

FCL Series

Intelligent Stepper Motor Linear Stages



The economical, mid range travel FCL Series of linear stages separates itself with a built-in plug-and-play stepper motor controller and driver, while maintaining high precision.

Built-In Stepper Motor Controller with iPP Technology

The FCL's design brings together a linear stage with a built-in controller and driver for easy integration. Not only is the controller pre-configured with intelligent stepper motor technology, iPP, the stage is ready for plug-and-play via USB connection. The built-in controller eliminates the need for an external controller and cables, thus saving work-space and cost.

Daisy-Chain up to 4 FC Units

With an RS-422 interface, the FC series is equipped to easily daisy-chain and synchronize communication with up to 4 stages. All 4 axes can be controlled within one GUI.



Design Details

• Base Material	Aluminum	• Limit Switches	Optical
• Motor	Integrated iPP 2-phase step motor and controller/driver	• Origin	Optical at center of travel
• Drive Mechanism	Backlash free ball screw	• Communication	RS422, USB
• Drive Screw Pitch	2 mm	• Cable	Cables and power supply sold separately
• Bearing	Recirculating Ball Bearings		

Specifications

	FCL50	FCL100	FCL200
Travel Range (mm)	50	100	200
Minimum Incremental Motion (µm)		0.15	
Uni-directional Repeatability ⁽¹⁾ (µm)	1.5	2	2
Bi-directional Repeatability ⁽¹⁾⁽²⁾ (µm)	4.5 or ± 2.25	5 or ± 2.5	5 or ± 2.5
Accuracy ⁽¹⁾ (µm)	4 or ± 2	5 or ± 2.5	10 or ± 5
Maximum Speed (mm/s)		20	
Pitch ⁽¹⁾⁽³⁾ (µrad)	50 or ± 25	100 or ± 50	200 or ± 100
Yaw ⁽¹⁾⁽³⁾ (µrad)	70 or ± 35	100 or ± 50	160 or ± 80
MTBF (h)		20,000	

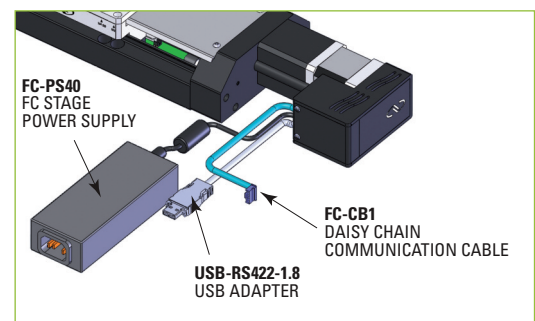
¹⁾ Shown are peak to peak, guaranteed specifications or ±half the value as sometimes shown. For the definition of Typical and Guaranteed specifications see "Motion Basics Terminology & Standards" Tutorial at www.newport.com

²⁾ After backlash compensation.

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

Key Features

- Built-in stepper motor controller with iPP technology, eliminating any motor cables and driver setup
- Fully pre-configured with USB communication and enables out-of-the-box control
- Up to 4 FC units can be daisy-chained and controlled via RS-422 with one GUI, or more units via USB hub
- Most economical stage and controller available without compromising MIM
- FEM-optimized aluminum body



Use the FC-CB1 to daisy chain communication between axis.

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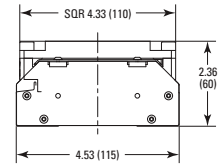
FEM-Optimized Aluminum Body

The optimized aluminum body allows for extreme stiffness and minimizes bi-metal bending without compromising weight. The rigid body reduces deflection under load.

