BLMX Series

Linear Motors

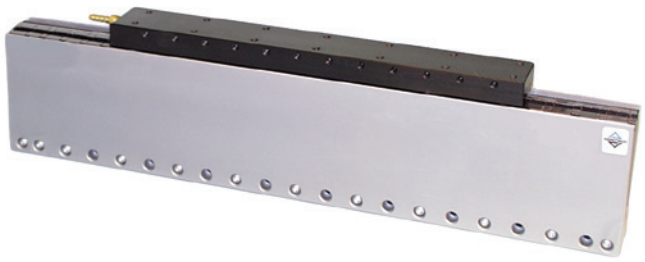
49% greater continuous output force in the same physical envelope than competitive models

Continuous force to 1063 N (239 lb); peak force to 4252 N (956 lb)

152.0 mm high x 50.8 mm wide cross section

Special magnet options available for increased force output

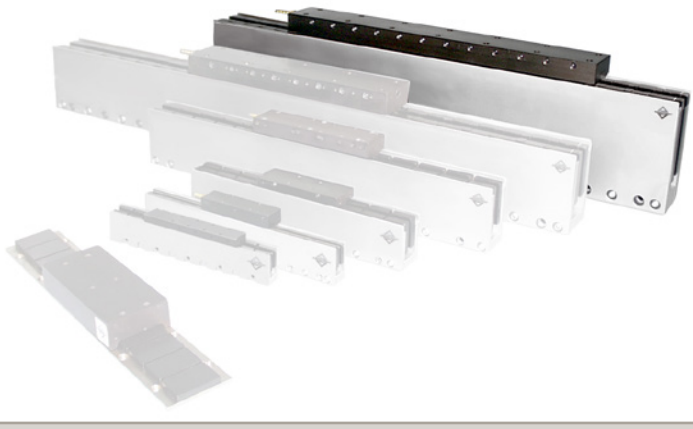
Follows the 2011/65/EU RoHS 2 Directive



The BLMX series "U-channel" brushless linear servomotors offer over 49% greater continuous output force in the same physical envelope than similar models from other manufacturers.

BLMX series motors feature a high-efficiency magnetic circuit design that provides continuous force ratings to 1063 N (239 lb) and peak forces to 4252 N (956 lb). This extremely high level of performance can be enhanced with special high-power magnet options that increase force output.

The BLMX moving forcer coil assembly contains Hall-effect devices, and a thermal sensor, and is constructed of reinforced ceramic epoxy. This ironless design eliminates eddy-current losses that otherwise would limit speed and produce additional heat.



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

BLMX linear motors are direct drive and consist of a moving forcer coil and "U-channel" rare-earth magnet track. This design eliminates backlash, windup, wear and maintenance issues associated with ball screws, belts, and rack and pinions.

The BLMX 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 applications demanding the ultimate in force output. BLMX 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. These motors are well-suited for industrial applications.

