

DXL Series Dual Carriage Linear Motor Table

Features

- ❑ Independently driven dual carriages
- ❑ Outstanding carriage to carriage co-planar motion
- ❑ Ultra precise velocity control and responsiveness
- ❑ Selectable encoder resolutions down to 20 nanometers
- ❑ Tooling reference surface and dowel holes on each carriage



The DXL dual carriage positioning table provides a precision platform for controlled translation and positioning of two independent carriages on the same linear travel path. The DXL ensures superior carriage to carriage flatness and coplanar motion by providing a common precision ground base and bearing ways for both carriages. Each carriage is independently driven by a cogfree, ironless linear motor to minimize velocity ripple and optimize responsiveness to match a complex motion profile (refer to chart on page A25). Extremely high resolution linear encoders provide the critical position data that allows superior velocity control and responsiveness necessary to optimize the precision control of the moving carriages. The twin carriages can be programmed to move in tandem, in opposing directions or independently with or without any ratio between the carriages.

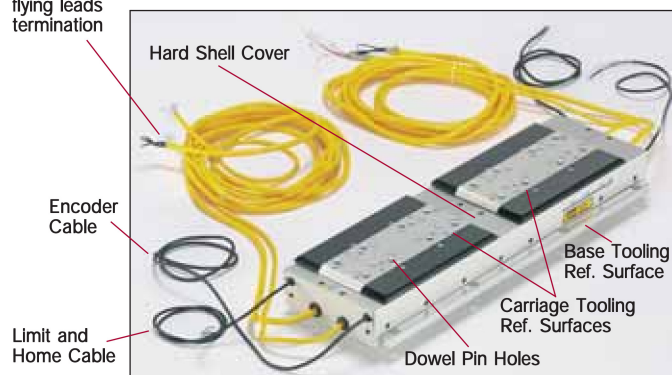
The DXL can be used in many precision motion applications but is especially effective for fiber optic industry applications where smooth, highly controlled velocity and motion path is employed for fusing fibers. Other applications include medical device manufacturing and imaging applications where focal distance must be precisely controlled.

Loaded with "ease of use" features, the DXL is designed to save time and effort. The DXL base includes a tooling edge parallel to the travel path. User tooling can be precisely located within 25 microns of the actual travel path of the positioner using the tooling reference features. A unique cover design prevents contamination (such as small fiber strands) from entering the positioner. The DXL is available with preconfigured digital servo drives that are compatible with all industry standard motion controllers. All DXL units ship complete with performance certification and laser interferometer test reports.

Key Attributes

- Cogfree linear motors with no moving cables
- One base and bearing way sets - common to both carriages
- Extremely high resolution optical encoders with digital output
- Hardshell cover protects internal components (IP30)
- Home sensor aligned to encoder reference marker for precise homing
- Adjustable end of travel sensors
- Tooling reference surface is aligned within 25 microns of the actual travel path
- Cleanroom compatible

Motor and Hall effect cable with flying leads termination



Specifications

Travel (Z-axis)	35 mm (per carriage – limit to limit)
Rated Load Capacity	150 Kg
Maximum Acceleration	2 Gs
Peak Force	44 N
Continuous Force	19 N
Resolution	
E2	1.0 µm digital encoder
E3	0.5 µm digital encoder
E4	0.1 µm digital encoder
E5	5.0 µm digital encoder
E7	Sine Output encoder
E8	0.02 µm digital encoder
Positional Accuracy^(1,2,4)	3 µm
Positional Repeatability^(1,2)	
1.0 µm digital encoder	+/-2 µm
0.5 µm digital encoder	+/-1 µm
0.1 µm digital encoder	+/-0.5 µm
5.0 µm digital encoder	+/-10 µm
Sine Output encoder	(interpolation dependent)
0.02 µm digital encoder	+/-0.3 µm
Maximum Velocity	
1.0 µm digital encoder	500 mm/sec ⁽³⁾
0.5 µm digital encoder	500 mm/sec ⁽³⁾
0.1 µm digital encoder	300 mm/sec
5 µm digital encoder	500 mm/sec
Sine Output encoder	500 mm/sec ⁽³⁾
0.02 µm digital encoder	100 mm/sec
Duty Cycle	100%
Linear Bearing – Coeff. of Friction	0.01
Flatness	+/-2 µm
Straightness	+/-2 µm
Unit Weight	7.1 Kg
Carriage Weight	1.6 Kg
Limit/Home Sensors	Refer to page B15

