

Precimar®



Better than ever:
Model 130B-24 and 130B-16
THE Gage Block Comparators

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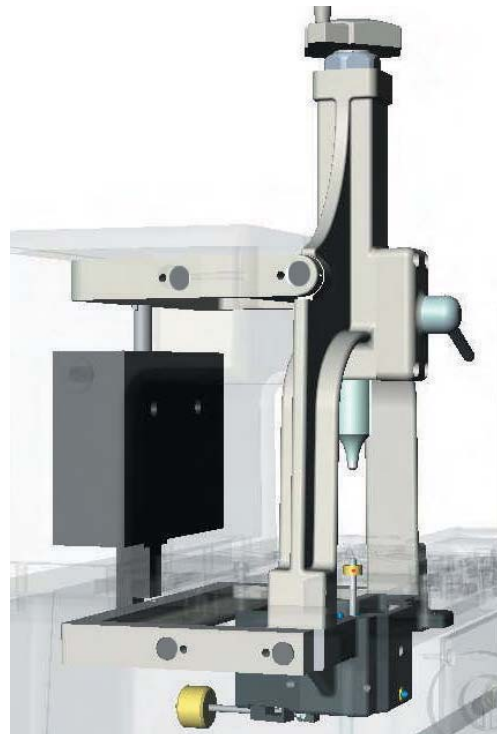
EXACTLY



Model 130B-24, the Standard of the Industry

Mahr Inc.'s 130B-24 Gage Block Comparator is truly the preferred choice of all major calibration laboratories. It is specifically designed for the measurement of gage blocks by comparison, with no compromises made. The Model 130B-24 provides the ultimate in resolution and reproducibility for measurement of industry's most important dimensional standards.

- Unique "Floating Measuring Frame" assures true point-to-point measurement.
- Single sensor design for the lowest possible electronic noise.
- Precise counterbalancing for control of measurement forces.
- Resolution of 0.1 microinch/0.001 micrometer.
- Repeatability of 0.2 microinches/0.005 micrometers ($6\sigma < 1$ microinch/0.025 micrometer).
- Measurement capacity from 0.010" through 4" (0.25 mm through 100 mm).
- Integrated measurement software and user interface.
- Built-in positioner for reproducible measurement locations.



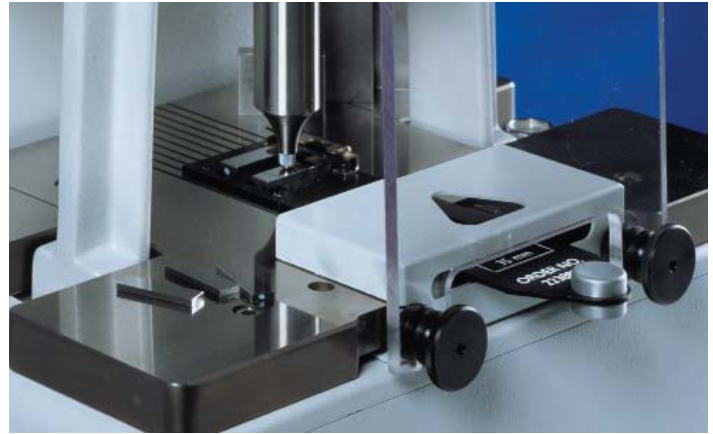
"Floating Measuring Frame" isolates measurements from vibration and makes the result independent of the platen.

Block Positioner

A precision positioning mechanism is built into the platen of the 130B-24. The master block and the work block are loaded into spaces in the template. The mechanism swings into place between the contacts and guides the position of the blocks - first the master block to its reference position, then the work block to its reference position, then to the corners of the block.

Three easily interchangeable templates are included for comparison of square and two different sizes (30 mm and 35mm) rectangular blocks. Alternate templates are optionally available.

The positioner accommodates blocks as thin as .020" (0.5 mm) up to 4" (100 mm). It can be hinged for left-hand or right-hand operation, or it can be removed completely if not needed. The positioner includes an acrylic breath shield that keeps body heat out of the measurement area.



The Best Electronics

The amplifier, sensor, and computer work together to provide unequalled measuring accuracy, along with convenient and simple operation. The amplifier has no user controls. The entire user interface is built into the controlling computer, which can be either a desktop or a laptop model. Communication to the computer is via USB, and is two-way. The computer reads the sensor position and returns a controlling signal to the amplifier, instruct-

ing it exactly how much offset it needs to allow the extremely high magnification of the actual measurement.

