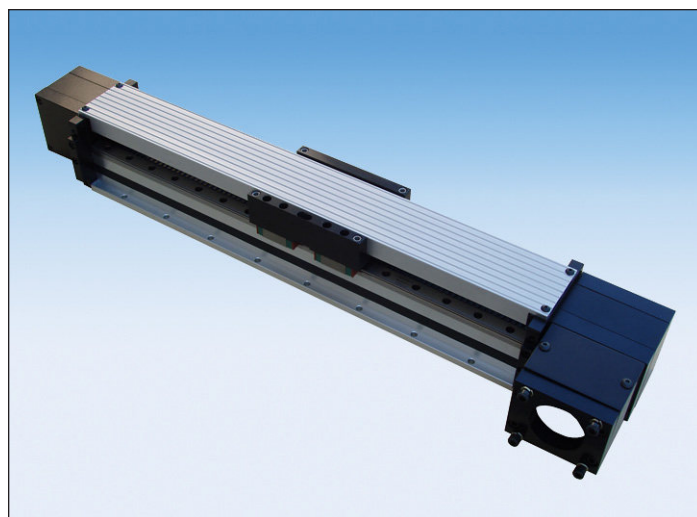
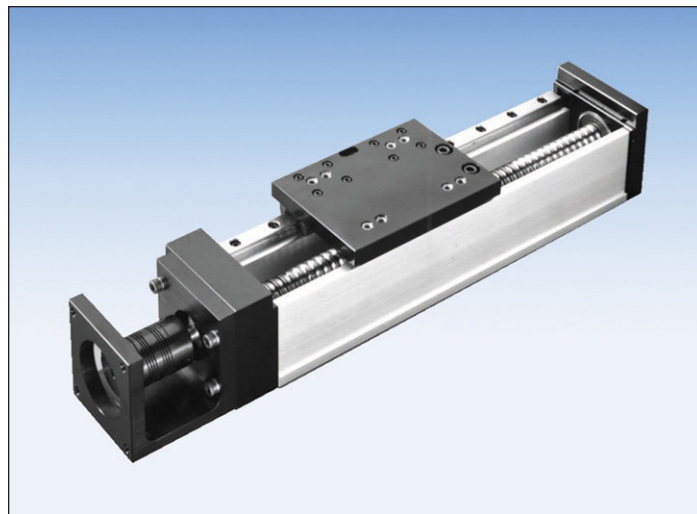


130 & 140 Series Positioning Tables

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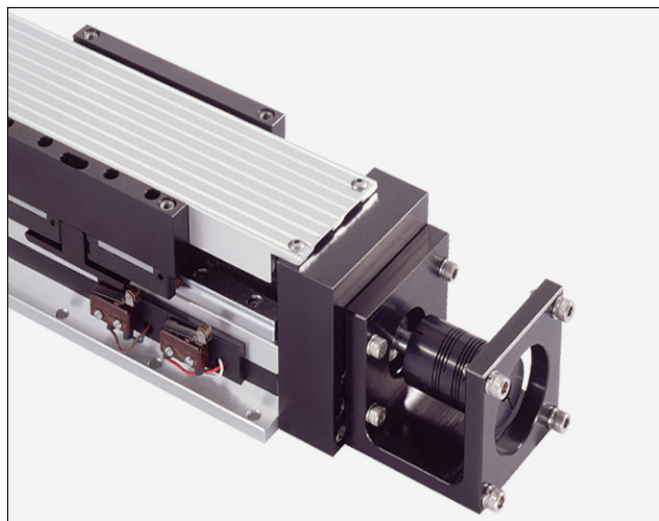
Single or Multiple Axis

LINTECH's 130 series positioning tables offer precision performance and design flexibility for use in a wide variety of Motion Control applications.

- ❑ Welding
- ❑ Test Stands
- ❑ Part Insertion
- ❑ Laser Positioning
- ❑ Liquid Dispensing
- ❑ Semiconductor Processing
- ❑ Gluing
- ❑ Pick & Place
- ❑ Part Scanning
- ❑ Inspection Stations
- ❑ General Automation

Quality Construction

LINTECH's 130 series tables are designed to maximize performance while minimizing physical size and cost. These tables use a low friction, preloaded, recirculating linear ball bearing system, which rides on a single precision ground linear rail. The single linear rail is mounted to a precision machined aluminum base, which offers a rigid support over the entire travel of the table's carriage. The load is mounted to a precision machined aluminum carriage, which has threaded stainless steel inserts for high strength and wear life. There are 30 different acme & ball screw options, that offer high efficiencies and long life at an economical price. These tables are designed to allow for numerous options. They include EOT & Home switches, linear & rotary encoders, power-off electric brakes, motor wrap packages and versatile mounting brackets for multiple axis applications.



Available Options

Acme Screws & Ball Screws

An assortment of acme screws and ball screws can be installed in the 130 series tables, providing solutions to load back driving, high duty cycle, high speed, extreme smoothness, and sensitive positioning applications.

Carriage Adapter Plates & Vertical Angle Brackets

Optional carriage adapter plates and vertical angle brackets can be mounted directly to the top of various **LINTECH** positioning tables, thus providing for easy multiple axis configurations.

Cover Plates

For operator protection, these tables can be fitted with aluminum cover plates. The entire length of the lead screw and linear bearing system will be covered.

End of Travel and Home Switches

The 130 series tables can be provided with end of travel (EOT) and home switches mounted and wired for each axis. Most position controllers can utilize the EOT switches to stop carriage motion when the extreme table travel has been reached in either direction. The home switch provides a known mechanical location on the table.

Linear and Rotary Encoders

Incremental encoders can be mounted to the table in order to provide positional data back to either a motion controller, or a digital display.

Motor Adapter Brackets

NEMA 23, NEMA 34, or any metric mount motor can be mounted to a 130 series positioning table with the use of adapter brackets.

Turcite Nut With Rolled Ball Screw

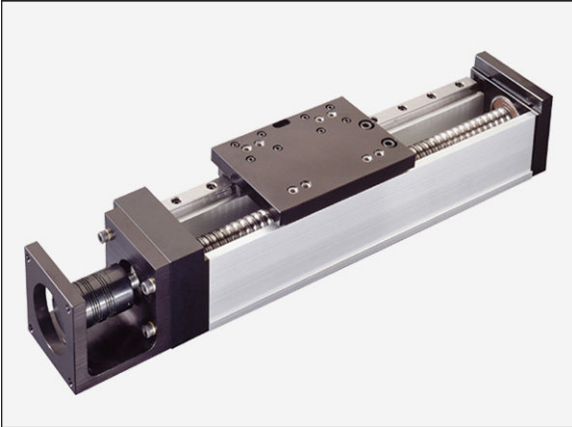
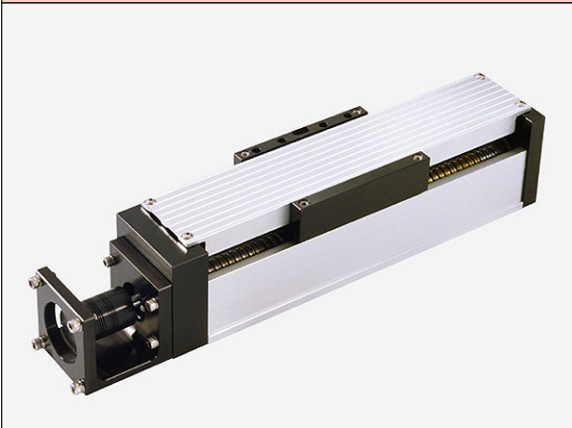
This solid polymer nut has no rolling elements in it, and performs very similar to an acme nut. It can provide smoother motion & less audible noise than most ball nuts, and is ideal for corrosive & vertical applications.

Other

The 130 series tables can accommodate **chrome plated linear bearings, rails, & screws** for corrosive environment applications, **power-off electric brakes** for load locking applications, **motor wrap packages** for space limited applications, and a **hand crank** for manually operated applications.

Standard Features - 130 Series

- ❑ Compact 2.875 inches (73 mm) wide by 2.375 inches (60 mm) tall
- ❑ Travel lengths from 2 inches (50 mm) to 60 inches (1520 mm)
- ❑ Threaded stainless steel inserts in carriage for load mounting
- ❑ 0° F to +185° F (-18° C to +85° C) operating temperature
- ❑ Recirculating linear ball bearing system
- ❑ Precision ground square rail design
- ❑ 1 rail, 1 or 2 bearing carriages

130-CP0 Series**130-CP1 Series****130-CP2 Series****Options - 130 Series**

- ❑ Chrome plated linear bearings, rails and screws
- ❑ AUTOCAD® drawings available via the internet
- ❑ End of travel (EOT) and home switches wired
- ❑ Adapter brackets for non-NEMA motors
- ❑ Linear and rotary incremental encoders
- ❑ NEMA 23 & 34 motor wrap packages
- ❑ NEMA 34 adapter bracket
- ❑ Power-off electric brakes
- ❑ Carriage adapter plates
- ❑ Vertical angle brackets
- ❑ Turcite nut options
- ❑ Motor couplings
- ❑ Cover plates
- ❑ Hand crank

❑ Ball screws:

Rolled - Non-preloaded & Preloaded Nuts:

- 0.625 inch diameter, 0.200 inch lead
- * 0.500 inch diameter, 0.500 inch lead
- 0.625 inch diameter, 1.000 inch lead

Precision - Non-preloaded & Preloaded Nuts:

- 0.625 inch diameter, 0.200 inch lead
- 16 mm diameter, 5 mm lead
- * 16 mm diameter, 10 mm lead
- * 16 mm diameter, 16 mm lead

Ground - Preloaded Nuts Only:

- 0.625 inch diameter, 0.200 inch lead
- 16 mm diameter, 5 mm lead
- 16 mm diameter, 16 mm lead

* (Reduction of travel with preloaded nut)

❑ Acme screws:

Rolled - Non-preloaded & Preloaded Nuts:

- 0.625 inch diameter, 0.100 inch lead
- 0.625 inch diameter, 0.200 inch lead
- 16 mm diameter, 4 mm lead

	13	2	4	02	-	CP0	-	1	-	S114	-	M02	-	C145	-	L01	-	E00	-	B00
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Table Series _____

Number of Bearings _____
1 - 1 bearing per carriage
2 - 2 bearings per carriage

Carriage Length _____
4 - 4 inches

Travel Length (see pages B-6, B-8 & B-10) _____
02 - 2 to 60 inches

Cover Plate _____
CP0 - no cover plates
CP1 - top cover plate only
CP2 - top & side cover plates

Carriage Inserts (see pages B-7, B-9 & B-11) _____
1 - English mount
2 - Metric mount

Screw Options (see pages B-14 to B-19) _____

<i>Rolled ball screws</i>	<i>Precision ball screws</i>	<i>Ground ball screws</i>
S001 - .500 x .500 NPL	S114 - .625 x .200 NPL	S212 - .625 x .200 PL
S002 - .500 x .500 PL	S115 - .625 x .200 PL	S213 - .625 x .500 PL
S003 - .500 x .500 NPL(T)	S116 - 16 x 5 NPL	S214 - 16 x 5 PL
S004 - .500 x .500 PL(T)	S117 - 16 x 5 PL	S215 - 16 x 16 PL
S005 - .625 x .200 NPL	S118 - 16 x 10 NPL	
S006 - .625 x .200 PL	S119 - 16 x 10 PL	<i>Rolled acme screws</i>
S007 - .625 x .200 NPL(T)	S120 - 16 x 16 NPL	S300 - .625 x .100 NPL
S008 - .625 x .200 PL(T)	S121 - 16 x 16 PL	S301 - .625 x .100 PL
S009 - .625 x 1.000 NPL		S302 - .625 x .200 NPL
S010 - .625 x 1.000 PL		S303 - .625 x .200 PL
S011 - .625 x 1.000 NPL(T)		S304 - 16 x 4 NPL
S012 - .625 x 1.000 PL(T)	S999 - other	S305 - 16 x 4 PL

Motor Mount (see pages B-7, B-9, B-11, B-42 & B-43) _____

M00 - none	M02 - NEMA 23 mount (E)	M06 - NEMA 23 (RH) wrap
M01 - hand crank	M03 - NEMA 23 mount (M)	M07 - NEMA 23 (LH) wrap
	M04 - NEMA 34 mount (E)	M08 - NEMA 34 (RH) wrap
M99 - other	M05 - NEMA 34 mount (M)	M09 - NEMA 34 (LH) wrap

Coupling Options (see pages B-38 to B-39) _____

C000 - none	C020 to C024 - C100	C125 to C129 - H100	C400 to C406 - G100
C999 - other	C040 to C047 - C125	C145 to C154 - H131	C425 to C434 - G126

Limit & Home Switches (see pages B-35 to B-37) _____

L00 - no switches		Mechanical	Reed	Hall	Prox (NPN)	Prox (PNP)
L99 - other	EOT & home switches	L01	L04	L07	L10	L13
	EOT switches only	L02	L05	L08	L11	L14
	home switch only	L03	L06	L09	L12	L15

Encoder Options (see page B-45) _____

E00 - none	E02 - rotary (1000 lines/rev)	E10 - linear (2500 lines/inch)	E99 - other
E01 - rotary (500 lines/rev)	E03 - rotary (1270 lines/rev)	E11 - linear (125 lines/mm)	

Power-off Brakes (see page B-44) _____

B00 - none	B01 - 24 VDC	B02 - 90 VDC	B99 - other
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(E) - English Interface	(NPL) - Non Preloaded
(LH) - Left Hand	(PL) - Preloaded
(M) - Metric Interface	(RH) - Right Hand
	(T) - Turcite Nut

Specifications

Load Capacities		One (1) Bearing Carriage		Two (2) Bearing Carriage	
Dynamic Horizontal	2 million inches (50 km) of travel	100 lbs	(45 kg)	200 lbs	(90 kg)
Dynamic Horizontal	50 million inches (1270 km) of travel	34 lbs	(15 kg)	68 lbs	(30 kg)
Static Horizontal		200 lbs	(90 kg)	400 lbs	(180 kg)
Dynamic Roll Moment	2 million inches (50 km) of travel	8 ft-lbs	(11 N-m)	16 ft-lbs	(22 N-m)
Dynamic Roll Moment	50 million inches (1270 km) of travel	3 ft-lbs	(4 N-m)	5 ft-lbs	(7 N-m)
Static Roll Moment		14 ft-lbs	(19 N-m)	28 ft-lbs	(38 N-m)
Dyn. Pitch & Yaw Moment	2 million inches (50 km) of travel	4 ft-lbs	(5,4 N-m)	15 ft-lbs	(20 N-m)
Dyn. Pitch & Yaw Moment	50 million inches (1270 km) of travel	1 ft-lbs	(1,9 N-m)	5 ft-lbs	(7 N-m)
Static Pitch & Yaw Moment		8 ft-lbs	(10 N-m)	30 ft-lbs	(40 N-m)
Each Bearing Dyn. Capacity	2 million inches (50 km) of travel	100 lbs	(45 kg)	100 lbs	(45 kg)
Each Bearing Dyn. Capacity	50 million inches (1270 km) of travel	34 lbs	(15 kg)	34 lbs	(15 kg)
Each Bearing Static Load Capacity		200 lbs	(90 kg)	200 lbs	(90 kg)
Thrust Force Capacity	10 million screw revolutions	665 lbs	(302 kg)	665 lbs	(302 kg)
Thrust Force Capacity	500 million screw revolutions	180 lbs	(82 kg)	180 lbs	(82 kg)
Maximum Acceleration		50 in/sec ²	(1,3 m/sec ²)	150 in/sec ²	(3,8 m/sec ²)
d₂	Center to center distance (spacing) of each bearing on a single rail	-		2.088 in	(53,0 mm)
d_r CP0 version	Center distance of the bearing to top of carriage plate surface	0.750 in	(19,1 mm)	0.750 in	(19,1 mm)
d_r CP1 version	Center distance of the bearing to top of carriage plate surface	1.375 in	(34,9 mm)	1.375 in	(34,9 mm)

Other	For One (1) & Two (2) Bearing Carriages
Table Material	Base, Carriage, End Plates, & Cover Plate option - 6061 anodized aluminum
Linear Rail Material	Stainless Steel
Screw Material (see pages B-14 to B-19)	Acme Screw - Stainless Steel
Screw Material (see pages B-14 to B-19)	Rolled Ball, Precision Ball, & Ground Ball - Case Hardened Steel
Straightness	< 0.00013 in/in (< 3,30 microns/25mm)
Flatness	< 0.00013 in/in (< 3,30 microns/25mm)
Orthogonality (multi-axis systems)	< 30 arc-seconds
Friction Coefficient	< 0.01
Motor Mount	NEMA 23 & 34 Mounts, Metric Mounts, Motor Wraps, and Hand Crank Option
Coupling	Three (3) different styles available

Dimensions & Specifications

- Without Cover Plates -

Model Number	Travel Length inches (mm)	Table Dimensions inches (mm)		Mounting Dimensions inches (mm)			Screw Length inches (mm)	Table ⁽¹⁾ Weight lbs (kg)
		A	B	C	E	M		
13x402-CP0	2 (50)	6.0 (152,4)	9.875 (250,8)	0.188 (4,8)	3	8	9.25 (235)	4.8 (2,2)
13x404-CP0	4 (100)	8.0 (203,2)	11.875 (301,6)	1.188 (30,2)	3	8	11.25 (286)	5.3 (2,4)
13x406-CP0	6 (150)	10.0 (254,0)	13.875 (352,4)	0.313 (8,0)	5	12	13.25 (337)	5.8 (2,6)
13x408-CP0	8 (200)	12.0 (304,8)	15.875 (403,2)	1.313 (33,4)	5	12	15.25 (387)	6.3 (2,9)
13x412-CP0	12 (300)	16.0 (406,4)	19.875 (504,8)	1.438 (36,5)	7	16	19.25 (489)	7.3 (3,3)
13x416-CP0	16 (405)	20.0 (508,0)	23.875 (606,4)	1.563 (39,7)	9	20	23.25 (591)	8.3 (3,8)
13x420-CP0	20 (505)	24.0 (609,6)	27.875 (708,0)	1.688 (42,9)	11	24	27.25 (692)	9.3 (4,2)
13x424-CP0	24 (605)	28.0 (711,2)	31.875 (809,6)	1.813 (46,1)	13	28	31.25 (794)	10.3 (4,7)
13x430-CP0	30 (760)	34.0 (863,6)	37.875 (962,0)	1.063 (27,0)	17	36	37.25 (946)	11.8 (5,4)
13x436-CP0	36 (910)	40.0 (1016,0)	43.875 (1114,4)	0.313 (8,0)	21	44	43.25 (1099)	13.3 (6,0)
13x442-CP0	42 (1060)	46.0 (1168,4)	49.875 (1266,8)	1.438 (36,5)	23	48	49.25 (1251)	14.8 (6,7)
13x448-CP0	48 (1215)	52.0 (1320,8)	55.875 (1419,2)	0.688 (17,5)	27	56	55.25 (1403)	16.3 (7,4)
13x454-CP0	54 (1370)	58.0 (1473,2)	61.875 (1571,6)	1.813 (46,1)	29	60	61.25 (1556)	17.8 (8,1)
13x460-CP0	60 (1520)	64.0 (1625,6)	67.875 (1724,0)	1.063 (27,0)	33	68	67.25 (1708)	19.3 (8,8)

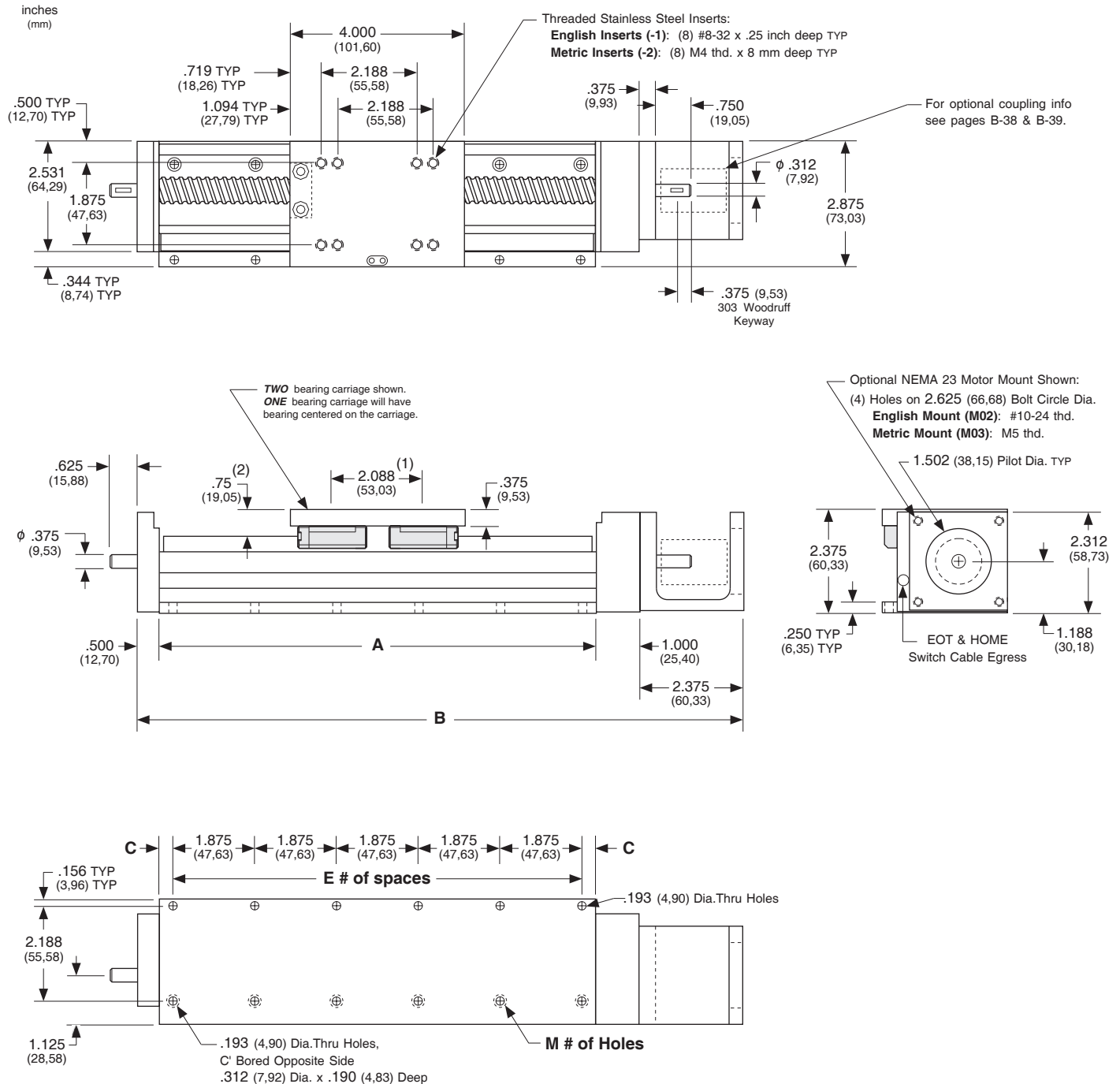
- └ x = 1; Carriage has 1 bearing; Carriage weight = 1.1 lbs. (0,50 kg)
- └ x = 2; Carriage has 2 bearings; Carriage weight = 1.2 lbs. (0,55 kg)

Footnotes:

(1) Weight shown is with a 0.625 inch (16 mm) diameter screw, a 1 bearing carriage [1.1 lbs (0,55 kg)], a NEMA 23 motor mount [0.34 lbs (0,16 kg)], and a C100 style [0.09 lbs (0,04 kg)] coupling. When using a 0.500 inch diameter screw subtract 0.022 lbs per inch (0,00039 kg per mm) of screw length for a given model number. When using a 2 bearing carriage add 0.1 lbs (0,05 kg) to each value.

