Miniature Steel Linear Stages

MFA SERIES

The MFA is part of Newport's steel stage series; designed for high thermal stability, stiffness and load capacity all in a very compact package. Relative to the stage's size, the miniature MFA is a low-cost option which offers precision motion for space-confined applications.

All Steel Construction

A full steel body allows for a more compact design with exceptional stiffness-to-weight ratio, greater thermal stability and high load capacity.

Vacuum Compatible Versions

The MFA-CCV6 is the vacuum compatible version of the MFA, compatible down to 10^{-6} hPa.

Double Row Linear Ball Bearing Slides

The double row, linear ball bearing slides provide excellent payload capabilities and longer life with accurate linear trajectory.

- All steel construction offers high stiffness and thermal stability
- Compact design utilized for space limited applications
- Stiff double-row linear ball bearings
- Vacuum-compatible versions to 10^{-6} hPa.
- Plug and Play - ESP compatible
- High-resolution, encoder feedback enables ultra-smooth motion with 100 nm sensitivity

DESIGN DETAILS

Base Material	Stainless Steel
Bearings	Double row linear ball bearings
Drive Mechanism	Backlash compensated leadscrew
Drive Screw Pitch	0.5 mm
Reduction Gear	MFA-CC: 1:14 MFA-PP: 1:43
Feedback	MFA-CC: Motor mounted rotary encoder; 2,048 cts/rev MFA-PP: None
Limit Switches	Optical switches
Origin	Uses motor side limit for homing, typically <5 mm repeatability
Cable Length	MFA-PP, MFA-PPD & MFA-CC: 3 m MFA-CCV6: 1.5 m

SPECIFICATIONS

	MFA-PP and MFA-PPD	MFA-CC
Travel Range [in. (mm)]	1 (25)	
Minimum Incremental Motion (µm)	0.1	0.1
Uni-directional Repeatability, Typical (Guaranteed) (µm)	0.12 (±0.25)	±0.08 (±0.15)
Bi-directional Repeatability, Typical (Guaranteed) [1] [2] (µm)	±0.2 (±0.75)	±0.15 (±0.75)
Accuracy, Typical (Guaranteed) [1] (µm)	±0.9 (±3.0)	±0.7 (±3.0)
Maximum Speed (mm/s)	0.3 (MFA-PP) 1.0 (MFA-PPD)	2.5
Pitch, Typical (Guaranteed) [1] (µrad) [3]	±25 (±100)	
Yaw, Typical (Guaranteed) [1] (µrad) [3]	±30 (±50)	
MTBF	10,000 h at a 1 kg load with a 20% duty cycle	

[1] 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.

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End-of Run Limit Switches

The stage contains end-of-run limit switches on both ends to prevent damage to the stage from over-travel.

Enhanced Repeatability

The MFA includes a backlash compensated leadscrew, which increases repeatability. For even greater repeatability, the MFA-CC utilizes a motor-mounted rotary encoder of 2,048 cts/rev.

Metrology Report Included at No Additional Cost

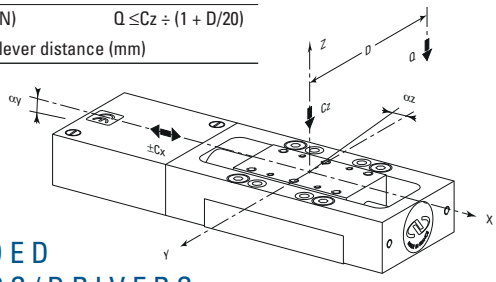
Newport guarantees specification values which are measured and recorded following ASME B5.57 and ISO 230-2 standards. The typical performance values are two times better than the guaranteed specifications.

MFA Stage with CONEX Controller

The CONEX-MFACC is a CONEX-CC DC motor controller/driver coupled with the all-steel MFA-CC linear stage. The unit is a miniature, low-cost option which offers precision motion in space-confined applications.

LOAD CHARACTERISTICS AND STIFFNESS

Cz,	Normal centered load capacity	50 N
-Cx, +Cx,	Axial load capacity	10 N
Kαx,	Compliance in roll	60 µrad/Nm
Kαy,	Compliance in pitch	10 µrad/Nm
Q,	Off-center load (N)	Q ≤Cz ÷ (1 + D/20)
	Where D = Cantilever distance (mm)	



RECOMMENDED CONTROLLERS/DRIVERS

Model	Description
XPS-D	1- to 8-axis universal high-performance motion controller/driver
XPS-DRV11	Universal digital driver card for stepper, DC and direct motors
XPS-RL	1- to 4-axis universal high-performance motion controller/driver
XPS-DRV01	PWM drive module for DC brush and stepper motors, 3 A/43 V max.
ESP301	1- to 3-axis motion controller/driver
SMC100CC	Single-axis DC motor controller/driver
SMC100PP	Single-axis stepper motor controller/driver

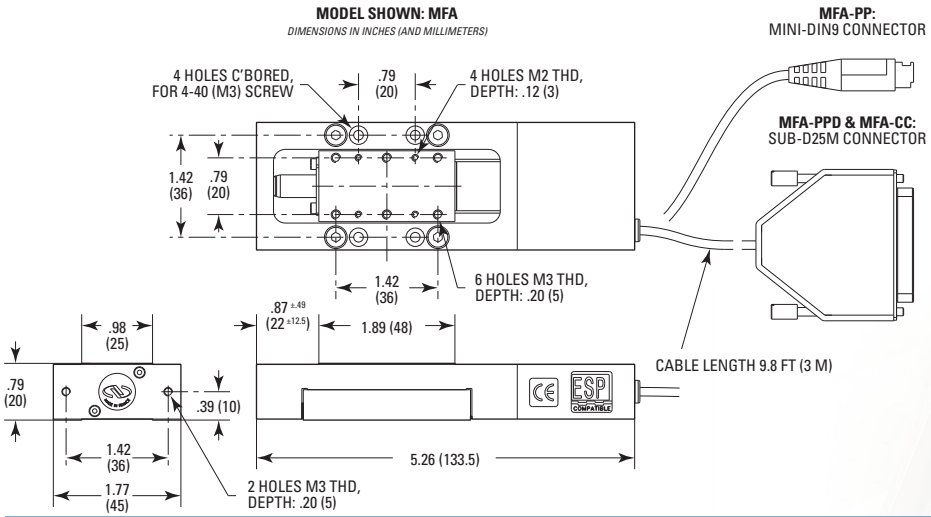
ACCESSORIES

Model	Description
M-MFA-TP	Top Plate, MFA Series Miniature Linear Stage, Metric Thread
MFA-BP	Universal Base Plate, MFA Series Stages
MFA-BK	Universal Top Plate, MFA Series, XZ and XYZ Mounting

ORDERING INFORMATION

Model	Description
MFA-CC	Miniature Linear Stage, 25 mm Travel, DC Motor
MFA-CCV6	Miniature Linear Stage, 25 mm Travel, DC Motor, Vacuum Compatible
MFA-PP	Miniature Linear Stage, 25 mm Travel, Stepper Motor, NSC200 Compatible
MFA-PPD	Miniature Linear Stage, 25 mm Travel, Stepper Motor
CONEX-MFACC	MFA-CC Linear Stage, Integrated with CONEX-CC Controller

DIMENSIONS



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