

LX80L Linear Motor Tables

Features

- Velocity to 3 m/sec
- Acceleration to 5 g's
- Encoder resolution to 0.1 micron
- Cleanroom compatible
- Easy multi-axis mounting
- Internal cable management



Introduction

Miniaturization of life sciences, electronics, photonics, and fiber optic processes has driven the need for smaller and more efficient positioners. Parker's MX80, the smallest linear servomotor driven positioner in the industry, has redefined 'high-throughput automation' in the world of miniature positioners. It is loaded with high performance features for both rapid linear translation and precise positioning of smaller loads within very small work envelopes. The LX80L picks up where the MX80 leaves off, offering longer travels than the MX80 while maintaining a very small profile. Like the MX80, it is designed to meet the rigors of today's 24/7 production demands.

High Performance in a small package

Although it has a small profile, the LX80L is large on performance and reliability. All key components are "built-in", residing within the body of the table to provide a clean looking, reliable, unobstructed package. At the heart of the LX80L is an innovative non-contact linear servo motor (patent pending). This direct drive motor has been optimized for force, speed, and acceleration to deliver outstanding performance and response. A high precision non-contact linear encoder provides submicron resolution, repeatability and accuracy with selectable resolutions ranging from 0.1 microns to 5 microns. Digital Hall effect travel limit and home sensors are conveniently designed into the unit for easy adjustment over the entire travel of the table.

Precision square rail bearings provide load support and precise linear translation, while effectively countering the problematic effects of heat, high speeds, and high acceleration. Cable management is neatly packaged inside the unit so no moving cables are visible. From the end of the unit, "hi-flex" cabling is provided for direct connection to the servo drive. This "hi-flex" cabling alleviates cable flexing concerns associated with the second or third axis in multi-axis system.

Flexibility and Multi-Axis Compatibility

The LX80L's selection flexibility and mounting compatibility with the MX80 miniature 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 LX80L tables to suit all application specific requirements. Parker has taken the mystery, difficulty and cost out of integrating linear motor tables into high throughput precision positioning applications.

