MaxPlus® Linear Servo Motors

The MaxPlus linear servo motors are revolutionizing the industry with its superior linear motion technology.

Available in both dual row and single row magnet configurations, MaxPlus linear motors are designed to exceed the rigorous demands required in advanced manufacturing, assembly, test and inspection environments. Our MaxPlus line of linear servo motors utilizes an ironless core design that provides high peak-to-continuous force ratios and extremely high acceleration in high-speed applications. MaxPlus linear motors have superior thermal properties and the highest force to coil weight available. All of which means you can expect exceptional performance, smooth motion, high accuracy, plus unparalleled acceleration and stiffness.

Compumotor is continually working with new and emerging technologies to improve our product offering. For example, MaxPlus linear servo motors utilize a patented, automated machine winding technology that results in excellent unit-tounit consistency at a significantly lower cost.

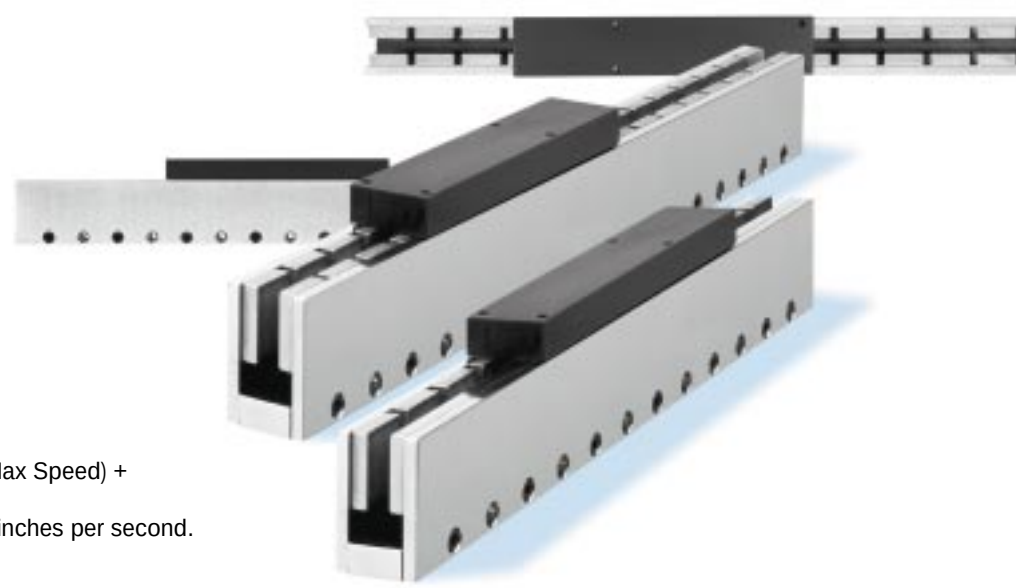
MaxPlus Linear Motor Features

- Continuous force up to 325 lbs./1446N
- Peak force up to 1620 lbs./7206N
- High force to coil mass ratio
- High accuracy/repeatability
- Efficient thermal performance
- Velocities > 10M/sec. Accelerations > 10G
- Zero magnetic preload
- Sinusoidal or hall effect commutation
- Thermistor
- Thermostat optional
- High-performance rare earth magnets
- Low inductance coil for fast response
- Non-contacting assemblies
- Continuous track to 72 in./1.8m*
- Configurable connections/cable options
- Fully customizable design

* 2000 Series available to 72 in./1.8m

BEMF Constant

The BEMF constant is multiplied by the maximum motor speed to determine how much voltage is generated by the motor. The amplifier must be able to produce more voltage than the generated voltage to cause current to flow in the motor. The following formula is a good rule of thumb to determine the needed amplifier voltage:



Bus Voltage = 1.25 * ((BEMF * Max Speed) + (DC Resistance (hot) * Current))
Remember to express speed in inches per second.

Continuous Force

Continuous force is the largest force that the motor can exert on the system for an extended period of time. To use the motor at this power level, a suitable heat sink must be provided for all the power dissipated by the motor (see Heat Management).

Force Constant

The force constant is the force produced by applying 1 amp DC to the motor and is specified in LBS/AMP (N/AMP).

Peak Force

Peak force is the largest force that the motor can exert on the system for a short period of time. It is specified for a 10% or shorter duty cycle. To use the motor at peak force, a suitable heat sink must be provided for all the power dissipated by the motor (see Heat Management).

Electrical Time Constant

The electrical time constant is the motor inductance divided by the motor resistance. It is a measure of how quickly the motor current can be changed. The stated value is the time it takes for the current to arrive at the 63% point of the applied current. The MaxPlus Linear Motor is ironless and has a low inductance. This allows the motor response to be very quick.

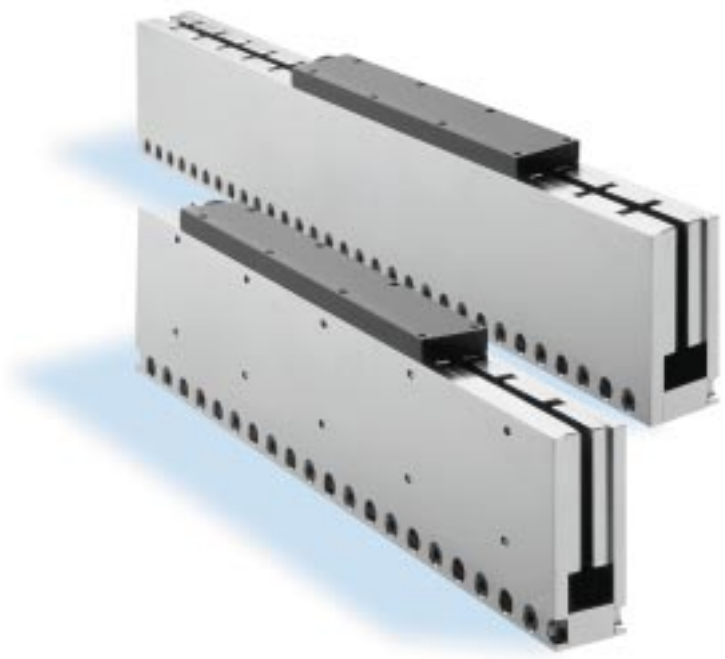
HED (Hall Effect Device)

All servo amplifiers will require some type of commutation device. A Hall Device is available for commutation of trapezoidal type drives and for initial positioning for Sine type drives. The HED is positioned deep within the magnet track to prevent picking up external disturbances. It is built in to the coil as an option to minimize added length.

Heat Management

All motor coils contain resistance. As current is driven through this resistance, heat is produced. The power lost (heat) is equal to the current squared times the resistance ($P=I^2R$). The MaxPlus linear motor has been optimized such that resistance is minimized and the thermal path to remove heat from the motor is as efficient as possible. Heat management is the principal design criteria when applying this style of motor. Failure to observe and control heat can result in motor failure.

MaxPlus motors come with a thermistor to measure the motor temperature, and provides complete thermal protection, ensuring a long life for both the motor and the system. A thermostat type switch is available as an option to shut the system down if the motor temperature rating is exceeded.



Heat Management, continued

When applications of the MaxPlus linear motor approach performance extremes, heat dissipation will be the principal limiting factor. Heat is removed from the motor by conduction into the attached mass (motor load), convection and radiation into the surrounding environment. Of these, conduction is the primary contributor. The motor load (stage, work-piece, table, etc.) must behave as a heat sink to conduct heat away from the motor. Heat must be conducted away fast enough to maintain a temperature below the maximum rating during motor “STALL” conditions. The motor temperature MUST NEVER be allowed to go higher than the maximum 125°C rating.

