



# Linear Servo Motor Driven Positioners

High Speed, High Precision Tables

Positioning systems needed for many of today's high-technology applications must satisfy an ever-increasing demand for high throughput and the need for extreme precision. Semiconductor, fiber optics, computer peripherals, metrology, solar scribing, digital printing, and other high-end industries require positioning systems which demonstrate quick response, high acceleration, high velocity, and fast settling time, in conjunction with micron and submicron level positioning.

Parker's linear motor product group is designed to satisfy this attribute combination of performance and precision. Products and systems in this section feature advanced direct-drive technology, which enables payloads to be directly driven by highly efficient brushless servo motors.

- Velocity up to 5 m/sec.
- Acceleration to 5 Gs
- Encoder resolution to 0.1 microns
- Long life cable management system
- Certified accuracy and repeatability

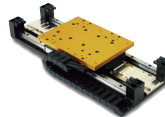
## 400LXR Series Linear Motor Tables



Optimum performance through slotless motor technology and performance-matched mechanical elements and feedback devices.

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## Trilogy Ironless Motor Positioning Tables



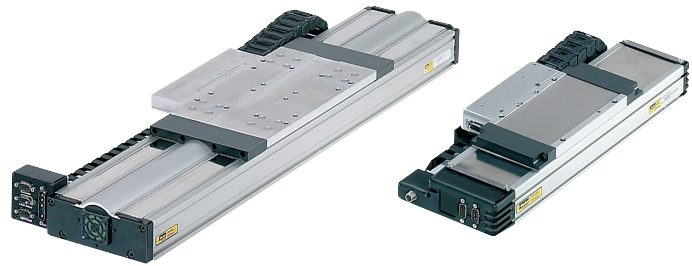
Trilogy motor and positioner combined in a pre-engineered, easily integrated, ready-to-run package.

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# 400LXR Series Linear Motor Tables

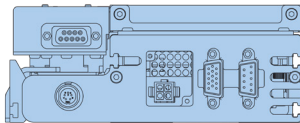
High precision “plug and play” modules

- Pre-engineered package
- Performance matched components
- Protection from environment
- Laser certified precision

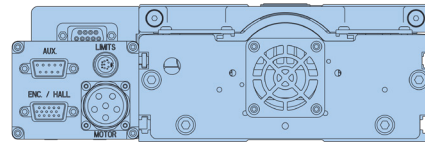


## Typical Enhancements

- Velocity to 3 m/sec.
- Acceleration to 5 Gs
- Encoder resolution to 0.1 microns
- Long life cable management system
- Proven protective strip seal
- Certified accuracy and repeatability



404LXR



406LXR

Series	404LXR	406LXR
Travel (mm)	1000	1950
Load (kg)	45	180
Continuous Force (N)	50	110
Peak Force (N)	180	330

Linear Motor  
Driven Tables

Linear motors cannot function on their own. Before motion can occur, a platform must be engineered to provide support, direction, and feedback for the linear motor. Bearings, cables, connectors, encoder, travel stops, homing sensor and other components must be performance matched and integrated to achieve desired motion and control.

Parker linear motor tables provide all this and more in a pre-engineered, easily mounted, ready to run package. The linear motor magnet rail is mounted to a stationary base and the forcer is mounted to the moveable carriage. The only contact between the moving carriage and the stationary base is through the linear support bearings. High-precision square rail bearings provide load support, low-friction translation, and a precise linear path.

A high resolution linear encoder provides the required velocity and positional information to the motor controller, and a unique cable management system enables high performance motion with a life of 10 million cycles, dependent on motion cycle speeds, acceleration, and environmental condition.

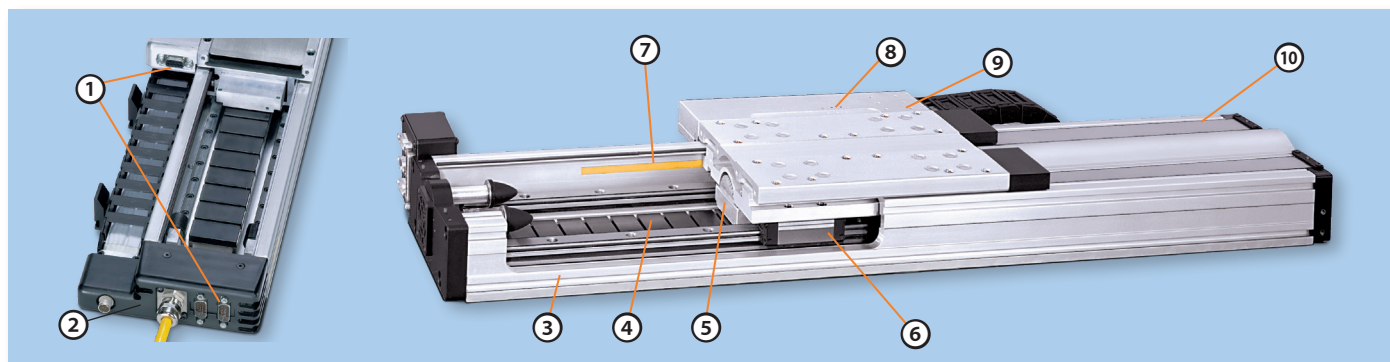
Parker tables, with the slotless linear motor, are offered in two sizes: 404LXR and 406LXR.

The 400LXR Series linear servo motor tables achieve optimum performance by combining slotless motor technology with performance matched mechanical elements and feedback devices. Fast response, high acceleration, smooth translation, high velocity, and quick settling time describe the performance characteristics found in the 400LXR while high repeatability, precise accuracy, and sub-micron resolution

define the positioning attributes.

The 400LXR Tables are offered in two widths (100 and 150mm), and travel lengths up to 2 meters to accommodate the size and performance requirements of many industries including life sciences, photonics, semiconductor, digital printing, solar panel, and general automation.

A vast assortment of “designer friendly” features and options simplify the engineering challenges often confronted with “base model” positioning devices. Features like the IP30 protective strip seal and long life cable management system exemplify the built-in value found in the 400LXR units. Other selectable enhancements like cleanroom compatibility, travel limit sensors, motor drives, encoder resolution, and pinning holes for tooling location, simplify machine design and integration efforts.



### ① “Pass-Through” Cabling

Pre-wired, plug-in connection of the moving payload for easy hookup of user instruments or end effectors.

### ② Connector Panel

Electrically shielded panel provides “plug-in” connectivity and quick disconnect for all signal and power requirements.

### ③ High Strength Aluminum Body

Extruded aluminum housing is precision machined to provide outstanding straightness and flatness.

### ④ Magnet Rail

Single rail of high energy rare earth magnets offers lower weight and lower cost than double magnet type.

### ⑤ Slotless Linear Motor

Provides a highly responsive, zero backlash drive system. Slotless motors offer excellent heat management, durability, and have built-in thermal sensor and hall sensors.

### ⑥ Linear Guidance System

The highly engineered carriage and bearing system effectively counters the combined problematic effects of heat, high-speed and high acceleration.

### ⑦ Integral Linear Encoder

Protected non-contact feedback with selectable resolutions to 0.1 micron. Z channel is factory aligned to home sensor for precise homing.

### ⑧ Limit/Home Sensors

Proximity sensors establish end of travel and “home” location and are easily adjustable over entire length to restrict the travel envelope.

### ⑨ “Quick Change” Cabling

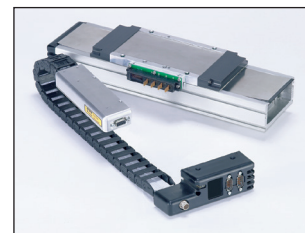
Innovative cable transport module offers extended life (10 million cycles, dependent on motion cycle speeds, acceleration, and environmental condition) and a simple cable changing system for preventative maintenance.

### ⑩ Protective Seals

Hard shell aluminum cover combined with stainless steel strip seals provide IP30 protection to interior components as well as enhances overall appearance.

### “Designer Friendly” Features and Options

A vast assortment of “designer friendly” features and options simplify the engineering challenges often confronted with “base model” positioning devices. Features like the IP30 protective strip seal and long life cable management system exemplify the built-in value found in the 400LXR units. Other selectable enhancements like cleanroom compatibility, travel limit sensors, motor drives, encoder resolution, and pinning holes for tooling location, simplify machine design and integration efforts.



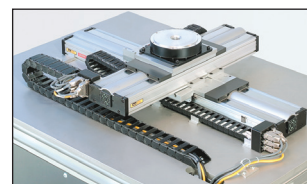
### Flexibility and Multi-Axis Compatibility

The 400LXR's selection flexibility and mounting compatibility with the 400XR ballscrew driven tables enables single-axis or complex multi-axis units to be configured in a straightforward manner. Parker's matching servo drives and motion controllers can be included to complete the motion system.



### Customs and Systems

For specialized applications requiring customization, Parker design engineers can easily modify these tables to suit, or engineer complete interactive linear motion systems to desired specifications. Parker's 400LXR series tables have taken the mystery, difficulty and cost out of integrating linear motor tables into high throughput precision positioning applications.



# SPECIFICATIONS

## 404LXR and 406LXR

## SPECIFICATIONS



The 400LXR Series linear servo motor tables are pre-engineered “plug and play” modules that combine slotless linear motor technology with performance matched mechanical elements.

Model		404LXR	406LXR	
Motor		8 Pole	8 Pole	12 Pole
Rated Load	kg (lb)	45 (99)	180 (396)	180 (396)
Maximum Acceleration		5 Gs		
Maximum Velocity	(m/sec)			
Encoder Resolution:				
0.1 $\mu$ m		0.3	0.3	0.3
0.5 $\mu$ m		1.5	1.5	1.5
1.0 $\mu$ m		3.0	3.0	3.0
5.0 $\mu$ m		3.0	3.0	3.0
Sine Output		3.0	3.0	3.0
Positional Repeatability				
Encoder Resolution:				
0.1 $\mu$ m		$\pm 1.0 \mu$ m		
0.5 $\mu$ m		$\pm 1.0 \mu$ m		
1.0 $\mu$ m		$\pm 2.0 \mu$ m		
5.0 $\mu$ m		$\pm 10.0 \mu$ m		
Sine Output		(Interpolation Dependent)		
Peak Force	N (lb)	180 (40)	225 (50)	330 (75)
Continuous Force	N (lb)	50 (11)	75 (17)	110 (25)
Carriage Mass	(kg)	1.4	3.2	4.1

Linear Motor  
Driven Tables

### Travel Dependent Specifications

Travel (mm)	Accuracy* ( $\mu$ m)			Unit Weight (Kg)		
	Positional Resolution					
	0.1	5.0	Straightness & Flatness	404LXR 8-Pole	406LXR 8-Pole	406LXR 12-Pole
	0.5	1.0				
50	6	16	6	4.4	8.7	11.1
100	7	17	6	4.8	—	—
150	8	18	9	5.2	10.3	13.4
200	10	20	10	5.6	—	—
250	12	22	12	6.0	12.6	14.1
300	14	24	13	6.4	—	—
350	16	26	15	6.8	13.3	15.7
400	18	28	16	7.2	—	—
450	20	30	18	—	14.8	17.2
500	21	31	19	8.0	—	—
550	23	33	21	—	16.4	18.7
600	25	35	22	8.9	—	—
650	26	36	24	—	17.9	20.2
700	28	38	25	9.7	—	—
750	29	39	27	—	19.4	21.8
800	31	41	29	10.6	—	—
850	32	43	30	—	20.9	23.3
900	33	44	32	11.5	—	—
950	34	44	33	—	22.5	—
1000	35	45	35	12.4	—	27.1
1050	37	47	36	—	—	—
1200	39	49	41	—	26.3	—
1350	42	52	45	—	—	30.9
1450	43	53	48	—	30.1	—
1500	44	54	50	—	—	—
1600	45	55	53	—	—	34.7
1700	46	56	56	—	33.9	—
1750	46	56	57	—	—	—
1850	47	57	60	—	—	38.6
1950	48	58	63	—	37.7	—
2000	48	58	65	—	—	—
2350	49	59	76	—	—	—
2500	50	60	80	—	—	—
2850	50	60	84	—	—	—
3000	50	60	84	—	—	—

\* Accuracy stated is at 20° C, utilizing slope correction factor provided

### Encoder Specifications

Description	Specification
Input Power	5 VDC $\pm$ 5% 150 mA
Output (Incremental)	Square wave differential line driver (EIA RS422) 2 channels A and B in quadrature (90°) phase shift.
Reference (Z Channel)	Synchronized pulse, duration equal to one resolution bit. Repeatability of position is unidirectional moving toward positive direction.

### Limit and Home Specifications

Description	Specification
Input Power	+5 to +24 VDC 60 mA (20 mA per sensor)
Output	Output form is selectable with product: Normally Closed Current Sinking Normally Open Current Sinking Normally Closed Current Sourcing Normally Open Current Sourcing All types Sink or Source max of 50 mA
Repeatability	Limits: $\pm$ 10 microns (unidirectional) Home: See Z channel specifications

### Hall Effect Specifications

Description	Specification
Input Power	+5 to +24 VDC, 30 mA
Output	Open Collector, Current Sinking, 20 mA Max



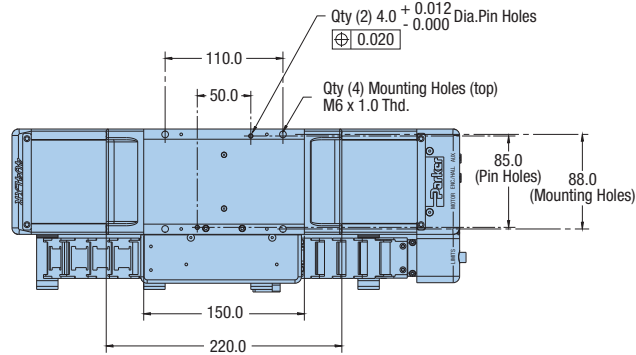
# DIMENSIONS

## 404LXR

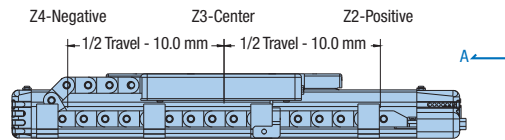
Download 2D & 3D files from  
[www.parker.com/emn/404LXR](http://www.parker.com/emn/404LXR)



