

M-664 PLine® Linear Motor Stage

Low-Profile High-Speed with Ultrasonic Piezo Linear Drives & Direct Position Measurement



- 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 4 N Drive Force
- Self Locking at Rest

M-664 micropositioning systems are low-profile, high-accuracy translation stages with linear encoders. The M-664 stage is next-larger in the series of piezomotor-driven stages of which the M-663 (see p. 4-28) is the smallest. 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 4 N and maximum closed-loop velocities to 400 mm/s over a 25 mm travel range.

Application Examples

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

Advantages of PLine® Micro-positioning Systems

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

- Higher Accelerations, up to 5 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 the piezoceramic element. For optimum performance the highly specialized C-867 motion controller (see p. 4-116) 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 (50 MHz) supports the outstanding high accelerations and velocities of PLine® drives at high resolutions.

Ordering Information

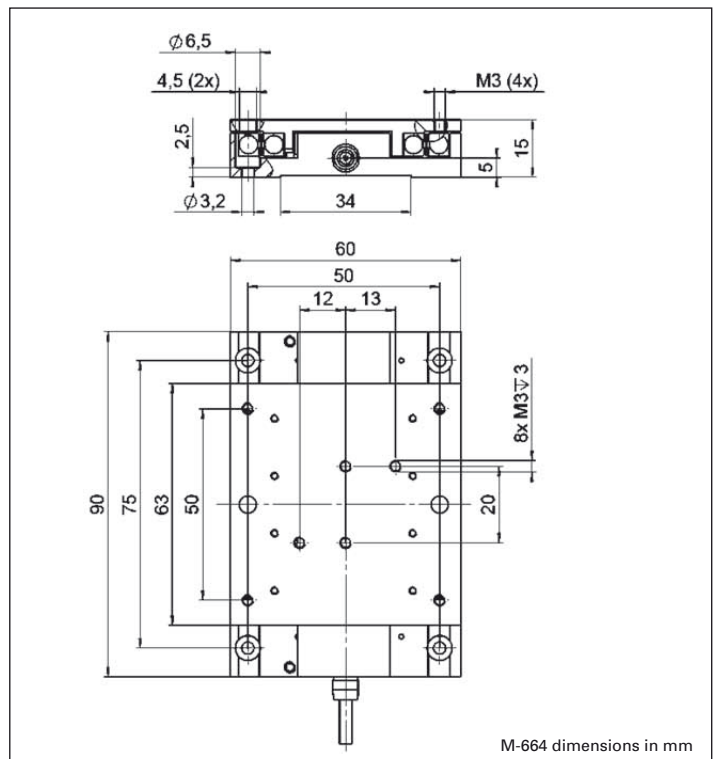
- M-664.164**
PLine® Micro Positioning Stage with P-664 Piezo Linear Motor, 25 mm, 4 N
- M-664.AP1**
Adapter plate for XY-mounting of M-664, 4 mm high

Ask about custom designs!

Optionally, for use with third party servo controllers, the C-185 analog drive electronics (stand-alone unit, see p. 1-36) 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





Technical Data

Model	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	0.3 μm	typ.
Bidirectional repeatability	0.2 μm	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	4 N	
Max. holding force	3 N	
Drive properties		
Motor type	P-664 PI Line® 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-867.164 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