The power (P) into the motor during static conditions is determined by the equation $P=I^2 R$ where I is the current being supplied to the motor and R is the resistance of the motor coils.

A current of 4 Amps through the resistance of 8 ohms will cause the motor to draw 128 watts. A rated motor resistance of 8 ohms at room temperature will become 11.3 ohms at 125°C. At this resistance the power draw becomes 180 watts. Heat must be withdrawn fast enough such that the motor does not exceed its maximum rated temperature.

The user must be aware of the system thermal dynamics, the heat removal process and the responsibility to design with one of the thermal protection devices active. Contact the factory for more information about the use of these devices in your system, or additional cooling options to extend the operating range of the motor.

Coil Length

The coil length is actually the length of the coil, excluding the mounting bracket. It does not include the bend radius of cable attached to the end of the motor bracket. The length of travel is normally described as the magnet track length minus the coil length. Remember to account for the length of the HED module when required.

Coil Weight

The specified weight of the coil assembly includes approximately one foot of cable. This weight should be added to the stage and load weights to calculate the total moving mass.

Inductance

The inductance of the winding and the resistance of the winding determine the electrical time constant of the motor. Lower inductance is desired for faster motor response but the amplifier may require a minimum inductance to drive the motor successfully. The option of coil connections in parallel reduces inductance, back EMF and resistance, but requires double the current to produce the same force.

Resistance

Understanding the motor resistance is important to proper motor application. Motor resistance increases with temperature by 0.393% per degree C. Motor power is defined by the equation: $P=I^2 * R$

Where: I=Current
P=Power
R=Resistance

As the motor warms up (keeping the current a constant) the power dissipated by the motor increases. This increase causes the motor to warm up even faster. The temperature reached by the winding is above the ambient temperature as a result of the power being dissipated by the motor.

Coil Ordering Chart

LMC	12	4	1	S	072	X
LINEAR MOTOR COIL	FRAME SIZE	COIL STATOR LENGTH	COIL TYPE	CONFIG	CABLE LENGTH	THERMAL DEVICE
					STANDARD	
	12=1200SERIES	1	1=COIL ONLY	S=SERIES	072=72"	L=NORMALLY CLOSED
	15=1500SERIES	2	3=COIL/120HED	P=PARALLEL	180=180"	F=NORMALLY OPEN
	20=2000SERIES	3				
	28=2800SERIES	4			*SPECIAL LENGTH CONSULT FACTORY	X=NEGATIVE TEMP. COEF. THERMISTOR
		5* ONLY WITH 2000and 2800SERIES				
		6, 7, and 8** ONLY WITH 2800SERIES				

The jacket strip length is 2.0" Standard. The lead strip length is .25" Standard.

If product cannot fall under this system, it will be processed as special. The special part number system will follow as the above example except after coil there will be a "-" and a 5 digit number, i.e., LMC1241-20000 (Thru 49999)

Magnet Track Ordering Chart

LM	D	T	12	25.2	F	S	S
LINEAR MOTOR	OPTION	TRACK	SIZE	TRACK LENGTH	MAGNET	PROFILE	STANDARD
	D=DOUBLE ROW		12=1200 SERIES	25.2=25.2"	F=1200,1500 and 2800 (STANDARD)	S=STANDARD	S=STANDARD
	S=SINGLE ROW		15=1500 SERIES	*1200and 1500 SERIES SOLD IN 1.2" INCREMENTS	B=2000 (STANDARD)		
			20=2000 SERIES	*2000and 2800 SERIES SOLD IN 2.4" INCREMENTS			
			28=2800 SERIES				

If product cannot fall under this system, it will be processed as special. The special part number system will follow as the above example except after track length there will be a "–" and a 5 digit number, i.e., LMD1225.2-50000 (thru 99999)

Note: For Metric Mounting, Consult Factory.

1200 Series Brushless Linear Servo Motor

1200 LMST Motor Data

	Units	1200-1	1200-2	1200-3	1200-4
Coil Length	IN[mm]	2.4[60.96]	4.8[121.92]	7.2[182.88]	9.6[243.84]
Bracket Length****	IN[mm]	3.6[91.44]	6.0[152.40]	8.4[213.36]	10.8[274.32]
Coil Weight	LBS[Kg]	0.22[0.099]	0.44[0.199]	0.66[0.299]	0.88[0.399]
Magnet Track Weight***	LBS/FT[gr/mm]	2.0[2.98]	2.0[2.98]	2.0[2.98]	2.0[2.98]
Max. Operating Temp	°C	125	125	125	125

Series Connected Coils	Units	1200-1	1200-2	1200-3	1200-4
Force Constant	LBS[N]/AMP	1.12[4.98]	2.24[9.96]	3.36[14.95]	4.48[19.93]
Continuous Force	LBS[N]	3.36[14.95]	6.72[29.89]	10.08[44.84]	13.44[59.78]
Continuous Current**	AMPS	3.0	3.0	3.0	3.0
Continuous Power at 125°C	WATTS	98.19	193.83	290.74	387.66
Peak Force	LBS[N]	10.62[47.24]	21.25[94.52]	31.88[141.81]	42.50[189.05]
Peak Current	AMPS	9.49	9.49	9.49	9.49
Peak Power at 125°C	WATTS	982.0	1938.0	2907.0	38770
Coil Resistance* at 25°C at Coil	OHMS	10.86	21.72	32.58	43.44
Phase Resistance* at 25°C in Delta	OHMS	7.24	14.48	21.72	28.96
Coil Resistance* at max operating temp at Coil	OHMS	16.37	32.30	48.46	64.61
Phase Resistance* at max operating temp in Delta	OHMS	10.91	21.54	32.30	43.07
Inductance at 1kHZ	mH	1.98	3.96	5.94	7.92
Back EMF Constant	V/IPS[V/MPS]	0.13[5.12]	0.26[10.23]	0.39[15.35]	0.52[20.47]
Electrical Time Constant*	MSEC	0.10	0.10	0.10	0.10

Parallel Connected Coils	Units	1200-1	1200-2	1200-3	1200-4
Force Constant	LBS[N]/AMP	0.56[2.49]	1.12[4.98]	2.24[9.96]	3.36[14.95]
Continuous Force	LBS[N]	3.36[14.95]	6.72[29.89]	10.08[44.84]	13.44[59.78]
Continuous Current**	AMPS	6.0	6.0	6.0	6.0
Continuous Power at 125°C	WATTS	98.19	193.83	290.74	387.66
Peak Force	LBS[N]	10.62[47.24]	21.25[94.52]	31.88[141.81]	42.50[189.05]
Peak Current	AMPS	18.97	18.97	18.97	18.97
Peak Power at 125°C	WATTS	982.0	1938.0	2907.0	3877.0
Coil Resistance* at 25°C at Coil	OHMS	2.72	5.43	8.15	10.86
Phase Resistance* at 25°C in Delta	OHMS	1.81	3.62	5.43	7.24
Coil Resistance* at max operating temp at Coil	OHMS	4.09	8.08	12.11	16.15
Phase Resistance* at max operating temp in Delta	OHMS	2.73	5.38	8.08	10.77
Inductance at 1kHZ	mH	0.50	0.99	1.49	1.98
Back EMF Constant	V/IPS[V/MPS]	0.06[2.36]	0.13[5.12]	0.20[7.87]	0.26[10.23]
Electrical Time Constant*	MSEC	0.10	0.10	0.10	0.10

