# 550 Series
# Positioning Tables



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## Single or Multiple Axis

LINTECH's 550 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 550 series tables are designed to handle large loads at very high speeds. 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 slots machined into it. These slots, along with the base mounting brackets, are used for the mounting of the user load. The drive system uses two pulleys, along with a high strength, steel reinforced polyurethane belt, which provides 8.071 inches (205 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. The belt also acts as a cover, preventing debris from getting into the linear bearings & rail.

***The 553 carriage*** uses 2 high load capacity linear bearings on one precision ground square rail. Both bearings are connected to an internal lubrication network. Any of the 4 lube ports, located on the carriage surface, can be used to supply lubrication to the 2 linear bearings.

***The 554 carriage*** uses 2 high load capacity linear bearings on one precision ground square rail. Both bearings are out-fitted with a self-lubricating material which eliminates the need for regular lubrication. No lube ports are provided on the carriage surface.

***The 555 carriage*** uses 2 high load capacity linear bearings on one precision ground square rail. A unique ball retainer design for the recirculating linear bearings provides a smoother operating system with less audible noise. Both bearings are connected to an internal lubrication network. Any of the 4 lube ports, located on the carriage surface, can be used to supply lubrication to the 2 linear bearings.

# 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 550 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, NEMA 42, or any metric mount motor can be mounted to a 550 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.

## Planetary Gearheads

LINTECH provides planetary gearheads which can be used with a 550 series. These gearheads are provided in either an in-line or right angle version, with standard gear ratios of 1:1, 3:1, 5:1 or 10:1. Gearheads may be required for applications which have a large mismatch of load to motor inertias. They also help reduce the torque required from the motor for a particular application.

## Other

The 550 series tables can accommodate **chrome plated linear bearings & rails** for corrosive environment applications and **power-off electric brakes** for load locking applications.

## Standard Features - 550 Series

- 10.236 inches (260 mm) long carriage with two M5 slots for load mounting
- Compact 3.15 inches (80 mm) wide by 3.937 inches (100 mm) tall
- Travel lengths from 12 inches (300 mm) to 30 feet (9,1 meters)
- Rigid belt driven design with fully enclosed aluminum housing
- 0º F to +176º F (-18º C to +80º C) operating temperature
- Two screw belt tensioning with self locking threads
- Dynamic Load Capacity to 10,500 lbs (4763 kg)
- Recirculating linear ball bearing system
- Precision ground square rail design
- 1 rail with 2 bearing carriages

## 550 Series (553 Carriage)

- Two bearing carriage
- 10,500 lbs (4763 kg) dynamic load capacity
- 410 ft-lbs (556 N-m) dynamic roll moment
- Less expensive than the 555 carriage
- Large moment load capability

## 550 Series (554 Carriage)

- Two bearing carriage
- 10,500 lbs (4763 kg) dynamic load capacity
- 410 ft-lbs (556 N-m) dynamic roll moment
- Self lubricating linear bearings
- Large moment load capability

## 550 Series (555 Carriage)

- Two bearing carriage
- 9,120 lbs (4136 kg) dynamic load capacity
- 172 ft-lbs (233 N-m) dynamic roll moment
- Less audible noise than the 553 or 554 series
- Smoother than the 553 or 554 carriage
- Unique linear bearing design

## Options - 550 Series

- Angle brackets for multiple axis configurations
- End of travel (EOT) and home switches wired
- CAD drawings available via the internet
- Chrome plated linear bearings and rails
- Motor mounts for non-NEMA motors
- NEMA 34 & 42 motor mounts
- Rotary incremental encoders
- Power-off electric brakes
- Base mounting brackets
- Carriage adapter plates
- Planetary gearheads
- Motor couplings

553 10 012 - D1 - M04 - C293 - L04 - E00 - B00

**Table Series**

- **553** - 553 carriage
- **554** - 554 carriage
- **555** - 555 carriage

**Carriage Length**

- **10** - 10 inches

**Travel Length** (see page K-6)

- **012** - 12 to 360 inches

**Drive Shaft** (see page K-7)

- **D1** - Right Hand single shaft
- **D2** - Left Hand single shaft
- **D3** - Right Hand thru shaft
- **D4** - Left Hand thru shaft

**Motor Mount** (see page K-20)

- **M00** - none; just shaft extension
- **M99** - other
- **M04** - NEMA 34 mount (E)
- **M05** - NEMA 34 mount (M)
- **M10** - NEMA 42 mount (E)
- **M11** - NEMA 42 mount (M)

**Coupling Options** (see pages K-24 & K-25)

- **C000** - none
- **C999** - none
- **C293** *to* **C303** - H197
- **C359** *to* **C369** - H225
- **C573** *to* **C583** - G177
- **C639** *to* **C649** - G220
- **C684** *to* **C691** - G260

**Limit & Home Switches** (see pages K-21 to K-23)

- **L00** - no switches
- **L99** - other

| | Reed | Hall | Prox (NPN) | Prox (PNP) |
|---|---|---|---|---|
| EOT & home switches | **L04** | **L07** | **L10** | **L13** |
| EOT switches only | **L05** | **L08** | **L11** | **L14** |
| home switch only | **L06** | **L09** | **L12** | **L15** |

**Encoder Options** (see page K-27)

- **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 K-26)

- **B00** - none
- **B05** - 24 VDC
- **B06** - 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 | | 553 & 554 Carriages | 555 Carriage |
|---|---|---|---|
| **Dynamic Horizontal** | 2 million inches (50 km) of travel | 10,500 lbs ( 4763 kg) | 9,120 lbs ( 4136 kg) (1) |
| **Dynamic Horizontal** | 50 million inches (1270 km) of travel | 3,590 lbs ( 1628 kg) | 3,119 lbs ( 1414 kg) (1) |
| **Static Horizontal** | | 15,400 lbs ( 6985 kg) | 14,700 lbs ( 6668 kg) (1) |
| **Dynamic Roll Moment** | 2 million inches (50 km) of travel | 410 ft-lbs ( 556 N-m) | 172 ft-lbs ( 233 N-m) |
| **Dynamic Roll Moment** | 50 million inches (1270 km) of travel | 140 ft-lbs ( 190 N-m) | 59 ft-lbs ( 80 N-m) |
| **Static Roll Moment** | | 650 ft-lbs ( 881 N-m) | 285 ft-lbs ( 386 N-m) |
| **Dyn. Pitch & Yaw Moment** | 2 million inches (50 km) of travel | 1,215 ft-lbs ( 1647 N-m) | 510 ft-lbs ( 690 N-m) |
| **Dyn. Pitch & Yaw Moment** | 50 million inches (1270 km) of travel | 414 ft-lbs ( 561 N-m) | 174 ft-lbs ( 236 N-m) |
| **Static Pitch & Yaw Moment** | | 1,775 ft-lbs ( 2406 N-m) | 845 ft-lbs ( 1145 N-m) |
| **Each Bearing Dyn. Capacity** | 2 million inches (50 km) of travel | 5,250 lbs ( 2381 kg) | 4,560 lbs ( 2068 kg) (1) |
| **Each Bearing Dyn. Capacity** | 50 million inches (1270 km) of travel | 1,795 lbs ( 814 kg) | 1,559 lbs ( 707 kg) (1) |
| **Each Bearing Static Load Capacity** | | 7,700 lbs ( 3493 kg) | 7,350 lbs ( 3334 kg) (1) |
| **Maximum Belt Tensile Force** | | 675 lbs ( 306 kg) | 675 lbs ( 306 kg) |
| **Maximum Carriage Thrust Force** | | 475 lbs ( 215 kg) | 475 lbs ( 215 kg) |
| **Maximum Speed** | | 118 in/sec ( 3 m/sec) | 197 in/sec ( 5 m/sec) |
| **Maximum Acceleration** | | 1,930 in/sec$^2$ ( 49,0 m/sec$^2$) | 1,930 in/sec$^2$ ( 49,0 m/sec$^2$) |
| $d_2$ | Center to center distance (spacing) of each bearing on a single rail | 3.876 in ( 98,4 mm) | 3.876 in ( 98,4 mm) |
| $d_r$ | Center distance of the bearing to top of carriage plate surface | 1.508 in ( 38,3 mm) | 1.626 in ( 41,3 mm) |

| Other | 553, 554 & 555 Carriages |
|---|---|
| **Table Material** | Base Extrusion, Carriage, & End Plates - 6061 anodized aluminum |
| **Linear Rail Material** | Case Hardened Steel |
| **Belt Properties** | Black, 50 mm wide, Polyurethane, Steel reinforced belt |
| **Drive Pulley Weight** | 1.500 lbs ( 0,68 kg) |
| **Drive Pulley Diameter** | 2.569 in ( 65,25 mm) |
| **Drive Lead** | 8.071 in ( 205,00 mm) |
| **Belt Stretch - x Load (lbs or N)** | 0.00006 in/ft per lbs ( 0,00114 mm/m per N) |
| **Unidirectional Repeatability** | +/- 0.001 in (+/- 0,0254 mm) |
| **Bidirectional Repeatability** | +/- 0.004 in (+/- 0,1016 mm) |
| **Position Accuracy** (Belt) (2) | < 0.010 in/ft (< 0,254 mm/300mm) |
| **Orthogonality** (multi-axis systems) | < 60 arc-seconds |
| **Friction Coefficient** | < 0.01 |
| **Breakaway Torque** (3) | < 16 lb-in (1,808 N-m) |
| **Motor Mount** | NEMA 34 & 42 Mounts, Metric Mounts, and Gearheads |
| **Coupling** | Two (2) different styles available |

### Footnotes:

(1) Derate value by 50 % when load is applied to the open end of the bearing (inverted configuration).

(2) 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.

(3) This is a nominal value. Breakaway torque will increase, or decrease, based on belt tension.

