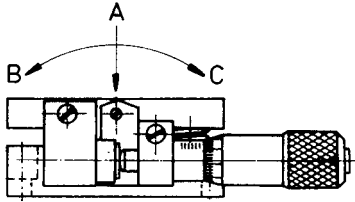


PZT Actuators
PZT Flexure NanoPositioners
PZT Active Optics / Steering Mirrors
Tutorial: Piezoelectrics...
Capacitive Position Sensors
PZT Control Electronics
MicroPositioners / Hexapod Systems
Photonics Alignment & Packaging Systems
Motor Controllers
Index

M-041 M-044 Tip/Tilt Stages



Load and torque definition of M-041, M-042, M-043 and M-044 tip/tilt stages

Notes

See "Accessories," page 7-82 ff. for adapters, brackets, etc.

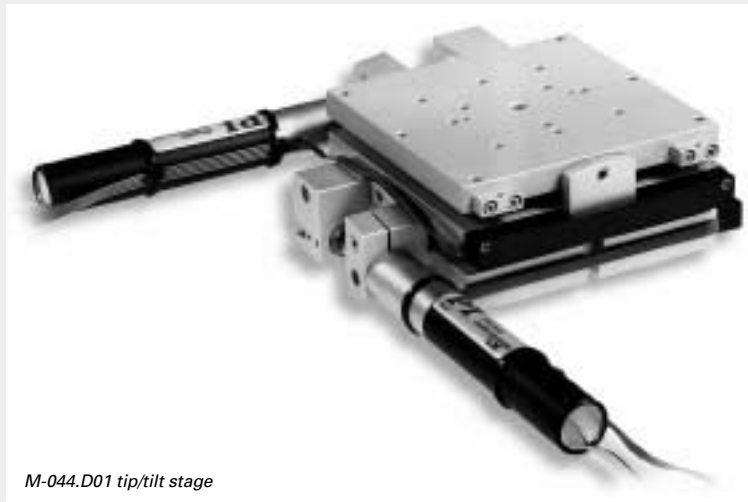
- One- & Two-Axis Tilt Stages
- Zero Backlash
- Sub- μ rad Resolution
- Manual and DC-Motor Drives
- Compatible with Leading Industrial Motion Controllers
- Optional PZT Drives for Tracking and Scanning

M-041 through M-044 are one- and two-axis (θ_x, θ_y) tip/tilt stages for small loads. They are spring preloaded for elimination of backlash and feature resolution and repeatability superior to that of goniometric cradles. Versions with PZT translators allow ultra-high-resolution dynamic scanning and tracking. (See the "PZT Active Optics" section for fast, ultra-high-resolution, tip/tilt platforms).

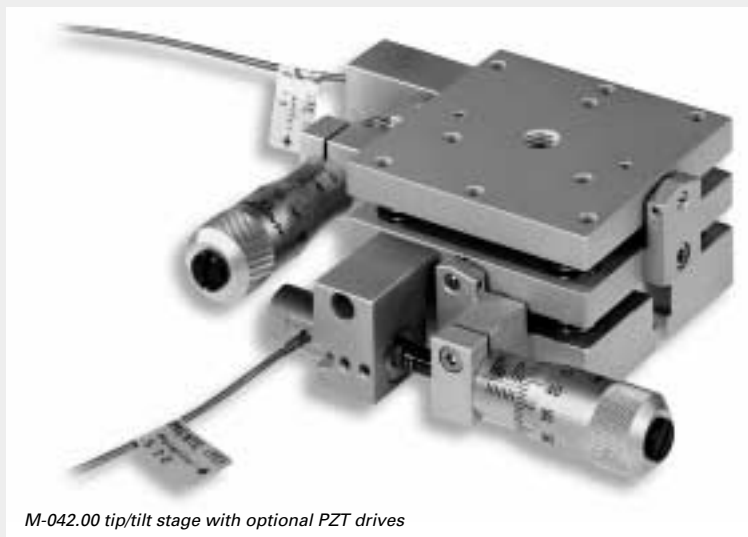
The two basic versions (with part number extension .00) are equipped with manual micrometer drives providing 65 and 80 μ rad minimum incremental motion, respectively. The versions with extension .D01 are equipped with closed-loop, DC-servo-motor drives (model M-227.10, see page 7-66 for further details and recommended motor controllers) providing 15 and 12 μ rad minimum incremental motion, respectively. Sets of limit switches eliminate the possibility of overtravel.