*These specifications reflect a 6-lead or delta connection coil with 1 foot of cable. A 6-lead motor has starts/finishes available at the cable end for control of each individual phase. Additional cable will increase resistance values.
**An appropriate heatsink is required to dissipate the continuous power generated by the motor coil, thus maintaining the coil assembly at or below the maximum specified operating temperature. Consult the Compumotor applications manual for more detail on thermal management.
***Magnet track weight specified for 1200-LMSTmodel. Lightweight magnet tracks are available. Please consult with your local representative or Compumotor for more information.
****Without Hall Effect Device

1200 LMDT Motor Data

	Units	1200-1	1200-2	1200-3	1200-4
Coil Length	IN[mm]	2.4[60.96]	4.8[121.92]	7.2[182.88]	9.6[243.84]
Bracket Length****	IN[mm]	3.6[91.44]	6.0[152.40]	8.4[213.36]	10.8[274.32]
Coil Weight	LBS[Kg]	0.22[0.099]	0.44[0.199]	0.66[0.299]	0.88[0.399]
Magnet Track Weight***	LBS/FT[gr/mm]	2.0[2.98]	2.0[2.98]	2.0[2.98]	2.0[2.98]
Max. Operating Temp	°C	125	125	125	125

Series Connected Coils	Units	1200-1	1200-2	1200-3	1200-4
Force Constant	LBS[N]/AMP	2.0[8.90]	4.0[17.79]	6.0[26.69]	8.0[35.59]
Continuous Force	LBS[N]	6.0[26.69]	12.0[53.38]	18.0[80.07]	24.0[106.76]
Continuous Current**	AMPS	3.0	3.0	3.0	3.0
Continuous Power at 125°C	WATTS	98.19	193.83	290.74	387.66
Peak Force	LBS[N]	18.97[84.38]	37.95[168.81]	56.94[253.26]	75.89[337.58]
Peak Current	AMPS	9.49	9.49	9.49	9.49
Peak Power at 125°C	WATTS	982.0	1938.0	2907.0	38770
Coil Resistance* at 25°C at Motor	OHMS	10.86	21.72	32.58	43.44
Phase Resistance* at 25°C in Delta	OHMS	7.24	14.48	21.72	28.96
Coil Resistance* at max operating temp at Coil	OHMS	16.37	32.30	48.46	64.61
Phase Resistance* at max operating temp in Delta	OHMS	10.91	21.54	32.30	43.07
Inductance at 1kHZ	mH	1.98	3.96	5.94	7.92
Back EMF Constant	V/IPS[V/MPS]	0.23[9.06]	0.47[18.50]	0.70[27.56]	0.93[36.61]
Electrical Time Constant*	MSEC	0.18	0.18	0.18	0.18

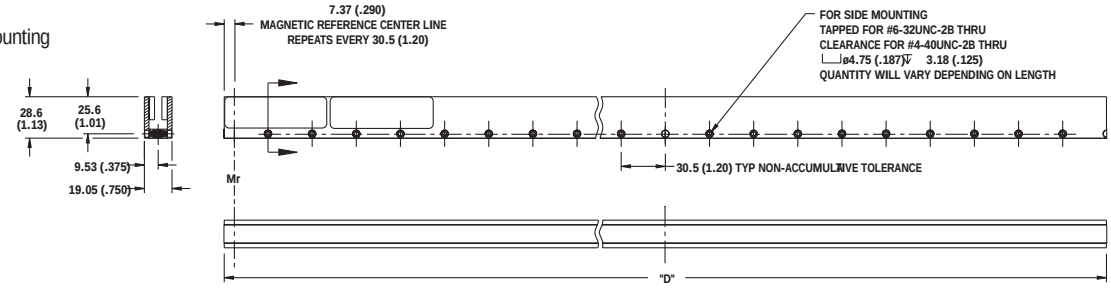
Parallel Connected Coils	Units	1200-1	1200-2	1200-3	1200-4
Force Constant	LBS[N]/AMP	1.0[4.45]	2.0[8.90]	3.0[13.34]	4.0[17.79]
Continuous Force	LBS[N]	6.0[26.69]	12.0[53.38]	18.0[80.07]	24.0[106.76]
Continuous Current**	AMPS	6.0	6.0	6.0	6.0
Continuous Power at 125°C	WATTS	98.19	193.83	290.74	387.66
Peak Force	LBS[N]	18.97[84.38]	37.95[168.81]	56.94[253.26]	75.89[337.58]
Peak Current	AMPS	18.97	18.97	18.97	18.97
Peak Power at 125°C	WATTS	982.0	1938.0	2907.0	38770
Coil Resistance* at 25°C at Motor	OHMS	2.72	5.43	8.15	10.86
Phase Resistance* at 25°C in Delta	OHMS	1.81	3.62	5.43	7.24
Coil Resistance* at max operating temp at Coil	OHMS	4.09	8.08	12.11	16.15
Phase Resistance* at max operating temp in Delta	OHMS	2.73	5.38	8.08	10.77
Inductance at 1kHZ	mH	0.50	0.99	1.49	1.98
Back EMF Constant	V/IPS[V/MPS]	0.12[4.53]	0.24[9.25]	0.35[13.78]	0.47[18.31]
Electrical Time Constant*	MSEC	0.18	0.18	0.18	0.18

*These specifications reflect a 6-lead or delta connection coil with 1 foot of cable. A 6-lead motor has starts/finishes available at the cable end for control of each individual phase. Additional cable will increase resistance values.
**An appropriate heatsink is required to dissipate the continuous power generated by the motor coil, thus maintaining the coil assembly at or below the maximum specified operating temperature. Consult the Compumotor applications manual for more detail on thermal management.
***Magnet track weight specified for 1200-LMDTmodel. Lightweight magnet tracks are available. Please consult with your local representative or Compumotor for more information.
****Without Hall Effect Device

1200 Series Magnet Track

Customer will also have 1/4-28UNF-2B holes in the bottom for mounting.

Consult factory for specific mounting patterns for different magnet track lengths.