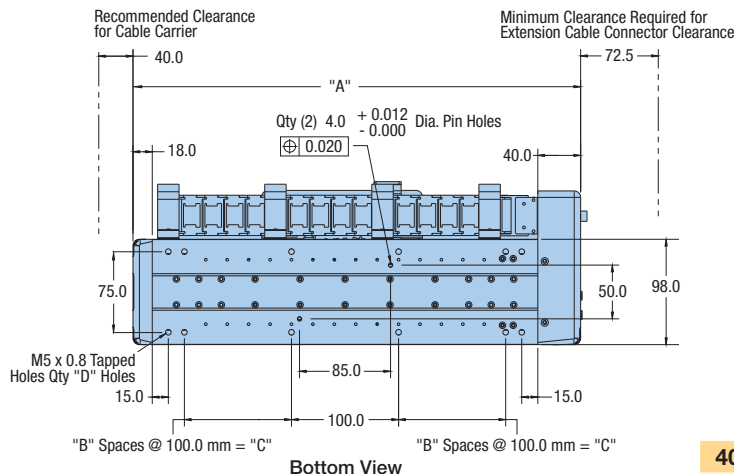
DIMENSIONS



**Top View  
(With Cable Transport Module)**

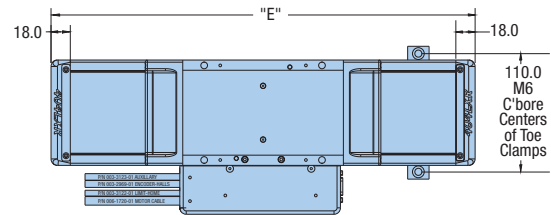


**Front View  
Z-Channel Location**

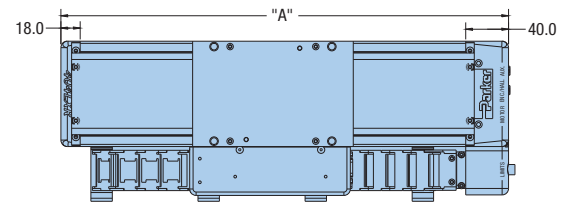


**Bottom View**

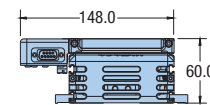
**Dimensions (mm)**



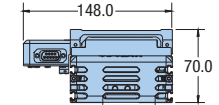
**OEM Cables (Strip Seal/Hardcover)**



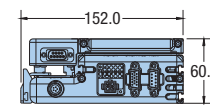
**Cable Module (Strip Seal/Hardcover)**



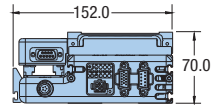
**OEM Cables/Strip Seal**



**OEM Cables/Hardcover**



**Cable Module/Strip Seal**



**Cable Module/Hardcover**

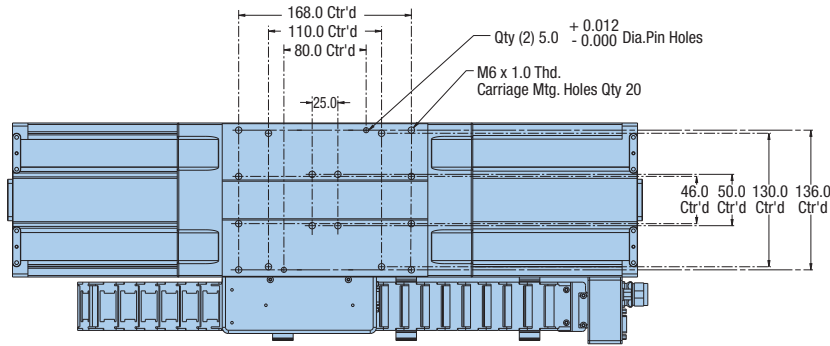
**End Views A-A**

Model	Travel (mm)	Dimensions (mm)				
		A	B	C	D	E
404T00LXR	50	368.0	1	100.0	12	346.0
404T01LXR	100	418.0	1	100.0	12	396.0
404T02LXR	150	468.0	1	100.0	12	446.0
404T03LXR	200	518.0	1	100.0	12	496.0
404T04LXR	250	568.0	1	100.0	12	546.0
404T05LXR	300	618.0	2	200.0	16	596.0
404T06LXR	350	668.0	2	200.0	16	646.0
404T07LXR	400	718.0	2	200.0	16	696.0
404T09LXR	500	818.0	3	300.0	20	796.0
404T11LXR	600	918.0	3	300.0	20	896.0
404T13LXR	700	1018.0	4	400.0	24	996.0
404T15LXR	800	1118.0	4	400.0	24	1096.0
404T17LXR	900	1218.0	5	500.0	28	1196.0
404T19LXR	1000	1318.0	5	500.0	28	1296.0

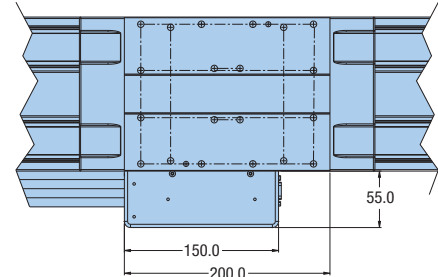


# 406LXR 8 or 12 Pole Slotless Motor

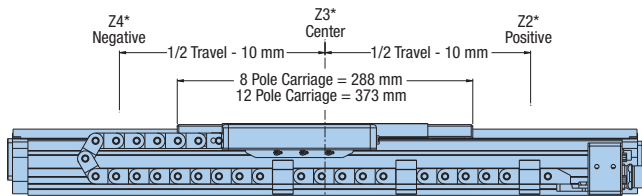
Dimensions (mm)



Top View  
(with Cable Transport Module)

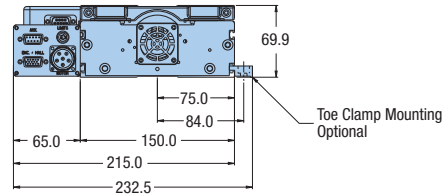


Top View  
(with OEM Cable System)

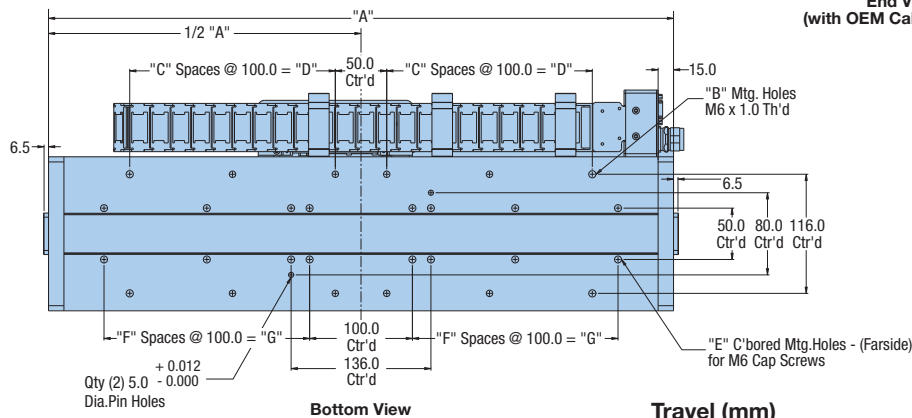


Front View  
(Z-Channel Location)

\*Z2, Z3, Z4 shows Carriage Center-line Location for Selected Z-Channel Position



End View  
(with OEM Cable System)



Bottom View

## Travel (mm)

## Dimensions (mm)

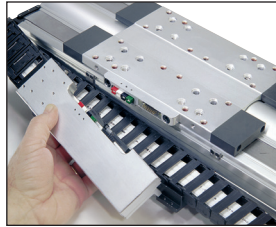
Model	8 Pole	12 Pole	A	B	C	D	E	F	G
406T01LXR	50	—	408	8	1	100.0	12	1	100.0
406T02LXR	150	50	508	8	1	100.0	12	1	100.0
406T03LXR	250	150	608	12	2	200.0	16	2	200.0
406T04LXR	350	250	708	12	2	200.0	16	2	200.0
406T05LXR	450	350	808	16	3	300.0	20	3	300.0
406T06LXR	550	450	908	16	3	300.0	20	3	300.0
406T07LXR	650	550	1008	20	4	400.0	24	4	400.0
406T08LXR	750	650	1108	20	4	400.0	24	4	400.0
406T09LXR	850	750	1208	24	5	500.0	28	5	500.0
406T10LXR	950	850	1308	24	5	500.0	28	5	500.0
406T11LXR	1200	1100	1558	32	7	700.0	32	6	600.0
406T12LXR	1450	1350	1808	36	8	800.0	40	8	800.0
406T13LXR	1700	1600	2058	40	9	900.0	44	9	900.0
406T14LXR	1950	1850	2308	44	10	1000.0	48	10	1000.0

# OPTIONS & ACCESSORIES

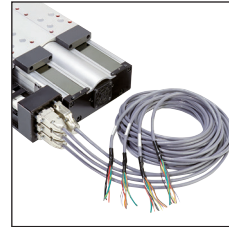
## OPTIONS & ACCESSORIES

### Cable Transport Module

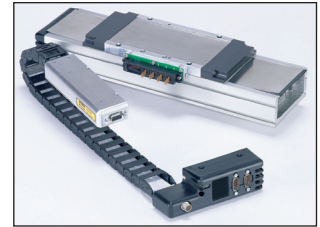
The LXR's Cable Transport Module offers the convenience of "plug and play" connectivity for fast, easy table installation and "quick change" replacement. This system of cable management includes the highest quality high-flex cable with a life rating of 10 million cycles (dependent on motion cycle speeds, acceleration, and environmental condition), a cable track with support brackets, a "quick change" carriage cartridge, and a plug-in connector panel housing. It also provides a "pass-through" connection and cabling for customer application. This transport module option is ideal for high throughput continuous duty requirements where downtime is not acceptable.



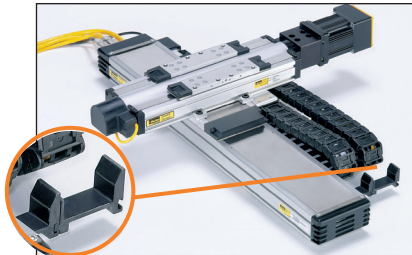
"Quick Change" Cartridge



Cable Extensions – Flying Leads Terminations



404LXR Cable Transport Module



2-Axis System w/Expandable Cable Management

#### Cable Transport Module Order Code

Order Code	Extension Cable	
	Length (m)	Termination
CM02	No Extension Cables	
CM07	3.0	Flying Leads
CM08	7.5	Flying Leads
CM13	3.0	HD15M-VF Connector
CM14	7.5	HD15M-VF Connector
CM17	3.0	HD15M-CF12 Connector
CM18	7.5	HD15M-CF12 Connector

#### Connection Ends



404LXR

406LXR

### OEM Cable System

The LXR's unharnessed cable system is offered for OEMs and others who have independent methods of routing and managing cables. These systems offer the "quick change" cartridge, "pass-through" connection and round high-flex cables in lengths of 3.0 or 7.5 meters. They are available with flying lead end terminations, as well as Gemini connectors.



406LXR with OEM cables and flying leads

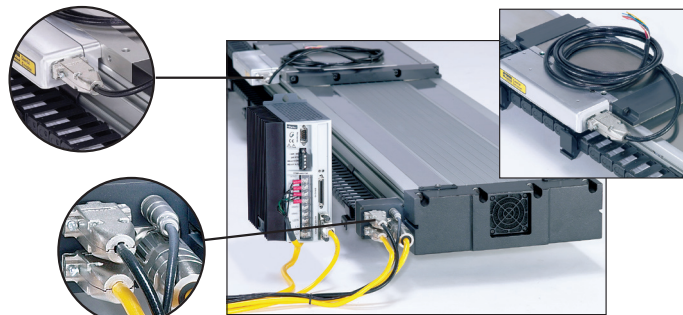
#### OEM Cable System Order Code

Order Code	Extension Cable	
	Length (m)	Termination
CM03	3.0	Flying Leads
CM04	7.5	Flying Leads
CM11	3.0	HD15M-VF Connector
CM12	7.5	HD15M-VF Connector
CM15	3.0	HD15M-CF12 Connector
CM16	7.5	HD15M-CF12 Connector

### User "Pass-Through" Cabling

Cable concerns regarding routing and durability for payload or instrument signals are addressed by the pass-through connectivity feature included with both of the LXR cable management systems. Nine pin D-connectors provided on the carriage (with the transport module units) and the cable connecting block combine with high-flex, long life cables for easy setup and dependable performance.

Note: Extension cables are available and can be ordered separately: 006-1743-01 (3 meters); 006-1743-02 (7.5 meters).



- Pre-wired plug-in connection to the moving payload
- Nine user conductors for end-effectors or instruments
- High-flex long life cables:

Ribbon Cable – Transport Module System  
Round Cable – OEM System

## Cable Connector Configuration

HD15M-VF 15 Pin HD-SUB Plug		HD15M-CF12 15 Pin HD-SUB Plug	
Pin #	Function	Pin #	Function
1	Z+	1	SENSE-
2	Z-	2	SENSE+
3	GND	3	HALL1
4	NO CONN	4	+5V
5	+5V	5	+5V
6	GND	6	HALL2
7	A-	7	A-/SIN-
8	A+	8	A+/SIN+
9	HALL1	9	HALL3
10	TEMP	10	TEMP
11	B-	11	B-/COS-
12	B+	12	B+/COS+
13	HALL2	13	Z+
14	HALL3	14	Z-
15	NO CONN	15	GND
HD15M-VF Connector compatible with IPA, Vix and Aries Feedback Connector		HD15M-CF12 Connector compatible with Compax 3 F12 Feedback Connector	

## Simple Configuration - Digital Drive Options

All digital drives ordered in the LXR part number configuration come set up with a motor file including electrical parameters to set continuous and peak currents, current loop compensation values, and default gain settings. Users will have the ability to override these parameters for special application requirements. Tuning is easy to use and intuitive for users and is available via a variety of methods. The motor and loading information must be known by the drive to determine the baseline tuning gains. These are simple parameter entries the user can complete with the help of standard Parker supplied front-end software tools.

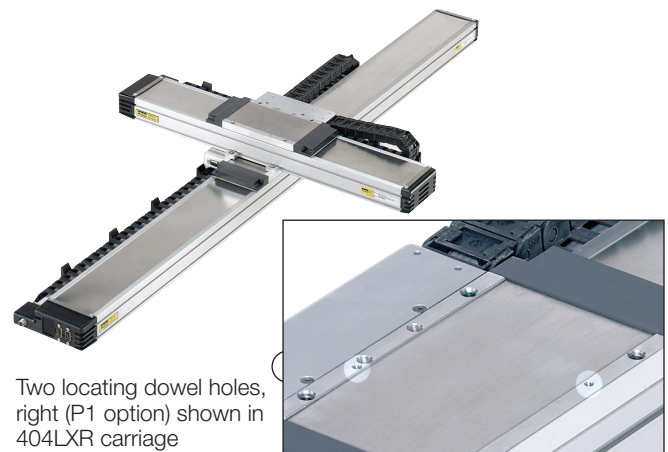


**For complete details on drive product features and specifications, please refer to the “Drives & Controllers” section of this catalog.**

## Dowel Pinning Options **Order Codes: P1 P2 P3**

Standard dowel pin locating holes P1 are offered on all 400LXR units to facilitate repeatable mounting of tooling or payload.

In addition, pinning options P2 and P3 are offered for precise orthogonal mounting of the second axis in a multi-axis system. In this case, the bottom side of the table base is match drilled and reamed to the first axis to provide exact orthogonal location. This convenient option eliminates concerns regarding contamination or damage often associated with machining for locating pins in an assembled unit. In some instances a 404LXR pinning adapter may be required part number 100-9584-01.



Two locating dowel holes, right (P1 option) shown in 404LXR carriage



## Cleanroom Preparation Option

### Order Codes: R2

Cleanroom compatible linear tables are often required for laboratory and production applications in industries such as semiconductor, life science, electronics, and pharmaceuticals.

400LXR tables with cleanroom preparation were tested in Parker's vertical laminar flow work station, which utilizes ULPA filters to produce an environment having a cleanliness of class 1 prior to testing. Tables were tested in a variety of orientations with sampling both below the table and at the carriage mounting surface. Laminar flow rate is 0.65 inches W.C.

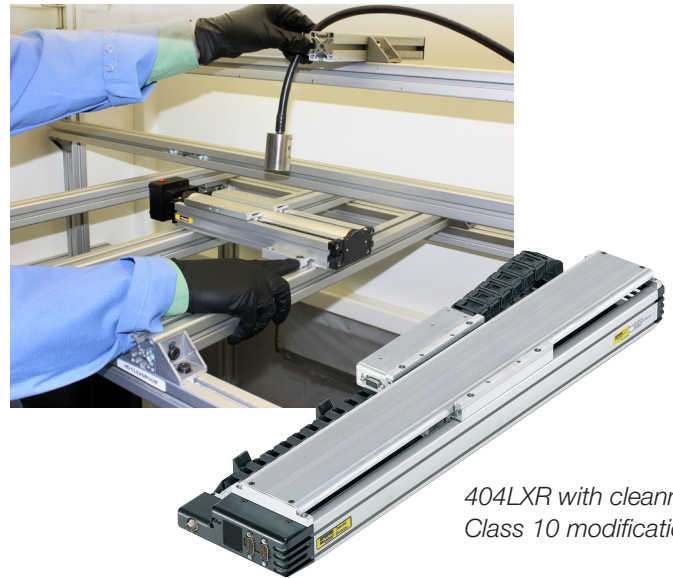
Special cleanroom testing can be provided upon request. For more information on cleanroom testing, contact a Parker Applications Engineer at 800-245-6903.

### About Cleanrooms

A room in which the concentration of airborne particles is controlled within defined limits. Federal Standard 209E statistically defines the allowable number of particles per cubic foot of air.

The chart below describes the conditions that must be maintained for the cleanroom to have a specific "class" rating.