## Dimensions & Specifications

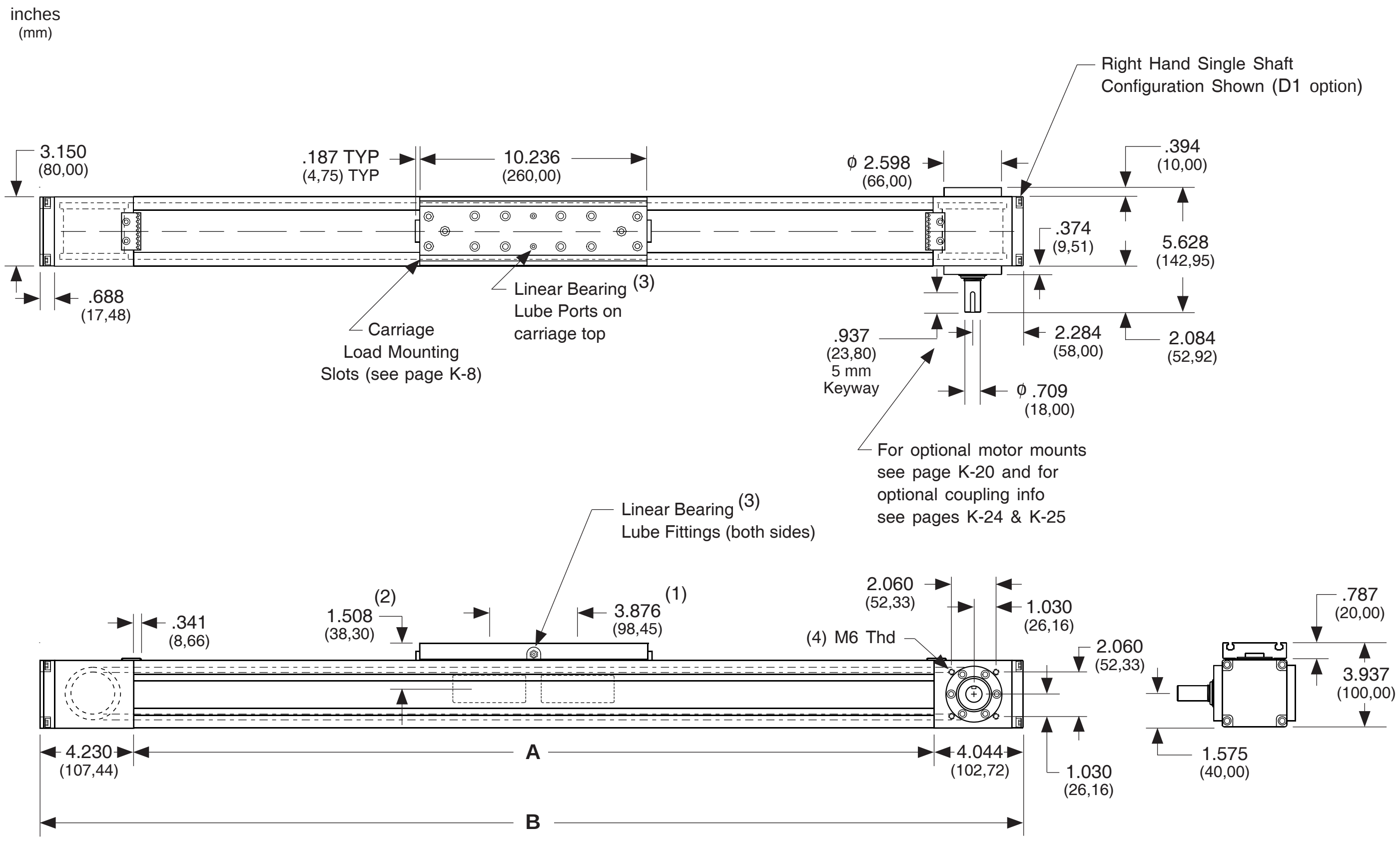
| Model Number | Travel (1) Length inches (mm) | Table Dimensions inches (mm) A | B | Belt Weight lbs (kg) | Table Weight (553 & 554 Carriages) lbs (kg) | Table Weight (555 Carriage) lbs (kg) |
|---|---|---|---|---|---|---|
| **55x10012** | 12 (300) | 24.00 (609,6) | 32.275 (819,8) | 0.29 (0,13) | 24.1 (10,9) | 23.0 (10,4) |
| **55x10018** | 18 (455) | 30.00 (762,0) | 38.275 (972,2) | 0.40 (0,18) | 27.3 (12,4) | 26.0 (11,8) |
| **55x10024** | 24 (605) | 36.00 (914,4) | 44.275 (1124,6) | 0.51 (0,23) | 30.6 (13,9) | 29.2 (13,2) |
| **55x10030** | 30 (760) | 42.00 (1066,8) | 50.275 (1277,0) | 0.62 (0,28) | 33.9 (15,4) | 32.3 (14,7) |
| **55x10036** | 36 (910) | 48.00 (1219,2) | 56.275 (1429,4) | 0.72 (0,33) | 37.2 (16,9) | 35.5 (16,1) |
| **55x10048** | 48 (1215) | 60.00 (1524,0) | 68.275 (1734,2) | 0.94 (0,43) | 43.8 (19,9) | 41.8 (19,0) |
| **55x10060** | 60 (1520) | 72.00 (1828,8) | 80.275 (2039,0) | 1.15 (0,52) | 50.3 (22,8) | 48.0 (21,8) |
| **55x10072** | 72 (1825) | 84.00 (2133,6) | 92.275 (2343,8) | 1.37 (0,62) | 56.9 (25,8) | 54.3 (24,6) |
| **55x10084** | 84 (2130) | 96.00 (2438,4) | 104.275 (2648,6) | 1.58 (0,72) | 63.5 (28,8) | 60.6 (27,5) |
| **55x10096** | 96 (2435) | 108.00 (2743,2) | 116.275 (2953,4) | 1.80 (0,82) | 70.1 (31,8) | 66.9 (30,3) |
| **55x10108** | 108 (2740) | 120.00 (3048,0) | 128.275 (3258,2) | 2.01 (0,91) | 76.7 (34,8) | 73.2 (33,2) |
| **55x10120** | 120 (3045) | 132.00 (3352,8) | 140.275 (3563,0) | 2.23 (1,01) | 83.2 (37,8) | 79.4 (36,0) |
| **55x10132** | 132 (3350) | 144.00 (3657,6) | 152.275 (3867,8) | 2.44 (1,11) | 89.8 (40,8) | 85.7 (38,9) |
| **55x10144** | 144 (3655) | 156.00 (3962,4) | 164.275 (4172,6) | 2.66 (1,21) | 96.4 (43,7) | 92.0 (41,7) |
| **55x10180** | 180 (4572) | 192.00 (4876,8) | 200.275 (5087,0) | 3.30 (1,50) | 116.1 (52,7) | 110.8 (50,3) |
| **55x10240** | 240 (6096) | 252.00 (6400,8) | 260.275 (6611,0) | 4.38 (1,99) | 149.0 (67,6) | 142.2 (64,5) |
| **55x10300** | 300 (7620) | 312.00 (7924,8) | 320.275 (8135,0) | 5.45 (2,47) | 181.9 (82,5) | 173.6 (78,7) |
| **55x10360** | 360 (9144) | 372.00 (9448,8) | 380.275 (9659,0) | 6.52 (2,96) | 214.8 (97,4) | 204.9 (92,9) |

- x = 3; 553 Carriage; Carriage weight = 7.98 lbs. (3,62 kg)
- x = 4; 554 Carriage; Carriage weight = 7.98 lbs. (3,62 kg)
- x = 5; 555 Carriage; Carriage weight = 7.14 lbs. (3,24 kg)

**Footnotes:**

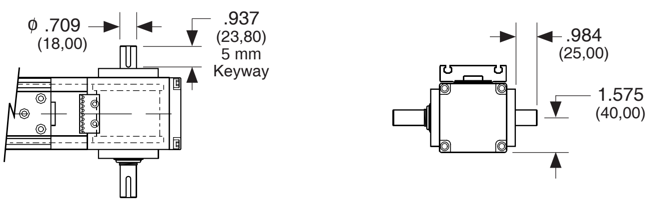
(1) Longest possible travel is 30 feet (9,1 meters). Any travel length less than 30 feet (9,1 meters) can be provided.

## Dimensions




**Thru Shaft Option**

**(D3 & D4)** (D3 shown)




### Footnotes:

(1) This value is center to center distance (spacing) of each bearing on a single rail **($d_2$)**.

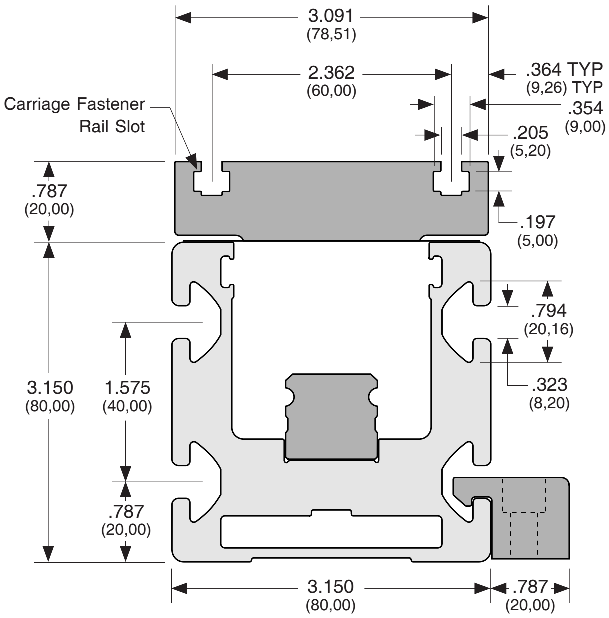
(2) This value is the center distance of the bearing to top of carriage plate surface **($d_r$)** for the 553 & 554 carriages. For the 555 carriage **$d_r$** = 1.626 inches (41,3 mm).

(3) Two lube ports on carriage top and lube fittings on each side of the 553 & 555 carriages are all interconnected. Only one port is required to lubricate both linear bearings. The 554 carriage will not have any lube ports.

## Carriage Fastener Rail & Base Mounting Brackets

*LinTech* provides the user with 2 vital optional accessories. The carriage fastener rails slide into the two slots on the 550 series carriage. These fastener rails give the user the ability to mount their load to the 550 series carriage. From 1 to 3 fastener rails can be used in each carriage slot. The base mounting brackets give the user the ability to mount the 550 series table to a mounting surface. These mounting brackets attach anywhere along the bottom T-slot's on both sides of the 550 series table.

inches
(mm)

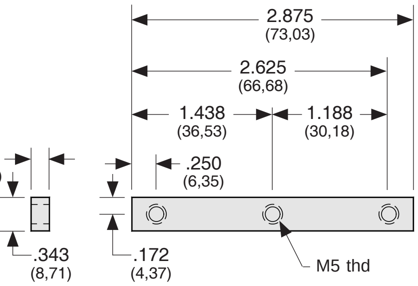



### Carriage Fastener Rail

**(part # 201174)**

Material
Stainless
Steel

Weight
.06 lbs
(0,027 kg)

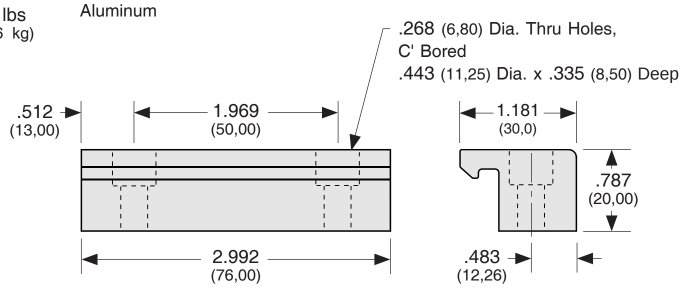



### Base Mounting Brackets

**(part # 46627)**

Weight
.19 lbs
(0,086 kg)

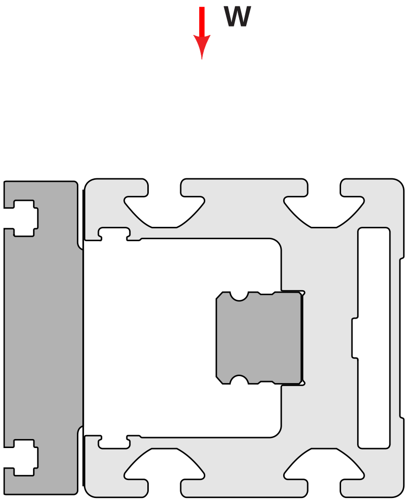
Material
Aluminum



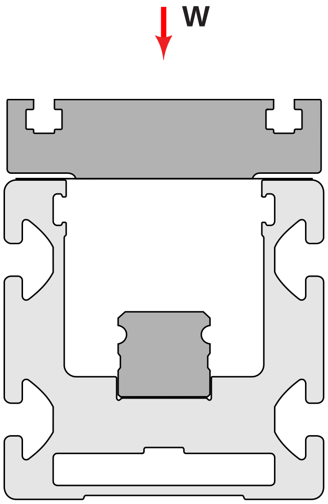
## Table Deflection - Moment of Inertia Values

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.

$I = 3.10\ in^4\ (1.29 \times 10^6\ mm^4)$




$I = 4.44\ in^4\ (1.85 \times 10^6\ mm^4)$



## Linear Bearing Load Capacities

The following equation, and graphs, can be used to help determine the linear bearing life, and load capacity, of a 550 series positioning table.

