M-116

Micro Rotation Stages with Worm Gear Drive

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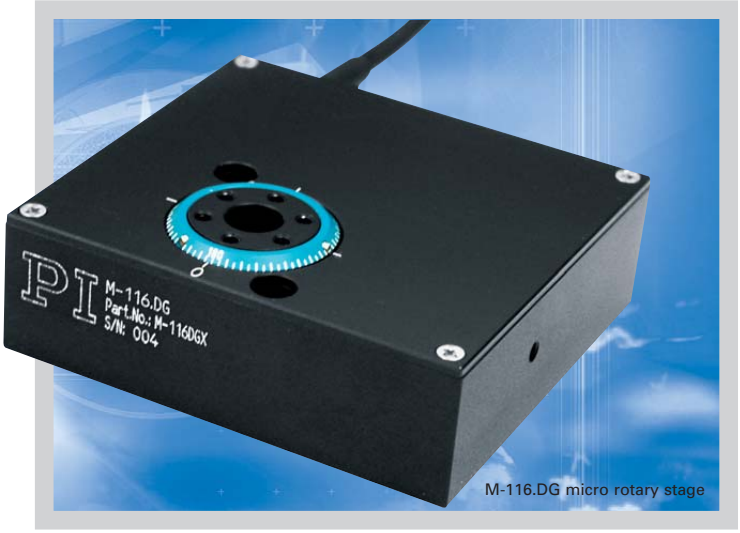


M-116.DG micro rotary stage

- **Ultra-Compact Design**
- **Continuous Rotation**
- **2.5 µrad Design Resolution**
- **Clear Aperture**
- **Velocity up to 20 degrees/second**
- **Preloaded Anti-Backlash Worm Drive**
- **Fits Directly on M-110 Micro Translation Stages**
- **Compatible with Leading Industrial Motion Controllers**
- **Non-Contact Reference Switch**
- **Up to 10 µrad Repeatability**

M-116 rotation stages are equipped with low-friction, spring-preloaded worm gear drives allowing unlimited rotation in either direction in an extremely compact package.

Stepper and Servo Motors

Both drive options provide a cost-effective solution for industrial and OEM environments. A miniature DC or stepper motor actuates motion via a spring-preloaded worm gear drive and zero-backlash (with M-116.xxH versions) gearhead. To meet the most critical positioning demands, the DC motor is equipped with a high-resolution encoder featuring resolution of 2.048 counts per revolution. The combination of the extremely low-stiction / low-friction construction and high-resolution encoder allows for minimum incremental motion of 25 µrad at speeds up to 20 degrees/second.

Application Examples

- Beam lines
- Adjustment of optics
- Metrology
- Quality control
- Photonics packaging
- R&D

Multi-Axis Combinations

M-116 rotary stages can be combined with the M-110, M-111 and M-112 micro linear stages without an additional adapter plate to keep the total height at a minimum. A variety of add-on Piezo-Nanoalignment units are also available, see the "Photonics" section.

Clear Aperture, Lens Adapter

The M-116 is designed with a clear aperture for extended versatility in optics applications. The M-116.AL1 lens adapter is available to accommodate 0.5" optics such as polarizers.

Non-Contact Reference Switch

M-116 micro rotary stages are equipped with an integrated optical reference switch. For ease of operation and setup, all models come with a scale ring on the outer edge of the turntable.

Optional Limit Switches

To protect your equipment and increase versatility in automation applications, the rotary stage can optionally be equipped with optical limit switches. The travel can be limited to a range between 0° and 330° ± 2° (reference switch between 30° and 330°).

Notes

See "Accessories", page 7-92 *ff.* for adapters, brackets, etc.

Ordering Information

M-116.DG
Micro Rotation Stage, 360°, Closed-Loop DC-Motor / Gearhead Drive

M-116.DGH
Micro Rotation Stage, 360°, Closed-Loop DC-Motor / Zero-Backlash Gearhead Drive

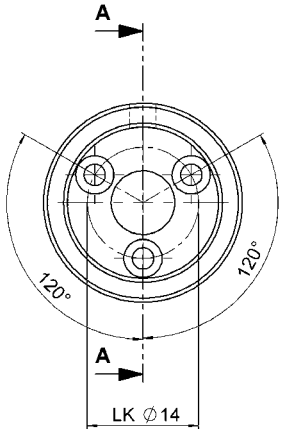
M-116.2S
Micro Rotation Stage, 360°, 2-Phase Stepper-Motor / Gearhead Drive

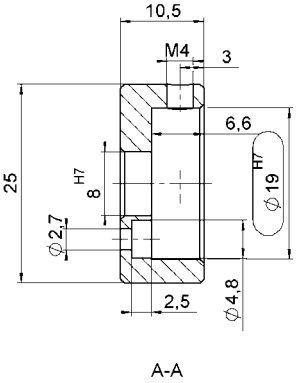
M-116.2SH
Micro Rotation Stage, 360°, 2-Phase Stepper-Motor / Zero-Backlash Gearhead Drive