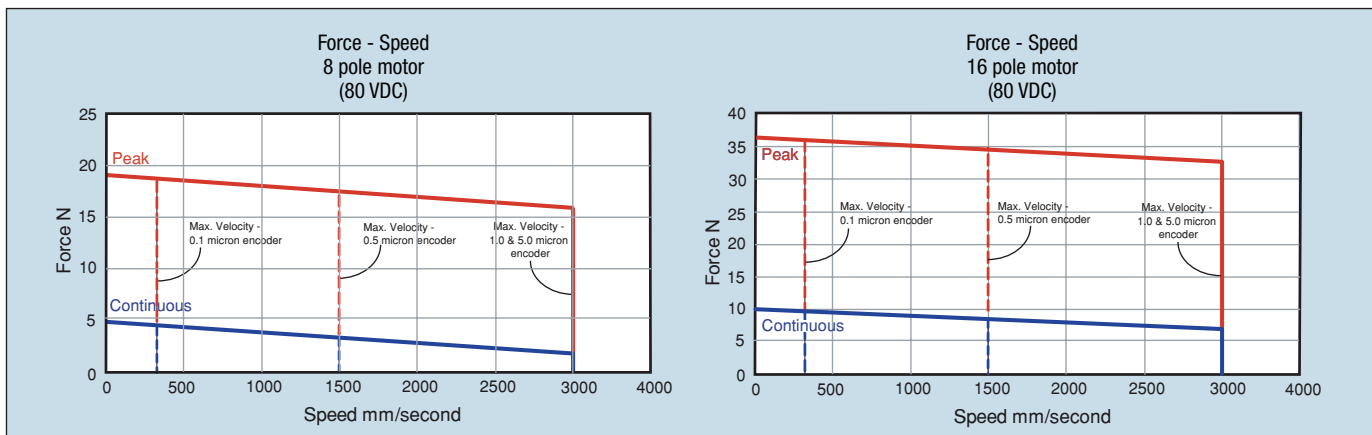


Specifications	8 Pole	8 Pole	16 Pole	16 Pole
	Single Rail	Double Rail	Single Rail	Double Rail
Rated Load (kg)	3(6.5 lb.)	3(6.5 lb.)	6(13 lb.)	6(13 lb.)
Maximum Acceleration	5 g's			
Maximum Velocity (m/sec.)				
Encoder Resolution:	0.1 μm		0.3	
	0.5 μm		1.5	
	1.0 μm		3.0	
	5.0 μm		3.0	
Positional Repeatability(μm)				
Encoder Resolution:	0.1 μm	+ 2.5	+ 1.5	+ 2.5
	0.5 μm	+ 2.5	+ 1.5	+ 2.5
	1.0 μm	+ 3.5	+ 2.5	+ 3.5
	5.0 μm	+ 10.0	+ 10.0	+ 10.0
Maximum Peak Force N (lb)	19 (4.3)	19 (4.3)	36 (8.1)	36 (8.1)
Maximum Continuous Force N (lb)	4.7 (1.0)	4.7 (1.0)	10 (2.2)	10 (2.2)
Maximum Moment (Nm)	.75	.75	3.0	3.0
Carriage Weight (g)	287	388	476	648

Travel Dependent Specifications

Code	Travel		Accuracy* (μm)			Length "L" (mm)	Unit Weight	
	8 pole (mm)	16 pole (mm)	Positional		Straightness & Flatness* (μm)		8 pole (kg)	16 pole (kg)
			0.1, 0.5, 1.0 resolution (μm)	5.0 resolution (μm)				
Double Rail Models								
T02	150	80	8	18	9	325	1.590	1.854
T04	250	180	12	22	14	425	1.944	2.207
T06	350	280	16	26	19	525	2.300	2.563
T08	450	380	20	30	24	625	2.652	2.915
T10	550	480	23	33	29	725	3.006	3.269
T14	750	680	29	39	37	922	3.713	3.976
Single Rail Models								
T02	150	80	12	22	13	325	1.396	1.586
T04	250	180	16	26	18	425	1.714	1.905
T06	350	280	20	30	23	525	2.035	2.225
T08	450	380	24	34	28	625	2.352	2.543
T10	550	480	27	37	33	725	2.671	2.861
T14	750	680	33	43	41	922	3.308	3.498

* Accuracy stated is at 20 degrees C, utilizing slope correction factor provided.



Cable Management

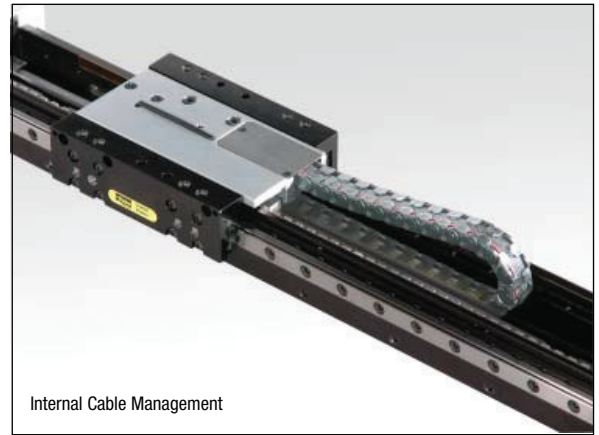
“Plug & Run” Cables

“User Friendly” and “robust” were the goals of the cabling design. All cables are ‘hi-flex’ for durability and are fully shielded. The cables are labeled for quick identification and have connectors at critical locations to simplify use. The drive end termination are ViX series servo drive compatible and have CE compliant connectors including a ferrite bead to improve EMI immunity.