Dimensions

- Without Cover Plates -



Note: Any 130 series table can be mounted on top of a second 130 series table, in order to create X-Y multiple axis configurations. **LINTECH** recommends that a 2 bearing carriage be used for the bottom axis, and that the top axis should never extend out more than 18 inches in either direction, from the bottom axis carriage edge, without the use of a support bearing system on the outer edges of the top axis. The 130-CP1, 130-CP2 or 140 series requires a **Carriage Adapter Plate** option. The carriage's threaded stainless steel insert hole pattern exactly matches the base mounting hole pattern on each table, therefore no adapter bracket or extra machining is required. However a precision square tool, or micrometer depth gauge, is required in order to obtain an orthogonality between the two tables of < 30 arc-seconds. The table base, carriage top & carriage sides are all precision machined. **LINTECH's** 100 or 120 series tables should be used for the bottom axis in a multiple axes application for better system rigidity, performance, and life.

Dimensions & Specifications

- With Top Cover Plate Only -

Model Number	Travel Length inches (mm)	Table Dimensions inches (mm)		Mounting Dimensions inches (mm)			Screw Length inches (mm)	Table Weight ⁽¹⁾ lbs (kg)
		A	B	C	E	M		
13x402-CP1	2 (50)	6.0 (152,4)	9.875 (250,8)	0.188 (4,8)	3	8	9.25 (235)	5.5 (2,5)
13x404-CP1	4 (100)	8.0 (203,2)	11.875 (301,6)	1.188 (30,2)	3	8	11.25 (286)	6.2 (2,8)
13x406-CP1	6 (150)	10.0 (254,0)	13.875 (352,4)	0.313 (8,0)	5	12	13.25 (337)	6.8 (3,1)
13x408-CP1	8 (200)	12.0 (304,8)	15.875 (403,2)	1.313 (33,4)	5	12	15.25 (387)	7.4 (3,4)
13x412-CP1	12 (300)	16.0 (406,4)	19.875 (504,8)	1.438 (36,5)	7	16	19.25 (489)	8.8 (4,0)
13x416-CP1	16 (405)	20.0 (508,0)	23.875 (606,4)	1.563 (39,7)	9	20	23.25 (591)	10.0 (4,5)
13x420-CP1	20 (505)	24.0 (609,6)	27.875 (708,0)	1.688 (42,9)	11	24	27.25 (692)	11.3 (5,1)
13x424-CP1	24 (605)	28.0 (711,2)	31.875 (809,6)	1.813 (46,1)	13	28	31.25 (794)	12.6 (5,7)
13x430-CP1	30 (760)	34.0 (863,6)	37.875 (962,0)	1.063 (27,0)	17	36	37.25 (946)	14.6 (6,6)
13x436-CP1	36 (910)	40.0 (1016,0)	43.875 (1114,4)	0.313 (8,0)	21	44	43.25 (1099)	16.5 (7,5)
13x442-CP1	42 (1060)	46.0 (1168,4)	49.875 (1266,8)	1.438 (36,5)	23	48	49.25 (1251)	18.4 (8,4)
13x448-CP1	48 (1215)	52.0 (1320,8)	55.875 (1419,2)	0.688 (17,5)	27	56	55.25 (1403)	20.4 (9,3)
13x454-CP1	54 (1370)	58.0 (1473,2)	61.875 (1571,6)	1.813 (46,1)	29	60	61.25 (1556)	22.3 (10,1)
13x460-CP1	60 (1520)	64.0 (1625,6)	67.875 (1724,0)	1.063 (27,0)	33	68	67.25 (1708)	24.3 (11,0)

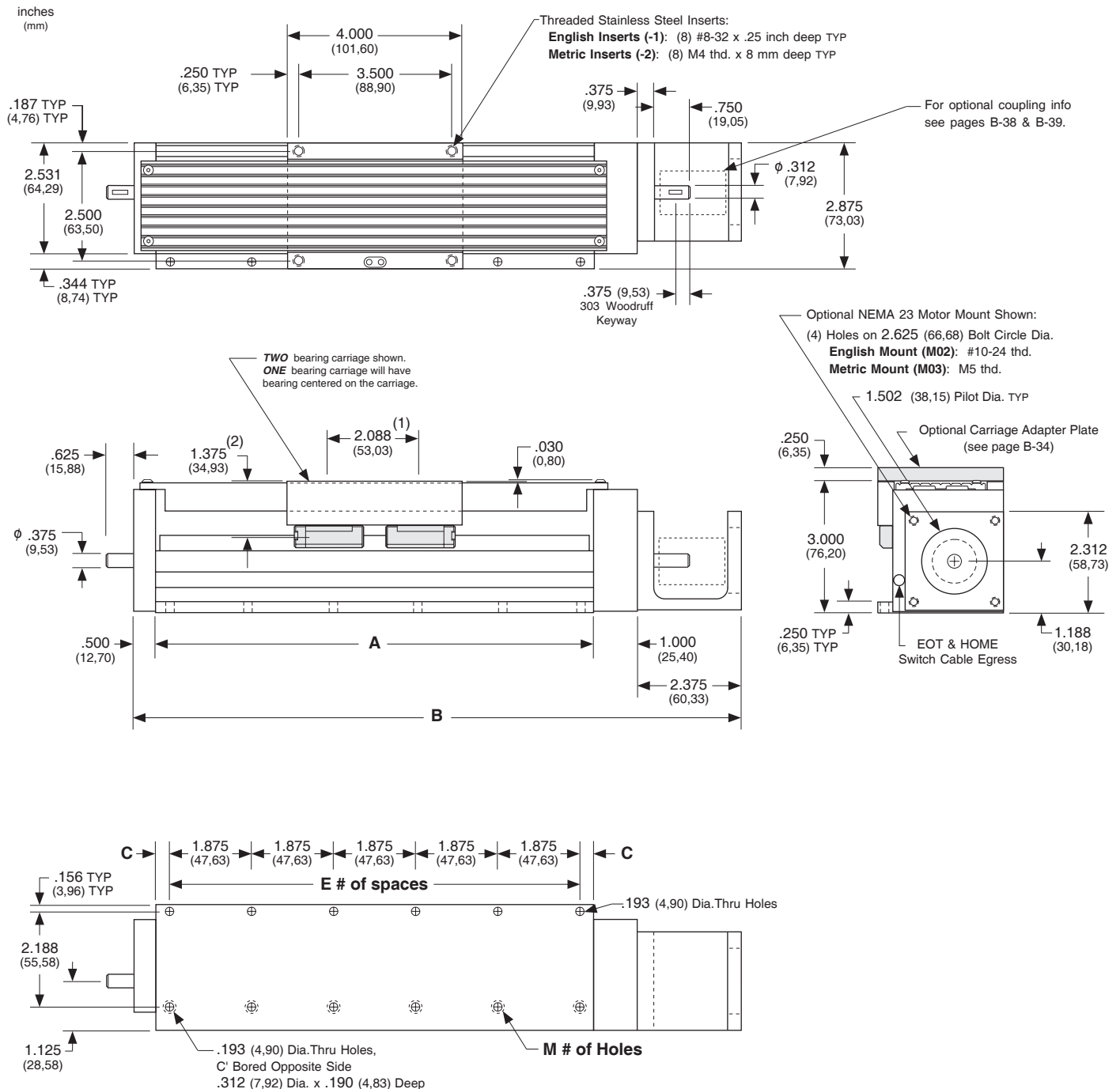
x = 1; Carriage has 1 bearing; Carriage weight = 1.4 lbs. (0,64 kg)
 x = 2; Carriage has 2 bearings; Carriage weight = 1.5 lbs. (0,68 kg)

Footnotes:

(1) Weight shown is with a 0.625 inch (16 mm) diameter screw, a 1 bearing carriage [1.1 lbs (0,55 kg)], a NEMA 23 motor mount [0.34 lbs (0,16 kg)], and a C100 style [0.09 lbs (0,04 kg)] coupling. When using a 0.500 inch diameter screw subtract 0.022 lbs per inch (0,00039 kg per mm) of screw length for a given model number. When using a 2 bearing carriage add 0.1 lbs (0,05 kg) to each value.

Dimensions

- With Top Cover Plate Only -



- (1) This value is center to center distance (spacing) of the bearings on a single rail (d_2).
- (2) This value is center distance of the bearing to top of carriage plate surface (d_1).

Note: Any 130 series table can be mounted on top of a second 130 series table, in order to create X-Y multiple axis configurations. **LINTECH** recommends that a 2 bearing carriage be used for the bottom axis, and that the top axis should never extend out more than 18 inches in either direction, from the bottom axis carriage edge, without the use of a support bearing system on the outer edges of the top axis. The 130-CP1, 130-CP2 or 140 series requires a **Carriage Adapter Plate** option. The carriage's threaded stainless steel insert hole pattern exactly matches the base mounting hole pattern on each table, therefore no adapter bracket or extra machining is required. However a precision square tool, or micrometer depth gauge, is required in order to obtain an orthogonality between the two tables of < 30 arc-seconds. The table base, carriage top & carriage sides are all precision machined. **LINTECH's** 100 or 120 series tables should be used for the bottom axis in a multiple axes application for better system rigidity, performance, and life.

Dimensions & Specifications

- With Top & Side Cover Plates -

Model Number	Travel Length inches (mm)	Table Dimensions inches (mm)		Mounting Dimensions inches (mm)			Screw Length inches (mm)	Table Weight ⁽¹⁾ lbs (kg)
		A	B	C	E	M		
13x402-CP2	2 (50)	6.0 (152,4)	9.875 (250,8)	0.188 (4,8)	3	8	9.25 (235)	5.7 (2,58)
13x404-CP2	4 (100)	8.0 (203,2)	11.875 (301,6)	1.188 (30,2)	3	8	11.25 (286)	6.4 (2,90)
13x406-CP2	6 (150)	10.0 (254,0)	13.875 (352,4)	0.313 (8,0)	5	12	13.25 (337)	7.0 (3,17)
13x408-CP2	8 (200)	12.0 (304,8)	15.875 (403,2)	1.313 (33,4)	5	12	15.25 (387)	7.6 (3,45)
13x412-CP2	12 (300)	16.0 (406,4)	19.875 (504,8)	1.438 (36,5)	7	16	19.25 (489)	9.1 (4,13)
13x416-CP2	16 (405)	20.0 (508,0)	23.875 (606,4)	1.563 (39,7)	9	20	23.25 (591)	10.4 (4,72)
13x420-CP2	20 (505)	24.0 (609,6)	27.875 (708,0)	1.688 (42,9)	11	24	27.25 (692)	11.7 (5,31)
13x424-CP2	24 (605)	28.0 (711,2)	31.875 (809,6)	1.813 (46,1)	13	28	31.25 (794)	13.1 (5,94)
13x430-CP2	30 (760)	34.0 (863,6)	37.875 (962,0)	1.063 (27,0)	17	36	37.25 (946)	15.1 (6,85)
13x436-CP2	36 (910)	40.0 (1016,0)	43.875 (1114,4)	0.313 (8,0)	21	44	43.25 (1099)	17.1 (7,76)
13x442-CP2	42 (1060)	46.0 (1168,4)	49.875 (1266,8)	1.438 (36,5)	23	48	49.25 (1251)	19.1 (8,66)
13x448-CP2	48 (1215)	52.0 (1320,8)	55.875 (1419,2)	0.688 (17,5)	27	56	55.25 (1403)	21.2 (9,62)
13x454-CP2	54 (1370)	58.0 (1473,2)	61.875 (1571,6)	1.813 (46,1)	29	60	61.25 (1556)	23.2 (10,52)
13x460-CP2	60 (1520)	64.0 (1625,6)	67.875 (1724,0)	1.063 (27,0)	33	68	67.25 (1708)	25.3 (11,47)

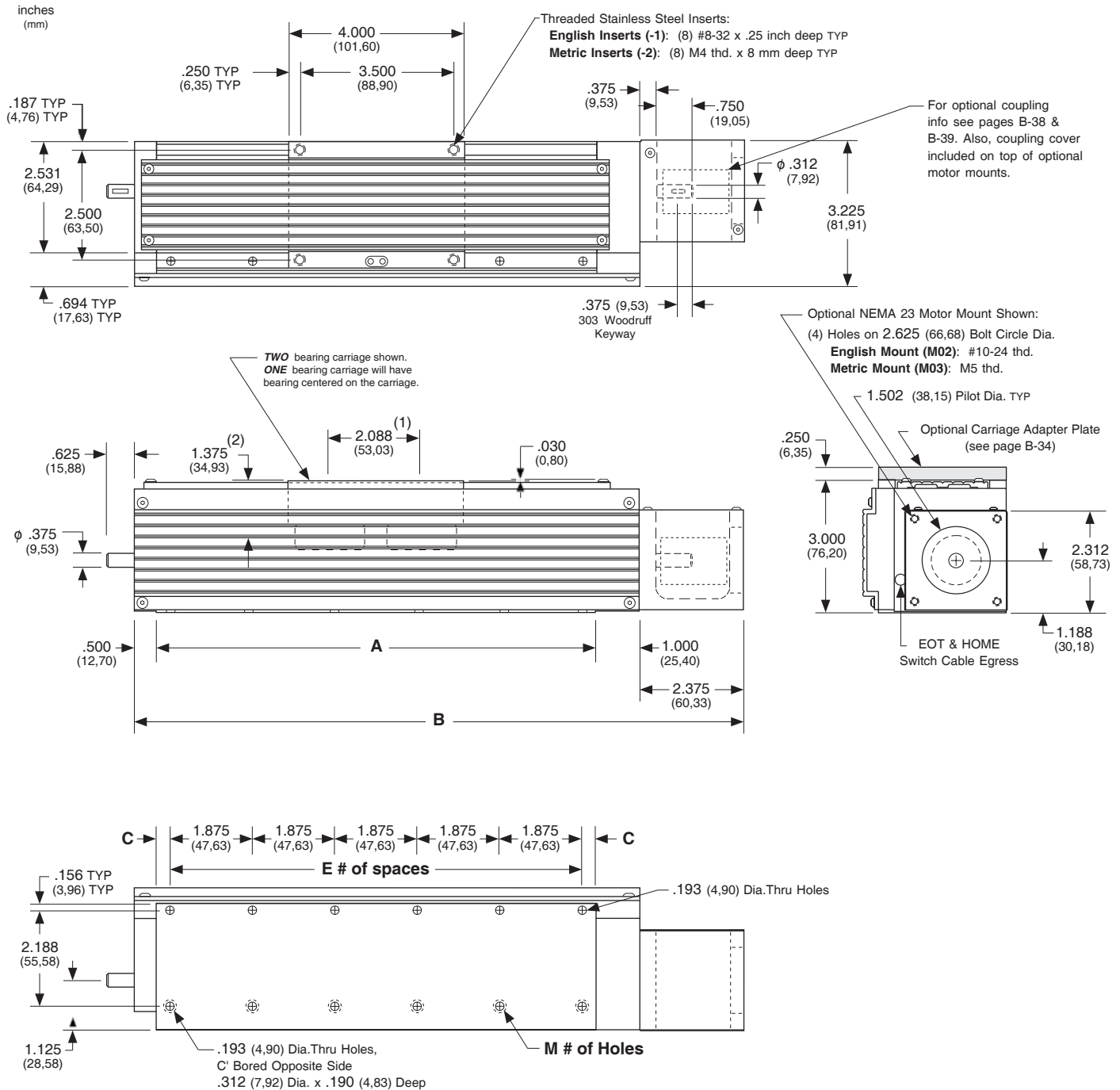
x = 1; Carriage has 1 bearing; Carriage weight = 1.4 lbs. (0,64 kg)
 x = 2; Carriage has 2 bearings; Carriage weight = 1.5 lbs. (0,68 kg)

Footnotes:

(1) Weight shown is with a 0.625 inch (16 mm) diameter screw, a 1 bearing carriage [1.1 lbs (0,55 kg)], a NEMA 23 motor mount [0.34 lbs (0,16 kg)], and a C100 style [0.09 lbs (0,04 kg)] coupling. When using a 0.500 inch diameter screw subtract 0.022 lbs per inch (0,00039 kg per mm) of screw length for a given model number. When using a 2 bearing carriage add 0.1 lbs (0,05 kg) to each value.

Dimensions

- With Top & Side Cover Plates -



(1) This value is center to center distance (spacing) of the bearings on a single rail (d_2).

(2) This value is center distance of the bearing to top of carriage plate surface (d_1). Add .250 inch (6,35 mm) if using a carriage adapter plate.

Note: Any 130 series table can be mounted on top of a second 130 series table, in order to create X-Y multiple axis configurations. **LINTECH** recommends that a 2 bearing carriage be used for the bottom axis, and that the top axis should never extend out more than 18 inches in either direction, from the bottom axis carriage edge, without the use of a support bearing system on the outer edges of the top axis. The 130-CP1, 130-CP2 or 140 series requires a **Carriage Adapter Plate** option. The carriage's threaded stainless steel insert hole pattern exactly matches the base mounting hole pattern on each table, therefore no adapter bracket or extra machining is required. However a precision square tool, or micrometer depth gauge, is required in order to obtain an orthogonality between the two tables of < 30 arc-seconds. The table base, carriage top & carriage sides are all precision machined. **LINTECH's** 100 or 120 series tables should be used for the bottom axis in a multiple axes application for better system rigidity, performance, and life.

Thrust Capacity (axial load)

The life of the screw end support bearings can be estimated by evaluating the applied axial (thrust) load. The applied load "as seen by the bearings" depends upon the table orientation. Typically, the extra force acting upon the bearings during the acceleration interval is offset by a reduction in force during the deceleration interval. Therefore, evaluating the life of the bearings at a constant speed is adequate. The life of the screw end support bearings may not be the limiting element for a given application. See page B-13 for load/life capacity of acme and ball screw nuts.

$$L = \left[\frac{R}{F \times S} \right]^3 \times B$$

- B** = 2 (for millions of revolutions)
- E** = externally applied extra forces
- F** = applied axial load (*as seen by the bearings*)
- L** = calculated life (millions of revolutions)
- R** = dynamic load capacity of bearings at 2 million screw revolutions (see below)
- S** = safety factor (1 to 8)
- W** = user mounted load weight to carriage
- μ** = coefficient of friction for linear bearing system (0.01)

Horizontal Application

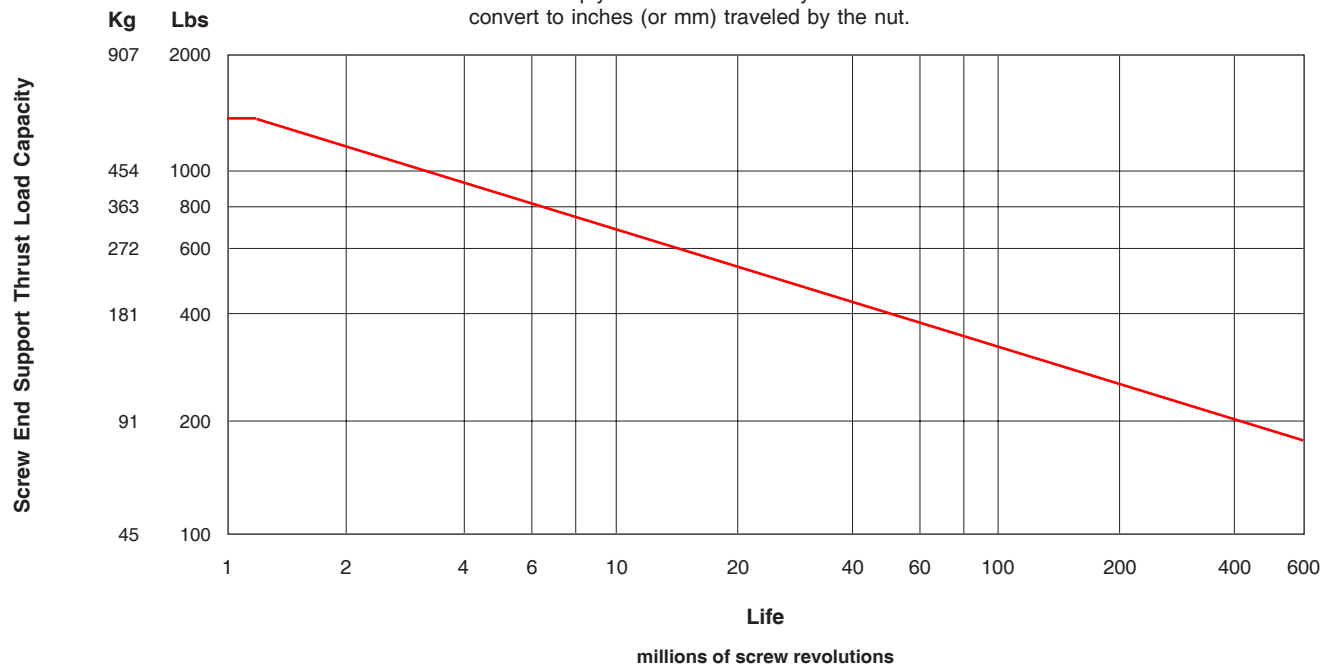
$$F = (W \times \mu) + E$$

Vertical Application

$$F = W + E$$

Screw End Supports		Number of Screw Revolutions						
		millions of screw revolutions						
		Static	1	2	10	50	100	500
Thrust Capacity	lbs (kg)	1,355 (615)	1,355 (615)	1,145 (519)	665 (302)	395 (179)	305 (138)	180 (82)

Note: Multiply screw revolutions by the screw lead in order to convert to inches (or mm) traveled by the nut.