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

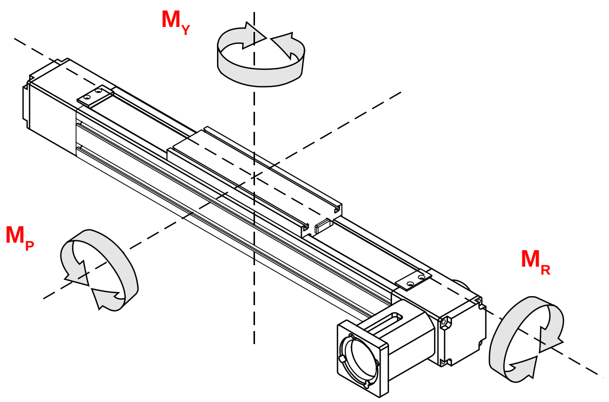
**L** = calculated travel life (millions of inches or Km)

**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)

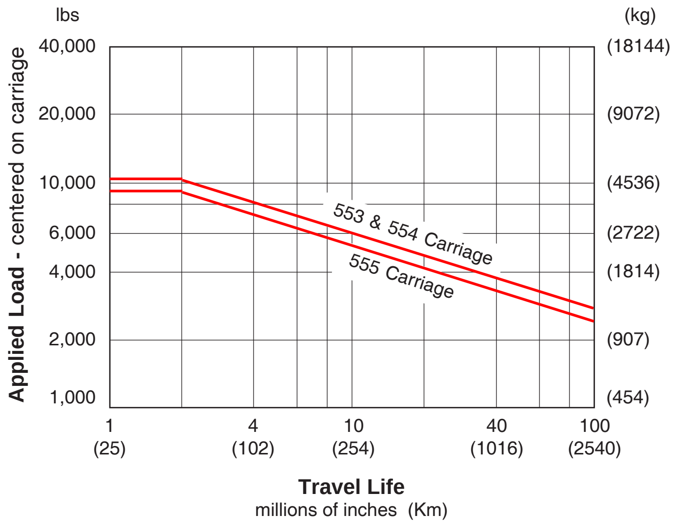
**B** = either 2 (for millions of inches) or 50 (for Km)




### Dynamic Horizontal Load Capacity

Load Centered on Carriage

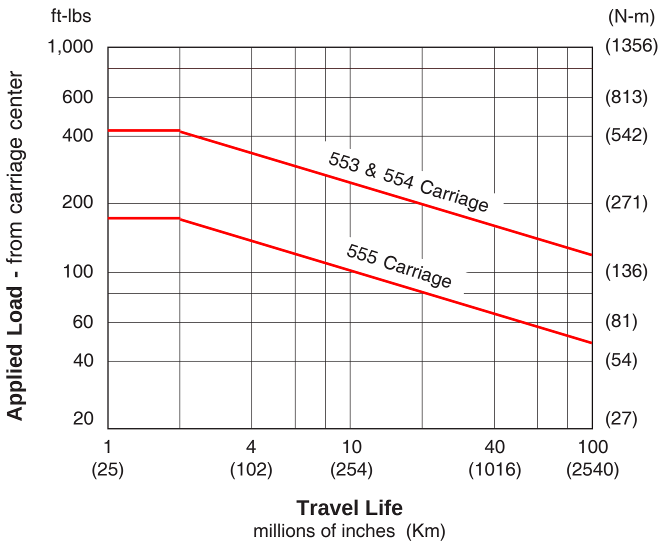
| travel life millions of inches | (Km) | 553 & 554 Carriage lbs | (kg) | 555 Carriage lbs | (kg) |
|---|---|---|---|---|---|
| 2 | ( 50) | 10,500 | (4763) | 9,120 | (4136) |
| 50 | (1270) | 3,590 | (1628) | 3,119 | (1414) |
| 100 | (2540) | 2,849 | (1292) | 2,475 | (1123) |




### Dynamic Moment Load ($M_R$) Capacity

Load applied away from Carriage Center

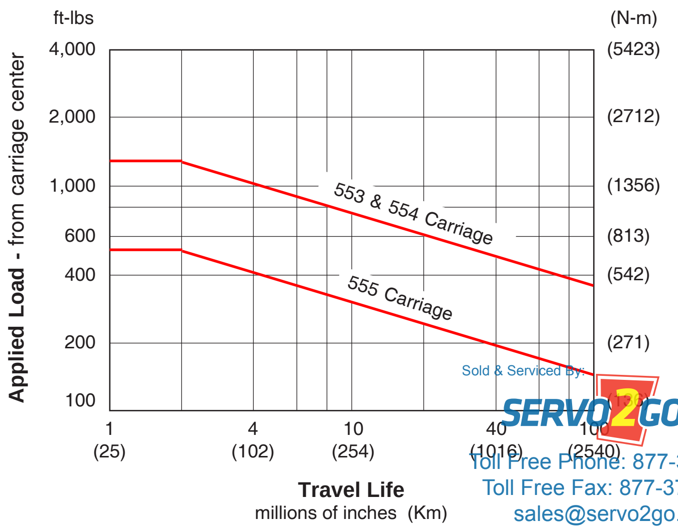
| travel life millions of inches | (Km) | 553 & 554 Carriage ft-lbs | (N-m) | 555 Carriage ft-lbs | (N-m) |
|---|---|---|---|---|---|
| 2 | ( 50) | 410 | (556) | 172 | (233) |
| 50 | (1270) | 140 | (190) | 59 | (80) |
| 100 | (2540) | 111 | (150) | 47 | (64) |
| Ratings are based on $d_3$ = 12 inches (305 mm) & $d_4$ = 0 | | | | | |




### Dynamic Moment Load ($M_P$ & $M_Y$) Capacity

Load applied away from Carriage Center

| travel life millions of inches | (Km) | 553 & 554 Carriage ft-lbs | (N-m) | 555 Carriage ft-lbs | (N-m) |
|---|---|---|---|---|---|
| 2 | ( 50) | 1,215 | (1647) | 510 | (690) |
| 50 | (1270) | 414 | (561) | 174 | (236) |
| 100 | (2540) | 330 | (447) | 138 | (187) |
| Ratings are based on $d_3$ = 0 & $d_4$ = 12 inches (305 mm) | | | | | |



## 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 550 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 550 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 550 series table can be determined by the simple equation **F = M x 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 550 series table is 5 g's.

### Maximum Acceleration Example

**F** = **M** x **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* |
|---|---|
| $A = \dfrac{F}{M}$ | $A = \dfrac{F - M \sin\phi}{M}$ |

**Example:** A 200 lb load is mounted to a 550 series carriage in a horizontal application. Determine the maximum accel rate in g's & in/sec² that can be used to achieve a maximum speed of 75 IPS.

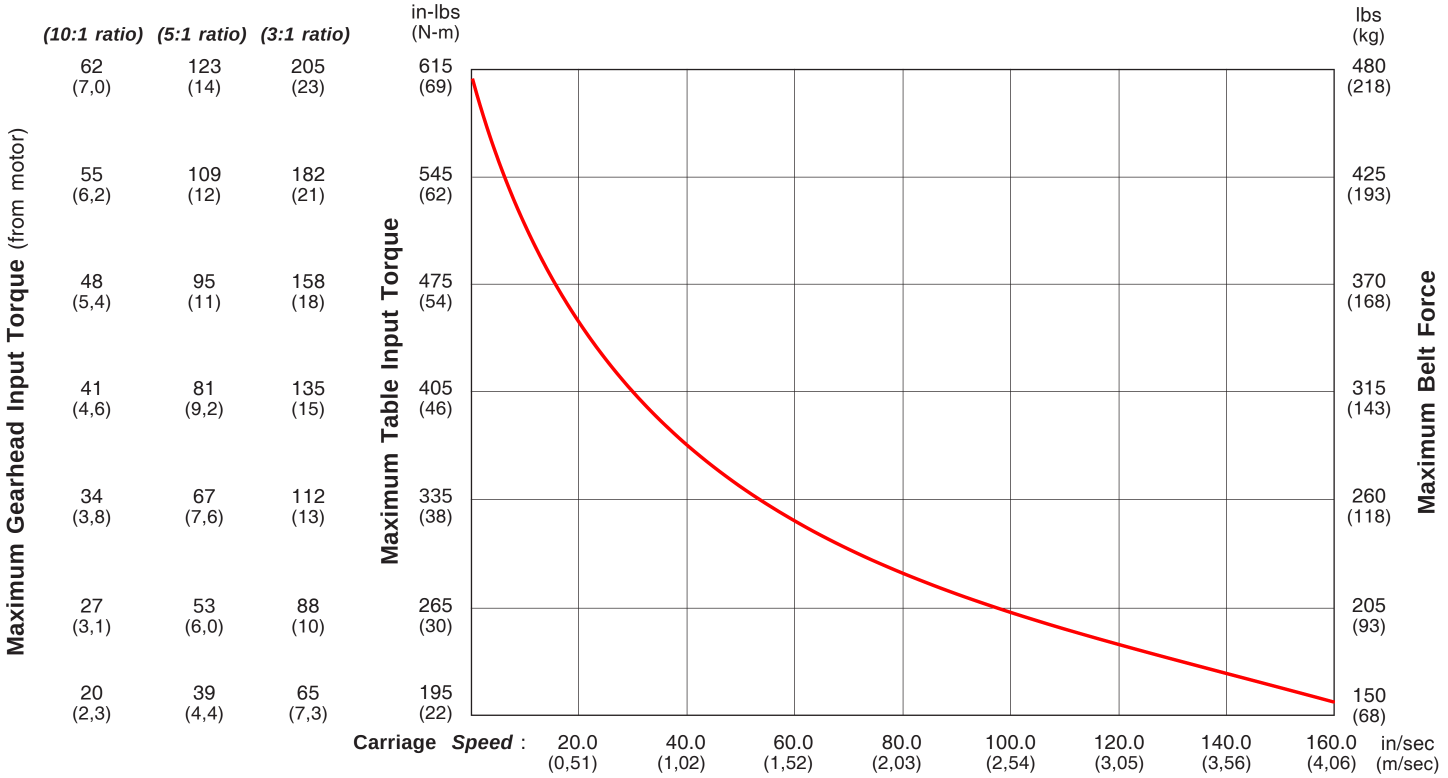
*Step 1:* From graph below, determine the maximum belt force at 75 IPS : (F = 235 lbs).

*Step 2:* Add up your total mass = load weight + carriage weight : (M = 5.4 + 200 = 205.4 lbs).

*Step 3:* Solve for A : (A = 235/205.4 = 1.1 g's).

**Note:** 1 g = 386 in/sec²

*Step 5:* 1.1 g's x 386 = 442 in/sec².




*RPS* - revs/sec

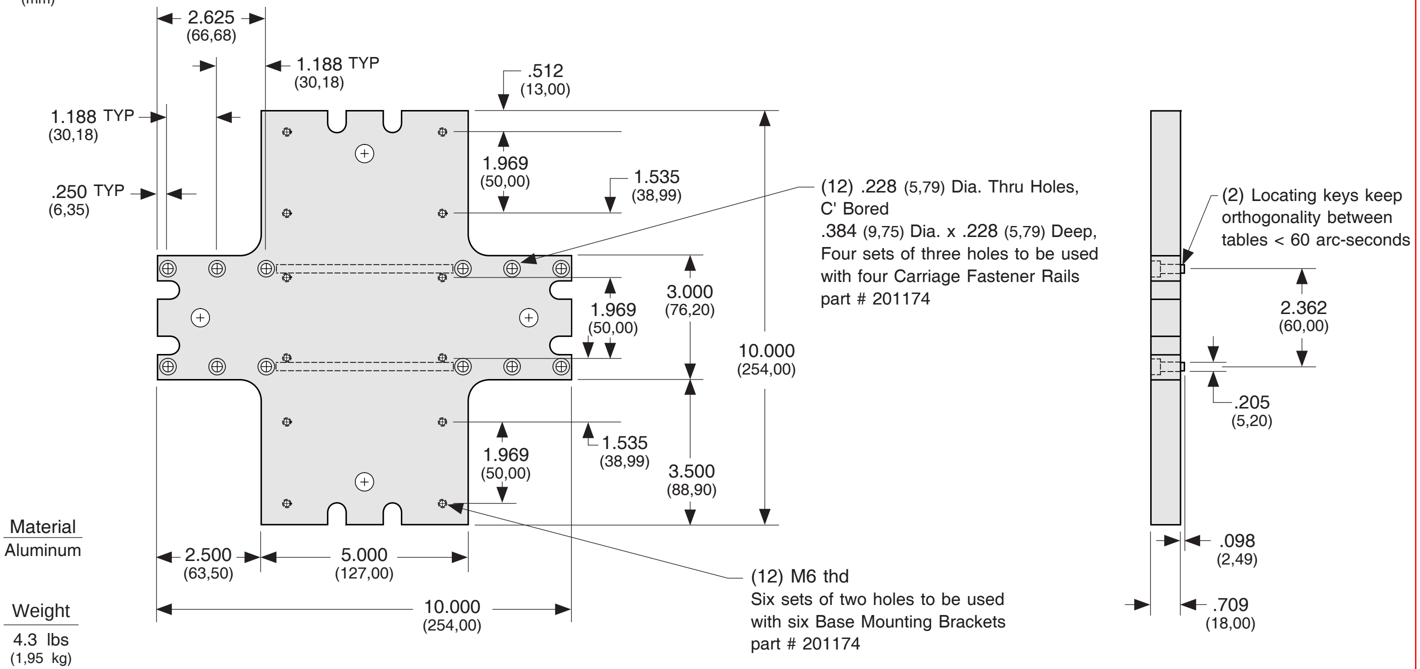
| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Table Input Shaft - *RPS* : | 2.5 | 5.0 | 7.4 | 9.9 | 12.4 | 14.9 | 17.3 | 19.8 |
| Gearhead Input *(3:1 ratio)* - *RPS* : | 7.4 | 14.9 | 22.3 | 29.7 | 37.2 | 44.6 | 52.0 | 59.5 |
| Gearhead Input *(5:1 ratio)* - *RPS* : | 12.4 | 24.8 | 37.2 | 49.6 | 62.0 | 74.3 | 86.7 | 99.1 |
| Gearhead Input *(10:1 ratio)* - *RPS* : | 24.8 | 49.6 | 74.3 | 99.1 | 123.9 | 148.7 | 173.5 | 198.2 |

