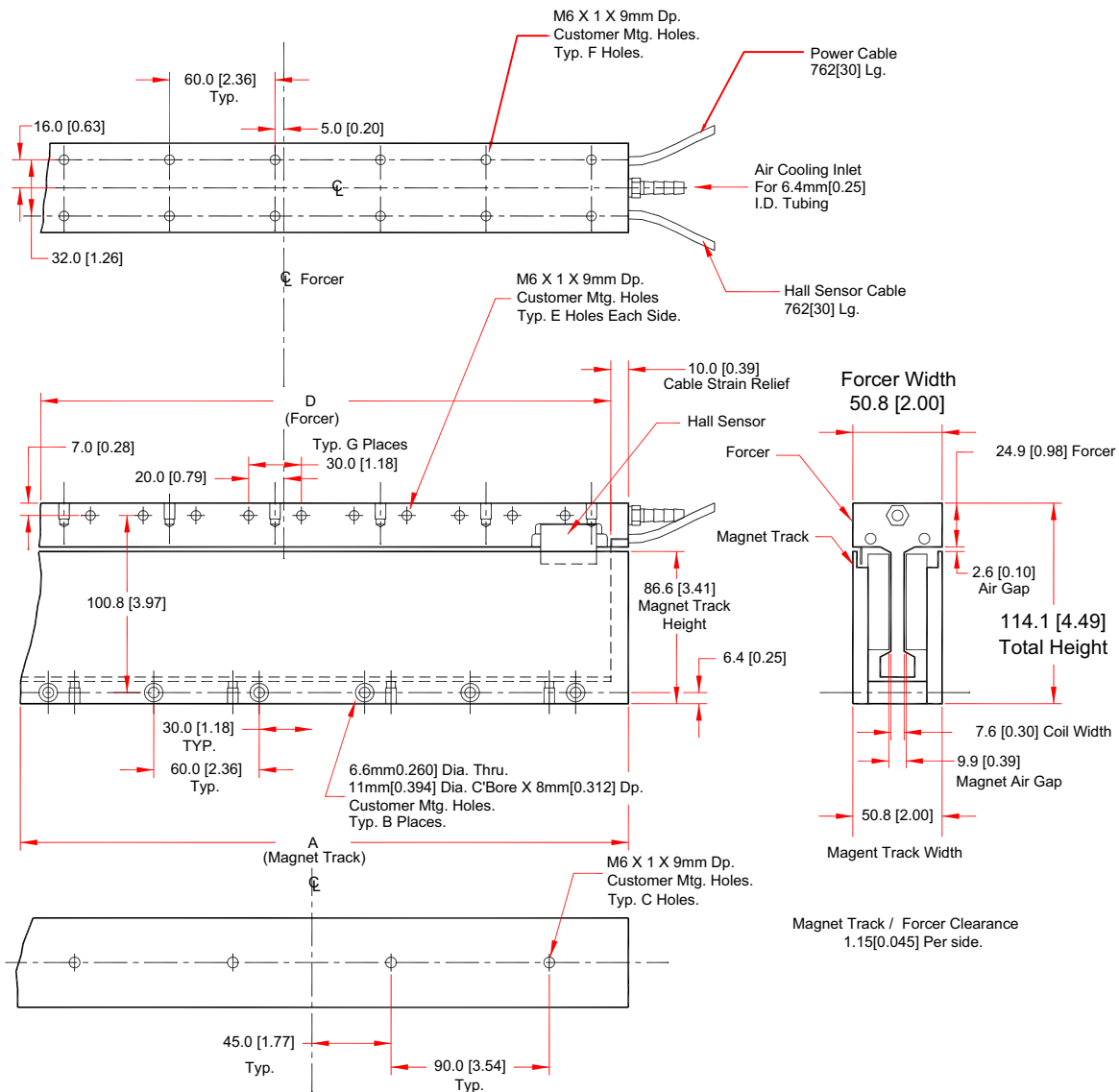
Notes:

- Performance is dependent upon heat sink configuration, system cooling conditions, and ambient temperature.
- Values shown @ 100°C rise above a 25°C ambient temperature, with motor mounted to the specified aluminum heat sink.
- Peak force assumes correct rms current; consult Aerotech.
- Force constant and motor constant specified at stall.
- All performance and electrical specifications ±10%.
- Maximum winding temperature is 125°C.
- Ambient operating temperature range 0°C - 25°C. Consult Aerotech for performance in elevated ambient temperatures.
- All Aerotech amplifiers are rated A_{pk}; use torque constant in N-m/A_{pk} when sizing.



BLMH linear motors are used in the high-performance Aerotech AGS20000 gantry system.

BLMH Series DIMENSIONS



Magnet Track

Model No.	A	B	C
MTH360	360mm 14.17"	6	4
MTH480	480mm 18.90"	8	4
MTH600	600mm 23.63"	10	6
MTH720	720mm 28.35"	12	8

Dimensions - millimeters [inches]

Forcer

Model No.	D	E	F
BLMH-142	142mm 5.59"	4	6
BLMH-202	202mm 7.95"	6	6
BLMH-262	262mm 10.31"	8	10
BLMH-322	322mm 12.67"	10	10
BLMH-382	382mm 15.04"	12	14

MTHx custom track lengths available

BLMH Series ORDERING INFORMATION

Ordering Example

BLMH	-142	-A
Motor Series	Forcer Coil Length	Standard Winding
	142 mm, 202 mm, 262 mm, 322 mm, 382 mm	76 cm (2.5 ft) flying leads std

Brushless Linear Servomotors - BLMH Series Compact "U" Channel Forcer Coils

BLMH-142-A	Linear motor coil, with HED, air cooling, and temperature switch, Fcont = 270.7 N (60.9 lb) @ 20 psi
BLMH-202-A	Linear motor coil, with HED, air cooling, and temperature switch, Fcont = 351.2 N (79.0 lb) @ 20 psi
BLMH-262-A	Linear motor coil, with HED, air cooling, and temperature switch, Fcont = 437.1 N (98.3 lb) @ 20 psi
BLMH-322-A	Linear motor coil, with HED, air cooling, and temperature switch, Fcont = 489.2 N (110.0 lb) @ 20 psi
BLMH-382-A	Linear motor coil, with HED, air cooling, and temperature switch, Fcont = 548.8 N (123.4 lb) @ 20 psi

BLMH Options

-LH	Remove HED sensor from BLMH series forcer coil
-B	Optional winding
-V	Vacuum prepared

"U" Channel Magnet Tracks – MTH Series for BLMH motors

MTH360	"U" channel magnet track for use with BLMH forcer coil, 360 mm (14.2 in) length
MTH480	"U" channel magnet track, for use with BLMH forcer coil, 480 mm (18.9 in) length
MTH600	"U" channel magnet track, for use with BLMH forcer coil, 600 mm (23.6 in) length
MTH720	"U" channel magnet track, for use with BLMH forcer coil, 720 mm (28.4 in) length
MTHx	Custom magnet track lengths available. Please consult factory.