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# Laser Interferometric Gauging Probe



**LM-Series**

## Design and Operation

Our LM-Series laser interferometric gauging probes are precision length measurement instruments; the first of their kind to make contact length measurements over ranges of 0 - 20 mm to 0 - 50 mm with nanometer precision.

Compactly designed gauging heads and 8h6-mm diameter probe shafts allow for their use with conventional length measurement systems.

The integral miniature interferometer converts displacements of the motor driven probe shaft into optical interference signals that are transmitted on a fiberoptic cable to an optoelectronic signal processing/power supply unit for processing and output as lengths.

A frequency stabilized HeNe Laser serves as the light source for the miniature interferometer. Compensation of environmental influences form the basis for high metric precisions and are achieved through the correction of laser wavelengths.

Instrument operation and display of measurement results are controlled either through a separate keypad/display unit or a PC running the software package supplied.



## Major Performance Features

- Ultrahigh precision and accuracy achieved through the employment of a laser interferometric measurement technique
- Employs a frequency stabilized HeNe laser as a length standard
- Excellent linearity in the whole measurement coverage
- Force exerted by the gauging probe remains constant over the full dynamic range
- Employs a fiberoptic coupled gauging probe
- Employs signal acquisition/transmission hardware immune to electromagnetic interference
- Causes no thermal interference with other metrological equipment experimental setups
- Corrects for variations in laser wavelength caused by ambient conditions
- Motor-driven probe shafts
- Usable in any orientation

## Applications

- Precision length measurements
- Final dimensional checks
- Calibrating gauge blocks/pins/plugs, rules, dial gauges, and other measuring devices
- Measuring thicknesses of, e.g., plastic films
- Measuring depths of indentations produced by hardness testers
- Contact surface profiling
- Measuring deformations
- Gauging tasks in research and development work at near-reference-standard precision

Technical Data		Model LM 20	Model LM 50
Measurement range	mm	20	50
Metric resolution	nm	1 (0.1)	1 (0.1)
Nominal laser wavelength	nm	632.8	632.8
Operating temperature range	°C	10 - 30	10 - 30
Probe-shaft diameter	mm	8h6	8h6
Force exerted by probe shaft (permanently factory preset)	N	0.5 - 1.5	0.5 - 1.5
Dimensions (H x W x D):			
Gauging head (less probe shaft)	mm	137 x 60 x 36	170 x 60 x 36
Gauging head (including probe shaft)	mm	170 x 60 x 36	220 x 60 x 36
Optoelectronic signal-processing/power-supply unit	mm	150 x 450 x 400	150 x 450 x 400
Keypad/display unit	mm	48 x 190 x 138	48 x 190 x 138
Mass:			
Gauging head	g	370	420
Optoelectronic signal-processing/power-supply unit	g	9,500	9,500
Keypad/display unit	g	630	630
Interface: serial			
		RS 232 C	RS 232 C
	optionally	USB	USB
Fiberoptic cable length	m	3, optionally up to 25	3, optionally up to 25
Supply-line voltage	VAC	100 - 240	100 - 240
Supply-line frequency	Hz	47 - 60	47 - 60

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