M-116.AL1
Lens Adapter for 0.5" Optics

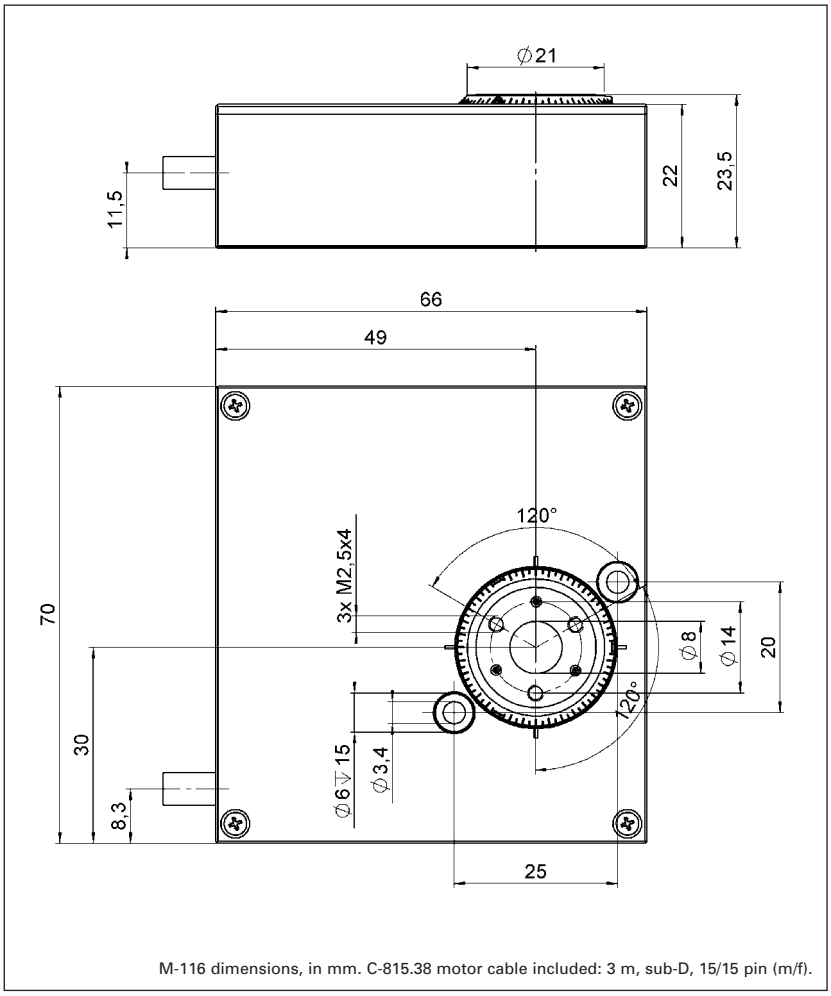
Ask about custom designs!

XY θ_z micropositioning combination consisting of (from top to bottom) M-116 micro rotary stage and two M-111 translation stages (M-110.01 adapter for mounting the M-111 on a honeycomb breadboard with M6 on 25 mm centers).





Dimensions of the M-116.AL1 lens adapter for 0.5" optic devices such as polarizers.



M-116 dimensions, in mm. C-815.38 motor cable included: 3 m, sub-D, 15/15 pin (m/f).

Technical Data

Models	M-116.DG	M-116.DGH	M-116.2S	M-116.2SH	Units	Notes see p. 7-106
Rotation range	continuous	continuous	continuous	continuous	degrees	
Design resolution	2.45 (0.00014)	3.16 (0.00018)	4.18 (0.00024)	5.40 (0.00031)	µrad (deg)	A3
Min. incremental motion	50	25	50	25	µrad	A4
Unidirectional repeatability	12	10	12	10	µrad	
Backlash	1000	500	1000	500	µrad	
Max. velocity	20	20	20	20	°/s	
Maximum axial force	15	15	15	15	N	
Maximum torque (θ_x, θ_y)	±1.5	±1.5	±1.5	±1.5	Nm	
Maximum torque (θ_z, CW/CCW)	0.4 / 0.8	0.4 / 0.8	0.4 / 0.8	0.4 / 0.8	Nm	
Encoder resolution	2048	2048	-	-	counts/rev.	
Motor resolution	–	–	1200 *	1200 *		
Gearhead ratio	28.444:1	22.0335:1	28.444:1	22.0335:1		
Worm gear ratio	44:1	44:1	44:1	44:1		
Nominal motor power	1.75	1.75			W	
Motor voltage	12	12	24*	24*	V	
Weight	0.4	0.4	0.4	0.4	kg	
Body material	Al	Al	Al	Al		
Recommended motor controller	C-862; C-843; C-848	C-862; C-843; C-848	C-600; C-630	C-600; C-630	D2	

* 2-phase stepper, 24 V chopper voltage, max. 250 mA / phase, 1,200 microsteps with C-600 or C-630 controller