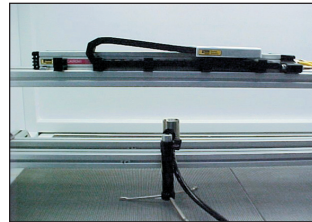
Class	Number of Allowable Particles (Measured particle size in microns $\mu\text{m}$ )				
	0.1	0.2	0.3	0.5	5
1	35	7.5	3	1	0
10	350	75	30	10	0
100	—	750	300	100	0
1000	—	—	—	1000	7
10000	—	—	—	10000	70
100000	—	—	—	100000	700



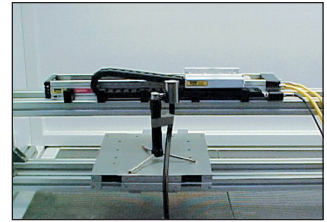
404LXR with cleanroom  
Class 10 modification

### Standard Cleanroom Preparation

- Stringent cleaning and handling measures
- Cleanroom rated lubrication
- Strip seal replaced with hard shell cover



Testing at 4.5 inches below  
table



Testing at carriage mounting  
surface

### 400LXR Cleanroom Compatibility

Table Velocity	Class	
	4.5" Below Table	At Carriage Surface
250 mm/sec	10	1
500 mm/sec	25	1
1000 mm/sec	50	5
2000 mm/sec	250	25
3000 mm/sec	500	100

## Toe Clamp Accessories

**Part Number:** 100-8376-01 (404LXR)  
002-3624-01 (406LXR)

Toe clamps for mounting 400LXR tables are ordered separately.

Note that 400LXR Series toe clamps are not interchangeable with toe clamps for 400XR Series tables.



# ORDERING INFORMATION

## 404LXR

## ORDERING INFORMATION

Fill in an order code from each of the numbered fields to create a complete model order code.

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫ ⑬ ⑭

<b>Order Example:</b>	<b>404</b>	<b>T04</b>	<b>LXR</b>	<b>M</b>	<b>P</b>	<b>D13</b>	<b>H3</b>	<b>L2</b>	<b>CM09</b>	<b>Z2</b>	<b>E2</b>	<b>R1</b>	<b>A4</b>	<b>P1</b>
-----------------------	------------	------------	------------	----------	----------	------------	-----------	-----------	-------------	-----------	-----------	-----------	-----------	-----------

① **Series**  
404

② **Travel – mm**  
**8 Pole Motor**

T00	50
T01	100
T02	150
T03	200
T04	250
T05	300
T06	350
T07	400
T09	500
T11	600
T13	700
T15	800
T17	900
T19	1000

③ **Model**  
LXR Linear Motor

④ **Mounting**  
M Metric

⑤ **Grade**  
P Precision

⑥ **Drive Type**  
D3 Free Travel (No Motor)  
D13 8 Pole Motor

⑦ **Home Sensor**  
H1 None-Free Travel (only)  
H2 N.C. Current Sinking  
H3 N.O. Current Sinking  
H4 N.C. Current Sourcing  
H5 N.O. Current Sourcing

⑧ **Limit Sensor**  
L1 None-Free Travel (only)  
L2 N.C. Current Sinking  
L3 N.O. Current Sinking  
L4 N.C. Current Sourcing  
L5 N.O. Current Sourcing

⑨ **Cable Management**

CM01	No Cables – Free Travel
CM02	Cable Transport Module (only)
CM03	3.0m OEM Cable Set - FL
CM04	7.5m OEM Cable Set - FL
CM07	Cable Trans Mod. w/3.0m - FL*
CM08	Cable Trans Mod. w/7.5m - FL*
CM11	3.0 m OEM Cable Set - HD15M-VF Connector
CM12	7.5 m OEM Cable Set - HD15M-VF Connector
CM13	Cable Trans Mod. w/3.0m - HD15M-VF Connector
CM14	Cable Trans Mod. w/7.5m - HD15M-VF Connector
CM15	3.0m OEM Cable Set - HD15M-CF12 Connector
CM16	7.5m OEM Cable Set - HD15M-CF12 Connector
CM17	Cable Trans Mod. w/3.0m - HD15M-CF12 Connector
CM18	Cable Trans Mod. w/7.5m - HD15M-CF12 Connector

\* Extension cable for pass through connection is available and can be ordered separately: #006-1743-01 (3 meters); #006-1743-02 (7.5 meters)

\*\* When wiring to a Compax3 please select current sourcing sensors

Notes - HD15M-VF Connector compatible with IPA, Vix and Aries Feedback Connector

HD15M-CF12 Connector compatible with Compax 3 F12 Feedback Connector  
MD14-PF Connector compatible with P Series (PD-xxP) Feedback Connector

⑩ **Z Channel Location\***

Z1	None
Z2	Positive End Position
Z3	Center Position
Z4	Negative End Position

\* Refer to dimensions

⑪ **Encoder Option**

E1	None
E2	1.0 µm Resolution
E3	0.5 µm Resolution
E4	0.1 µm Resolution
E5	5.0 µm Resolution
E7	Sine Output Encoder

⑫ **Environmental**

R1	Strip Seal
R2	Hard Cover w/Class 10 Cleanroom Prep
R3	Hard Cover without Cleanroom Prep

⑬ **Digital Drive**

A1	No Drive
----	----------

⑭ **Pinning Option**

P1	No multi-axis pinning
P2 *	X axis transfer pinning to Y or Z axis - 30 arc-sec
P3 *	Y axis transfer pinning to X axis - 30 arc-sec

\* Transfer pinning to XR from LXR requires additional bracket and EPS request. Call 1-800-245-6903 for multi-axis pinning options & quote

Linear Motor  
Driven Tables

# ORDERING INFORMATION

## 406LXR

## ORDERING INFORMATION

Fill in an order code from each of the numbered fields to create a complete model order code.

	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭
Order Example:	406	T08	LXR	M	P	D13	H2	L2	CM09	Z2	E2	R1	A4	P1

### ① Series

406

### ② Travel – mm

	8 Pole Motor	12 Pole Motor
T01	50	—
T02	150	50
T03	250	150
T04	350	250
T05	450	350
T06	550	450
T07	650	550
T08	750	650
T09	850	750
T10	950	850
T11	1200	1100
T12	1450	1350
T13	1700	1650
T14	1950	1850

### ③ Model

LXR Linear Motor

### ④ Mounting

M Metric

### ⑤ Grade

P Precision

### ⑥ Drive Type

#### Free Travel (No Motor)

D3	8 Pole Motor (No Motor)
D5	12 Pole Motor (No Motor)

#### Linear Motor

D13	8 Pole Motor Carriage
D15	12 Pole Motor Carriage

### ⑦ Home Sensor

H1	None-Free Travel (only)
H2	N.C. Current Sinking
H3	N.O. Current Sinking
H4	N.C. Current Sourcing
H5	N.O. Current Sourcing

### ⑧ Limit Sensor

L1	None-Free Travel (only)
L2	N.C. Current Sinking
L3	N.O. Current Sinking
L4	N.C. Current Sourcing
L5	N.O. Current Sourcing

### ⑨ Cable Management

CM01	No Cables – Free Travel
CM02	Cable Transport Module (only)
CM03	3.0m OEM Cable Set-FL
CM04	7.5m OEM Cable Set-FL
CM07	Cable Trans Mod. w/3.0m-FL*
CM08	Cable Trans Mod. w/7.5m-FL*
CM11	3.0m OEM Cable Set - HD15M-VF Connector
CM12	7.5m OEM Cable Set - HD15M-VF Connector
CM13	Cable Trans Mod. w/3.0m - HD15M-VF Connector
CM14	Cable Trans Mod. w/7.5m - HD15M-VF Connector
CM15	3.0m OEM Cable Set - HD15M-CF12 Connector
CM16	7.5m OEM Cable Set - HD15M-CF12 Connector
CM17	Cable Trans Mod. w/3.0m - HD15M-CF12 Connector
CM18	Cable Trans Mod. w/7.5m - HD15M-CF12 Connector

\* Extension cable for pass through connection is available and can be ordered separately: #006-1743-01 (3 meters); #006-1743-02 (7.5 meters)

\*\* When wiring to a Compax3 please select current sourcing sensors  
Notes - HD15M-VF Connector compatible with IPA, Vix and Aries  
Feedback Connector

HD15M-CF12 Connector compatible with Compax 3 F12 Feedback Connector  
MD14-PF Connector compatible with P Series (PD-xxP) Feedback Connector

### ⑩ Z Channel Location\*

Z1	None
Z2	Positive End Position
Z3	Center Position
Z4	Negative End Position

\* Refer to dimensions

### ⑪ Encoder Option

E1	None
E2	1.0 µm Resolution
E3	0.5 µm Resolution
E4	0.1 µm Resolution
E5	5.0 µm Resolution
E7	Sine Output Encoder

### ⑫ Environmental

R1	Strip Seal
R2	Hard Cover w/Class 10 Cleanroom Prep

### ⑬ Digital Drive

A1	No Drive
----	----------

### ⑭ Pinning Option

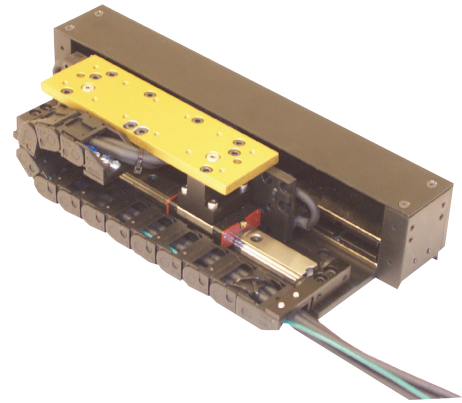
P1	No multi-axis pinning
P2 *	X axis transfer pinning to Y or Z axis - 30 arc-sec
P3 *	Y axis transfer pinning to X axis - 30 arc-sec

\* Transfer pinning to XR from LXR requires additional bracket and EPS request. Call 1-800-245-6903 for multi-axis pinning options & quote

# Trilogy I-FORCE Ironless Linear Positioners

High performance and design flexibility

- Trilogy positioners use ground steel or aluminum bases for flatness and parallelism
- Single- or dual-bearing rail positioners for application flexibility
- Available with magnetic or optical encoder



Linear Motor  
Driven Tables

- Dual-rail positioners have bellows as a standard option.
- Multiple carriage options are available on all positioner series.
- Different cable track widths available for added stiffness and rigidity
- Different cable track widths available as custom options for user payload tubes and cables

Series	T1S / T1D	T2S / T2D	T3S / T3D	T4S / T4D
Motor	110 ironless	210 ironless	310 ironless	410 ironless
Max base length (in)	33.6	120	144	137.76
Load (kg)	11.3*/13.5**	27.2*/45.3**	72*/108**	90*/181**
Acceleration (G's) ***	5	5	5	5
Velocity (m/s) †	up to 3	up to 5	up to 5	up to 5
Peak force (N)	202.5	494.2	1170.0	3928.1
Continuous force (N)	45.4	110.3	262.0	878.6
Resolution (micron)	0.1 to 5.0	0.1 to 5.0	0.1 to 5.0	0.1 to 5.0
Repeatability (micron) ‡	±1	±1	±1	±1

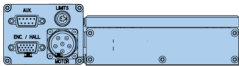
\* Single rail load specifications

\*\* Dual rail load specifications

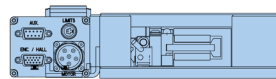
\*\*\* Consult factory for higher accelerations

† Peak velocity is encoder dependent

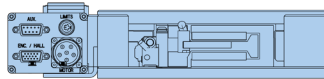
‡ Repeatability is resolution dependent



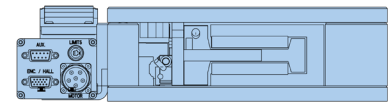
T1D/T1S



T2D/T2S



T3D/T3S



T4D/T4S

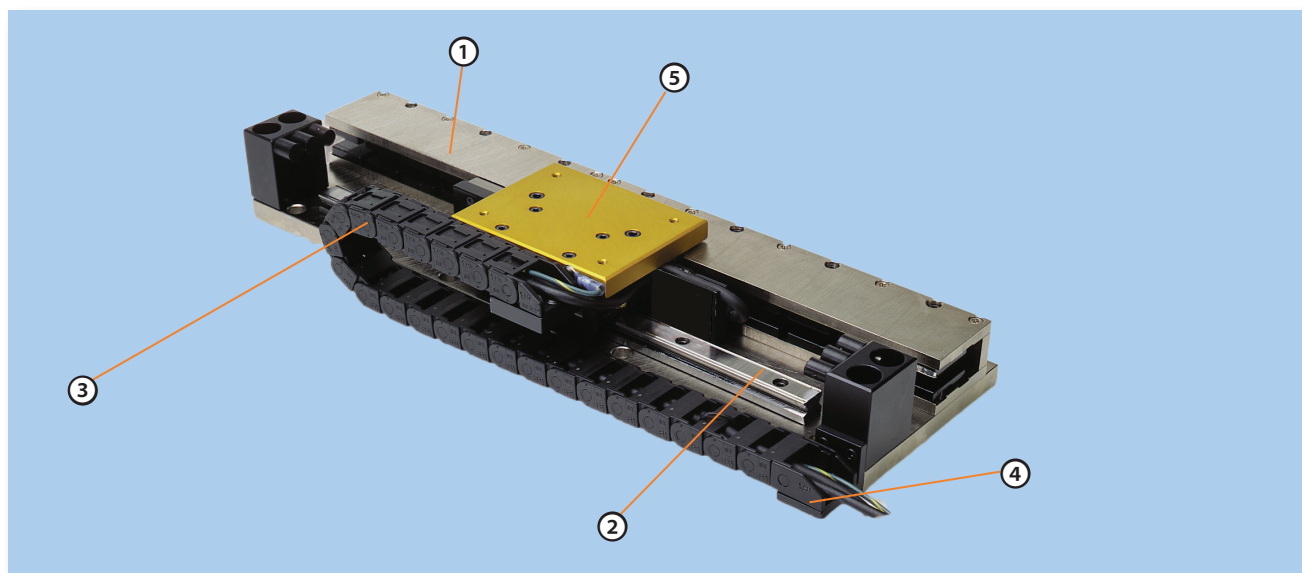
Parker Trilogy's I-Force linear positioners utilize our high-performance I-Force ironless linear motors in a pre-engineered, easily integrated, ready-to-run package. The principal design goal for these positioners is to achieve high performance at an economical cost while preserving the design flexibility to accommodate customization.

Trilogy's positioners have selectable single- or dual-bearing to match the performance and cost requirements for each application. In addition, they are designed to connect together using transition plates for XY or multi-axis configurations. Options include a variety of cable management systems in addition

to bellows and hard covers. Consult the factory for more details on the bellows positioner option (2D, 3D, and 4D positioners).

Flexibility, multi-axis compatibility, and ease of customization make the I-Force linear positioners a superior choice for high performance and value.





- ① Trilogy positioners use **ground steel or aluminum bases** for flatness and parallelism because aluminum extrusions often do not meet the accuracy requirements for straightness and flatness.
- ② Trilogy has **single- or dual-bearing rail positioners** to better match the performance and cost requirements for each application
- ③ **Flexible cable management system** for various customer options
- ④ **Single rail of high energy rare earth magnets** offers lower weight and lower cost than double magnet type.
- ⑤ **Multiple carriage options** available for each Trilogy Series model

Trilogy positioners are powered by Trilogy I-FORCE Ironless Linear Motors



For detailed specifics on standalone Trilogy Linear Motors, visit [http://bit.ly/AT\\_IM](http://bit.ly/AT_IM).