The sensor is Mahr Inc.'s best, friction-free, LVDT-based sensor. It is mounted on stable flexures, allowing it to withstand the side loading of a sliding gage block without any loss of accuracy over time.

Model 130B-24

Specifications	
Approximate Size (without computer)	15" x 15" x 23" (400mmx400mmx600mm)
Approximate Weight (without computer)	225 lb (100kg)
Gaging Capacity	0.010" to 4" 0.25mm to 100mm
Gaging Force (Upper Contact) (Lower Contact)	3 oz (0.8N) 1 oz. (0.3N)
Contact Material	Tungsten Carbide, (Diamond - Optional)
Contact Radius	0.125" (3mm)
Sensor Range	±0.015" (±0.38mm)
Measurement Range	±500μ" (±10μm)
Repeatability	6σ <1μ" (25nm) Measured on a 1" gage block without removing the block
Linearity	Linearity <1μ" over the central ±50μ" and <1μ" in any 50μ" over the ±500μ" meas- uring range <20nm over the central ±1μm and <20nm in any ±1μm over the ±10μm meas- uring range

Ordering Information	Order Number
Systems	
Complete System with Desktop Computer	2150076
Complete System with Laptop Computer	2150077
Complete System except without Computer	2150078
Options	
	Templates
30 mm Rectangular Block Template*	2238822
35 mm Rectangular Block Template*	2238821
Square Block Template*	2239637
Square Block Template - 4 positions	2238823
30mm Rect. Master/Square Work	2238826
35mm Rect. Master/Square Work	2238825
Square Master/30 mm Rect. Work	2240939
Square Master/35 mm Rect. Work	2240940
	Replacement Contacts
	Tungsten Carbide*
	Upper 2240154
	Lower 2239733
	Diamond
	Upper EPT-1029
	Lower EPT-1036
	Software Only 2240073
	DeskJet Printer 2950950
	Printer Cable ECB-1775

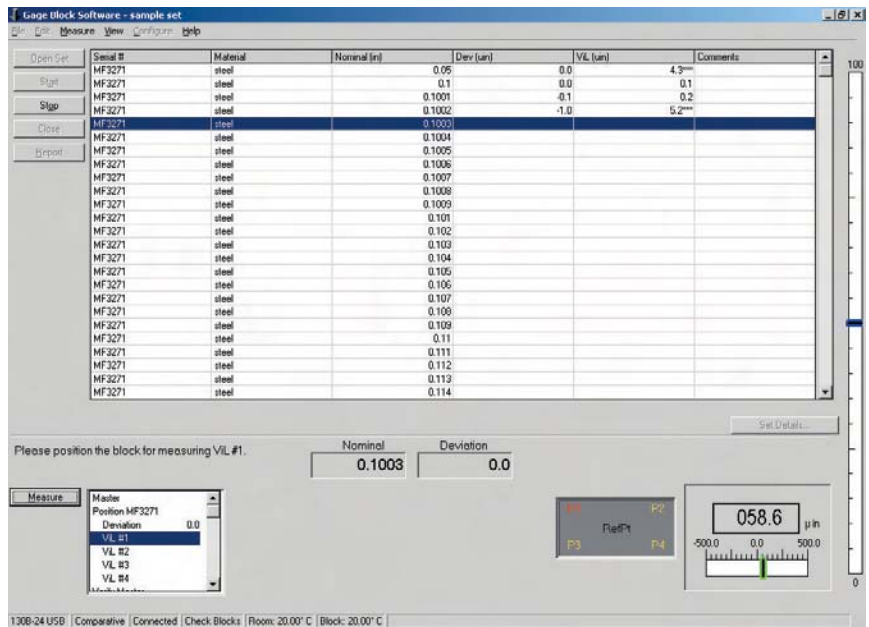
*Provided at no extra charge with systems