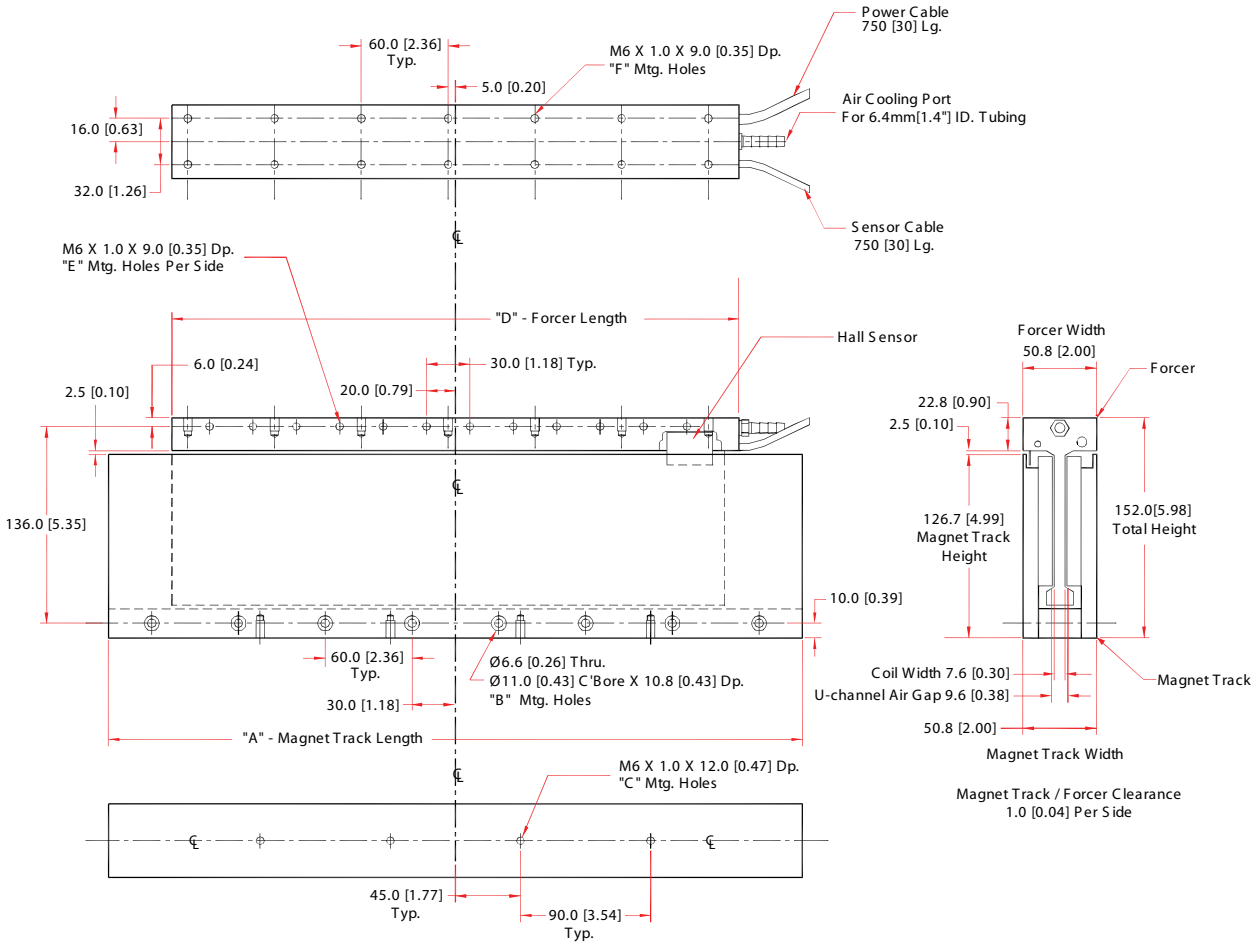
The BLMX can be driven using standard Aerotech brushless amplifiers and controllers to provide a complete, integrated system.

