

Aerotech Linear Motors



Aerotech Linear Motors

Aerotech's "U-channel" brushless linear servomotors are ideal for robots, actuators, positioning stages, fiberoptics/phonics alignment and positioning, assembly, machine tools, semiconductor equipment, electronic manufacturing, vision systems, and in many other industrial automation applications that require high-speed/high-accuracy motion. Aerotech linear motors are direct drive and are available in two different configurations - "U-channel" and "flat" versions.

The U-channel design consists of a noncontacting forcer coil and U-channel rare-earth magnet track. This design eliminates backlash, windup, wear, and maintenance issues associated with ball screw, belt, and rack-and-pinion based motion systems.

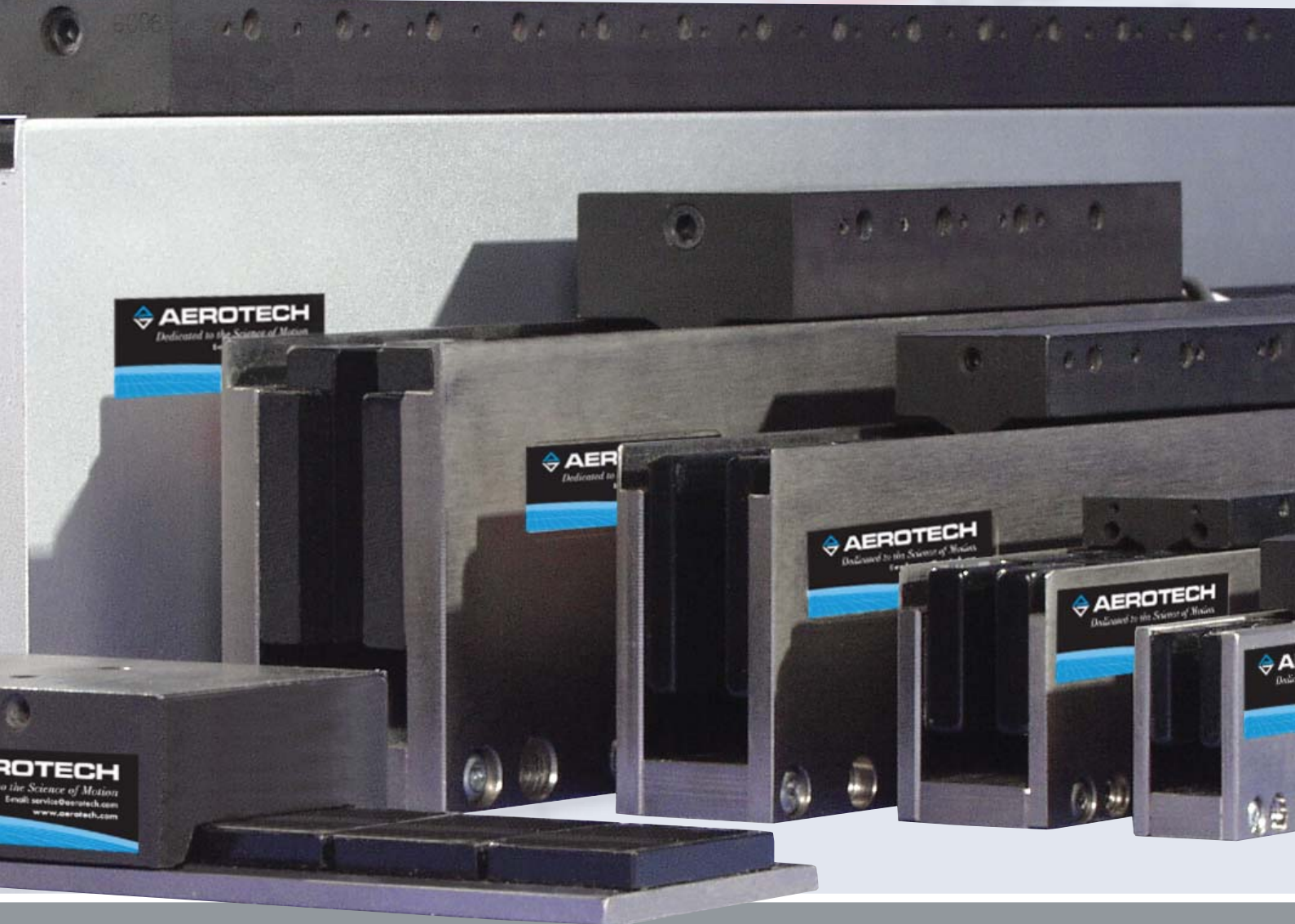
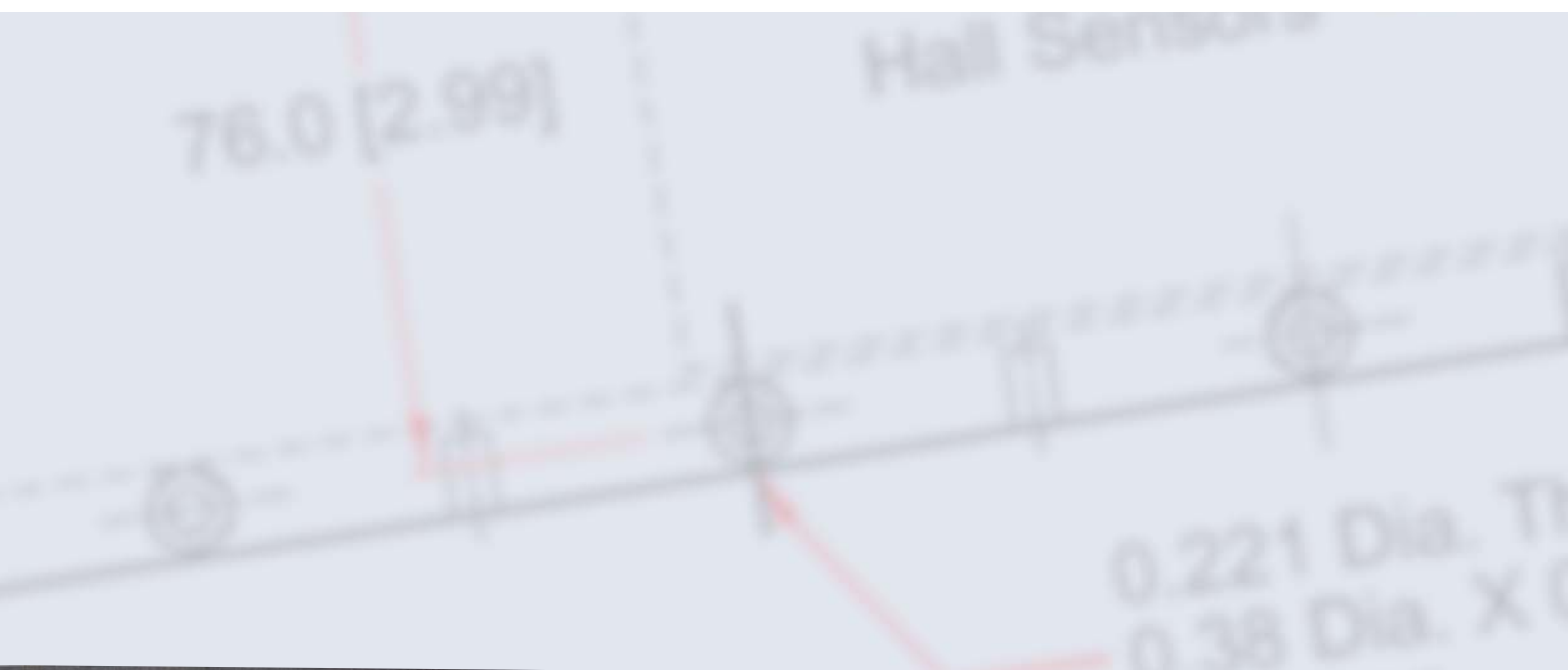
The flat linear motor design consists of a low profile, low-cost forcer and rare-earth magnet track. Aerotech flat linear motors are available with either non-magnetic forcers (to achieve zero cogging for extremely smooth motion and very tight velocity and position

control), or with magnetic forcers (to achieve higher force per unit volume). The flat magnet track can accommodate either type of forcer.

The noncontact design of the forcer and magnet track results in a maintenance-free system. Aerotech manufactures a complete line of linear motors to meet the needs of your industrial automation application.

	Continuous Force (No Air) N (lb)	Continuous Force (20 psi) N (lb)	Peak Force N (lb)
BLMUC-79	18.3 (4.1)	31.4 (7.0)	125.4 (28.2)
BLMUC-95	23.0 (5.2)	40.5 (9.1)	161.9 (36.4)
BLMUC-111	30.6 (6.9)	46.9 (10.5)	187.6 (42.2)
BLMUC-143	39.8 (9.0)	58.0 (13.0)	231.8 (52.1)
BLMC-92	39.0 (8.8)	65.9 (14.8)	263.7 (59.3)
BLMC-142	68.2 (15.3)	105.5 (23.7)	422.1 (94.9)
BLMC-192	93.6 (21.0)	135.7 (30.5)	542.8 (122.0)
BLMC-267	108.3 (24.4)	161.4 (36.3)	645.6 (145.2)
BLM-142	110.5 (24.8)	173.2 (38.9)	692.7 (155.7)
BLM-203	153.3 (34.5)	251.6 (56.6)	1006.4 (226.3)
BLM-264	197.2 (44.3)	301.7 (67.8)	1206.6 (271.3)
BLM-325	230.7 (51.9)	332.2 (74.7)	1328.6 (298.7)
BLM-386	257.3 (57.8)	397.6 (89.4)	1590.4 (357.5)
BLMH-142	150.0 (33.7)	270.7 (60.9)	1082.7 (243.4)
BLMH-202	194.2 (43.7)	351.2 (79.0)	1404.9 (315.9)
BLMH-262	266.2 (59.9)	437.1 (98.3)	1748.6 (393.1)
BLMH-322	303.2 (68.2)	489.2 (110.0)	1956.7 (439.9)
BLMH-382	357.9 (80.5)	548.8 (123.4)	2195.0 (493.5)
BLMX-382	537 (121)	972 (218)	3887 (874)
BLMX-502	601 (135)	1063 (239)	4252 (956)
BLMFI-81	18.7 (4.2)	N/A	74.7 (16.8)
BLMFI-142	32.4 (7.3)	N/A	129.7 (29.2)
BLMFI-264	64.8 (14.6)	N/A	259.1 (58.2)
BLMFI-325	90.2 (20.3)	N/A	360.7 (81.1)
BLMFI-386	112.1 (25.2)	N/A	448.4 (100.8)
BLMFS-81	28.0 (6.3)	N/A	112.1 (25.2)
BLMFS-142	48.0 (10.8)	N/A	192.2 (43.2)
BLMFS-264	97.1 (21.8)	N/A	388.6 (87.4)
BLMFS-325	134.5 (30.2)	N/A	538.0 (121.0)
BLMFS-386	159.4 (35.8)	N/A	637.7 (143.4)
BLMFSS-142	174.8 (39.3)	323.4 (72.7)*	699.3 (157.2)
BLMFSS-262	282.3 (63.5)	522.3 (117.4)*	1129.2 (253.9)
BLMFSS-382	376.8 (84.7)	697.1 (156.7)*	1507.2 (338.8)

* Water cooling



BLMUC Series

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.