High-Resolution Piezo Option

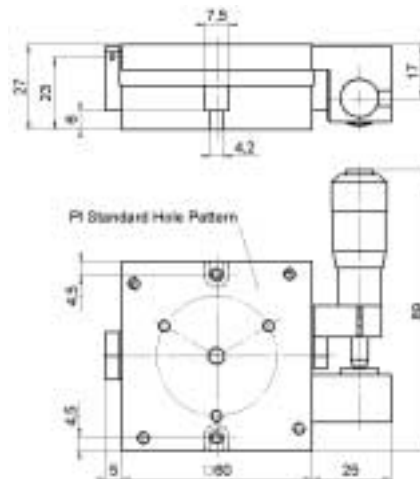
For sub- μ rad resolution and dynamic tracking or scanning, optional open-loop/closed-loop PZT drive upgrade kits are available. See the P-840 and P-841 on p. 1-16 in the "PZT Actuators" section for further details and recommended controllers. The PZT drives can also be ordered subsequently to upgrade manual or motorized systems.



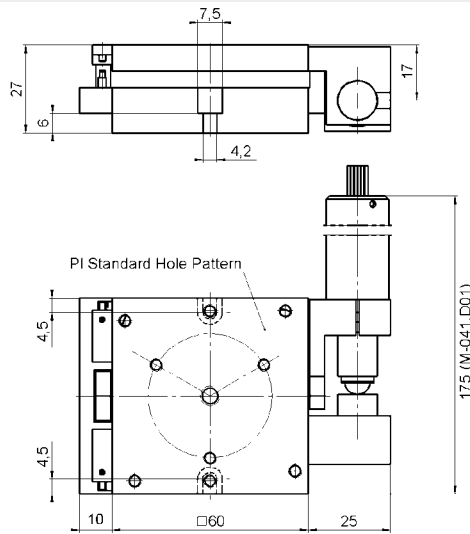
M-044.D01 tip/tilt stage



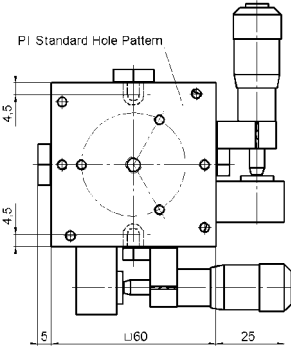
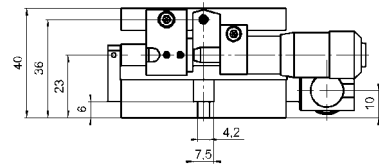
M-042.00 tip/tilt stage with optional PZT drives



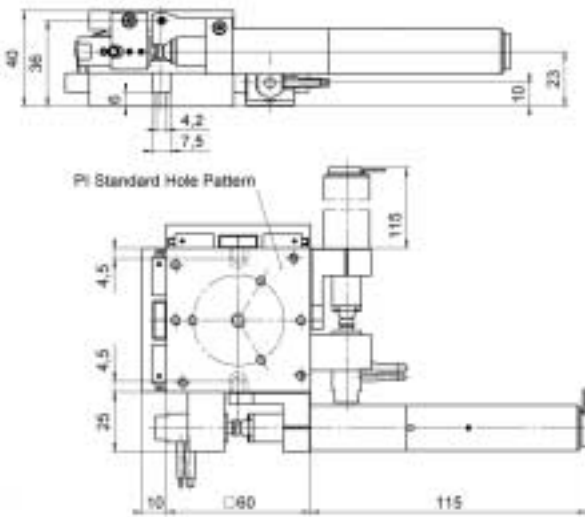
M-041.00 dimensions (in mm)



