

[Manuals.plus](#) /

› [Mitutoyo](#) /

› Mitutoyo 514-103 Vernier Height Gauge Instruction Manual

Mitutoyo 514-103

Mitutoyo 514-103 Vernier Height Gauge Instruction Manual

MODEL: 514-103

Brand: Mitutoyo

Introduction

The Mitutoyo 514-103 Vernier Height Gauge is a precision measuring instrument designed for accurate vertical distance measurements. It features a measurement range of 0 to 12 inches (0 to 300 mm) with a resolution of 0.001 inches (0.02 mm) and an accuracy of ± 0.002 inches (0.04 mm). This gauge is constructed from hardened stainless steel with a glare-free satin chrome finish, ensuring durability and resistance to rust. This manual provides essential information for the proper setup, operation, and maintenance of your Mitutoyo 514-103 Vernier Height Gauge.





Figure 1: Mitutoyo 514-103 Vernier Height Gauge. This image displays the complete height gauge assembly, including the base, vertical

Product Features

- **Measurement Range:** 0 to 12 inches (0 to 300 mm), graduated to 0.001 inches (0.02 mm).
- **Vernier Scale:** Provides precise measurement readings.
- **Adjustable Zero Reference Point:** Allows for manual change of the base position for relative measurements.
- **Hand-Operated Slider:** Features a fine-adjustment carriage for precise feed and positioning.
- **Carbide-Tipped Scriber:** Enhances hardness and prolongs the life of the marking tool.
- **Durable Construction:** Slider and beam made of hardened stainless steel with a glare-free satin chrome finish.
- **Secure Scriber Fastening:** Scriber is held by a screw clamp for stable attachment.
- **Grip-Base:** Aids in holding the unit securely by hand.

Setup

1. **Unpacking:** Carefully remove the height gauge from its packaging. Inspect for any signs of damage during transit.
2. **Placement:** Place the height gauge on a stable, flat, and clean surface. Ensure the surface is free from dust, debris, or any foreign particles that could affect measurement accuracy.
3. **Scriber Attachment:** The carbide-tipped scriber (32 mm x 80 mm) is typically pre-attached or included separately. If separate, insert the scriber into the designated clamp on the slider. Securely tighten the screw clamp to hold the scriber firmly in place. Ensure the scriber is oriented correctly for marking or measurement.
4. **Zero Reference Point:** The gauge features an adjustable beam with a ring-type lock nut. To set the zero reference point, loosen the lock nut, position the slider so the scriber tip rests on the measurement surface (or a known reference block), and then adjust the beam until the vernier scale reads zero. Securely tighten the lock nut to fix the zero position. This allows for manual adjustment of the base position for relative measurements.
5. **Initial Cleaning:** Before first use, gently wipe all measuring surfaces with a clean, lint-free cloth. Avoid using harsh solvents.

Operating Instructions

The Mitutoyo 514-103 Vernier Height Gauge is designed for precise vertical measurements and marking. Follow these steps for accurate operation:

1. **Prepare Workpiece:** Place the workpiece on the same stable, flat surface as the height gauge. Ensure both the gauge and the workpiece are stable and will not move during measurement.
2. **Coarse Adjustment:** Loosen the main clamp on the slider. Manually slide the scriber close to the desired measurement height.
3. **Fine Adjustment:** Tighten the main clamp. Use the fine-adjustment carriage (calibrated screw mechanism) to slowly move the scriber to the exact desired position. For measurement, bring the scriber tip into gentle contact with the feature to be measured. For marking, apply light pressure to scratch the surface of the workpiece.
4. **Reading the Vernier Scale:**
 - **Main Scale Reading:** Read the main scale (inches or millimeters) at the point immediately to the left of the zero mark on the vernier scale.
 - **Vernier Scale Reading:** Identify the mark on the vernier scale that aligns perfectly with any mark on the main scale. Multiply this vernier scale value by the gauge's resolution (0.001" or 0.02 mm).
 - **Total Measurement:** Add the main scale reading and the vernier scale reading to obtain the total measurement.

5. **Locking Measurement:** Once the desired measurement or mark is achieved, ensure all clamps are tightened to prevent accidental movement.

Maintenance

Proper maintenance ensures the longevity and accuracy of your Mitutoyo Vernier Height Gauge.

- **Cleaning:** After each use, wipe all surfaces, especially the measuring faces and scale, with a clean, soft, lint-free cloth. If necessary, use a mild cleaning solution specifically designed for precision instruments, applied sparingly to the cloth, not directly to the gauge. Ensure all moisture is removed.
- **Lubrication:** Periodically apply a thin film of light machine oil (e.g., clock oil or precision instrument oil) to the sliding surfaces of the beam and slider to ensure smooth operation and prevent corrosion. Wipe off any excess oil.
- **Storage:** Store the height gauge in its original protective case or a designated storage area when not in use. Keep it in a dry environment, away from direct sunlight, extreme temperatures, and corrosive substances. Ensure the scribe is not left in contact with any surface to prevent dulling or damage.
- **Inspection:** Regularly inspect the scribe tip for wear or damage. A dull or chipped scribe can lead to inaccurate marking. Replace the scribe if significant wear is observed. Check all clamps and fasteners for tightness.
- **Calibration:** For critical applications, periodic calibration by a qualified technician is recommended to maintain certified accuracy.

Troubleshooting

If you encounter issues with your Mitutoyo Vernier Height Gauge, consider the following:

- **Inaccurate Readings:**
 - Ensure the zero reference point is correctly set.
 - Check for debris on the measuring surfaces or beam.
 - Verify the workpiece and gauge are stable and not moving.
 - Confirm the scribe is securely fastened and not loose.
 - Inspect the scribe tip for wear or damage.
- **Slider Movement is Stiff or Jerky:**
 - Clean the beam and slider surfaces thoroughly.
 - Apply a thin film of light machine oil to the sliding surfaces.
 - Ensure no clamps are overtightened, causing friction.
- **Scribe Not Holding Firmly:**
 - Ensure the scribe clamp screw is fully tightened.
 - Check the scribe for any deformities that prevent proper seating.

If problems persist, contact Mitutoyo customer support or a qualified service technician.

Specifications

Feature	Specification
Model Number	514-103

Feature	Specification
Brand	Mitutoyo
Measurement Range	0-12 inches / 0-300 mm
Resolution	0.001 inches / 0.02 mm
Accuracy	+/-0.002 inches / +/-0.04 mm
Material	Hardened Stainless Steel
Finish	Glare-free Satin Chrome
Scriber Dimensions (H x W)	32 mm x 80 mm
Scriber Type	Carbide-tipped
Item Weight	3.1 kg (6.83 lbs)

Warranty and Support

For specific warranty information, terms, and conditions related to your Mitutoyo 514-103 Vernier Height Gauge, please refer to the documentation provided with your purchase or visit the official Mitutoyo website.

For technical support, service, or replacement parts, please contact Mitutoyo customer service directly. Contact details can typically be found on the manufacturer's website or in the product packaging.

Mitutoyo Official Website: www.mitutoyo.com

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Ask about setup, troubleshooting, compatibility, parts, safety, or missing instructions. Manuals+ will review the question and use this page’s manual context to help answer it.

Name

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After a successful submission, we securely hash the supplied account or form email before sending it to Microsoft Advertising for conversion attribution. [Privacy details](#).

Question

Example: How do I reset this device or fix this error?

Details

Model number, symptoms, what you tried, or the section of the manual you are using.

Submit question