Screw Travel Life

The life of an acme or ball screw can be estimated by evaluating the load applied to the nut. The applied load "as seen by the screw nut" depends upon the table orientation. Typically, the extra force acting upon the screw nut during the acceleration interval is offset by a reduction in force during the deceleration interval. Therefore, evaluating the life of the screw nut at a constant speed is adequate. The life of the screw nut may not be the limiting element for a given application. See page B-12 for load/life capacity of the screw end support bearings.

Horizontal Application

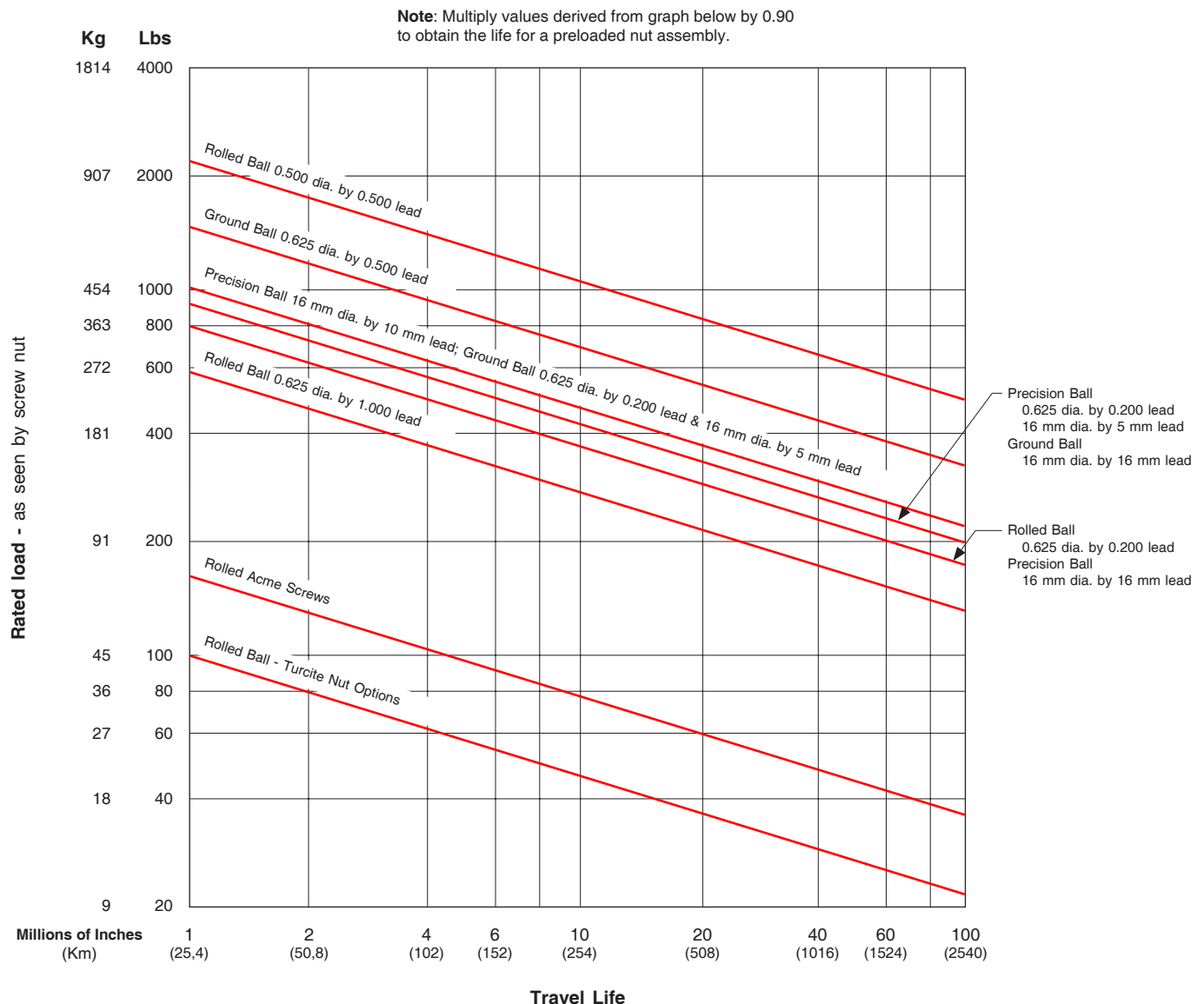
$$F = (W \times \mu) + E$$

Vertical Application

$$F = W + E$$

$$L = \left[\frac{R}{F \times S} \right]^3 \times B$$

- B** = either 1 (for millions of inches) or 25 (for Km)
- E** = externally applied extra forces
- F** = applied axial load (*as seen by screw nut*)
- L** = calculated travel life (millions of inches or Km)
- R** = rated dynamic load capacity of screw nut at 1 million inches of travel or 25 Km (see pages B-22 to B-25)
- S** = safety factor (1 to 8)
- W** = user mounted load weight to carriage
- μ** = coefficient of friction for linear bearing system (0.01)



Screws - Acme & Ball

Acme screws use a turcite (polymer), or bronze nut. The nut threads ride in the matching acme screw threads, much like the ordinary nut and bolt system. This produces a higher friction (lower efficiency) system than a ball screw assembly, since there are no rolling elements between the nut and the acme screw threads. For applications requiring low speeds, noise and duty cycles, an acme screw works fine. Also, an acme screw is a good choice for most vertical applications, as it typically prevents back driving of the attached load.

Ball screws are the screw of choice for high duty cycle, high speed, and long life applications. The 130 series tables can be fitted with an assortment of ball screws. The ball screw nut uses one or more circuits of recirculating steel balls which roll between the nut and ball screw grooves, providing an efficient low friction system. Using a higher lead

ball screw (for example a 0.500 inch lead instead of a 0.200 inch lead) will offer greater carriage speed for applications requiring rapid traverse, or fast, short moves. Low wear and long life are key features of a ball screw system.

LINTECH provides three different ball screw configurations. The rolled ball screw system utilizes a tapped nut with a standard accuracy grade rolled screw. The precision ball screw system utilizes a ground nut with a higher accuracy grade rolled screw. The ground ball screw system utilizes a ground nut with a high accuracy precision ground screw.

Some screws are available with preloaded nuts. The preloaded nut assembly offers high *bidirectional* repeatability by eliminating backlash.

Consideration	Acme Screw	Ball Screws			Comments
		Rolled	Precision	Ground	
Audible noise	least audible noise	most audible noise	less audible noise than rolled screw	less audible noise than precision screw	Acme: no rolling elements provide for quiet operation. Ball: recirculating balls in nut assembly transmit audible noise during motion; due to more accurate machining procedures - precision & ground ball screws are quieter than rolled ball screws.
Back Driving Loads	may prevent back driving	can easily back drive a load	can easily back drive a load	can easily back drive a load	Acme: good for light loads & vertical applications. Ball: recirculating balls in nut assembly produce a low friction system; vertical applications may require a brake to hold the load when no power is applied to the motor.
Backlash <i>non-preloaded nut</i>	will increase with wear	constant	constant	constant	Acme: preloaded nut assembly eliminates backlash. Ball: preloaded nut assembly eliminates backlash.
Duty Cycle	low to medium (< 50 %)	high (100 %)	high (100 %)	high (100 %)	Acme: low duty cycle due to high sliding friction. Ball: high duty cycle due to recirculating balls in nut assembly; high efficiency & low friction system.
Life	shorter due to higher friction	long	long	long	Acme: mechanical wear related to duty cycle, load & speed. Ball: minimal wear if operated in proper environment, within load specifications, and periodically lubricated.
Relative - Cost	slightly more than rolled ball	least expensive	slightly more than rolled ball	most expensive	Acme: a little more expensive than the rolled ball screw. Ball: due to more accurate manufacturing procedures precision rolled & ground ball screws are more expensive.
Screw Efficiency	low 40 % -Acme 60 % -Turcite	high (90 %)	high (90 %)	high (90 %)	Acme: low efficiency due to high sliding friction. Ball: high efficiency due to recirculating balls in nut assembly - low friction system.
Smoothness	can be smooth	least smooth	medium smoothness	smoothest	Acme: due to friction can start/stop at very low speeds. Ball: smoothness is constant through a wide speed range; due to more accurate manufacturing procedures precision rolled & ground ball screws are smoother than rolled ball screws.
Speeds	low	high	high	high	Acme: high friction can causes excess heat & wear at high speeds. Ball: recirculating balls in nut provide for a high speed system due to low friction & high efficiency.

Screws - Acme & Ball

130 Series		Maximum Safe Table Operating Speed ⁽¹⁾								
		in/sec (mm/sec)								
		Screw								
Model Number	Travel Length inches (mm)	0.500 dia. 0.500 lead	0.625 dia. 0.100 lead	0.625 dia. 0.200 lead	0.625 dia. 0.500 lead	0.625 dia. 1.000 lead	16 mm dia. 4 mm lead	16 mm dia. 5 mm lead	16 mm dia. 10 mm lead	16 mm dia. 16 mm lead
13x402	2 (50)	25.0 (635)	5.0 (127)	10.0 (254)	25.0 (635)	50.0 (1270)	7.9 (201)	9.8 (249)	19.7 (500)	31.5 (800)
13x404	4 (100)	25.0 (635)	5.0 (127)	10.0 (254)	25.0 (635)	50.0 (1270)	7.9 (201)	9.8 (249)	19.7 (500)	31.5 (800)
13x406	6 (150)	25.0 (635)	5.0 (127)	10.0 (254)	25.0 (635)	50.0 (1270)	7.9 (201)	9.8 (249)	19.7 (500)	31.5 (800)
13x408	8 (200)	25.0 (635)	5.0 (127)	10.0 (254)	25.0 (635)	50.0 (1270)	7.9 (201)	9.8 (249)	19.7 (500)	31.5 (800)
13x412	12 (300)	25.0 (635)	5.0 (127)	10.0 (254)	25.0 (635)	50.0 (1270)	7.9 (201)	9.8 (249)	19.7 (500)	31.5 (800)
13x416	16 (405)	25.0 (635)	5.0 (127)	10.0 (254)	25.0 (635)	50.0 (1270)	7.9 (201)	9.8 (249)	19.7 (500)	31.5 (800)
13x420	20 (505)	21.5 (546)	5.0 (127)	10.0 (254)	25.0 (635)	50.0 (1270)	7.9 (201)	9.8 (249)	19.7 (500)	31.5 (800)
13x424	24 (605)	16.1 (409)	4.2 (107)	8.4 (213)	21.0 (533)	41.9 (1064)	6.5 (165)	8.2 (208)	16.4 (416)	26.2 (665)
13x430	30 (760)	11.2 (284)	2.9 (74)	5.8 (147)	14.5 (368)	29.0 (737)	4.5 (114)	5.6 (142)	11.3 (287)	18.1 (460)
13x436	36 (910)	8.2 (208)	2.1 (53)	4.2 (107)	10.6 (269)	21.3 (541)	3.3 (84)	4.1 (104)	8.3 (211)	13.3 (338)
13x442	42 (1060)	6.2 (157)	1.6 (41)	3.3 (81)	8.1 (206)	16.3 (414)	2.5 (63)	3.2 (81)	6.3 (160)	10.1 (257)
13x448	48 (1215)	4.9 (124)	1.3 (33)	2.5 (63)	6.4 (162)	12.8 (325)	2.0 (51)	2.5 (63)	5.0 (127)	8.0 (203)
13x454	54 (1370)	4.0 (102)	1.0 (25)	2.0 (51)	5.2 (132)	10.4 (264)	1.6 (41)	2.0 (51)	4.0 (102)	6.5 (165)
13x460	60 (1520)	3.3 (84)	0.8 (20)	1.7 (43)	4.3 (109)	8.6 (218)	1.3 (33)	1.7 (43)	3.3 (84)	5.3 (135)

Footnotes:

- (1) These listed speeds are a mechanical limitation. The maximum speed of a positioning table depends on the screw diameter, screw lead, screw length, and the screw end bearing support configuration. **LINTECH** uses a fixed-simple screw end bearing support configuration in its positioning tables. The correct motor & drive system needs to be selected in order to obtain the above maximum table speeds.

Screws - Acme & Ball

SCREW	ROLLED BALL SCREWS							
	Dyn. ⁽¹⁾ Capacity lbs (kg)	Static Capacity lbs (kg)	Screw Efficiency %	Breakaway Torque oz-in (N-m)	Position Accuracy inch/ft (microns/300 mm)	Backlash inches (microns)	Unidirectional Repeatability inches (microns)	Bidirectional Repeatability inches (microns)
0.500 inch dia. 0.500 inch lead	Non-preloaded (S001)	2,200 (997)	13,350 (6055)	90	15 (0,11)	< 0.008 (203)	+/- 0.0002 (5)	+ 0.0002 to - 0.0082 (5) (208)
	(2) Preloaded (S002)	1,980 (898)	13,130 (5955)		30 (0,21)	0		+ 0.0002 to - 0.0002 (5) (5)
	Non-preloaded Turcite Nut (S003)	100 (45)	800 (363)	60	25 (0,18)	< 0.008 (203)		+ 0.0002 to - 0.0082 (5) (208)
	Preloaded Turcite Nut (S004)	90 (41)	800 (363)		40 (0,28)	0		+ 0.0002 to - 0.0002 (5) (5)
0.625 inch dia. 0.200 inch lead	Non-preloaded (S005)	800 (363)	6,150 (2790)	90	10 (0,07)	< 0.008 (203)	+/- 0.0002 (5)	+ 0.0002 to - 0.0082 (5) (208)
	Preloaded (S006)	720 (326)	6,070 (2753)		20 (0,14)	0		+ 0.0002 to - 0.0002 (5) (5)
	Non-preloaded Turcite Nut (S007)	100 (45)	800 (363)	60	15 (0,11)	< 0.008 (203)		+ 0.0002 to - 0.0082 (5) (208)
	Preloaded Turcite Nut (S008)	90 (41)	800 (363)		30 (0,21)	0		+ 0.0002 to - 0.0002 (5) (5)
0.625 inch dia. 1.000 inch lead	Non-preloaded (S009)	590 (267)	2,425 (1100)	90	25 (0,18)	< 0.008 (203)	+/- 0.0002 (5)	+ 0.0002 to - 0.0082 (5) (208)
	Preloaded (S010)	530 (240)	2,390 (1084)		40 (0,28)	0		+ 0.0002 to - 0.0002 (5) (5)
	Non-preloaded Turcite Nut (S011)	100 (45)	800 (363)	60	35 (0,25)	< 0.008 (203)		+ 0.0002 to - 0.0082 (5) (208)
	Preloaded Turcite Nut (S012)	90 (41)	800 (363)		60 (0,42)	0		+ 0.0002 to - 0.0002 (5) (5)

Footnotes:

(1) Dynamic load capacity of screw based on 1 million inches of travel (25Km).

(2) There is a 2.2 inch (55,9 mm) reduction of carriage travel (from the listed travel length) when using a preloaded nut with this screw option.

Screws - Acme & Ball

SCREW	PRECISION BALL SCREWS							
	Dyn. ⁽¹⁾ Capacity	Static Capacity	Screw Efficiency	Breakaway Torque	Position Accuracy	Backlash	Unidirectional Repeatability	Bidirectional Repeatability
	lbs (kg)	lbs (kg)	%	oz-in (N-m)	inch/ft (microns/300 mm)	inches (microns)	inches (microns)	inches (microns)
0.625 inch dia. 0.200 inch lead	<i>Non-preloaded</i> (S114)	876 (397)	90	10 (0,07)	< 0.002 (50)	< 0.003 (76)	+/- 0.0002 (5)	+ 0.0002 (5) to - 0.0032 (81)
	<i>Preloaded</i> (S115)	788 (357)		20 (0,14)		0		+ 0.0002 (5) to - 0.0002 (5)
16 mm dia. 5 mm lead	<i>Non-preloaded</i> (S116)	876 (397)	90	10 (0,07)	< 0.002 (50)	< 0.003 (76)	+/- 0.0002 (5)	+ 0.0002 (5) to - 0.0032 (81)
	<i>Preloaded</i> (S117)	788 (357)		20 (0,14)		0		+ 0.0002 (5) to - 0.0002 (5)
16 mm dia. 10 mm lead	<i>Non-preloaded</i> (S118)	1,080 (489)	90	15 (0,11)	< 0.002 (50)	< 0.003 (76)	+/- 0.0002 (5)	+ 0.0002 (5) to - 0.0032 (81)
	⁽²⁾ <i>Preloaded</i> (S119)	972 (440)		25 (0,18)		0		+ 0.0002 (5) to - 0.0002 (5)
16 mm dia. 16 mm lead	<i>Non-preloaded</i> (S120)	819 (371)	90	20 (0,14)	< 0.002 (50)	< 0.003 (76)	+/- 0.0002 (5)	+ 0.0002 (5) to - 0.0032 (81)
	⁽³⁾ <i>Preloaded</i> (S121)	737 (334)		35 (0,24)		0		+ 0.0002 (5) to - 0.0002 (5)

Footnotes:

- (1) Dynamic load capacity of screw based on 1 million inches of travel (25Km).
- (2) There is a 0.5 inch (12,7 mm) reduction of carriage travel (from the listed travel length) when using a preloaded nut with this screw option.
- (3) There is a 0.7 inch (17,8 mm) reduction of carriage travel (from the listed travel length) when using a preloaded nut with this screw option.

Screws - Acme & Ball

SCREW	GROUND BALL SCREWS ⁽²⁾							
	Dyn. ⁽¹⁾ Capacity lbs (kg)	Static Capacity lbs (kg)	Screw Efficiency %	Breakaway Torque oz-in (N-m)	Position Accuracy inch/ft (microns/300 mm)	Backlash inches (microns)	Unidirectional Repeatability inches (microns)	Bidirectional Repeatability inches (microns)
0.625 dia., 0.200 lead <i>Preloaded</i> (S212)	987 (447)	3,080 (1397)	90	20 (0,14)	< 0.0012 (30)	0	+/- 0.0001 (2,5)	+ 0.0001 to - 0.0001 (2,5) (2,5)
0.625 dia., 0.500 lead <i>Preloaded</i> (S213)	1430 (649)	4,191 (1901)	90	30 (0,21)	< 0.0012 (30)	0	+/- 0.0001 (2,5)	+ 0.0001 to - 0.0001 (2,5) (2,5)
16 mm dia., 5 mm lead <i>Preloaded</i> (S214)	987 (447)	3,080 (1397)	90	20 (0,14)	< 0.0012 (30)	0	+/- 0.0001 (2,5)	+ 0.0001 to - 0.0001 (2,5) (2,5)
16 mm dia., 16 mm lead <i>Preloaded</i> (S215)	910 (412)	1,800 (816)	90	35 (0,24)	< 0.0012 (30)	0	+/- 0.0001 (2,5)	+ 0.0001 to - 0.0001 (2,5) (2,5)

Footnotes:

(1) Dynamic load capacity of screw based on 1 million inches of travel (25Km).

(2) The Ground Ball Screw options are only available in travel lengths up to 36 inches (910 mm) of travel.

Screws - Acme & Ball

SCREW	ROLLED ACME SCREWS							
	Dyn. ⁽¹⁾ Capacity lbs (kg)	Static Capacity lbs (kg)	Screw Efficiency %	Breakaway Torque oz-in (N-m)	Position Accuracy inch/ft (microns/300 mm)	Backlash inches (microns)	Unidirectional Repeatability inches (microns)	Bidirectional Repeatability inches (microns)
0.625 inch dia. 0.100 inch lead	<i>Non-preloaded</i> (S300)	160 (73)	40	10 (0,07)	< 0.003 (75)	< 0.008 (203)	+/- 0.0002 (5)	+ 0.0002 to - 0.0082 (5) (208)
	<i>Preloaded</i> (S301)	140 (64)		20 (0,14)		0		+ 0.0002 to - 0.0002 (5) (5)
0.625 inch dia. 0.200 inch lead	<i>Non-preloaded</i> (S302)	160 (73)	40	15 (0,11)	< 0.003 (75)	< 0.008 (203)	+/- 0.0002 (5)	+ 0.0002 to - 0.0082 (5) (208)
	<i>Preloaded</i> (S303)	140 (64)		30 (0,21)		0		+ 0.0002 to - 0.0002 (5) (5)
16 mm dia. 4 mm lead	<i>Non-preloaded</i> (S304)	160 (73)	40	15 (0,11)	< 0.003 (75)	< 0.008 (203)	+/- 0.0002 (5)	+ 0.0002 to - 0.0082 (5) (208)
	<i>Preloaded</i> (S305)	140 (64)		30 (0,21)		0		+ 0.0002 to - 0.0002 (5) (5)

Footnotes:

(1) Dynamic load capacity of screw based on 1 million inches of travel (25Km).

