ZABER Simplifying Motion Control

GMP GENERAL MICROTECHNOLOGY & PHOTONICS

- 12 mm travel and 15.5 N peak thrust with adjustable force control mode
- Up to 1400 mm/s speed, 25 Hz full-travel
- Built-in controller; daisy-chains with other Zaber products
- Integrated 200 nm resolution linear encoder provides closed-loop, high precision position control

Product Description

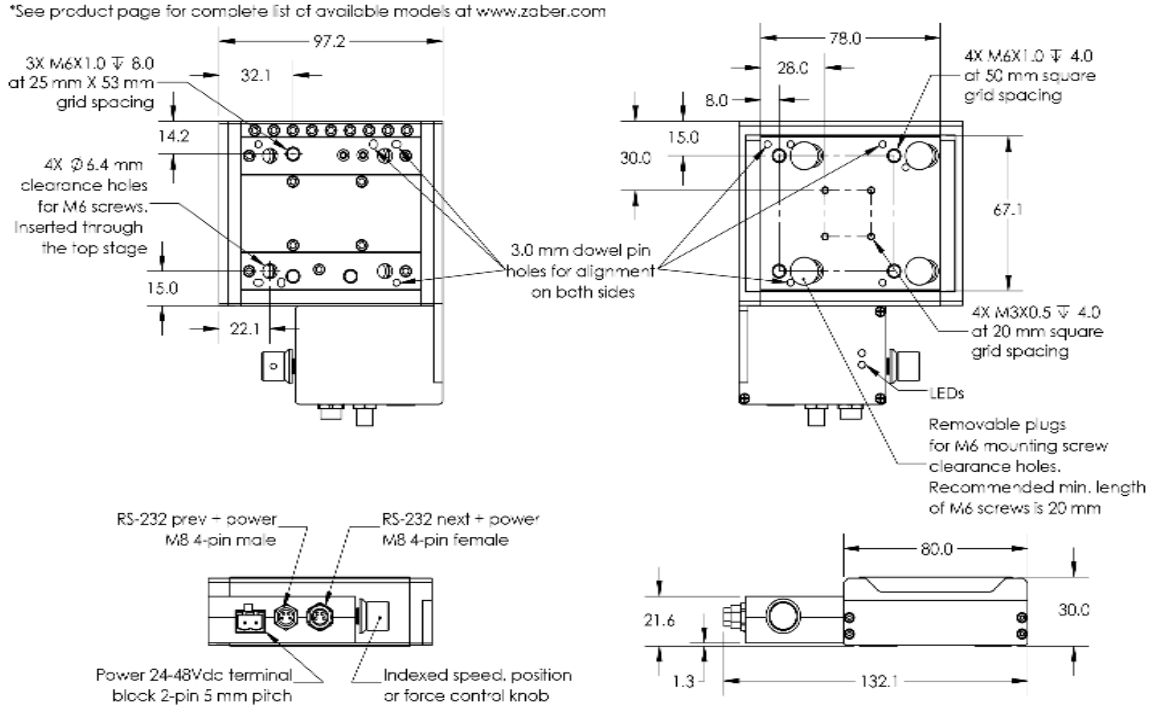
Zaber's X-DMQ-DE Series devices are computer-controlled, voice coil driven, linear stages with high acceleration and precision capabilities in a compact size. They are stand-alone units requiring only a standard 24 V or 48 V power supply.

At only 30 mm high, these miniature stages are excellent for applications where a low profile is required. The X-DMQ-DE's innovative design allows speeds up to 1400 mm/s and loads up to 1 kg. Like all of Zaber's products, the X-DMQ-DE Series is designed to be 'plug and play' and very easy to set up and operate.

The built-in linear encoder with 200 nm resolution allows closed-loop servo control of position and velocity. Zaber's controller comes pre-tuned out of the box, while still allowing easy access to settings for users to fine tune the servo control to their application if desired. The DMQ's direct-drive actuator also allows it to operate in force-control mode with very high bandwidth. The innovative moving-coil actuator design has a very flat force-vs-position profile, a minimal moving mass for high acceleration, and no exposed moving cables.

An optional indexed knob provides convenient manual control for versatile operation even without a computer. These stages connect to the RS-232 port or USB port of any computer, and they can be daisy-chained with any other Zaber products. The daisy-chain also shares power, making it possible for multiple X-Series products to share a single power supply. Convenient locking, 4-pin, M8 connectors on the unit allow for secure connection between units.

