



Gauge Block Comparators

Gauge Block Calibration System



Designed for Perfection

GBC 150 Gold

Gauge Block Comparator System
with interferometric probe from SIOS, Germany



Comparator with 20mm measuring span
measurement of gauge blocks with
variation in nominal length

GBC 150 Silver

Gauge Block Comparator System
with optical probe from Heidenhain, Germany



Comparator with 20mm measuring span
measurement of gauge blocks with
variation in nominal length

GBC 170

Gauge Block Comparator System
with high precision inductive probes



Comparator with 0.2 mm measuring span
measurement of gauge block
with same nominal length

- Gauge Block Comparator for comparative measurement- calibration of gauge blocks by comparison method with high resolution two mutually opposed aligned probes connected in sum measurement (A + B). Method complying to ISO 3650.
- Single or dual template system for positioning the gauge blocks and optimum ease of gauge handling.
- Temperature device available as an option. This device has two PT 100 temperature sensors each capturing the temperature of both reference and under test gauge blocks simultaneously for online thermal error correction for differential expansion.
- Computer aided measurement system for online data transfer of length and temperature values, measurement & analysis of gauge block length, parallelism as per ISO 3650, ASME B89.1.9, BS-04311-1. Report generation through software complying with ISO/IEC 17025.
- **Octagon GBC 150 Gold* and GBC 150 Silver*** Gauge block comparators has probing system with 1 nanometer resolution with comparison span of 20mm. Due to this feature direct measurement of gauge blocks with variation in nominal length up to 20mm are possible. This new comparison method of measurements of Gauge blocks is developed and validated by PTB Germany and is now widely adopted throughout the world-wide calibration laboratories of National metrology Institutes (NMIs). This comparison method allows the number of reference gauge blocks to be reduced by nearly 80%. This feature of long comparison span provides advantage to use same reference gauge blocks for measurements of Imperial (inch) and Metric sizes.

Features :

- Rigid cast-iron stand to ensure high thermally stable comparator structure.
- Gentle, precise and extremely smooth operation carriage fixture due to slide ways, which are impervious to dirt.
- Comparator table support consisting of hardened circular guide pins, provides line contact to ensure smooth movement of gauge blocks on comparator table.
- Accurate positioning of gauge blocks with specially designed templates facilitating single point (central length) / five point (central length + parallelism) measurements.
- Electro-pneumatic lifting of both top and bottom probes minimises thermal errors due to untouched operation.
- Very effective protection from heat due to an acrylic glass screen works as heat protection shield.
- Correction for measuring force. Correction of differing thermal expansion. (Differential expansion coefficients + differential temperature)
- Automatic computation of mean value of number of repeat measurement cycles in software based measurement program. No zero setting required, since the set value is automatically related to the nominal value of the respective reference gauge block.

Optionally offered- Gauge block set grade K (11 pcs / 13pcs) made from tungsten carbide for calibration of comparator, compliance with procedure for calibration comparator EURAMET CG-2 guide. Calibration measurement uncertainty for gauge blocks calibration can be offered through calibration from NMI with $U \leq \pm 0.02 \mu\text{m}$ and determined coefficient of thermal stability.

Technical Specifications:	GBC 150 Gold	GBC 150 Silver	GBC 170
Measuring Range (mm / inch)	0.5 - 150 mm / 0 - 6"	0.5 - 150 mm / 0 - 6"	0.5 - 170 mm / 0 - 6.5"
Comprison Range (mm / inch)	20 mm / 0.75"	20 mm / 0.75"	0.2 mm / 0.0075"
Resolution (μm / μ inch)	0.001 μm / 0.04 μ inch	0.001 μm / 0.04 μ inch	0.01 μm / 0.4 μ inch
Measurement uncertainty	0.01 μm *under specified conditions	0.03 μm *under specified conditions	0.03 μm *under specified conditions
Active table surface	60 mm x 60 mm (Carbide Line Contact)	60 mm x 60 mm (Carbide Line Contact)	60 mm x 60 mm (Carbide Line Contact)
Repeatability	$\pm 0.005 \mu\text{m}$	$\pm 0.01 \mu\text{m}$	$\pm 0.01 \mu\text{m}$
Dimensions (mm)	300(L) X 400 (H)X 250 (W)	300(L) X 400 (H)X 250 (W)	300(L) X 400 (H)X 250 (W)
Weight	38 kg	38 kg	38 kg