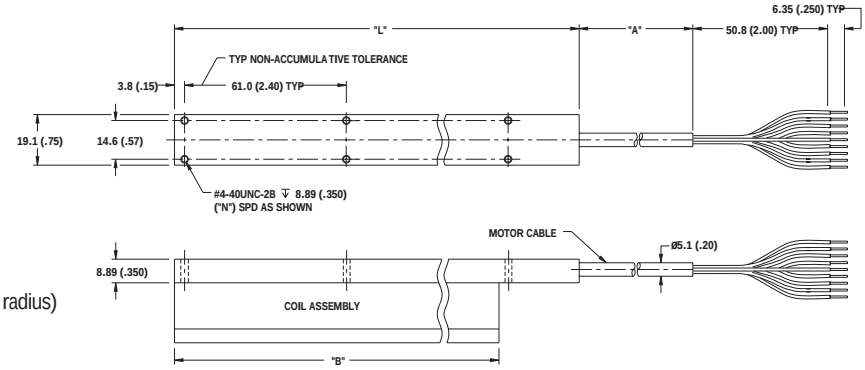


1200 Series Coil

Coil Length	"L" in / mm	"N" # of Holes	"B" in / mm
1	3.6 / 91.4	4	2.41/ 61.2
2	6.0 / 152.4	6	4.81/ 122.2
3	8.4 / 213.4	8	7.21/ 183.1
4	10.8/ 274.3	10	9.61/ 244.1

Travel distance (no vertical obstruction) =
Magnet track length ("D") – Coil length ("B")

Travel distance (with vertical obstruction) =
Magnet track length ("D") – (Coil length ("L") + 2.0" Cable bend radius)

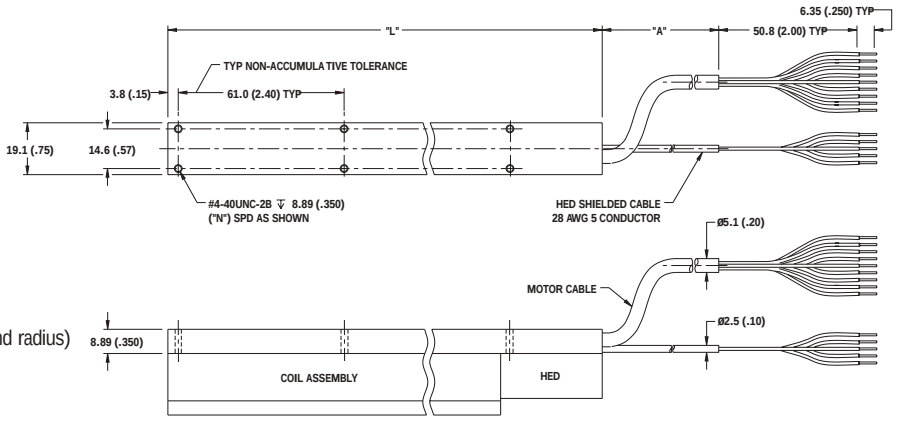


1200 Series Coil/120° HED

Coil Length	"L" in / mm	"N" # of Holes
1	3.9 / 99.1	4
2	6.3 / 160.0	6
3	8.7 / 221.0	8
4	11.1/ 281.9	10

Travel distance (no vertical obstruction) =
Magnet track length ("D") – Coil length ("L")

Travel distance (with vertical obstruction) =
Magnet track length ("D") – (Coil length ("L") + 2.0" Cable bend radius)

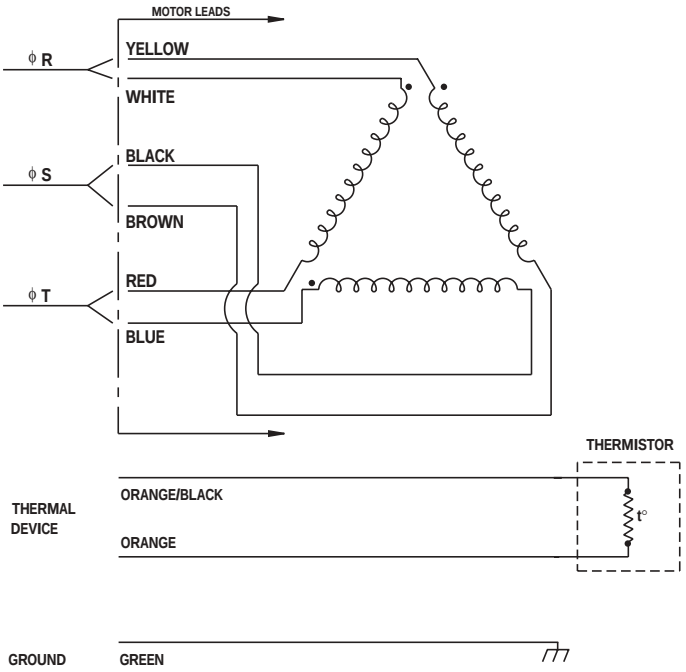


Parker Automation
Parker Hannifin Corporation
Compumotor Division
compumotor.com

Motor/Hall Wiring

Hall Commutation	
SHLD	SHLD
BLK	GND
RED	+5VDC
GRN	W
BLUE	V
WHT	U

Care should be taken to center coil within the track as evenly as possible in all directions when mounting the magnet track and coil.



For Detailed Commutation, Consult Factory.

Additional Products

To meet all of your linear motion requirements, these additional products and linear system capabilities are available:

Custom Mounting Holes/Brackets
Clean Room Compatibility
Cable/Connector Options
Air Cooling
Water Cooling

1500 Series Brushless Linear Servo Motor

1500 LMST Motor Data

	Units	1500-1	1500-2	1500-3	1500-4
Coil Length	IN[mm]	2.4[60.96]	4.8[121.92]	7.2[182.88]	9.6[243.84]
Bracket Length****	IN[mm]	3.6[91.44]	6.0[152.40]	8.4[213.36]	10.8[274.32]
Coil Weight	LBS[Kg]	0.23[0.104]	0.55[0.249]	0.78[0.353]	1.10[0.498]
Magnet Track Weight***	LBS/FT[gr/mm]	3.7[5.51]	3.7[5.51]	3.7[5.51]	3.7[5.51]
Max. Operating Temp	°C	125	125	125	125

Series Connected Coils	Units	1500-1	1500-2	1500-3	1500-4
Force Constant	LBS[N]/AMP	1.58[7.03]	3.15[14.01]	4.73[21.04]	6.30[28.02]
Continuous Force	LBS[N]	5.04[22.42]	10.14[45.01]	15.17[67.76]	20.16[89.68]
Continuous Current**	AMPS	3.3	3.3	3.3	3.3
Continuous Power at 125°C	WATTS	103.0	206.3	310.0	4130
Peak Force	LBS[N]	16.07[71.48]	32.14[142.97]	48.16[214.23]	63.84[283.97]
Peak Current	AMPS	10.44	10.44	10.44	10.44
Peak Power at 125°C	WATTS	1032.0	2063.0	3095.0	41260
Coil Resistance* at 25°C at Motor	OHMS	10.20	20.40	30.60	40.80
Phase Resistance* at 25°C in Delta	OHMS	6.80	13.60	20.40	27.20
Coil Resistance* at max operating temp at Coil	OHMS	14.21	28.42	42.63	56.83
Phase Resistance* at max operating temp in Delta	OHMS	9.47	18.94	28.42	37.89
Inductance at 1kHZ	mH	2.02	4.04	6.06	8.08
Back EMF Constant	V/IPS[V/MPS]	0.16[6.30]	0.31[12.20]	0.47[18.50]	0.62[24.41]
Electrical Time Constant*	MSEC	0.17	0.17	0.17	0.17

Parallel Connected Coils	Units	1500-1	1500-2	1500-3	1500-4
Force Constant	LBS[N]/AMP	0.79[3.51]	1.57[6.98]	2.35[10.45]	3.08[13.70]
Continuous Force	LBS[N]	5.04[22.42]	10.14[45.10]	15.12[67.26]	20.16[89.68]
Continuous Current**	AMPS	6.6	6.6	6.6	6.6
Continuous Power at 125°C	WATTS	103.0	206.3	310.0	4130
Peak Force	LBS[N]	16.07[71.48]	32.14[142.97]	48.16[214.23]	63.84[283.97]
Peak Current	AMPS	20.87	20.87	20.87	20.87
Peak Power at 125°C	WATTS	1032.0	2063.0	3100.0	41260
Coil Resistance* at 25°C at Motor	OHMS	2.55	5.10	7.65	10.20
Phase Resistance* at 25°C in Delta	OHMS	1.70	3.40	5.10	6.80
Coil Resistance* at max operating temp at Coil	OHMS	3.55	7.10	10.66	14.21
Phase Resistance* at max operating temp in Delta	OHMS	2.37	4.74	7.10	9.47
Inductance at 1kHZ	mH	0.51	1.01	1.52	2.02
Back EMF Constant	V/IPS[V/MPS]	0.08[3.15]	0.16[6.30]	0.23[9.06]	0.31[12.20]
Electrical Time Constant*	MSEC	0.08	0.08	0.08	0.08