Dimension Drawings

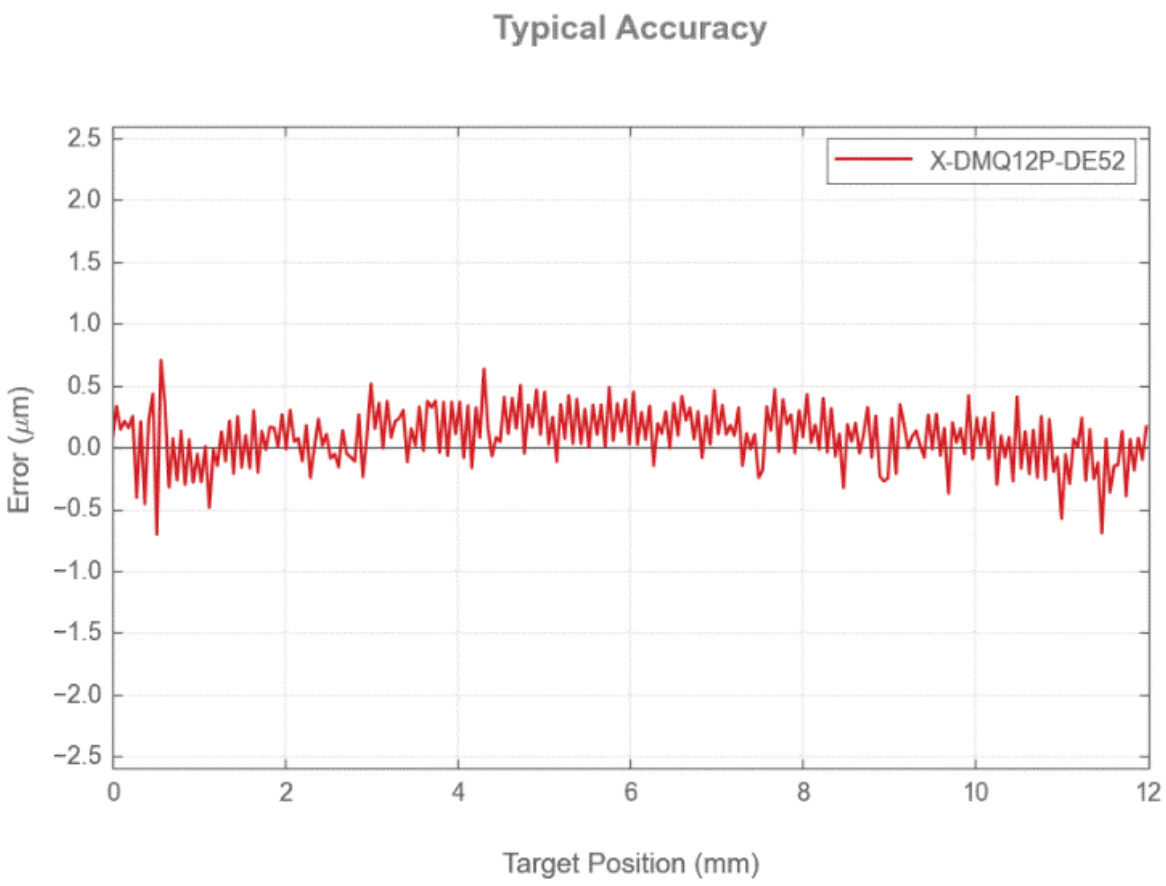


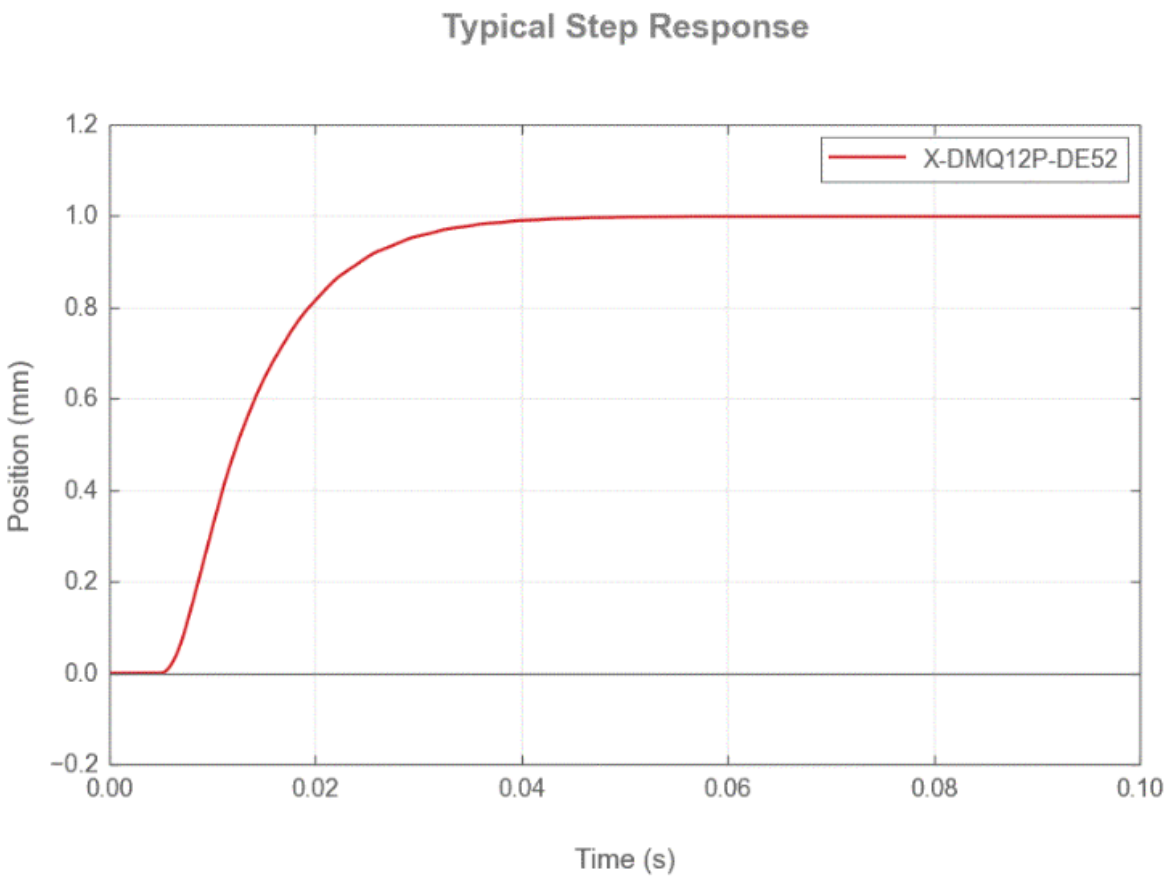
Product Specifications

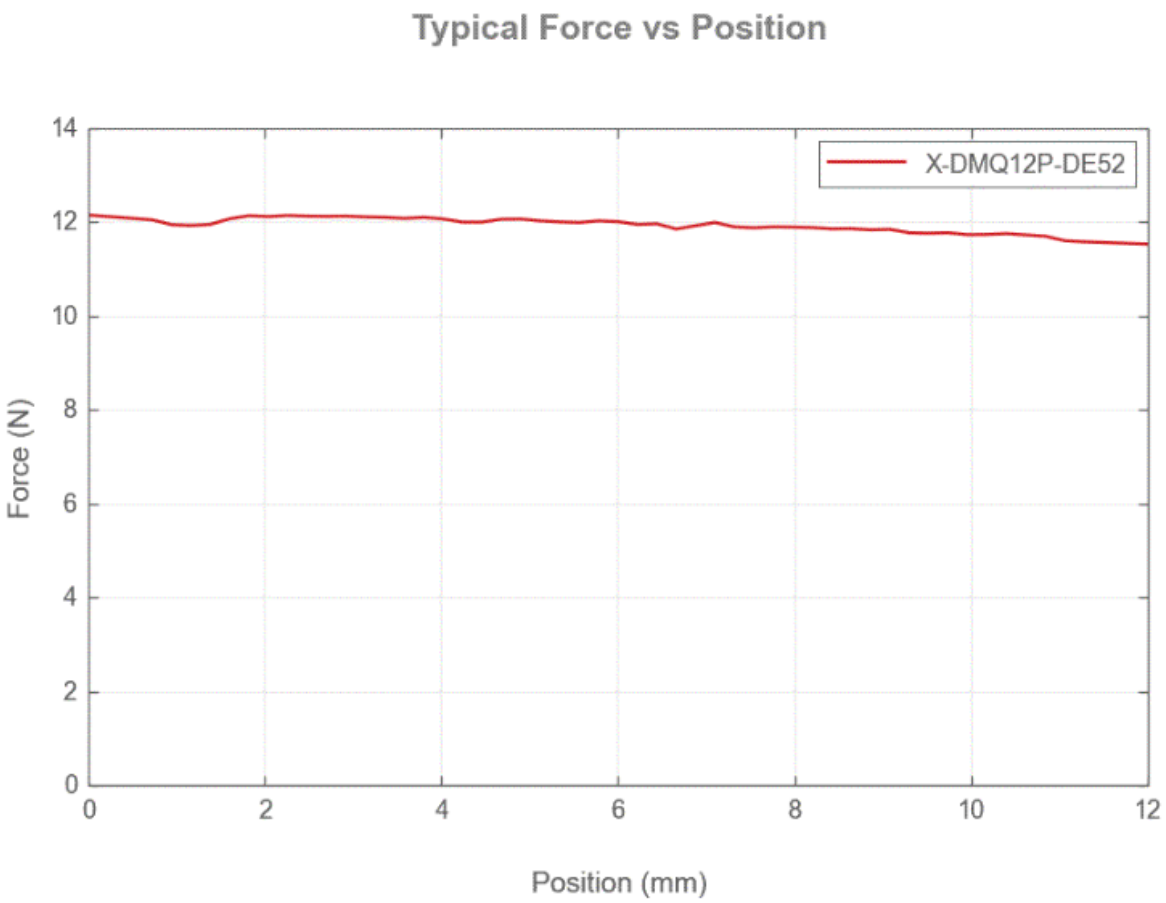
Specification	Value	Alternate Unit
Built-in Controller	Yes	
Travel Range	12 mm	0.472 "
Accuracy (unidirectional)	5 µm	0.000197 "
Repeatability	< 2 µm	< 0.000079 "
Maximum Speed	1400 mm/s	55.118 "/s
Minimum Speed	0.000122 mm/s	0.000005 "/s
Encoder Type	Linear quadrature encoder	
Encoder Resolution	200 nm	
Peak Thrust	15.5 N	3.5 lb
Force Resolution	25 mN	0.09 oz
Maximum Continuous Thrust	12 N	2.7 lb