1 Measured at the carriage center, 35 mm off mounting surface.

2 With slope correction value provided.

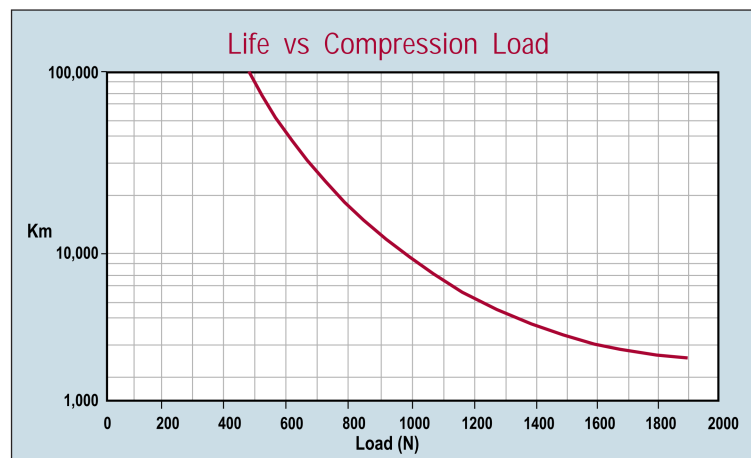
3 Speed is limited due to acceleration limit (2g's) and total travel of stage (35 mm).

Higher speeds can be commanded but constant velocity will not be reached due to required acceleration distance.

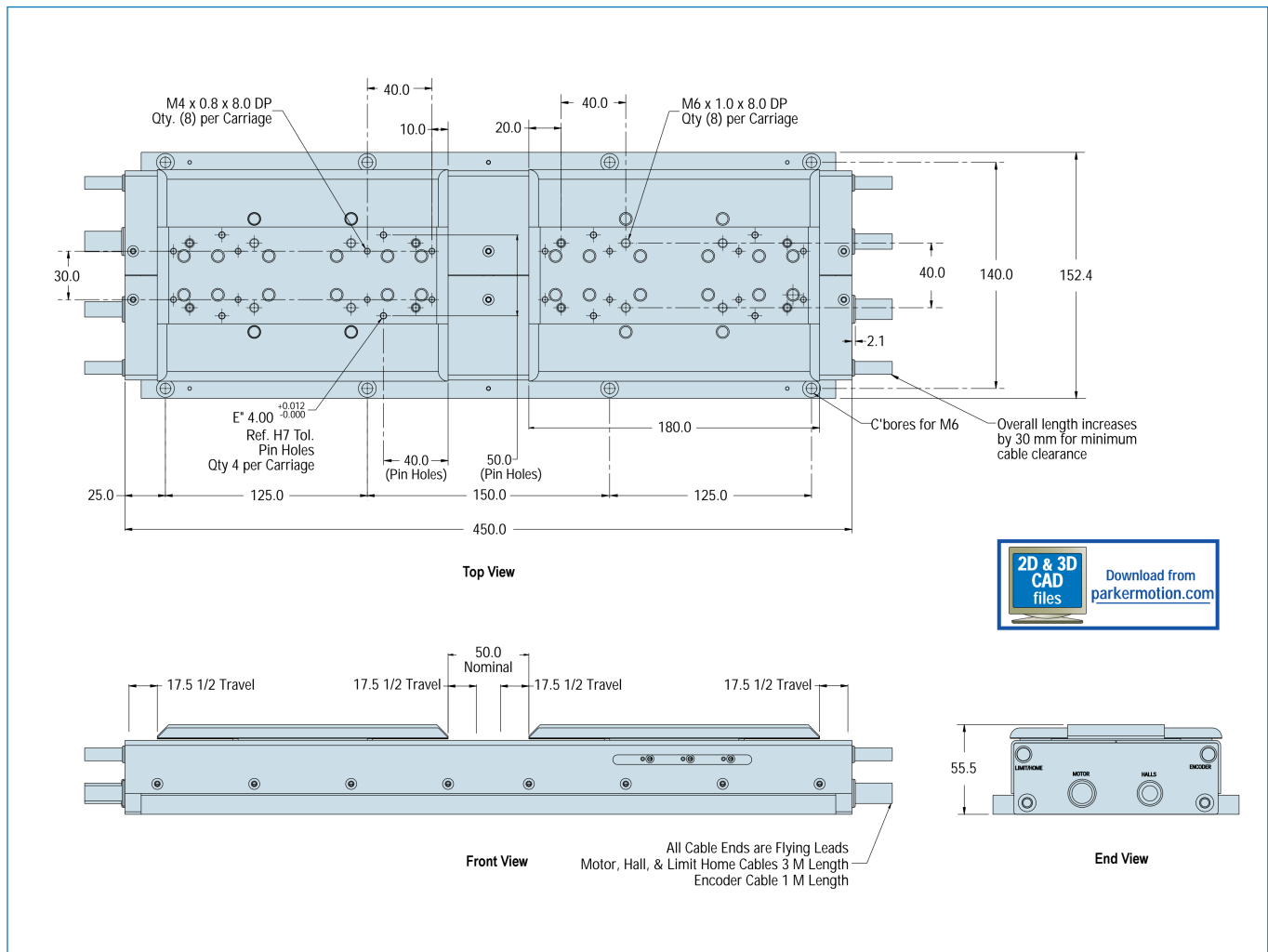
4 Based on 0.1 micron or finer encoder resolution.

