

MX80S Ballscrew and Leadscrew Driven Stages

Features

- Miniature Size - Low Profile (35 mm high X 80 mm wide)
- Normal or cleanroom environments
- 25, 50, 100, 150 mm travels
- Multi-axis platform
- Ballscrew or leadscrew drive options

Attributes

- Low profile miniature size
- Up to 123 N axial thrust
- 2g acceleration
- Cross roller bearing (zero cage creep option)
- Stepper or servo motor drive
- Digital limit/home system
- Optional linear encoder
- Cleanroom prep. option
- Low ESD option for electrically sensitive applications

The MX80S miniature positioner is the screw driven member of Parker's MX80 family. Like its counterparts, the MX80L linear motor driven stage and MX80M manual stage, the MX80S is designed for applications requiring reliable linear positioning in space restricted applications. It is the complementary product that bridges the product spectrum between the high dynamic linear motor performance of the MX80L, and the manual precision of the MX80M. The MX80S can be supplied with a high-efficiency leadscrew drive capable of reaching 200 mm per second velocity, or a precision ground ballscrew drive offering axial thrust to 123 N.



The leadscrew drive employs a PTFE coated leadscrew with a preloaded nut to produce extremely smooth linear translation. A choice of three leads provides improved opportunity for matching desired velocity/resolution requirements.



Leadscrew drive



Ballscrew drive

The 2.0 mm lead ballscrew stage offers high performance 24/7 operation with a thrust load capacity of 123 N (28 lb) and velocity to 100 mm/second at 100% duty cycle.

Cross Roller Bearings
provide high stiffness and extremely smooth linear translation. A rack and pinion anti-cage creep design within the bearing races prevents cage creep even at 5 g acceleration, or with cantilevered loads.

Master Reference Surface
is a feature unique to the MX80 that enables customers to align their process to the actual travel path within microns.

Ballscrew or leadscrew drive
The 2.0 mm lead ballscrew driven stage offers high performance 24/7 operation with a thrust load capacity of 123 N (28 lb.) and velocity to 100 mm/second at 100% duty cycle. Leadscrew driven stages are available with 1 mm, 2 mm, or 10 mm leads. The PTFE coated leadscrew provides extremely smooth linear translation at velocities up to 200 mm/second.

Home/Limit Sensors
are magnetic sensors completely housed within the body of the stage, and fully adjustable over the entire travel range.

MX80S Specifications



		MX80S Leadscrew Drive				MX80S Ballscrew Drive			
Travel (mm)		25	50	100	150	25	50	100	150
Normal Load Capacity	kg (lb)	8 (18)	8 (18)	8 (18)	8 (18)	8 (18)	8 (18)	8 (18)	8 (18)
Thrust Load Capacity	N (lb)	44 (10)	44 (10)	44 (10)	44 (10)	123 (28)	123 (28)	123 (28)	123 (28)
Maximum Velocity									
1.0 mm lead	mm/sec	20	20	20	20	—	—	—	—
2.0 mm lead		40	40	40	40	100	100	100	100
10.0 mm lead		200	200	200	200	—	—	—	—
Breakaway Torque	Nm	0.021	0.021	0.021	0.021	0.050	0.050	0.050	0.050
Running Torque									
1.0 mm lead	Nm	0.028	0.028	0.035	0.035	—	—	—	—
2.0 mm lead		0.028	0.028	0.035	0.035	0.085	0.085	0.085	0.085
10.0 mm lead		0.021	0.021	0.021	0.028	—	—	—	—
Duty Cycle	%	50	50	50	50	100	100	100	100
Straightness & Flatness*	μm	8	12	16	20	8	12	16	20
Positional Accuracy*									
1.0 mm lead	μm	30	45	75	100	—	—	—	—
2.0 mm lead		30	45	75	100	10	15	18	20
10.0 mm lead		35	50	80	105	—	—	—	—
Bi-directional Repeatability*									
1.0 mm lead	μm	±5.0	±5.0	±5.0	±5.0	—	—	—	—
2.0 mm lead		±5.0	±5.0	±5.0	±5.0	±1.5	±1.5	±1.5	±1.5
10.0 mm lead		±10.0	±10.0	±10.0	±10.0	—	—	—	—
Inertia (without motor & coupling)									
1.0 mm lead	10 ⁻⁷ kg-m ²	1.47	1.47	2.42	3.06	—	—	—	—
2.0 mm lead		1.62	1.62	2.68	3.42	4.19	4.19	6.08	7.68
10.0 mm lead		6.34	6.34	11.30	14.90	—	—	—	—
Screw Speed (max)	rps	20	20	20	20	50	50	50	50
Leadscrew Efficiency									
1.0 mm lead	%	40	40	40	40	—	—	—	—
2.0 mm lead		59	59	59	59	90	90	90	90
10.0 mm lead		78	78	78	78	—	—	—	—
Screw Diameter	mm	6.35	6.35	6.35	6.35	8.00	8.00	8.00	8.00
Bearing Coefficient of Friction		0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
Unit Mass									
Table only	g	597	597	1003	1268	694	694	1114	1392
With 2-stack stepper		748	748	1154	1419	845	845	1265	1513
Carriage Mass (unloaded)	g	194	194	353	471	291	291	464	595