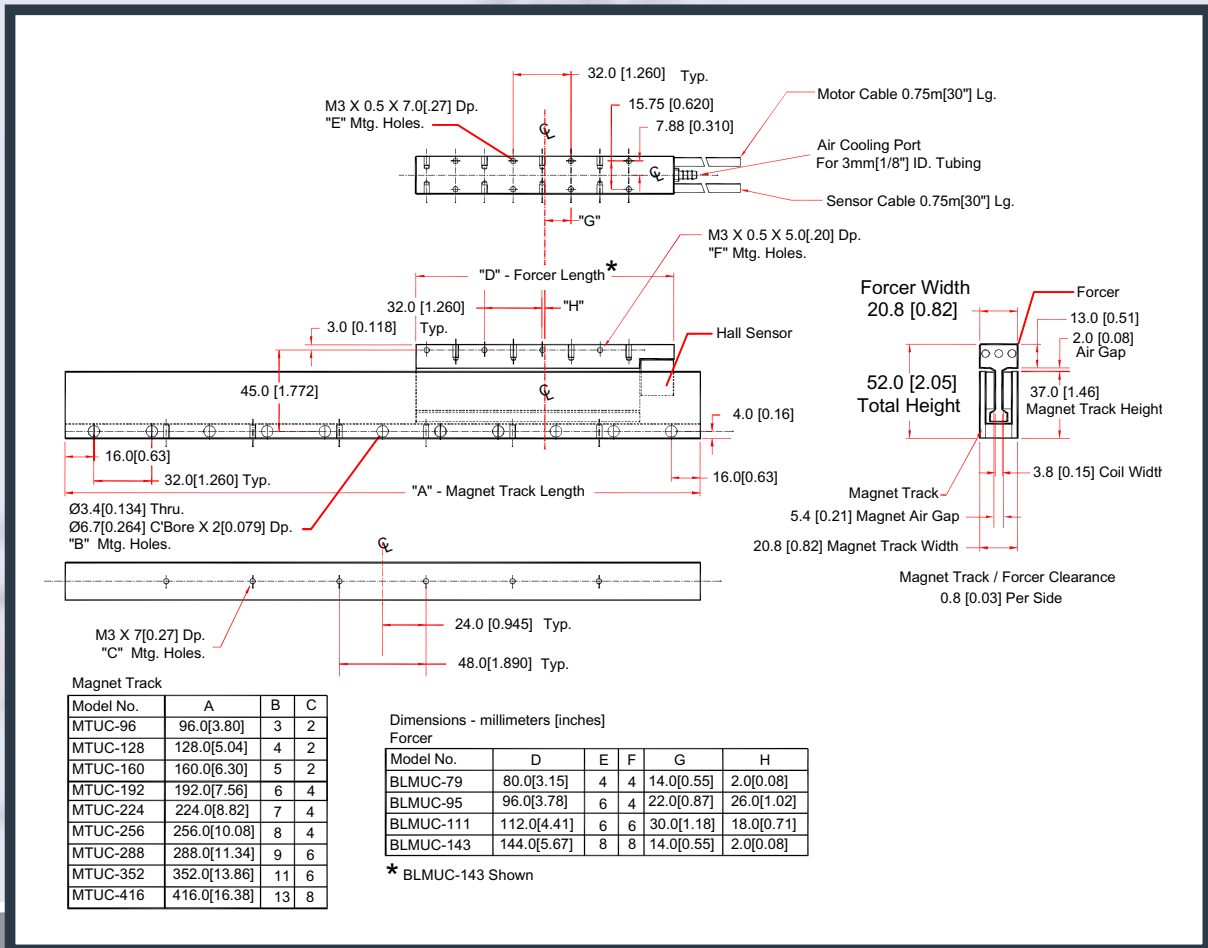
Motor Model	Units	BLMUC-79	BLMUC-95	BLMUC-111	BLMUC-143
Performance Specifications^(1,5)					
Continuous Force, 1.4 bar (20 psi) ⁽²⁾	N (lb)	31.4 (7.0)	40.5 (9.1)	46.9 (10.5)	58.0 (13.0)
Continuous Force, No Air ⁽²⁾	N (lb)	18.3 (4.1)	23.0 (5.2)	30.6 (6.9)	39.8 (9.0)
Peak Force ⁽³⁾	N (lb)	125.4 (28.2)	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	1.5x10 ⁻³	1.5x10 ⁻³	1.5x10 ⁻³	1.5x10 ⁻³
	SCFM	3.12	3.15	3.22	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)	80.0 (3.15)	96.0 (3.78)	112.0 (4.41)	144.0 (5.61)
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:

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



Aerotech BLMUC
linear motor



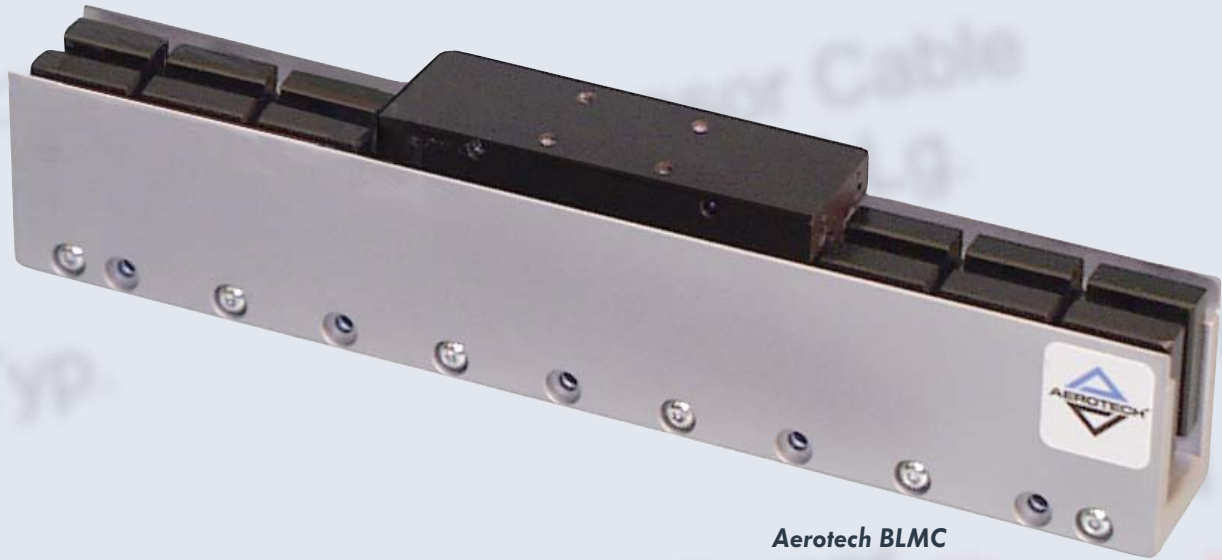
BLMC Series

Aerotech's "U-channel" BLMC series compact linear motors are only 57.2 mm x 31.8 mm and designed for high force in a compact package. The compact moving force 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. For highest rms force, optional air cooling is available. Offering high peak forces in its standard configuration, BLMC motors are available with special high-power magnets that can increase output force.