**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.

## Carriage Adapter Plate (550 Base to 550 Carriage)

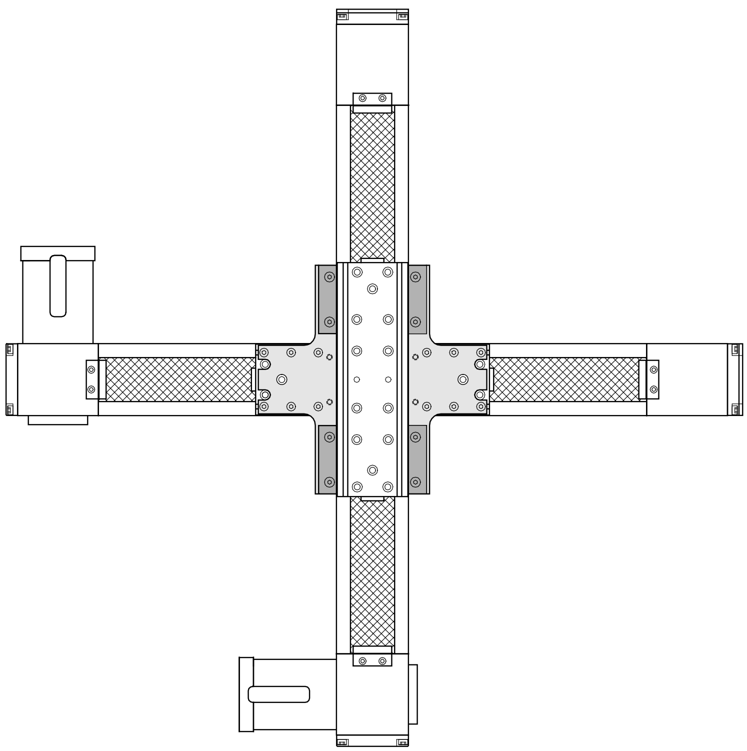
Optional carriage adapter plates assist in the creation of simple X-Y, X-Z, and X-Y-Z multiple axis systems. Using one of the adapter plates below, allows a 550 series table to be mounted on top of a second 550 series table in order to make an X-Y axes system (see below). Also, using two of the adapter plates below, allows a 550 series table to be mounted on top of two 550 series tables in order to make an X-Y axes gantry system (see page K-14).

**Part # 201353**




Material
Aluminum

Weight
4.3 lbs
(1,95 kg)



**Mounting Hardware Kit**
**Part # 202023**

a) 4 Carriage Fastener Rails
b) 4 Base Mounting Brackets
c) 12 M5 x 20 mm Bolts
d) 8 M6 x 30 mm Bolts

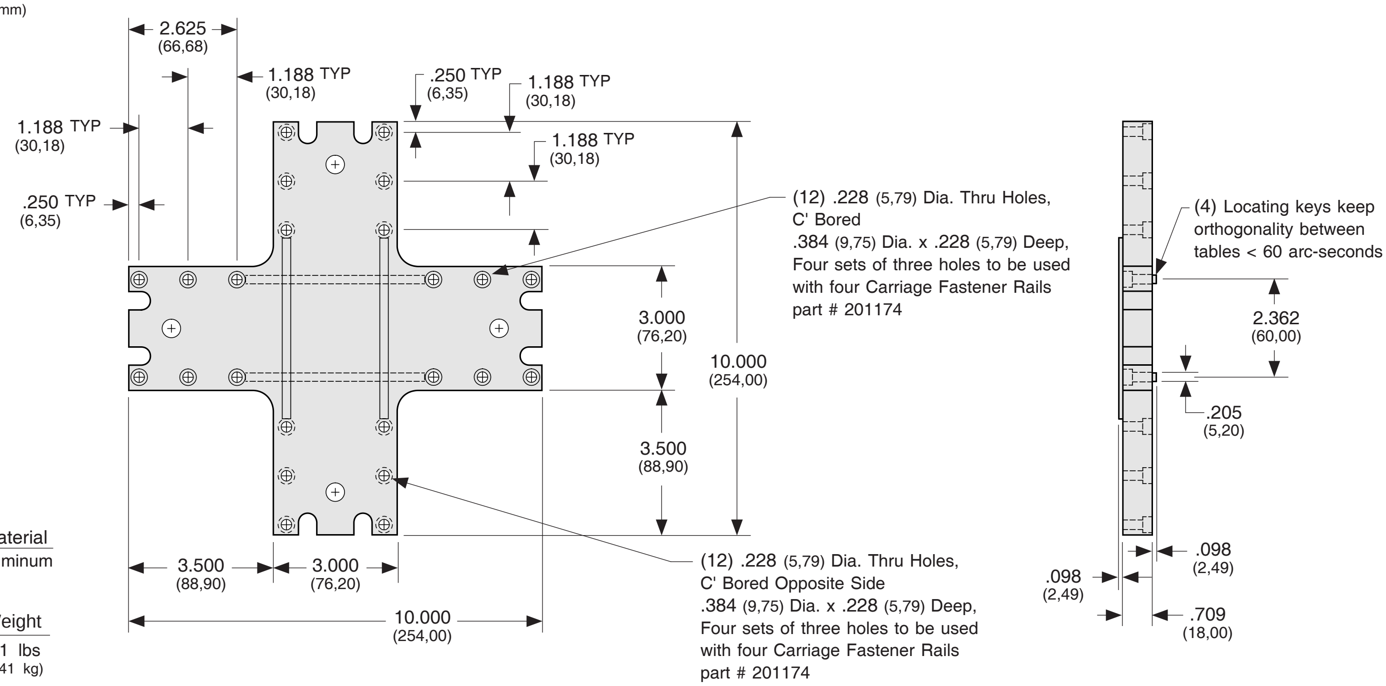
**Mounting Hardware Kit**
**Part # 202024**

a) 4 Carriage Fastener Rails
b) 6 Base Mounting Brackets
c) 12 M5 x 20 mm Bolts
d) 12 M6 x 30 mm Bolts

## Carriage Adapter Plate (550 Carriage to 550 Carriage)

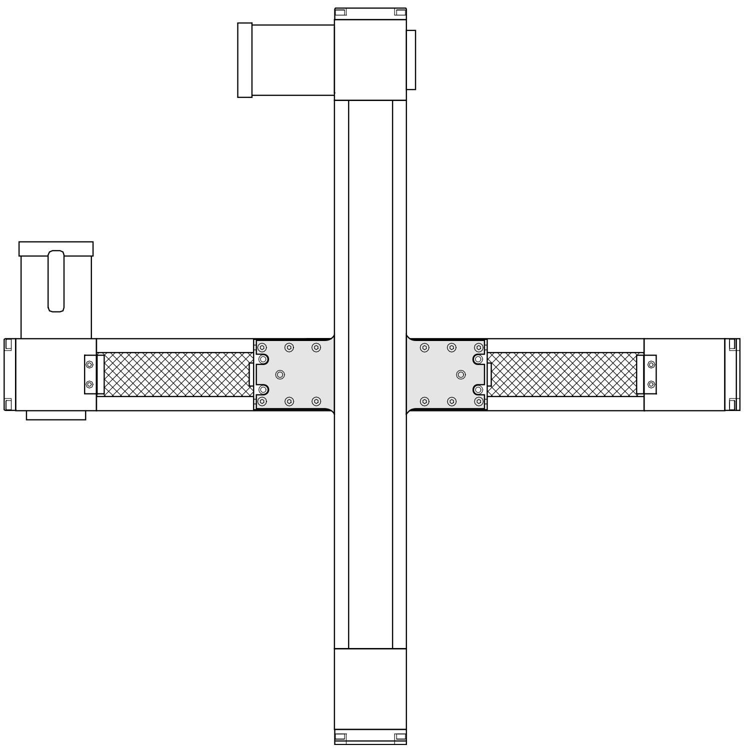
Optional carriage adapter plates assist in the creation of simple X-Y, X-Z, and X-Y-Z multiple axis systems. The adapter plate below allows two 550 series tables to be mounted carriage to carriage in order to make an X-Y axes system.

**Part # 201173**




Material
Aluminum

Weight
3.1 lbs
(1,41 kg)



**Mounting Hardware Kit**
**Part # 202025**

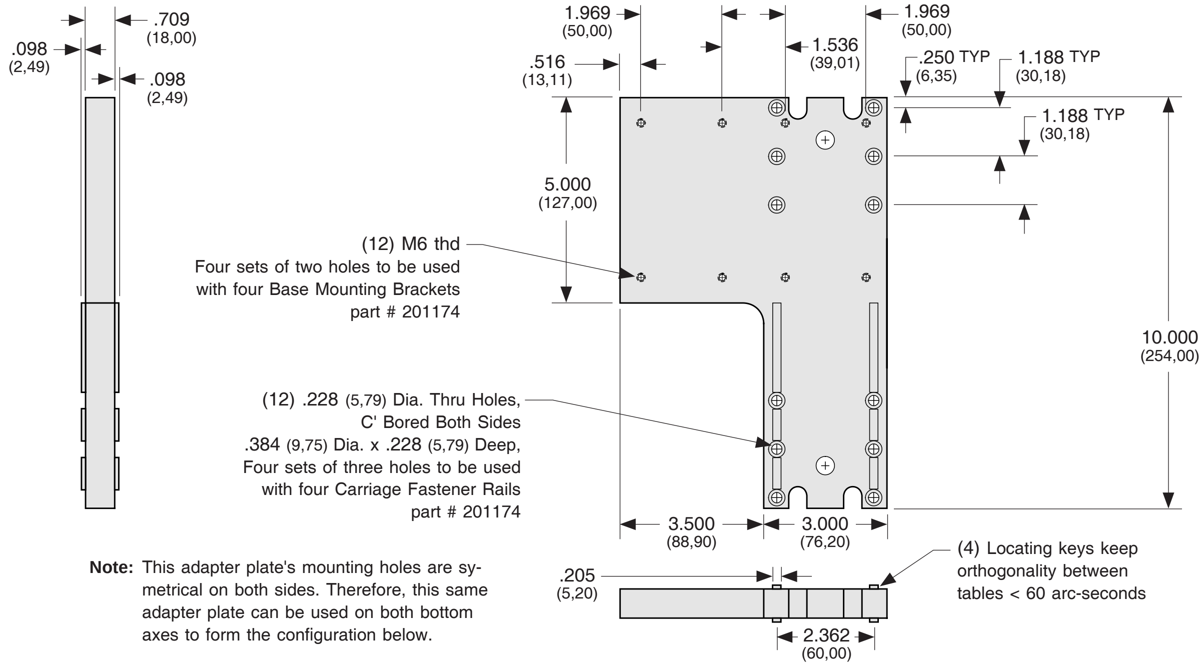
a) 8 Carriage Fastener Rails
b) 24 M5 x 20 mm Bolts

## Carriage Adapter Plate (550 Base to 550 Carriage)

Optional carriage adapter plates assist in the creation of simple X-Y, X-Z, and X-Y-Z multiple axis systems. Using one of the adapter plates below, allows a 550 series table to be mounted on top of a second 550 series table in order to make an X-Y axes system (see page K-12). Also, using two of the adapter plates below, allows a 550 series table to be mounted on top of two 550 series tables in order to make an X-Y axes gantry system (see below).