Internal Cable Management

The LX80’s pre-engineered internal cable management offers several benefits. It preserves the LX80’s narrow footprint by not requiring additional space for cable management. It allows the table to be mounted in any orientation without a need to re-engineer the cable management. The innovative design is field serviceable and can be maintained without a trip back to the factory. It is designed for and fully tested to last over 20 million cycles. And best of all, it is already done for you!

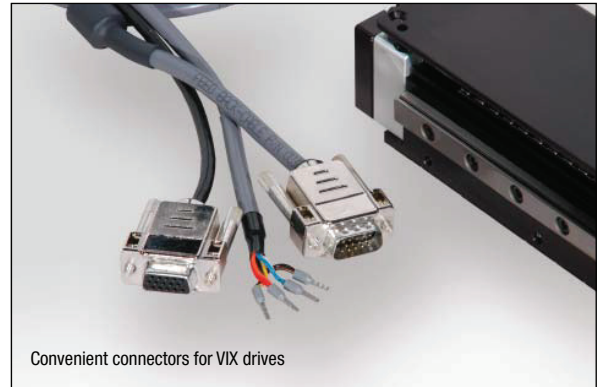


Internal Cable Management

Cable Options

From the end of the LX80L, high flex extension cables are included for connection to the servo drive and control. They are offered in 1m and 3m lengths and are connectorized at both ends for easy installation or removal. The servo drive end is connectorized for Parker’s ViX series servo drives.

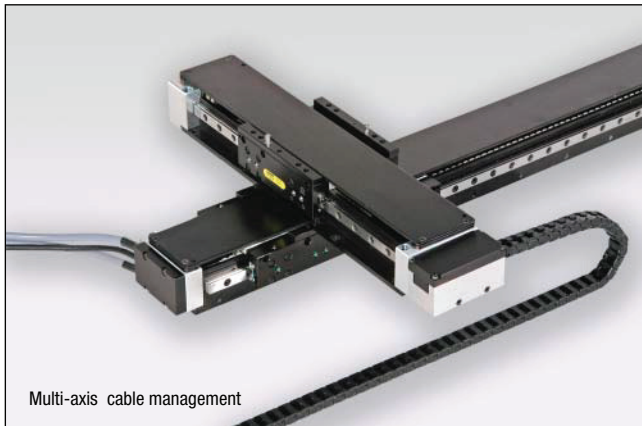
The extension cables egress from the table at a right angle to minimize the overall length of the system. In the standard configuration the cable egress to the left, however, the design is flexible and allows them to egress to the right if desired.



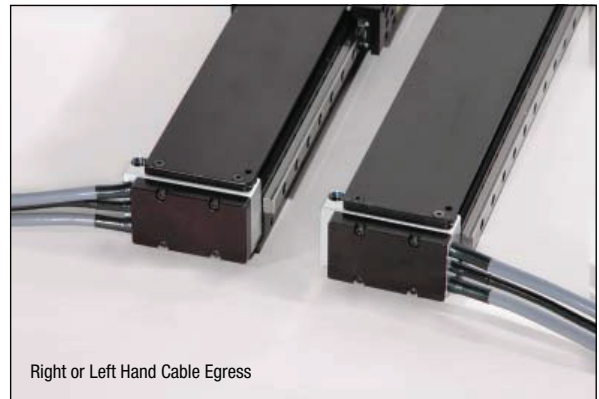
Convenient connectors for ViX drives

Multi-Axis Cable Management

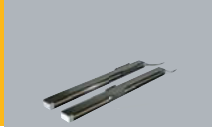
When building multi-axis systems, flexible cable management for the moving axes should be considered. Parker offers pre-engineered cable management for MX80s and LX80s used as the Y-axis. Contact Parker when putting multi-axis systems together to take advantage of these pre-engineered solutions.