Series	I-Force Ironless
<b>Continuous force</b>	5.5 to 197.5 lbf (24.5 to 878.6 N)
<b>Peak force</b>	45.5 to 883 lbf (202.5 to 3928 N)
<b>Cogging force</b>	Zero
<b>Attractive force</b>	Zero
<b>Magnet tracks</b>	Dual
<b>Heat dissipation</b>	Good
<b>Applications</b>	Rapid accelerations, extremely smooth motion

# SPECIFICATIONS

## SPECIFICATIONS

### T1D

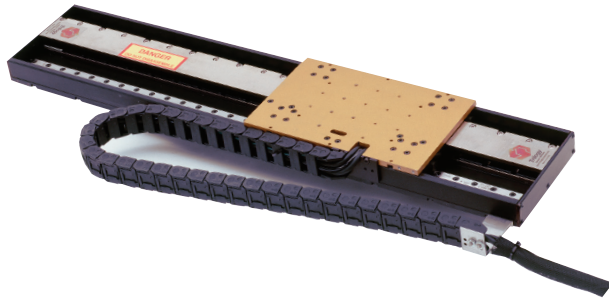
#### LINEAR MAGNETIC ENCODER

#### LINEAR OPTICAL ENCODER OPTIONS (NOTE 5)

#### PERFORMANCE

		5.0µm	1.0µm	5.0µm	1.0µm
<b>Peak Velocity</b>	in/s (m/s)	275 (7)	100 (2.5)	196 (5)	120 (3)
<b>Resolution</b>	in (µm)	0.0002 (5)	0.000 04 (1.0)	0.000 02 (0.5)	0.000 004 (0.1)
<b>Repeatability</b>	in (µm)	±0.0004 (±10)	±0.000 8 (2.0)	±0.000 06 (1.5)	±0.000 04 (1.0)
<b>Accuracy – Magnetic</b>	±(30µm +50µm/m) ± (25µm +50µm/m)				
<b>Accuracy – Optical</b>	±(5µm +30µm/m)				

Note: For travels less than 1 meter, accuracy should be calculated at 1 meter



#### MOTOR MODEL

		110-1	110-2
<b>Peak Force</b>	N	108.5	202.5
	lb	24.4	45.5
<b>Continuous Force</b>	N	24.5	45.4
	lb	5.5	10.2
<b>Peak Power</b>	W	938	1641
<b>Continuous Power</b>	W	47	82

Linear Motor Driven Tables

#### ACCURACY

#### STANDARD

#### LASER ALIGNMENT OPTION

Straightness restrained on flat surface in (µm)	±.000127 in/in (±127µm/m)	±.000013 in/in (±13µm/m)
Flatness restrained on flat surface in (µm)	±0.013 (±330)	

Note: Straightness/Flatness specifications based on system mounted to surface of flatness ±0.0005in/ft

#### PHYSICAL

#### - 1

#### - 2

<b>Carriage Assembly</b>	lbs (kg)	Please consult factory for weight.	
<b>Base Assembly</b>			
T1DA Aluminum (0.375" thick)	lbs/ft (kg/m)	Please consult factory for weight.	
<b>Carriage Assembly</b>	in (mm)	5.4 (137.2)	7.8 (198.1)
<b>Coil Bar Length</b>	in (mm)	3.20 (81.3)	5.60 (142.2)

#### LOAD

<b>Vertical (Fv) see note 11</b>	lbs (kg)	30 (13.5)	30 (13.5)
<b>Side (Fs) see note 11</b>	lbs (kg)	15 (6.8)	15 (6.8)
<b>Moments - Roll (Mr) see note 11</b>	Lb-ft (N-m)	15 (20)	15 (20)
<b>Moments - Pitch (Mp) see note 11</b>	Lb-ft (N-m)	52 (70)	52 (70)
<b>Moments - Yaw (My) see note 11</b>	Lb-ft (N-m)	52 (70)	52 (70)

- Total travel = OAL - .45" (11.43 mm) - carriage length.
- Maximum base length is 33.6" (853.4 mm).
- Aluminum base is black anodized.
- For complete motor specifications, refer to 110 series motor data sheet.
- Optical encoder, RGH series, available in 0.05µm, 0.1µm, 0.5µm, 1.0µm, 5.0µm.
- Cables extend past base by approximately 0.6" when carriage is at negative hard stop.
- Cable Track extends 0.280" higher than carriage mounting surface. Space must be taken into account when mounting load.
- Standard cable track provided is 20mm wide 18mm BR.
- Base mounting holes are equidistant, 1.200" (12.0, 16.8, 21.6...) or 2.400" (9.6, 14.4, 19.2, 24.0...) from each end depending on base length.
- Specification subject to change without notice.
- Listed specifications based on motor size and typical performance requirements. Bearing manufacturer specifications exceed listed specifications.
- For high load, high speed applications, customer-supplied deceleration shocks are required (not included with product).
- The repeatability for the home switch is estimated to be +/- 10-20 microns. However, repeatability of the home switch does not dictate the system or encoder repeatability.

# DIMENSIONS

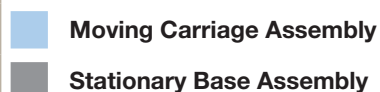
## T1D

Download 2D & 3D files from  
[www.parker.com/emn/T1D](http://www.parker.com/emn/T1D)

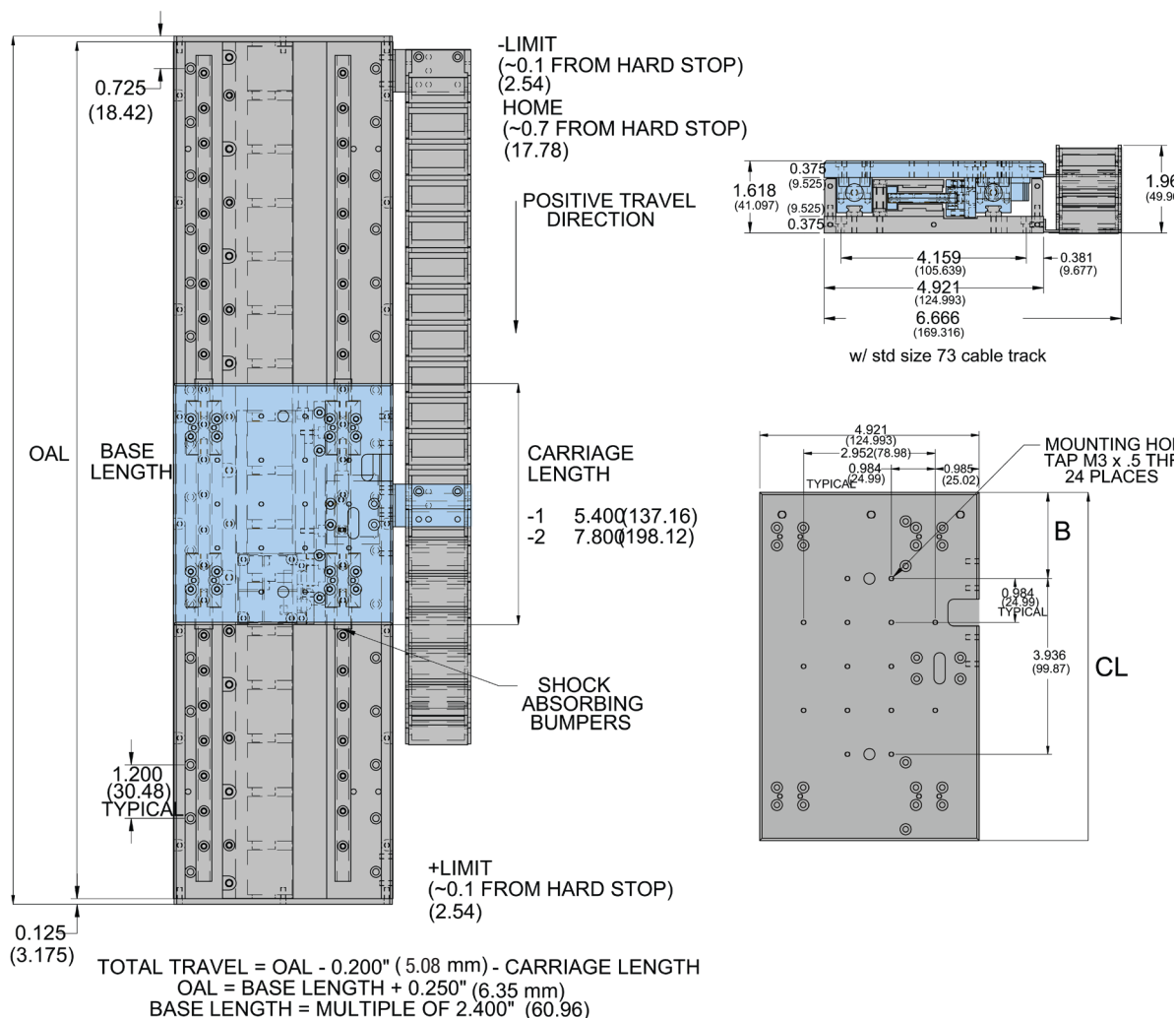


DIMENSIONS

Dimensions shown in inches.



Dimensions – mm (in)



### CARRIAGE SIZE

	- 1	mm	- 2	mm
<b>CL</b>	5.400	137.16	7.800	198.12
<b>B</b>	0.732	18.59	1.932	49.07
<b>Coil</b>	110-1	110-1	110-2	110-2

Free sizing and selection support  
 from Virtual Engineer at  
[parker.com/VirtualEngineer](http://parker.com/VirtualEngineer)



# SPECIFICATIONS

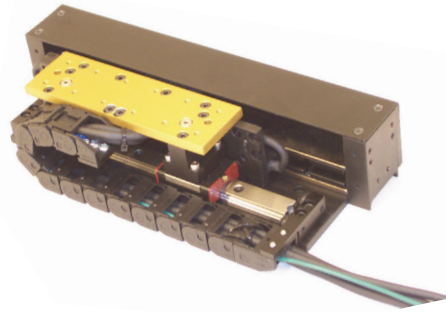
## T1S

## SPECIFICATIONS

PERFORMANCE		LINEAR MAGNETIC ENCODER		LINEAR OPTICAL ENCODER OPTIONS (NOTE 5)	
		5.0µm	1.0µm	5.0µm	1.0µm
Peak Velocity	in/s (m/s)	275 (7)	100 (2.5)	196 (5)	120 (3)
Resolution	in (µm)	0.0002 (5)	0.000 04 (1.0)	0.000 02 (0.5)	0.000 004 (0.1)
Repeatability	in (µm)	±0.0004 (±10)	±0.000 8 (2.0)	±0.000 06 (1.5)	±0.000 04 (1.0)
Accuracy – Magnetic		±(30µm +50µm/m) ±(25µm +50µm/m)			
Accuracy – Optical		±(5µm +30µm/m)			

Note: For travels less than 1 meter, accuracy should be calculated at 1 meter

MOTOR MODEL		110-1	110-2
Peak Force	N	108.5	202.5
	lb	24.4	45.5
Continuous Force	N	24.5	45.4
	lb	5.5	10.2
Peak Power	W	938	1641
Continuous Power	W	47	82



Linear Motor  
Driven Tables

ACCURACY	STANDARD	LASER ALIGNMENT OPTION
Straightness restrained on flat surface in [µm]	±0.000127 in/in (±127µm/m)	±.000013 in/in (±13µm/m)
Flatness restrained on flat surface in [µm]	±0.013 (±330)	

Note: Straightness/Flatness specifications based on system mounted to surface of flatness ±0.0005in/ft

PHYSICAL		- 2	- 3
Carriage Assembly	lbs (kg)	1.1 (0.50)	1.5 (0,68)
Base Assembly			
T1SA Aluminum (0.375" thick)	lbs/ft (kg/m)	2.8 (1.3)	2.8 (1.3)
Carriage Assembly	in (mm)	3.40 (86.4)	5.80 (147.3)
Coil Bar Length	in (mm)	3.20 (81.3)	5.60 (142.2)

LOAD		- 1	- 2
Vertical (Fv) see note 11	lbs (kg)	25 (11.3)	25 (11.3)
Side (Fs) see note 11	lbs (kg)	13 (5.7)	13 (5.7)
Moments - Roll (Mr) see note 11	Lb-ft (N-m)	11 (15)	11 (15)
Moments - Pitch (Mp) see note 11	Lb-ft (N-m)	44 (60)	44 (60)
Moments - Yaw (My) see note 11	Lb-ft (N-m)	44 (60)	44 (60)

- Total travel = OAL – 2.85" (72.39 mm) – carriage length.
- Maximum base length is 33.6" (853.4mm).
- Aluminum base is black anodized.
- For complete motor specifications, refer to 110 series motor data sheet.
- Optical encoder, RGH series, available in 0.05µm, 0.1µm, 0.5µm, 1.0µm, 5.0µm.
- Cables extend past base by approximately 0.6" when carriage is at negative hard stop.
- Standard cable track provided is 33mm wide 18mm BR.
- Base mounting holes are equidistant, 1.200" (12.0, 16.8, 21.6....) or 2.400" (9.6, 14.4, 19.2, 24.0....) from each end depending on base length.
- Specification subject to change without notice.
- Listed specifications based on motor size and typical performance requirements. Bearing manufacturer specifications exceed listed specifications.
- For high load, high speed applications, customer-supplied deceleration shocks are required (not included with product).
- The repeatability for the home switch is estimated to be +/- 10-20 microns. However, repeatability of the home switch does not dictate the system or encoder repeatability.



# DIMENSIONS

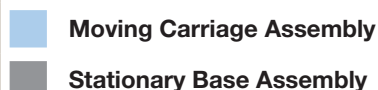
## T1S

Download 2D & 3D files from  
[www.parker.com/emn/T1S](http://www.parker.com/emn/T1S)



## DIMENSIONS

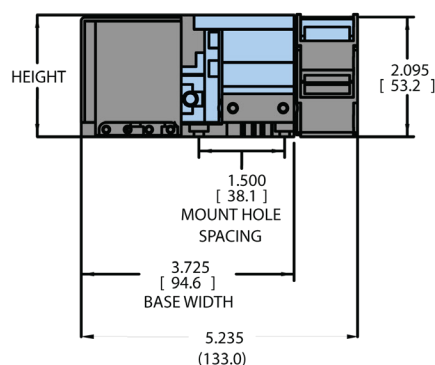
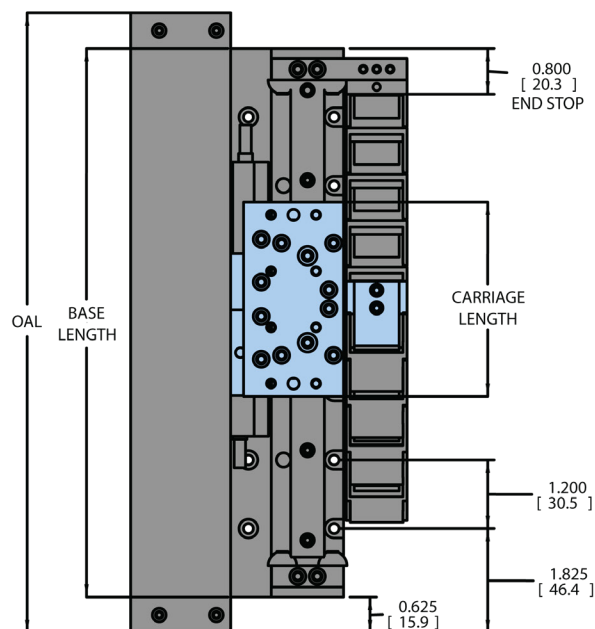
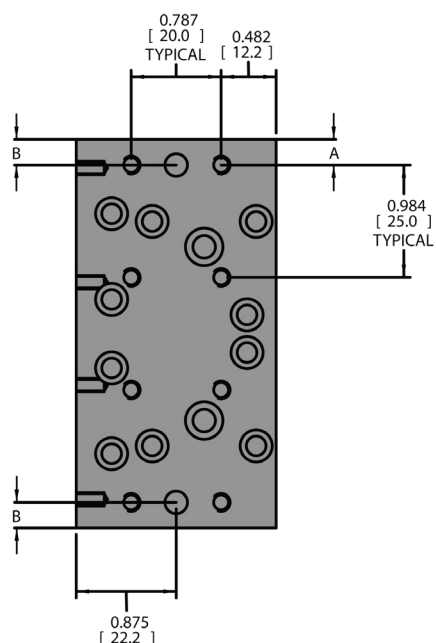
Dimensions shown in inches.



$$\text{OAI} = \text{BASE LENGTH} + 1.25 \text{ IN (31.75)}$$

$$\text{TRAVEL} = \text{BASE LENGTH} - 1.6 - \text{CARRIAGE LENGTH}$$

$$\text{TRAVEL (mm)} = \text{BASE LENGTH} - 40.64 - \text{CARRIAGE LENGTH}$$



## COIL SIZE

	- 1	- 2
<b>CARRIAGE LENGTH</b>	3.4 (86.4)	5.8 (147.3)
<b>A (1ST MOUNTING HOLE)</b>	0.224 (5.7)	0.440 (11.2)
<b>B (DOWEL PIN HOLE)</b>	0.224 (5.7)	0.440 (11.2)

Free sizing and selection support  
 from Virtual Engineer at  
[parker.com/VirtualEngineer](http://parker.com/VirtualEngineer)



# ORDERING INFORMATION

## ORDERING INFORMATION

### T1D/T1S

Fill in an order code from each of the numbered fields to create a complete model order code **for T1D/T1S**.