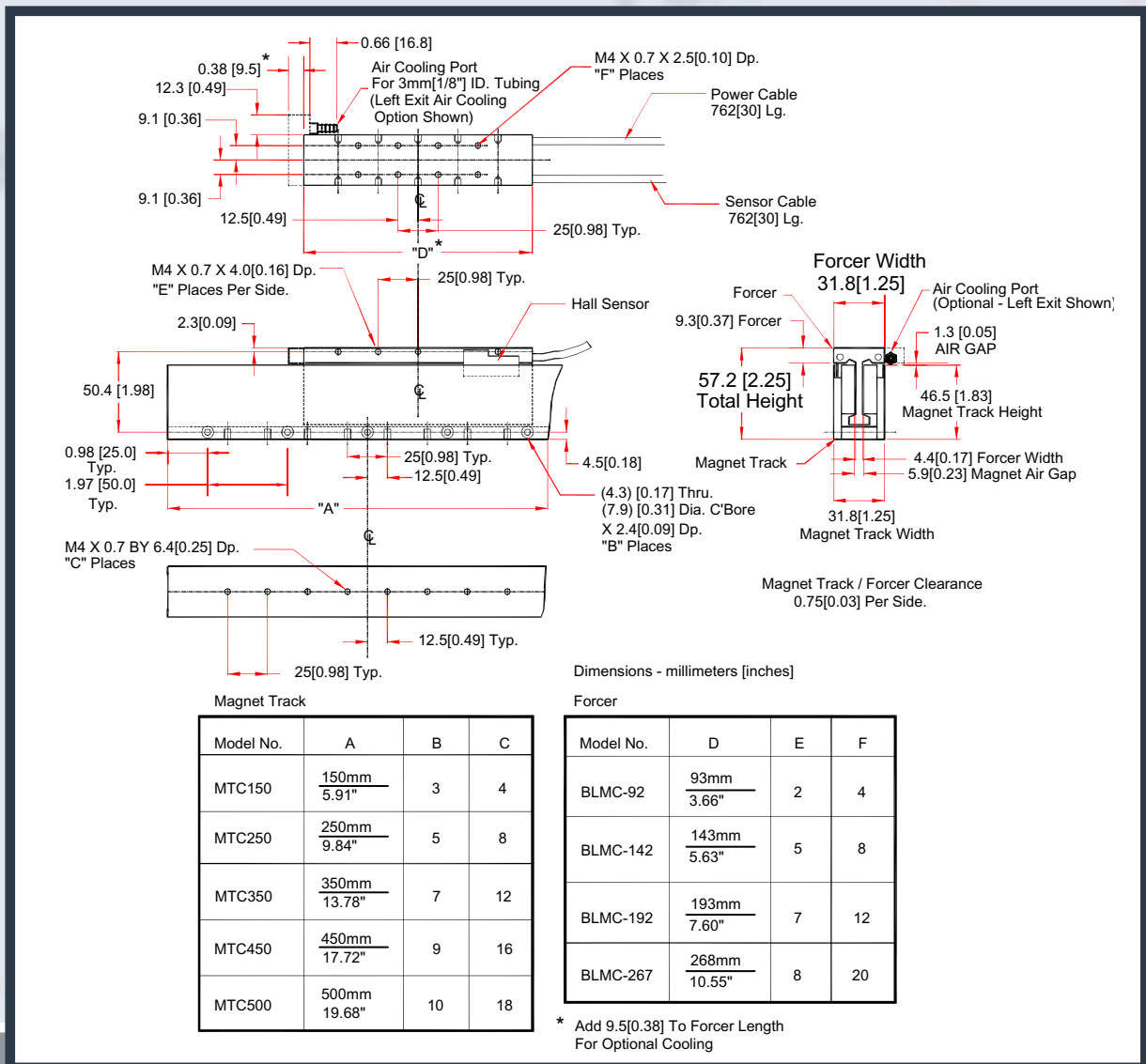
Motor Model	Units	BLMC-92	BLMC-142	BLMC-192	BLMC-267
Performance Specifications^(1,5)					
Continuous Force, 1.4 bar (20 psi) ⁽²⁾	N (lb)	65.9 (14.8)	105.5 (23.7)	135.7 (30.5)	161.4 (36.3)
Continuous Force, No Air ⁽²⁾	N (lb)	39.0 (8.8)	68.2 (15.3)	93.6 (21.0)	108.3 (24.4)
Peak Force ⁽³⁾	N (lb)	263.7 (59.3)	422.1 (94.9)	542.8 (122.0)	645.6 (145.2)
Electrical Specifications⁽⁵⁾					
Winding Designation		-A	-A	-A	-A
BEMF Constant (Line-Line, Max)	V/m/s (V/in/s)	9.97 (0.25)	18.66 (0.47)	26.89 (0.68)	36.10 (0.92)
Continuous Current, 1.4 bar (20 psi) ⁽²⁾	Amp _{pk}	7.60	6.50	5.80	5.14
	Amp _{rms}	5.37	4.60	4.10	3.63
Continuous Current, No Air ⁽²⁾	Amp _{pk}	4.50	4.20	4.00	3.45
	Amp _{rms}	3.18	2.97	2.83	2.44
Peak Current, Stall ⁽³⁾	Amp _{pk}	30.40	26.00	23.20	20.56
	Amp _{rms}	21.50	18.38	16.40	14.54
Force Constant, Sine Drive ^(4,8)	N/Amp _{pk} (lb/Amp _{pk})	8.67 (1.95)	16.24 (3.65)	23.40 (5.26)	31.40 (7.06)
	N/Amp _{rms} (lb/Amp _{rms})	12.27 (2.76)	22.96 (5.16)	33.09 (7.44)	44.41 (9.98)
Motor Constant ^(2,4)	N/√W (lb/√W)	4.97 (1.12)	7.23 (1.63)	9.03 (2.03)	10.10 (2.27)
Resistance, 25°C (Line-Line)	ohms	2.9	4.8	6.4	9.2
Inductance (Line-Line)	mH	0.83	1.33	1.90	3.40
Thermal Resistance, 1.4 bar (20 psi)	°C/W	0.57	0.47	0.44	0.39
Thermal Resistance (No Cooling)	°C/W	1.62	1.12	0.93	0.87
Maximum Bus Voltage	VDC	340	340	340	340
Mechanical Specifications					
Air Flow, 20 psi	m ³ /s	1.3x10 ⁻³	1.7x10 ⁻³	1.4x10 ⁻³	1.5x10 ⁻³
	SCFM	2.9	3.6	2.9	3.2
Coil Weight	kg (lb)	0.16 (0.35)	0.26 (0.57)	0.34 (0.75)	0.52 (1.14)
Coil Length	mm (in)	93.0 (3.66)	143.0 (5.63)	193.0 (7.60)	268.0 (10.55)
Heat Sink	mm (in)	250x250x25 (10x10x1)	250x250x25 (10x10x1)	250x250x25 (10x10x1)	250x250x25 (10x10x1)
Magnet Track Weight	kg/m (lb/ft)	9.06 (6.08)	9.06 (6.08)	9.06 (6.08)	9.06 (6.08)
Magnetic Pole Pitch	mm (in)	25.00 (0.98)	25.00 (0.98)	25.00 (0.98)	25.00 (0.98)

Notes:

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



Aerotech BLMC
linear motor



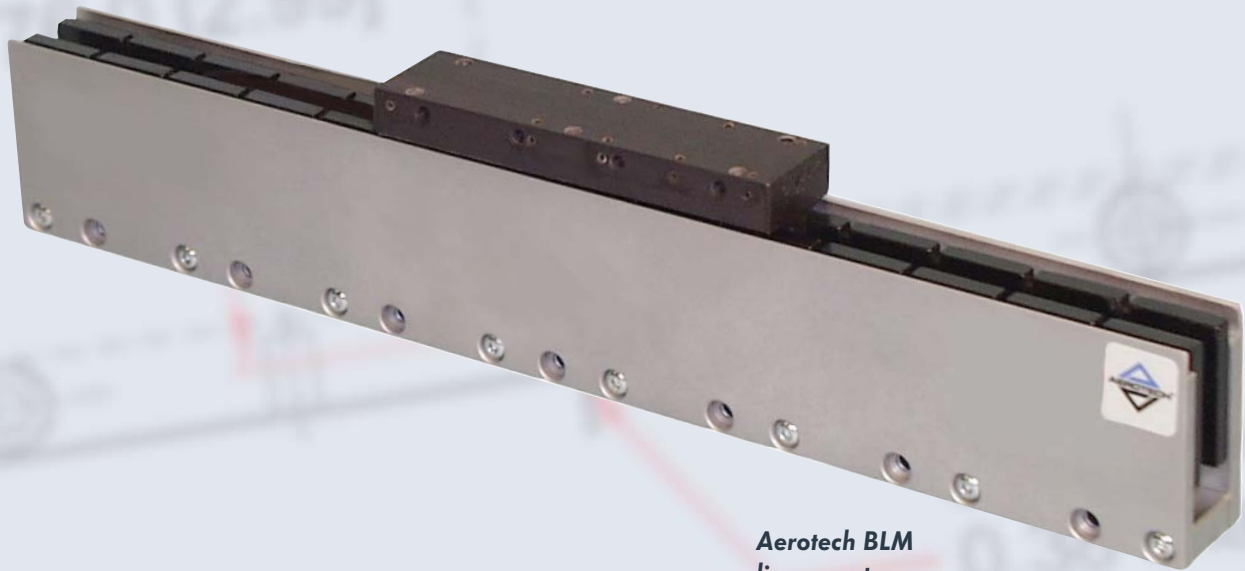
BLM Series

Aerotech's "U-channel" BLM series linear motors are 86.4 mm x 34.3 mm in cross section and have proven ideal for both high-accuracy and high-throughput applications. The BLM series nonmagneticforcer eliminates cogging and magnetic attraction to allow extremely smooth motion and very tight velocity and position control. These linear motors are ideal for any application that requires high levels of positioning resolution and accuracy. BLM 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.