### Part # 201742

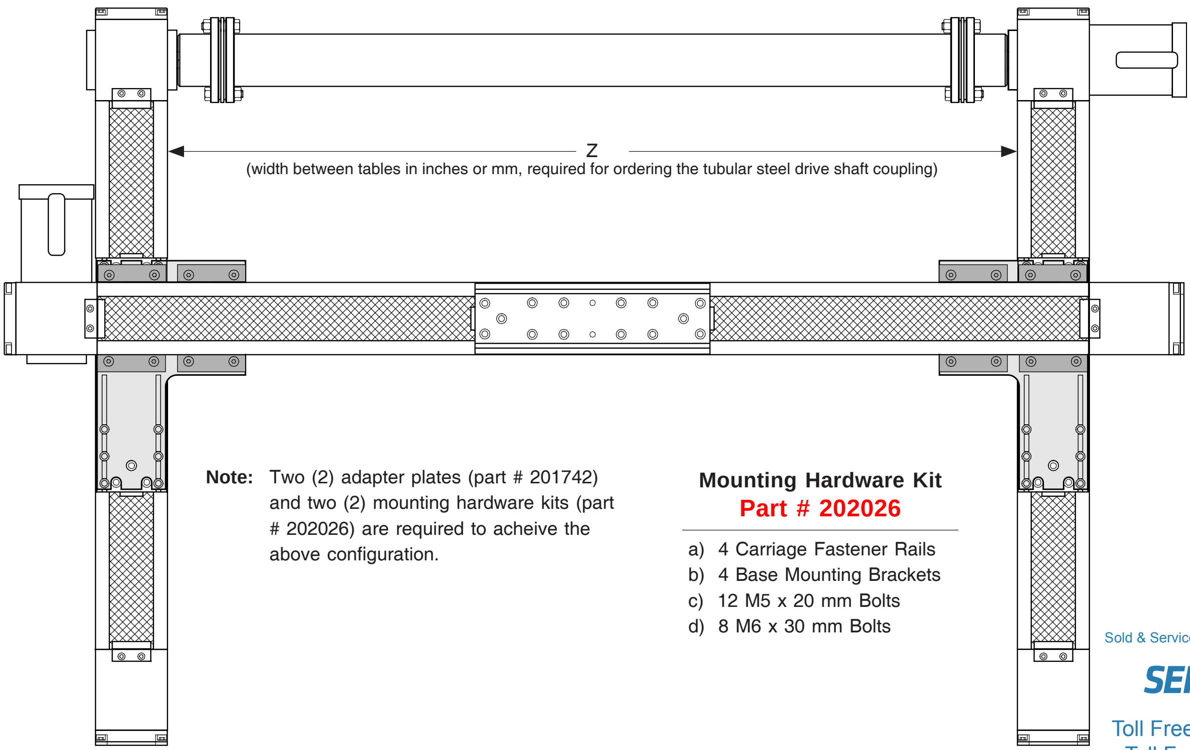
inches
(mm)




Material
Aluminum

Weight
3.3 lbs
(1,50 kg)

**Note:** This adapter plate's mounting holes are symetrical on both sides. Therefore, this same adapter plate can be used on both bottom axes to form the configuration below.




**Note:** Two (2) adapter plates (part # 201742) and two (2) mounting hardware kits (part # 202026) are required to acheive the above configuration.

**Mounting Hardware Kit**
**Part # 202026**

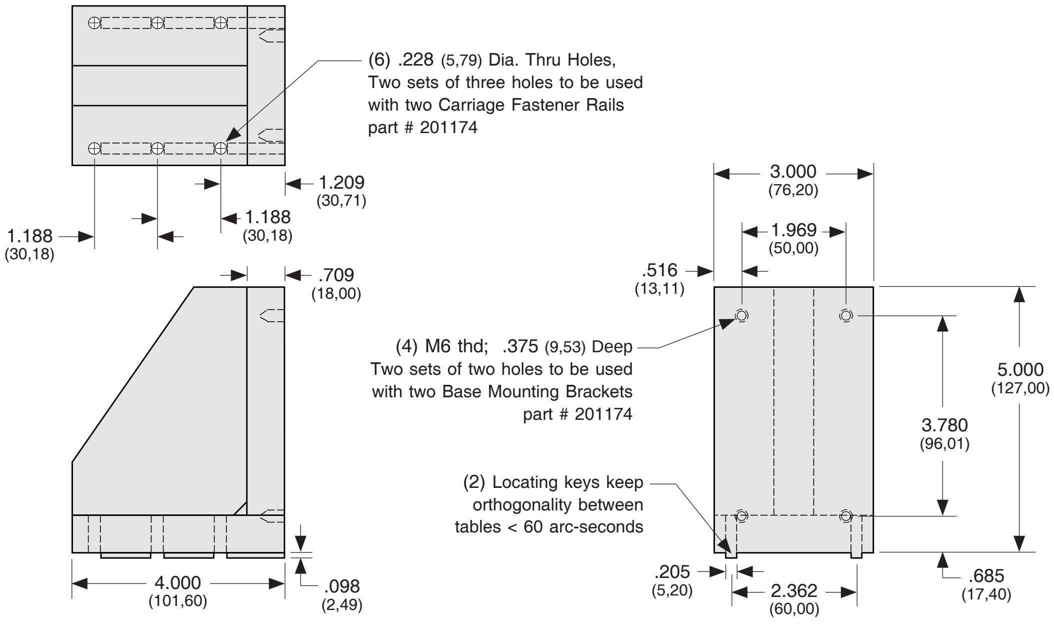
a) 4 Carriage Fastener Rails
b) 4 Base Mounting Brackets
c) 12 M5 x 20 mm Bolts
d) 8 M6 x 30 mm Bolts

## Horizontal Adapter Bracket (550 Series Base to 550 Carriage)

Optional horizontal adapter brackets assist in the creation of simple X-Y, X-Z, and X-Y-Z multiple axis systems. Using one of the adapter plates below, allows a 550 series table to be mounted on top of a second 550 series table in order to make an X-Y axes system. Also, using two of the adapter plates below, allows a 550 series table to be mounted on top of two 550 series tables in order to make an X-Y axes gantry system (see below).

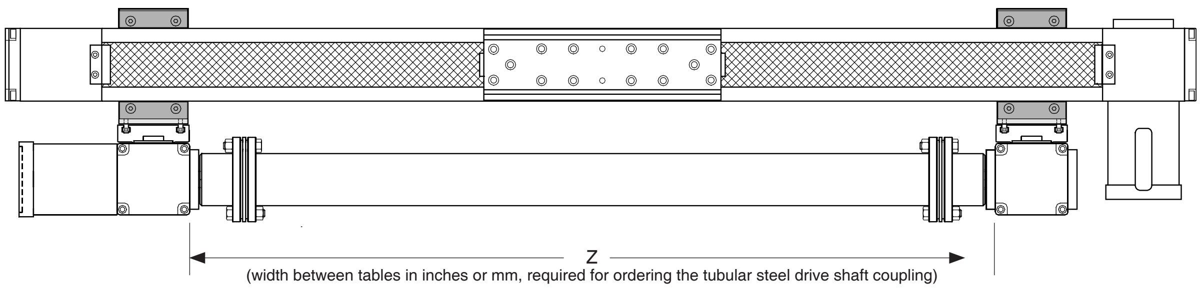
inches
(mm)

**Part # 201171**




Material
Aluminum

Weight
2.7 lbs
(1,22 kg)




### Tubular Steel Drive Shaft Coupling

| | |
|---|---|
| Material | - Steel |
| Torsional Stiffness | - 62,690 ft-lbs/rad (85,000 M-m/rad) |
| Bore both sides | - 18 mm with 5 mm keyway |
| Maximum Length | - 118 inches (3 meters) |
| Maximum Speeds: | |

| Length (Z) (inches) | Length (Z) (mm) | Max Speed (rpm) |
|---|---|---|
| 20 | 500 | 3000 |
| 40 | 1000 | 3000 |
| 60 | 1500 | 2600 |
| 80 | 2000 | 1450 |
| 100 | 2500 | 950 |
| 118 | 3000 | 650 |

**Note:** Two (2) adapter plates (part # 201171) and two (2) mounting hardware kits (part # 202027) are required to acheive the above configuration.

### Mounting Hardware Kit
**Part # 202027**

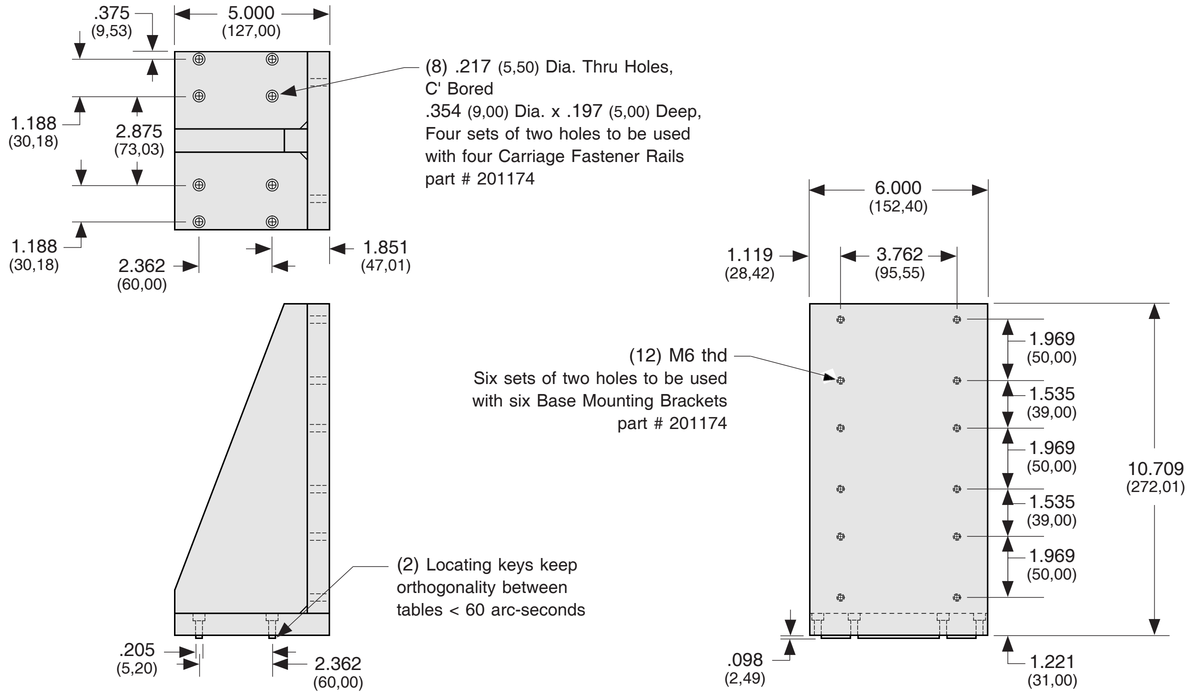
a) 2 Carriage Fastener Rails
b) 2 Base Mounting Brackets
c) 6 M5 x 20 mm Bolts
d) 4 M6 x 30 mm Bolts

## Vertical Adapter Bracket (550 Base to 550 Carriage)

Optional vertical adapter brackets assist in the creation of simple X-Y, X-Z, and X-Y-Z multiple axis systems. The vertical adapter bracket below allows a 550 series table to be mounted on top of a second 550 series table in order to make an X-Z axes system.