Logon Screen

Integrated Software

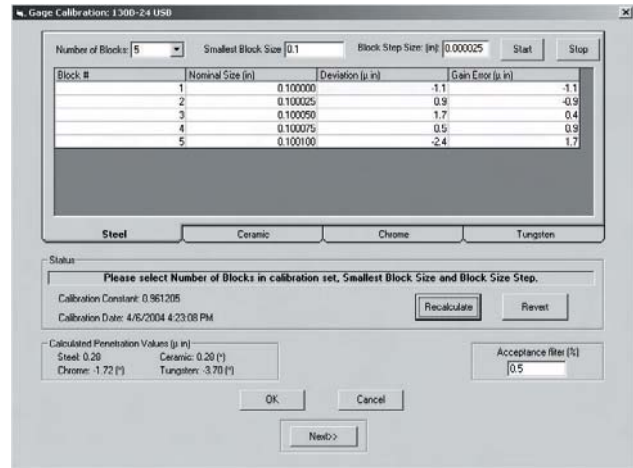
All user functions are controlled and displayed on the screen of the comparator's computer. From set-up to printout of the final report, all is handled in one place. Software v4.18 runs in Win7 and Win10. The report generator is a run-time version of Microsoft's powerful Access database program, running either Access 2010 or 2013. The flow of the program has been tested by use in many calibration laboratories, evolving over more than fifteen years, with improvements constantly being made.



Measurement Screen

Software Features

- Master Set values stored in computer's memory, and calibrated deviation values automatically applied during measurement.
- System calibration achieved by measuring multiple known blocks and fitting the data with a straight line – providing an extremely robust value for the gain calibration.
- Penetration coefficients can be from default values, or can be calculated, providing current effective penetration coefficients for the machine.
- Calibration history for measured sets kept in the same file record – for each time the set is measured, year after year.
- Automatic correction made for temperature induced errors when measuring dissimilar materials. Temperature can also be monitored automatically.
- Analysis screens provide a history of a single block or for a quick visual report on calibration of a complete set.
- Supports tolerance grades from both ASME B89.1.9-1984 (same tolerances as Federal Specification GGG-G-15C) and ASME B89.1.9-2002 (same tolerances as ISO-3650).
- Printed reports available for each calibration.
- Password protection for set-up parameters.
- Automatic switching from inch to metric.
- Evaluates measured deviation from nominal, plus Variation in Length with the number of points selectable from one (reference position only) to ten. Defaults to five places for compliance with current standards.
- Powerful User Interface displays Sensor Position, Measurement Value, and Current Measurement.
- Status bar reports instrument status, temperatures, and if Check Standards are being used.
- User is prompted through the process for each block in a set.



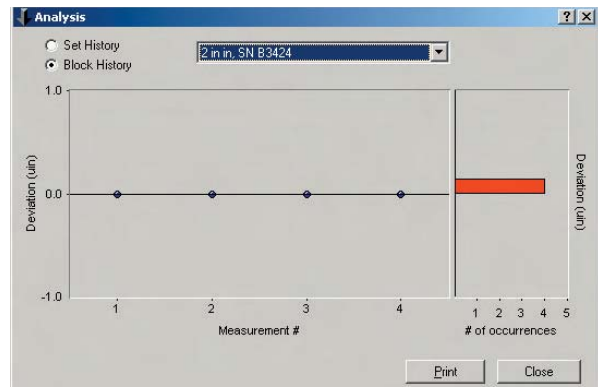
Calibration Screen

Gage Block Inspection Certificate - Inch blocks

Job Number:	Grade:	Set Size:
Make: C/E Johnson	Tolerance: Inf	Block Shape: Square
Part for: example	Set S/R: 1234	Date: 02-Apr-04

SN	Material	Type	Nom. (in)	Dev (um)	VIL (um)	Comments	SN	Material	Type	Nom. (in)	Dev (um)	VIL (um)	Comments
93434	Steel	Werk	1.000000	0	0								
93434	Steel	Werk	2.000000	0	0								
93434	Steel	Werk	3.000000	0	0								
93434	Steel	Werk	4.000000	0	0	Skipped							

Sample Report



Analysis Screen

Model 130B-16 "Long Block" Comparator

- Same highly linear, stable electronics as 130B-24.
- Designed for measuring blocks above 4.000" (100 mm) but capable of checking shorter blocks as well.
- Linear ball slide for smoothly moving long gage blocks without danger of tipping them over.
- Large platen area for staging blocks before measurement - critical to achieving thermal equilibrium with the gage.
- Fully counterbalanced "floating measurement frame" to isolate measurements from vibration.
- Open frame design allows comparison measurement of large disks, up to 24" in diameter.
- Can be operated from the same computer as 130B-24.
- Scale on left-hand post allows rough positioning, and micrometer-style spindle allows smooth, easy mechanical fine-adjustment.