Multi-axis cable management



Right or Left Hand Cable Egress



Features

Single or double row bearings - Precision linear bearings support the carriage, motor, and payload. Sized to provide virtually unlimited life, the bearings provide stable and accurate linear motion while maintaining high rigidity even under combined or fluctuating loads. Unique in the



LX80L's design are single and double linear bearing rail options. The double rail design consists of two linear rails spaced apart with a total of four bearing trucks. This version offers the best load capacity, straightness/flatness, and stability. For applications requiring

minimal load capacity and precision, a single rail version is offered with a single linear rail and two bearing trucks. This version reduces cost and further reduces the width to 63mm. The single rail version is also useful when building gantry systems where stability is achieved through use of a second axis or idler rail.

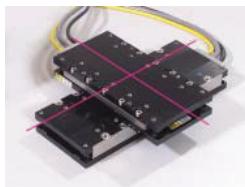
Tooling Features - Standard dowel pin locating holes facilitate repeatable mounting of a table and payloads. Two dowel holes in the LX80L base enable simple, repeatable mounting of the table into a machine. Similarly, two dowel holes in the carriage enable simple, repeatable mounting of a fixture or payload onto the LX80L.



Mounting Variations - All versions of the LX80 can be mounted flat to a surface using 4mm cap screws. The single rail version offers an additional mounting option where the table can be edge mounted. This allows further reduction of axis width to 45mm for applications where space is very limited.



Orthogonality - In any multi-axis positioning system, the perpendicular alignment of the axes must be clearly specified. "Degree of orthogonality" defines the perpendicular alignment of axis one to another. The LX80L is offered with two choices for orthogonality. As standard, (S3 or S4 designators) perpendicularity is held to within 60 arc seconds. For more exacting applications the LX80L can be optioned for 15 arc seconds orthogonality (S5 or S6 designators).



Cleanroom Option - LX80 tables can be prepared for cleanroom compatibility. Preparation involves material changes, element modification and cleanroom compatible lubricants. The LX80L with the R2 option is class 100 cleanroom compatible. When applying an XY or XYZ combination in a cleanroom environment, moving wires need to be considered - please consult a Parker application engineer.



Home and Limit Sensors - Digital Hall effect home and limit sensors are completely housed within the body of the motor driven table. An innovative design adds functionality without sacrificing geometry. Sensor triggers can be easily adjusted over the travel. The output format is an open collector type capable of sinking up to 50ma.



E - Encoder Options - A non-contact linear optical encoder provides a quadrature output and offers resolution ranging from 0.1 micron to 5 micron. On the LX80L, the encoder is internal to the table body. There is no increase to the footprint of the unit and no additional external cabling is required.

Z-axis Bracket- Lightweight aluminum Z-brackets are available for easy construction of vertical axis combinations. These include brackets for mounting both the MX80L and MX80S tables as verticals.

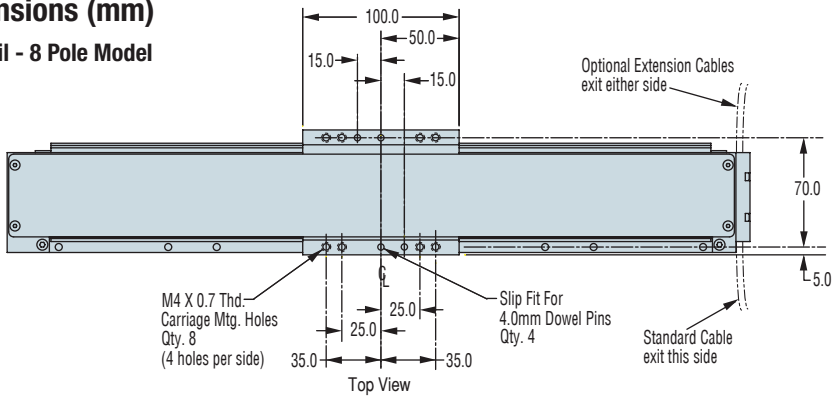


Idler Rail- For gantry or cartesian configurations, an idler rail is available to provide greater system stability. Contact a Parker application engineer for detail on adding this to your system.