*These specifications reflect a 6-lead or delta connection coil with 1 foot of cable. A 6-lead motor has starts/finishes available at the cable end for control of each individual phase. Additional cable will increase resistance values.
**An appropriate heatsink is required to dissipate the continuous power generated by the motor coil, thus maintaining the coil assembly at or below the maximum specified operating temperature. Consult the Compumotor applications manual for more detail on thermal management.
***Magnet track weight specified for 1500-LMST model. Lightweight magnet tracks are available. Please consult with your local representative or Compumotor for more information.
****Without Hall Effect Device

1500 LMDT Motor Data

	Units	1500-1	1500-2	1500-3	1500-4
Coil Length	IN[mm]	2.4[60.96]	4.8[121.92]	7.2[182.88]	9.6[243.84]
Bracket Length****	IN[mm]	3.6[91.44]	6.0[152.40]	8.4[213.36]	10.8[274.32]
Coil Weight	LBS[Kg]	0.23[0.104]	0.55[0.249]	0.78[0.353]	1.1[0.498]
Magnet Track Weight***	LBS/FT[gr/mm]	3.7[5.51]	3.7[5.51]	3.7[5.51]	3.7[5.51]
Max. Operating Temp	°C	125	125	125	125

Series Connected Coils	Units	1500-1	1500-2	1500-3	1500-4
Force Constant	LBS[N]/AMP	2.8[12.46]	5.5[24.47]	8.3[36.92]	11.0[48.93]
Continuous Force	LBS[N]	9.0[40.03]	18.1[80.51]	27.0[120.10]	36.0[160.14]
Continuous Current**	AMPS	3.3	3.3	3.3	3.3
Continuous Power at 125°C	WATTS	103.0	206.3	310.0	4130
Peak Force	LBS[N]	28.7[127.66]	57.4[255.33]	86.0[382.55]	114.0[507.10]
Peak Current	AMPS	10.44	10.44	10.44	10.44
Peak Power at 125°C	WATTS	1032.0	2063.0	3095.0	41260
Coil Resistance* at 25°C at Motor	OHMS	10.20	20.40	30.60	40.80
Phase Resistance* at 25°C in Delta	OHMS	6.80	13.60	20.40	27.20
Coil Resistance* at max operating temp at Coil	OHMS	14.21	28.42	42.63	56.83
Phase Resistance* at max operating temp in Delta	OHMS	9.47	18.94	28.42	37.89
Inductance at 1kHZ	mH	2.02	4.04	6.06	8.08
Back EMF Constant	V/IPS[V/MPS]	0.28[11.02]	0.55[21.65]	0.83[32.68]	1.10[43.31]
Electrical Time Constant*	MSEC	0.30	0.30	0.30	0.30

Parallel Connected Coils	Units	1500-1	1500-2	1500-3	1500-4
Force Constant	LBS[N]/AMP	1.4[6.23]	2.8[12.46]	4.2[18.68]	5.5[24.47]
Continuous Force	LBS[N]	9.0[40.03]	18.1[80.51]	27.0[120.10]	36.0[160.14]
Continuous Current**	AMPS	6.6	6.6	6.6	6 .6
Continuous Power at 125°C	WATTS	103.0	206.3	310.0	4130
Peak Force	LBS[N]	28.7[127.66]	57.4[255.33]	86.0[382.55]	114.0[507.10]
Peak Current	AMPS	20.87	20.87	20.87	20.87
Peak Power at 125°C	WATTS	1032.0	2063.0	3100.0	41260
Coil Resistance* at 25°C at Motor	OHMS	2.55	5.10	7.65	10.20
Phase Resistance* at 25°C in Delta	OHMS	1.70	3.40	5.10	6.80
Coil Resistance* at max operating temp at Coil	OHMS	3.55	7.10	10.66	14.21
Phase Resistance* at max operating temp in Delta	OHMS	2.37	4.74	7.10	9.47
Inductance at 1kHZ	mH	0.51	1.01	1.52	2.02
Back EMF Constant	V/IPS[V/MPS]	0.14[5.51]	0.28[11.02]	0.41[16.14]	0.55[21.65]
Electrical Time Constant*	MSEC	0.14	0.14	0.14	0.14

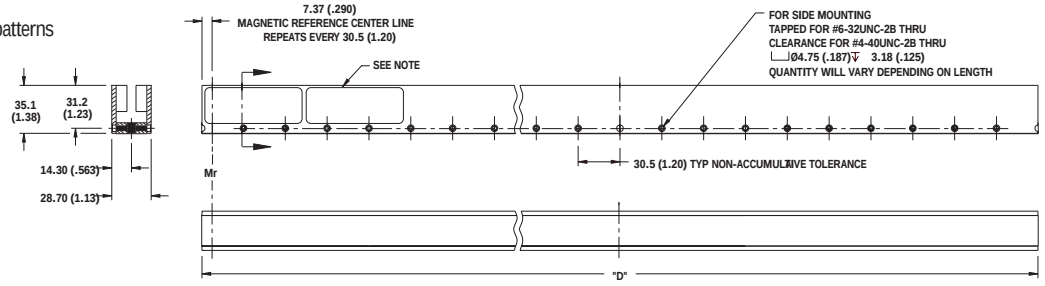
*These specifications reflect a 6-lead or delta connection coil with 1 foot of cable. A 6-lead motor has starts/finishes available at the cable end for control of each individual phase. Additional cable will increase resistance values.
**An appropriate heatsink is required to dissipate the continuous power generated by the motor coil, thus maintaining the coil assembly at or below the maximum specified operating temperature. Consult the Compumotor applications manual for more detail on thermal management.
***Magnet track weight specified for 1500-LMDT model. Lightweight magnet tracks are available. Please consult with your local representative or Compumotor for more information.
****Without Hall Effect Device

1500 Series Magnet Track

Customer will also have 1/4-28UNF-2Bholes in the bottom for mounting.

Consult factory for specific mounting patterns for different magnet track lengths.

Note: Labels are placed on non-flat side of track.

