

BLMSC Series

Linear Motors

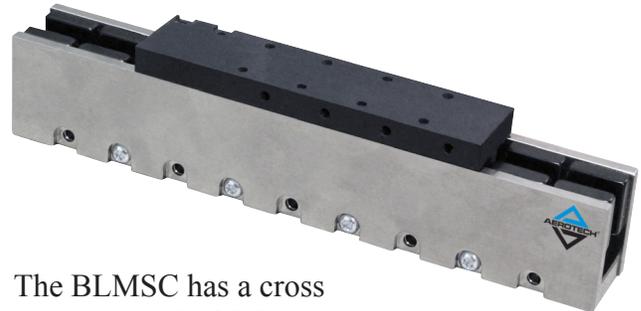
**Aerotech's smallest linear motor:
37.5 mm x 22 mm cross section**

Continuous force to 27.7 N; peak force to 110.9 N

**Non-magnetic forcer coil provides high force
with zero cogging for super-smooth velocity and
position control**

Ideal for space-constrained applications

Follows the 2011/65/EU RoHS 2 Directive



The BLMSC has a cross section of only 37.5 mm x 22 mm.

The BLMSC linear motor is Aerotech's smallest "U-channel" linear motor measuring only 37.5 mm x 22 mm in cross section. With a high power density and force output, the BLMSC is ideally suited for space-constrained applications requiring high-acceleration or high force output.

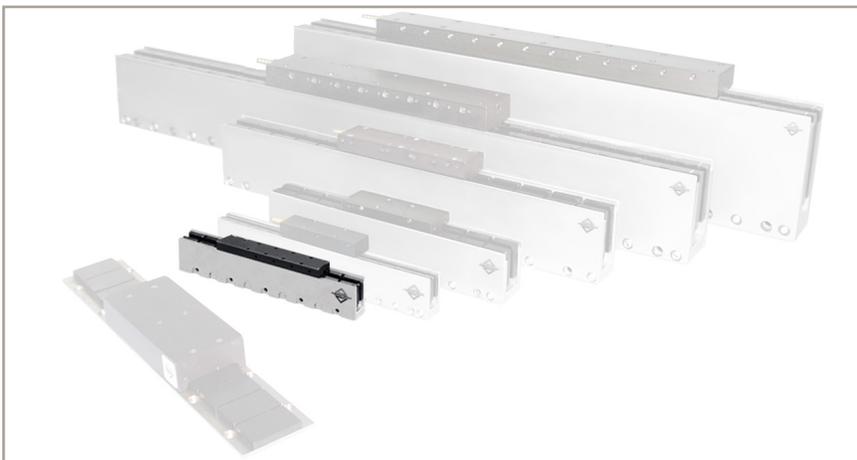
The motor consists of a noncontact forcer coil assembly with thermal sensor, optional Hall-effect devices, and "U-channel" magnet track. The design eliminates backlash, windup, wear, and maintenance issues associated with ball-screws, belts, and rack and pinions.

The moving forcer coil assembly is a compact, reinforced ceramic-epoxy structure. The ironless design eliminates

cogging and eddy-current losses that otherwise would limit speed and produce additional heat.

These linear motors are ideal for any application that requires high levels of positioning resolution and accuracy. BLMSC 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 cleanroom use as they produce no particulates.