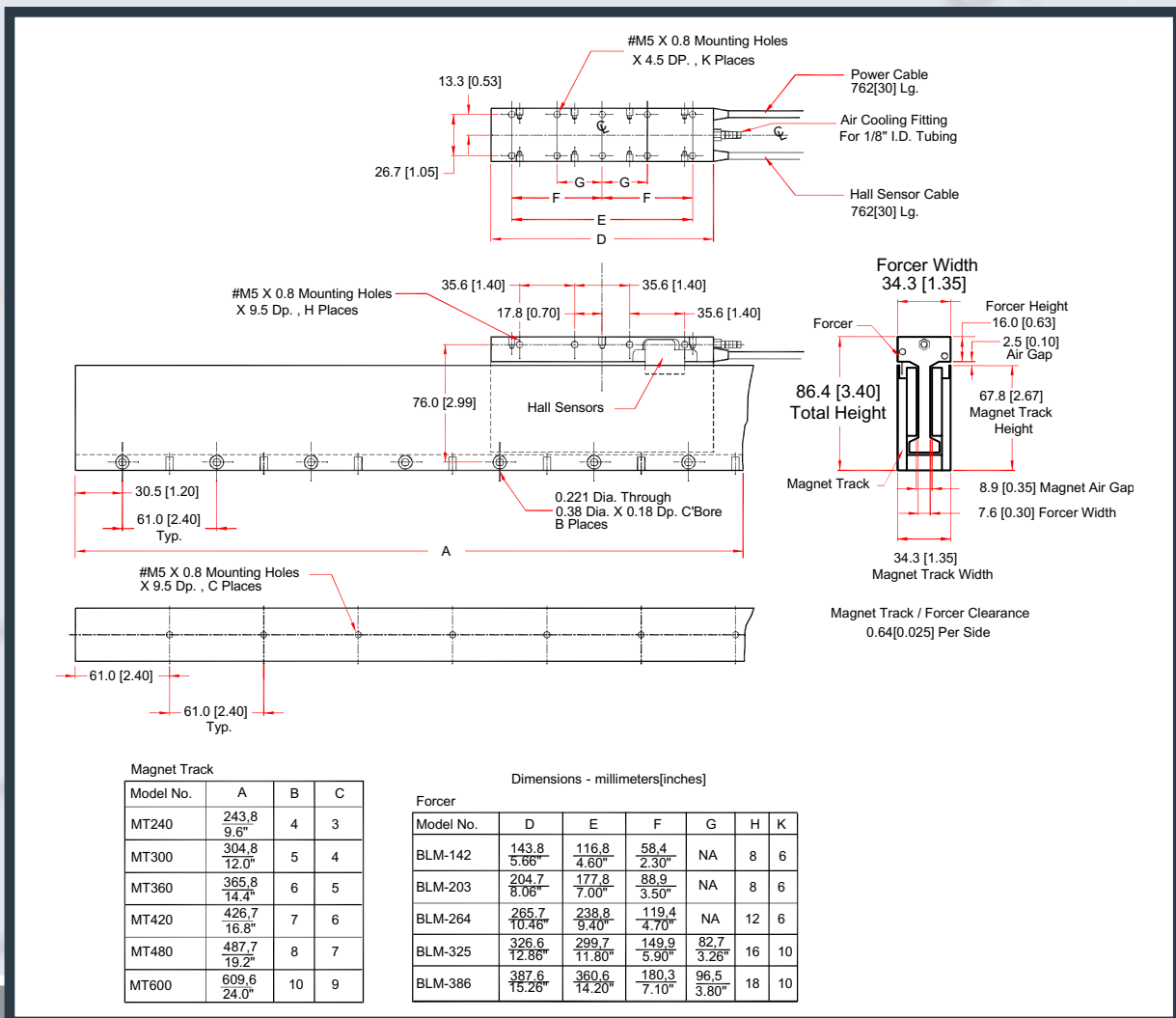
Motor Model (assumes -P magnet track)	Units	BLM-142		BLM-203		BLM-264		BLM-325		BLM-386	
Performance Specifications^(1,5)											
Continuous Force, 1.4 bar (20 psi) ⁽²⁾	N (lb)	173.2 (38.9)		251.6 (56.6)		301.7 (67.8)		332.2 (74.7)		397.6 (89.4)	
Continuous Force, No Air ⁽²⁾	N (lb)	110.5 (24.8)		153.3 (34.5)		197.2 (44.3)		230.7 (51.9)		257.3 (57.8)	
Peak Force ⁽³⁾	N (lb)	692.7 (155.7)		1006.4 (226.3)		1206.6 (271.3)		1328.6 (298.7)		1590.4 (357.5)	
Electrical Specifications⁽⁵⁾											
Winding Designation		-A		-B (opt)		-A		-B (opt)		-A	
BEMF Constant (Line-Line, Max)	V/m/s (V/in/s)	40.96 (1.04)	20.48 (0.52)	33.24 (0.84)	66.49 (1.69)	44.46 (1.13)	88.91 (2.26)	53.03 (1.35)	106.06 (2.69)	67.21 (1.71)	134.42 (3.41)
Continuous Current, 1.4 bar, 20 psi ⁽²⁾	Amp _{pk} (Amp _{rms})	4.86 (3.44)	9.72 (6.87)	8.70 (6.15)	4.35 (3.08)	7.80 (5.52)	3.90 (2.76)	7.20 (5.09)	3.60 (2.55)	6.80 (4.81)	3.40 (2.40)
Continuous Current, No Air ⁽²⁾	Amp _{pk} (Amp _{rms})	3.10 (2.19)	6.20 (4.38)	5.30 (3.75)	2.65 (1.87)	5.10 (3.61)	2.55 (1.80)	5.00 (3.54)	2.50 (1.77)	4.40 (3.11)	2.20 (1.56)
Peak Current, Stall ⁽³⁾	Amp _{pk} (Amp _{rms})	19.44 (13.75)	38.88 (27.49)	34.80 (24.61)	17.40 (12.30)	31.20 (22.06)	15.60 (11.03)	28.80 (20.36)	14.40 (10.18)	27.20 (19.23)	13.60 (9.62)
Force Constant, Sine Drive ^(4,8)	N/Amp _{pk} (lb/Amp _{pk})	35.63 (8.01)	17.82 (4.01)	28.92 (6.50)	57.84 (13.00)	38.67 (8.69)	77.35 (17.39)	46.13 (10.37)	92.27 (20.74)	58.47 (13.15)	116.94 (26.29)
	N/Amp _{rms} (lb/Amp _{rms})	50.39 (11.33)	25.20 (5.66)	40.90 (9.19)	81.80 (18.39)	54.69 (12.30)	109.39 (24.59)	65.24 (14.67)	130.48 (29.34)	82.69 (18.59)	165.38 (37.18)
Motor Constant ^(2,4)	N/√W (lb/√W)	10.53 (2.37)		14.11 (3.17)		16.39 (3.69)		17.66 (3.97)		20.17 (4.54)	
Resistance, 25°C (Line-Line)	ohms	10.9	2.7	4.0	16.0	5.3	21.2	6.5	26.0	8.0	32.0
Inductance (Line-Line)	mH	8.70	2.18	3.20	12.80	4.20	16.80	5.20	20.80	6.20	24.80
Thermal Resistance, 1.4 bar, 20 psi	°C/W	0.37		0.31		0.30		0.28		0.26	
Thermal Resistance, No Cooling	°C/W	0.91		0.85		0.69		0.59		0.61	
Maximum Bus Voltage	VDC	340		340		340		340		340	
Mechanical Specifications											
Air Flow, 20 psi	m ³ /s SCFM	1.7x10 ⁻³ 3.5		1.5x10 ⁻³ 3.2		1.6x10 ⁻³ 3.3		1.6x10 ⁻³ 3.3		1.6x10 ⁻³ 3.4	
Coil Weight	kg (lb)	0.60 (1.32)		0.90 (1.98)		1.10 (2.42)		1.40 (3.08)		1.70 (3.74)	
Coil Length	mm (in)	143.8 (5.66)		204.7 (8.06)		265.7 (10.46)		326.6 (12.86)		387.6 (15.26)	
Heat Sink	mm (in)	250x250x25 (10x10x1)		250x250x25 (10x10x1)		250x250x25 (10x10x1)		250x400x25 (10x16x1)		250x400x25 (10x16x1)	
Magnet Track Weight	kg/m (lb/ft)	10.76 (7.22)		10.76 (7.22)		10.76 (7.22)		10.76 (7.22)		10.76 (7.22)	
Magnetic Pole Pitch	mm (in)	30.48 (1.20)		30.48 (1.20)		30.48 (1.20)		30.48 (1.20)		30.48 (1.20)	

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.



Aerotech BLM
linear motor



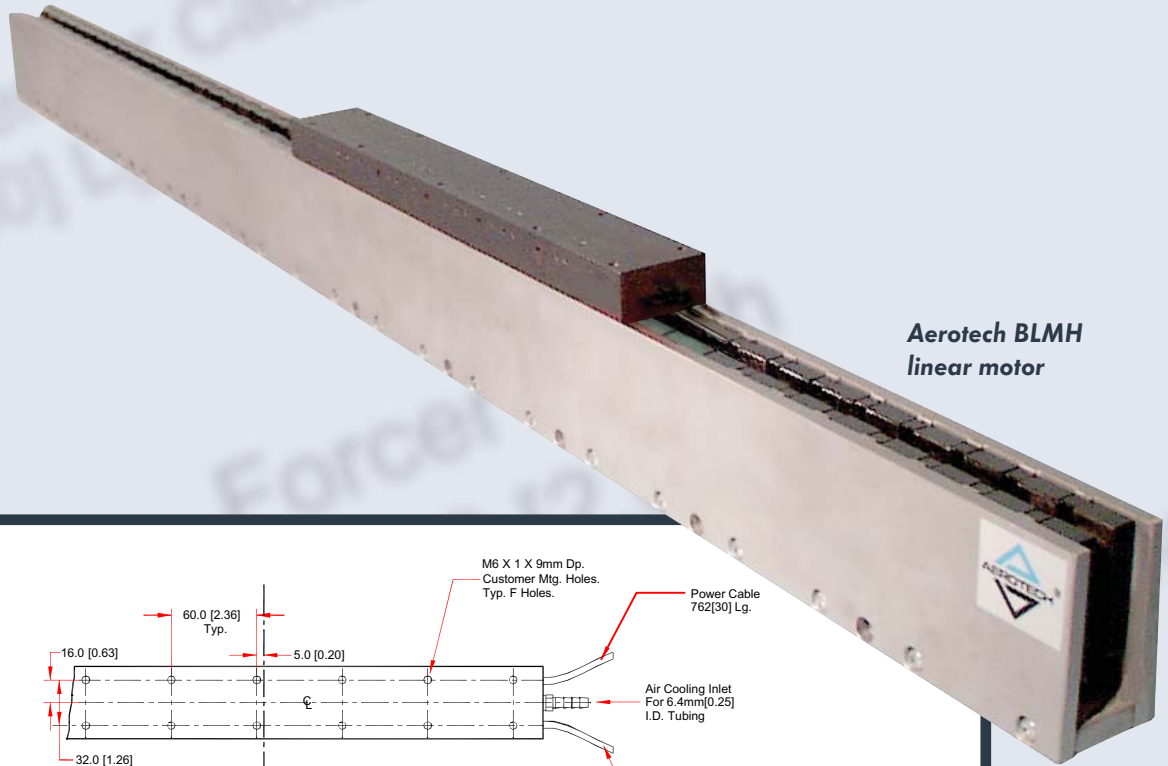
BLMH Series

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.