①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫					
Order Example:					T	1	D	A	012	3	N	S	B	A	G	2
①	<b>Series</b> T            Open Positioner					⑩	<b>Cable Length</b> A            1 Meter B            3 Meter C            7.5 Meter L            3 Meter Extension Cables (with Connector Box) M            7.5 Meter Extension Cables (with Connector Box) Z            Connector Box ONLY (no cables) <small>*Options A, B, C: cable measured from last cable carrier link</small> <small>*Options L, M: cable measured from connection box at end of base.</small>									
②	<b>Motor Coil Series</b> 1            110 Motor Coil					<b>Cable Connectorization</b> A            P-Series DC B            Flying Leads C            HD15M-CF12 Connector G            Gemini V            HD15M-VF Connector Z            No cables  Notes - HD15M-VF Connector compatible with IPA, Vix and Aries Feedback Connector HD15M-CF12 Connector compatible with Compax 3 F12 Feedback Connector MD14-PF Connector compatible with P Series (PD-xxP) Feedback Connector										
③	<b>Bearing Rail Configuration</b> D            Dual Bearing Rails S            Single Bearing Rails															
④	<b>Base Material</b> A            0.375" Al															
⑤	<b>Length of Base</b> XXX        Length of base in inches* Maximum: 33.6" Minimum: 9.6" Increment: 2.4" <b>T1S Base Length (increments of 2.4" [60.96mm]) =</b> Travel + Carriage Length + 1.6" [40.64mm] <b>T1D Base Length (increments of 2.4" [60.96mm]) =</b> Travel + Carriage Length + 0.2" [5.08mm]  <small>*Truncate base length in part number. Example: for a 16.8 inch base, "XXX" equals "016"</small>															
⑥	<b>Coil Size</b> <b>Carriage Length</b> 1            1 pole            T1S 3.4" (86.4mm) 2            2 pole            T1S 5.8" (147.3mm) 1 pole            T1D 5.4" (137.6mm) 2 pole            T1D 7.8" (198.12mm)															
⑦	<b>Cooling</b> N            No cooling					⑫	<b>Cable Track</b> 0            None 2            Standard									
⑧	<b>Winding Type</b> S            Series P            Parallel															
⑨	<b>Encoder</b> A            Magnetic 1µm B            Magnetic 5µm Q            Optical 5µm L            Optical 1µm M            Optical 0.5µm P            Optical 0.1µm R            Optical 1 V p-p sine/cosine X            No encoder															

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# SPECIFICATIONS

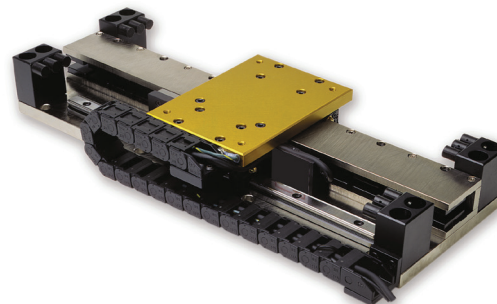
## T2D

## SPECIFICATIONS

		LINEAR MAGNETIC ENCODER		LINEAR OPTICAL ENCODER OPTIONS (NOTE 5)	
PERFORMANCE		5.0µm	1.0µm	5.0µm	1.0µm
Peak Velocity	in/s (m/s)	275 (7)	100 (2.5)	196 (5)	120 (3)
Resolution	in (µm)	0.0002 [5]	0.000 04 (1.0)	0.000 02 (0.5)	0.000 004 (0.1)
Repeatability	in (µm)	±0.0004 [±10]	±0.000 8 (2.0)	±0.000 06 (1.5)	±0.000 04 (1.0)
Accuracy – Magnetic		±(30µm +50µm/m) ±(25µm +50µm/m)			
Accuracy – Optical		±(5µm +30µm/m)			

Note: For travels less than 1 meter, accuracy should be calculated at 1 meter

MOTOR MODEL		210-2	210-3	210-4
Peak Force	N	255.8	375.0	494.2
	lb	57.5	84.3	111.1
Continuous Force	N	57.4	84.1	110.3
	lb	12.9	18.9	24.8
Peak Power	W	1583	2261	2940
Continuous Power	W	79	113	147



### ACCURACY

#### STANDARD

#### LASER ALIGNMENT OPTION

Straightness restrained on flat surface in (µm)	±0.000127 in/in (±127µm/m)	±.000013 in/in (±13µm/m)
Flatness restrained on flat surface in (µm)	±0.003 + .000254 in/in (±76 + 254µm/m)	

Note: Straightness/Flatness specifications based on system mounted to surface of flatness ±0.0005in/ft

### PHYSICAL

		- 2	- 3	- 4
Carriage Assembly	lbs (kg)	3.1 (1.4)	4.1 (1.9)	5.5 (2.5)
Base Assembly				
T2DA Aluminum (0.375" thick)	lbs/ft (kg/m)	10.8 (4.9)	10.8 (4.9)	10.8 (4.9)
Carriage Assembly	in (mm)	4.20 (106.7)	6.60 (167.6)	9.00 (228.6)
Coil Bar Length	in (mm)	7.20 (182.9)	9.60 (243.8)	12.00 (304.8)

### LOAD

		- 2	- 3	- 4
Vertical (Fv) see note 11	lbs (kg)	60 (27. 1)	80 (36.3)	100 (45.3)
Side (Fs) see note 11	lbs (kg)	40 (18.1)	60 (27.2)	60 (27.2)
Moments - Roll (Mr) see note 11	Lb-ft (N-m)	40 (53)	60 (80)	60 (80)
Moments - Pitch (Mp) see note 11	Lb-ft (N-m)	100 (34)	200 (270)	200 (270)
Moments - Yaw (My) see note 11	Lb-ft (N-m)	100 (34)	200 (270)	200 (270)

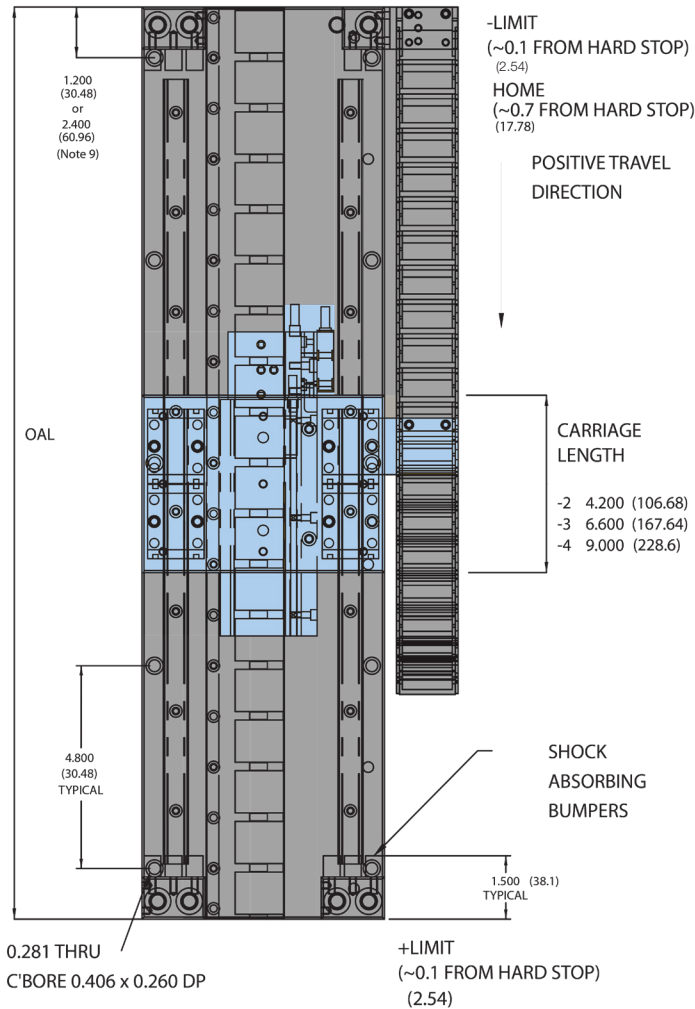
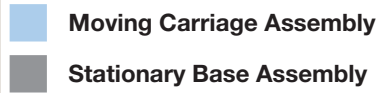
- Total travel = OAL – 3.00" (76.2 mm) – carriage length.
- Maximum base length is 120" (3048 mm).
- Aluminum base is black anodized.
- For complete motor specifications, refer to 210 series motor data sheet.
- Optical encoder, RGH series, available in 0.05µm, 0.1µm, 0.5µm, 1.0µm, 5.0µm.
- Cables extend past base by approximately 0.6" when carriage is at negative hard stop.
- Cable Track extends 0.15" higher than carriage mounting surface. Space must be taken into account when mounting load.
- Standard cable track provided is 30mm wide 18mm BR.
- Base mounting holes are equidistant, 1.200" (12.0, 16.8, 21.6....) or 2.400" (9.6, 14.4, 19.2, 24.0....) from each end depending on base length.
- Specification subject to change without notice.
- Listed specifications based on motor size and typical performance requirements. Bearing manufacturer specifications exceed listed specifications.
- For high load, high speed applications, customer-supplied deceleration shocks are required (not included with product).
- The repeatability for the home switch is estimated to be +/- 10-20 microns. However, repeatability of the home switch does not dictate the system or encoder repeatability.



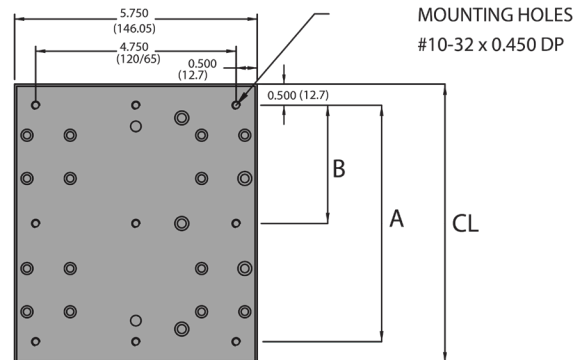
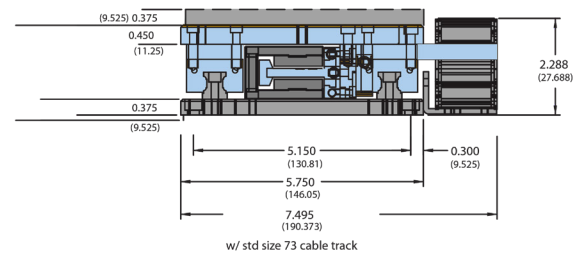
# DIMENSIONS

## T2D

Dimensions shown in inches.



**0.375 THICK CARRIAGE SPACER PLATE (optional)**  
 (9.525)



TOTAL TRAVEL = OAL - 3.00" (76.2 mm) - CARRIAGE LENGTH  
 OAL = MULTIPLE OF 2.400" (60.96)

### CARRIAGE SIZE

	- 2	mm	- 3	mm	- 4	mm
CL	4.200	106.68	6.600	167.64	9.00	228.6
A	3.200	81.28	5.600	142.24	8.00	203.80
B	—	—	2.800	71.12	4.0	101.60
Coil	210-2		210-3		210-4	



# SPECIFICATIONS

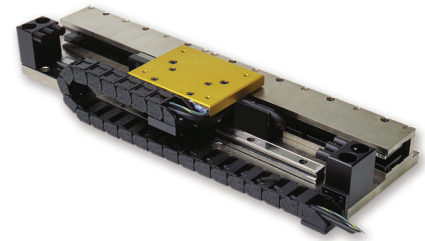
## T2S

## SPECIFICATIONS

		LINEAR MAGNETIC ENCODER		LINEAR OPTICAL ENCODER OPTIONS (NOTE 5)	
PERFORMANCE		5.0µm	1.0µm	5.0µm	1.0µm
Peak Velocity	in/s (m/s)	275 (7)	100 (2.5)	196 (5)	120 (3)
Resolution	in (µm)	0.0002 (5)	0.000 04 (1.0)	0.000 02 (0.5)	0.000 004 (0.1)
Repeatability	in (µm)	±0.0004 (±10)	±0.000 8 (2.0)	±0.000 06 (1.5)	±0.000 04 (1.0)
Accuracy – Magnetic		±(30µm +50µm/m)			
Accuracy – Optical				±(5µm +30µm/m)	

Note: For travels less than 1 meter, accuracy should be calculated at 1 meter

MOTOR MODEL		210-2	210-3	210-4
Peak Force	N	255.8	375.0	494.2
	lb	57.5	84.3	111.1
Continuous Force	N	57.4	84.1	110.3
	lb	12.9	18.9	24.8
Peak Power	W	1583	2261	2940
Continuous Power	W	79	113	147



ACCURACY	STANDARD	LASER ALIGNMENT OPTION
Straightness restrained on flat surface in (µm)	±0.000127 in/in (±127µm/m)	±.000013 in/in (±13µm/m)
Flatness restrained on flat surface in (µm)	±0.003 + .000254 in/in (±76 + 254µm/m)	

Note: Straightness/Flatness specifications based on system mounted to surface of flatness ±0.0005in/ft

PHYSICAL		- 2	- 3	-4
Carriage Assembly	lbs(kg)	2.1 (0.9)	3.1 (1.4)	3.8 (1.7)
Base Assembly				
T2SA Aluminum (0.375" thick)	lbs/ft (kg/m)	9.10 (4.2)	9.10 (4.2)	9.10 (4.2)
Carriage Assembly	in (mm)	4.20 (106.7)	6.60 (167.6)	9.00 (228.6)
Coil Bar Length	in (mm)	7.20 (182.9)	9.60 (243.8)	12.00 (304.8)

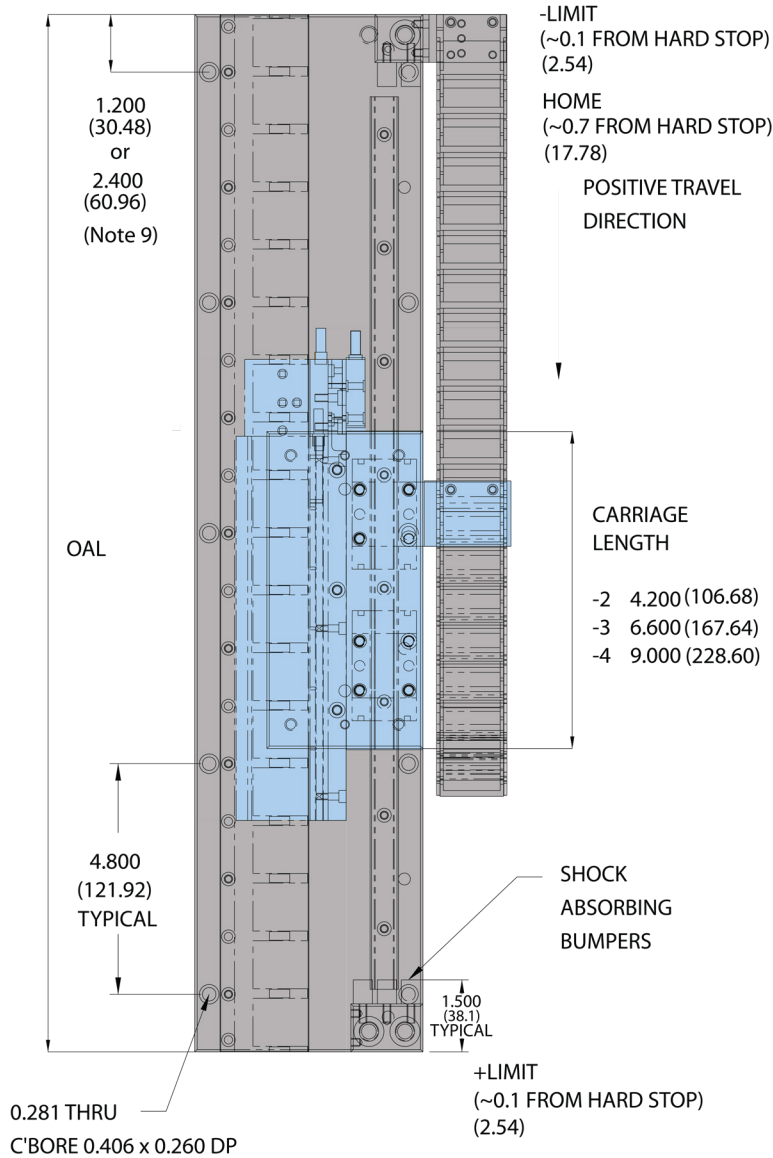
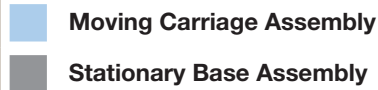
LOAD		- 2	- 3	- 4
Vertical (Fv) see note 11	lbs (kg)	40 (18.1)	50 (22.7)	60 (27.2)
Side (Fs) see note 11	lbs (kg)	20 (9.1)	30 (13.6)	30 (13.6)
Moments - Roll (Mr) see note 11	Lb-ft (N-m)	20 (27)	30 (40)	30 (40)
Moments - Pitch (Mp) see note 11	Lb-ft (N-m)	50 (67)	100 (135)	100 (135)
Moments - Yaw (My) see note 11	Lb-ft (N-m)	50 (67)	100 (135)	100 (135)

- Total travel = OAL – 3.00" (76.2 mm) – carriage length.
- Maximum base length is 120" (3048 mm).
- Aluminum base is black anodized.
- For complete motor specifications, refer to 210 series motor data sheet.
- Optical encoder, RGH series, available in 0.05µm, 0.1µm, 0.5µm, 1.0µm, 5.0µm.
- Cables extend past base by approximately 0.6" when carriage is at negative hard stop.
- Cable Track extends 0.15" higher than carriage mounting surface. Space must be taken into account when mounting load.
- Standard cable track provided is 30mm wide 18mm BR.
- Base mounting holes are equidistant, 1.200" (12.0, 16.8, 21.6....) or 2.400" (9.6, 14.4, 19.2, 24.0....) from each end depending on base length.
- Specification subject to change without notice.
- Listed specifications based on motor size and typical performance requirements. Bearing manufacturer specifications exceed listed specifications.
- For high load, high speed applications, customer-supplied deceleration shocks are required (not included with product).
- The repeatability for the home switch is estimated to be +/- 10-20 microns. However, repeatability of the home switch does not dictate the system or encoder repeatability.

