Linear Metrology Stages

FMS SERIES

The FMS series all steel linear stages are engineered to address sensitive metrology applications that require stability, high straightness and flatness, such as surface measurements, profilometry, etc.

All Steel Body

The all steel construction allows for extreme stiffness and thermal stability, by eliminating bi-metallic bending. Due to the hardness of steel, it can be machined flatter to give excellent trajectory.

Anti-creep Crossed Roller Bearings

To ensure the most accurate trajectory control, FMS stages feature matched pairs of best-in-class anti-creep crossed roller bearings. The absence of recirculating elements in these bearings leads to outstanding ripple-free motion adequate for the most demanding scanning and inspection systems. Moreover, the geared retainers prevent bearing cage migration, which can occur with other linear bearing products.

Plug and Play - ESP Compatible

The FMS is an ESP-compatible stage. When connected to a Newport controller, it is quickly recognized and configured without the need for user input, facilitating the startup and usability of the FMS.

This Plug and Play feature is not only transparent to the use, but it also ensures the safe operation of the stage.

Precision Ground Ball Screw

The ground ball screw ensures higher speed motion and enables higher throughput capability over the long life of the FMS.

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.

- Engineered to address demanding surface measurement and profilometry applications
- All steel construction for high stiffness, thermal stability, repeatable positioning and overall durability
- Anti-creep crossed roller bearings to provide exceptional straightness and flatness while reducing measurement noise and eliminating measurement variability
- High accuracy and repeatability enabled by linear encoder and precision ball screw
- Plug and Play - ESP compatible
- 100 to 300 mm travel range

SPECIFICATIONS

	FMC-CC	FMC-PP	FMC-PPHA
Travel Range (mm)		100; 200; 300	
Minimum Incremental Motion (µm)	0.5	0.1 [1]	0.1
Uni-directional Repeatability, Typical (Guaranteed) (µm)	±0.40 (±0.75)	±0.35 (±0.75)	±0.06 (±0.10)
Bi-directional Repeatability [2], Typical (Guaranteed) (µm)	±0.8 (±1.5)	±1.3 (±2.25)	±0.15 (±0.25)
Maximum Speed (mm/s)	100	20	50

		FMS100	FMS200	FMS300
Accuracy [2], Typical (Guaranteed) (µm)	-CC and -PP	±1.5 (±3.0)	±2.0 (±5.0)	±2.5 (±6.5)
	-PPHA	±0.2 (±0.5)	±0.4 (±1.0)	±0.5 (±1.5)
Straightness, Flatness [2], Typical (Guaranteed) (µm)		±0.25 (±0.75)	±0.5 (±1.5)	±1.0 (±3.0)
Pitch [2] [3], Typical (Guaranteed) (µrad)		±15 (±40)	±20 (±50)	±30 (±60)
Yaw [2] [3], Typical (Guaranteed) (µrad)		±4.0 (±10)	±5.0 (±15)	±6.0 (±20)

[1] 0.1 µm with XPS; 0.5 µm with SMC100PP and ESP301.

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

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

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DESIGN DETAILS

Base Material	Stainless Steel
Bearings	Crossed Roller Bearings
Drive Mechanism	8 mm, precision ground ball screw
Drive Screw Pitch (mm)	2
Feedback	DC: Screw mounted rotary encoder, 4000 cts/rev, index pulse PP: No feedback PPHA: Steel scale, 50 nm
Origin	PP: optical, located ~9.5 mm from negative software limit CC & PPHA: Optical, located ~10.5 mm from negative software limit
Drive Type	Stepper and DC Servo
Cable (m)	3 (included)

RECOMMENDED CONTROLLERS/DRIVERS

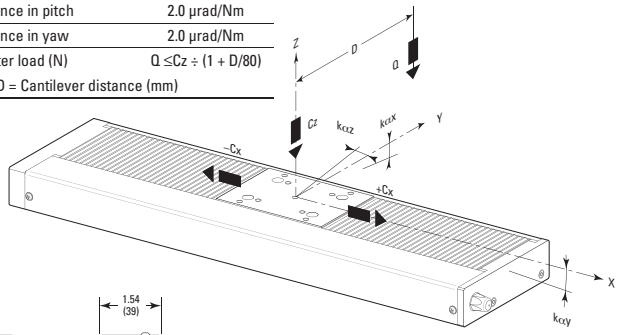
Model	Description
XPS-D	1- to 8-axis universal high-performance motion controller/driver
XPS-DRV11	Universal digital driver card for stepper, DC and direct motors
XPS-RL	1- to 4-axis universal high-performance motion controller/driver
XPS-DRV01	PWM drive module for DC brush and stepper motors, 3 A/43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