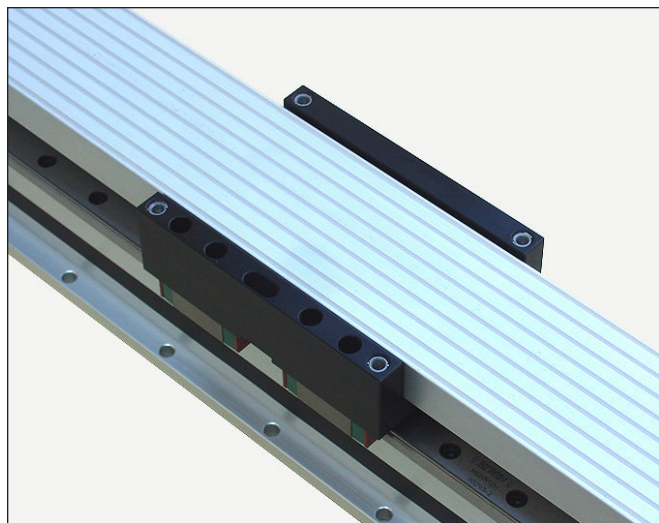
Single or Multiple Axis

LINTECH's 140 series positioning tables offer precision performance and design flexibility for use in a wide variety of Motion Control applications.

- ❑ *Welding*
- ❑ *Test Stands*
- ❑ *Part Insertion*
- ❑ *Laser Positioning*
- ❑ *Liquid Dispensing*
- ❑ *Semiconductor Processing*
- ❑ *Gluing*
- ❑ *Pick & Place*
- ❑ *Part Scanning*
- ❑ *Inspection Stations*
- ❑ *General Automation*

Quality Construction

LINTECH's 140 series tables are designed to handle light loads at very high speeds. These tables use a low friction, preloaded, recirculating linear ball bearing system, which rides on precision ground linear rails. The linear rails are mounted to a precision machined aluminum base, which offers a rigid support over the entire travel of the table's carriage. The load is mounted to a precision machined aluminum carriage, which has threaded stainless steel inserts for high strength and wear life. The drive system uses two pulleys, along with a high strength, steel reinforced polyurethane belt, which provides 3.543 inches (90 mm) of linear movement per revolution of the input shaft. The simple belt tensioning system allows for easy adjustment of belt tension by the user. NEMA 23 & 34 motor mounts, or gearhead mounts are available as well as planetary gearheads.



Available Options

Carriage Adapter Plates & Vertical Angle Brackets

Optional carriage adapter plates and vertical angle brackets can be mounted directly to the top of various **LINTECH** positioning tables, thus providing for easy multiple axis configurations.

End of Travel and Home Switches

The 140 series tables can be provided with end of travel (EOT) and home switches mounted and wired for each axis. Most position controllers can utilize the EOT switches to stop carriage motion when the extreme table travel has been reached in either direction. The home switch provides a known mechanical location on the table.

Motor Adapter Brackets

NEMA 34 or any metric mount motor can be mounted to a 140 series positioning table with the use of adapter brackets.

Rotary Encoders

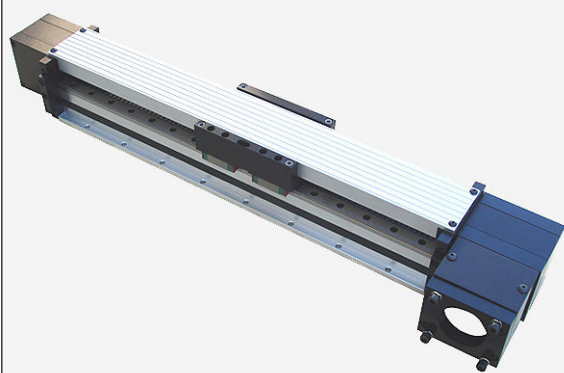
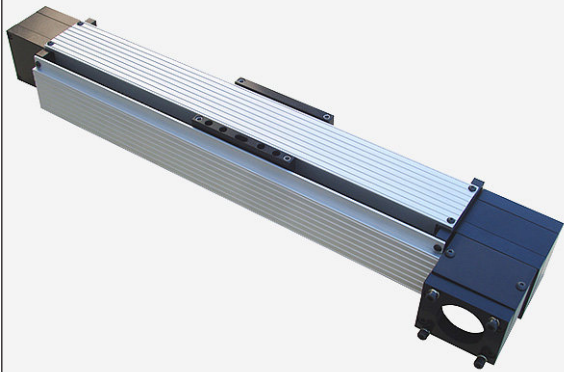
Incremental rotary encoders can be mounted to the table in order to provide positional data back to either a motion controller, or a digital display.

Other

The 140 series tables can accommodate **chrome plated linear bearings & rails** for corrosive environment applications and **power-off electric brakes** for load locking applications.

Standard Features - 140 Series

- ❑ Compact 2.875 inches (73 mm) wide by 3.000 inches (76 mm) tall
- ❑ Travel lengths from 4 inches (100 mm) to 10 feet (3,0 meters)
- ❑ Threaded stainless steel inserts in carriage for load mounting
- ❑ Polyurethane belt with high strength steel tension members
- ❑ 0° F to +176° F (-18° C to +80° C) operating temperature
- ❑ Single screw belt tensioning with self locking thread
- ❑ Dynamic Load Capacity to 200 lbs (90 kg)
- ❑ Recirculating linear ball bearing system
- ❑ Precision ground square rail design
- ❑ 1 rail, 1 or 2 bearing carriages

140-CP0 Series**140-CP1 Series****140-CP2 Series****Options - 140 Series**

- ❑ AUTOCAD® drawings available via the internet
- ❑ End of travel (EOT) and home switches wired
- ❑ Adapter brackets for non-NEMA motors
- ❑ Chrome plated linear bearings & rails
- ❑ Rotary incremental encoders
- ❑ NEMA 34 adapter bracket
- ❑ Power-off electric brakes
- ❑ Carriage adapter plates
- ❑ Vertical angle bracket
- ❑ Motor couplings

Specifications subject to change without notice

	14	2	4	004	- CP1	- 1	- D1	- M02	- C155	- L04	- E00	- B00
Table Series _____												
Number of Bearings _____												
1 - 1 bearing per carriage												
2 - 2 bearings per carriage												
Carriage Length _____												
4 - 4 inches												
Travel Length (see pages B-24, B-26 & B-28) _____												
004 - 4 to 120 inches												
Cover Plate _____												
CP0 - no cover plate												
CP1 - top cover plate only												
CP2 - top & side cover plates												
Carriage Inserts (see pages B-25, B-27 & B-29) _____												
1 - English mount												
2 - Metric mount												
Drive Shaft (see pages B-25, B-27 & B-29) _____												
D1 - Right Hand single shaft												
D2 - Left Hand single shaft												
D3 - Right Hand thru shaft												
D4 - Left Hand thru shaft												
Motor Mount (see pages B-25, B-27, B-29 & B-42) _____												
M00 - none												
M99 - other												
M02 - NEMA 23 mount (E)												
M03 - NEMA 23 mount (M)												
M04 - NEMA 34 mount (E)												
M05 - NEMA 34 mount (M)												
Coupling Options (see pages B-38 & B-39) _____												
C000 - none												
C999 - none												
C130 to C134 - H100												
C155 to C164 - H131												
C190 to C200 - H163												
C407 to C413 - G100												
C435 to C444 - G126												
C470 to C480 - G158												
Limit & Home Switches (see pages B-35 to B-37) _____												
L00 - no switches												
L99 - other												
EOT & home switches												
EOT switches only												
home switch only												
Reed												
Hall												
Prox (NPN)												
Prox (PNP)												
L04												
L07												
L10												
L13												
L05												
L08												
L11												
L14												
L06												
L09												
L12												
L15												
Encoder Options (see page B-45) _____												
E00 - none												
E01 - rotary (500 lines/rev)												
E02 - rotary (1000 lines/rev)												
E03 - rotary (1270 lines/rev)												
E99 - other												
note: When selecting any rotary encoder option, the Drive Shaft D3 or D4 above is required.												
Power-off Brakes (see page B-44) _____												
B00 - none												
B01 - 24 VDC												
B02 - 90 VDC												
B99 - other												
note: When selecting any brake option, the Drive Shaft D3 or D4 above is required.												

(E) - English Interface
(M) - Metric Interface

Specifications

Load Capacities		One (1) Bearing Carriage		Two (2) Bearing Carriage	
Dynamic Horizontal	2 million inches (50 km) of travel	100 lbs	(45 kg)	200 lbs	(90 kg)
Dynamic Horizontal	50 million inches (1270 km) of travel	34 lbs	(15 kg)	68 lbs	(30 kg)
Static Horizontal		200 lbs	(90 kg)	400 lbs	(180 kg)
Dynamic Roll Moment	2 million inches (50 km) of travel	8 ft-lbs	(11 N-m)	16 ft-lbs	(22 N-m)
Dynamic Roll Moment	50 million inches (1270 km) of travel	3 ft-lbs	(4 N-m)	5 ft-lbs	(7 N-m)
Static Roll Moment		14 ft-lbs	(19 N-m)	28 ft-lbs	(38 N-m)
Dyn. Pitch & Yaw Moment	2 million inches (50 km) of travel	4 ft-lbs	(5,4 N-m)	15 ft-lbs	(20 N-m)
Dyn. Pitch & Yaw Moment	50 million inches (1270 km) of travel	1 ft-lbs	(1,9 N-m)	5 ft-lbs	(7 N-m)
Static Pitch & Yaw Moment		8 ft-lbs	(10 N-m)	30 ft-lbs	(40 N-m)
Each Bearing Dyn. Capacity	2 million inches (50 km) of travel	100 lbs	(45 kg)	100 lbs	(45 kg)
Each Bearing Dyn. Capacity	50 million inches (1270 km) of travel	34 lbs	(15 kg)	34 lbs	(15 kg)
Each Bearing Static Load Capacity		200 lbs	(90 kg)	200 lbs	(90 kg)
Maximum Belt Tensile Force		250 lbs	(113 kg)	250 lbs	(113 kg)
Maximum Carriage Thrust Force		115 lbs	(52 kg)	115 lbs	(52 kg)
Maximum Speed		78 in/sec	(2 m/sec)	78 in/sec	(2 m/sec)
Maximum Acceleration		193 in/sec ²	(4,9 m/sec ²)	386 in/sec ²	(9,8 m/sec ²)
d₂	Center to center distance (spacing) of each bearing on a single rail	-		2.088 in	(53,0 mm)
d_r	Center distance of the bearing to top of carriage plate surface	1.375 in		(34,9 mm)	1.375 in (34,9 mm)

Other	For One (1) & Two (2) Bearing Carriages	
Table Material	Base, Carriage, End Plates, & Cover Plate - 6061 anodized aluminum	
Linear Rail Material	Stainless Steel	
Belt Properties	Black, 16 mm wide, Polyurethane, Steel reinforced belt	
Drive Pulley Weight	0.21 lbs	(0,10 kg)
Drive Pulley Diameter	1.128 in	(28,65 mm)
Drive Lead	3.543 in	(90,00 mm)
Belt Stretch - x Load (lbs or N)	0.00025 in/ft per lbs	(0,00476 mm/m per N)
Unidirectional Repeatability	+/- 0.001 in	(+/- 0,0254 mm)
Bidirectional Repeatability	+/- 0.004 in	(+/- 0,1016 mm)
Position Accuracy (Belt) ⁽¹⁾	< 0.010 in/ft	(< 0,254 mm/300mm)
Orthogonality (multi-axis systems)	< 30 arc-seconds	
Friction Coefficient	< 0.01	
Breakaway Torque	< 40 oz-in (0,282 N-m)	
Motor Mount	NEMA 23 & 34 Mounts, Metric Mounts, and Gearheads	
Coupling	Two (2) different styles available	

Footnotes:

(1) Position accuracy varies based on belt stretch. The given rating is based upon a carriage speed of 5 inches/sec (127 mm/sec) and a no load condition.

Dimensions & Specifications

- Without Cover Plates -

Model Number	Travel Length inches (mm)	Table Dimensions inches (mm)		Mounting Dimensions inches (mm)			Belt Weight ounces (gm)	Table Weight ⁽¹⁾ lbs (kg)
		A	B	C	E	M		
14x4004-CP0	4 (100)	8.0 (203,2)	14.0 (355,6)	1.188 (30,2)	3	8	1.3 (36,8)	4.8 (2,2)
14x4006-CP0	6 (150)	10.0 (254,0)	16.0 (406,4)	0.313 (8,0)	5	12	1.5 (42,5)	5.3 (2,4)
14x4008-CP0	8 (200)	12.0 (304,8)	18.0 (457,2)	1.313 (33,4)	5	12	1.7 (48,2)	5.8 (2,6)
14x4012-CP0	12 (300)	16.0 (406,4)	22.0 (558,8)	1.438 (36,5)	7	16	2.1 (59,5)	6.3 (2,9)
14x4016-CP0	16 (405)	20.0 (508,0)	26.0 (660,4)	1.563 (39,7)	9	20	2.5 (70,9)	7.3 (3,3)
14x4020-CP0	20 (505)	24.0 (609,6)	30.0 (762,0)	1.688 (42,9)	11	24	2.9 (82,2)	8.3 (3,8)
14x4024-CP0	24 (605)	28.0 (711,2)	34.0 (863,6)	1.813 (46,1)	13	28	3.3 (93,6)	9.3 (4,2)
14x4030-CP0	30 (760)	34.0 (863,6)	40.0 (1016,0)	1.063 (27,0)	17	36	3.9 (110,6)	10.3 (4,7)
14x4036-CP0	36 (910)	40.0 (1016,0)	46.0 (1168,4)	0.313 (8,0)	21	44	4.5 (127,6)	11.8 (5,4)
14x4042-CP0	42 (1060)	46.0 (1168,4)	52.0 (1320,8)	1.438 (36,5)	23	48	5.1 (144,6)	13.3 (6,0)
14x4048-CP0	48 (1215)	52.0 (1320,8)	58.0 (1473,2)	0.688 (17,5)	27	56	5.7 (161,6)	14.8 (6,7)
14x4054-CP0	54 (1370)	58.0 (1473,2)	64.0 (1625,6)	1.813 (46,1)	29	60	6.3 (178,6)	16.3 (7,4)
14x4060-CP0	60 (1520)	64.0 (1625,6)	70.0 (1778,0)	1.063 (27,0)	33	68	6.9 (195,6)	17.8 (8,1)
14x4072-CP0	72 (1820)	76.0 (1930,4)	82.0 (2082,8)	0.500 (12,7)	39	80	8.1 (229,6)	20.8 (9,4)
14x4084-CP0	84 (2130)	88.0 (2235,2)	94.0 (2387,6)	0.875 (22,2)	45	92	9.3 (263,7)	23.8 (10,8)
14x4096-CP0	96 (2435)	100.0 (2540,0)	106.0 (2692,4)	0.313 (8,0)	51	104	10.5 (297,7)	26.8 (12,2)
14x4108-CP0	108 (2740)	112.0 (2844,8)	118.0 (2997,2)	0.688 (17,5)	57	116	11.7 (331,7)	29.8 (13,5)
14x4120-CP0	120 (3045)	124.0 (3149,6)	130.0 (3302,0)	1.063 (27,0)	63	128	12.9 (365,7)	32.8 (14,9)

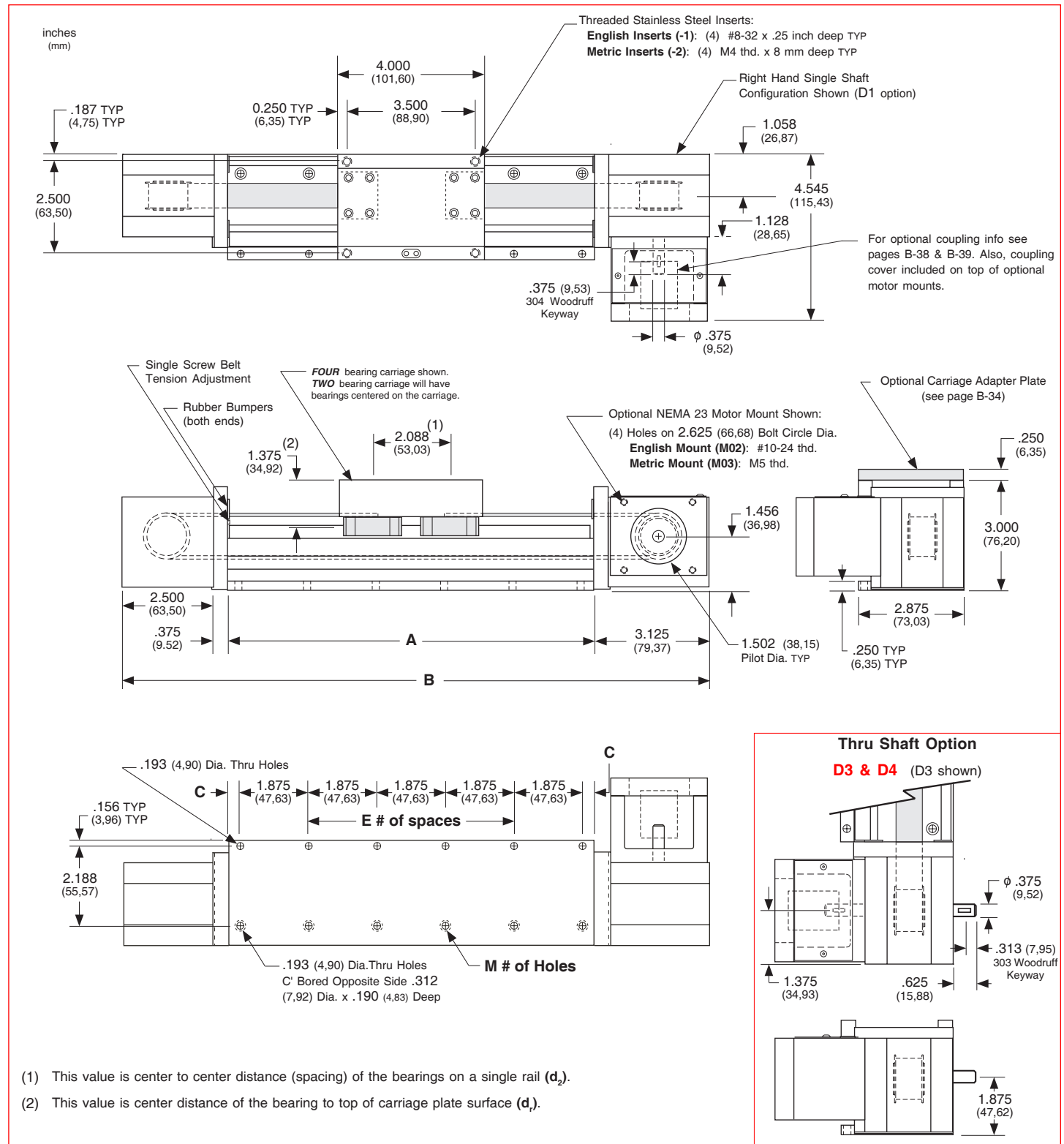
x = 1; Carriage has 1 bearing; Carriage weight = 1.4 lbs. (0,64 kg)
 x = 2; Carriage has 2 bearings; Carriage weight = 1.5 lbs. (0,68 kg)

Footnotes:

(1) Weight shown is with a 1 bearing carriage [1.4 lbs (0,64 kg)], a NEMA 23 motor mount [0.34 lbs (0,16 kg)], and a H100 style [0.08 lbs (0,04 kg)] coupling. When using a 2 bearing carriage add 0.1 lbs (0,04 kg) to each value.

Dimensions

- Without Cover Plates -



Note: Any 130 or 140 series table can be mounted on top of a second 130 or 140 series table, in order to create X-Y multiple axis configurations. *LINTECH* recommends that a 2 bearing carriage be used for the bottom axis, and that the top axis should never extend out more than 18 inches in either direction, from the bottom axis carriage edge, without the use of a support bearing system on the outer edges of the top axis. The 130-CP1, 130-CP2 or 140 series requires a **Carriage Adapter Plate** option. The carriage's threaded stainless steel insert hole pattern exactly matches the base mounting hole pattern on each table, therefore no adapter bracket or extra machining is required. However a precision square tool, or micrometer depth gauge, is required in order to obtain an orthogonality between the two tables of < 30 arc-seconds. The table base, carriage top & carriage sides are all precision machined. *LINTECH's* 100 or 120 series tables should be used for the bottom axis in a multiple axes application for better system rigidity, performance, and life.

