

M-664 Linear Positioning Stage

Low-Profile High-Speed PLine® Linear Stage with Linearencoder



Fast and compact M-664 piezo translation stage with linear encoder

- Travel Range 25 mm
- Max. Velocity 400 mm/s
- Ultra-Low Profile, 15 mm
- Direct Metrology Linear Encoder with 0.1 µm Resolution
- High Guiding Accuracy with Crossed Roller Bearings
- Compact XY Combinations
- Piezo Linear Motor with 6 N Drive Force
- Self Locking at Rest

M-664 micropositioning systems are low-profile, high-accuracy translation stages with piezo linear encoders. The M-664 stage is next-larger in the series of piezomotor-driven stages of which the M-663 is the smallest.

Application Examples

- Biotechnology
- Micromanipulation
- Microscopy
- Quality assurance testing
- Metrology
- Mass storage device testing
- R&D
- Photonics packaging

For improved guiding accuracy, the M-664 uses two crossed roller bearings mounted on ground aluminum profiles. The integrated P-664 PLine® linear motor can generate forces up to 6 N and maximum closed-loop velocities to 400 mm/s over a 25 mm travel range.

Advantages of PLine® Micropositioning Systems

The ultrasonic piezoceramic drives used in PLine® micro-positioners have a number of advantages over classical drives:

- Higher Accelerations, up to 10 g
- Speeds up to 500 mm/s
- Small Form Factor
- Self-Locking When Powered Down

- No Shafts, Gears or Other Rotating Parts
- Non-Magnetic and Vacuum-Compatible Drive Principle

Optimized Controller and Drive Electronics

PLine® motors require a special drive electronics to generate the ultrasonic oscillations for piezoceramic element. For optimum performance the highly specialized C-866 motion controller is recommended. This sophisticated controller also integrates the drive electronics. Furthermore, the controller has a number of special features, including dynamic parameter switching for an optimized high-speed motion and settling behavior to take into account the motion characteristics typical of piezomotors. The broad-band encoder input (35 MHz) supports the outstanding high accelerations and velocities of

Ordering Information

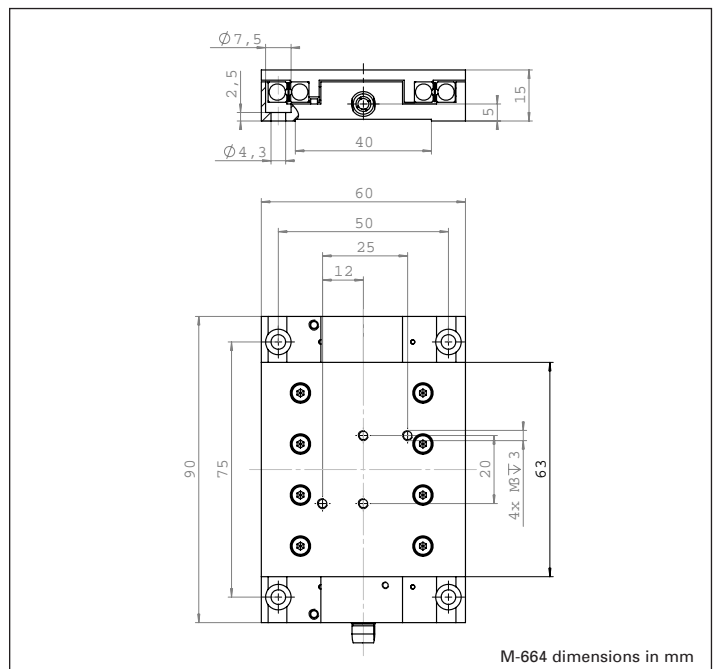
M-664.164
PLine® Micro Positioning Stage with P-664 Piezo Linear Motor, 25 mm, 6 N
Ask about custom designs!

PLine® drives at high resolutions.

Optionally, for use with third party servo controllers, the C-185 analog drive electronic (stand-alone unit) is available. It controls the motor speed by an analog ± 10 V signal. For optimum performance this driver must be tuned together with the stage and should be ordered at the same time as the motor/stage.

Notes

The products described in this document are in part protected by the following patents:
US Pat. No. 6,765,335
German Patent No. 10154526





PILine® Micropositioning stages: M-682, M-664 and M-663 (from left)

Technical Data

Models	M-664.164	Tolerance
Active axes	X	
Motion and positioning		
Travel range	25 mm	
Integrated sensor	Linear encoder	
Sensor resolution	0.1 μm	
Min. incremental motion	0.1 μm	typ.
Backlash	$\pm 0.2 \mu\text{m}$	typ.
Unidirectional repeatability	0.2 μm	typ.
Pitch	$\pm 50 \mu\text{rad}$	typ.
Yaw	$\pm 50 \mu\text{rad}$	typ.
Max. velocity	400 mm/s	
Reference switch repeatability	1 μm	typ.
Mechanical properties		
Max. load	25 N	
Max. push/pull force	6 N	
Max. holding force	4 N	
Drive properties		
Motor type	P-664 PLine® ultrasonic piezo drive	
Operating voltage	168 V (peak-to-peak) * 60 V (RMS) *	
Electrical power	10 W **	nominal
Current	800 mA **	
Limit and reference switches	Hall-effect	
Miscellaneous		
Operating temperature range	-20 to +50 °C	
Material	Al (black anodized)	
Dimensions	90 x 60 x 15 mm	
Mass	0.190 kg	$\pm 5 \%$
Cable length	1.5 m	$\pm 10 \text{ mm}$
Connector	MDR, 14-pin	
Recommended controller/driver	C-866.164 single-axis controller/driver C-185.164 drive electronics	

* The stage supply power is drawn from the drive electronics, which runs on 12 V.

** For drive electronics