* Notes:

(1) Measured at the carriage center, 35 mm above the mounting surface @ 20 C with no load. Unit bolted to granite surface, flat to within 1 micron/300 mm.
 (2) Total accuracy and bi-directional repeatability over full travel (peak to peak).

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 (2) Total accuracy and bi-directional repeatability over full travel (peak to peak).
 (3) Repeatability valid with M21 servo motor.

Miniature Positioners

Simple Configuration Digital Drive Options

All digital drives ordered in the MX80 part number configuration come set up with a motor file including electrical parameters to set continuous and peak currents, current loop compensation values, and default gain settings. Users will have the ability to override these parameters for special application requirements.



Tuning is easy and intuitive for users and is available via a variety of methods. The motor and loading information must be known by the drive to determine the baseline tuning gains. These are simple parameter entries the user can complete with the help of standard Parker supplied front-end software tools. Seamless integration of drives and controls ensures performance matched functionality of the completed motion system.

ViX Intelligent Servo & Microstepping Drives/Controllers

The ViX servo and microstepping drives are the perfect drive solution to be paired with the MX80 family. These drives use advanced field oriented digital control technology to enhance dynamic performance and improve efficiency. In addition to servo and microstepping versions, the ViX family is offered with different levels of control.

ViX Servo Drive

Order Codes: A10 A11 A12

ViX Servo Drive/Controller

Order Codes: A15

ViX Microstep Drive/Controller

Order Codes: A62

E-AC and E-DC Microstepping Drive

Order Codes: A31

XL-PSU Power Supply Module Accessory

The Parker XL-PSU power supply offers a convenient way of powering a ViX series servo drive.



For complete details on drive product features and specifications, please refer to the “Drives & Controllers” section of this catalog.

“Plug & Play” Cable Options

**Order Codes: CM02 CM03 CM04 CM05 CM06 CM07
CM08 CM09 CM10 CM11 CM12 CM13 CM15 CM17**

“User convenience” is high on the list of cable attributes found in the MX80. The high-flex cabling and connectors are reliable, durable and offer easy hook-up for “plug and run” installation.



- High-flex cables
- Plug-in compatibility with ViX drive
- CE compliant connectors and shielding
- CE compliant ferrite beads
- Color coded jackets and labeling
- Connectors simplify installation

Encoder Options

Order Codes: E2 E3 E4 E5 E7

A non-contact linear optical encoder provides a quadrature output and offers resolution ranging from 10 nanometer to 5 micron. On the MX80L, the encoder is internal to the stage body. There is no increase to the footprint of the unit and no additional external cabling is required.

Home and Limit Sensor Options

Order Codes: H2L2 H2L3 H3L2 H3L3

Magnetic home and limit sensors are completely housed within the body of the stage. An innovative design adds functionality without sacrificing geometry. Sensor triggers can be easily adjusted over the travel. The output format is an open collector type capable of sinking up to 50 mA, and be set as N.O. or N.C.



Cleanroom Option

Order Codes: R2 R20

Both precision and standard grade products can be prepared for cleanroom compatibility. Preparation involves material changes, element modification and cleanroom compatible lubricants. MX80L and MX80S stages with this option are class 10 cleanroom compatible. When applying an XY or XYZ combination in a cleanroom environment, moving wires need to be considered – please consult a Parker application engineer.



Z-Axis Bracket Accessory

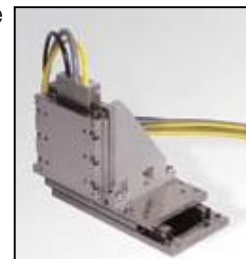
Lightweight aluminum Z-brackets are available for easy construction of vertical axis combinations.

