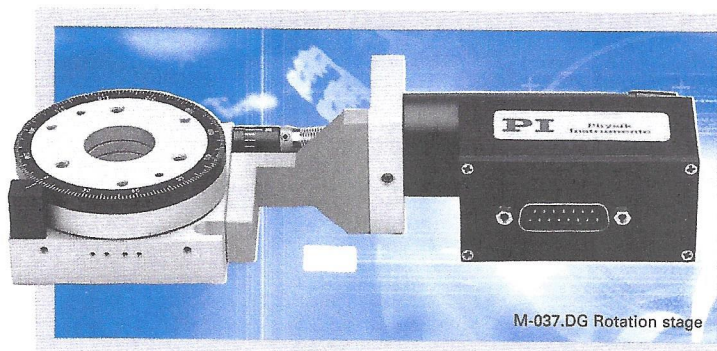


M-037 Compact Precision Rotation Stage

Unlimited Travel Range, Vacuum-Compatible Versions



M-037.DG Rotation stage

- Ultra-High Resolution
- Compact Design
- Continuous Rotation Range
- Preloaded Worm Drive for Zero Backlash
- ActiveDrive™ Manual, DC-Servo and Stepper-Motor Drives
- Clear Aperture Ø 20 mm
- Vacuum-Compatible Versions Available to 10⁻⁶ hPa

Coarse position can be read from an adjustable scale ring on the outer edge of the turntable graduated in 2 degree increments.

Each M-037 stage is individually broken in before delivery to achieve the exceptional mechanical precision.

Notes

For adapters, bracket, etc. see page 4-90 ff.

Ordering Information

M-037.00
Rotation Stage, Ø 60 mm, 360°, Manual Drive

M-037.DG
Rotation Stage, Ø 60 mm, 360°, Closed-Loop DC Motor Gearhead

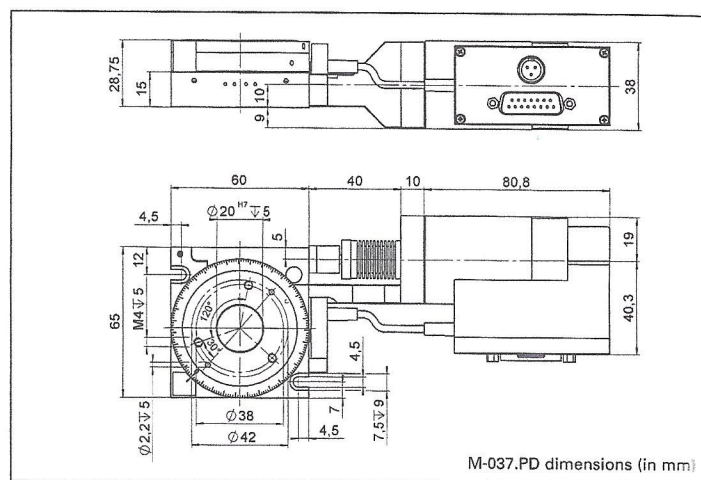
M-037.VG
Vacuum Compatible to 10⁻⁶ hPa of M-037.DG

M-037.PD
Rotation Stage, Ø 60 mm, 360°, ActiveDrive™ DC Motor (includes 24 V power supply)

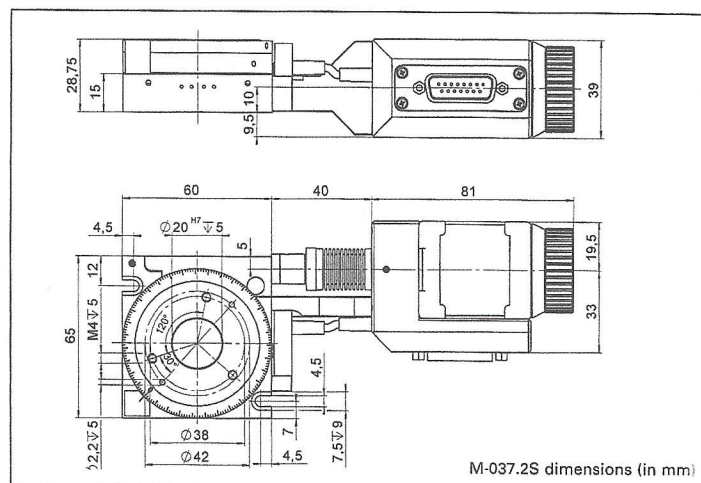
M-037.VP
Vacuum Compatible to 10⁻⁶ hPa of M-037.PD

M-037.2S
Rotation Stage, Ø 60 mm, 360°, 2-Phase Stepper Motor

Ask about custom designs!



M-037.PD dimensions (in mm)



M-037.2S dimensions (in mm)

M-037 rotation stages are equipped with ultra-precise worm gear drives allowing unlimited rotation in either direction. An integrated spring preload eliminates backlash. Double-row ball bearings allow zero backlash, high load capacity and extremely low wobble.

The worm gear ratio is 180:1, which allows an extraordinary position resolution of the turntable.

DC-Motor and Stepper Motor Drives

A variety of servo and stepper motors are available, besides the manual version.

Model M-037.DG is closed-loop DC motors with shaft-mounted position encoders and precision gearheads providing 3.5 µrad at a design resolution of 0.6 µrad.