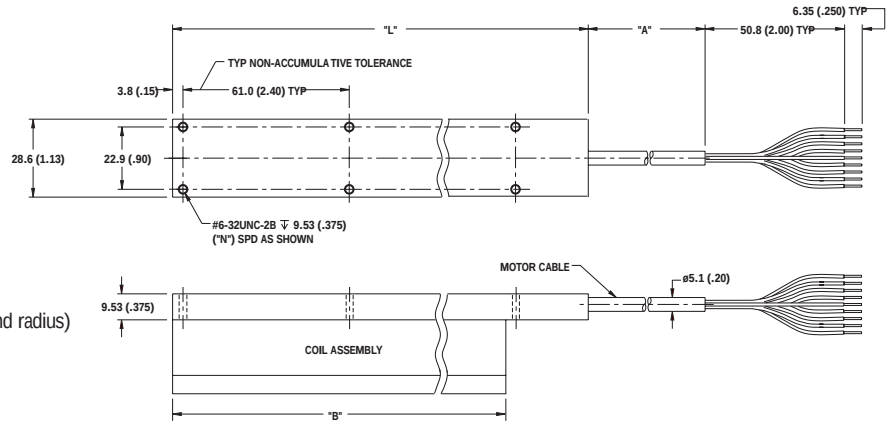


1500 Series Coil

Coil Length	"L" in / mm	"N" # of Holes	"B" in / mm
1	3.6 / 91.4	4	2.41/ 61.2
2	6.0 / 152.4	6	4.81/ 122.2
3	8.4 / 213.4	8	7.21/ 183.1
4	10.8/ 274.3	10	9.61/ 244.1

Travel distance (no vertical obstruction) = Magnet track length ("D") – Coil length ("B")

Travel distance (with vertical obstruction) = Magnet track length ("D") – (Coil length ("L") + 2.0" Cable bend radius)

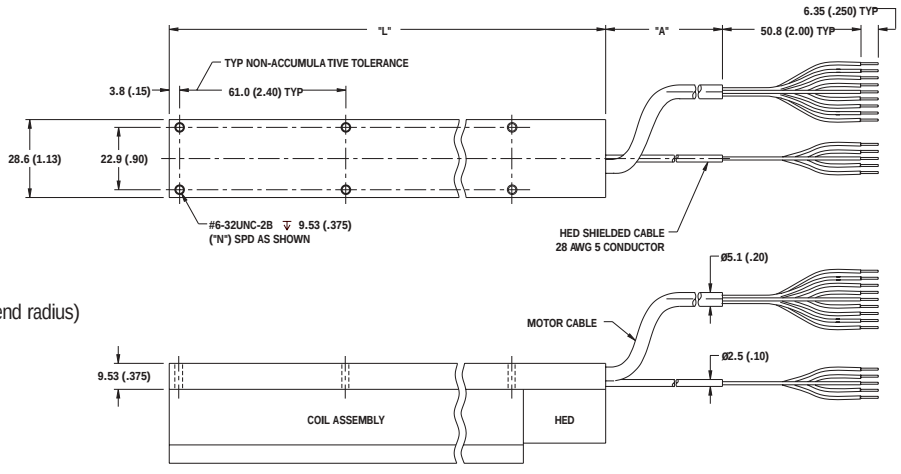


1500 Series Coil/120° HED

Coil Length	"L" in / mm	"N" # of Holes
1	3.9 / 99.1	4
2	6.3 / 160.0	6
3	8.7 / 221.0	8
4	11.1/ 281.9	10

Travel distance (no vertical obstruction) = Magnet track length ("D") – Coil length ("L")

Travel distance (with vertical obstruction) = Magnet track length ("D") – (Coil length ("L") + 2.0" Cable bend radius)

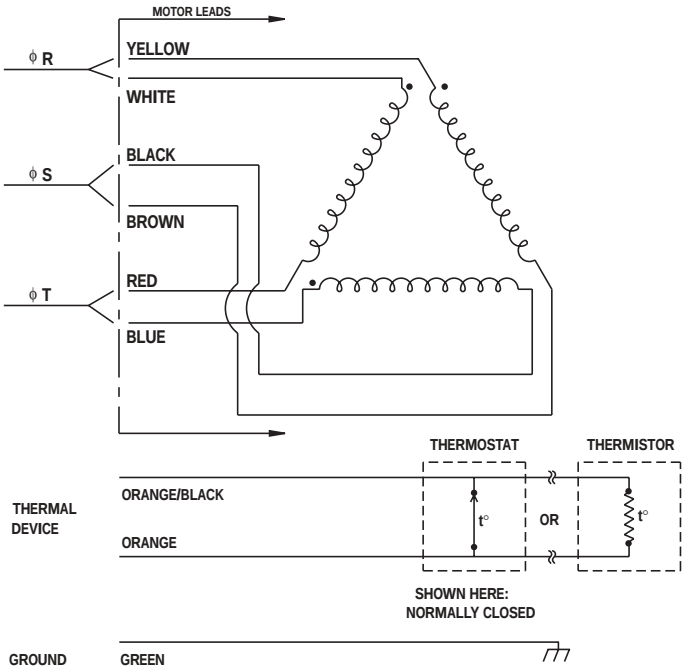


Parker Automation
Parker Hannifin Corporation
Compumotor Division
compumotor.com

Motor/Hall Wiring

Hall Commutation	
SHLD	SHLD
BLK	GND
RED	+5VDC
GRN	W
BLUE	V
WHT	U

Care should be taken to center coil within the track as evenly as possible in all directions when mounting the magnet track and coil.



For Detailed Commutation, Consult Factory.

Additional Products

To meet all of your linear motion requirements, these additional products and linear system capabilities are available:

Custom Mounting Holes/Brackets
Clean Room Compatibility
Cable/Connector Options
Air Cooling
Water Cooling

Custom Designed Servo Motors For Your Specific Application. Call 1-800-358-9070 Today.

Parker Automation
Parker Hannifin Corporation
Compumotor Division
compumotor.com

2000 Series Brushless Linear Servo Motor

2000 LMST Motor Data

	Units	2000-1	2000-2	2000-3	2000-4	2000-5
Coil Length	IN[mm]	2.4[61.0]	4.8[122.0]	7.2[182.9]	9.6[243.8]	12.0[305.0]
Bracket Length****	IN[mm]	3.2[81.3]	5.6[142.2]	8.0[203.2]	10.4[264.2]	12.8[325.1]
Coil Weight	LBS[Kg]	0.45[0.204]	0.85[0.386]	1.25[0.567]	1.65[0.748]	2.05[0.930]
Magnet Track Weight***	LBS/FT[N/cm]	11.0[1.61]	11.0[1.61]	11.0[1.61]	11.0[1.61]	11.0[1.61]
Max. Operating Temp	°C	125	125	125	125	125

Series Connected Coils	Units	2000-1	2000-2	2000-3	2000-4	2000-5
Force Constant	LBS[N]/AMP	2.8[12.45]	5.6[24.91]	8.4[37.36]	11.2[49.82]	14.0[62.27]
Continuous Force	LBS[N]	11.2[49.82]	22.4[96.64]	33.6[149.46]	44.8[199.28]	56.0[249.10]
Continuous Current**	AMPS	4.0	4.0	4.0	4.0	4.0
Continuous Power at 125°C	WATTS	84.40	168.79	253.19	337.59	421.99
Peak Force	LBS[N]	35.42[157.56]	70.84[315.11]	106.25[472.62]	144.67[643.52]	177.09[787.73]
Peak Current	AMPS	12.65	12.65	12.65	12.65	12.65
Peak Power at 125°C	WATTS	843.97	1687.94	2531.92	3375.89	4219.86
Coil Resistance* at 25°C at Motor	OHMS	5.68	11.36	17.04	22.72	28.40
Phase Resistance* at 25°C in Delta	OHMS	3.79	7.57	11.36	15.15	18.93
Coil Resistance* at max operating temp at Coil	OHMS	7.91	15.82	23.74	31.65	39.56
Phase Resistance* at max operating temp in Delta	OHMS	5.27	10.55	15.82	21.10	26.37
Inductance at 1kHZ	mH	1.19	2.38	3.57	4.76	5.95
Back EMF Constant	V/IPS[V/MPS]	0.32[12.60]	0.64[25.20]	0.97[38.19]	1.29[50.79]	1.61[63.39]
Electrical Time Constant*	MSEC	0.31	0.31	0.31	0.31	0.31