Standard Model Part Numbers:

25 & 50 mm: 002-2238-01
100 & 150 mm: 002-2240-01

Low ESD Model Part Numbers:

5 & 50 mm: 002-2239-01
100 & 150 mm: 002-2241-01



Low ESD Coating Option

Order Codes: R10 R20

An optional low ESD electroless nickel or Armoloy coating is offered for improved electrical conductivity, providing a low resistance to ground path for electric discharge.



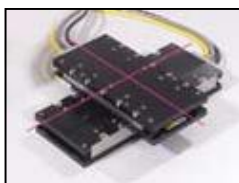
Environmental Protection Option

Both precision and standard grade units have a hard coat protective finish. The precision units have a hard coat (Rc 78) satin chrome finish, and the standard units have a low luster black anodized finish.

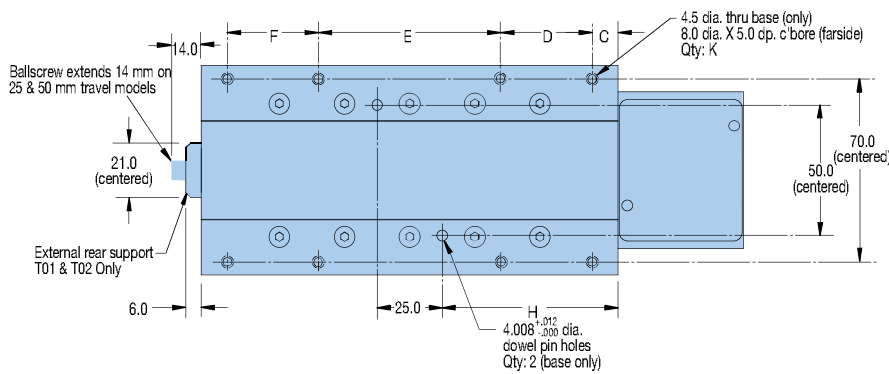
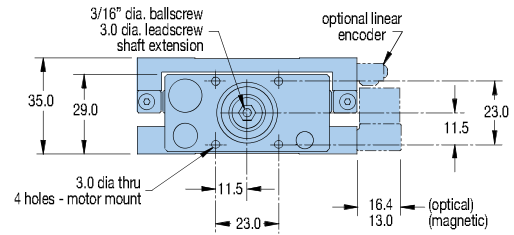
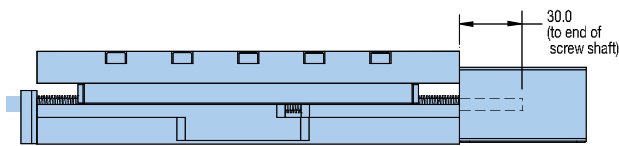
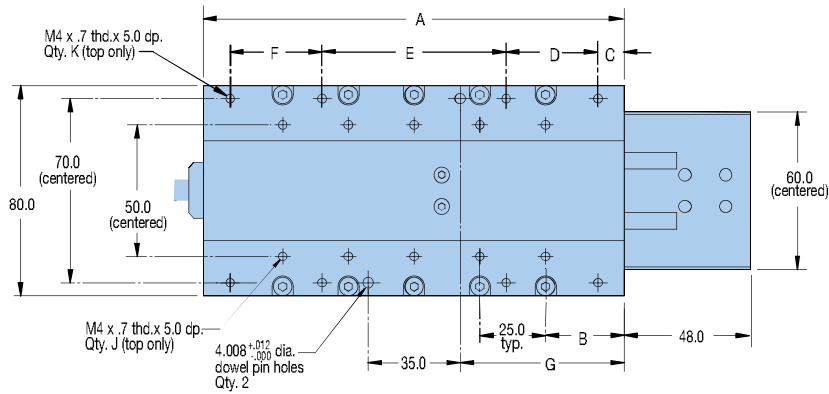
System Orthogonality Option

Order Codes: S2 S3 S4 S5 S6

In any multi-axis positioning system, the perpendicular alignment of the axes must be clearly specified. “Degree of orthogonality” defines the perpendicular alignment of axis one to another. The MX80s offer two choices for orthogonality. As standard, perpendicularity is held to within 60 arc seconds. For more exacting applications the MX80 can be optioned for 15 arc seconds orthogonality.