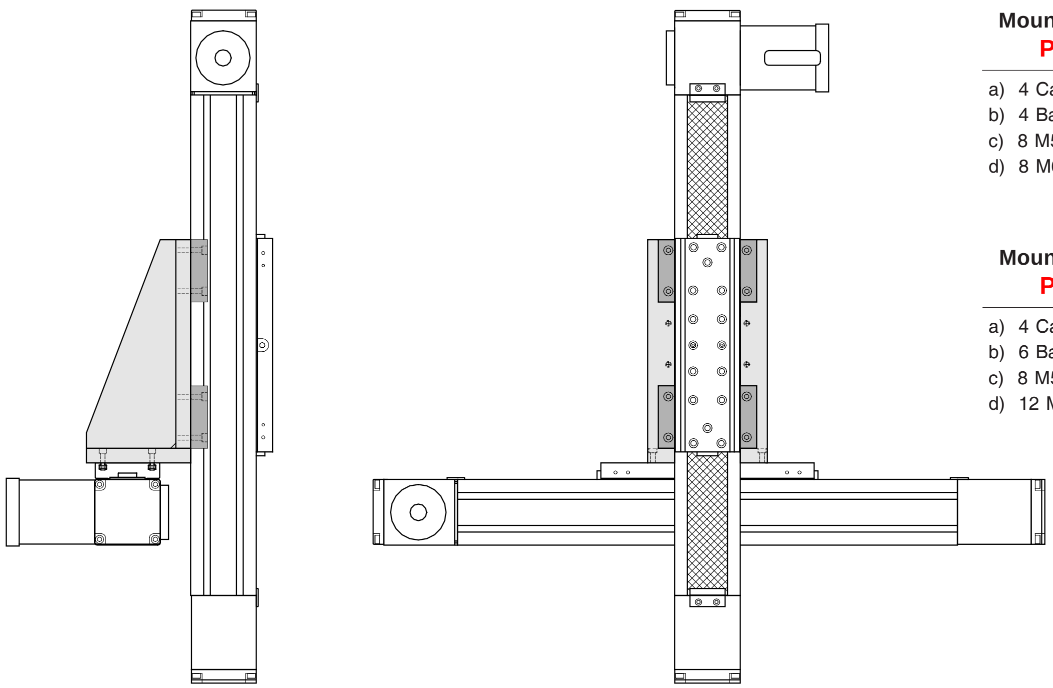
**Part # 201724**

inches
(mm)




Material
Aluminum

Weight
5.5 lbs
(2,50 kg)



**Mounting Hardware Kit**
**Part # 202028**

a) 4 Carriage Fastener Rails
b) 4 Base Mounting Brackets
c) 8 M5 x 20 mm Bolts
d) 8 M6 x 30 mm Bolts

**Mounting Hardware Kit**
**Part # 202029**

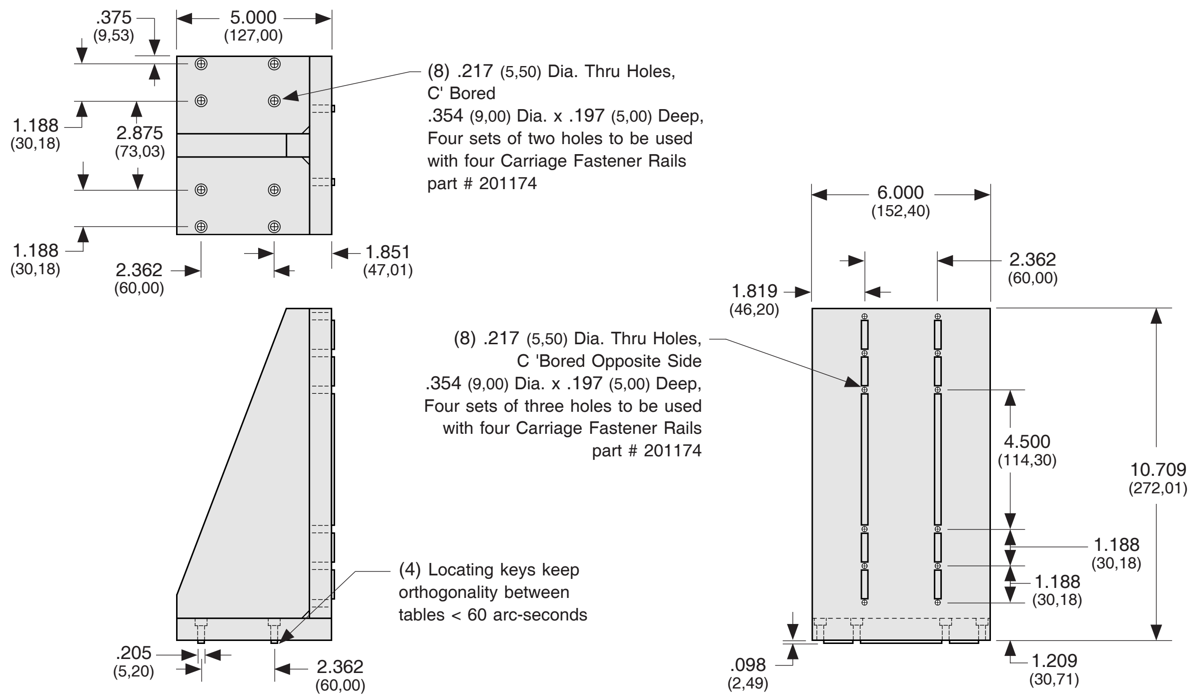
a) 4 Carriage Fastener Rails
b) 6 Base Mounting Brackets
c) 8 M5 x 20 mm Bolts
d) 12 M6 x 30 mm Bolts

## Vertical Adapter Bracket (550 Carriage to 550 Carriage)

Optional vertical adapter brackets assist in the creation of simple X-Y, X-Z, and X-Y-Z multiple axis systems. The vertical adapter bracket below allows two 550 series tables to be mounted carriage to carriage in order to make an X-Z axes system.

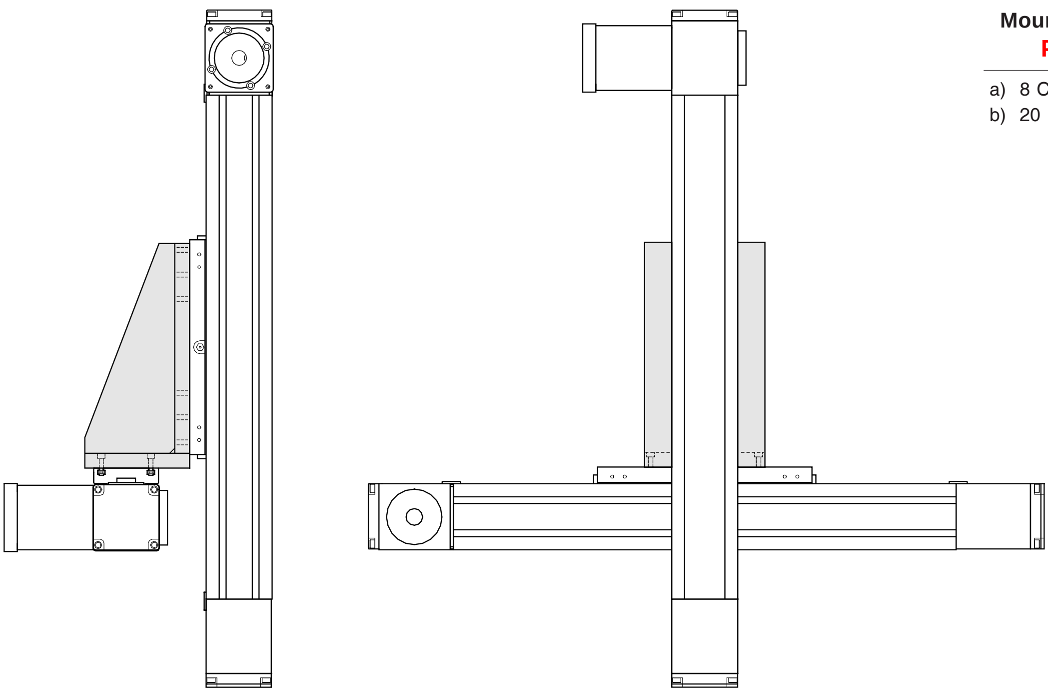
**Part # 201738**

inches
(mm)




Material
Aluminum

Weight
5.5 lbs
(2,50 kg)



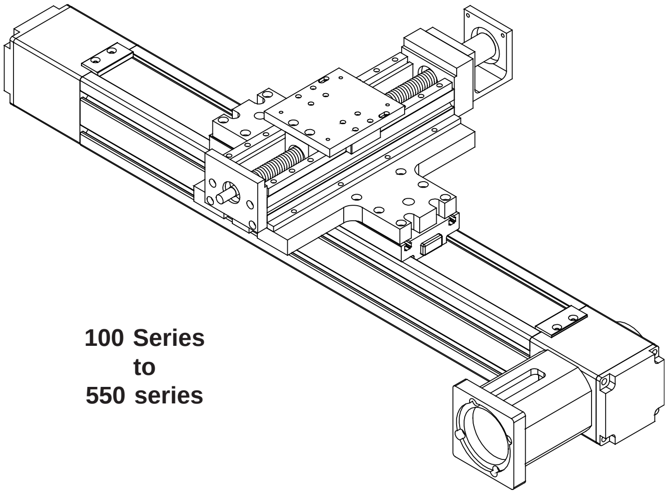
**Mounting Hardware Kit**
**Part # 202030**

a) 8 Carriage Fastener Rails
b) 20 M5 x 20 mm Bolts

## Multi-Axis Configurations

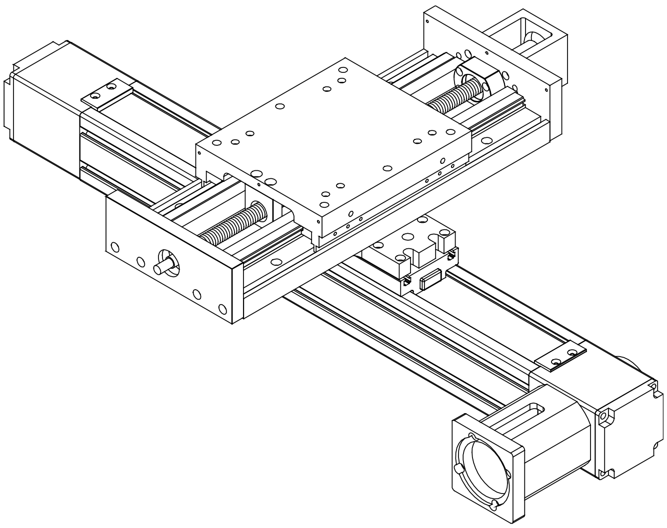
*LINTECH* can provide various adapter plates, horizontal adapter brackets, and vertical adapter brackets to facilitate the construction of X-Y, X-Z, and X-Y-Z multiple axis configurations using its many different standard positioning systems.

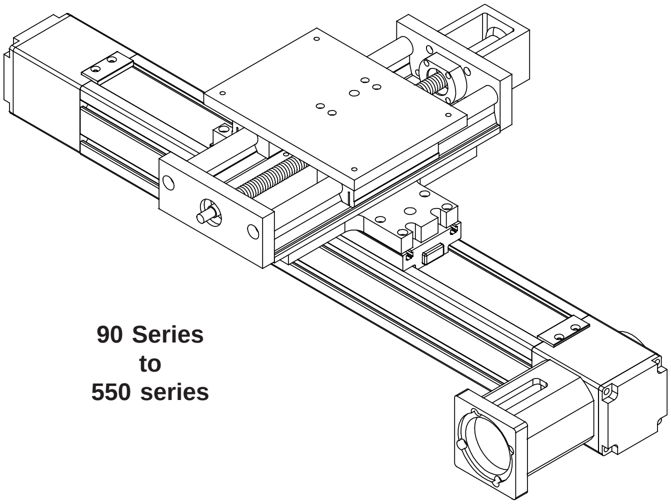
### (X-Y) Configurations



100 Series
to
550 series

150 Series
to
550 series



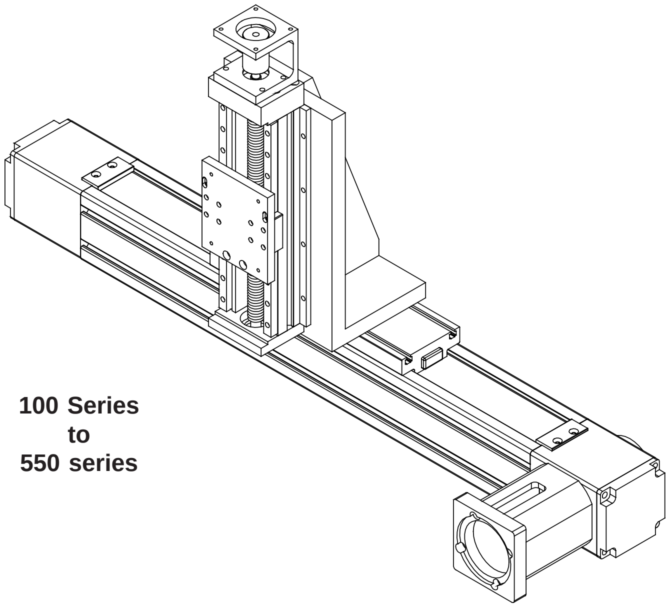


90 Series
to
550 series

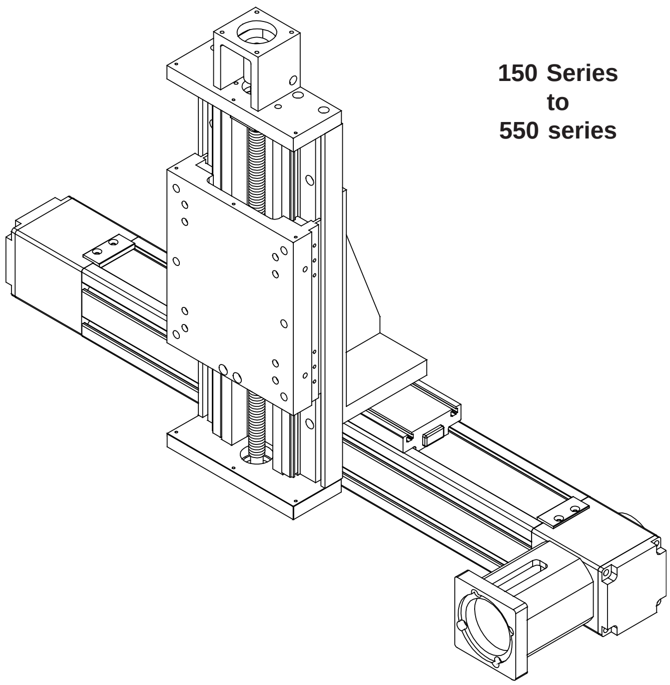
## Multi-Axis Configurations

*LinTech* can provide various adapter plates, horizontal adapter brackets, and vertical adapter brackets to facilitate the construction of X-Y, X-Z, and X-Y-Z multiple axis configurations using its many different standard positioning systems.

