

DL Series

High-Performance Delay Line Stages



The DL linear stage series is a high performance but very affordable, linear motor driven stage with an integrated motion controller. Optimized for small loads, repeatable positioning and fast traverse speeds, it is an ideal solution for spectroscopy applications that require delay lines. With travels of 125 mm, 225 mm and 325 mm, this offering covers almost all possible delay needs from femtosecond to nanosecond delays. Spectroscopy applications range from pump-probe, interferometry, 2DIR, etc. To facilitate setups, beam kits consisting of retroreflectors, mirrors, mounts and other optomechanical parts, are available to suit various wavelengths and delay line configurations .



Design Details

- Base Material Extruded Aluminum
- Bearings Recirculating bearings
- Drive System 3-phase synchronous ironless linear motor (without Hall effect sensors)
- Motor Initialization Done by the controller.
- Motor Commutation Done by the controller on encoder feedback
- Feedback Linear glass scale, 80 μm signal period, 1 VPP
- Limit Optical
- Home Switch Optical, on encoder's fiducial track, located at the minus end of travel
- Controller DL Controller
- Cable 3 m long pigtail cables included
- MTBF 20,000 hours

Key Features

- Excellent delay sensitivity and bi-directional repeatability
- Low angular deviation where it counts (pitch)
- Compatibility with optical tables & mounts
- Small footprint
- No moving cable
- Easy to use (Delay line GUI, LabVIEW drivers)

Specifications

		DL125	DL225	DL325
Travel Range (Single Pass)	(mm)	125	225	325
	(ns)	0.8	1.5	2.2
Minimum Incremental Motion (Single Pass)	(nm)	75	75	75
	(fs)	0.5	0.5	0.5
Bi-direct. Repeatability, Guar. ⁽¹⁾ (μm)		± 0.15	± 0.15	± 0.15
Accuracy, Guaranteed ⁽¹⁾ (μm)		± 1.5	± 2	± 2.5
Encoder Resolution (nm)		50	50	50
Origin Repeatability (μm)		0.4	0.4	0.4
Maxi. Speed ⁽²⁾ (mm/s)		500	500	500
Max. Acceleration, No Load (mm/s ²)		7500	7500	7500
Pitch, Typical (Guaranteed) ^{(1) (3)} (μrad)		$\pm 60 (\pm 100)$	$\pm 60 (\pm 100)$	$\pm 90 (\pm 150)$
Yaw, Typical (Guaranteed.) ^{(1) (3)} (μrad)		$\pm 30 (\pm 60)$	$\pm 40 (\pm 90)$	$\pm 50 (\pm 120)$

¹⁾ For the definition of Typical and Guaranteed specifications see "Motion Basics Terminology & Standards" Tutorial at www.newport.com

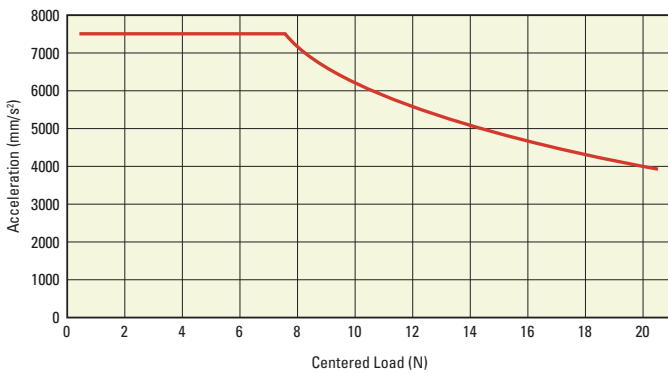
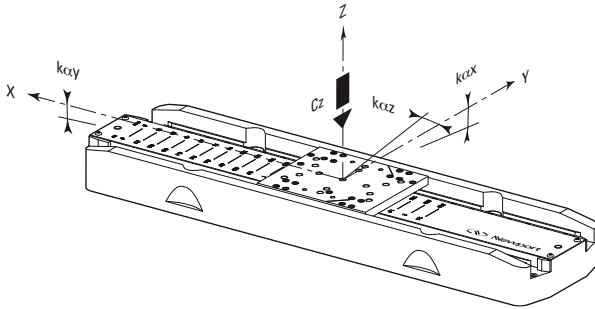
²⁾ With DL controller.

³⁾ To obtain arcsec units, divide μrad value by 4.8.

		Single Pass	Dual Pass	Quad Pass
Delay	DL125 (ns)	0.8	1.7	3.3
	DL225 (ns)	1.5	3.0	6.0
	DL325 (ns)	2.2	4.3	8.7
MIM	(fs)	0.5	1.0	2.0

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Load Characteristics and Stiffness



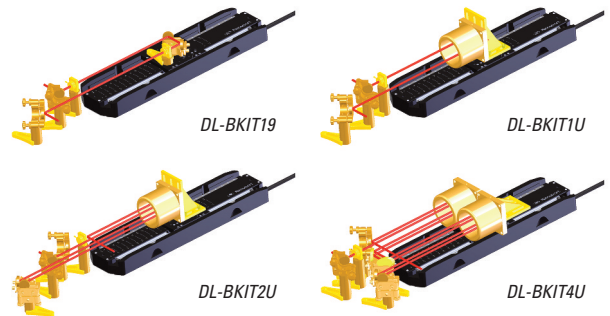
- C_z , Normal center load capacity on bearings 20 N
- k_{cx} , Compliance in roll 15 $\mu\text{rad}/\text{Nm}$
- k_{cy} , Compliance in pitch 10 $\mu\text{rad}/\text{Nm}$
- k_{cz} , Compliance in yaw 10 $\mu\text{rad}/\text{Nm}$

Note: It is recommended to keep the load centered on the carriage.
For other applications, contact tech@newport.com

Ordering Information

Stages	Code
125 mm Travel range stage with DL controller	DL125
225 mm Travel range stage with DL controller	DL225
325 mm Travel range stage with DL controller	DL325

Accessory & Kits	Code
Power supply for DL stages	DL-PS
Beam Kit, 9848 reflector, 1 pass for UV, IR or Vis	DL-BKIT19
Beam Kit, UBBR retroreflector, 1 pass, IR or Vis	DL-BKIT1U-S
Beam Kit, UBBR retroreflector, 1 pass, UV Beam	DL-BKIT1U-UV
Beam Kit, UBBR retroreflector, 2 pass, IR or Vis	DL-BKIT2U-S
Beam Kit, UBBR retroreflector, 2 pass, UV Beam	DL-BKIT2U-UV
Beam Kit, UBBR retroreflector, 4 pass, IR or Vis	DL-BKIT4U-S
Beam Kit, UBBR retroreflector, 4 pass, UV Beam	DL-BKIT4U-UV



Dimensions

MODEL	TRAVEL	L	A	B	C
DL125	4.92 (125)	11.42 (290)	5.91 (150)	6.0 (152.4)	5.91 (150)
DL225	8.86 (225)	15.35 (390)	7.87 (200)	8.0 (203.2)	7.87 (200)
DL325	12.80 (325)	19.29 (490)	9.84 (250)	10.0 (254)	9.84 (250)