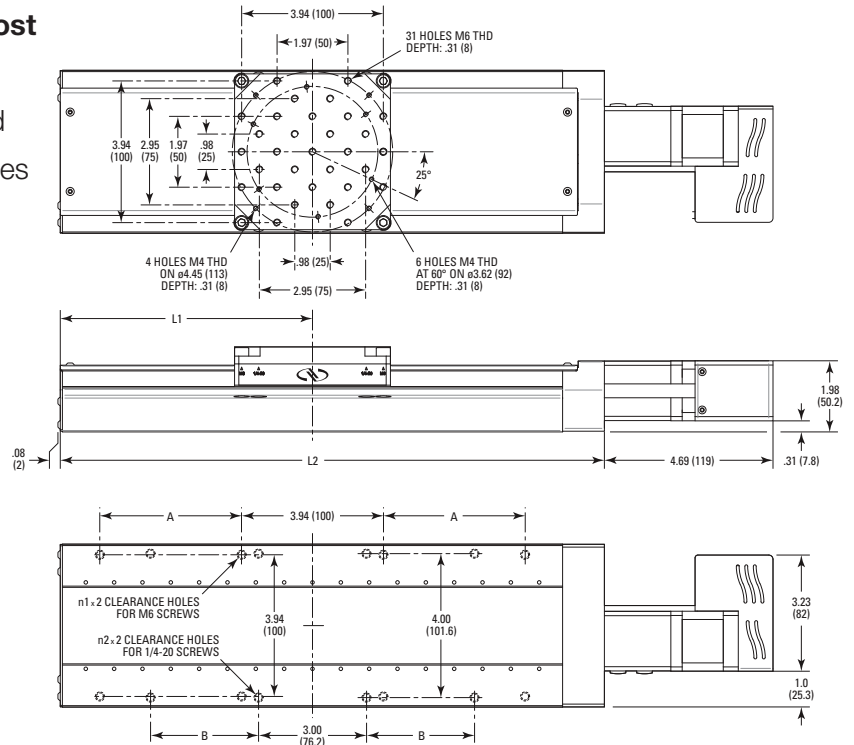
Metrology Report Included at No Additional Cost

Newport guarantees specification values which are measured and recorded following ASME B5.57 and ISO 230-2 standards. The typical performance values are two times better than the guaranteed specifications.

Dimensions



MODEL SHOWN: FCL200
DIMENSIONS IN INCHES AND MILLIMETERS



MODEL	A	n1	B	n2	L1	L2
FCL50	-	2	-	2	4.06 (103)	9.21 (234)
FCL100	-	2	-	2	5.04 (128)	11.18 (284)
FCL200	3.94 (100)	4	3.0 (76.2)	4	7.01 (178)	15.12 (384)

Ordering Information

Stages

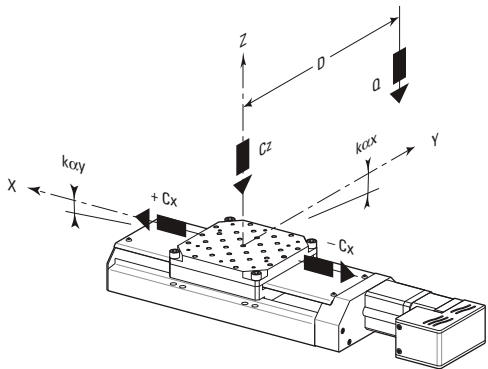
Stages	Code
Stepper Linear Stage, 50 mm, iPP motor/controller	FCL50
Stepper Linear Stage, 100 mm, iPP motor/controller	FCL100
Stepper Linear Stage, 200 mm, iPP motor/controller	FCL200

Accessories

1 m communication cable, daisy chain, RS422	FC-CB1
Power supply, iPP step motor, RoHS	FC-PS40
Cable adapter, USB to RS422, 1.8 m	USB-RS422-1.8

Note: Power supply and cables are sold separately.

Load Characteristics and Stiffness



- C_z , Normal centered load capacity 250 N
- $+C_x/-C_x$, Direct/Inverse load capacity on X axis <40 N
- $k_{\alpha x}$, Compliance in roll 15 $\mu\text{rad}/\text{Nm}$
- $k_{\alpha y}$, Compliance in pitch 10 $\mu\text{rad}/\text{Nm}$
- $k_{\alpha z}$, Compliance in yaw 10 $\mu\text{rad}/\text{Nm}$
- Q , Off-center load (N) $Q \leq C_z \div (1 + D/60)$
Where D = Cantilever distance (mm)