Parallel Connected Coils	Units	2000-1	2000-2	2000-3	2000-4	2000-5
Force Constant	LBS[N]/AMP	1.4[6.23]	2.8[12.45]	4.2[18.68]	5.6[24.91]	7.0[31.14]
Continuous Force	LBS[N]	11.2[49.82]	22.4[96.64]	33.6[149.46]	44.8[199.28]	56.0[249.10]
Continuous Current**	AMPS	8.0	8.0	8.0	8.0	8.0
Continuous Power at 125°C	WATTS	84.40	168.79	253.19	337.59	421.99
Peak Force	LBS[N]	35.42[157.56]	70.84[315.11]	106.25[472.62]	144.67[643.52]	177.09[787.73]
Peak Current	AMPS	25.3	25.3	25.3	25.3	25.3
Peak Power at 125°C	WATTS	843.97	1687.94	2531.92	3375.89	4219.86
Coil Resistance* at 25°C at Motor	OHMS	1.42	2.84	4.26	5.68	7.10
Phase Resistance* at 25°C in Delta	OHMS	0.95	1.89	2.84	3.79	4.73
Coil Resistance* at max operating temp at Coil	OHMS	1.98	3.96	5.93	7.91	9.89
Phase Resistance* at max operating temp in Delta	OHMS	1.32	2.64	3.96	5.27	6.59
Inductance at 1kHZ	mH	0.30	0.60	0.89	1.19	1.49
Back EMF Constant	V/IPS[V/MPS]	0.16[6.30]	0.32[12.60]	0.48[18.90]	0.64[25.20]	0.81[31.89]
Electrical Time Constant*	MSEC	0.15	0.15	0.15	0.15	0.15

*These specifications reflect a 6-lead or delta connection coil with 1 foot of cable. A 6-lead motor has starts/finishes available at the cable end for control of each individual phase. Additional cable will increase resistance values.
**An appropriate heatsink is required to dissipate the continuous power generated by the motor coil, thus maintaining the coil assembly at or below the maximum specified operating temperature. Consult the Compumotor applications manual for more detail on thermal management.
***Magnet track weight specified for 2000-LMSTmodel. Lightweight magnet tracks are available. Please consult with your local representative or Compumotor for more information.
****Without Hall Effect Device

2000 LMDT Motor Data

	Units	2000-1	2000-2	2000-3	2000-4	2000-5
Coil Length	IN[mm]	2.4[61.0]	4.8[122.0]	7.2[182.9]	9.6[243.8]	12.0[305.0]
Bracket Length****	IN[mm]	3.2[81.3]	5.6[142.2]	8.0[203.2]	10.4[264.2]	12.8[325.1]
Coil Weight	LBS[Kg]	0.45[0.204]	0.85[0.386]	1.25[0.567]	1.65[0.748]	2.05[0.930]
Magnet Track Weight***	LBS/FT[N/cm]	11.0[1.61]	11.0[1.61]	11.0[1.61]	11.0[1.61]	11.0[1.61]
Max. Operating Temp	°C	125	125	125	125	125

Series Connected Coils	Units	2000-1	2000-2	2000-3	2000-4	2000-5
Force Constant	LBS[N]/AMP	4.0[17.79]	8.0[35.59]	12.0[53.38]	16.0[71.17]	20.0[88.96]
Continuous Force	LBS[N]	16.0[71.17]	32.0[142.34]	48.0[213.51]	64.0[284.68]	80.0[355.86]
Continuous Current**	AMPS	4.0	4.0	4.0	4.0	4.0
Continuous Power at 125°C	WATTS	84.40	168.79	253.19	337.59	421.99
Peak Force	LBS[N]	50.0[222.41]	101.0[449.27]	152.0[676.13]	202.0[898.54]	253.0[1125.39]
Peak Current	AMPS	12.65	12.65	12.65	12.65	12.65
Peak Power at 125°C	WATTS	843.97	1687.94	2531.92	3375.89	4219.86
Coil Resistance* at 25°C at Motor	OHMS	5.68	11.36	17.04	22.72	28.40
Phase Resistance* at 25°C in Delta	OHMS	3.79	7.57	11.36	15.15	18.93
Coil Resistance* at max operating temp at Coil	OHMS	7.91	15.82	23.74	31.65	39.56
Phase Resistance* at max operating temp in Delta	OHMS	5.27	10.55	15.82	21.10	26.37
Inductance at 1kHZ	mH	1.70	3.40	5.10	6.80	8.50
Back EMF Constant	V/IPS [V/MPS]	0.46[18.11]	0.92[36.22]	1.38[54.33]	1.84[72.44]	2.30[90.55]
Electrical Time Constant*	MSEC	0.45	0.45	0.45	0.45	0.45

Parallel Connected Coils	Units	2000-1	2000-2	2000-3	2000-4	2000-5
Force Constant	LBS[N]/AMP	2.0[8.90]	4.0[17.79]	6.0[26.69]	8.0[35.59]	10.0[44.48]
Continuous Force	LBS[N]	16.0[71.17]	32.0[142.34]	48.0[213.51]	64.0[284.68]	80.0[355.86]
Continuous Current**	AMPS	8.0	8.0	8.0	8.0	8.0
Continuous Power at 125°C	WATTS	84.40	168.79	253.19	337.59	421.99
Peak Force	LBS[N]	50.0[222.41]	101.0[449.27]	152.0[676.13]	202.0[898.54]	253.0[1125.39]
Peak Current	AMPS	25.3	25.3	25.3	25.3	25.3
Peak Power at 125°C	WATTS	843.97	1687.94	2531.92	3375.89	4219.86
Coil Resistance* at 25°C at Motor	OHMS	1.42	2.84	4.26	5.68	7.10
Phase Resistance* at 25°C in Delta	OHMS	0.95	1.89	2.84	3.79	4.73
Coil Resistance* at max operating temp at Coil	OHMS	1.98	3.96	5.93	7.91	9.89
Phase Resistance* at max operating temp in Delta	OHMS	1.32	2.64	3.96	5.27	6.59
Inductance at 1kHZ	mH	0.43	0.85	1.28	1.70	2.13
Back EMF Constant	V/IPS [V/MPS]	0.23[9.06]	0.46[18.11]	0.69[27.17]	0.92[36.22]	1.15[45.28]
Electrical Time Constant*	MSEC	0.21	0.21	0.21	0.21	0.21