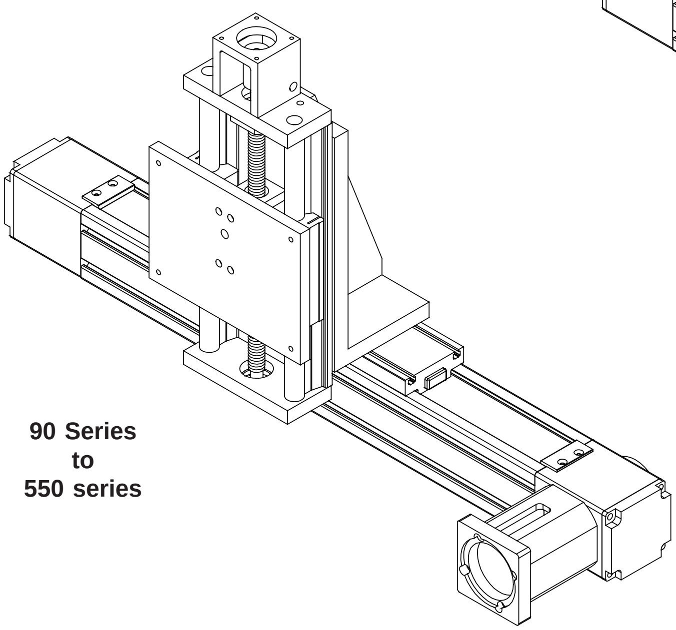
### (X-Z) Configurations



**100 Series to 550 series**



**150 Series to 550 series**



**90 Series to 550 series**

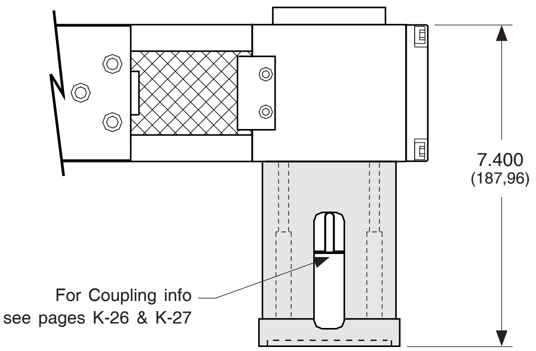
## NEMA 34 & NEMA 42 Motor Mounts

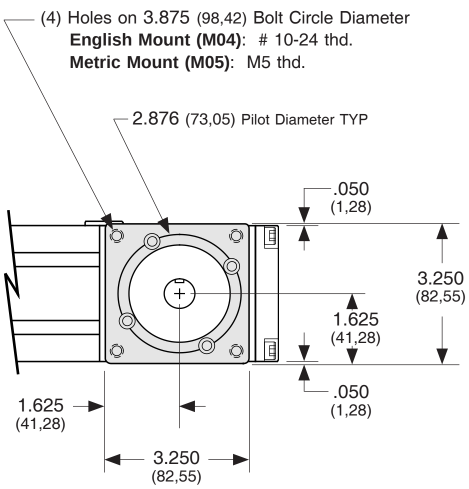
NEMA 34 & 42 motor mounts can be ordered with either English, or Metric threads. *LINTECH* can provide adapter brackets for any step motor, or servo motor, that has other mounting requirements.

### NEMA 34 Mount

**(M04 & M05)**

inches
(mm)



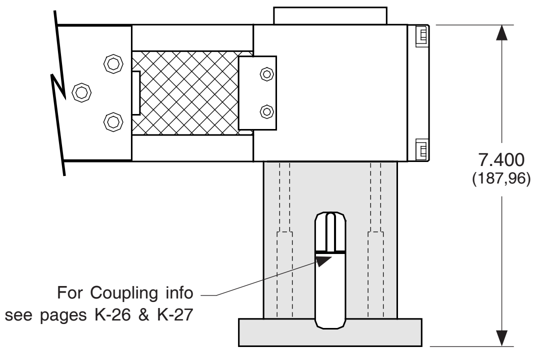

Material
Aluminum

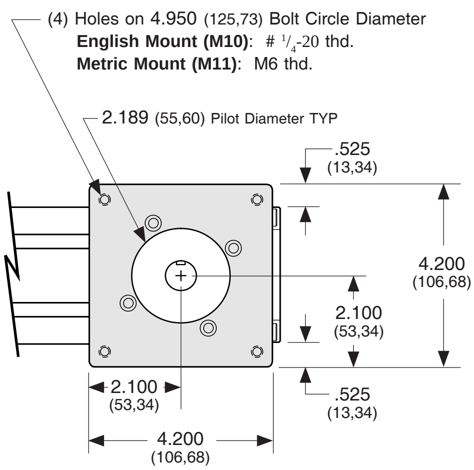
Weight
1.500 lbs
(0,680 kg)

### NEMA 42 Mount

**(M10 & M11)**

inches
(mm)




Material
Aluminum

Weight
1.600 lbs
(0,726 kg)

## Chrome Plated Linear Bearings & Rails

For applications in high moisture, high humidity, clean room, or highly corrossive environments, chrome plating of the linear bearings, and linear rails, 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, 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. This chrome plating process differs from a normal hard chrome plate which just lays on the surface of the part plated.

## End of Travel (EOT) Switches & Home Switch

*LINTECH* provides several options for EOT & home switches. When ordered with a *LINTECH* 550 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 both sides of the 550 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

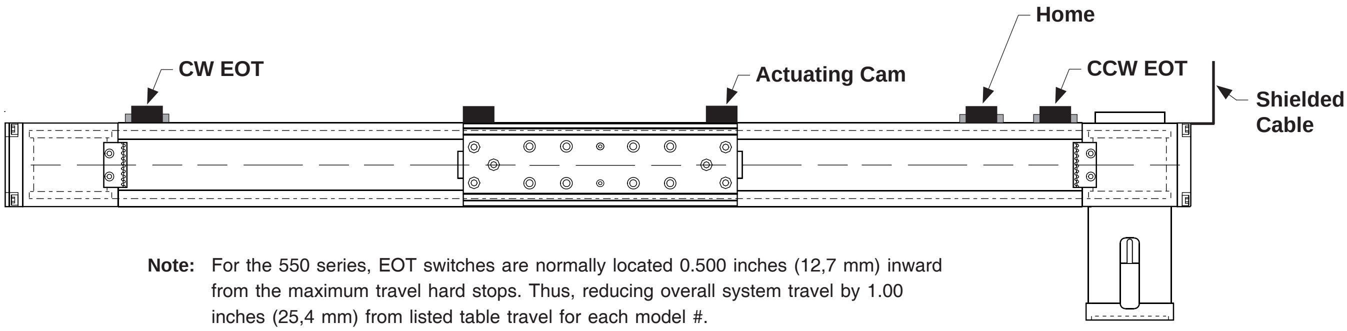
End of travel (EOT) switches can be utilized by a motion controller to stop carriage motion, thereby preventing any damage to personnel, table carriage, or user mounted load if the extreme end of travel has been reached by the carriage. There are two EOT switches mounted to the side of the table, one 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 550 series, EOT switches are normally located 0.500 inches (12,7 mm) inward from the maximum travel hard stops. Thus, reducing overall system travel by 1.00 inches (25,4 mm) from listed table travel for each model #.

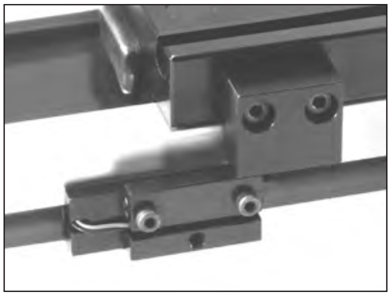
**Note:** Each switch can be located anywhere along the T-slots, which run on both sides of the table.

| Switch Type | Cost | Repeatability inches (microns) | Actuated | Power Supply Required | Activation Area inches (mm) | Comments |
|---|---|---|---|---|---|---|
| **reed** | least expensive | +/- 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 |

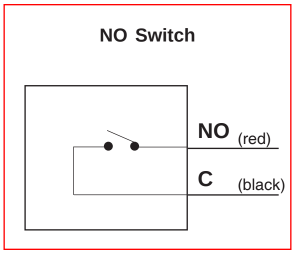
**Note:** The repeatability of any switch is dependent upon several factors: carriage speed, accel rate, load weight, switch style, and the position controller. *LINTECH*'s ratings are based upon a carriage speed of 0.5 inches/sec (12.7 mm/sec) and a no load condition.

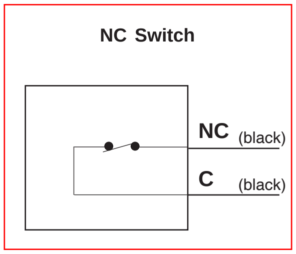
## End of Travel (EOT) Switches & Home Switch

### *Non-Contact Reed Switches*



| | |
|---|---|
| Repeatability | : +/- 0.0020 inch (50 microns) |
| Electrical | : 1.0 amps @ 125 VAC<br>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 | : 0.45 inch (11,4 mm) (EOT switches)<br>0.45 inch (11,4 mm) (Home switch) |
| Individual Switch Wiring | : 12 inch (305 mm) leads |



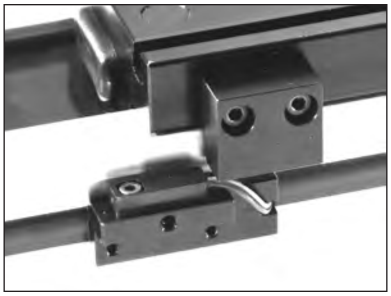

Standard *LinTech* Wiring *(provided when switch option is ordered with any table)* : from table end plate, 10 foot (3 m) shielded cable, 6 conductor, 24 AWG, unterminated leads

| Wire Color | Description | | |
|---|---|---|---|
| *Black* | CW EOT | (black) | NC |
| *Blue* | CW Common | (black) | |
| *Red* | CCW EOT | (black) | NC |
| *White* | CCW Common | (black) | |
| *Brown* | HOME | (red) | NO |
| *Green* | HOME Common | (black) | |
| *Silver* | Shield | | |

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

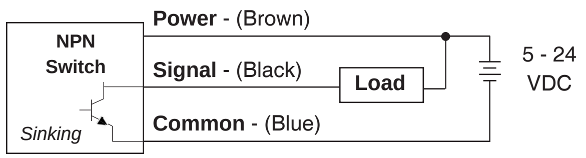
## End of Travel (EOT) Switches & Home Switch

### *Non-Contact Hall Effect Switches*



| | |
|---|---|
| Repeatability | : +/- 0.0002 inch (5 microns) |
| Electrical | : 5 - 24 VDC<br>15 mA - power input<br>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 | : 0.45 inch (11,4 mm) (EOT switches)<br>0.45 inch (11,4 mm) (Home switch) |
| Individual Switch Wiring | : 12 inch (305 mm) leads |

