

High-Load Precision Z Stage

Combinations with Piezo Nanopositioning Stages Possible



M-451

- Travel range 12.5 mm
- Load capacity to 12 kg, self-locking
- High stiffness for combination with piezo systems
- Compatible with P-500 and PIMars piezo systems
- Design resolution to 3 nm
- Min. incremental motion to 100 nm

Precision Z stage for high loads

The M-451 Z stages position high loads to 12 kg in a vertical direction with the highest precision. Variants are available with ActiveDrive DC motor, DC gear motor, and 2-phase stepper motor. The design with stress-relieved, machined aluminum allows building of multi-axis systems with very low weight and excellent stability. The construction with roller bearing guided wedges allows high tilt/tilt stiffness and load capacity as well as maintenance-free operation.

Specifications

	M-451.1PD	M-451.1DG	M-451.12S	Unit	Tolerance
Active axes	Z	Z	Z		

Motion and positioning	M-451.1PD	M-451.1DG	M-451.12S	Unit	Tolerance
Travel range	12.5	12.5	12.5	mm	
Integrated sensor	Rotary encoder	Rotary encoder	–		
Sensor resolution	4000	2000	–	Cts./rev.	
Design resolution	0.042	0.0028	1.25	µm	
Minimum incremental motion	0.2	0.1	0.2	µm	
Backlash	1	1	1	µm	
Unidirectional repeatability	0.3	0.3	0.3	µm	
Pitch / yaw	±75	±75	±75	µrad	
Straightness	1	1	1	µm	
Flatness	1	1	1	µm	
Velocity	3	0.5	0.8	mm/s	max.
Reference point switch repeatability	1	1	1	µm	

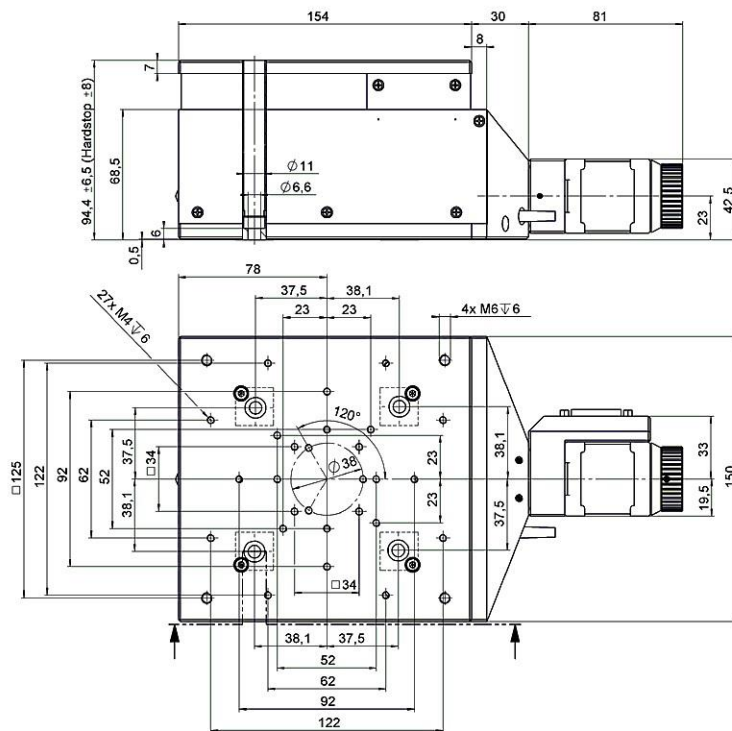
Mechanical properties	M-451.1PD	M-451.1DG	M-451.12S	Unit	Tolerance
Drive screw	Leadscrew	Leadscrew	Leadscrew		
Drive screw pitch	0.5	0.5	0.5	mm	
Gear ratio	–	29.6:1	–		
Motor resolution	–	–	400	Full steps/rev	
Load capacity (self-locking)	120	120	120	N	max.

Drive properties	M-451.1PD	M-451.1DG	M-451.12S	Unit	Tolerance
Motor type	DC motor, ActiveDrive	DC gear motor	2-phase stepper motor		
Operating voltage	24	0 to ±12	24	V	
Nominal current per phase	–	–	0.85	A	max.
Motor power	25	4	4.8	W	
Limit and reference point switches	Hall effect	Hall effect	Hall effect		

Miscellaneous	M-451.1PD	M-451.1DG	M-451.12S	Unit	Tolerance
Operating temperature range	-20 to 50	-20 to 50	-20 to 50	°C	
Material	Anodized aluminum	Anodized aluminum	Anodized aluminum		
Mass	5	5	5	kg	
Recommended controllers/drivers	C-863 (1 axis), C-884 (4/6 axes)	C-863 (1 axis), C-884 (4/6 axes)	C-663 (1 axis)		

Ask about customized versions.

M-451.1PD, Dimensions in mm



M-451.12S, Dimensions in mm

Ordering Information

M-451.1DG

Precision Z Stage, 12.5 mm travel range, DC gear motor

M-451.1PD

Precision Z stage, 12.5 mm travel range, ActiveDrive DC motor, including 24 V power adapter

M-451.12S

Precision Z Stage, 12.5 mm travel range, 2-phase stepper motor