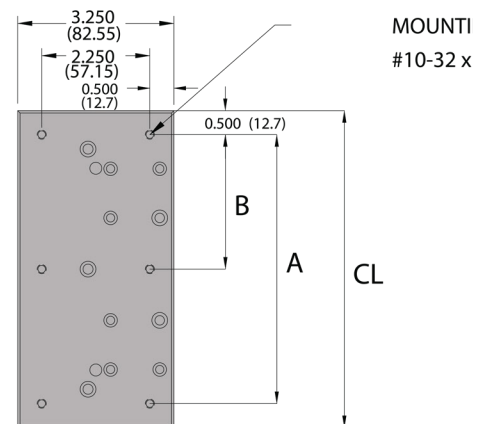
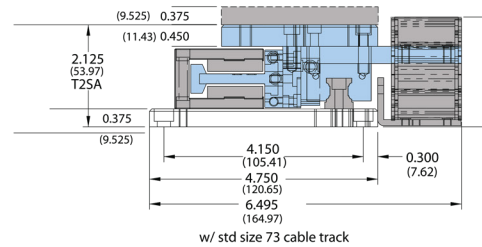


# DIMENSIONS T2S

Dimensions shown in inches.



**0.375 THICK CARRIAGE SPACER PLATE (optional)  
(9.525)**



TOTAL TRAVEL = OAL - 3.00" - CARRIAGE LENGTH  
= OAL - 76.2 mm - CARRIAGE LENGTH  
OAL = MULTIPLE OF 2.400" (60.96)

## CARRIAGE SIZE

	- 2	mm	- 3	mm	- 4	mm
<b>CL</b>	4.200	106.68	6.600	167.64	9.00	228.6
<b>A</b>	3.200	81.28	5.600	142.24	8.00	203.80
<b>B</b>	—	71.12	2.800	101.60	4.00	101.64
<b>Coil</b>	210-2		210-3		210-4	

# ORDERING INFORMATION

## T2D/T2S

### ORDERING INFORMATION

Fill in an order code from each of the numbered fields to create a complete model order code **for T2D/T2S**.

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫

#### Order Example:

T 2 D A 012 3 N S B A B 3

- |   |   |
|---|---|
| <p>① <b>Series</b><br/> <b>T</b> Open Positioner<br/> <b>B</b> Bellows Positioner available - consult factory for details</p> <p>② <b>Motor Coil Series</b><br/> <b>2</b> 210 Motor Coil</p> <p>③ <b>Bearing Rail Configuration</b><br/> <b>D</b> Dual Bearing Rails<br/> <b>S</b> Single Bearing Rails</p> <p>④ <b>Base Material</b><br/> <b>A</b> 0.375" Al</p> <p>⑤ <b>Length of Base</b><br/> <b>XXX</b> Length of base in inches*<br/> Maximum: 120.0" *<br/> Minimum: 9.6"<br/> Increment: 2.4"<br/> <b>Base Length (increments of 2.4" [60.96mm]) =</b><br/> Travel + Carriage Length + 3.0" [76.2mm]<br/> *Truncate base length in part number. Example: for a 16.8 inch base, "XXX" equals "016"<br/> *Consult factory for longer lengths.</p> <p>⑥ <b>Coil Size</b>                      <b>Carriage Length</b><br/> <b>2</b>      2 pole                      4.2" (106.68mm)<br/> <b>3</b>      3 pole                      6.6" (106.64mm)<br/> <b>4</b>      4 pole                      9.0" (228.60mm)</p> <p>⑦ <b>Cooling</b><br/> <b>N</b> No cooling</p> <p>⑧ <b>Winding Type</b><br/> <b>S</b> Series<br/> <b>P</b> Parallel</p> <p>⑨ <b>Encoder</b><br/> <b>A</b> Magnetic 1µm<br/> <b>B</b> Magnetic 5µm<br/> <b>Q</b> Optical 5µm<br/> <b>L</b> Optical 1µm<br/> <b>M</b> Optical 0.5µm<br/> <b>P</b> Optical 0.1µm<br/> <b>R</b> Optical 1 V p-p sine/cosine<br/> <b>X</b> No encoder</p> | <p>⑩ <b>Cable Length</b><br/> <b>A</b> 1 Meter<br/> <b>B</b> 3 Meter<br/> <b>C</b> 7.5 Meter<br/> <b>L</b> 3 Meter Extension Cables (with Connector Box)<br/> <b>M</b> 7.5 Meter Extension Cables (with Connector Box)<br/> <b>Z</b> Connector Box ONLY (no cables)<br/> *Options A, B, C: cable measured from last cable carrier link<br/> *Options L, M: cable measured from connection box at end of base.<br/> *7.5 Meter Flying Lead Cables available on:<br/> <ul style="list-style-type: none"> <li>All bases with Magnetic encoder</li> <li>All bases with Optical encoder under 86"</li> <li>For bases with Optical encoder over 86" the cable length will be CL = 10M - (base length in meters + 0.3M)</li> </ul> </p> <p>⑪ <b>Cable Connectorization</b><br/> <b>A</b> P-Series DC<br/> <b>B</b> Flying Leads<br/> <b>C</b> HD15M-CF12 Connector<br/> <b>G</b> Gemini<br/> <b>V</b> HD15M-VF Connector<br/> <b>Z</b> No cables<br/> Notes - HD15M-VF Connector compatible with IPA, Vix and Aries Feedback Connector<br/> HD15M-CF12 Connector compatible with Compax 3 F12 Feedback Connector<br/> MD14-PF Connector compatible with P Series (PD-xxP) Feedback Connector</p> <p>⑫ <b>Cable Track</b><br/> <b>0</b> None<br/> <b>3</b> Standard</p> |
|---|---|

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# SPECIFICATIONS

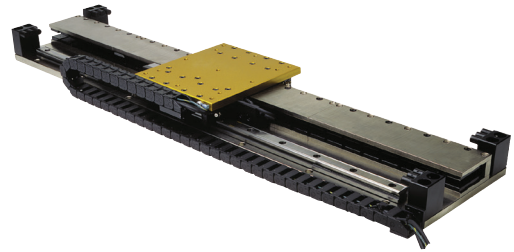
## T3D

## SPECIFICATIONS

PERFORMANCE		LINEAR MAGNETIC ENCODER		LINEAR OPTICAL ENCODER OPTIONS (NOTE 5)	
		5.0µm	1.0µm	5.0µm	1.0µm
Peak Velocity	in/s (m/s)	275 (7)	100 (2.5)	196 (5)	120 (3)
Resolution	in (µm)	0.0002 (5)	0.000 04 (1.0)	0.000 02 (0.5)	0.000 004 (0.1)
Repeatability	in (µm)	±0.0004 (±10)	±0.000 8 (2.0)	±0.000 06 (1.5)	±0.000 04 (1.0)
Accuracy – Magnetic		±(30µm +50µm/m)			
Accuracy – Optical				±(5µm +30µm/m)	

Note: For travels less than 1 meter, accuracy should be calculated at 1 meter

MOTOR MODEL		310-2	310-3	310-4	310-5	310-6
Peak Force	N	409.3	600.0	790.0	980.0	1170.0
	lb	92.0	135.1	177.2	220.3	263.2
Continuous Force	N	91.6	133.9	176.2	219.3	262.0
	lb	20.6	30.1	39.6	49.3	58.9
Peak Power	W	1885	2693	3500	4308	5116
Continuous Power	W	4	135	179	215	256



Linear Motor Driven Tables



ACCURACY	STANDARD	LASER ALIGNMENT OPTION
Straightness restrained on flat surface in (µm)	±0.000127 in/in (±127µm/m)	±.000013 in/in (±13µm/m)
Flatness restrained on flat surface in (µm)	±0.003 + .000254 in/in (±76 + 254µm/m)	

Note: Straightness/Flatness specifications based on system mounted to surface of flatness ±0.0005in/ft

PHYSICAL		- 2	- 3	- 4	- 5	- 6
Carriage Assembly	lbs (kg)	4.6 (2.1)	6.7 (3.0)	8.1 (3.7)	9.5 (4.3)	11.0 (5.0)
Base Assembly						
T3DB Aluminum (0.500" thick)	lbs/ft (kg/m)	16.9 (25.1)	16.9 (25.1)	16.9 (25.1)	16.9 (25.1)	16.9 (25.1)
Carriage Assembly	in (mm)	4.20 (106.7)	6.60 (167.6)	9.00 (228.6)	11.40 (289.6)	13.80 (350.5)
Coil Bar Length	in (mm)	7.20 (182.9)	9.60 (243.8)	12.00 (304.8)	14.40 (365.8)	16.8 (426.7)

LOAD		- 2	- 3	- 4	- 5	- 6
Vertical (Fv) see note 11	lbs (kg)	120 (54)	150 (68)	180 (81)	210 (95)	240 (108)
Side (Fs) see note 11	lbs (kg)	80 (36)	100 (45)	100 (45)	100 (45)	100 (45)
Moments - Roll (Mr) see note 11	Lb-ft (N-m)	80 (107)	100 (134)	100 (134)	100 (134)	100 (134)
Moments - Pitch (Mp) see note 11	Lb-ft (N-m)	160 (214)	300 (402)	300 (402)	300 (402)	300 (402)
Moments - Yaw (My) see note 11	Lb-ft (N-m)	160 (214)	300 (402)	300 (402)	300 (402)	300 (402)

- Total travel = OAL – 3.00" (76.2 mm) – carriage length.
- Maximum base length is 144" (3657 mm).
- Aluminum base is black anodized.
- For complete motor specifications, refer to 310 series motor data sheet.
- Optical encoder, RGH series, available in 0.05µm, 0.1µm, 0.5µm, 1.0µm, 5.0µm.
- Cables extend past base by approximately 0.6" when carriage is at negative hard stop.
- Cable Track extends 0.15" higher than carriage mounting surface. Space must be taken into account when mounting load.
- Standard cable track provided is 30mm wide 18mm BR.
- Base mounting holes are equidistant, 1.200" (12.0, 16.8, 21.6...) or 2.400" (9.6, 14.4, 19.2, 24.0...) from each end depending on base length.
- Specification subject to change without notice.
- Listed specifications based on motor size and typical performance requirements. Bearing manufacturer specifications exceed listed specifications.
- For high load, high speed applications, customer-supplied deceleration shocks are required (not included with product).
- The repeatability for the home switch is estimated to be +/- 10-20 microns. However, repeatability of the home switch does not dictate the system or encoder repeatability.

 **Moving Carriage Assembly**  
 **Stationary Base Assembly**



	- 2	mm	- 3	mm	- 4	mm	- 5	mm	- 6	mm
<b>CL</b>	4.200	106.68	6.600	167.64	9.00	228.6	11.400	289.56	13.800	350.52
<b>A</b>	3.200	81.28	5.600	142.24	8.00	203.80	10.400	264.16	12.800	325.12
<b>B</b>	—	71.12	2.800	101.60	4.00	101.64	5.200	132.08	6.400	162.56
<b>Coil</b>	310-2		310-3		310-4		310-5		310-6	



# SPECIFICATIONS

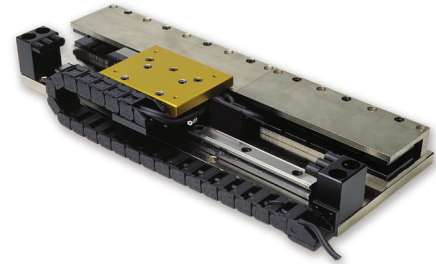
## T3S

## SPECIFICATIONS

PERFORMANCE		LINEAR MAGNETIC ENCODER		LINEAR OPTICAL ENCODER OPTIONS (NOTE 5)	
		5.0µm	1.0µm	5.0µm	1.0µm
Peak Velocity	in/s (m/s)	275 (7)	100 (2.5)	196 (5)	120 (3)
Resolution	in (mm)	0.0002 (5)	0.000 04 (1.0)	0.000 02 (0.5)	0.000 004 (0.1)
Repeatability	in (mm)	±0.0004 (±10)	±0.000 8 (2.0)	±0.000 06 (1.5)	±0.000 04 (1.0)
Accuracy – Magnetic		±(30µm +50µm/m) ±(25µm +50µm/m)			
Accuracy – Optical		±(5µm +30µm/m)			

Note: For travels less than 1 meter, accuracy should be calculated at 1 meter

MOTOR MODEL		310-2	310-3	310-4	310-5	310-6
Peak Force	N	409.3	600.0	790.0	980.0	1170.0
	lb	92.0	135.1	177.2	220.3	263.2
Continuous Force	N	91.6	133.9	176.2	219.3	262.0
	lb	20.6	30.1	39.6	49.3	58.9
Peak Power	W	1885	2693	3500	4308	5116
Continuous Power	W	4	135	179	215	256



Linear Motor Driven Tables

ACCURACY	STANDARD	LASER ALIGNMENT OPTION
Straightness restrained on flat surface in (µm)	±0.000127 in/in (±127µm/m)	±.000013 in/in (±13µm/m)
Flatness restrained on flat surface in (µm)	±0.003 + .000254 in/in (±76 + 254µm/m)	

Note: Straightness/Flatness specifications based on system mounted to surface of flatness ±0.0005in/ft

PHYSICAL		- 2	- 3	- 4	- 5	- 6
Carriage Assembly	lbs (kg)	3.0 (1.4)	4.4 (2.0)	5.5 (2.5)	6.4 (2.9)	7.4 (3.4)
Base Assembly						
T3SB Aluminum (0.500" thick)	lbs/ft (kg/m)	14.3 (21.2)	14.3 (21.2)	14.3 (21.2)	14.3 (21.2)	14.3 (21.2)
Carriage Assembly	in (mm)	4.20 (106.6)	6.60 (167.6)	9.00 (228.6)	11.40 (289.6)	13.80 (350.5)
Coil Bar Length	in (mm)	7.20 (182.9)	9.60 (243.8)	12 (304.8)	14.40 (365.8)	16.80 (426.7)

LOAD		- 2	- 3	- 4	- 5	- 6
Vertical (Fv) see note 11	lbs (kg)	80 (36)	100 (45)	120 (54)	140 (63)	160 (72)
Side (Fs) see note 11	lbs (kg)	30 (13)	50 (22)	50 (22)	50 (22)	50 (22)
Moments - Roll (Mr) see note 11	Lb-ft (N-m)	35 (47)	50 (67)	50 (67)	50 (67)	50 (67)
Moments - Pitch (Mp) see note 11	Lb-ft (N-m)	75 (100)	150 (201)	150 (201)	150 (201)	150 (201)
Moments - Yaw (My) see note 11	Lb-ft (N-m)	75 (100)	150 (201)	150 (201)	150 (201)	150 (201)

- Total travel = OAL – 3.00" (76.2 mm) – carriage length.
- Maximum base length is 144" (3657 mm).
- Aluminum base is black anodized.
- For complete motor specifications, refer to 310 series motor data sheet.
- Optical encoder, RGH series, available in 0.05µm, 0.1µm, 0.5µm, 1.0µm, 5.0µm.
- Cables extend past base by approximately 0.6" when carriage is at negative hard stop.
- Cable Track extends 0.15" higher than carriage mounting surface. Space must be taken into account when mounting load.
- Standard cable track provided is 30mm wide 18mm BR.
- Base mounting holes are equidistant, 1.200" (12.0, 16.8, 21.6....) or 2.400" (9.6, 14.4, 19.2, 24.0....) from each end depending on base length.
- Specification subject to change without notice.
- Listed specifications based on motor size and typical performance requirements. Bearing manufacturer specifications exceed listed specifications.
- For high load, high speed applications, customer-supplied deceleration shocks are required (not included with product).
- The repeatability for the home switch is estimated to be +/- 10-20 microns. However, repeatability of the home switch does not dictate the system or encoder repeatability.