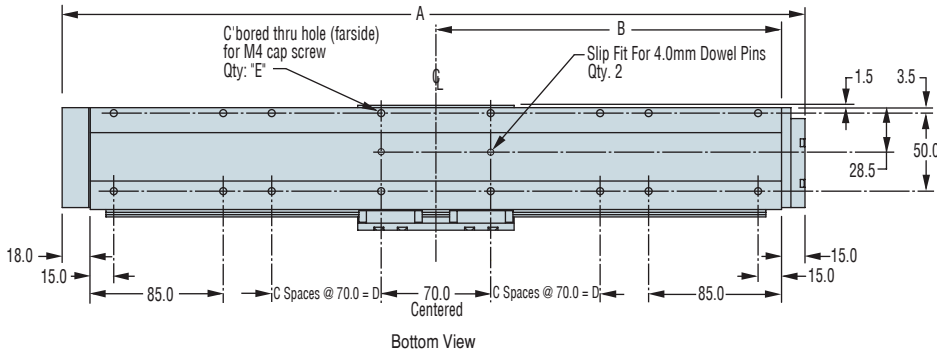
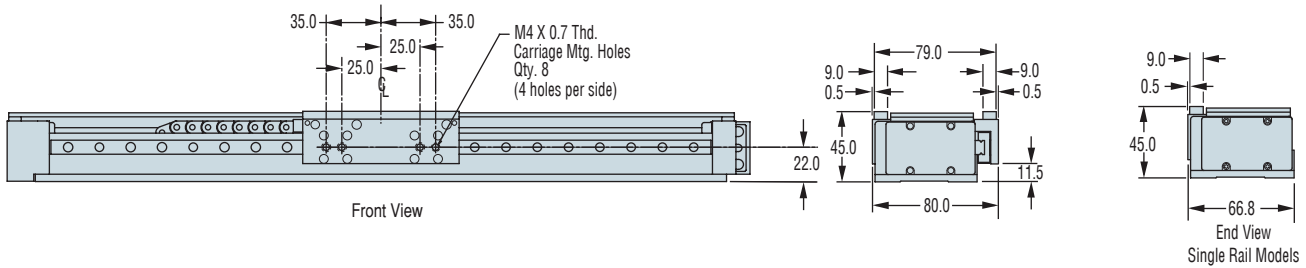


Dimensions (mm)