For testing gage blocks beyond 100 mm, we recommend the Octaogn Gold Plus universal measuring machine

Automatic Gauge Block Comparator

Robotic Automation

Specially designed completely automated system to calibrate Gauge blocks



Octagon "Automatic Gauge Block Comparator" specially designed as completely automated system to calibrate Gauge blocks as per ISO 3650 . This is the world's first fully automated gauge block calibration system completes calibration of entire set of Gauge block without manual intervention.

The PLC based Gauge block comparator has Robotic automation for loading/ unloading of gauge blocks which are completely programmed. The Automated measuring machine can perform measurements of all M122 gauge blocks as per ISO 3650, with-out manual intervention in a cycle time of 8 ½ hrs for 5 point measurement cycle & 3 repeat measurement runs on each gauge block. The measurement uncertainty of this measurement system is $< \pm 0.05 \mu\text{m}$, at K=2, 95.45% C.L.



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CNC Gauge Block Comparator

Specially designed CNC semi-automated system to calibrate Gauge blocks as per ISO 3650.

Octagon "CNC Gauge Block Comparator" specially designed as semi-automatic measurement system to calibrate Gauge blocks as per ISO 3650. This CNC system with Gauge block comparator provides most efficient operations, reduces measurement cycle time and operator fatigue.

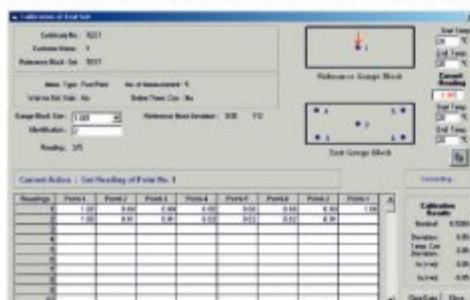
Features :

- CNC version has minimum manual intervention. CNC operation for 5 point measurement program (or only midpoint measurement program) with number of selected runs.
- Loading / unloading operation of gauge block will only be manual.
- This CNC system with Gauge block comparator is most efficient.



Octa-Block

A Windows based Software program for measurement of Gauge Blocks.

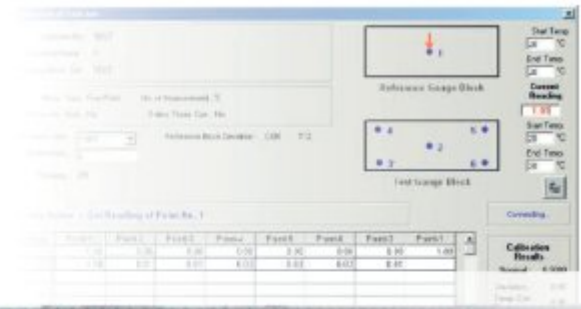
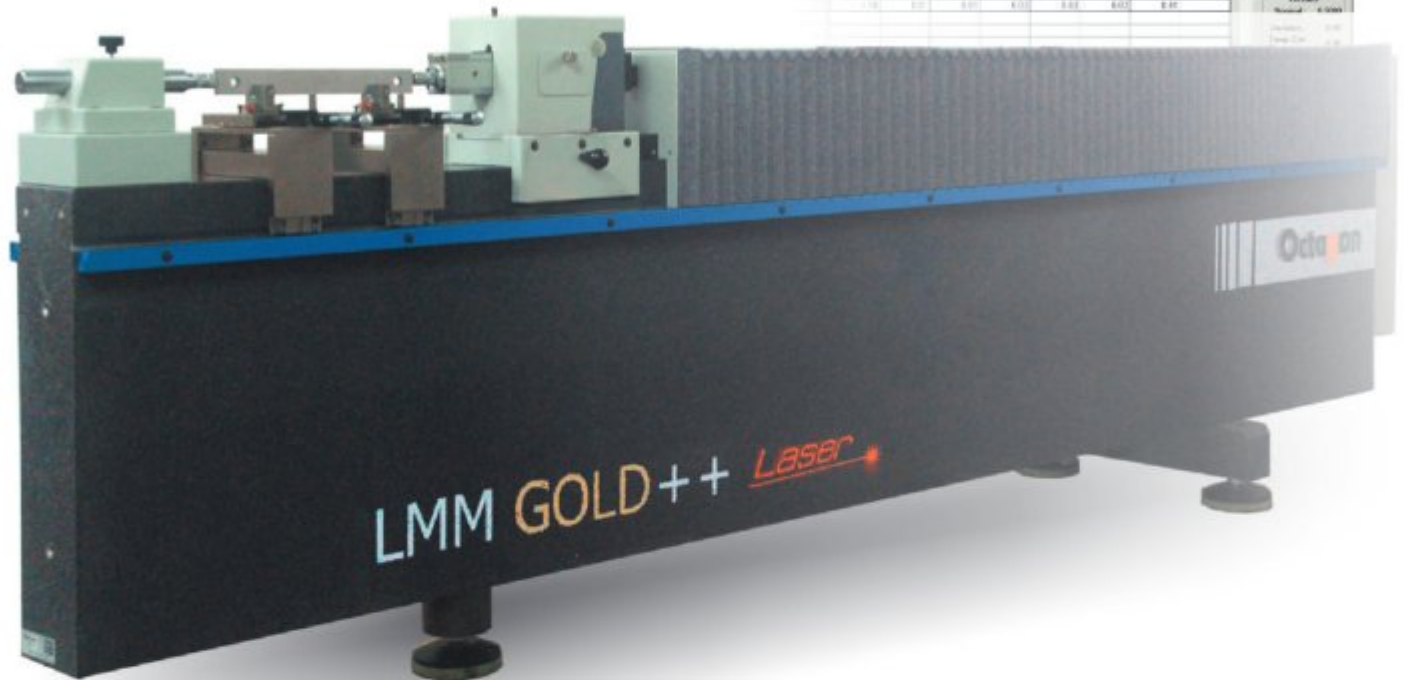