# DIMENSIONS

## T3S

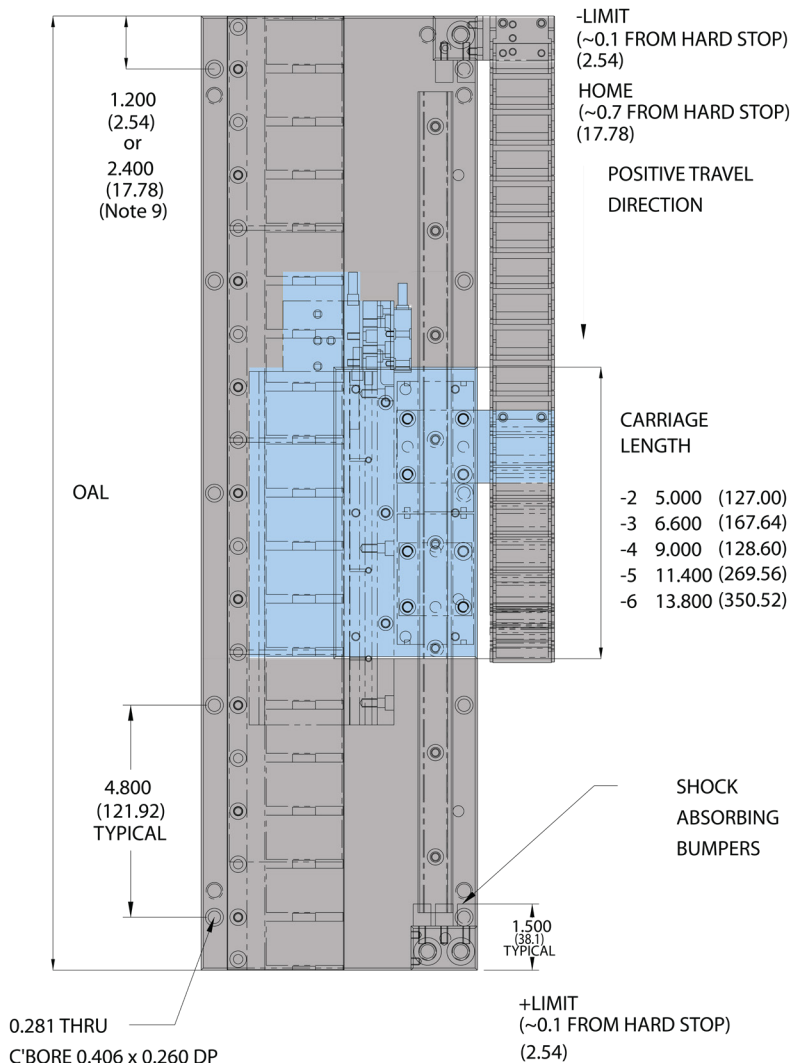
Download 2D & 3D files from  
[www.parker.com/emn/T3S](http://www.parker.com/emn/T3S)



DIMENSIONS

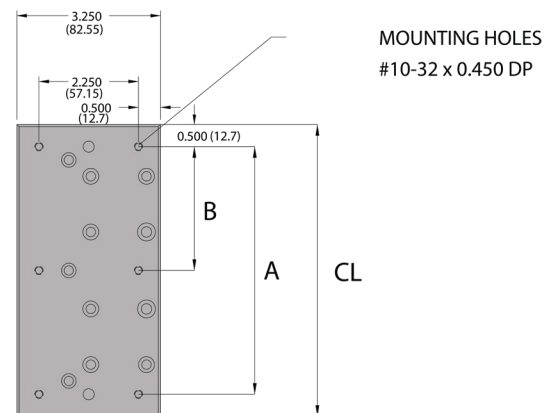
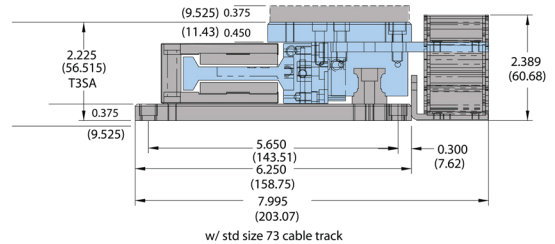
Dimensions shown in inches.

Moving Carriage Assembly  
 Stationary Base Assembly



TOTAL TRAVEL = OAL - 3.00" (76.2) - CARRIAGE LENGTH  
 OAL = MULTIPLE OF 2.400" (60.96)

**0.375 THICK CARRIAGE SPACER PLATE (optional)**  
 (9.525)



### CARRIAGE SIZE

	- 2	mm	- 3	mm	- 4	mm	- 5	mm	- 6	mm
<b>CL</b>	5.00	127.00	6.600	167.64	9.00	228.6	11.400	289.56	13.800	350.52
<b>A</b>	4.00	101.60	5.650	142.24	8.00	203.2	10.400	264.16	12.800	325.12
<b>B</b>	2.00	50.8	2.800	71.12	4.00	101.64	5.200	132.08	6.400	162.56
<b>Coil</b>	310-2		310-3		310-4		310-5		310-6	

# ORDERING INFORMATION

## T3D/T3S

### ORDERING INFORMATION

Fill in an order code from each of the numbered fields to create a complete model order code **for T3D/T3S**.

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫

#### Order Example:

T 3 D B 012 3 N S B A C 3

- | <p>① <b>Series</b><br/> <b>T</b> Open Positioner<br/> <b>B</b> Bellows Positioner available - consult factory for details</p> <p>② <b>Motor Coil Series</b><br/> <b>3</b> 310 Motor Coil</p> <p>③ <b>Bearing Rail Configuration</b><br/> <b>D</b> Dual Bearing Rails<br/> <b>S</b> Single Bearing Rails</p> <p>④ <b>Base Material</b><br/> <b>B</b> 0.5" Al</p> <p>⑤ <b>Length of Base</b><br/> <b>XXX</b> Length of base in inches*<br/> Maximum: 144.0"<br/> Minimum: 9.6"<br/> Increment: 2.4"<br/> <b>Base Length (increments of 2.4" [60.96mm]) =</b><br/> Travel + Carriage Length + 3.0" [76.2mm]<br/> *Truncate base length in part number. Example: for a 16.8 inch base, "XXX" equals "016"</p> <p>⑥ <table border="0"> <thead> <tr> <th>Coil Size</th> <th>Carriage Length</th> </tr> </thead> <tbody> <tr> <td><b>2</b> 2 pole</td> <td>4.2" (106.68mm)</td> </tr> <tr> <td><b>3</b> 3 pole</td> <td>6.6" (106.64mm)</td> </tr> <tr> <td><b>4</b> 4 pole</td> <td>9.0" (228.60mm)</td> </tr> <tr> <td><b>5</b> 5 pole</td> <td>11.4" (289.56mm)</td> </tr> <tr> <td><b>6</b> 6 pole</td> <td>13.8" (350.52mm)</td> </tr> </tbody> </table></p> <p>⑦ <b>Cooling</b><br/> <b>N</b> No cooling</p> <p>⑧ <b>Winding Type</b><br/> <b>S</b> Series<br/> <b>P</b> Parallel</p> <p>⑨ <b>Encoder</b><br/> <b>A</b> Magnetic 1µm<br/> <b>B</b> Magnetic 5µm<br/> <b>Q</b> Optical 5µm<br/> <b>L</b> Optical 1µm<br/> <b>M</b> Optical 0.5µm<br/> <b>P</b> Optical 0.1µm<br/> <b>R</b> Optical 1 V p-p sine/cosine<br/> <b>X</b> No encoder</p> | Coil Size        | Carriage Length | <b>2</b> 2 pole | 4.2" (106.68mm) | <b>3</b> 3 pole | 6.6" (106.64mm) | <b>4</b> 4 pole | 9.0" (228.60mm) | <b>5</b> 5 pole | 11.4" (289.56mm) | <b>6</b> 6 pole | 13.8" (350.52mm) | <p>⑩ <b>Cable Length</b><br/> <b>A</b> 1 Meter<br/> <b>B</b> 3 Meter<br/> <b>C</b> 7.5 Meter<br/> <b>L</b> 3 Meter Extension Cables (with Connector Box)<br/> <b>M</b> 7.5 Meter Extension Cables (with Connector Box)<br/> <b>Z</b> Connector Box ONLY (no cables)<br/> *Options A, B, C: cable measured from last cable carrier link<br/> *Options L, M: cable measured from connection box at end of base.<br/> *7.5 Meter Flying Lead Cables available on:<br/> <ul style="list-style-type: none"> <li>• All bases with Magentic encoder</li> <li>• All bases with Optical encoder under 86"</li> <li>• For bases with Optical encoder over 86" the cable length will be CL = 10M - (base length in meters + 0.3M)</li> </ul></p> <p>⑪ <b>Cable Connectorization</b><br/> <b>A</b> P-Series DC<br/> <b>B</b> Flying Leads<br/> <b>C</b> HD15M-CF12 Connector<br/> <b>G</b> Gemini<br/> <b>V</b> HD15M-VF Connector<br/> <b>Z</b> No cables<br/> Notes - HD15M-VF Connector compatible with IPA, Vix and Aries Feedback Connector<br/> HD15M-CF12 Connector compatible with Compax 3 F12 Feedback Connector<br/> MD14-PF Connector compatible with P Series (PD-xxP) Feedback Connector</p> <p>⑫ <b>Cable Track</b><br/> <b>0</b> None<br/> <b>3</b> Standard</p> |
|---|------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|------------------|-----------------|------------------|--|
| Coil Size   | Carriage Length  |                 |                 |                 |                 |                 |                 |                 |                 |                  |                 |                  |  |
| <b>2</b> 2 pole   | 4.2" (106.68mm)  |                 |                 |                 |                 |                 |                 |                 |                 |                  |                 |                  |  |
| <b>3</b> 3 pole   | 6.6" (106.64mm)  |                 |                 |                 |                 |                 |                 |                 |                 |                  |                 |                  |  |
| <b>4</b> 4 pole   | 9.0" (228.60mm)  |                 |                 |                 |                 |                 |                 |                 |                 |                  |                 |                  |  |
| <b>5</b> 5 pole   | 11.4" (289.56mm) |                 |                 |                 |                 |                 |                 |                 |                 |                  |                 |                  |  |
| <b>6</b> 6 pole   | 13.8" (350.52mm) |                 |                 |                 |                 |                 |                 |                 |                 |                  |                 |                  |  |

Linear Motor  
Driven Tables

Free sizing and selection support  
from Virtual Engineer at  
[parker.com/VirtualEngineer](http://parker.com/VirtualEngineer)



# SPECIFICATIONS

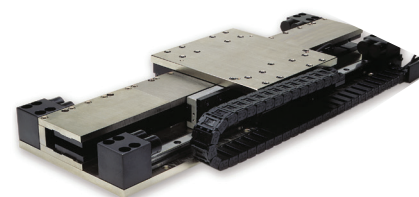
## T4D

## SPECIFICATIONS

		LINEAR MAGNETIC ENCODER		LINEAR OPTICAL ENCODER OPTIONS (NOTE 5)	
PERFORMANCE		5.0µm	1.0µm	5.0µm	1.0µm
Peak Velocity	in/s (m/s)	275 (7)	100 (2.5)	196 (5)	120 (3)
Resolution	in (µm)	0.0002 (5)	0.000 04 (1.0)	0.000 02 (0.5)	0.000 004 (0.1)
Repeatability	in (µm)	±0.0004 (±10)	±0.000 8 (2.0)	±0.000 06 (1.5)	±0.000 04 (1.0)
Accuracy – Magnetic		±(30µm +50µm/m)			
Accuracy – Optical				±(5µm +30µm/m)	

Note: For travels less than 1 meter, accuracy should be calculated at 1 meter

MOTOR MODEL		410-2	410-3	410-4	410-5	410-6
Peak Force	N	1041.4	1523.6	2006.3	2967.2	3928.1
	lb	234.1	342.5	451.0	667.0	883.0
Continuous Force	N	233.1	340.8	448.9	663.7	878.6
	lb	52.4	76.6	100.9	149.2	197.5
Peak Power	W	2835	4050	5265	7695	10125
Continuous Power	W	142	203	263	385	506



ACCURACY		STANDARD	LASER ALIGNMENT OPTION
Straightness restrained on flat surface in [µm]		±0.000127 in/in (±127µm/m)	±.000013 in/in (±13µm/m)
Flatness restrained on flat surface in [µm]		±0.003 + .000254 in/in (±76 + 254µm/m)	

Note: Straightness/Flatness specifications based on system mounted to surface of flatness ±0.0005in/ft

PHYSICAL		- 2	- 3	- 4	- 6	- 8
<b>Carriage Assembly</b>						
T4DB Aluminum (0.500" thick)	lbs (kg)	9.0 (4.1)	14.9 (6.8)	18.1 (8.2)	24.1 (11.0)	30.0 (13.6)
<b>Base Assembly</b>						
T4DB Aluminum (0.500" thick)	lbs/ft (kg/m)	29.4 (43.8)	29.4 (43.8)	29.4 (43.8)	29.4 (43.8)	29.4 (43.8)
Carriage Assembly	in (mm)	4.8 (121.9)	8.15 (207.0)	11.50 (292.1)	18.20 (462.3)	24.90 (632.5)
Coil Bar Length	in (mm)	10.00 (254)	13.36 (339)	16.72 (424)	23.44 (595)	30.16 (766)

LOAD		- 2	- 3	- 4	- 5	- 6
Vertical (Fv) see note 11	lbs (kg)	200 (90)	250 (113)	300 (136)	400 (181)	400 (181)
Side (Fs) see note 11	lbs (kg)	150 (68)	150 (68)	150 (68)	150 (68)	150 (68)
Moments - Roll (Mr) see note 11	Lb-ft (N-m)	100 (133)	150 (200)	150 (200)	150 (200)	150 (200)
Moments - Pitch (Mp) see note 11	Lb-ft (N-m)	200 (266)	400 (532)	400 (532)	400 (532)	400 (532)
Moments - Yaw (My) see note 11	Lb-ft (N-m)	200 (266)	400 (532)	400 (532)	400 (532)	400 (532)

- Total travel = OAL – 5.5" (139.7 mm) – carriage length.
- Maximum base length is 137.76" (3499 mm).
- Aluminum base is black anodized.
- For complete motor specifications, refer to 410 series motor data sheet.
- Optical encoder, RGH series, available in 0.05µm, 0.1µm, 0.5µm, 1.0µm, 5.0µm.
- Cables extend past base by approximately 0.6" when carriage is at negative hard stop.
- Cable Track extends 0.050" below carriage mounting surface. Space must be taken into account when mounting load.
- Standard cable track provided is 40mm wide 18mm BR.
- Base mounting holes are equidistant, 1.68" (12.0, 16.8, 21.6....) or 3.36" (9.6, 14.4, 19.2, 24.0....) from each end depending on base length.
- Specification subject to change without notice.
- Listed specifications based on motor size and typical performance requirements. Bearing manufacturer specifications exceed listed specifications.
- For high load, high speed applications, customer-supplied deceleration shocks are required (not included with product).
- The repeatability for the home switch is estimated to be +/- 10-20 microns. However, repeatability of the home switch does not dictate the system or encoder repeatability.