ORDERING INFORMATION

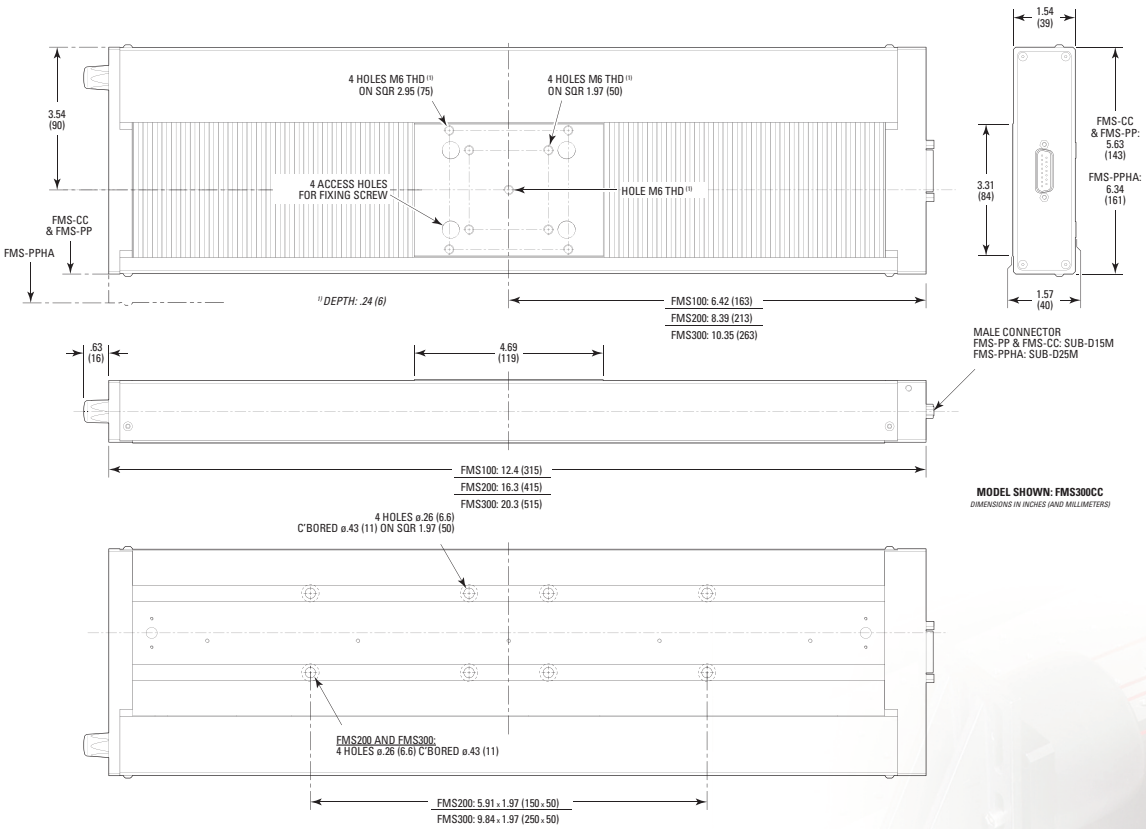
Model	Description
FMS100CC	Metrology Linear Stage, 100 mm Travel, DC Motor
FMS100PP	Metrology Linear Stage, 100 mm Travel, Stepper Motor
FMS100PPHA	Metrology Linear Stage, High Accuracy, 100 mm Travel, Stepper Motor
FMS200CC	Metrology Linear Stage, 200 mm Travel, DC Motor
FMS200PP	Metrology Linear Stage, 200 mm Travel, Stepper Motor
FMS200PPHA	Metrology Linear Stage, High Accuracy, 200 mm Travel, Stepper Motor
FMS300CC	Metrology Linear Stage, 300 mm Travel, DC Motor
FMS300PP	Metrology Linear Stage, 300 mm Travel, Stepper Motor
FMS300PPHA	Metrology Linear Stage, High Accuracy, 300 mm Travel, Stepper Motor

LOAD CHARACTERISTICS AND STIFFNESS

Cz,	Normal centered load capacity	150 N
-Cx, +Cx,	Axial load capacity	<30 N
Kαx,	Compliance in roll	3.0 µrad/Nm
Kαy,	Compliance in pitch	2.0 µrad/Nm
Kαz,	Compliance in yaw	2.0 µrad/Nm
Q,	Off-center load (N)	Q ≤Cz ÷ (1 + D/80)
	Where D = Cantilever distance (mm)	



DIMENSIONS



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