Dimensions & Specifications

- With Top Cover Plate Only -

Model Number	Travel Length inches (mm)	Table Dimensions inches (mm)		Mounting Dimensions inches (mm)			Belt Weight ounces (gm)	Table ⁽¹⁾ Weight lbs (kg)
		A	B	C	E	M		
14x4004-CP1	4 (100)	8.0 (203,2)	14.0 (355,6)	1.188 (30,2)	3	8	1.3 (36,8)	4.8 (2,2)
14x4006-CP1	6 (150)	10.0 (254,0)	16.0 (406,4)	0.313 (8,0)	5	12	1.5 (42,5)	5.3 (2,4)
14x4008-CP1	8 (200)	12.0 (304,8)	18.0 (457,2)	1.313 (33,4)	5	12	1.7 (48,2)	5.8 (2,6)
14x4012-CP1	12 (300)	16.0 (406,4)	22.0 (558,8)	1.438 (36,5)	7	16	2.1 (59,5)	6.3 (2,9)
14x4016-CP1	16 (405)	20.0 (508,0)	26.0 (660,4)	1.563 (39,7)	9	20	2.5 (70,9)	7.3 (3,3)
14x4020-CP1	20 (505)	24.0 (609,6)	30.0 (762,0)	1.688 (42,9)	11	24	2.9 (82,2)	8.3 (3,8)
14x4024-CP1	24 (605)	28.0 (711,2)	34.0 (863,6)	1.813 (46,1)	13	28	3.3 (93,6)	9.3 (4,2)
14x4030-CP1	30 (760)	34.0 (863,6)	40.0 (1016,0)	1.063 (27,0)	17	36	3.9 (110,6)	10.3 (4,7)
14x4036-CP1	36 (910)	40.0 (1016,0)	46.0 (1168,4)	0.313 (8,0)	21	44	4.5 (127,6)	11.8 (5,4)
14x4042-CP1	42 (1060)	46.0 (1168,4)	52.0 (1320,8)	1.438 (36,5)	23	48	5.1 (144,6)	13.3 (6,0)
14x4048-CP1	48 (1215)	52.0 (1320,8)	58.0 (1473,2)	0.688 (17,5)	27	56	5.7 (161,6)	14.8 (6,7)
14x4054-CP1	54 (1370)	58.0 (1473,2)	64.0 (1625,6)	1.813 (46,1)	29	60	6.3 (178,6)	16.3 (7,4)
14x4060-CP1	60 (1520)	64.0 (1625,6)	70.0 (1778,0)	1.063 (27,0)	33	68	6.9 (195,6)	17.8 (8,1)

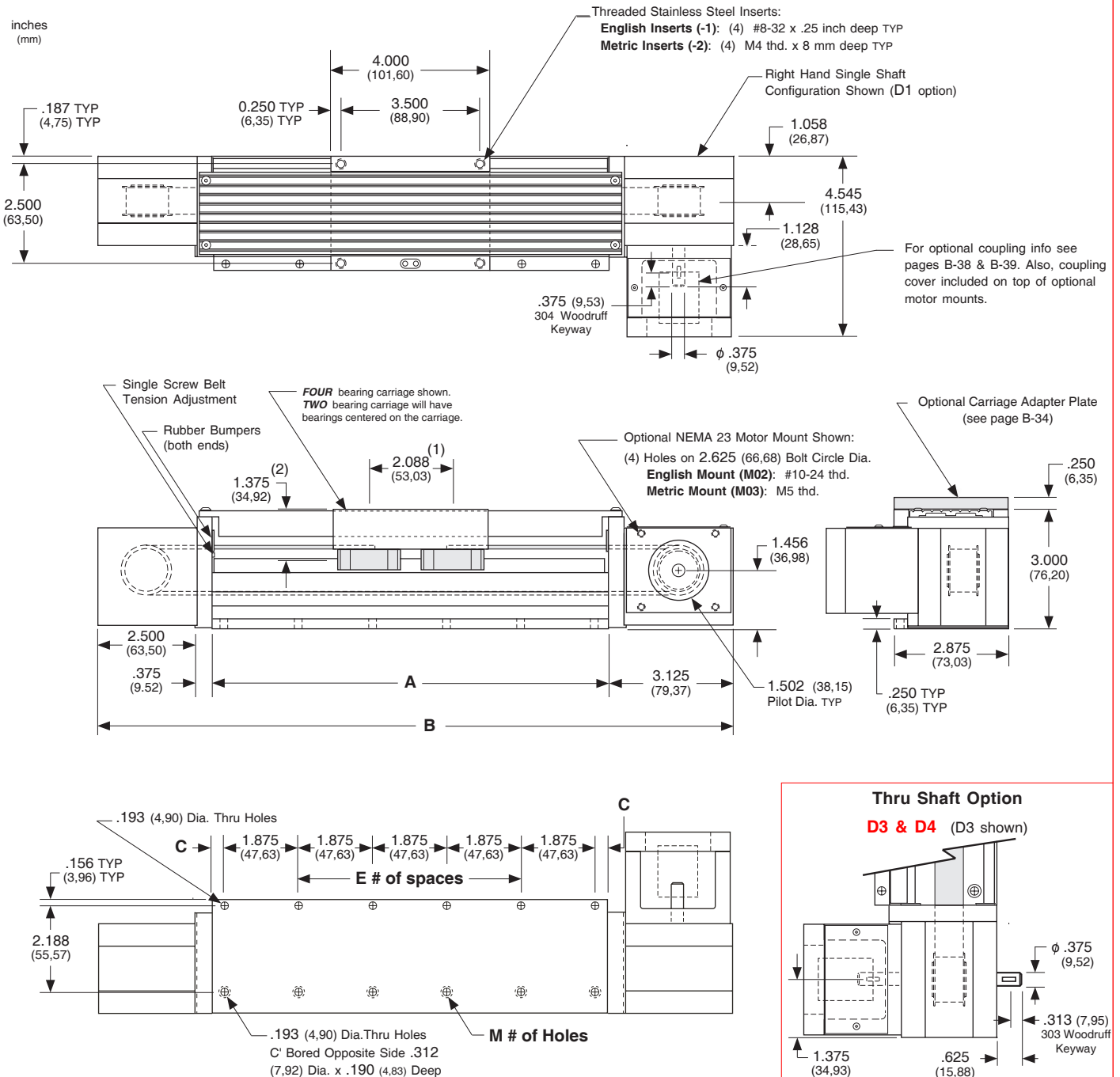
x = 1; Carriage has 1 bearing; Carriage weight = 1.4 lbs. (0,64 kg)
 x = 2; Carriage has 2 bearings; Carriage weight = 1.5 lbs. (0,68 kg)

Footnotes:

(1) Weight shown is with a 1 bearing carriage [1.4 lbs (0,64 kg)], a NEMA 23 motor mount [0.34 lbs (0,16 kg)], and a H100 style [0.08 lbs (0,04 kg)] coupling. When using a 2 bearing carriage add 0.1 lbs (0,04 kg) to each value.

Dimensions

- With Top Cover Plate Only -



(1) This value is center to center distance (spacing) of the bearings on a single rail (d_2).

(2) This value is center distance of the bearing to top of carriage plate surface (d_1).


Note: Any 130 or 140 series table can be mounted on top of a second 130 or 140 series table, in order to create X-Y multiple axis configurations. **LINTECH** recommends that a 2 bearing carriage be used for the bottom axis, and that the top axis should never extend out more than 18 inches in either direction, from the bottom axis carriage edge, without the use of a support bearing system on the outer edges of the top axis. The 130-CP1, 130-CP2 or 140 series requires a **Carriage Adapter Plate** option. The carriage's threaded stainless steel insert hole pattern exactly matches the base mounting hole pattern on each table, therefore no adapter bracket or extra machining is required. However a precision square tool, or micrometer depth gauge, is required in order to obtain an orthogonality between the two tables of < 30 arc-seconds. The table base, carriage top & carriage sides are all precision machined. **LINTECH's** 100 or 120 series tables should be used for the bottom axis in a multiple axes application for better system rigidity, performance, and life.

Specifications subject to change without notice

Dimensions & Specifications

- With Top Cover Plate Only -

Model Number	Travel Length inches (mm)	Table Dimensions inches (mm)		Mounting Dimensions inches (mm)			Belt Weight ounces (gm)	Table Weight ⁽¹⁾ lbs (kg)
		A	B	C	E	M		
14x4004-CP2	4 (100)	8.0 (203,2)	14.0 (355,6)	1.188 (30,2)	3	8	1.3 (36,8)	5.0 (2,3)
14x4006-CP2	6 (150)	10.0 (254,0)	16.0 (406,4)	0.313 (8,0)	5	12	1.5 (42,5)	5.5 (2,5)
14x4008-CP2	8 (200)	12.0 (304,8)	18.0 (457,2)	1.313 (33,4)	5	12	1.7 (48,2)	6.0 (2,7)
14x4012-CP2	12 (300)	16.0 (406,4)	22.0 (558,8)	1.438 (36,5)	7	16	2.1 (59,5)	6.6 (3,0)
14x4016-CP2	16 (405)	20.0 (508,0)	26.0 (660,4)	1.563 (39,7)	9	20	2.5 (70,9)	7.7 (3,5)
14x4020-CP2	20 (505)	24.0 (609,6)	30.0 (762,0)	1.688 (42,9)	11	24	2.9 (82,2)	8.7 (3,9)
14x4024-CP2	24 (605)	28.0 (711,2)	34.0 (863,6)	1.813 (46,1)	13	28	3.3 (93,6)	9.8 (4,5)
14x4030-CP2	30 (760)	34.0 (863,6)	40.0 (1016,0)	1.063 (27,0)	17	36	3.9 (110,6)	10.9 (5,0)
14x4036-CP2	36 (910)	40.0 (1016,0)	46.0 (1168,4)	0.313 (8,0)	21	44	4.5 (127,6)	12.5 (5,7)
14x4042-CP2	42 (1060)	46.0 (1168,4)	52.0 (1320,8)	1.438 (36,5)	23	48	5.1 (144,6)	14.0 (6,4)
14x4048-CP2	48 (1215)	52.0 (1320,8)	58.0 (1473,2)	0.688 (17,5)	27	56	5.7 (161,6)	15.6 (7,1)
14x4054-CP2	54 (1370)	58.0 (1473,2)	64.0 (1625,6)	1.813 (46,1)	29	60	6.3 (178,6)	17.2 (7,8)
14x4060-CP2	60 (1520)	64.0 (1625,6)	70.0 (1778,0)	1.063 (27,0)	33	68	6.9 (195,6)	18.8 (8,5)

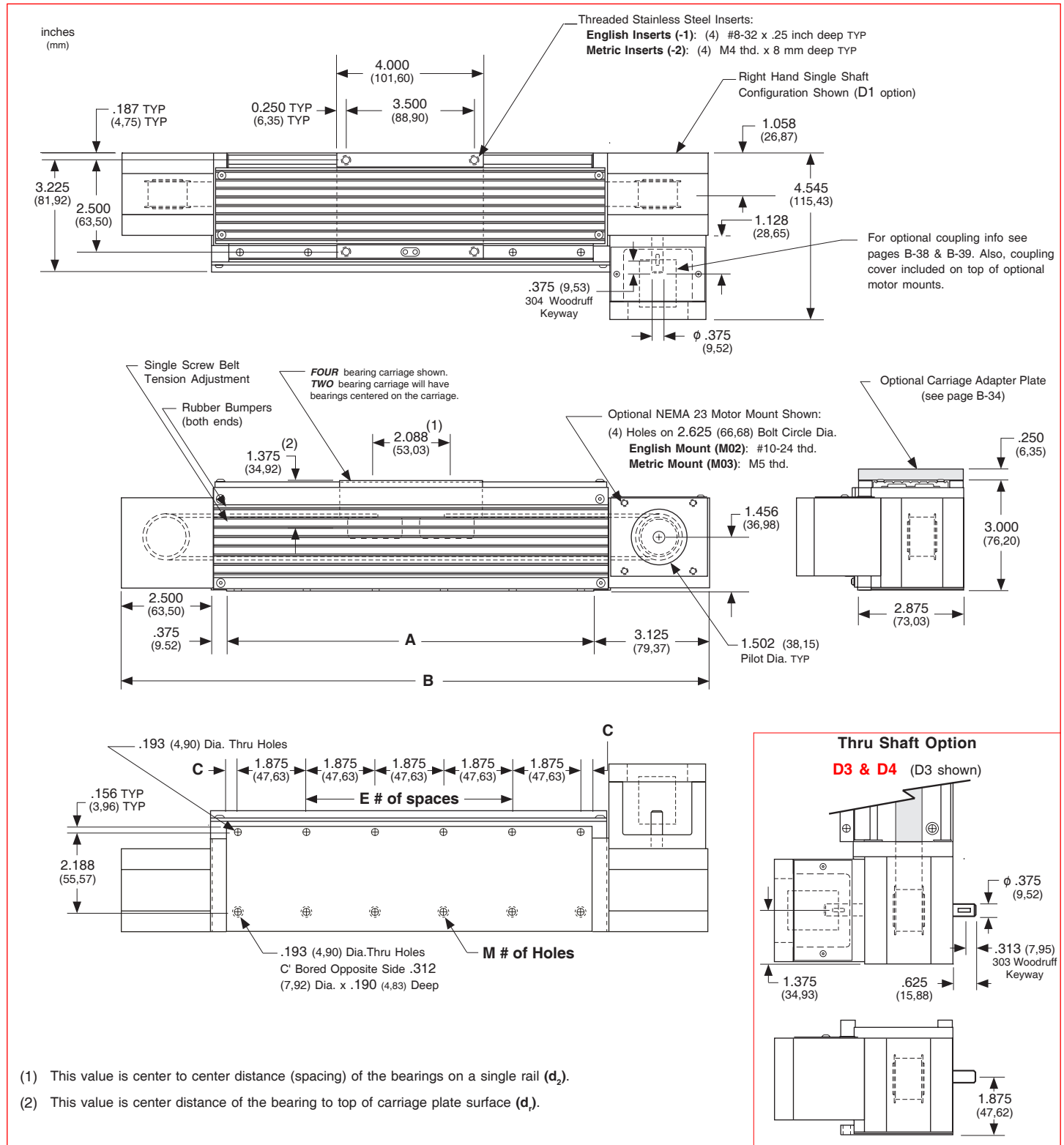

 x = 1; Carriage has 1 bearing; Carriage weight = 1.4 lbs. (0,64 kg)
 x = 2; Carriage has 2 bearings; Carriage weight = 1.5 lbs. (0,68 kg)

Footnotes:

(1) Weight shown is with a 1 bearing carriage [1.4 lbs (0,64 kg)], a NEMA 23 motor mount [0.34 lbs (0,16 kg)], and a H100 style [0.08 lbs (0,04 kg)] coupling. When using a 2 bearing carriage add 0.1 lbs (0,04 kg) to each value.

Dimensions

- With Top Cover Plate Only -



Note: Any 130 or 140 series table can be mounted on top of a second 130 or 140 series table, in order to create X-Y multiple axis configurations. **LINTECH** recommends that a 2 bearing carriage be used for the bottom axis, and that the top axis should never extend out more than 18 inches in either direction, from the bottom axis carriage edge, without the use of a support bearing system on the outer edges of the top axis. The 130-CP1, 130-CP2 or 140 series requires a **Carriage Adapter Plate** option. The carriage's threaded stainless steel insert hole pattern exactly matches the base mounting hole pattern on each table, therefore no adapter bracket or extra machining is required. However a precision square tool, or micrometer depth gauge, is required in order to obtain an orthogonality between the two tables of < 30 arc-seconds. The table base, carriage top & carriage sides are all precision machined. **LINTECH's** 100 or 120 series tables should be used for the bottom axis in a multiple axes application for better system rigidity, performance, and life.

Specifications subject to change without notice

Maximum Motor Input Torque, Maximum Belt Force, & Maximum Acceleration Rate

Maximum Motor Input Torque

The maximum safe speed/torque of a motor/drive system that can be used with the 140 series, is limited by the belt strength at a given speed. The maximum linear forces the belt can adequately handle are determined by the number of teeth on the pulley and the belt width. The chart below illustrates the relationship between motor input torque/belt force and carriage speed. Care should be taken when sizing and selecting a motor/drive system for use with a 140 series table. Exceeding the maximum input torque values at the listed speeds can cause belt "skipping" over pulley teeth. This will result in mis-positioning of the carriage.

Maximum Acceleration

The maximum acceleration rate using a 140 series table can be determined by the simple equation $F = M \times A$. Knowing the mass of the load, and the maximum safe operating force for the belt, the maximum possible acceleration rate can be determined. **Note:** The mechanical limitation for acceleration of the 140 series table is 1 g.

Maximum Acceleration Example

$$F = M \times A$$

F = maximum belt force at desired speed
 M = user applied load
 A = maximum acceleration rate (g's)
 $\sin \phi$ = angle of table from horizontal (degrees)

Horizontal Application	Vertical Application
$A = \frac{F}{M}$	$A = \frac{F - M \sin \phi}{M}$

Example: A 30 lb load is mounted to a 140 series carriage in a horizontal application. Determine the maximum acceleration rate in g's & in/sec² that can be used to achieve a maximum speed of 75 IPS.

Step 1: From graph below, determine the maximum belt force at 75 IPS : ($F = 80$ lbs)

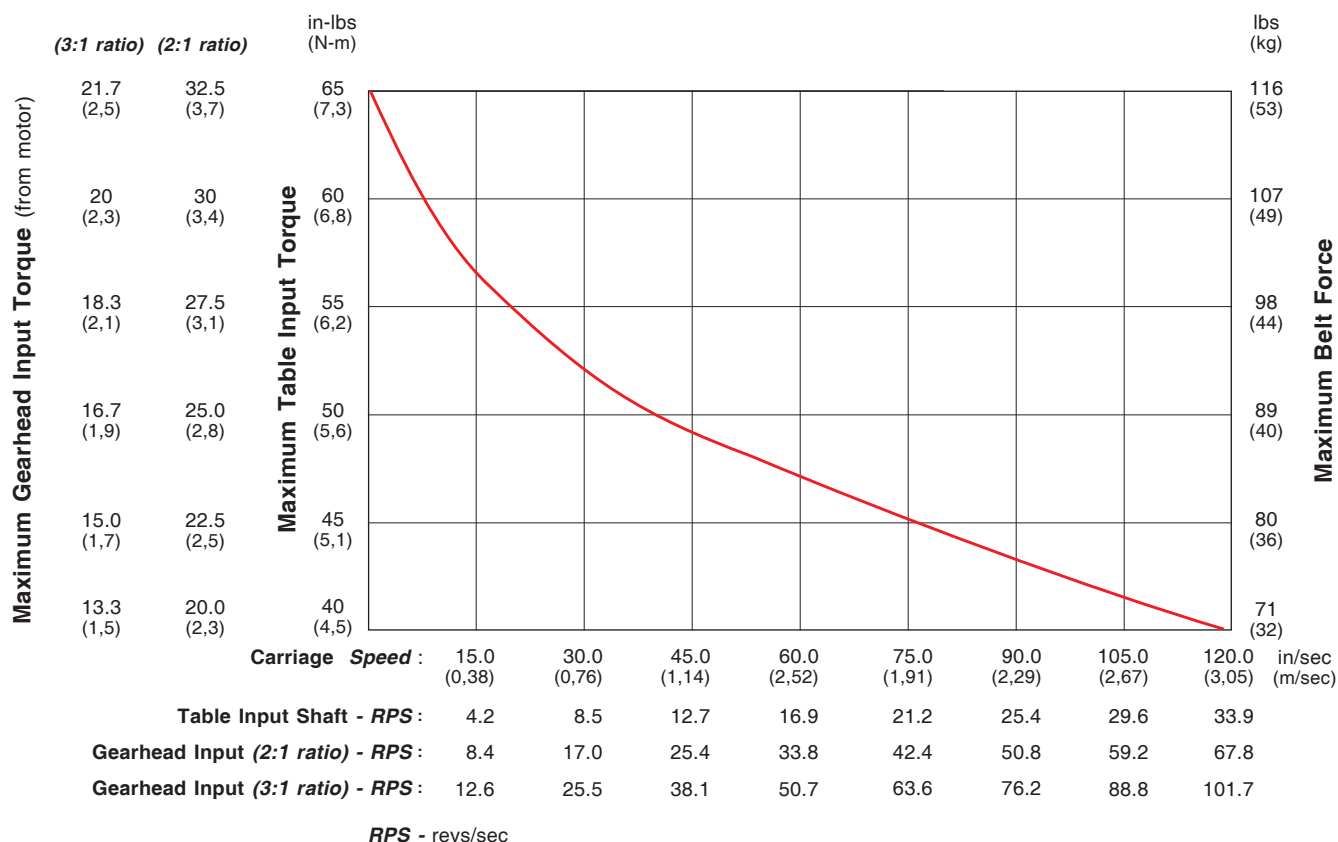
Step 2: Add up your total mass = load weight + carriage weight : ($M = 30 + 1.8 = 31.8$ lbs)

Step 3: Solve for A : ($A = 80/31.8 = 2.5$ g's)

Note: 1 g = 386 in/sec²

Step 4: 2.5 g's x 386 = 968 in/sec²

Step 5: Cannot exceed the 1.0 g mechanical limitation.



- 1) Table friction & breakaway forces have already been deducted from the above maximum belt force values.
- 2) Curve based upon maximum belt values. Select a motor coupling that can handle the required torque.

Master/Slave 140 Series Configuration

For some X-Y belt drive applications, the master/slave configuration shown to the right may be required. This system provides two bottom (X) axes spread apart a set distance, yet driven by one motor. The spreading of the two bottom axes minimizes the deflection on the Y axis, reduces the moment loading on the X axes carriages, increases the system rigidity, and prevents twisting of the Y axis as it accelerates to a set speed. **LINTECH** can provide the shaft supports, the cross shaft, the couplings, and the 140 series belt drive table without a motor mount bracket. The shaft supports are required as the couplings DO NOT provide adequate support of the shaft by themselves. Also, the shaft supports prevent the cross shaft from "whipping" at long lengths and high speeds.

The chart below lists the maximum carriage speed available with a given distance between shaft supports. A minimum of two shaft supports is always required. More than two can be used to increase the speed of a longer spread system. The equations below show the relationship between the # of shaft supports, the spread between the two bottom axes (B), and the distance between individual shaft supports (A).