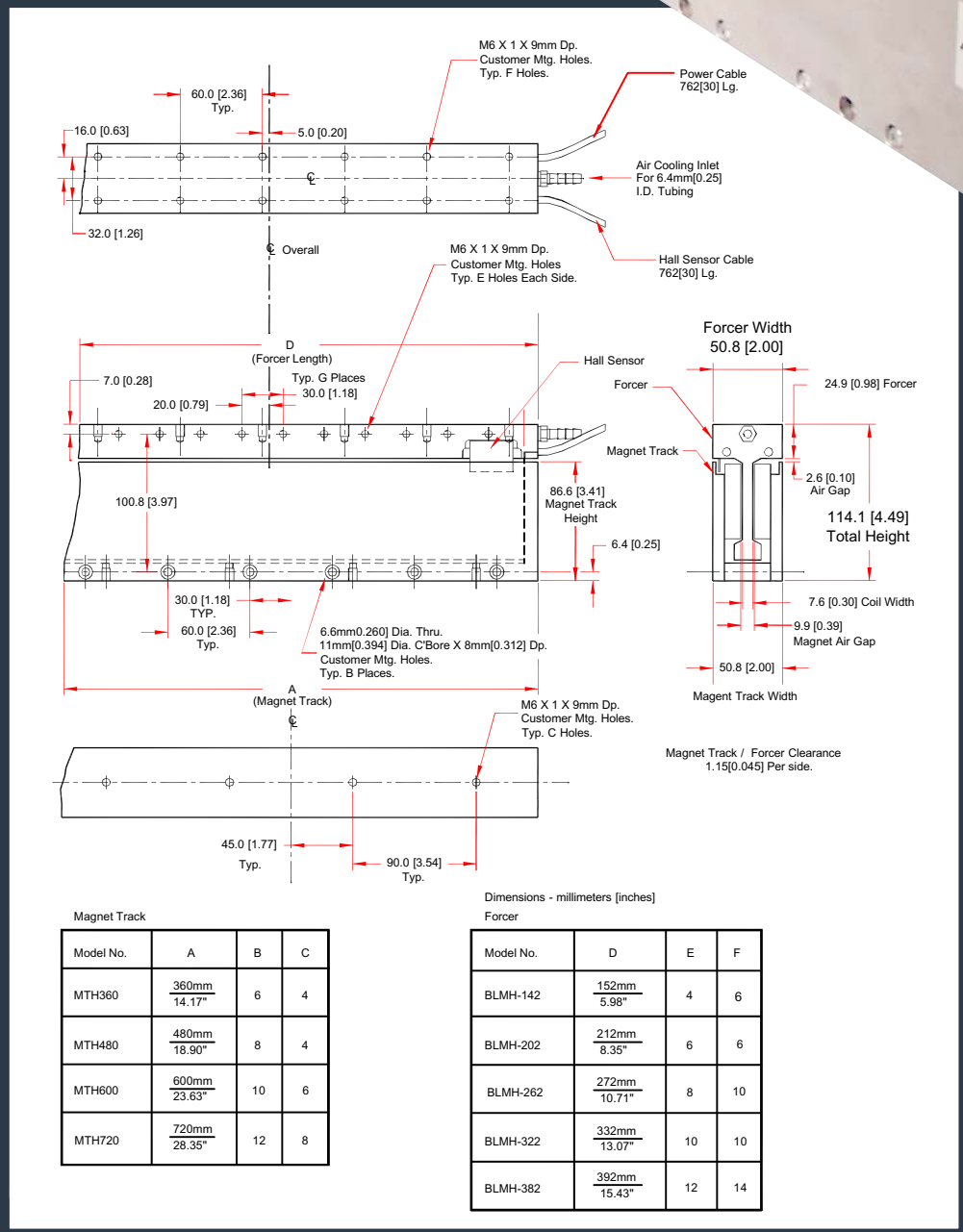
Motor Model (assumes -S magnet track)	Units	BLMH-142		BLMH-202		BLMH-262		BLMH-322		BLMH-382	
Performance Specifications^(1,5)											
Continuous Force, 1.4 bar, 20 psi ⁽²⁾	N (lb)	270.7 (60.9)		351.2 (79.0)		437.1 (98.3)		489.2 (110.0)		548.8 (123.4)	
Continuous Force, No Air ⁽²⁾	N (lb)	150.0 (33.7)		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.



**Aerotech BLMH
linear motor**



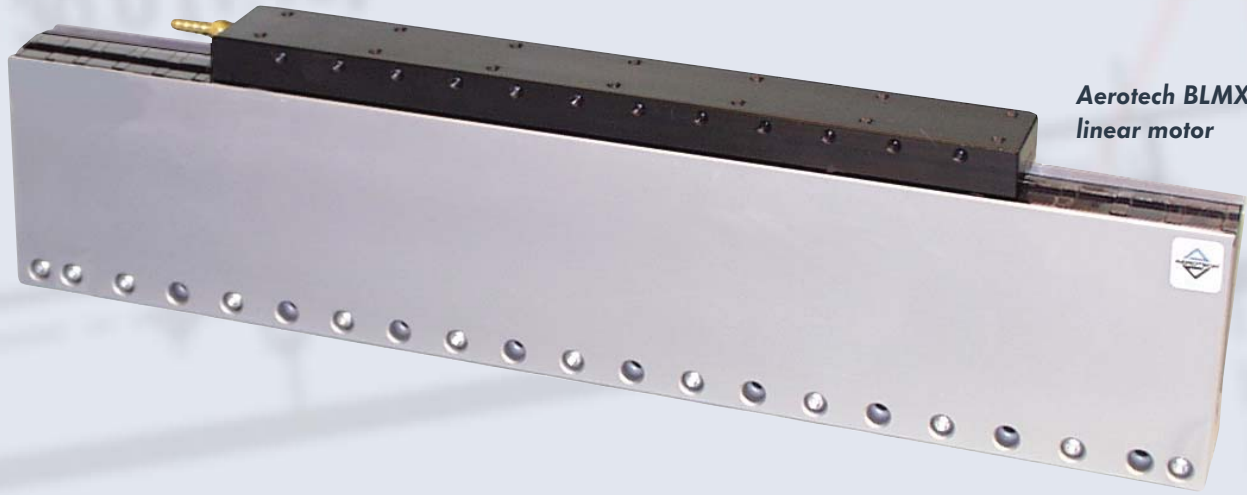
BLMX Series

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

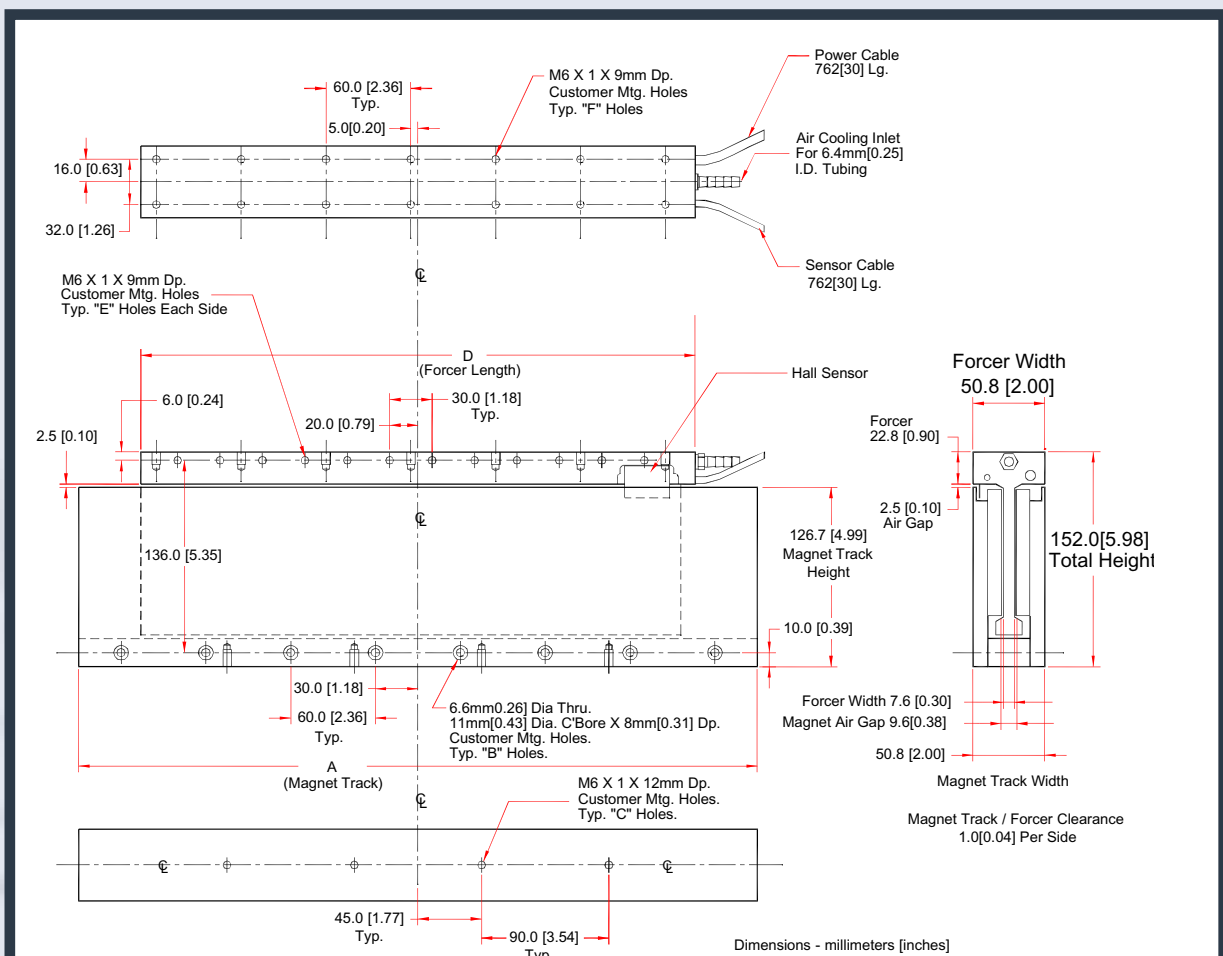
Motor Model	Units	BLMX-382		BLMX-502	
Performance Specifications^(1,5)					
Continuous Force, 1.4 bar, 20 psi ⁽²⁾	N (lb)	972 (218)		1063 (239)	
Continuous Force, No Air ⁽²⁾	N (lb)	537 (121)		601 (135)	
Peak Force ⁽²⁾	N (lb)	3887 (874)		4252 (956)	
Electrical Specifications⁽⁵⁾					
Winding Designation		-A	-B (opt)	-A	-B (opt)
BEMF Constant (Line-Line)	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 psi ⁽²⁾	Amp _{pk} (Amp _{rms})	12.95 (9.16)	6.48 (4.58)	11.15 (7.88)	22.30 (15.77)
Continuous Current, No Air ⁽²⁾	Amp _{pk} (Amp _{rms})	7.15 (5.06)	3.58 (2.53)	6.30 (4.45)	12.60 (8.91)
Peak Current, Stall ⁽³⁾	Amp _{pk} (Amp _{rms})	51.80 (36.63)	25.90 (18.31)	44.60 (31.54)	89.20 (63.08)
Force Constant, Sine Drive ^(4,8)	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 ^(2,4)	N/√W (lb/√W)	39.72 (8.93)		46.23 (10.39)	
Resistance, 25°C (Line-Line)	ohms	3.4	13.6	4.5	1.1
Inductance (Line-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 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)	37.26 (24.99)		37.26 (24.99)	
Magnetic Pole Pitch	mm (in)	30.00 (1.18)		30.00 (1.18)	

Notes:

- Performance is dependent upon heat sink configuration, system cooling conditions, and ambient temperature.
- Values shown @ 65°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 90°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.