BLMX Series SPECIFICATIONS

Motor Model	Units	BLMX-382		BLMX-502	
Performance Specifications[1,2]					
Continuous Force, 1.4 bar (20 psi)[3]	N (lb)	972 (218)		-A: 1063 (239)	-B (opt): 1011 (227)
Continuous Force, No Forced Cooling[3]	N (lb)	537 (121)		601 (135)	
Peak Force[4]	N (lb)	3887 (874)		4252 (956)	
Electrical Specifications[2]					
Winding Designation		-A	-B (opt)	-A	-B (opt)
BEMF Constant (Line to Line, Max)	V/m/s (V/in/s)	86.26 (2.19)	172.52 (4.38)	109.59 (2.78)	54.79 (1.39)
Continuous Current,1.4 bar, 20 ps[3]	Amp_{pk} Amp_{rms}	12.95 9.16	6.48 4.58	11.15 7.88	21.21 15.00
Continuous Current, No Forced Cooling[3]	Amp_{pk} Amp_{rms}	7.15 5.06	3.58 2.53	6.30 4.45	12.60 8.91
Peak Current, Stall[4]	Amp_{pk} Amp_{rms}	51.80 36.63	25.90 18.31	44.60 31.54	89.20 63.08
Force Constant, Sine Drive[5,6]	N/Amp_{pk} (lb/Amp_{pk})	75.04 (16.87)	150.09 (33.74)	95.33 (21.43)	47.67 (10.72)
	N/Amp_{rms} (lb/Amp_{rms})	106.13 (23.86)	212.25 (47.72)	134.82 (30.31)	67.41 (15.16)
Motor Constant[3,5]	N/√W (lb/√W)	39.72 (8.93)		46.23 (10.39)	
Resistance, 25°C, (Line to Line)	ohms	3.4	13.6	4.5	1.1
Inductance (Line to Line)	mH	3.00	12.00	4.00	1.00
Thermal Resistance, 1.4 bar, 20 psi	°C/W	0.12		0.12	
Thermal Resistance, No Forced Cooling	°C/W	0.40		0.39	
Maximum Bus Voltage	VDC	340		340	
Mechanical Specifications					
Air Flow, 20 psi	m^3/s (SCFM)	$5.4x10^{-3}$ (11.5)		$5.6x10^{-3}$ (11.8)	
Coil Weight	kg (lb)	3.40 (7.48)		4.45 (9.79)	
Coil Length	mm (in)	382.0 (15.04)		502.0 (19.76)	
Heat Sink	mm (in)	250x400x25 (10x16x1)		250x500x25 (10x20x1)	
Magnet Track Weight	kg/m (lb/ft)	35.8 (24.01)			
Magnet Pole Pitch	mm (in)	30.00 (1.18)		30.00 (1.18)	
Standards		2011/65/EU RoHS 2 Directive			

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

BLMX Series DIMENSIONS



Dimensions - millimeters [inches]

Magnet Track

Model No.	A	B	C
MTX480	480.0 [18.90]	8	4
MTX600	600.0 [23.63]	10	6
MTX720	720.0 [28.35]	12	8

Forcer

Model No.	D	E	F
BLMX-382	392.0 [15.43]	12	14
BLMX-502	512.0 [20.16]	16	18

BLMX Series ORDERING INFORMATION

Brushless Linear Servomotors – BLMX Series Compact "U" Channel Forcer Coils

BLMX-382	Linear motor forcer with thermistor; 382 mm long
BLMX-502	Linear motor forcer with thermistor; 502 mm long

Winding Designation (Required)

-A	-A Winding

Note: Contact factory to inquire about or check availability of alternate winding options.

Air Cooling (Required)

-NC	No air cooling fitting is installed
-AC	Includes air cooling fitting

Hall Effect Sensors (Required)

-H	Hall effect sensors included
-NH	No Hall effect sensors included

Preparation (Required)

-S	Standard preparation
-V	Vacuum preparation to 10^{-6} Torr
-UHV	Ultra-high vacuum preparation; contact factory

Cable Length (Required)

-750	750 mm length high-flex cables
-5000	5.0 meter length high-flex cables

Magnet Tracks (Optional)

MTX480P	"U" channel magnet track for use with BLMX-series forcers; 480 mm long
MTX600P	"U" channel magnet track for use with BLMX-series forcers; 600 mm long
MTX720P	"U" channel magnet track for use with BLMX-series forcers; 720 mm long
MTXxP	"U" channel magnet track for use with BLMX-series forcers; custom length

Note: Magnet tracks are ordered as separate line items. Magnet track part numbers ending with "P" are high performance grade, including magnets on both sides of the track.

Integration (Required)

Aerotech offers both standard and custom integration services to help you get your system fully operational as quickly as possible. The following standard integration options are available for this system. Please consult Aerotech if you are unsure what level of integration is required, or if you desire custom integration support with your system.

-TAS	Integration - Test as system Testing, integration, and documentation of a group of components as a complete system that will be used together (ex: drive, controller, and stage). This includes parameter file generation, system tuning, and documentation of the system configuration.
-TAC	Integration - Test as components Testing and integration of individual items as discrete components that ship together. This is typically used for spare parts, replacement parts, or items that will not be used together. These components may or may not be part of a larger system.