Table Life/Load Chart Compression (normal load)

The graphs provide a preliminary evaluation of the support bearing life/load characteristics. The curves show the life/load relationship when the applied load is centered on the carriage, normal (perpendicular) to the carriage mounting surface. For final evaluation of life vs load, including off center, tension, and side loads refer to the charts and formulas found on pages B13 and B14.



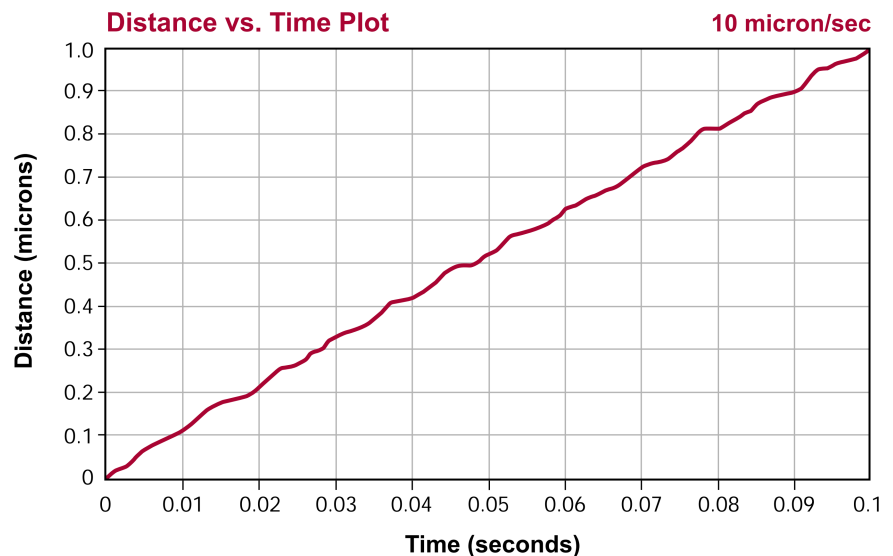
DXL Series Dimensions (mm)



Time/Distance Chart

Distance against time (linear)

The linearity of this plot illustrates the precision constant velocity of the DXL150. Moving at a velocity of only 10 mm/second, the maximum position error does not exceed 40 nanometers. This plot shows displacement of 1 mm with a data capture rate of 1000 hz.



DXL Series How to Order

Order Example

		DXL	150	T01	M	P	D20	H3	L3	A3	R1	E3	Z3	CM2
Model	DXL													
Series (150 mm wide) ...	150													
Travel (35 mm)	T01													
Mounting														
Metric	M													
Grade														
Precision	P													
Drive Type														
Free Travel (no motor) ...	D01													
4 pole slotless-ironless ...	D20													
Home Sensor														
None - free travel only ...	H1													
N.C. current sinking	H2													
N.O. current sinking	H3													
N.C. current sourcing	H4													
N.O. current sourcing	H5													
Travel Limit Sensors														
None - free travel only ...	L1													
N.C. current sinking	L2													
N.O. current sinking	L3													
N.C. current sourcing	L4													
N.O. current sourcing	L5													
Digital Drives*														
None	A1													
GV-L3E Drive	A2													
GV6-L3E Drive	A3													
*2 drives/table														
Environment														
Class 1000 - standard ...	R1													
Class 10 cleanroom	R2													
Encoder Option														
None - free travel only ...	E1													
1.0 µm Resolution Linear	E2													
0.5 µm Resolution Linear	E3													
0.1 µm Resolution Linear	E4													
5.0 µm Resolution Linear	E5													
Sine Output Encoder	E7													
0.02 µm Resolution Linear	E8													
Z Channel Location														
None - free travel only ...	Z1													
Center Position	Z3													
Cable Management														
None - free travel only ...	CM1													
3 m cable set w/ flying lead	CM2													