**Aerotech BLMX
linear motor**



Magnet Track

Model No.	A	B	C
MTX480	480mm 18.90"	8	4
MTX600	600mm 23.63"	10	6
MTX720	720mm 28.35"	12	8

Forcer

Model No.	D	E	F
BLMX-382	392mm 15.43"	12	14
BLMX-502	512mm 20.16"	16	18

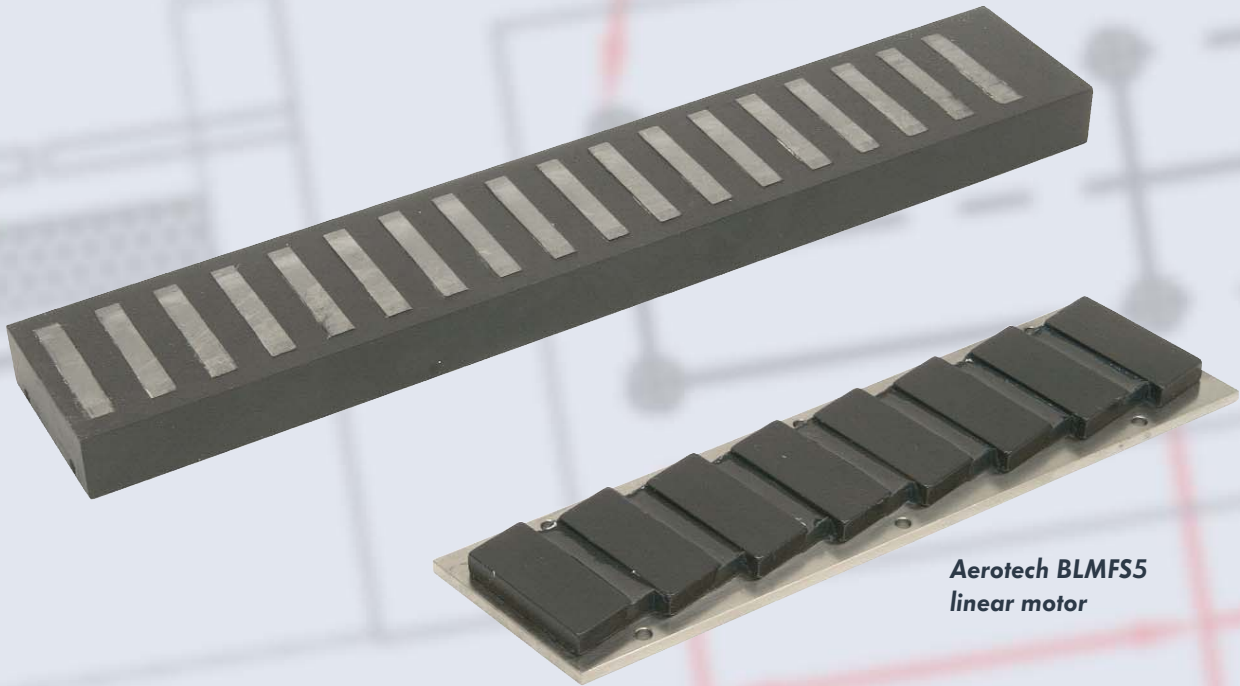
BLMFS-5 Series

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 BLMFS5 series utilizes steel laminations to produce more force for a given force 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.

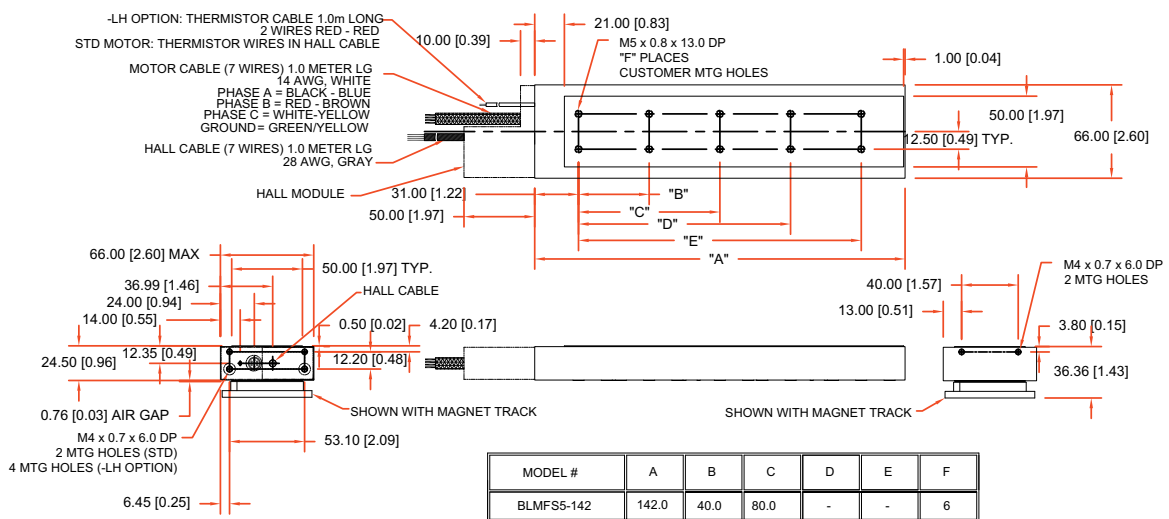
Motor Model	Units	BLMFS5-142		BLMFS5-262		BLMFS5-382	
Performance Specifications^(1,5)							
Continuous Force, Water Cooling ^(2,6)	N (lb)	323.4 (72.7)		522.3 (117.4)		697.1 (156.7)	
Continuous Force, No Cooling ⁽²⁾	N (lb)	174.8 (39.3)		282.3 (63.5)		376.8 (84.7)	
Peak Force ⁽³⁾	N (lb)	699.3 (157.2)		1129.2 (253.9)		1507.2 (338.8)	
Cogging Force	N (lb)	57.8 (13.0)		62.3 (14.0)		67.2 (15.1)	
Attractive Force	N (lb)	2410 (542)		4446 (1000)		6482 (1457)	
Electrical Specifications⁽⁵⁾							
Winding Designation		-A	-B	-A	-B	-A	-B
BEMF (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, Water Cooling ^(2,6)	Amp _{pk} (Amp _{rms})	16.91 (11.96)	8.45 (5.98)	27.31 (19.31)	13.65 (9.65)	36.45 (25.77)	18.22 (12.89)
Continuous Current, No Cooling ⁽²⁾	Amp _{pk} (Amp _{rms})	9.14 (6.46)	4.57 (3.23)	14.76 (10.44)	7.38 (5.22)	19.70 (13.93)	9.85 (6.97)
Peak Current, Stall ⁽²⁾	Amp _{pk} (Amp _{rms})	36.56 (25.85)	18.28 (12.93)	59.04 (41.75)	29.52 (20.87)	78.80 (55.72)	39.40 (27.86)
Average Force Constant, Sine Drive ^(4,8)	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 ^(2,4)	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-Line)	ohms	1.7	6.7	0.8	3.4	0.6	2.2
Inductance (Line-Line)	mH	9.90	39.60	4.95	19.80	3.30	13.20
Thermal Resistance, Water Cooling ⁽⁶⁾	°C/W	0.20		0.15		0.13	
Thermal Resistance, No 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)	4.40 (2.95)					
Magnetic Pole Pitch	mm (in)	30.00 (1.18)					

Notes:

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



**Aerotech BLMF55
linear motor**



BLMF Series

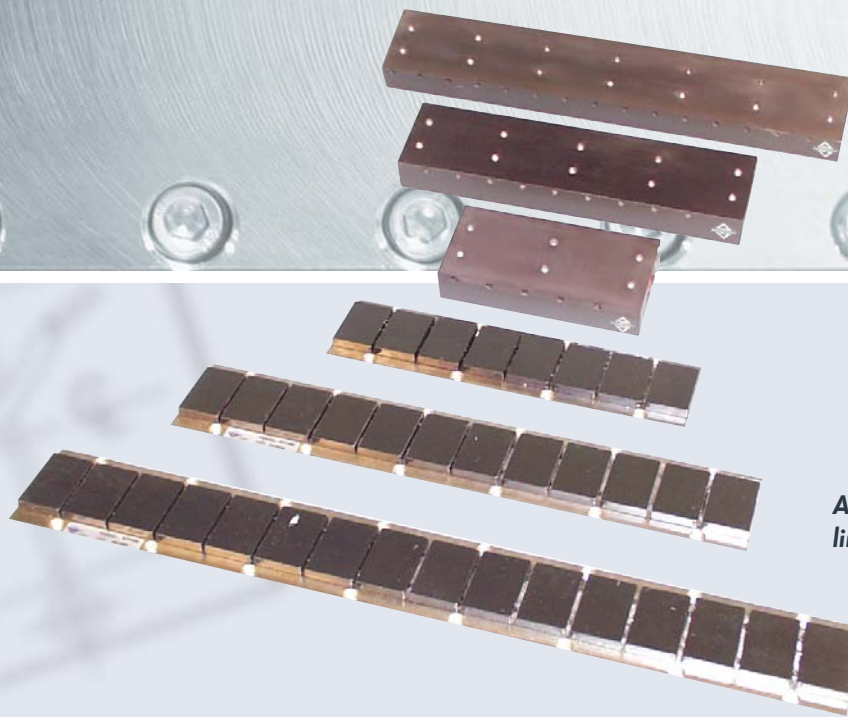
BLMF series flat linear motors are designed to provide a lower cost and lower profile alternative to U-channel linear motors. The BLMFI forcer contains no magnetic material to achieve zero cogging and zero magnetic attraction, while the BLMFS forcer contains magnetic material to achieve higher force per unit volume. The BLMF can be driven using standard Aerotech brushless amplifiers and controllers to provide a complete, integrated system.

