
Gauge Block Calibration System



EPP-Series

Design and Operation

The EPP-Series gauge-block calibration system for calibrating parallel-sided gauge blocks employs an LM 20 laser-interferometric gauging probe as its upper gauging probe. It has a measuring range of 20 mm and a length resolution of 1 nm. Investigations conducted by the German national bureau of standards (PTB) yielded metric errors of less than 10 nm for this gauging probe when used for calibrating gauge blocks. According to a PTB recommendation, the total number of reference-standard gauge blocks required for calibrating a 122-piece set of gauge blocks may thus be reduced to fifteen.

A calibration procedure determines system linearity errors (errors due to misalignments, angular misalignments of its gauging probe, and thermal effects) and corrects for them.

The system is easy to operate from a PC running "Parallel Gauge Block Calibration" (PEKAL) signal-processing and control software, which also corrects, processes, and outputs metrological data.

Major Performance Features

- Only around 15 standard gauge blocks are needed for calibrating a 122-block set.
- Cuts calibration costs, thanks to its low recalibration requirements.
- Yields faster measurements, thanks to its menu-driven metrological procedures and the low number of standard gauge blocks required.
- Calibrates unusual nominal sizes and items fabricated from nonstandard materials.
- Features high linearity over its entire measuring range.
- Maintains a constant applied force for the gauging probe over the entire measurement range.
- Supplied complete with stable, high-precision, measuring stands.
- Employs the PEKAL software, which corrects for test object temperature and ambient temperature.
- Optionally available with a set of four temperature sensors.
- Employs a software package running under Windows on any standard PC.



Technical Data

EPP 01

Measurement range:	0.5 mm ... 100 mm
Upper gauging probe:	SIOS Model LM 20 laser-interferometric gauging probe
Measurement range:	20 mm
Resolution:	1 nm
Uncertainty:	$\leq \pm 10$ nm over 15 mm
Measurement force:	1 N
Probe tip:	Interchangeable, 1.5-mm radius, spherical, ruby-tipped insert equipped with an M 2.5 external thread
Lower gauging probe:	Inductive type
Measuring force:	0.6 N
Probe tip:	1.5-mm radius ball
Serial interface:	RS 232 C
Operating temperature:	20°C \pm 0.5 K
Resolution of temperature measurement:	± 0.01 K

Applications

- Calibration of plane-parallel gauge blocks with rectangular cross sections ranging from 0.5 mm to 100 mm.
- Measurement characteristic dimensional parameters in compliance with ISO 3650.

Signal-Processing and Control Software

- Controls the motion (raising/lowering) of both gauging probes.
- Simultaneously transmits metrological data obtained by both upper and lower gauging probes.
- Compensates for errors, computes center sizes, recognizes nominal sizes, outputs deviations of center sizes from nominal sizes, and classifies gauge blocks by their degrees of accuracy.
- Reads out signals from the system's online temperature measurement system and compensates for deviations from reference temperatures.
- Outputs custom-designed test reports and certificates

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