# DIMENSIONS

## T4D

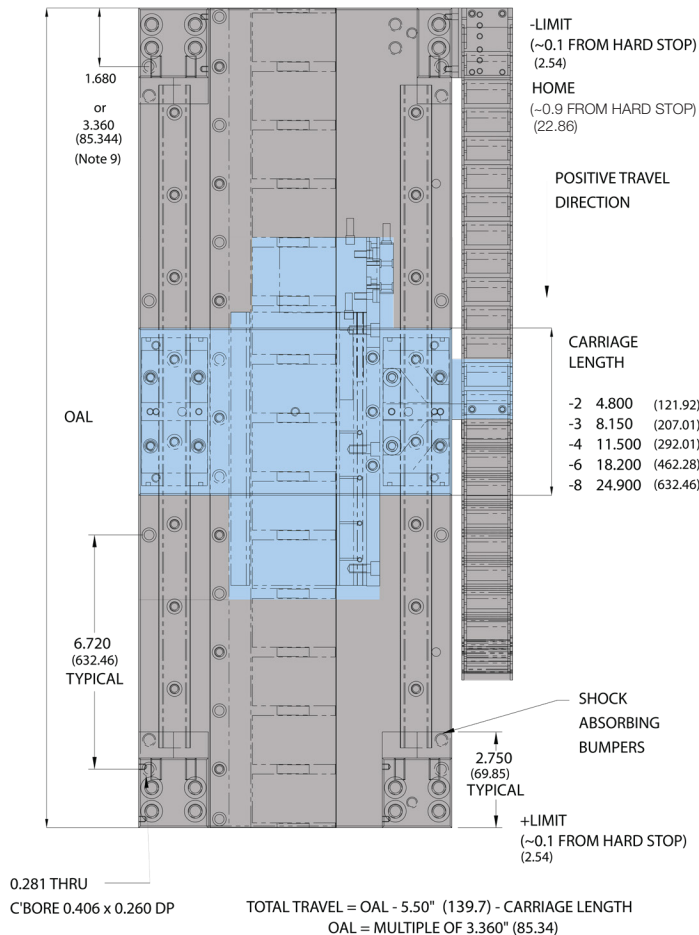
Download 2D & 3D files from  
[www.parker.com/emn/T4D](http://www.parker.com/emn/T4D)



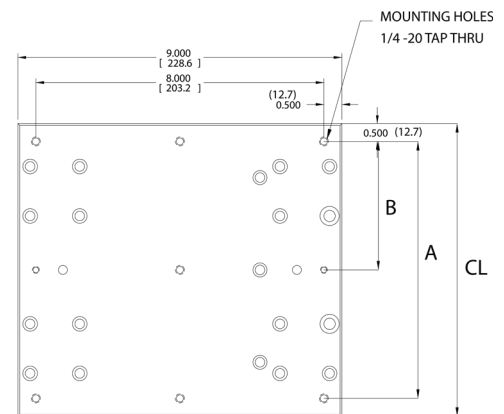
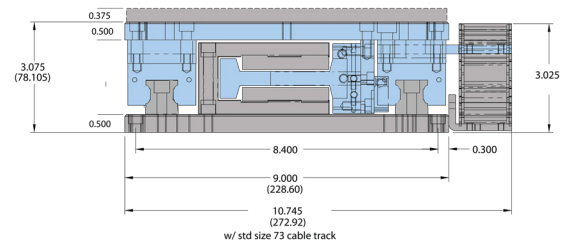
DIMENSIONS

Dimensions shown in inches.

- Moving Carriage Assembly
- Stationary Base Assembly



0.375 THICK CARRIAGE SPACER PLATE (optional)  
 (9.525)



### CARRIAGE SIZE

	- 2	mm	- 3	mm	- 4	mm	- 6	mm	- 8	mm
CL	4.80	121.92	8.150	207.01	11.50	292.10	18.200	462.28	24.900	632.46
A	3.800	96.52	7.150	181.61	10.500	266.70	17.200	436.88	23.900	607.66
B	—	—	3.575	90.805	5.250	133.35	8.600	218.44	11.950	303.53
Coil	410-2		410-3		410-4		410-5		410-6	



# SPECIFICATIONS

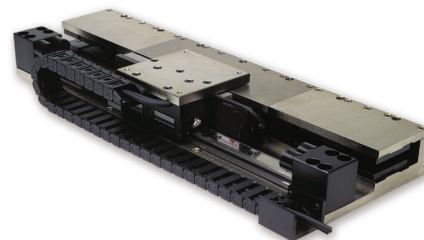
## T4S

## SPECIFICATIONS

		LINEAR MAGNETIC ENCODER		LINEAR OPTICAL ENCODER OPTIONS (NOTE 5)	
PERFORMANCE		5.0µm	1.0µm	5.0µm	1.0µm
Peak Velocity	in/s (m/s)	275 (7)	100 (2.5)	196 (5)	120 (3)
Resolution	in (µm)	0.0002 (5)	0.000 04 (1.0)	0.000 02 (0.5)	0.000 004 (0.1)
Repeatability	in (µm)	±0.0004 (±10)	±0.000 8 (2.0)	±0.000 06 (1.5)	±0.000 04 (1.0)
Accuracy – Magnetic		±(30µm +50µm/m)			
Accuracy – Optical				±(5µm +30µm/m)	

Note: For travels less than 1 meter, accuracy should be calculated at 1 meter

MOTOR MODEL		410-2	410-3	410-4	410-6	410-8
Peak Force	N	1041.4	1523.6	2006.3	2967.2	3928.1
	lb	234.1	342.5	451.0	667.0	883.0
Continuous Force	N	233.1	340.8	448.9	663.7	878.6
	lb	52.4	76.6	100.9	149.2	197.5
Peak Power	W	2835	4050	5265	7695	10125
Continuous Power	W	142	203	263	385	506



ACCURACY		STANDARD	LASER ALIGNMENT OPTION
Straightness restrained on flat surface in (µm)		±0.000127 in/in (±127µm/m)	±.000013 in/in (±13µm/m)
Flatness restrained on flat surface in (µm)		±0.003 + .000254 in/in (±76 + 254µm/m)	

Note: Straightness/Flatness specifications based on system mounted to surface of flatness ±0.0005in/ft

PHYSICAL		- 2	- 3	- 4	- 6	- 8
<b>Carriage Assembly</b>						
T4SB Aluminum (0.500" thick)	lbs (kg)	6.5 (3.0)	10.3 (4.7)	13.0 (5.9)	17.8 (8.1)	22.7 (10.3)
<b>Base Assembly</b>						
T4SB Aluminum (0.500" thick)	lbs/ft (kg/m)	26.7 (39.8)	26.7 (39.8)	26.7 (39.8)	26.7 (39.8)	26.7 (39.8)
Carriage Assembly	in (mm)	4.8 (121.9)	8.15 (207.0)	11.50 (292.1)	18.20 (462.3)	24.90 (632.5)
Coil Bar Length	in (mm)	10.00 (254)	13.36 (339)	16.72 (424)	23.44 (595)	30.16 (766)

LOAD		- 2	- 3	- 4	- 6	- 8
Vertical (Fv) see note 11	lbs (kg)	150 (68)	175 (79)	175 (79)	200 (90)	200 (90)
Side (Fs) see note 11	lbs (kg)	75 (34)	75 (34)	75 (34)	75 (34)	75 (34)
Moments - Roll (Mr) see note 11	Lb-ft (N-m)	50 (66)	100 (133)	100 (133)	100 (133)	100 (133)
Moments - Pitch (Mp) see note 11	Lb-ft (N-m)	100 (133)	200 (266)	200 (266)	200 (266)	200 (266)
Moments - Yaw (My) see note 11	Lb-ft (N-m)	100 (133)	200 (266)	200 (266)	200 (266)	200 (266)

- Total travel = OAL – 5.5" (139.7 mm) – carriage length.
- Maximum base length is 137.76" (3499 mm).
- Aluminum base is black anodized.
- For complete motor specifications, refer to 410 series motor data sheet.
- Optical encoder, RGH series, available in 0.05µm, 0.1µm, 0.5µm, 1.0µm, 5.0µm.
- Cables extend past base by approximately 0.6" when carriage is at negative hard stop.
- Cable Track extends 0.050" below carriage mounting surface. Space must be taken into account when mounting load.
- Standard cable track provided is 40mm wide 18mm BR.
- Base mounting holes are equidistant, 1.68" (12.0, 16.8, 21.6....) or 3.36" (9.6, 14.4, 19.2, 24.0....) from each end depending on base length.
- Specification subject to change without notice.
- Listed specifications based on motor size and typical performance requirements. Bearing manufacturer specifications exceed listed specifications.
- For high load, high speed applications, customer-supplied deceleration shocks are required (not included with product).
- The repeatability for the home switch is estimated to be +/- 10-20 microns. However, repeatability of the home switch does not dictate the system or encoder repeatability.

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# DIMENSIONS

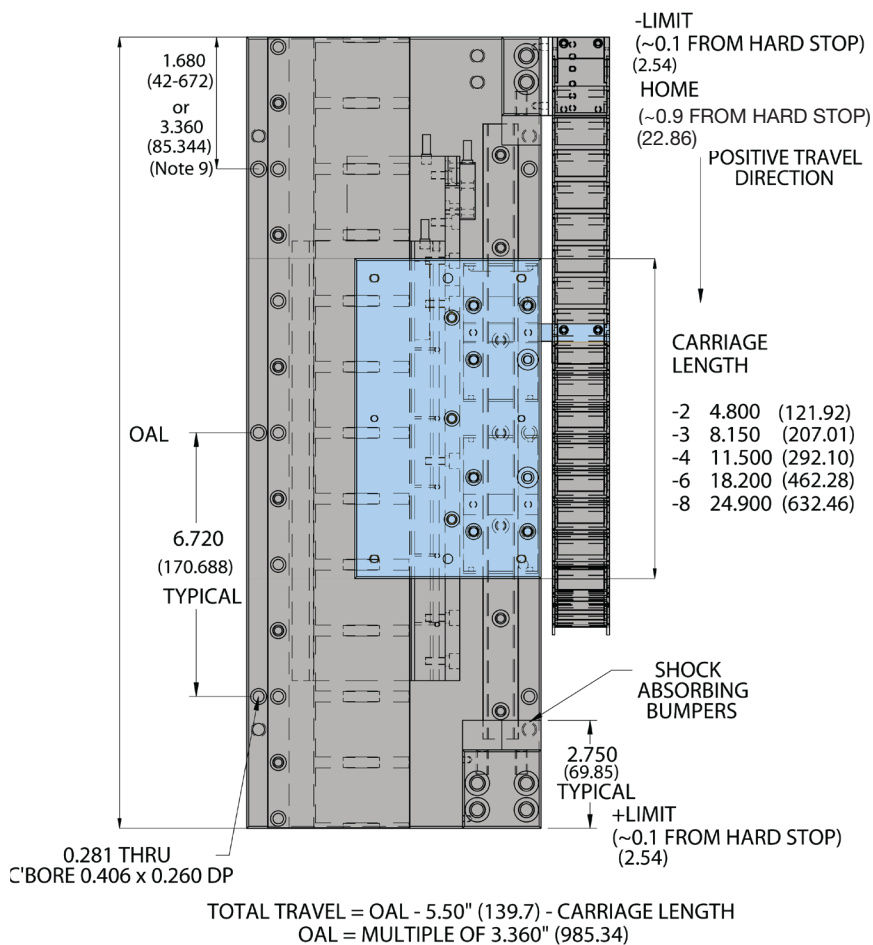
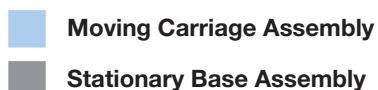
## T4S

Download 2D & 3D files from  
[www.parker.com/emn/T4S](http://www.parker.com/emn/T4S)

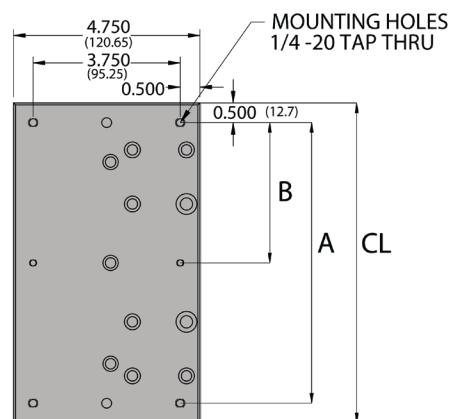
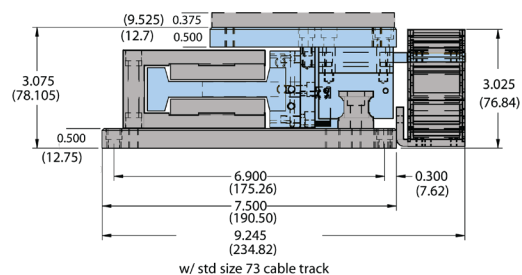


DIMENSIONS

Dimensions shown in inches.



0.375 THICK CARRIAGE SPACER PLATE (optional)  
 9.525



Linear Motor  
Driven Tables

### CARRIAGE SIZE

	- 2	mm	- 3	mm	- 4	mm	- 6	mm	- 8	mm
CL	4.800	121.92	8.150	207.01	11.50	292.10	18.200	462.28	24.900	632.46
A	3.800	96.52	7.150	181.61	10.500	266.70	17.200	436.88	23.900	607.66
B	—	—	3.575	90.805	5.250	133.35	8.600	218.44	11.950	303.53
Coil	410-2		410-3		410-4		410-6		410-8	

# ORDERING INFORMATION

## T4D/T4S

## ORDERING INFORMATION

Fill in an order code from each of the numbered fields to create a complete model order code for T4D/T4S.

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫

### Order Example:

T 4 D B 012 3 N S B A B 4

①	<b>Series</b> T Open Positioner B Bellows Positioner available - consult factory for details	⑩	<b>Cable Length</b> A 1 Meter B 3 Meter C 7.5 Meter L 3 Meter Extension Cables (with Connector Box) M 7.5 Meter Extension Cables (with Connector Box) Z Connector Box ONLY (no cables) *Options A, B, C: cable measured from last cable carrier link *Options L, M: cable measured from connection box at end of base. *7.5 Meter Flying Lead Cables available on: • All bases with Magnetic encoder • All bases with Optical encoder under 86" • For bases with Optical encoder over 86" the cable length will be CL = 10M - (base length in meters + 0.3M)
②	<b>Motor Coil Series</b> 4 410 Motor Coil	⑪	<b>Cable Connectorization</b> A P-Series DC B Flying Leads C HD15M-CF12 Connector G Gemini V HD15M-VF Connector Z No cables  Notes - HD15M-VF Connector compatible with IPA, Vix and Aries Feedback Connector HD15M-CF12 Connector compatible with Compax 3 F12 Feedback Connector MD14-PF Connector compatible with P Series (PD-xxP) Feedback Connector
③	<b>Bearing Rail Configuration</b> D Dual Bearing Rails S Single Bearing Rails	⑫	<b>Cable Track</b> 0 None 4 Standard
④	<b>Base Material</b> B 0.5" Al		
⑤	<b>Length of Base</b> XXX Length of base in inches* Maximum: 137.76" * Minimum: 13.44" Increment: 3.36" <b>Base Length (increments of 3.36" [85.344mm]) =</b> Travel + Carriage Length + 5.5" [39.7mm] *Truncate base length in part number. Example: for a 16.8 inch base, "XXX" equals "016" *Consult factory for longer lengths.		
⑥	<b>Coil Size</b> 2 2 pole 3 3 pole 4 4 pole 6 6 pole 8 8 pole		<b>Carriage Length</b> 4.8" (121.92mm) 8.15" (207.01mm) 11.5" (292.10mm) 18.2" (462.28mm) 24.9" (632.46mm)
⑦	<b>Cooling</b> N No cooling		
⑧	<b>Winding Type</b> S Series P Parallel		
⑨	<b>Encoder</b> A Magnetic 1µm B Magnetic 5µm Q Optical 5µm L Optical 1µm M Optical 0.5µm P Optical 0.1µm R Optical 1 V p-p sine/cosine X No encoder		

Free sizing and selection support  
from Virtual Engineer at  
[parker.com/VirtualEngineer](http://parker.com/VirtualEngineer)



## Cable Connector Configuration

**HD15M-VF**

15 Pin HD-SUB Plug

Pin #	Function
1	Z+
2	Z-
3	GND
4	NO CONN
5	+5V
6	GND
7	A-
8	A+
9	HALL1
10	TEMP
11	B-
12	B+
13	HALL2
14	HALL3
15	NO CONN
HD15M-VF Connector compatible with IPA, Vix and Aries Feedback Connector	

**HD15M-CF12**

15 Pin HD-SUB Plug

Pin #	Function
1	SENSE-
2	SENSE+
3	HALL1
4	+5V
5	+5V
6	HALL2
7	A-/SIN-
8	A+/SIN+
9	HALL3
10	TEMP
11	B-/COS-
12	B+/COS+
13	Z+
14	Z-
15	GND
HD15M-CF12 Connector compatible with Compax 3 F12 Feedback Connector	