BLMFI "Ironless" Forcer Models

Motor Model	Units	BLMFI-81	BLMFI-142	BLMFI-264	BLMFI-325	BLMFI-386					
Performance Specifications^(1,5)											
Continuous Force, No Air ⁽²⁾	N (lb)	18.7 (4.2)	32.4 (7.3)	64.8 (14.6)	90.2 (20.3)	112.1 (25.2)					
Peak Force ⁽³⁾	N (lb)	74.7 (16.8)	129.7 (29.2)	259.1 (58.2)	360.7 (81.1)	448.4 (100.8)					
Attraction Force	N (lb)	0	0	0	0	0					
Electrical Specifications⁽⁵⁾											
Winding Designation		-A	-B	-A	-B	-A	-B	-A	-B	-A	-B
BEMF Constant (Line-Line, Max)	V/m/s (V/in/s)	7.16 (0.18)	3.58 (0.09)	13.81 (0.35)	6.90 (0.18)	14.32 (0.36)	28.63 (0.73)	18.51 (0.47)	37.02 (0.94)	23.01 (0.58)	46.02 (1.17)
Continuous Current, No Air ⁽²⁾	Amp _{pk} (Amp _{rms})	3.00 (2.12)	6.00 (4.24)	2.70 (1.91)	5.40 (3.82)	5.20 (3.68)	2.60 (1.84)	5.60 (3.96)	2.80 (1.98)	5.60 (3.96)	2.80 (1.98)
Peak Current, Stall ⁽³⁾	Amp _{pk} (Amp _{rms})	12.00 (8.49)	24.00 (16.97)	10.80 (7.64)	21.60 (15.27)	20.80 (14.71)	10.40 (7.35)	22.40 (15.84)	11.20 (7.92)	22.40 (15.84)	11.20 (7.92)
Force Constant, Sine Drive ^(4,8)	N/Amp _{pk} (lb/Amp _{pk})	6.23 (1.40)	3.11 (0.70)	12.01 (2.70)	6.00 (1.35)	12.45 (2.80)	24.91 (5.60)	16.10 (3.62)	32.20 (7.24)	20.02 (4.50)	40.03 (9.00)
	N/Amp _{rms} (lb/Amp _{rms})	8.81 (1.98)	4.40 (0.99)	16.98 (3.82)	8.49 (1.91)	17.61 (3.96)	35.23 (7.92)	22.77 (5.12)	45.54 (10.24)	28.31 (6.36)	56.61 (12.73)
Motor Constant ^(2,4)	N/√W (lb/√W)	2.59 (0.58)		3.55 (0.80)		5.28 (1.19)		6.16 (1.39)		6.91 (1.55)	
Resistance, 25°C (Line-Line)	ohms	5.5	1.4	10.9	2.7	5.3	21.2	6.5	26.0	8.0	32.0
Inductance (Line-Line)	mH	2.90	0.73	6.50	1.63	3.50	14.00	4.48	17.92	5.30	21.20
Thermal Resistance, No Cooling	°C/W	1.92		1.20		0.66		0.47		0.38	
Maximum Bus Voltage	VDC	340		340		340		340		340	
Mechanical Specifications											
Coil Weight	kg (lb)	0.50 (1.10)		0.84 (1.85)		1.10 (2.42)		1.40 (3.08)		1.70 (3.74)	
Coil Length	mm (in)	81.0 (3.19)		142.2 (5.60)		264.2 (10.40)		325.1 (12.80)		386.1 (15.20)	
Heat Sink	mm (in)	100x100x13 (4x4x0.5)		150x150x13 (6x6x0.5)		300x300x13 (12x12x0.5)		350x350x13 (14x14x0.5)		400x400x13 (16x16x0.5)	
Magnet Track Weight	kg/m (lb/ft)	4.75 (3.19)		4.75 (3.19)		4.75 (3.19)		4.75 (3.19)		4.75 (3.19)	
Magnetic Pole Pitch	mm (in)	30.00 (1.18)		30.00 (1.18)		30.00 (1.18)		30.00 (1.18)		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.



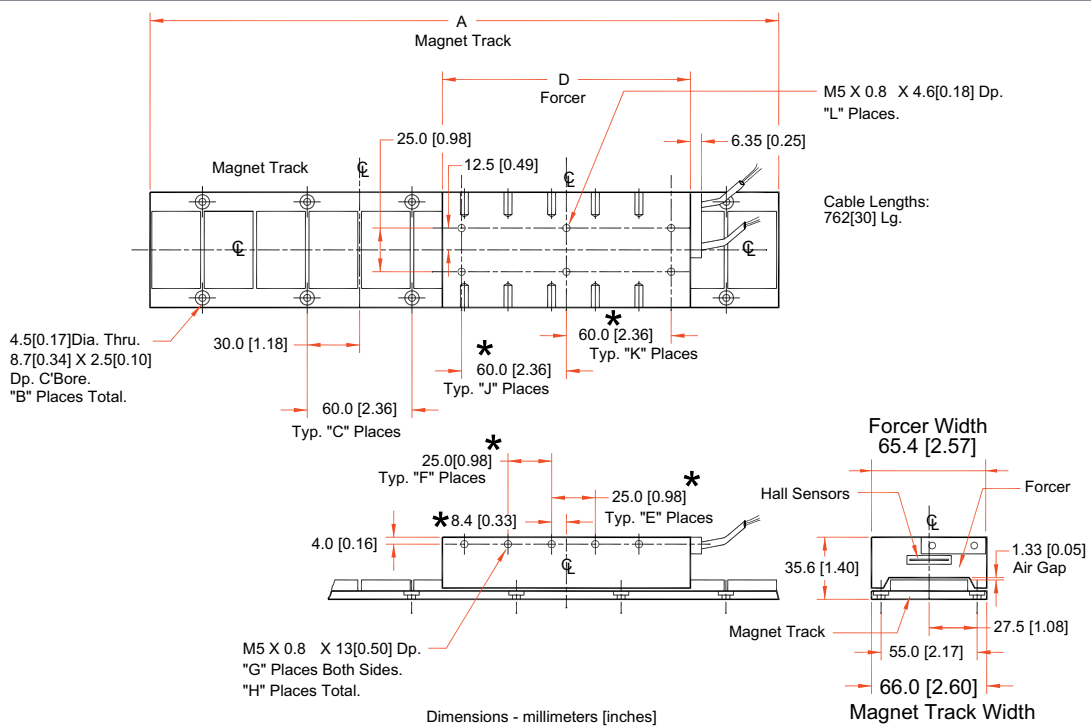
**Aerotech BLMF series
linear motors**

BLMFS "Steel Laminated" Forcer Models											
Motor Model	Units	BLMFS-81	BLMFS-142	BLMFS-264	BLMFS-325	BLMFS-386					
Performance Specifications^(1,5)											
Continuous Force, No Air⁽²⁾	N (lb)	28.0 (6.3)	48.0 (10.8)	97.1 (21.8)	134.5 (30.2)	159.4 (35.8)					
Peak Force⁽³⁾	N (lb)	112.1 (25.2)	192.2 (43.2)	388.6 (87.4)	538.0 (121.0)	637.7 (143.4)					
Attraction Force	N (lb)	134 (30)	232 (52)	427 (96)	535 (120)	629 (141)					
Electrical Specifications⁽⁵⁾											
Winding Designation		-A	-B	-A	-B	-A	-B	-A	-B	-A	-B
BEMF Constant (Line-Line, Max)	V/m/s (V/in/s)	10.74 (0.27)	5.37 (0.14)	20.45 (0.52)	10.23 (0.26)	21.47 (0.55)	42.95 (1.09)	27.61 (0.70)	55.22 (1.40)	32.72 (0.83)	65.45 (1.66)
Continuous Current, No Air⁽²⁾	Amp _{pk} (Amp _{rms})	3.0 (2.12)	6.00 (4.24)	2.70 (1.91)	5.40 (3.82)	5.20 (3.68)	2.60 (1.84)	5.60 (3.96)	2.80 (1.98)	5.60 (3.96)	2.80 (1.98)
Peak Current, Stall⁽³⁾	Amp _{pk} (Amp _{rms})	12.00 (8.49)	24.00 (16.97)	10.80 (7.64)	21.60 (15.27)	20.80 (14.71)	10.40 (7.35)	22.40 (15.84)	11.20 (7.92)	22.40 (15.84)	11.20 (7.92)
Force Constant, Sine Drive^(4,8)	N/Amp _{pk} (lb/Amp _{pk})	9.34 (2.10)	4.67 (1.05)	17.79 (4.00)	8.90 (2.00)	18.68 (4.20)	37.36 (8.40)	24.02 (5.40)	48.04 (10.80)	28.47 (6.40)	56.93 (12.80)
	N/Amp _{rms} (lb/Amp _{rms})	13.21 (2.97)	6.60 (1.48)	25.16 (5.66)	12.58 (2.83)	26.42 (5.94)	52.84 (11.88)	33.97 (7.64)	67.94 (15.27)	40.26 (9.05)	80.52 (18.10)
Motor Constant^(2,4)	N/√W (lb/√W)	3.89 (0.87)		5.26 (1.18)		7.92 (1.78)		9.19 (2.07)		9.82 (2.21)	
Resistance, 25°C (Line-Line)	ohms	5.5	1.4	10.9	2.7	5.3	21.2	6.5	26.0	8.0	32.0
Inductance (Line-Line)	mH	4.50	1.13	10.40	2.60	5.70	22.80	7.40	29.60	8.75	35.00
Thermal Resistance, No Cooling	°C/W	1.92		1.20		0.66		0.47		0.38	
Maximum Bus Voltage	VDC	340		340		340		340		340	
Mechanical Specifications											
Coil Weight	kg (lb)	0.60 (1.32)		1.02 (2.24)		1.90 (4.18)		2.31 (5.08)		2.76 (6.07)	
Coil Length	mm (in)	81.0 (3.19)		142.2 (5.60)		264.2 (10.40)		325.1 (12.80)		386.1 (15.20)	
Heat Sink	mm (in)	100x100x13 (4x4x0.5)		150x150x13 (6x6x0.5)		300x300x13 (12x12x0.5)		350x350x13 (14x14x0.5)		400x400x13 (16x16x0.5)	
Magnet Track Weight	kg/m (lb/ft)	4.75 (3.19)		4.75 (3.19)		4.75 (3.19)		4.75 (3.19)		4.75 (3.19)	
Magnetic Pole Pitch	mm (in)	30.00 (1.18)		30.00 (1.18)		30.00 (1.18)		30.00 (1.18)		30.00 (1.18)	