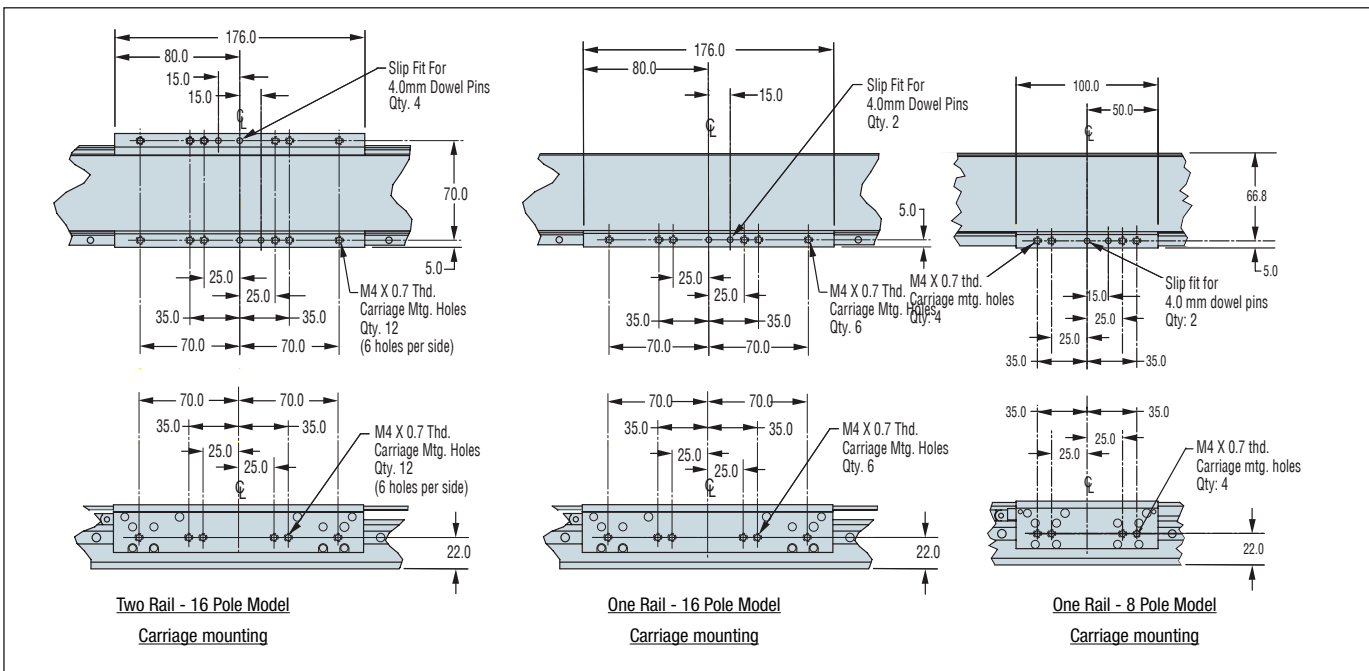
Two Rail - 8 Pole Model

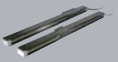


Code	Travel		Dimensions (mm)				
	8 pole	16pole	A	B	C	D	E
T02	150	80	325	146	-	-	6
T04	250	180	425	196	1	70	8
T06	350	280	525	246	1	70	8
T08	450	380	625	296	2	140	10
T10	550	480	725	346	3	210	12
T14	750	680	925	396	4	280	14



Note:
For edge mounting dimensions go to parkermotion.com - CAD Drawing files





Order Example:

LX80L T04 M P D D13 CM05 Z3 E3 R1 A25 X1 S1

Model

LX80L

Travel

8 pole 16 pole (motor)

150mm..... 80mm.....

T02

250mm.....180mm.....

T04

350mm.....280mm.....

T06

450 mm.....380mm.....

T08

550 mm.....480mm

T10

750 mm.....680mm

T14

Mounting...(metric).....

M

Grade.....(precision)....

P

Bearings

Double Rail

D

Single Rail

S

Drive Type

None - 8 pole carriage

D3

None - 16 pole carriage

D7

8 pole linear motor*

D13

16 pole linear motor*

D17

* includes home or limit sensors

Cable Options

No Cables (free travel)

CM03

1.0 meter high-flex cables w/ ViX connector

CM04

3.0 meter high-flex cables w/ ViX connector

CM05

X-Y Orthogonality

- S1** None (no X-Y configuration)
- S2** X axis unit (cables @12 o'clock)
- S3** 60 arc sec. - Y-axis (3 o'clock)
- S4** 60 arc sec. - Y-axis (9 o'clock)
- S5** 15 arc sec. - Y-axis (3 o'clock)
- S6** 5 arc sec. - Y-axis (9 o'clock)

Other Options

- X1** None

Digital Drive Options

- A1** No drive
- A20** ViX250-AH force mode
- A21** ViX250-AH velocity mode
- A22** ViX250-AH step/direction mode
- A25** ViX 250-IH drive/controller

Environmental Options

- R1** Standard finish
- R2** Cleanroom prep.

Digital Linear Encoder

- E1** No encoder (free travel only)
- E2** 1.0 micron resolution
- E3** 0.5 micron resolution
- E4** 0.1 micron resolution
- E5** 5.0 micron resolution

Z-Channel Location

- Z1** No Z-Channel (free travel only)
- Z2** Positive end position