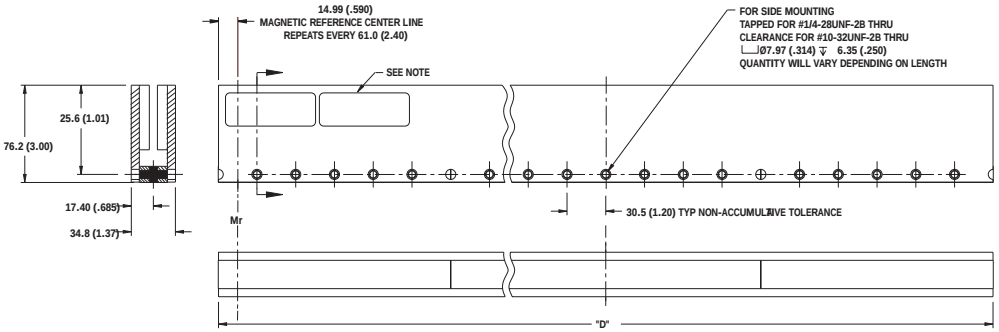
*These specifications reflect a 6-lead or delta connection coil with 1 foot of cable. A 6-lead motor has starts/finishes available at the cable end for control of each individual phase. Additional cable will increase resistance values.
**An appropriate heatsink is required to dissipate the continuous power generated by the motor coil, thus maintaining the coil assembly at or below the maximum specified operating temperature. Consult the Compumotor applications manual for more detail on thermal management.
***Magnet track weight specified for 2000-LMDT model. Lightweight magnet tracks are available. Please consult with your local representative or Compumotor for more information.
****Without Hall Effect Device

2000 Series Magnet Track

Customer will also have 1/4-28UNF-2B holes in the bottom for mounting.

Consult factory for specific mounting patterns for different magnet track lengths.

Note: Labels are placed on non-flat side of track.

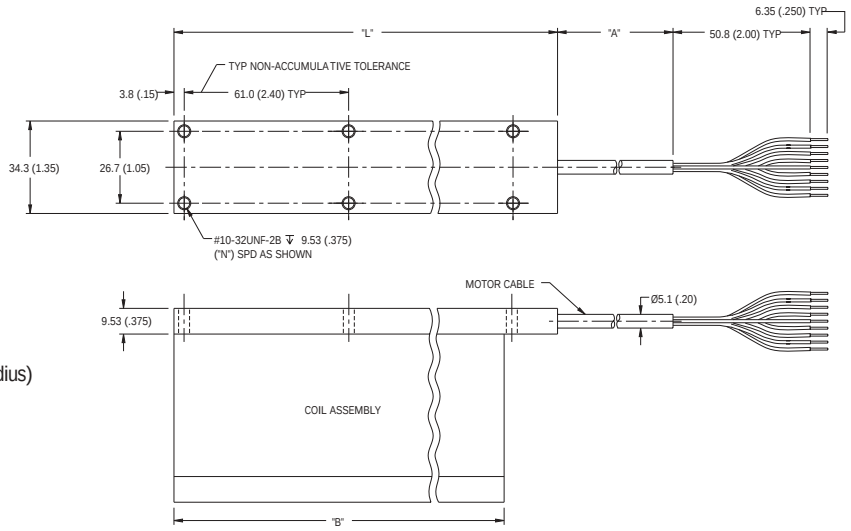


2000 Series Coil

Coil Length	"L" in / mm	"N" # of Holes	"B" in / mm
1	3.2 / 81.3	4	2.41 / 61.2
2	5.6 / 142.2	6	4.81 / 122.2
3	8.0 / 203.2	8	7.21 / 183.1
4	10.4 / 264.2	10	9.61 / 244.1
5	12.8 / 325.1	12	12.01 / 305.1

Travel distance (no vertical obstruction) = Magnet track length ("D") – Coil length ("B")

Travel distance (with vertical obstruction) = Magnet track length ("D") – (Coil length ("L") + 2.0" Cable bend radius)

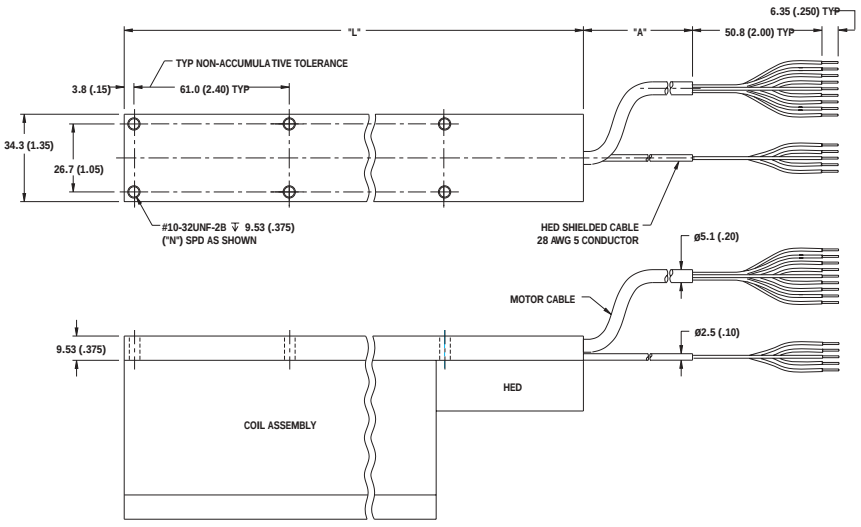


2000 Series Coil/120° HED

Coil Length	"L" in / mm	"N" # of Holes
1	4.69 / 119.1	4
2	7.09 / 180.1	6
3	9.49 / 241.0	8
4	11.89 / 302.0	10
5	14.29 / 363.0	12

Travel distance (no vertical obstruction) = Magnet track length ("D") – Coil length ("L")

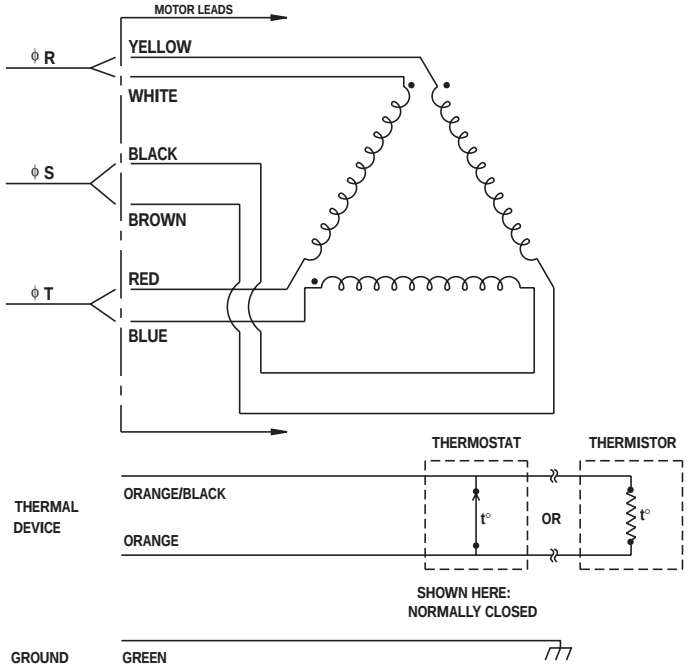
Travel distance (with vertical obstruction) = Magnet track length ("D") – (Coil length ("L") + 2.0" Cable bend radius)



Motor/Hall Wiring

Hall Commutation	
SHLD	SHLD
BLK	GND
RED	+5VDC
GRN	W
BLUE	V
WHT	U

Care should be taken to center coil within the track as evenly as possible in all directions when mounting the magnet track and coil.



For Detailed Commutation, Consult Factory.

Additional Products

To meet all of your linear motion requirements, these additional products and linear system capabilities are available:

Custom Mounting Holes/Brackets
Clean Room Compatibility
Cable/Connector Options
Air Cooling
Water Cooling

Custom Designed Servo Motors For Your Specific Application. Call 1-800-358-9070 Today.