

BLMFS5 Series

Linear Motors

Steel-core forcer coil provides high force per unit volume

Continuous force to 697.1 N (156.7 lb); peak force to 1507.2 N (338.8 lb)

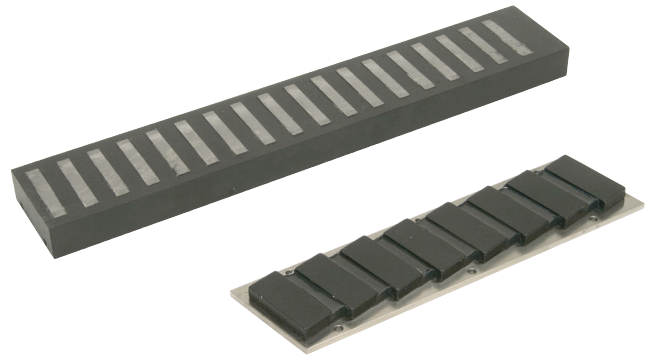
Unlimited travel length by stacking magnet tracks

High-energy, rare-earth magnets used in magnet track for high acceleration capability

Optional water cooling for highest throughput

Ideal for pick and place, assembly, and general automation

Follows the 2011/65/EU RoHS 2 Directive



The BLMFS5 series linear motors are designed to provide a higher throughput and lower profile alternative to conventional linear motor applications. This is achieved through a proprietary manufacturing process and laminated iron-core design.

The moving forcer coil assembly contains Hall-effect devices and a thermal sensor, and is a compact, reinforced ceramic epoxy structure.

The BLMFS5 series utilizes steel laminations to produce more force for a given forcer coil length. This makes it ideal for high speed point-to-point motion. The attraction force can also be used as a bearing pre-load.

Offering high peak forces in its standard configuration, BLMFS5 motors are available with higher-power magnets that can be used to increase output force.

These linear motors are ideal for any application requiring high levels of positioning resolution and accuracy. Tracks are stackable for any travel length. The BLMFS5 linear motors are also ideal for clean-room use as they produce no particulates.

The BLMFS5 can be driven using standard Aerotech brushless amplifiers and controllers to provide a complete, integrated system.

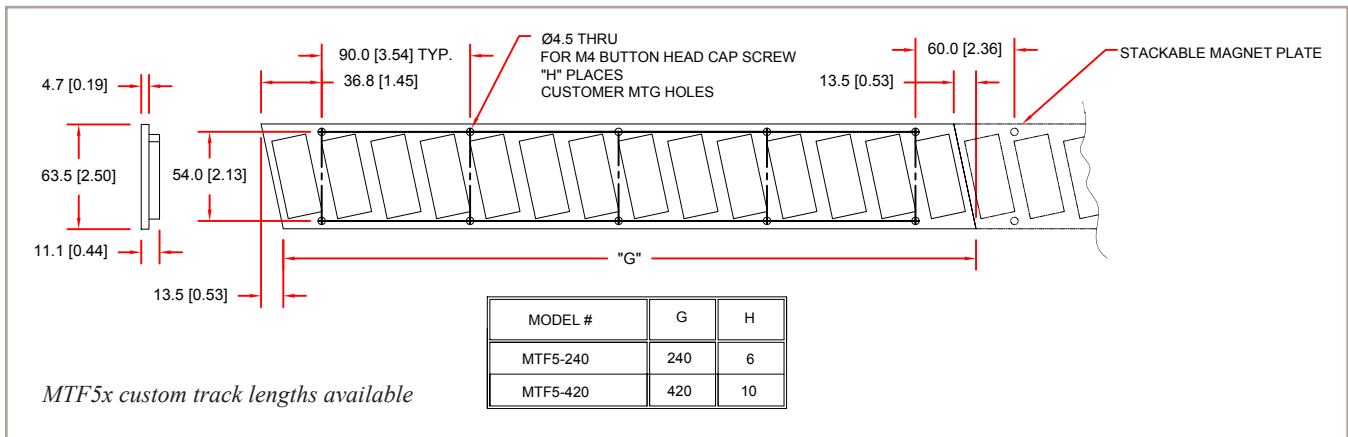
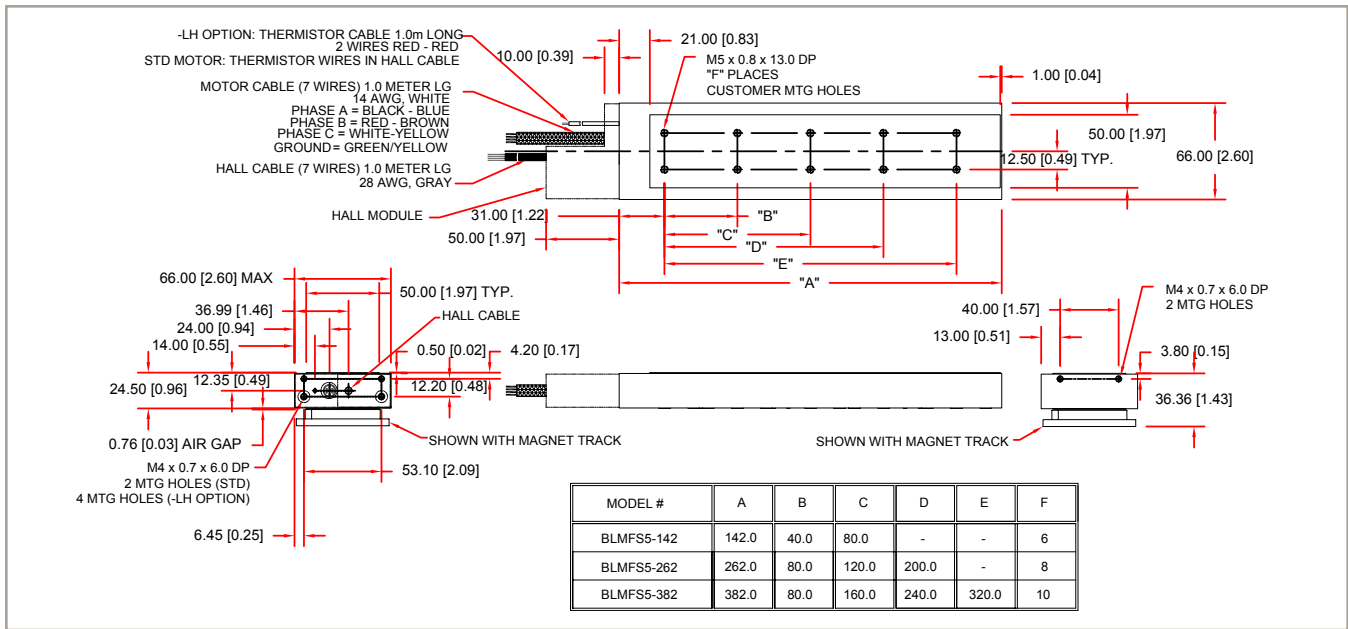
BLMFS5 Series SPECIFICATIONS