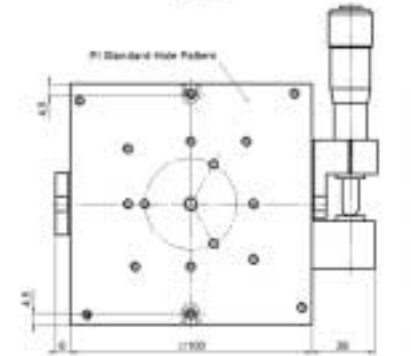
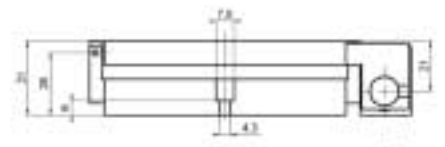
M-041.D01 dimensions (in mm)



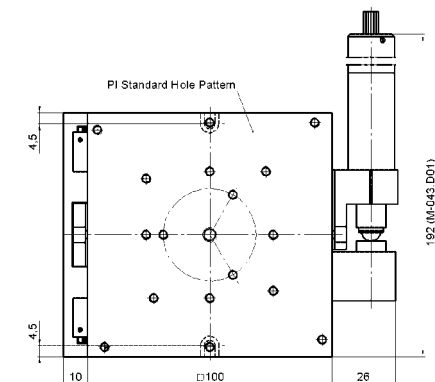
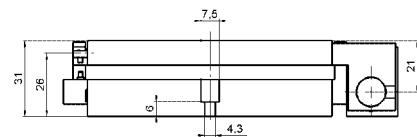
M-042.00 dimensions (in mm)



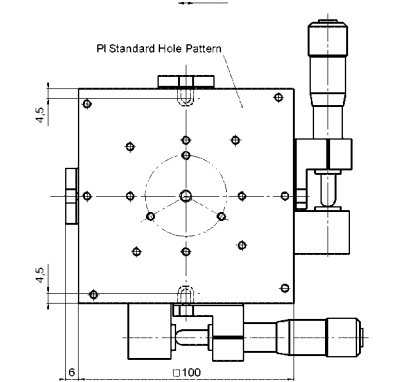
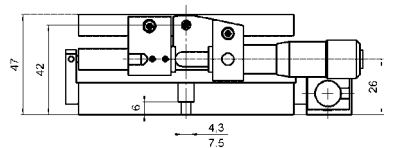
M-042.D01 with optional PZT drives (dimensions in mm)



M-043.00 dimensions (in mm)



M-043.D01 dimensions (in mm)



M-044.00 dimensions (in mm)

PZT Actuators
PZT Flexure NanoPositioners
PZT Active Optics / Steering Mirrors
Tutorial: Piezoelectrics...
Capacitive Position Sensors
PZT Control Electronics
MicroPositioners / Hexapod Systems
Photonics Alignment & Packaging Systems
Motor Controllers
Index