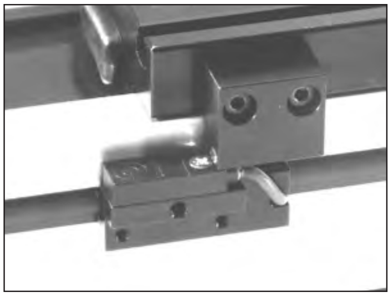
NPN wiring connection - both NC & NO




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

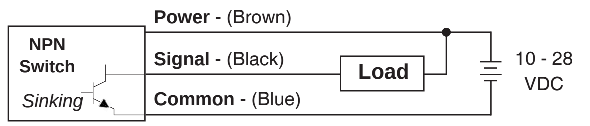
| Wire Color | Description | | | |
|---|---|---|---|---|
| *Brown* | CW Power | (brown) | switch | NC |
| *Black* | CW EOT | (black) | | |
| *Blue* | CW Common | (blue) | | |
| *Red* | CCW Power | (brown) | switch | NC |
| *White* | CCW EOT | (black) | | |
| *Green* | CCW Common | (blue) | | |
| *Orange*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

### *Non-Contact Proximity Switches*

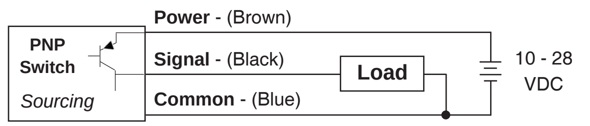


| | |
|---|---|
| Repeatability | : +/- 0.0002 inch (5 microns) |
| Electrical | : 10 - 28 VDC<br>15 mA - power input<br>100 mA max - signal |
| Actuation Style | : non-magnetic cam |
| Activation Area | : 1.75 inches (44,45 mm) of travel |
| Temperature Range | : - 25° C to + 75° C |
| Environment | : IEC IP67 wash down |
| Added Table Width | : 0.45 inch (11,4 mm) (EOT switches)<br>0.45 inch (11,4 mm) (Home switch) |
| Individual Switch Wiring | : 6.5 foot (2 m) cable for NPN<br>: 3.3 foot (1 m) cable for PNP |

NPN wiring connection - both NC & NO




NPN wiring connection - both NC & NO



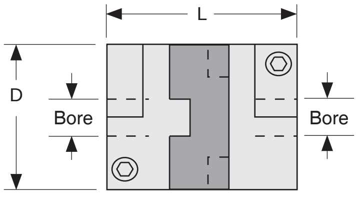

Standard *LINTECH* Wiring
*(provided when switch option is ordered with any table)*
: from table end plate, 10 foot (3 m) shielded cable; 9 conductor, 24 AWG, unterminated leads

| 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 | | | |

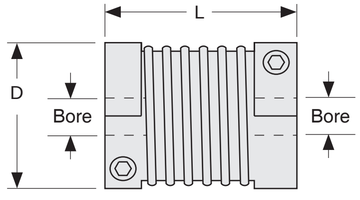
## Motor Couplings

*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 & belt drive 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.

**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** Table | Motor | Minimum (in) | Minimum (mm) | Maximum (in) | Maximum (mm) | **Weight** ounces (grams) | **Inertia** oz-in² (g-cm²) | **Wind-up** arc-sec/oz-in (deg/N-m) | **Max Torque** oz-in (N-m) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **H197-018-aaa** | 1.97 (50,0) | 2.35 (59,7) | **018** | **aaa** | .375 | 10 | .750 | 20 | 7.6 (215) | 3.69 (674) | 1.1 (0,043) | 3,600 (25,4) |
| **H225-018-aaa** | 2.25 (57,2) | 3.07 (78,0) | **018** | **aaa** | .500 | 12 | 1.000 | 24 | 13.1 (371) | 8.29 (1516) | 0.6 (0,024) | 5,300 (37,4) |
| **G177-018-aaa** | 1.77 (45,0) | 2.48 (63,0) | **018** | **aaa** | .375 | 10 | .750 | 20 | 7.1 (200) | 2.78 (508) | 0.2 (0,008) | 4,250 (30,0) |
| **G220-018-aaa** | 2.20 (56,0) | 2.56 (65,0) | **018** | **aaa** | .500 | 12 | 1.000 | 24 | 10.6 (300) | 6.41 (1172) | 0.04 (0,002) | 7,100 (50,0) |
| **G260-018-aaa** (1) | 2.60 (66,0) | 3.07 (78,0) | **018** | **aaa** | .625 | 16 | 1.000 | 24 | 21.2 (600) | 17.91 (3276) | 0.03 (0,001) | 9,600 (68,0) |
| Possible values for **aaa** | 375 = .375 inch<br>500 = .500 inch<br>625 = .625 inch<br>750 = .750 inch | | 999 = 1.000 inch | | | 010 = 10 mm<br>012 = 12 mm<br>014 = 14 mm<br>016 = 16 mm | | 018 = 18 mm<br>019 = 19 mm<br>020 = 20 mm<br>024 = 24 mm | | | | |

### Footnotes:

(1) This coupling option can not be used with the optional NEMA 34 & 42 motor mounts because its diameter is too large. Custom motor mounts can be provided upon request. See page K-25 for maximum coupling diameter and length specifications for use with the optional NEMA 34 & 42 motor mounts.

## Motor Couplings

| Coupling | Cost | Torque Capacity | Wind-up | Suggested Motor | Comments |
|---|---|---|---|---|---|
| **H Type** | less expensive | medium | medium | stepper or servo | use for high accels & for starting & stopping large inertia loads |
| **G Type** | more expensive | high | the least | servo | use for very high torque requirements & very high servo accelerations |

| Specification | **550 Series** NEMA 34 & 42 bracket inches (mm) |
|---|---|
| **Shaft extension diameter at motor mount end** | 0.709 (18,0) |
| **Maximum coupling diameter** | 2.300 (58,42) |
| **Maximum coupling length** | 3.100 (78,74) |
| **Note:** Custom brackets available upon request. | |

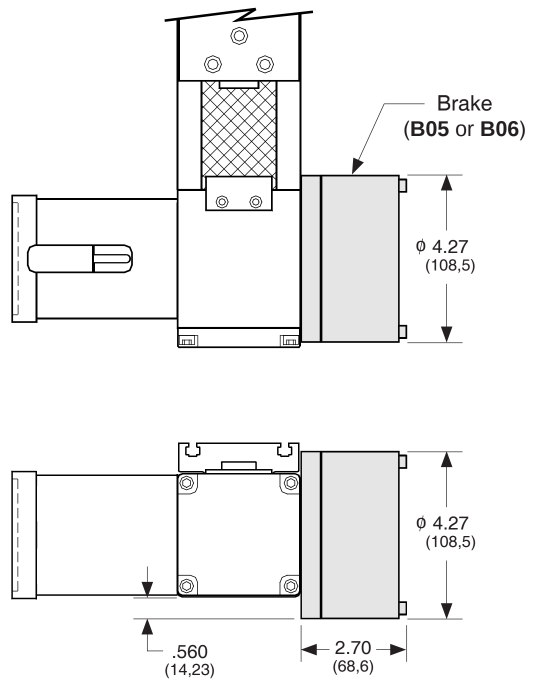
## Coupling Part Numbers

| | |
|---|---|
| **C293** | H197-018-375 |
| **C294** | H197-018-500 |
| **C295** | H197-018-625 |
| **C296** | H197-018-750 |
| **C297** | H197-018-010 |
| **C298** | H197-018-012 |
| **C299** | H197-018-014 |
| **C300** | H197-018-016 |
| **C301** | H197-018-018 |
| **C302** | H197-018-019 |
| **C303** | H197-018-020 |
| **C359** | H225-018-500 |
| **C360** | H225-018-625 |
| **C361** | H225-018-750 |
| **C362** | H225-018-999 |
| **C363** | H225-018-012 |
| **C364** | H225-018-014 |
| **C365** | H225-018-016 |
| **C366** | H225-018-018 |
| **C367** | H225-018-019 |
| **C368** | H225-018-020 |
| **C369** | H225-018-024 |
| **C573** | G177-018-375 |
| **C574** | G177-018-500 |
| **C575** | G177-018-625 |
| **C576** | G177-018-750 |
| **C577** | G177-018-010 |
| **C578** | G177-018-012 |
| **C579** | G177-018-014 |
| **C580** | G177-018-016 |
| **C581** | G177-018-018 |
| **C582** | G177-018-019 |
| **C583** | G177-018-020 |
| **C639** | G220-018-500 |
| **C640** | G220-018-625 |
| **C641** | G220-018-750 |
| **C642** | G220-018-999 |
| **C643** | G220-018-012 |
| **C644** | G220-018-014 |
| **C645** | G220-018-016 |
| **C646** | G220-018-018 |
| **C647** | G220-018-019 |
| **C648** | G220-018-020 |
| **C649** | G220-018-024 |
| **C684** | G260-018-625 |
| **C685** | G260-018-750 |
| **C686** | G260-018-999 |
| **C687** | G260-018-016 |
| **C688** | G260-018-018 |
| **C689** | G260-018-019 |
| **C690** | G260-018-020 |
| **C691** | G260-018-024 |

## 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 550 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 550 series 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) |
|---|---|---|---|---|
| **B05** | 180 (20,3) | 24 VDC | 1.136 | 4.8 (2,18) |
| **B06** | 180 (20,3) | 90 VDC | 0.287 | 4.8 (2,18) |

**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.

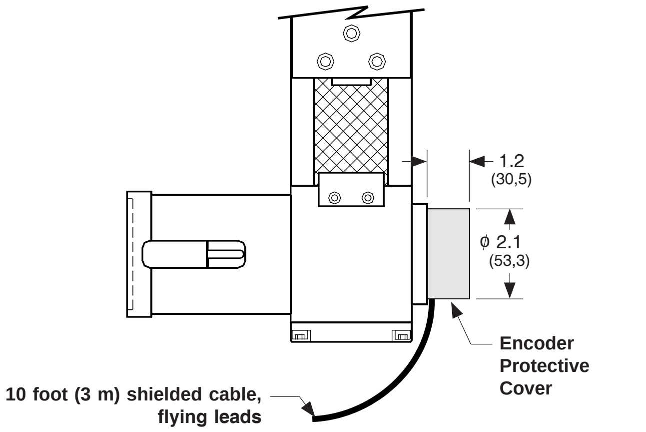
### Power Supplies

| 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 |

## Rotary Incremental Encoders

Shaftless, incremental, optical rotary encoders can be mounted to the "Thru Drive Shaft" option on the 550 series positioning tables. These encoders provide positional feedback to either a motion controller, or a digital position display.

**Rotary Encoder - 550 Series**




| Wire Color | Description |
|---|---|
| *White* | Channel $A^+$ (or A) |
| *Blue* | Channel $A^-$ (or $\overline{A}$) |
| *Green* | Channel $B^+$ (or B) |
| *Orange* | Channel $B^-$ (or $\overline{B}$) |
| *White/Black* | Channel $Z^+$ (or Z) |
| *Red/Black* | Channel $Z^-$ (or $\overline{Z}$) |
| *Black* | Common |
| *Red* | + 5 vdc (+/- 5%) |

| Specification | ROTARY ENCODERS | | |
|---|---|---|---|
| | E01 | E02 | E03 |
| **Line Count** | 500 lines/rev | 1000 lines/rev | 1270 lines/rev |
| **Pre Quadrature Resolution** | 0.002 revs/pulse | 0.001 revs/pulse | 0.00079 revs/pulse |
| **Post Quadrature Resolution** | 0.0005 revs/pulse | 0,00025 revs/pulse | 0.00019 revs/pulse |
| **Maximum Speed** | 50 revs/sec | | |
| **Maximum Accel** | 40 revs/sec$^2$ | | |
| **Excitation Power** | + 5 VDC @ 125 ma | | |
| **Operating Temperature** | 32$^0$ F to 140$^0$ F (0$^0$ C to 60$^0$ C) | | |
| **Humidity** | 20% to 80% non condensing | | |
| **Shock** | 10 G's for 11 msec duration | | |
| **Weight** | 0.7 lbs (0,283 kg) | | |
| **Cable Length** | 10 ft (3 m), unterminated 26 gauge leads | | |
| **Zero Reference Output** | Once per revolution | | |
| **Outputs** | TTL square wave; Two channel (A+ & B+); Differential (A- & B-); Line Driver | | |