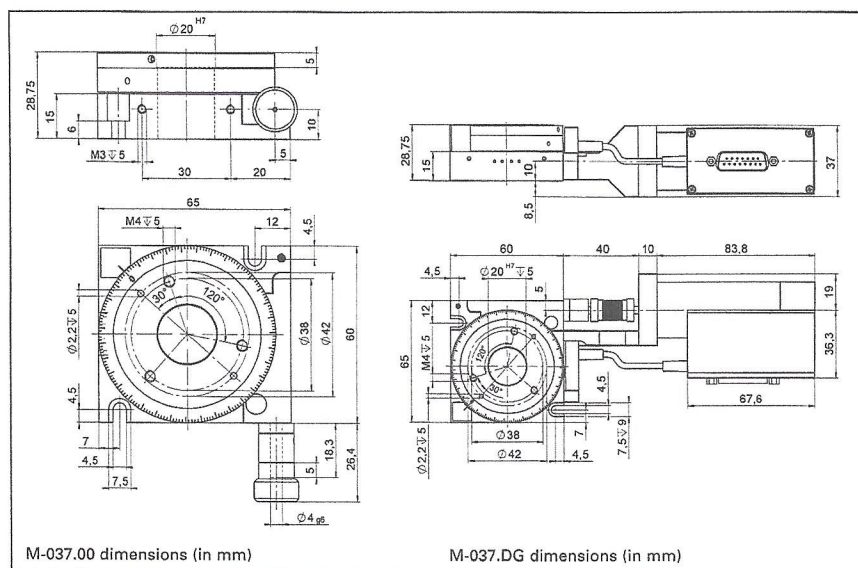
Model M-037.2S models feature a cost-effective direct-drive, 2-phase stepper motor,

providing very smooth operation and a resolution of 5.45 µrad at a minimum incremental motion of 21 µm.

ActiveDrive™

Model M-037.PD is equipped with the high efficient Active Drive™ direct drive and provides velocities up to 45°/s. The ActiveDrive™ design, developed by PI, features a high-efficiency PWM (pulse width modulation) servo-amplifier mounted side-by-side with the DC motor and offers several advantages:

- Increased efficiency, by eliminating power losses between the amplifier and motor
- Reduced cost of ownership and improved reliability, because no external driver is required
- Elimination of PWM amplifier noise radiation, by mounting the amplifier and motor together in a single, electrically shielded case



Technical Data

| Model | M-037.00 | M-037.DG | M-037.PD | M-037.2S | |
|---|------------|--|---|----------------------------------|------------|
| Active axes | Rotation | Rotation | Rotation | Rotation | |
| Motion and positioning | | | | | |
| Rotation range | >360 | >360 | >360 | >360 | ° |
| Integrated sensor | – | Rotary encoder | Rotary encoder | – | |
| Sensor resolution | – | 2000 | 4000 | – | cts./rev. |
| Design resolution | – | 0.59 (34 x 10 ⁻⁶) | 8.75 (0.0005) | 5.45* (0.00031) | μrad (°) |
| Min. incremental motion | – | 3.5 | 27 | 21 | μrad |
| Backlash | – | 200 | 200 | 200 | μrad |
| Unidirectional repeatability | – | 30 | 30 | 30 | μrad |
| Wobble | <150 | <150 | <150 | <150 | μrad |
| Max. velocity | – | 6 | 45 | 10 | °/s |
| Mechanical properties | | | | | |
| Worm gear ratio | 180:1 | 180:1 | 180:1 | 180:1 | |
| Gear ratio | – | (28/12) ^a ≈ 29.6:1 | – | – | |
| Motor resolution | – | – | – | 6400* | steps/rev. |
| Load capacity/axial force, self-locking | ±300 | ±300 | ±300 | ±300 | N |
| Max. torque (θ _X , θ _Y) | ±3 | ±3 | ±3 | ±3 | Nm |
| Max. torque clockwise (θ _Z) | 1 | 1 | 1 | 1 | Nm |
| Max. torque counter clockwise (θ _Z) | 0.5 | 0.5 | 0.5 | 0.5 | Nm |
| Drive properties | | | | | |
| Motor type | – | DC motor, gearhead | ActiveDrive™ DC Motor | 2-phase stepper motor* | |
| Operating voltage | – | 0 to ±12 | 24 (PWM) | 24 | V |
| Electrical power | – | 3 | 30 | | W |
| Reference switch | – | Hall-effect | Hall-effect | Hall-effect | |
| Miscellaneous | | | | | |
| Operating temperature range | -20 to +65 | -20 to +65 | -20 to +65 | -20 to +65 | °C |
| Material | Aluminum | Aluminum | Aluminum | Aluminum | |
| Mass | 0.3 | 0.65 | 0.62 | 0.64 | kg |
| Recommended controller/driver | – | C-863 (single-axis) C-843 PCI-Karte (for up to 4 axes) | C-863 (single-axis, p. 4-114) C-843 PCI-Karte (p. 4-120) (for up to 4 axes) | C-663 (single-axis, p. 4-112) | |

incl. motor cable, 3 m, sub-D connector 15-pin

*2-phase stepper motor, 24 V chopper voltage, max. 0.8 A/phase, 400 full steps/rev., motor resolution with C-663 stepper motor controller

Linear Actuators & Motors

Nanopositioning / Piezoelectrics

Nanometrology

Micropositioning

Hexapod 6-Axis Systems /
Parallel Kinematics

Linear Stages

Translation (X)

Vertical (Y)

Multi-Axis

Rotary & Tilt Stages

Accessories

Servo & Stepper Motor Controllers

Single-Channel

Hybrid

Multi-Channel

Micropositioning Fundamentals

Index