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



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

BLMSC Series SPECIFICATIONS

Motor Model	Units	BLMSC-79-A	BLMSC-111-A	BLMSC-143-A
Performance Specifications^(1,2)				
Continuous Force ⁽³⁾	N (lb)	14 (3.1)	20.8 (4.7)	27.7 (6.2)
Peak Force ⁽⁴⁾	N (lb)	55.9 (12.6)	83.3 (18.7)	110.9 (24.9)
Electrical Specifications⁽²⁾				
Winding Designation		-A	-A	-A
BEMF Constant (Line to Line, Max)	V/m/s (V/in/s)	5.5 (0.14)	9.2 (0.23)	12.9 (0.31)
Continuous Current ⁽³⁾	A _{pk} A _{rms}	2.97 2.1	2.67 1.89	2.59 1.83
Peak Current, Stall ⁽⁴⁾	A _{pk} A _{rms}	11.88 8.4	10.68 7.55	10.36 7.33
Force Constant, Sine Drive ^(5,6)	N/A _{pk} (lb/A _{pk})	4.7 (1.06)	7.8 (1.75)	10.7 (2.41)
	N/A _{rms} (lb/A _{rms})	6.65 (1.49)	11.03 (2.48)	15.14 (3.40)
Motor Constant ^(3,5)	N/√W (lb/√W)	2.26 (0.51)	2.91 (0.65)	3.4 (0.76)
Resistance, 25°C, (Line to Line)	Ω	4.1	6.8	9.4
Inductance (Line to Line)	mH	0.59	1.02	1.45
Thermal Resistance	°C/W	2.63	1.95	1.51
Maximum Bus Voltage	VDC	340		
Mechanical Specifications				
Coil Weight	kg (lb)	0.09 (0.20)	0.13 (0.29)	0.16 (0.35)
Coil Length	mm (in)	79 (3.11)	111 (4.37)	143 (5.63)
Heat Sink	mm (in)	250x250x25 (10x10x1)		
Magnet Track Weight	kg/m (lb/ft)	2.81 (1.88)		
Magnet Pole Pitch	mm (in)	16.0 (0.63)		
Standards		2011/65/EU RoHS 2 Directive		

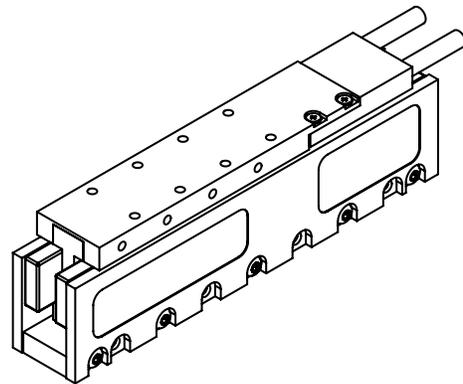
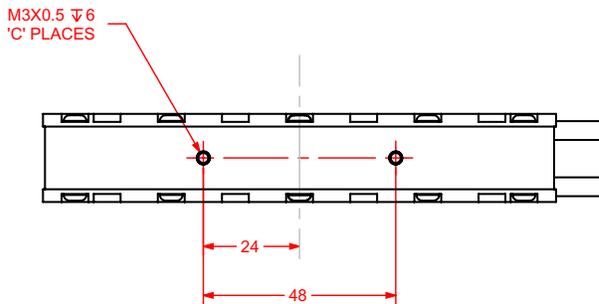
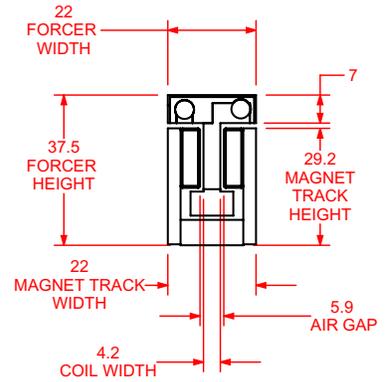
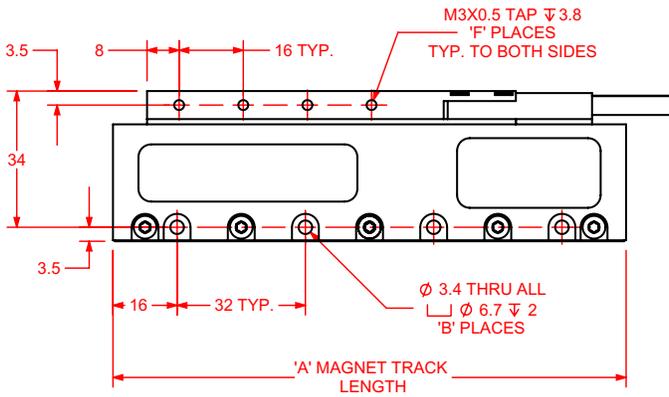
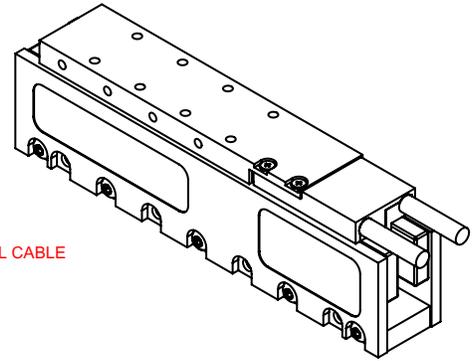
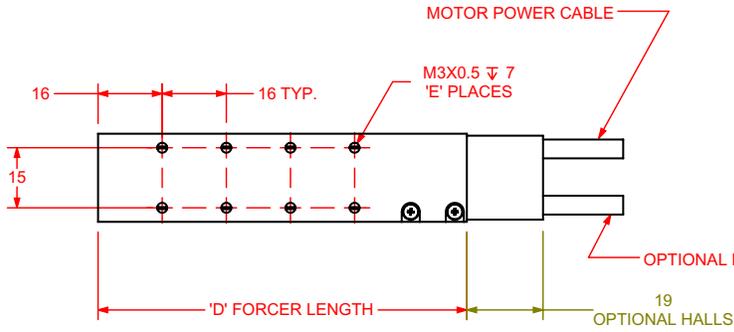
Notes:

- 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/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.



The BLMSC linear motor is used in Aerotech's PRO115LM positioning stage.

BLMSC Series DIMENSIONS



MAGNET TRACK DIMS			
PART NUMBER	A	B	C
MTSC64	64	2	0
MTSC96	96	3	2
MTSC128	128	4	2
MTSC160	160	5	2
MTSC192	192	6	4
MTSC224	224	7	4
MTSC256	256	8	4
MTSC288	288	9	6
MTSC352	352	11	6
MTSC416	416	13	8

FORCER DIMS			
PART NUMBER	D	E	F
BLMSC-79	60	4	2
BLMSC-111	92	8	4
BLMSC-143	124	12	6

DIMENSIONS: MILLIMETERS
NOTE: BLMSC-111 FORCER SHOWN WITH MTSC128 MAGNET TRACK

BLMSC Series ORDERING INFORMATION

BLMSC Brushless Linear Servomotor

BLMSC-79	Linear motor forcer with thermistor, 79 mm long
BLMSC-111	Linear motor forcer with thermistor, 111 mm long
BLMSC-143	Linear motor forcer with thermistor, 143 mm long

Winding Designation (Required)

-A	76 cm (2.5 ft) flying leads (standard)
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Air Cooling (Required)

-NC	No air cooling (standard)
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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)

MTSC64P	“U” channel magnet track for use with BLMSC series forcers; 64 mm long
MTSC96P	“U” channel magnet track for use with BLMSC series forcers; 96 mm long
MTSC112P	“U” channel magnet track for use with BLMSC series forcers; 112 mm long
MTSC128P	“U” channel magnet track for use with BLMSC series forcers; 128 mm long
MTSC144P	“U” channel magnet track for use with BLMSC series forcers; 144 mm long
MTSC160P	“U” channel magnet track for use with BLMSC series forcers; 160 mm long
MTSC192P	“U” channel magnet track for use with BLMSC series forcers; 192 mm long
MTSC224P	“U” channel magnet track for use with BLMSC series forcers; 224 mm long
MTSC256P	“U” channel magnet track for use with BLMSC series forcers; 256 mm long
MTSC288P	“U” channel magnet track for use with BLMSC series forcers; 288 mm long
MTSC352P	“U” channel magnet track for use with BLMSC series forcers; 352 mm long
MTSC400P	“U” channel magnet track for use with BLMSC series forcers; 400 mm long
MTSC416P	“U” channel magnet track for use with BLMSC series forcers; 416 mm long
MTSCxP	“U” channel magnet track for use with BLMSC 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.