Computer-aided calibration program

Main Features of Octa-Block

- Computer-aided online data transfer and evaluation of the measuring values as per ISO 3650 ASME B89.1.9, BS-04311-1.
- Facility for thermal error corrections (offline / Online), and correction of systematic machine errors.
- Measurement program for individual gauge blocks / measurement program for gauge block sets.
- Measurement program for both Imperial (inch) and Metric gauge blocks set.
- Operator guided measurement program for gauge block calibration Selection and determination of measuring sequences with following two options
- Five Point measurement – central length deviation and parallelism of faces fu & fo.
- Only central point measurement for measurement of central length deviation.
- Storage of measurement records, calibration report generation in the format complying to ISO/IEC 17025.

LMM GOLD++ Length Measuring Machine



Technical Specifications:	
Measuring Range	
Absolute	1000mm/ 2000 mm/ 3000mm
Application Range	
Length bars, Gauge blocks	1000mm/ 2000 mm/ 3000mm
Performance data	
Resolution	0.01 μm
Measurement uncertainty	0.1 + 0.5 L / 1000 μm^*
Measuring force	1N, 2N (Selectable)
Dimensions, weight and operational conditions	
L x W x H	2750 x 380 x 700 mm
Weight (kg)	650 kg
Power supply	230 V Single phase AC, 50 Hz
Display System	PC based
Compressed Air	3 bar

Features :

- Very high precision length measuring machine with highly stable He-Ne Laser interferometer specially designed for large direct measuring range.
- 100% Compliance with Abbe's comparator principle.
- Adjustable support for holding long gauge blocks and length bars.
- Granite horizontal base for structural stability and minimising effect of the temperature variations.
- Anti vibration mounts for protection from environment vibrations.
- Air bearing slides to ensure high precision performance and smooth & easy alignment of measuring carriage.
- Environmental error corrections for Laser interferometer temperature, air pressure, humidity. Online temperature measurement & computer aided correction facility.
- Display System : PC based software display with gauge management features and computer aided measurement including automatic reversal point recognition.

Note:

- Special accuracies, measuring ranges are available upon request.
- * Measurement Uncertainty subject to temperature control of $20 \pm 2^\circ\text{C}$ with gradient less than 0.5°C/hr and humidity control of $50\% \pm 10\% \text{RH}$.