Ordering Information

Order Number

Systems

Complete System with Desktop Computer	2150080
Complete System with Laptop Computer	2150079
Complete System except without Computer	2150081

Options

Replacement Contacts

Tungsten Carbide*

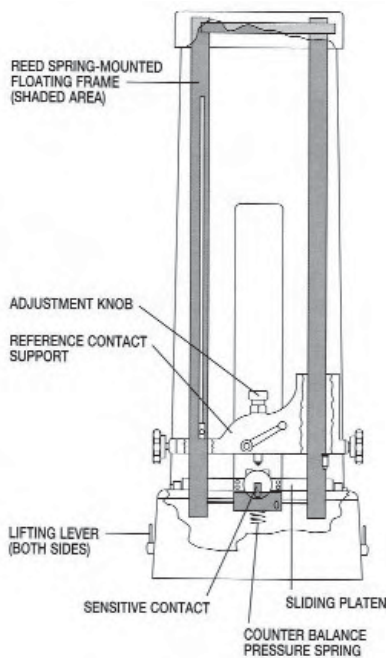
Upper	2240154
Lower	2239733

Diamond

Upper	EPT-1029
Lower	EPT-1036

Software Only	2240073
DeskJet Printer	2950950
Printer Cable	ECB-1775

*Provided at no extra charge with systems



"Floating Measuring Frame" in the 130B-16

Specifications

Approximate Size (without computer)	15" x 15" x 40" (400mmx400mmx1016mm)
Approximate Weight (without computer)	310 lb (140kg)
Gaging Capacity	0.10" to 24" 2.5mm to 600mm
Gaging Force (Upper Contact) (Lower Contact)	4 oz (1.1N) 2 oz. (0.6N)
Contact Material	Tungsten Carbide (Diamond - Optional)
Contact Radius	0.125" (3mm)
Sensor Range/ Measurement Range	$\pm 0.015"$ ($\pm 0.38\text{mm}$) $\pm 500\mu"$ ($\pm 10\mu\text{m}$)
Repeatability	$6\sigma < 1\mu"$ (25nm) Measured on a 1" gage block without removing the block
Linearity	Linearity $< 1\mu"$ over the central $\pm 50\mu"$ and $< 1\mu"$ in any $50\mu"$ over the $\pm 500\mu"$ measuring range $< 20\text{nm}$ over the central $\pm 1\mu\text{m}$ and $< 20\text{nm}$ in any $\pm 1\mu\text{m}$ over the $\pm 10\mu\text{m}$ measuring range



Upgrades for Older Comparators

Older Model 130B-24 and 130B-16 comparators may be upgradable to the current design level or any one of several other levels:

- Complete system upgrades including full factory reconditioning, replacement of electronics and addition of a computer.
- Mechanical upgrade only - 130B-24 platen replaced by a new platen which incorporates the gage block positioner. This can be accomplished on site.
- Software upgrade only. Add the capability to handle the tolerance grades of the ASME B89.1.9-2002 standard to your existing 130B-24.

Contact Mahr Inc. for a quotation on the i d[fUXY"Y] Y'' you wish to achieve.

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Accessories

2253440 Thermometer with Two Precision Probes

An electronic thermometer with platinum-resistance probes that the comparator can read directly. Includes a USB cable, calibrated probes, and a magnetic block for staging one of the probes on the platen. The second probe is used to monitor the room temperature and should be placed near the comparator.



2240602 Gage Block Measurement Accessories Kit

This Kit includes all of the helpful tools for moving gage blocks, preparing them for measurement, and maintaining the gage block comparator. The kit includes: forceps, tongs, brush, blower, cham-oiis, deburring stone, optical flat, vacuum pick-up, load tester, hex wrenches, and rust inhibiting grease.



Calibration Services

Mahr Inc. provides calibration services for dimensional standards, including gage blocks, master rings and discs, surface roughness specimens, roundness master balls, and other reference masters. In the unique Precision Measurement Center temperatures are controlled to within 0.1°F (0.05°C) and strict process control is followed to achieve extremely low uncertainties in the measurement process. The measurement processes in the PMC have been accredited to ISO 17025 by NVLAP (Lab Code #20605-0) and the scope of this

Accreditation can be viewed at Mahr Inc.'s web site (www.mahr.com).

Gage Block Master sets can be calibrated to uncertainties as low as 2.0µ" (0.050µm) by sending them to:

**Repair and Calibration Department, Mahr Inc.,
 1139 Eddy Street, Providence, RI 02905**



**Mahr Inc. 1144 Eddy Street Providence, RI 02905
 Customer Resource Center: 1-800-343-2050 Internet: www.mahr.com**