

BLMUC Series

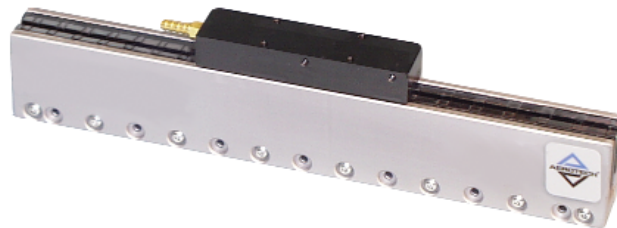
Linear Motors

Ultra-compact size for tight space constraints;
52.0 mm x 20.8 mm cross section

Continuous force to 58.0 N (13.0 lb); peak force
to 231.8 N (52.1 lb)

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

Ideal for pick-and-place machines where Z-axis
space is limited



The BLMUC linear motor is an ultra-compact “U-channel” motor measuring only 52.0 mm x 20.8 mm in cross section, designed to provide high force in an ultra-compact package. The BLMUC is ideally suited for small load applications with tight space constraints such as a pick head on a pick-and-place machine, and low-mass, high-acceleration material handling machines.

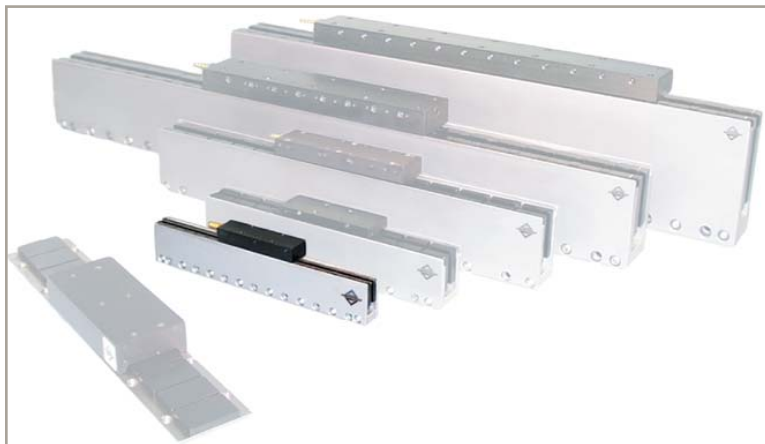
The motor consists of a noncontact forcer coil assembly with Hall-effect devices, thermal sensor, and “U-channel” magnet track. This design eliminates backlash, windup, wear and maintenance issues associated with ball screws,

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. To produce the highest rms force, air cooling is standard.

These linear motors are ideal for any application that requires high levels of positioning resolution and accuracy. BLMUC 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 BLMUC can be driven using standard Aerotech brushless amplifiers and controllers to provide a complete integrated system.