Dimensions (mm)



Dimensions (mm)										
Travel	A	B	C	D	E	F	G	H	J	K
25	80	15	5	70	—	—	22.5	27.5	6	4
50	80	15	5	70	—	—	22.5	27.5	6	4
100	160	30	10	35	70	35	62.5	67.5	10	8
150	210	30	5	65	70	65	87.5	92.5	14	8

Mounting

Model	# Stack	NEMA	Dimension L (mm)
Stepper	1		42.0
	2	11	50.0
	3		61.5
Servo	1	16	83.6



Fill in an order code from each of the numbered fields to create a complete model order code.

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫ ⑬ ⑭ ⑮

Order Example: MX80S T04 M P K - D1 M1 H3L3 CM12 E1 Z1 R1 A11 X1 S1

① **Series**
MX80S

- ② **Travel – mm**
T01 25
T02 50
T03 100
T04 150

- ③ **Mounting**
M Metric

- ④ **Grade**
S Standard
P Precision*
* Must order E3 or E4 Digital Option to meet catalog specification.

- ⑤ **Bearing Type**
J Standard Cross Roller
K ACS Cross Roller

- ⑥ **Drive Type**
D1 1 mm Leadscrew⁽¹⁾
D2 2 mm Leadscrew⁽¹⁾
D3 10 mm Leadscrew^(1,3)
D4 2 mm Ballscrew^(2,3)
(1) Standard grade only (2) Precision grade only
(3) Not available with 1- or 2-stack stepper motor.

- ⑦ **Motor**
M0 No motor, flange, coupling
M1 NEMA 16 flange, no motor, coupling
M14 Stepper, 1 stack, NEMA 11
M15 Stepper, 2 stack, NEMA 11
M16 Stepper, 3 stack, NEMA 11
M21 Servo, 1 stack, NEMA 16

- ⑧ **Home/Limit Switch***
H1L1 None-Free Travel (only)
H2L2 N.C. Home/N.C. Limit
H2L3 N.C. Home/N.O. Limit
H3L2 N.O. Home/N.C. Limit
H3L3 N.O. Home/N.O. Limit
*NC = Normally Closed; NO = Normally Open

- ⑨ **Cable Options (High-flex)**
CM01 None
CM02 Limits (only) w/Flying Leads (1 meter)
CM03 Limits (only) w/Flying Leads (3 meter)
CM04 Limits (only) w/ViX Connector (1 meter)
CM05 Limits (only) w/ViX Connector (3 meter)
CM06 Stepper Motor & Limits w/ViX Connector (1 meter)
CM07 Stepper Motor & Limits w/ViX Connector (3 meter)
CM08 Stepper Motor (no Limits) w/ViX Connector (1 meter)
CM09 Stepper Motor (no Limits) w/ViX Connector (3 meter)
CM10 Stepper Motor (E Drive) & Limits (1 meter)
CM11 Stepper Motor (E Drive) & Limits (3 meter)
CM12 Stepper Motor (E Drive) no Limits (1 meter)
CM13 Stepper Motor (E Drive) no Limits (3 meter)
CM15 Servo Motor, Encoder & Limits w/ViX Connector (3 m)
CM17 Servo Motor, Encoder (no Limits) w/ViX Connector (3 m)

- ⑩ **Digital Option**
E1 None
E2 1.0 µm Resolution
E3 0.5 µm Resolution
E4 0.1 µm Resolution
E5 5.0 µm Resolution
E7 Sine Output

- ⑪ **Z Channel Location**
Z1 None
Z3 Center Position

- ⑫ **Environmental**
R1 Standard Finish (black anodized)
R2 Cleanroom Prep
R10 Low ESD Finish
R20 Low ESD Finish & Cleanroom Prep

- ⑬ **Digital Drive**
A1 No Drive
A10 ViX250-AE Servo (torque mode)
A11 ViX250-AE Servo (velocity mode)
A12 ViX250-AE Servo (step/direction mode)
A15 ViX250-IE Servo Drive/Controller
A31 E-DC Stepper Drive
A62 ViX250-IM Stepper Drive/Controller

- ⑭ **Axis Designator**
S1 None (single-axis)
S2 X-axis base unit (cables @ 12 o'clock)
S3 Y-axis 60 arc-sec (cables @ 3 o'clock)
S4 Y-axis 60 arc-sec (cables @ 9 o'clock)
S5 Y-axis 15 arc-sec (cables @ 3 o'clock)
S6 Y-axis 15 arc-sec (cables @ 9 o'clock)

- ⑮ **Required Designator**
X1

Miniature Positioners