A = distance between shaft supports

B = distance between 2 bottom axes

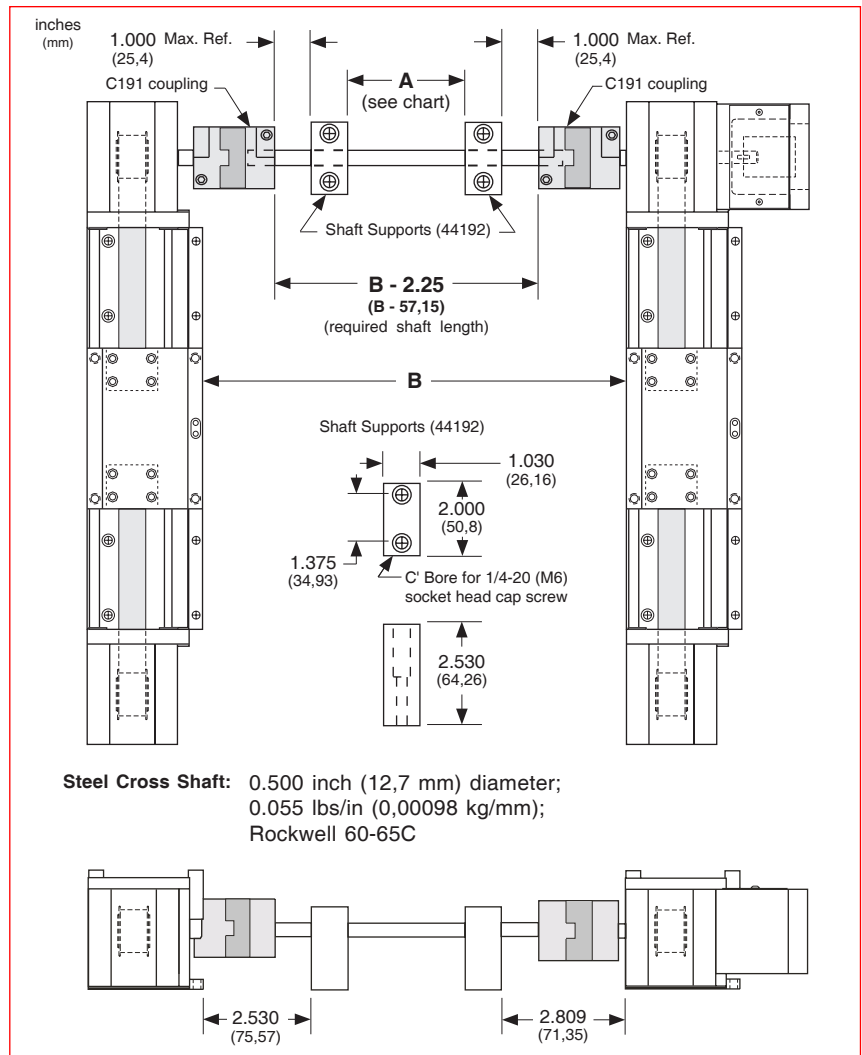
2 Shaft Supports: **A** = [B - 7.50 in (190,5 mm)]

3 Shaft Supports: **A** = [B - 8.53 in (216,7 mm)] / 2

4 Shaft Supports: **A** = [B - 9.56 in (242,8 mm)] / 3

Maximum Distance Between Shaft Supports A		Maximum Shaft Speed	Equivalent Carriage Speed	
(inches)	(mm)	(RPM)	(in/sec)	(mm/sec)
<= 30	762	2000	118	3000
<= 36	914	1500	89	2250
<= 48	1219	840	50	1260
<= 54	1372	660	39	990
<= 60	1524	535	32	802
<= 66	1676	440	26	660
<= 72	1829	370	22	555
<= 84	2134	270	16	405
<= 96	2438	208	12	312
<= 108	2743	164	10	246
<= 120	3048	133	8	200

Note: The user is required to supply the mounting surface for the above configurations. **LINTECH** normally only supplies all the positioning hardware. A common base plate can be provided by **LINTECH** upon request.

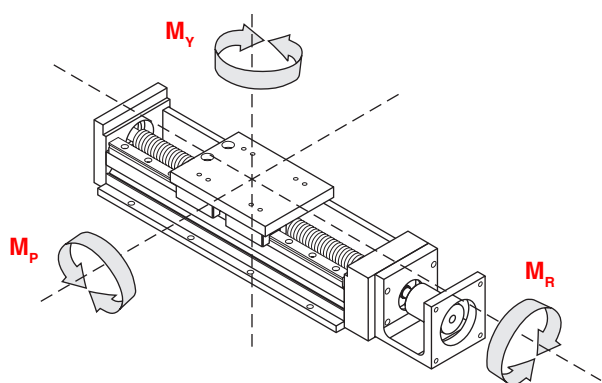


Linear Bearing Load Capacities

The following equation, and graphs, can be used to help determine the linear bearing life, and load capacity, of a 130 or 140 series positioning table.

$$L = \left[\frac{R}{F \times S} \right]^3 \times B$$

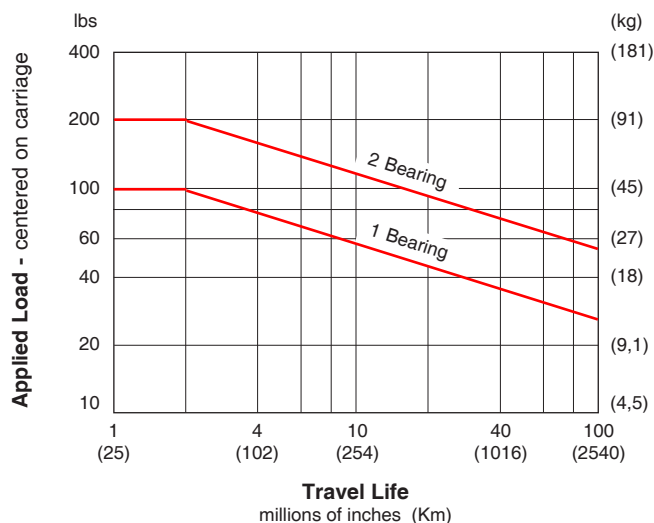
- L** = calculated travel life (millions of inches or Km)
R = rated dynamic load capacity of carriage (or each bearing) at 2 million inches of travel or 50 Km
F = user applied load
S = safety factor (1 to 8)
B = either 2 (for millions of inches) or 50 (for Km)



Dynamic Horizontal Load Capacity

Load Centered on Carriage

travel life millions of inches (Km)		1 Bearing		2 Bearing	
		lbs	(kg)	lbs	(kg)
2	(50)	100	(45)	200	(90)
50	(1270)	34	(15)	68	(30)
100	(2540)	27	(12)	54	(24)

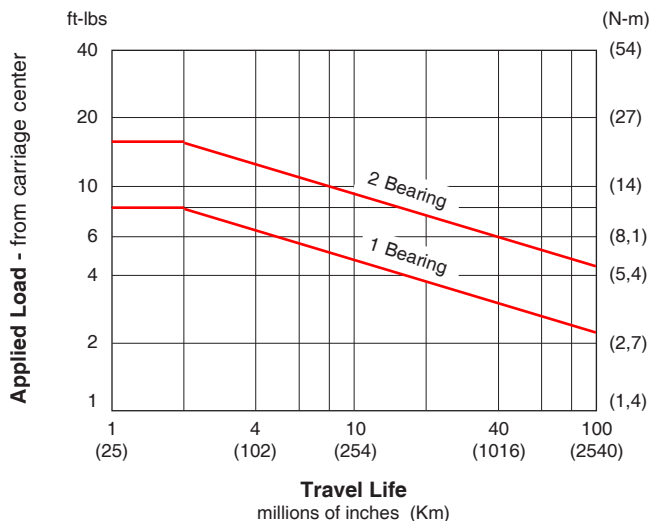


Dynamic Moment Load (M_R) Capacity

Load applied away from Carriage Center

travel life millions of inches (Km)		1 Bearing		2 Bearing	
		ft-lbs	(N-m)	ft-lbs	(N-m)
2	(50)	8.0	(10,8)	16	(22)
50	(1270)	2.7	(3,7)	5	(7)
100	(2540)	2.2	(3,0)	4	(5)

Ratings are based on d₃ = 12 inches (305 mm) & d₄ = 0



Dynamic Moment Load (M_p & M_y) Capacity

Load applied away from Carriage Center

travel life millions of inches (Km)		1 Bearing		2 Bearing	
		ft-lbs	(N-m)	ft-lbs	(N-m)
2	(50)	4.0	(5,4)	15	(20)
50	(1270)	1.4	(1,9)	5	(7)
100	(2540)	1.1	(1,5)	4	(5)

Ratings are based on d₃ = 0 & d₄ = 12 inches (305 mm)

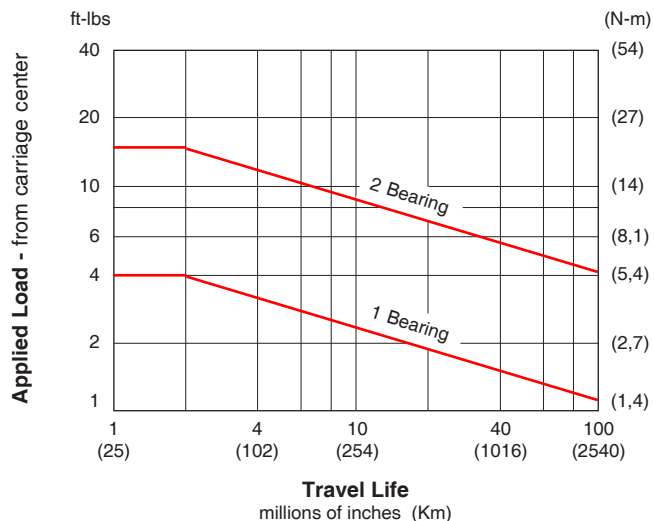
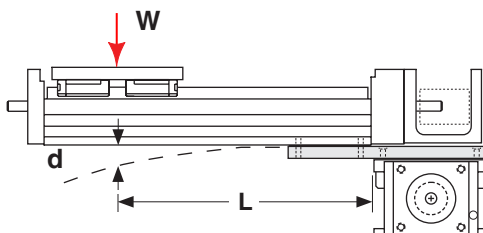


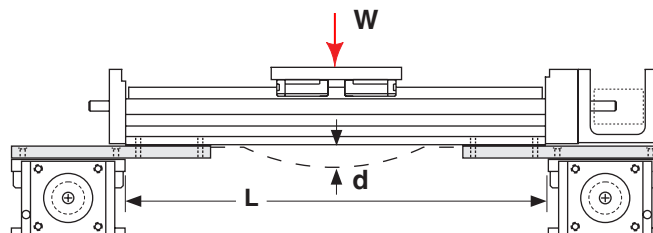
Table Deflection - Multiple Axis Configurations

The following graphs can be used to estimate the deflection value for a given configuration. The information in the graphs was obtained with the bottom axis firmly mounted to a granite surface plate and also includes the deflection of the bottom axis carriage assembly & all mounting hardware. Individual applications will vary depending on the user mounting surface, user mounting hardware, and user mounting configuration. If the deflection values below are too high for your application, a steel sub plate, or aluminum cross member, can be added for additional "Y" axis support. Contact **LINTECH** for more details.

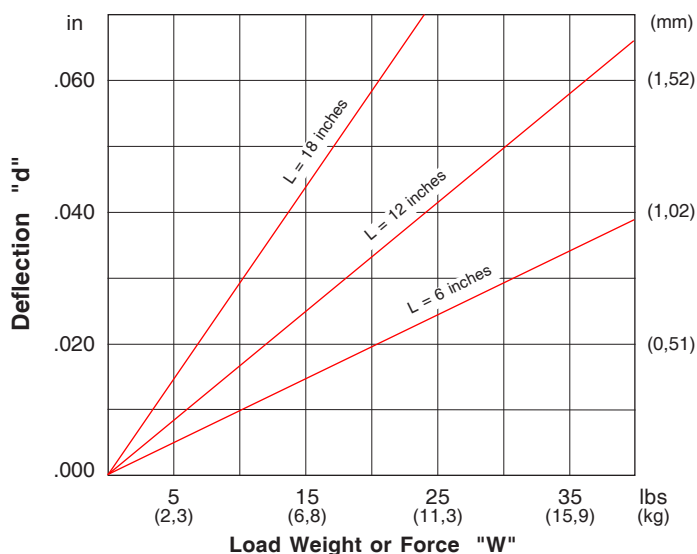
2 Bearing 130 or 140 Series on Top Axis



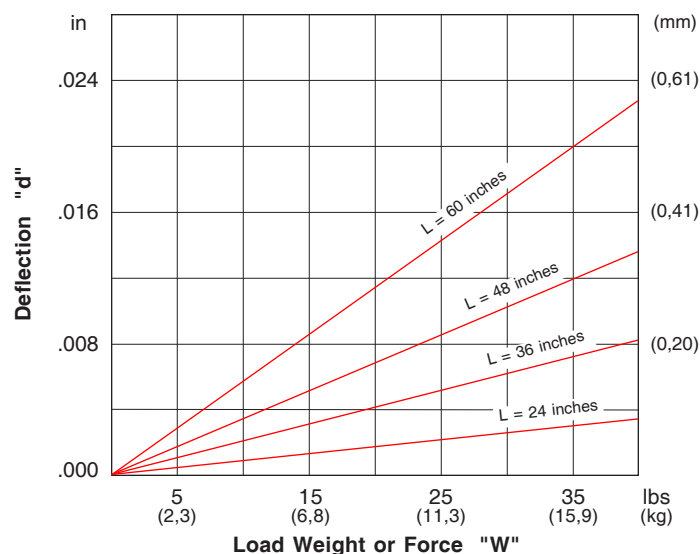
2 Bearing 130 or 140 Series on Top Axis



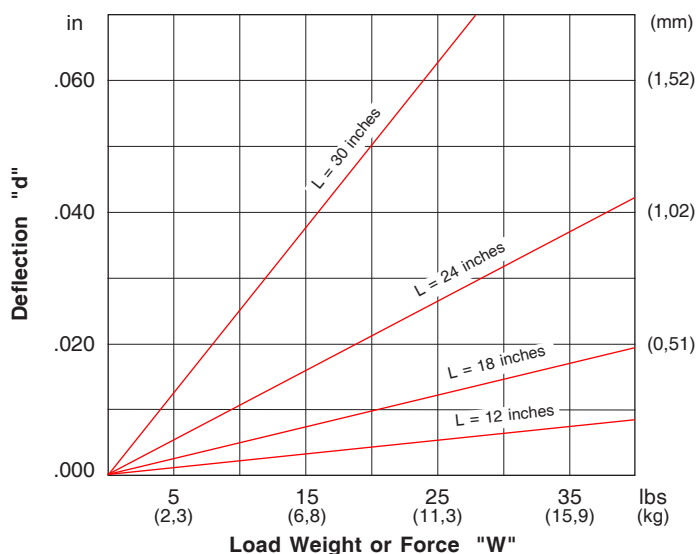
2 Bearing 130 or 140 Series on Bottom Axis



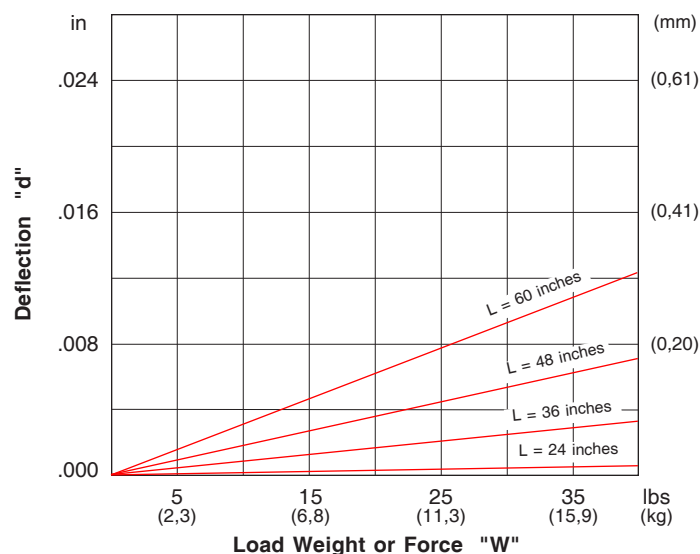
2 Bearing 130 or 140 Series on Bottom Axis



4 Bearing 100 Series on Bottom Axis



4 Bearing 100 Series on Bottom Axis

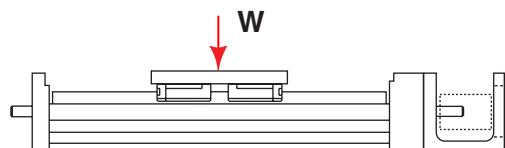


Specifications subject to change without notice

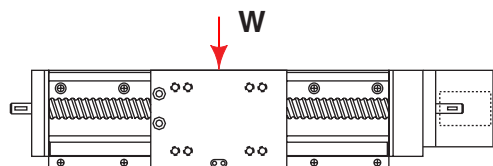
Moment of Inertia Values

The "moment of inertia" of an object is a gauge of the strength of that object to resist deflecting when used in an application or orientation where deflection might occur. The higher an I value relates to a lower amount of deflection.

$$I = 0.61 \text{ in}^4 (2.54 \times 10^5 \text{ mm}^4)$$



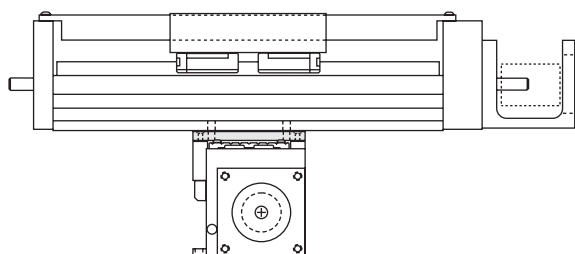
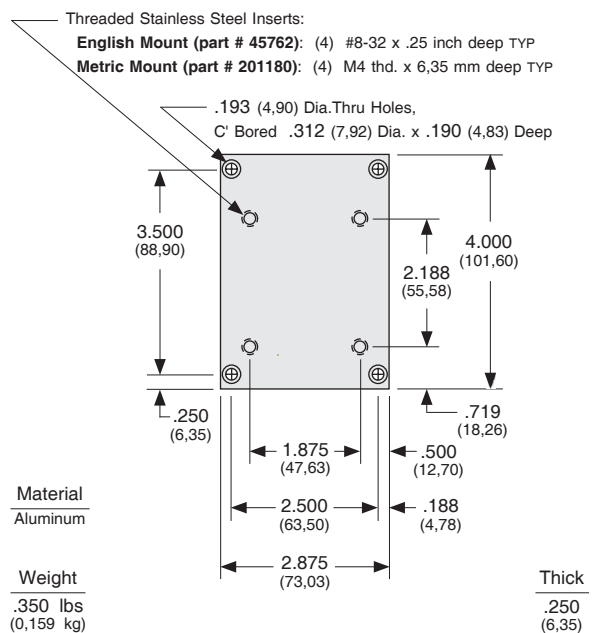
$$I = 1.7 \text{ in}^4 (7.07 \times 10^5 \text{ mm}^4)$$



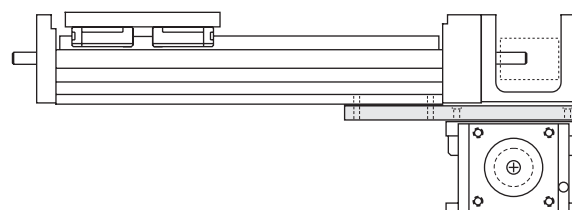
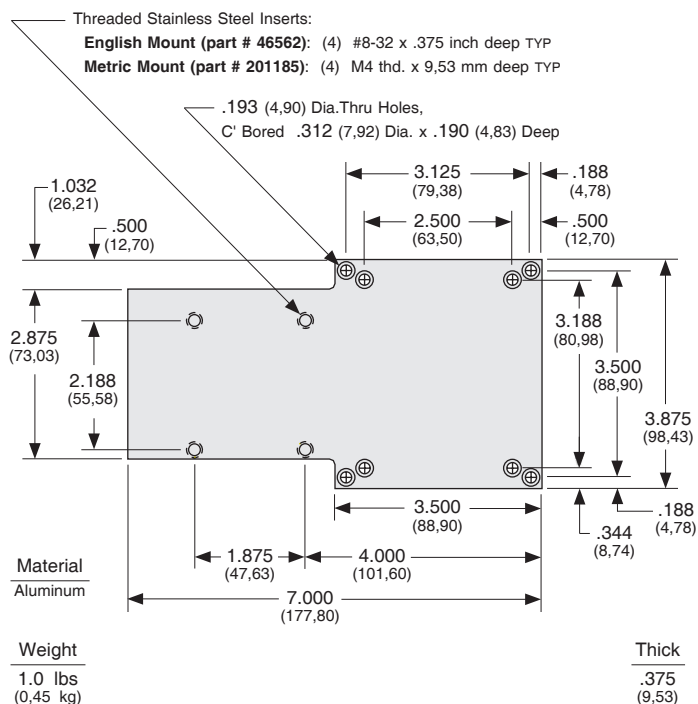
Carriage Adapter Plates

Optional carriage adapter plates assist in the creation of simple X-Y, X-Z, and X-Y-Z multiple axis systems. One adapter plate allows a 130 or 140 series table to be mounted on top of any 130-CP1, 130-CP2, or 140-CP1 table to make an X-Y axes system. The second adapter plate allows any 130 or 140 series table to be mounted to any **LINTECH** 100, 110, and 120 series table. A precision square tool, or micrometer depth gauge, is required in order to obtain an orthogonality between the two tables of < 30 arc-seconds.

130/140 series to 130/140 series (-CP1 & -CP2)



130/140 series to 100 series



End of Travel (EOT) Switches & Home Switch

LINTECH provides several options for EOT & home switches. One style uses mechanically actuated switches, while other styles use "non-contact" versions. When ordered with a **LINTECH** 130 or 140 series table, each switch is mounted to the side of the table, while the actuating cams are mounted to the carriage assembly. The *T-slot* which runs along the one side of the 130 series, allows the switches to be located anywhere along the table. The switches are pre-wired by **LINTECH** for easy interfacing to the users Motion Controller.

End of Travel (EOT) Switches

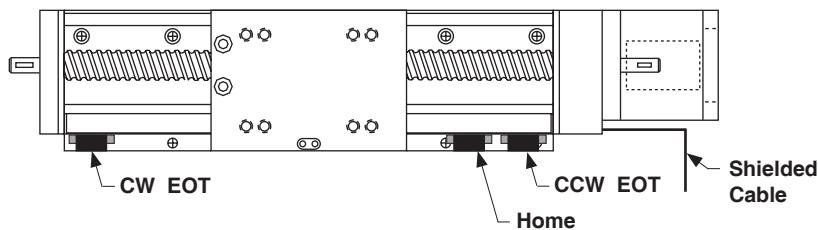
End of travel (EOT) switches can be utilized by a motion controller to stop carriage motion, thereby preventing any damage to personnel, table carriage, or user mounted load if the extreme end of travel has been reached by the carriage. There are two EOT switches mounted to the side of the table, one on each end. The CCW switch is mounted at the motor mount end, while the CW switch is located at the opposite end of the table. **LINTECH** provides normally closed (NC) end of travel switches. This provides for a power-off fail safe system, where the position controller can detect broken wires. *It is highly recommended that any positioning table used with a position controller, should have end of travel switches installed for protection of personnel, table carriage, and user mounted load.*

Home Switch

The home switch can be utilized by a motion controller as a known fixed mechanical location on the positioning table. The switch is located between the EOT switches, near the motor mount end, and is a normally open (NO) switch.

Switch Locations

The following diagram shows the locations of the switches when ordered from **LINTECH**.