<http://www.pi.ws>
info@pi.ws

Ordering Information

M-041.00
 Small Tilt Stage, Manual Micrometer Drive

M-041.D01
 Small Tilt Stage, DC-Motor Drive

M-042.00
 Small Tip/Tilt Stage, Manual Micrometer Drive

M-042.D01
 Small Tip/Tilt Stage, DC-Motor Drive

M-043.00
 Tilt Stage, Manual Micrometer Drive

M-043.D01
 Tilt Stage, DC-Motor Drive

M-044.00
 Tip/Tilt Stage, Manual Micrometer Drive

M-044.D01
 Tip/Tilt Stage, DC-Motor Drive

Upgrades

M-041.U0
 Open-Loop PZT Drive Upgrade Kit for M-041 Tilt Stages

M-041.US
 Closed-Loop PZT Drive Upgrade Kit for M-041 Tilt Stages

M-042.U0
 Open-Loop PZT Drive Upgrade Kit for M-042 Tip/Tilt Stages

M-042.US
 Closed-Loop PZT Drive Upgrade Kit for M-042 Tip/Tilt Stages

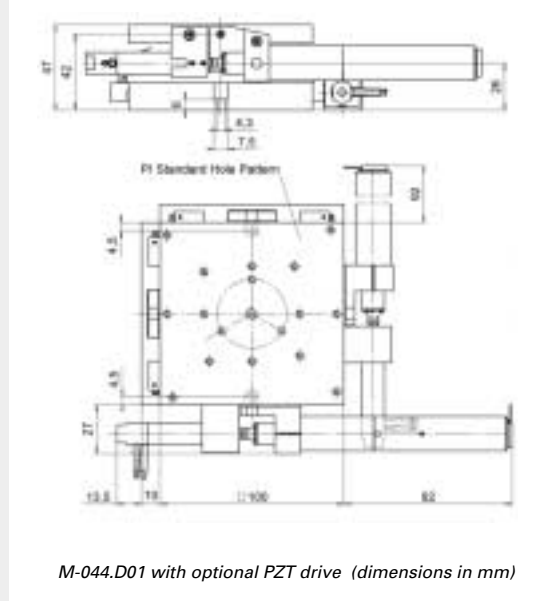
M-043.U0
 Open-Loop PZT Drive Upgrade Kit for M-043 Tilt Stages

M-043.US
 Closed-Loop PZT Drive Upgrade Kit for M-043 Tilt Stages

M-044.U0
 Open-Loop PZT Drive Upgrade Kit for M-044 Tip/Tilt Stages

M-044.US
 Closed-Loop PZT Drive Upgrade Kit for M-044 Tip/Tilt Stages

Custom Designs for Volume Buyers



M-044.D01 with optional PZT drive (dimensions in mm)

Technical Data

Models	M-041.00	M-042.00	M-043.00	M-044.00	M-041.D01	M-042.D01	M-043.D01	M-044.D01	Units	Notes see p. 7-96
Tilt Axes	θ_x	θ_x, θ_y	θ_x	θ_x, θ_y	θ_x	θ_x, θ_y	θ_x	θ_x, θ_y		
Tilt Range	± 9	± 9	± 7	± 7	± 9	± 9	± 7	± 7	deg (axis)	
Fine Range (PZT option)	± 1.2	± 0.6	± 1.4	± 1.4	± 1.2	± 0.6	± 1.4	± 1.4	mrad (axis)	
Design resolution	-	-	-	-	0.28	0.28	0.23	0.23	μ rad	A3
Min. incremental motion	80	80	65	65	5	5	5	5	μ rad	A4
Min. incremental motion (PZT option)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	μ rad	A4
Rotation / linear input	80	80	65	65	80	80	65	65	μ rad / μ m	A5
Unidirectional repeatability	-	-	-	-	20	20	15	15	μ rad	
Backlash	-	-	-	-	200	200	175	175	μ rad	
Max. velocity	-	-	-	-	4.5	4.5	3.6	3.6	deg/sec	
Max. load (A)	4	4	5	5	4	4	5	5	kg	
Max torque (B, C)	450, 150	450, 150	750, 250	750, 250	450, 150	450, 150	750, 250	750, 250	mNm	
Drive	M-622 Micrometer	M-622 Micrometer	M-624 Micrometer	M-624 Micrometer	M-227.10 DC-Mike	M-227.10 DC-Mike	M-227.10 DC-Mike	M-227.10 DC-Mike		
PZT drive (optional)	P-840.20 / P-841.20	P-840.10 / P-841.10	P-840.30 / P-841.30	P-840.30 / P-841.30	P-840.20 / P-841.20	P-840.10 / P-841.10	P-840.30 / P-841.30	P-840.30 / P-841.30		D1
Weight	0.4	0.6	0.8	1.2	0.5	0.7	0.9	1.5	kg	
Body material	Al	Al	Al	Al	Al	Al	Al	Al		L