Notes:

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

BLMF Series

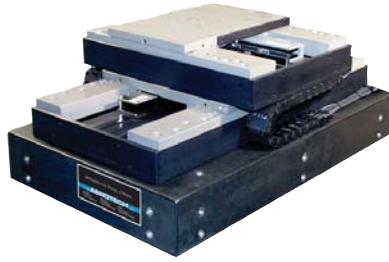


Magnet Track			
Model No.	A	B	C
MTF240	240mm 9.45"	8	3
MTF300	300mm 11.81"	10	4
MTF360	360mm 14.17"	12	5
MTF480	480mm 18.90"	16	7
MTF540	540mm 21.26"	16	7

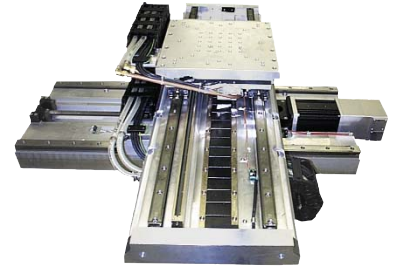
Forcer								
Model No.	D	E	F	G	H	J	K	L
BLMF-81	81mm 3.19"	1	1	2	4	1	1	4
BLMF-142	142mm 5.59"	2	2	5	10	1	1	6
BLMF-264	264mm 10.39"	4	4	9	18	2	2	10
BLMF-325	325mm 12.80"	5	5	11	22	2	2	10
BLMF-386	386mm 15.20"	7	7	15	30	3	3	14

* Dimensions Do Not Apply To BLMF-81. Consult Aerotech Inc.

Linear Motors in Action



ABL8000XY



Vacuum-Prepped ALS5000



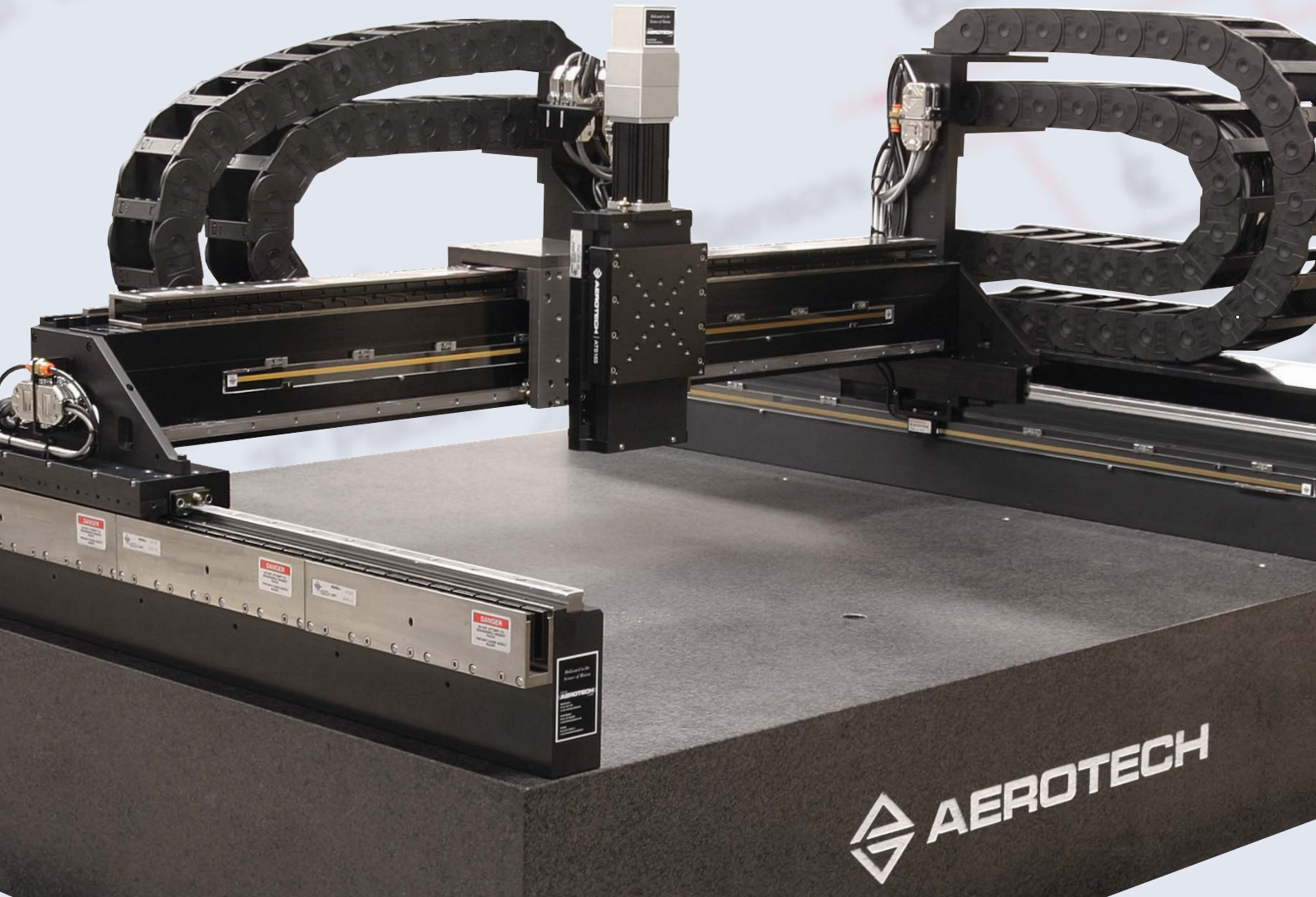
Open Aperture Z Stage



Multi-Axis Mask Aligner



AGS15000 Gantry System

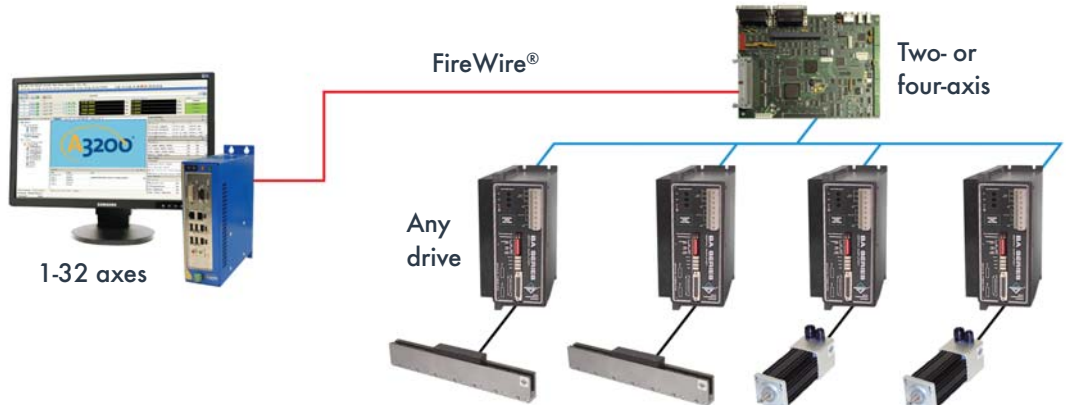


AEROTECH

Advanced System Controls

- High performance
- Reduced setup time
- Ease of use

OEM Controller: A3200 and Nservo Software-Based Controller



Automation 3200

- Up to 32 tasks
- PC-based
- RS-274 G-code, .NET, C, LabVIEW®, or AeroBasic™
- Advanced features for demanding applications
- 1 to 32 axes of coordinated motion
- Scanner control for marking
- Tightly integrated laser functionality
- Retrofit package
- Analog and digital I/O



Ensemble

- Up to 4 tasks
- Stand-alone 1- to 10-axis controller
- Versatile, cost-effective, coordinated motion
- PWM or linear drives (10-150 A peak)
- Brushless, brush, or stepper motors
- Desktop or panel mount
- .NET, C, LabVIEW®, or AeroBasic™
- GPIB, Ethernet, USB



Soloist

- Stand-alone, single-axis controller
- Clock and direction input
- PWM or linear drives (10-150 A peak)
- .NET, C, LabVIEW®, or AeroBasic™
- Ethernet, USB
- Commutation for servo motors



WORLD HEADQUARTERS
Aerotech, Inc.
101 Zeta Drive
Pittsburgh, PA 15238
Ph: 412-963-7470
Fax: 412-963-7459
Email: sales@aerotech.com

Aerotech, Ltd.
Jupiter House, Calleva Park
Aldermaston, Berkshire
RG7 8NN, UK
Ph: +44-118-9409400
Fax: +44-118-9409401
Email: sales@aerotech.co.uk

Aerotech GmbH
Südwestpark 90
90449 Nürnberg, Germany
Ph: +49-911-9679370
Fax: +49-911-96793720
Email: sales@aerotechgmbh.de

Aerotech KK
17-25 1-chome
Kitahoncho Funabashi-shi
Chiba-ken, 273-0864, Japan
Ph: +81-47-489-1741
Email: sales@aerotechkk.co.jp

Aerotech China
Unit 3328, 33/F,
China Merchants Tower,
168 - 200 Connaught Road Central,
Hong Kong
Ph: +852-3793-3488
Email: saleschina@aerotech.com