Note: For the 130 or 140 series, EOT switches are normally located 0.125 inches (3 mm) inward from the maximum travel hard stops. Thus, reducing overall system travel by 0.25 inches (6 mm) from listed table travel for each model #.

Note: Each switch can be located anywhere along the T-slot which runs along the entire one side of the table.

Switch Type	Cost	Repeatability inches (microns)	Actuated	Power Supply Required	Activation Area inches (mm)	Comments
mechanical	least expensive	+/- 0.0002 (5)	mechanical	No	1.75 (44,45)	for most applications
reed	slightly more	+/- 0.0020 (50)	magnetic	No	0.30 (7,62)	for non-contact & low repeatable applications
hall effect	medium priced	+/- 0.0002 (5)	magnetic	Yes	0.32 (8,13)	for non-contact and wash down applications
proximity	most expensive	+/- 0.0002 (5)	non-magnetic	Yes	1.75 (44,45)	for non-contact, high speed, & wash down applications

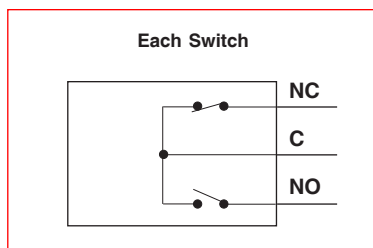
Note: The repeatability of any switch is dependent upon several factors: carriage speed, accel rate, load weight, switch style, and the position controller. **LINTECH**'s ratings are based upon a carriage speed of 0.5 inches/sec (12.7 mm/sec) and a no load condition.

End of Travel (EOT) Switches & Home Switch

Mechanical Switches



Repeatability	: +/- 0.0002 inch (5 microns)
Electrical	: 5 amps @ 125 VAC 1 amp @ 85 VDC
Activation Style	: mechanical cam
Activation Area	: 1.75 inches (44,45 mm) of travel
Temperature Range	: - 25° C to + 85° C
Environment	: non wash down
Added Table Width	: 0.063 inch (1,6 mm) (EOT switches) 0.063 inch (1,6 mm) (with Home switch)
Individual Switch Wiring	: none

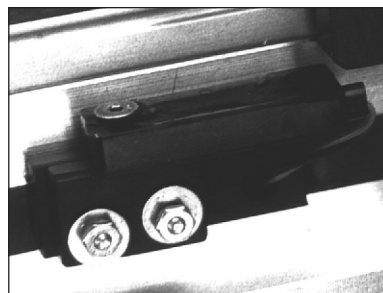


Standard *LINTECH* Wiring : from table end plate,
(provided when switch option is
ordered with any table) 10 foot (3 m) shielded cable,
6 conductor, 24 AWG,
underminated leads

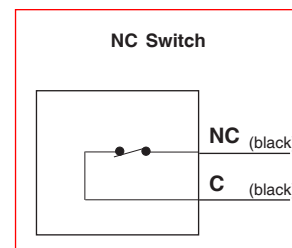
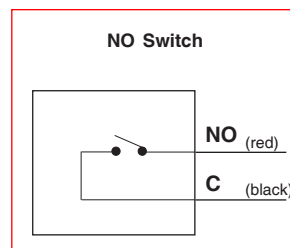
Wire Color	Description
Black	CW EOT
Blue	CW Common
Red	CCW EOT
White	CCW Common
Brown	HOME
Green	HOME Common
Silver	Shield

Note: Hermetically sealed mechanical switches can be ordered as an option. This may be desired for "wash down" applications. Contact *LINTECH*.

Non-Contact Reed Switches



Repeatability	: +/- 0.0020 inch (50 microns)
Electrical	: 1.0 amps @ 125 VAC 0.5 amps @ 100 VDC
Activation Style	: magnetic
Activation Area	: 0.30 inches (7,62 mm) of travel
Temperature Range	: - 10° C to + 60° C
Environment	: non wash down
Added Table Width	: none
Individual Switch Wiring	: 12 inch (305 mm) leads



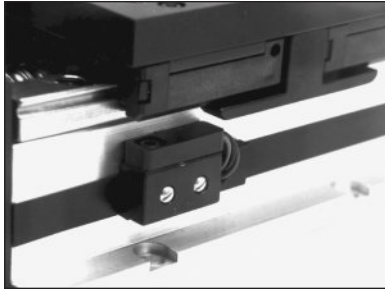
Standard *LINTECH* Wiring : from table end plate,
(provided when switch option is
ordered with any table) 10 foot (3 m) shielded cable,
6 conductor, 24 AWG,
underminated leads

Wire Color	Description
Black	CW EOT (black)
Blue	CW Common (black)
Red	CCW EOT (black)
White	CCW Common (black)
Brown	HOME (red)
Green	HOME Common (black)
Silver	Shield

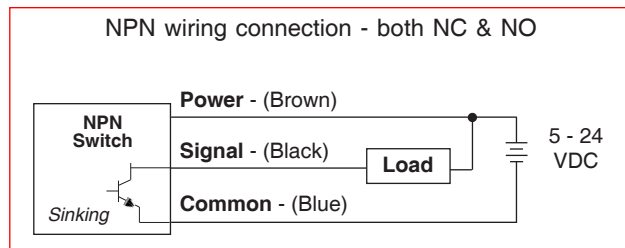
CW - Clockwise
CCW - Counter Clockwise
EOT - End of Travel
NC - Normally Closed
NO - Normally Open

End of Travel (EOT) Switches & Home Switch

Non-Contact Hall Effect Switches



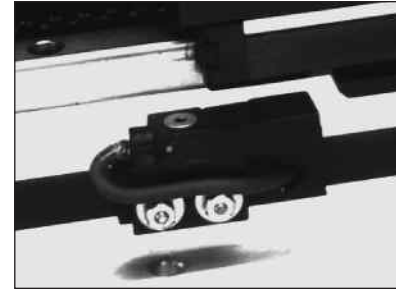
Repeatability	: +/- 0.0002 inch (5 microns)
Electrical	: 5 - 24 VDC 15 mA - power input 25 mA max - signal
Actuation Style	: magnetic
Activation Area	: 0.32 inches (8,13 mm) of travel
Temperature Range	: - 10° C to + 60° C
Environment	: wash down
Added Table Width	: none
Individual Switch Wiring	: 12 inch (305 mm) leads



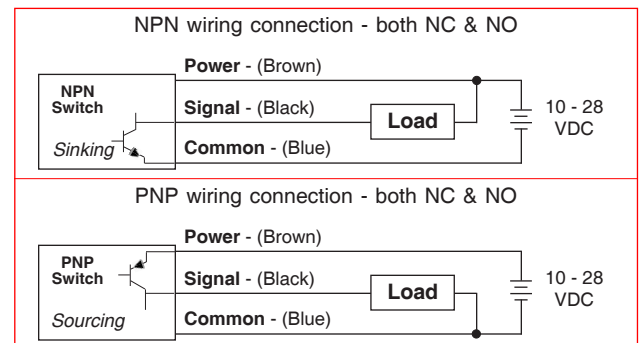
Standard **LINTECH** Wiring : from table end plate,
(provided when switch option is
ordered with any table)
10 foot (3 m) shielded cable;
9 conductor, 24 AWG,
unterminated leads

Wire Color	Description		
Brown	CW Power	(brown)	switch NC
Black	CW EOT	(black)	
Blue	CW Common	(blue)	
Red	CCW Power	(brown)	switch NC
White	CCW EOT	(black)	
Green	CCW Common	(blue)	
Orange	Home Power	(brown)	switch NO
Yellow	Home	(black)	
Grey	Home Common	(blue)	
Silver	Shield		

Non-Contact Proximity Switches



Repeatability	: +/- 0.0002 inch (5 microns)
Electrical	: 10 - 28 VDC 15 mA - power input 100 mA max - signal
Actuation Style	: non-magnetic cam
Activation Area	: 1.75 inches (44,45 mm) of travel
Temperature Range	: - 25° C to + 75° C
Environment	: IEC IP67 wash down
Added Table Width	: 0.20 inch (5,1 mm) (EOT switches) 0.20 inch (5,1 mm) (Home switch)
Individual Switch Wiring	: 6.5 foot (2 m) cable for NPN 3.3 foot (1 m) cable for PNP



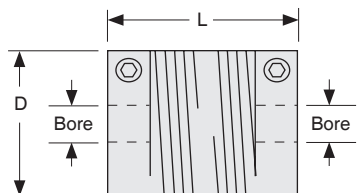
Standard **LINTECH** Wiring : from table end plate,
(provided when switch option is
ordered with any table)
10 foot (3 m) shielded cable;
9 conductor, 24 AWG,
unterminated leads

Wire Color	Description		
Brown	CW Power	(brown)	switch NC
Black	CW EOT	(black)	
Blue	CW Common	(blue)	
Red	CCW Power	(brown)	switch NC
White	CCW EOT	(black)	
Green	CCW Common	(blue)	
Orange	Home Power	(brown)	switch NO
Yellow	Home	(black)	
Grey	Home Common	(blue)	
Silver	Shield		

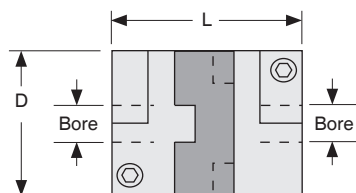
Motor Couplings

LINTECH provides three different types of couplings that can be used to mount a motor to a positioning table. These couplings compensate for misalignment between the motor shaft & screw shaft extension. This provides for trouble-free operation as long as certain precautions are taken. The connected motor output torque should never exceed the coupling maximum torque capacity. Larger capacity couplings may be required for applications having high accelerations, large back driving loads, high torque output motors, or servo motors.

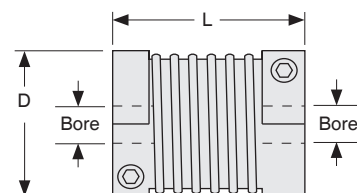
**C Type - Helical-Cut
Clamp Style Design**
(Aluminum)



**H Type - 3 Member
Clamp Style Design**
(Aluminum Hubs with Acetal Disc)



**G Type - Low Wind-up, High Torque
Clamp Style Design**
(Aluminum Hubs with Stainless Steel Bellows)



Model Number	D inches (mm)	L inches (mm)	Bore Diameters				Weight ounces (grams)	Inertia oz-in ² (g-cm ²)	Wind-up arc-sec/oz-in (deg/N-m)	Max Torque oz-in (N-m)
			Table	Motor	Minimum (in) (mm)	Maximum (in) (mm)				
C100-312-aaa	1.00 (25,4)	1.50 (38,1)	312	aaa	.250 6	.375 10	1.5 (43)	.19 (35)	23.0 (0,9)	400 (2,8)
C125-312-aaa ⁽¹⁾	1.25 (31,8)	2.00 (50,8)	312	aaa	.250 6	.500 14	3.5 (99)	.68 (124)	15.0 (0,59)	700 (4,9)
H100-312-aaa	1.00 (25,4)	1.28 (32,5)	312	aaa	.250 6	.375 10	1.2 (34)	.15 (27)	7.2 (0,28)	450 (2,8)
H131-312-aaa ⁽¹⁾	1.31 (33,3)	1.89 (48,0)	312	aaa	.250 6	.625 16	2.9 (82)	.62 (114)	2.5 (0,098)	1,000 (7,1)
G100-312-aaa	0.99 (25,2)	1.26 (32,0)	312	aaa	.250 6	.500 12	1.3 (36)	.16 (29)	1.0 (0,39)	500 (3,5)
G126-312-aaa	1.26 (32,1)	1.62 (41,0)	312	aaa	.250 6	.625 16	2.7 (74)	.54 (99)	0.3 (0,012)	1,100 (7,7)
Possible values for aaa	250 = .250 inch 005 = 5 mm 012 = 12 mm 375 = .375 inch 006 = 6 mm 014 = 14 mm 500 = .500 inch 008 = 8 mm 016 = 16 mm 625 = .625 inch 010 = 10 mm									

Footnotes:

- (1) This coupling option can not be used with the optional NEMA 23 motor mount because its length is too long. However, this coupling option can be used with the optional NEMA 34 motor mount. Custom motor mounts can be provided upon request. See page B-39 for maximum coupling diameter and length specifications for use with the optional NEMA 23 & 34 motor mounts.

Motor Couplings

Coupling	Cost	Torque Capacity	Wind-up	Suggested Motor	Comments
C Type	least expensive	light	the most	stepper	ideal for most step motor applications
H Type	medium priced	medium	medium	stepper or servo	use for high accels & for starting & stopping large inertia loads
G Type	most expensive	high	the least	servo	use for very high torque requirements & very high servo accelerations

Specification	130 Series NEMA 23 bracket	130 Series NEMA 34 bracket	140 Series NEMA 23 bracket	140 Series NEMA 34 bracket
	inches (mm)	inches (mm)	inches (mm)	inches (mm)
Shaft extension diameter at motor mount end	0.312 (7,92)	0.312 (7,92)	0.375 (9,53)	0.375 (9,53)
Maximum coupling diameter	1.500 (38,10)	1.500 (38,10)	1.500 (38,10)	2.000 (50,80)
Maximum coupling length	1.750 (44,45)	2.250 (57,15)	1.900 (48,26)	2.375 (60,32)
Note: Custom brackets available upon request.				

Coupling Part Numbers

C020 C100-312-250	C125 H100-312-250	C155 H131-375-250	C400 G100-312-250	C435 G126-375-250
C021 C100-312-375	C126 H100-312-375	C156 H131-375-375	C401 G100-312-375	C436 G126-375-375
C022 C100-312-006	C127 H100-312-006	C157 H131-375-500	C402 G100-312-500	C437 G126-375-500
C023 C100-312-008	C128 H100-312-008	C158 H131-375-625	C403 G100-312-006	C438 G126-375-625
C024 C100-312-010	C129 H100-312-010	C159 H131-375-006	C404 G100-312-008	C439 G126-375-006
		C160 H131-375-008	C405 G100-312-010	C440 G126-375-008
		C161 H131-375-010	C406 G100-312-012	C441 G126-375-010
C040 C125-312-250	C130 H100-375-250	C162 H131-375-012		C442 G126-375-012
C041 C125-312-375	C131 H100-375-375	C163 H131-375-014		C443 G126-375-014
C042 C125-312-500	C132 H100-375-006	C164 H131-375-016		C444 G126-375-016
C043 C125-312-006	C133 H100-375-008		C407 G100-375-250	
C044 C125-312-008	C134 H100-375-010		C408 G100-375-375	
C045 C125-312-010			C409 G100-375-500	
C046 C125-312-012	C145 H131-312-250	C190 H163-375-375	C410 G100-375-006	C470 G158-375-375
C047 C125-312-014	C146 H131-312-375	C191 H163-375-500	C411 G100-375-008	C471 G158-375-500
	C147 H131-312-500	C192 H163-375-625	C412 G100-375-010	C472 G158-375-625
	C148 H131-312-625	C193 H163-375-750	C413 G100-375-012	C473 G158-375-750
	C149 H131-312-006	C194 H163-375-010		C474 G158-375-010
	C150 H131-312-008	C195 H163-375-012	C425 G126-312-250	C475 G158-375-012
	C151 H131-312-010	C196 H163-375-014	C426 G126-312-375	C476 G158-375-014
	C152 H131-312-012	C197 H163-375-016	C427 G126-312-500	C477 G158-375-016
	C153 H131-312-014	C198 H163-375-018	C428 G126-312-625	C478 G158-375-018
	C154 H131-312-016	C199 H163-375-019	C429 G126-312-006	C479 G158-375-019
		C200 H163-375-020	C430 G126-312-008	C480 G158-375-020
			C431 G126-312-010	
			C432 G126-312-012	
			C433 G126-312-014	
			C434 G126-312-016	

Vertical Angle Brackets

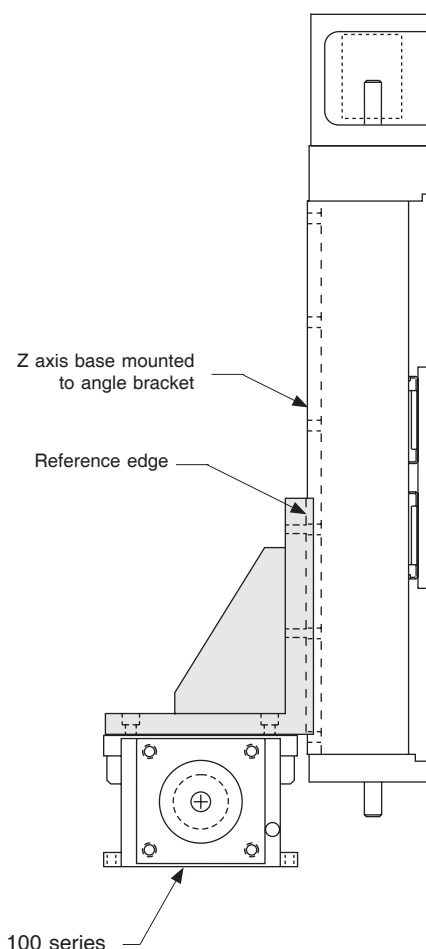
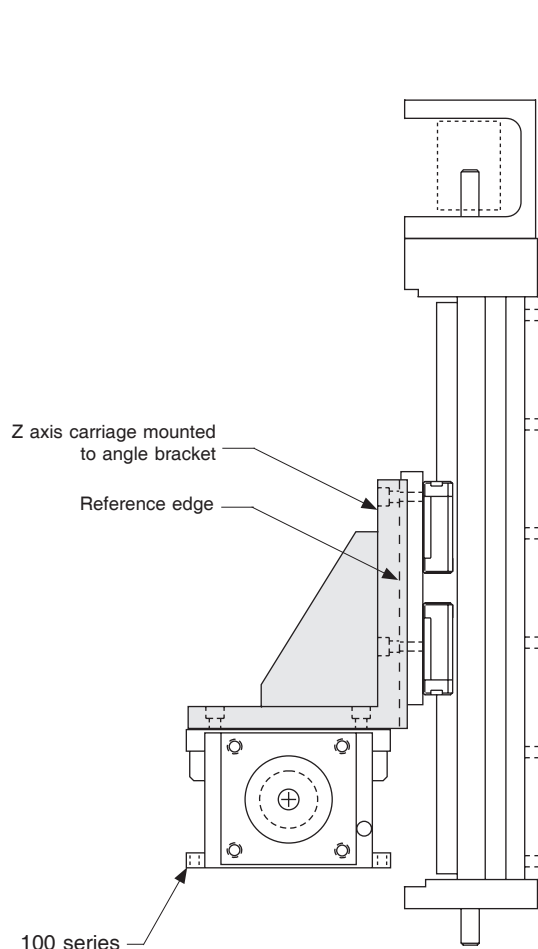
LINTECH has provided a simple solution for those applications requiring a Z axis within a multiple axis configuration. Two different vertical angle brackets are available. One allows a 130 or 140 series Z axis table to be mounted to a second 130 or 140 series table. The other vertical angle bracket allows a 130 or 140 series Z axis table to be mounted to a 100 series table. The 100 series table has a higher dynamic load and moment load capacity.

These precision machined aluminum angle brackets ensure that the orthogonality of the two tables is maintained to < 30 arc-seconds. To achieve this orthogonality, one side of the angle bracket must be mounted to the table carriage with a precision square tool or micrometer depth gauge, while the second axis is mounted securely against the reference edge

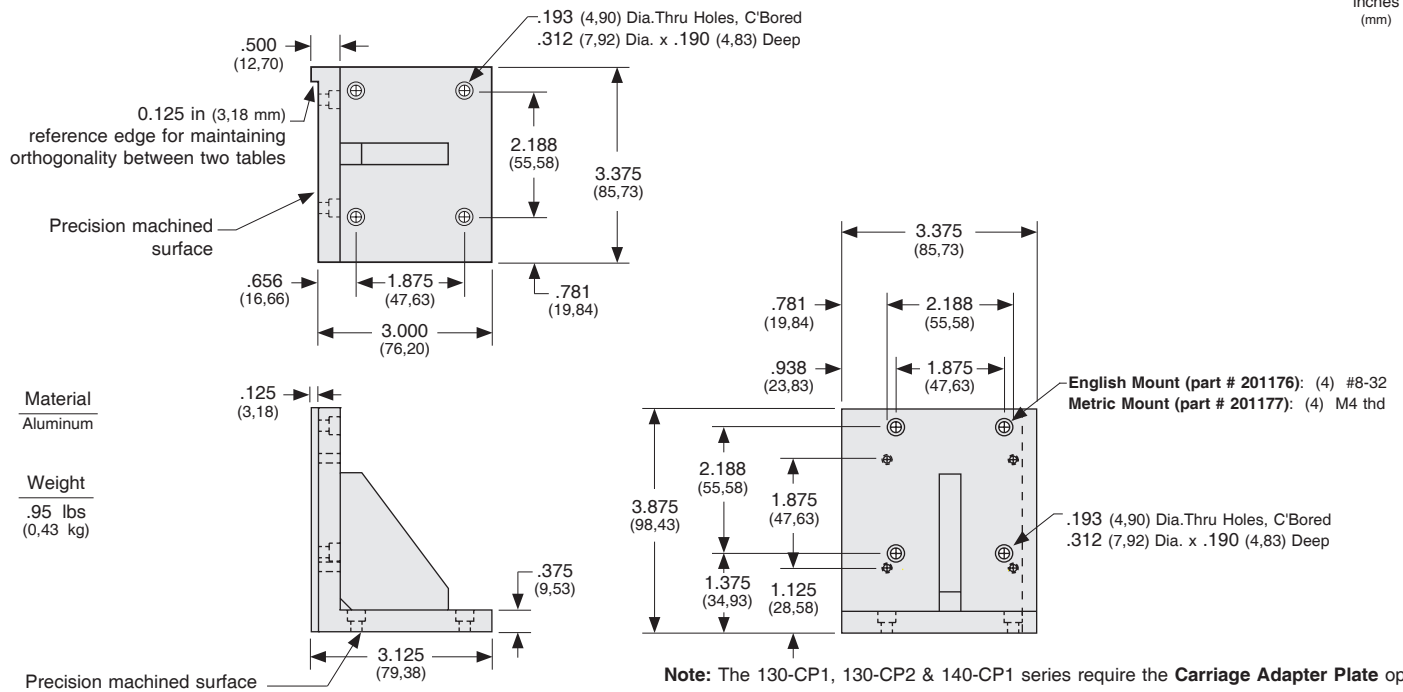
of the angle bracket. The angle bracket hole pattern is pre-engineered for easy mounting of either the table carriage or table base.

