Optical-Interference Testing Rig for Applanation Tonometers

PT-Series

SIOS Meßtechnik GmbH

Design and Operation

Our PT-Series optical interference testing rig for applanation tonometers consists of an automated laser based testing device equipped with a USB interface for coupling to a PC, plus signal-processing software running on standard PCs/notebook computers. Its flexibility of configuration allows its use with various types of tonometers. The buckling force set on the tonometer to be tested is automatically recorded over its full travel. Detecting the limits of the tonometer‘s travel allows outputting both its buckling force characteristic curve over its full travel and the buckling force at the midpoint of its travel, as stipulated by testing regulations.

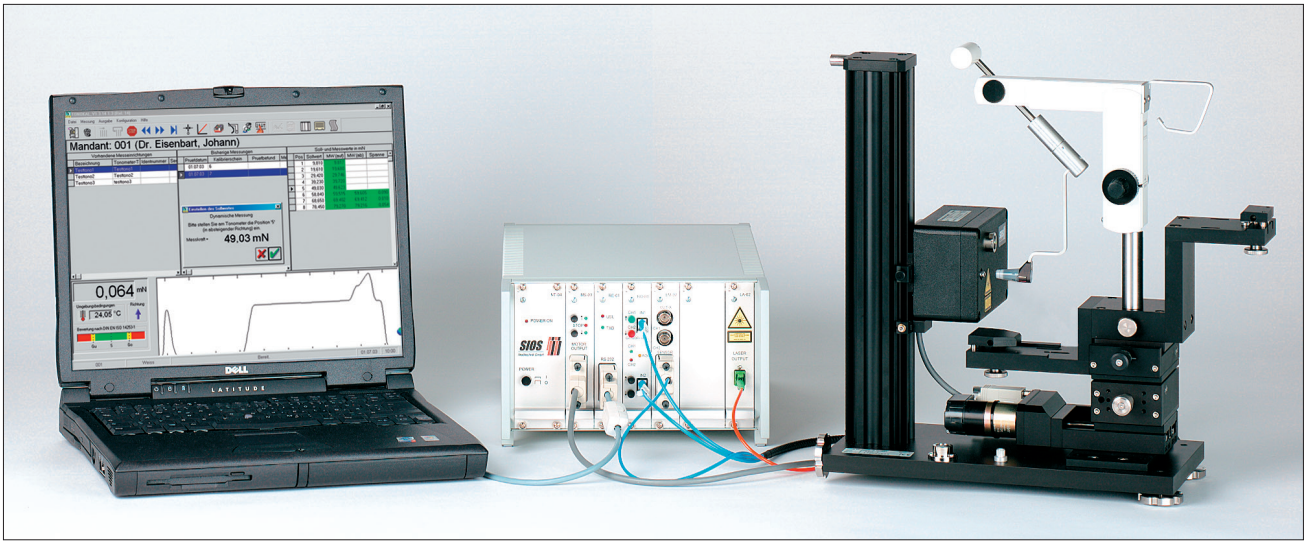
The force sensor employed is an optical interferometric device with a measurement range of 100 mN and a resolution of 0.01 mN. To test a tonometer, the tonometer is driven up against this force sensor by an electromechanical drive, where the measured buckling force characteristic curve is employed internally for controlling the motions of the drive and detecting the limits of the tonometer‘s travel. The measured value of the buckling force at the midpoint of the travel is then compared with the prescribed tolerance range and displayed either in green, indicating that it falls within that range, or in red, indicating that it falls outside that range. A complete series of measurements, including printing the calibration certificate, takes less than five minutes, thanks to the fully automated test procedures of the rig. The facilities provided for calibrating its optical interference force sensor using standard weights allow tracing its calibration back to national reference standards.

Major Performance Features

- Allows making orientation independent force measurements by laser interferometric force sensor over the full measurement range while maintaining compliance with tolerated error limits.
- Provides automated test procedures complying with ISO 8612 testing regulations for applanation tonometers (determinations of both buckling forces at the midpoints of their travels and hysteresis).
- Diagram of tonometers‘ buckling-force characte-ristic curves over their full travels
- The first rig to allow the testing of tonometers over the full prescribed temperature range of 15°C to 30°C.
- Testing, including setup, takes only about 10 min.
- Printout of a calibration certificate
- Calibration using standard weights allows tracing its calibration back to national standards.
- The rig is portable, and thus may be used on-site e.g. at hospitals or ophthalmologists‘ offices.
- Certification by German calibration authorities has been granted.

Applications

- Conducting metrological accuracy checks on applanation tonometers in accordance with § 11, section 3, MPBetreibV, both in the laboratory and on-site at remote locations.
- Testing tonometers for compliance with the EN ISO 8612 testing standard.
- Quality control testing during tonometer manufacture.



Technical Data

Suitable for use with all types of applanation tonometers.

Measurement range:	0...10g	(100 mN)
Resolution:	1 mg intern 0.1 mg	(0.01 mN)
Standard calibration error of the force sensor employed:	0.5 mg	(0,005 mN)
Test duration:	≤ 5 min	

Laser Safety Class according DIN EN 60825-1:2007 and ANSI Z136.1 (CDRH)	2M II
Dimensions (H x B x T)	
• Testing rig:	360 x 390 x 190 mm
• Electronics unit:	150 x 240 x 400 mm

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Warning:

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