Communication Interface	RS-232	
Communication Protocol	Zaber ASCII (Default), Zaber Binary	
Maximum Centered Load	10 N	2.2 lb
Maximum Cantilever Load	32 N-cm	45.3 oz-in
Guide Type	Crossed-Roller Bearing	
Vertical Runout	< 6 µm	< 0.000236 "
Horizontal Runout	< 5 µm	< 0.000197 "
Pitch	0.03 degrees	0.524 mrad
Roll	0.03 degrees	0.524 mrad
Yaw	0.03 degrees	0.524 mrad
Maximum Current Draw	1500 mA	
Power Supply	24 - 48 VDC	
Power Plug	2-pin screw terminal	
Motor Type	Voice Coil Linear Actuator	
Force Constant	12.6 N/A	2.8 lbs/A
Data Cable Connection	Locking 4-pin M8	
Mechanical Drive System	Moving Coil, Direct Drive	
Limit or Home Sensing	Optical Index Mark	
Axes of Motion	1	
LED Indicators	Yes	
Mounting Interface	M6 and M3 threaded holes	

Specification	Value	Alternate Unit
Vacuum Compatible	No	
Operating Temperature Range	0 - 50 degrees C	
RoHS Compliant	Yes	
CE Compliant	Yes	
Weight	0.76 kg	
Moving Mass	0.095 kg	0.209 lbs
Stiffness in Pitch	50 N-m/deg	349 µrad/N-m
Stiffness in Roll	70 N-m/deg	249 µrad/N-m
Stiffness in Yaw	85 N-m/deg	205 µrad/N-m

Specification Charts






Typical Force vs Position
X-DMQ12P-DE52
Force (N)
Position (mm)
0
2
4
6
8
10
12
14