When ordered, the angle bracket is shipped separately from the tables. The user is required to assemble the angle bracket to the tables. However, if requested to, **LINTECH** can pre-assemble the multiple axis system before shipping. Anytime an angle bracket is used for multiple axis configurations, moment loads will result on one or more axes. Be sure to review moment loads, and the positioning table life, for your application.

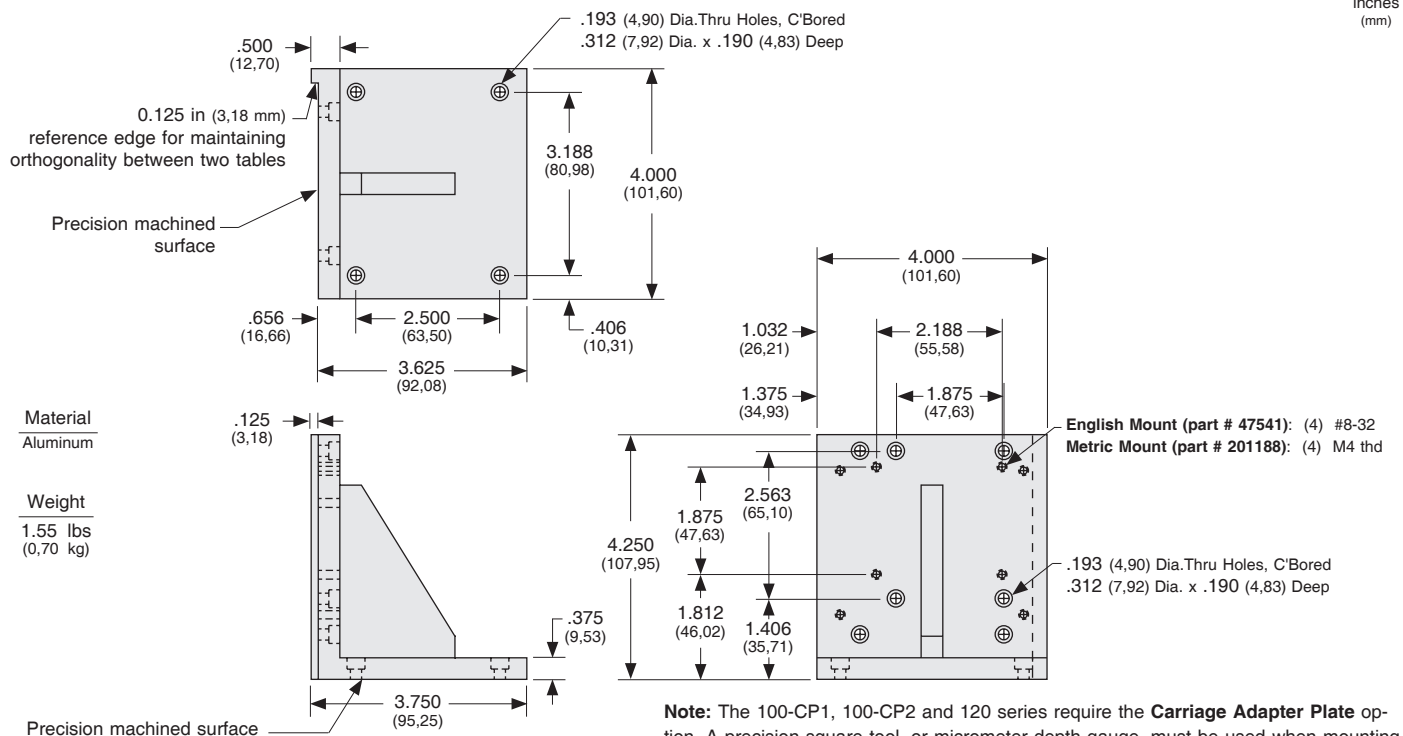
Either the 130 or 140 series base or carriage can be mounted to either vertical angle bracket.



Vertical Angle Bracket (130 or 140 series to 130 or 140 series)

inches
(mm)

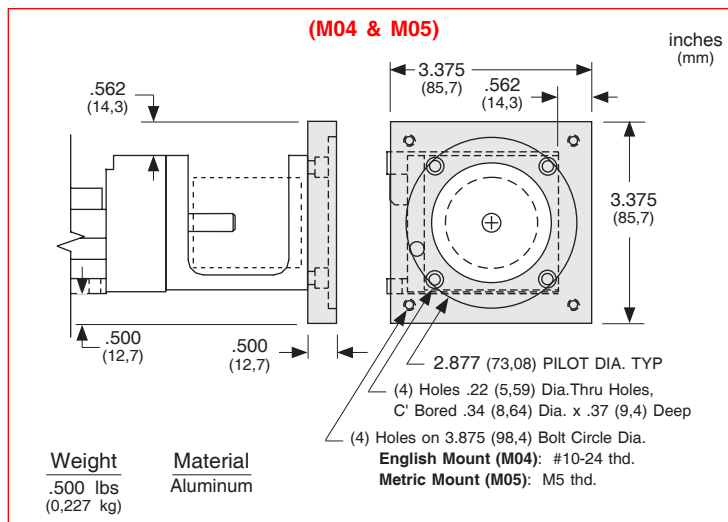
Vertical Angle Bracket (130 or 140 series to 100 series)

inches
(mm)

Specifications subject to change without notice

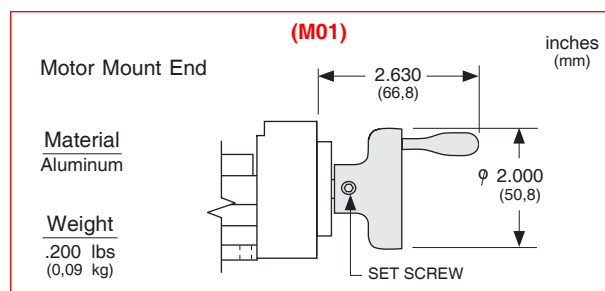
NEMA 34 Motor Mount for 130 Series

The NEMA 34 motor adapter bracket is an aluminum flange that mounts to the front of the NEMA 23 motor mount. The bracket can be ordered in either an English, or Metric motor mount. **LINTECH** can provide adapter brackets for any step motor, or servo motor, that has other mounting requirements.



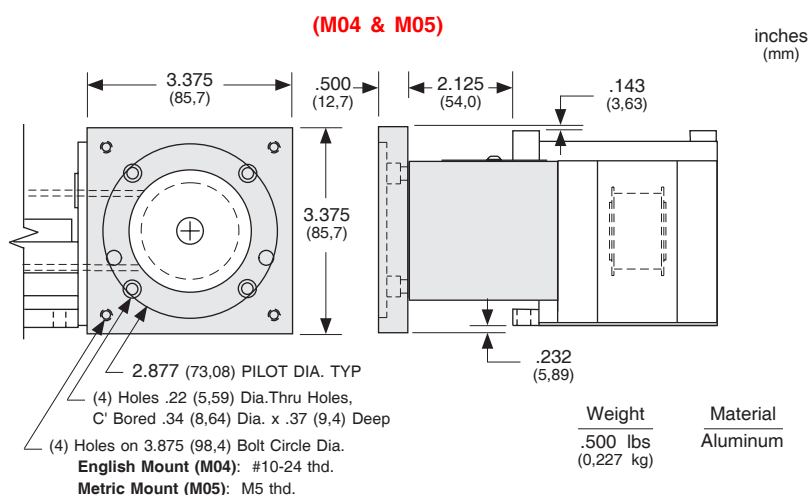
Hand Crank

For manually operated applications, **LINTECH** provides a hand crank option for the 130 table series. The hand crank replaces the motor mount and coupling on the table.



NEMA 34 Motor Mount for 140 Series

The 140 series positioning table can be provided with an optional NEMA 34 motor adapter bracket. The bracket can be ordered in either an English, or Metric motor mount. **LINTECH** can provide adapter brackets for any step motor, or servo motor, that has other mounting requirements.



Chrome Plated Linear Bearings, Rails, and Screws

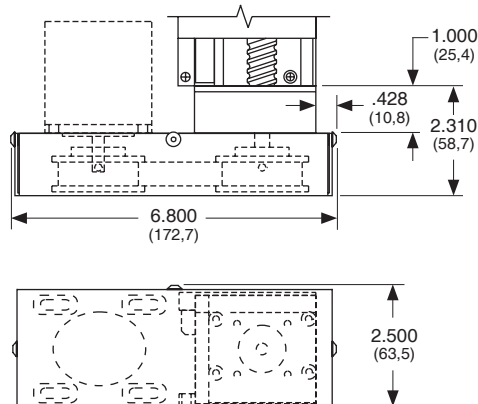
For applications in high moisture, high humidity, clean room, or highly corrosive environments, chrome plating of the linear bearings, linear rails, and screw will offer superior resistance to corrosion than stainless steel components, resulting in longer table life. The process uniformly deposits dense, hard, high chromium alloy on the rails or screw, and has a Rockwell C hardness value of 67-72. This process also conforms to MIL Spec: (MIL-C-23422). The chrome plating bonds to the parent material and will not crack or peel off under the high point loading of balls on the rail, or screw. This chrome plating process differs from a normal hard chrome plate which just lays on the surface of the part plated.

Motor Wrap Packages

For space limited 130 series applications, a belt and pulley system can couple the screw shaft extension to the motor shaft. This wraps the motor parallel to the table in order to decrease the overall positioning system length. Pulley weights and diameters are given in order to assist in calculating motor torque requirements.

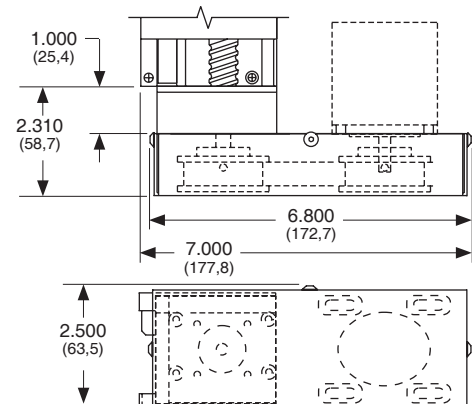
NEMA 23 Right Hand Motor Wrap (M06)

0.7 lbs (0,32 kg) added to table weight
Motor Pulley Bore: 0.250 inch (6,35 mm)



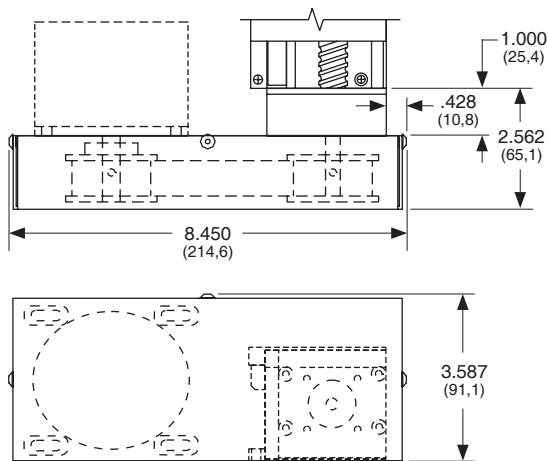
NEMA 23 Left Hand Motor Wrap (M07)

0.7 lbs (0,32 kg) added to table weight
Motor Pulley Bore: 0.250 inch (6,35 mm)



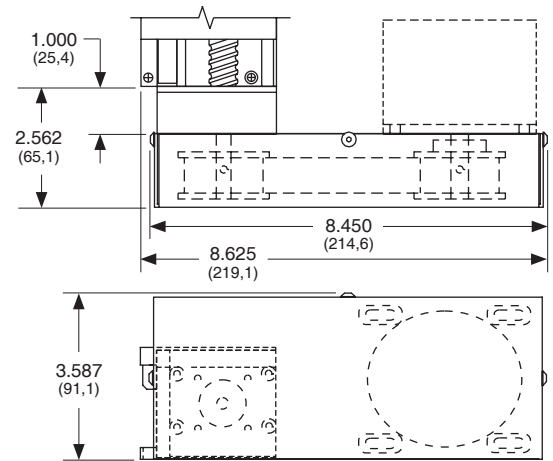
NEMA 34 Right Hand Motor Wrap (M08)

1.1 lbs (0,50 kg) added to table weight
Motor Pulley Bore: 0.375 inch (9,52 mm)



NEMA 34 Left Hand Motor Wrap (M09)

1.1 lbs (0,50 kg) added to table weight
Motor Pulley Bore: 0.375 inch (9,52 mm)



Motor Wrap Frame Size	Motor Pulley Dia. inches (mm)	Motor Pulley Wt. ounces (kg)	Screw Pulley Dia. inches (mm)	Screw Pulley Wt. ounces (kg)	Belt Weight ounces (kg)
NEMA 23	1.65 (41,9)	7.5 (0,21)	1.65 (41,9)	7.5 (0,21)	1.0 (0,028)
NEMA 34	1.65 (41,9)	8.0 (0,23)	1.65 (41,9)	8.0 (0,23)	1.2 (0,034)

Note: Motor pulley & belt shipped "loose". No motor mount nuts & bolts are provided. Custom motor wrap packages are available upon request. Other motor pulley bores MUST be specified for non-NEMA motors.

Power-off Electric Brakes

For vertical table applications, or for those applications requiring the load to be locked securely in place, an electric brake may be mounted to the positioning table. The 130 series will have the brake mounted to the screw shaft extension located on the table end, opposite the motor mount bracket. The 140 series will have the brake mounted to the thru drive shaft option. With proper wiring from a control system, this power-off friction brake can ensure that the carriage is firmly held in place, when no electric power is applied to the brake. When power is applied to the brake, the brake is opened or "released".

For proper emergency braking of the positioning table, this electric brake needs to be interfaced to a position controller or relay network. **LINTECH** also provides 24 & 90 VDC power supplies which can be used to power the brakes.

Brakes

Model Number	Holding Force in-lbs (N-m)	Excitation Voltage volts	Current amps	Weight lbs (kg)
B01	18 (2,0)	24 VDC	0.733	1.4 (0,62)
B02	18 (2,0)	90 VDC	0.178	1.4 (0,62)

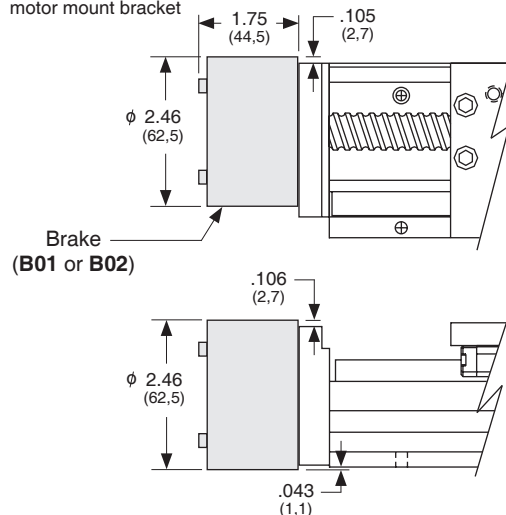
Note: This power-off electric brake **MUST NOT** be engaged when the positioning table is in motion. Moving the table with the brake applied could damage the brake and the positioning table. Also, continuous use of this brake to stop a table (load) that is in motion could damage the brake and the positioning table. Dynamic braking of a positioning table should be done by the motor and not the brake.

Power Supplies

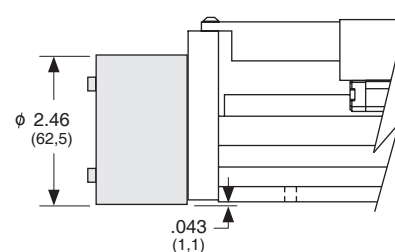
Model Number	DC Output			AC Input		
	volts	amps	style	volts	amps	Hz
41970	5	3.0	regulated	120 / 240	0.8 / 0.4	47-63
37488	24	1.2	regulated	120 / 240	0.8 / 0.4	47-63
37489	90	0.8	unregulated	120	1.0	50/60
37490	90	0.8	unregulated	240	0.5	50/60

130-CP0 Series

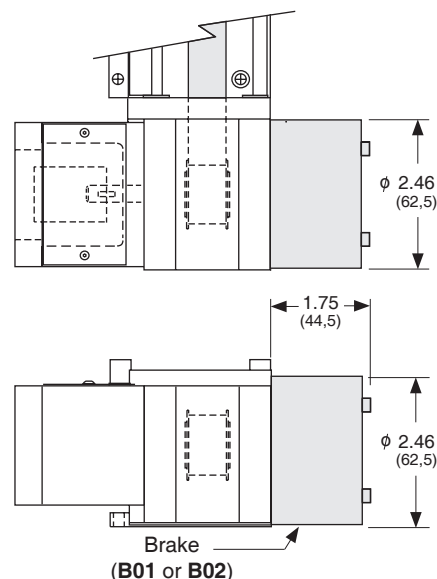
 inches
(mm)

 Table end opposite
motor mount bracket


130-CP1 or 130-CP2 Series



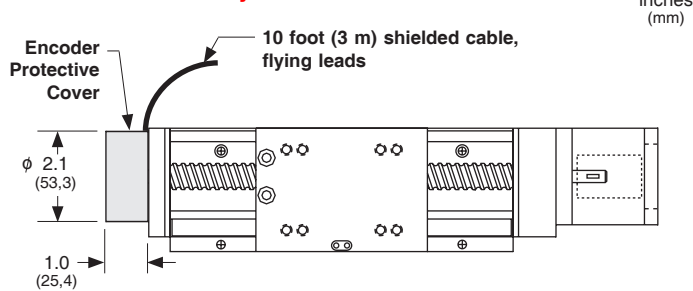
140 Series

 inches
(mm)


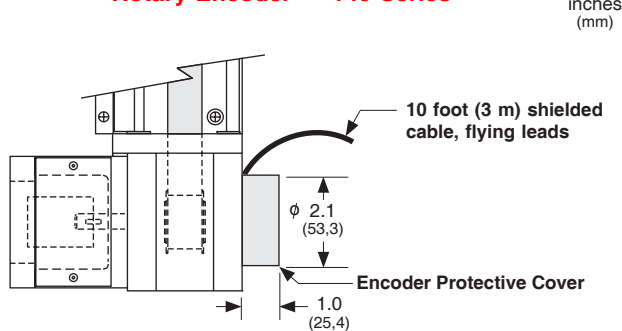
Linear & Rotary Incremental Encoders

Fully enclosed, incremental, optical linear encoders can be mounted on the side of any **LINTECH** 130 series. Shaftless, incremental, optical rotary encoders can be mounted to the screw shaft extension on the opposite end from the motor mount end on the 130 or 140 series positioning tables. These encoders provide positional feedback to either a motion controller, or a digital position display.

Rotary Encoder - 130 Series

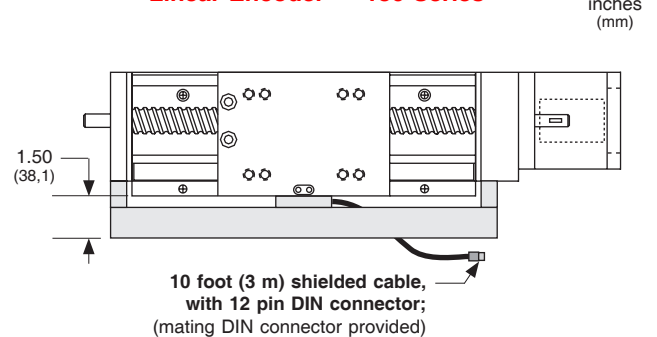


Rotary Encoder - 140 Series



LINEAR		ROTARY	Description
Din Pin #	Wire Color	Wire Color	
C	Green	White	Channel A ⁺ (or A)
D	Yellow	Blue	Channel A ⁻ (or \bar{A})
E	Pink	Green	Channel B ⁺ (or B)
L	Red	Orange	Channel B ⁻ (or \bar{B})
G	Brown	White/Black	Channel Z ⁺ (or Z)
H	Grey	Red/Black	Channel Z ⁻ (or \bar{Z})
A	Shield		Case ground
B	White	Black	Common
K	Black	Red	+ 5 vdc (+/- 5%)

Linear Encoder - 130 Series



Note: The encoder read head is mounted to the table carriage with the encoder lip seal facing down.

Specification	ROTARY ENCODERS			LINEAR ENCODERS	
	E01	E02	E03	E10	E11
Line Count	500 lines/rev	1000 lines/rev	1270 lines/rev	2500 lines/inch	125 lines/mm
Pre Quadrature Resolution	0.002 revs/pulse	0.001 revs/pulse	0.00079 revs/pulse	0.0004 inch/pulse	8 microns/pulse
Post Quadrature Resolution	0.0005 revs/pulse	0,00025 revs/pulse	0.00019 revs/pulse	0.0001 inch/pulse	2 micron/pulse
Accuracy				+/- 0.0002 in/40"	+/- 5 microns/m
Maximum Speed	50 revs/sec			79 inches/sec	2 m/sec
Maximum Accel	40 revs/sec²			130 ft/sec²	40 m/sec²
Excitation Power	+ 5 VDC @ 125 ma			+ 5 VDC @ 150 ma	
Operating Temperature	32º F to 140º F (0º C to 60º C)			32º F to 120º F (0º C to 50º C)	
Humidity	20% to 80% non condensing			20% to 80% non condensing	
Shock	10 G's for 11 msec duration			15 G's for 8 msec duration	
Weight	0.7 lbs (0,283 kg)			0.7 oz/inch (0,00078 kg/mm) length of scale + 0.5 lbs (0,23 kg) read head and brackets	
Cable Length	10 ft (3 m), unterminated 26 gauge leads			10 ft (3 m) with DIN connector	
Zero Reference Output	Once per revolution			At center of encoder length	
Outputs	TTL square wave; Two channel (A+ & B+); Differential (A- & B-); Line Driver				

Specifications subject to change without notice