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

BLMUC Series SPECIFICATIONS

Motor Model	Units	BLMUC-79	BLMUC-95	BLMUC-111	BLMUC-143
Performance Specifications^(1,5)					
Continuous Force, 1.4 bar (20 psi) ⁽²⁾	N (lb)	31.4 (7.0)	40.5 (9.1)	46.9 (10.5)	58.0 (13.0)
Continuous Force, No Air ⁽²⁾	N (lb)	18.3 (4.1)	23.0 (5.2)	30.6 (6.9)	39.8 (9.0)
Peak Force ⁽³⁾	N (lb)	125.4 (28.2)	161.9 (36.4)	187.6 (42.2)	231.8 (52.1)
Electrical Specifications⁽⁵⁾					
Winding Designation		-A	-A	-A	-A
BEMF Constant (line-line, max)	V/m/s (V/in/s)	6.80 (0.17)	9.00 (0.23)	11.35 (0.29)	15.90 (0.40)
Continuous Current, 1.4 bar (20 psi) ⁽²⁾	Amp _{pk}	5.30	5.17	4.75	4.19
	Amp _{rms}	3.75	3.66	3.36	2.96
Continuous Current, No Air ⁽²⁾	Amp _{pk}	3.10	2.94	3.10	2.88
	Amp _{rms}	2.19	2.08	2.19	2.04
Peak Current, Stall ⁽³⁾	Amp _{pk}	21.20	20.68	19.00	16.76
	Amp _{rms}	14.99	14.62	13.44	11.85
Force Constant, Sine Drive ^(4,8)	N/Amp _{pk} (lb/Amp _{pk})	5.92 (1.33)	7.83 (1.76)	9.87 (2.22)	13.83 (3.11)
	N/Amp _{rms} (lb/Amp _{rms})	8.37 (1.88)	11.07 (2.49)	13.96 (3.14)	19.56 (4.40)
Motor Constant ^(2,4)	N/√W (lb/√W)	2.89 (0.65)	3.35 (0.75)	3.78 (0.85)	4.53 (1.02)
Resistance, 25°C, Line-Line	ohms	4.0	5.2	6.5	8.9
Inductance, Line-Line	mH	0.51	0.70	0.87	1.10
Thermal Resistance, 1.4 bar (20 psi)	°C/W	0.85	0.69	0.65	0.61
Thermal Resistance, No Air	°C/W	2.48	2.12	1.52	1.29
Maximum Bus Voltage	VDC	160	160	160	160
Mechanical Specifications					
Air Flow, 20 psi	m ³ /s SCFM	1.5x10 ⁻³ 3.12	1.5x10 ⁻³ 3.15	1.5x10 ⁻³ 3.22	1.5x10 ⁻³ 3.12
Coil Weight	kg (lb)	0.10 (0.22)	0.12 (0.26)	0.14 (0.31)	0.20 (0.44)
Coil Length	mm (in)	79.0 (3.11)	95.0 (3.74)	111.0 (4.37)	143.0 (5.63)
Heat Sink	mm (in)	250x250x25 (10x10x1)	250x250x25 (10x10x1)	250x250x25 (10x10x1)	250x250x25 (10x10x1)
Magnet Track Weight	kg/m (lb/ft)	4.04 (2.71)	4.04 (2.71)	4.04 (2.71)	4.04 (2.71)
Magnetic Pole Pitch	mm (in)	16.00 (0.63)	16.00 (0.63)	16.00 (0.63)	16.00 (0.63)

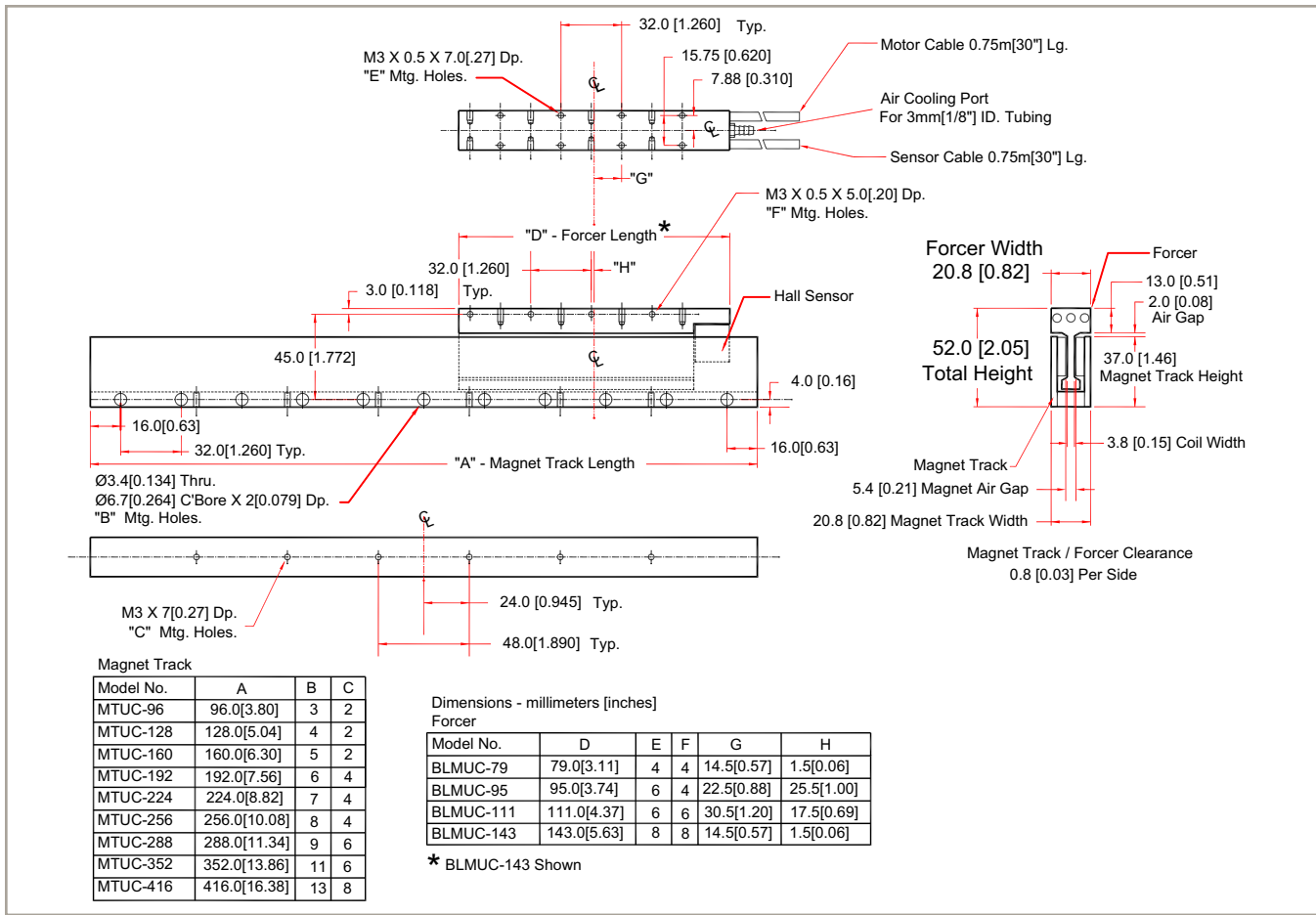
Notes:

- 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.



The BLMUC linear motor is used in Aerotech's high-performance ALS130 positioning stage.

BLMUC Series DIMENSIONS and ORDERING INFORMATION



Ordering Example

BLMUC	-79	-A
Motor Series	Forcer Coil Length	Standard Winding
	79 mm, 95 mm, 111 mm, 143 mm	76 cm (2.5 ft) flying leads std

Brushless Linear Servomotors - BLMUC Series

BLMUC-79-A	Linear motor coil, with HED, air cooling, and temperature switch, Fcont=31.4 N (7.0 lb) @ 20 psi
BLMUC-95-A	Linear motor coil, with HED, air cooling, and temperature switch, Fcont=40.5 N (9.1 lb) @ 20 psi
BLMUC-111-A	Linear motor coil, with HED, air cooling, and temperature switch, Fcont=46.9 N (10.5 lb) @ 20 psi
BLMUC-143-A	Linear motor coil, with HED, air cooling, and temperature switch, Fcont=58.0 N (13.0 lb) @ 20 psi

BLMUC Options

-LH	Remove HED sensor from BLMUC series forcer coil
-HF	High-flex cable
-V	Vacuum prepared

"U" Channel Magnet Tracks - MTUC Series for BLMUC motors

MTUC96	"U" channel magnet track for use with BLMUC forcer coil, 96 mm (3.8 in) length
MTUC128	"U" channel magnet track for use with BLMUC forcer coil, 128 mm (5.0 in) length
MTUC160	"U" channel magnet track for use with BLMUC forcer coil, 160 mm (6.3 in) length
MTUC192	"U" channel magnet track for use with BLMUC forcer coil, 192 mm (7.6 in) length
MTUC224	"U" channel magnet track for use with BLMUC forcer coil, 224 mm (8.8 in) length
MTUC256	"U" channel magnet track for use with BLMUC forcer coil, 256 mm (10.1 in) length
MTUC288	"U" channel magnet track for use with BLMUC forcer coil, 288 mm (11.3 in) length
MTUC352	"U" channel magnet track for use with BLMUC forcer coil, 352 mm (13.9 in) length
MTUC416	"U" channel magnet track for use with BLMUC forcer coil, 416 mm (16.4 in) length
MTUCx	Custom magnet track lengths available; please consult factory