Motor Model	Units	BLMFS5-142		BLMFS5-262		BLMFS5-382	
Performance Specifications^(1,2)							
Continuous Force, No Forced Cooling ⁽³⁾	N (lb)	174.8 (39.3)		282.3 (63.5)		376.8 (84.7)	
Peak Force ⁽⁴⁾	N (lb)	699.3 (157.2)		1129.2 (253.9)		1507.2 (338.8)	
Cogging Force	N (lb)	57.8 (13.0)		62.3 (14.0)		67.2 (15.1)	
Attraction Force	N (lb)	2410 (542)		4446 (1000)		6482 (1457)	
Electrical Specifications⁽²⁾							
Winding Designation		-A	-B	-A	-B	-A	-B
BEMF Constant (Line-Line, Max)	V/m/s (V/in/s)	21.99 (0.56)	43.97 (1.12)	21.99 (0.56)	43.97 (1.12)	21.99 (0.56)	43.97 (1.12)
Continuous Current, No Forced Cooling ⁽³⁾	Amp _{pk}	9.14	4.57	14.76	7.38	19.70	9.85
	Amp _{rms}	6.46	3.23	10.44	5.22	13.93	6.97
Peak Current, Stall ⁽⁴⁾	Amp _{pk}	36.56	18.28	59.04	29.52	78.80	39.40
	Amp _{rms}	25.85	12.93	41.75	20.87	55.72	27.86
Average Force Constant, Sine Drive ^(5,6)	N/Amp _{pk} (lb/Amp _{pk})	19.13 (4.30)	38.25 (8.60)	19.13 (4.30)	38.25 (8.60)	19.13 (4.30)	38.25 (8.60)
	N/Amp _{rms} (lb/Amp _{rms})	27.05 (6.08)	54.10 (12.16)	27.05 (6.08)	54.10 (12.16)	27.05 (6.08)	54.10 (12.16)
Motor Constant ^(3,5)	N/√W (lb/√W)	14.40 (3.24)	14.40 (3.24)	20.37 (4.58)	20.37 (4.58)	24.94 (5.61)	24.94 (5.61)
Resistance, 25°C, (Line to Line)	ohms	1.7	6.7	0.8	3.4	0.6	2.2
Inductance (Line to Line)	mH	9.90	39.60	4.95	19.80	3.30	13.20
Thermal Resistance, No Forced Cooling	°C/W	0.68		0.52		0.44	
Maximum Bus Voltage	VDC	340	340	340	340	340	340
Mechanical Specifications							
Coil Weight	kg (lb)	1.42 (3.12)		2.31 (5.08)		3.81 (8.38)	
Coil Length	mm (in)	142.0 (5.59)		262.0 (10.31)		382.0 (15.04)	
Heat Sink	mm (in)	380x380x13 (15x15x0.5)					
Magnet Track Weight	kg/m (lb/ft)	4.2 (2.82)					
Magnet Pole Pitch	mm (in)	30.00 (1.18)					
Standards		2011/65/EU RoHS 2 Directive					

Notes:

- Performance is dependent upon heat sink configuration, system cooling conditions, and ambient temperature.
- All performance and electrical specifications ±10%.
- 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 Aerotech amplifiers are rated A_{pk}; use torque constant in N·m/A_{pk} when sizing.
- Maximum winding temperature is 125°C.
- Ambient operating temperature range 0°C - 25°C. Consult Aerotech for performance in elevated ambient temperatures.

BLMFS5 Series DIMENSIONS



BLMFS5 Series ORDERING INFORMATION

BLMFS5 Brushless Linear Servo Motor

BLMFS5-142	Flat linear motor forcer, ironless design for zero cogging with thermistor; 142 mm long
BLMFS5-262	Flat linear motor forcer, ironless design for zero cogging with thermistor; 262 mm long
BLMFS5-382	Flat linear motor forcer, ironless design for zero cogging with thermistor; 382 mm long

Winding Designation (Required)

-A	76 cm (2.5 ft) flying leads (standard)
-B	Optional winding

Hall Effect Sensors (Required)

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

Vacuum Preparation (Optional)

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

Note: Vacuum preparation motors are ordered as an Engineering Special line item

Flat Magnet Tracks (Optional)

MTF5-240	Flat magnet track, for use with BLMFS5 forcer coil, 240 mm long
MTF5-420	Flat magnet track, for use with BLMFS5 forcer coil, 420 mm long
MTF5x	Flat magnet track length available

Note: Magnet tracks are ordered as separate line items.

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.