High Performance 2D Measurement System

LINEAR HEIGHT

World's best-in-class accuracy 2D measurement system
A sophisticated height gage offering exceptional accuracy of \((1.1+0.6L/600)\mu m\)

(* L = measured height in mm)
World's Best Accuracy High Performance 2D
Linear Height Series LH-600E/EG

*As of July 2012.

**World-class accuracy**

- Achieved accuracy: $(1.1 + 0.6L/600)$ μm
- Best-in-class accuracy has been achieved by using a high-accuracy scale unit and high-accuracy guiding mechanism manufactured in our dedicated scale plant.
- Displacement accuracy when measuring a height of 600mm: 1.7 μm

**Superior ease of operation**

- Easy operation with a single touch of a key
  - Each frequently-used measurement type is initiated by one dedicated icon-type command key.
  - Even a novice can immediately start measurement without instruction.
- Color TFT LCD
  - This has improved legibility and operability.
- Unlimited USB memory
  - Compatible models support more than 2 GB of USB memory.

- High-accuracy air suspension assists measuring
  - The Linear Height can move without friction over a surface plate using an air bearing incorporated in the base, powered by the small built-in compressor.
  - A semi-floating mode is also provided that allows measurement with the gage barely floating with no influence on the measuring accuracy.
  - This mode is effective in operations such as scanning measurement of a hole or shaft on a large workpiece and displacement measurements performed while moving the gage.
  - Additionally, the power grip model (518-352A-21 LH600EG) has improved handling operability.

**Numerous functions and options**

- Powerful measurement/calculation functions
  - Numerous types of measurement such as displacement/straightness/squareness are possible in addition to basic measurement functions including height and circle measurement.
  - This gage is also equipped with the 2D measurement function, tolerance judgment function, and others.
- Standardization of measuring procedures
  - Teaching the gage a series of measuring operations for a workpiece is possible (Repeat function). This function is very effective when measuring large batches of workpieces. Upon execution of the Repeat function, the probe automatically moves to the next measurement position (height). If an operation procedure manual is available, measurement can be standardized.
- Supporting quality control with statistical processing functions
  - GO/NG judgment is performed real-time on measured data. Up to 60,000 pieces of data can be stored in the database, on which can be performed various statistical calculations such as average, standard deviation and process capability. Quality control is also supported by graphic display of histograms.
- Highly capable data processing unit
  - The high-performance CPU supports future software upgrading.
  - Measurement results are output in CSV format, thus allowing users to reuse those results with their own software.
- Versatile external interfaces
  - A printer interface is provided, which is installed in the main unit to connect a thermal printer or Letter-size printer.
  - The USB interface allows a USB memory to back up and restore part programs and measured data that have been stored.
  - Moreover, the RS-232C interface can output measurement results to an external device such as a PLC.
- Numerous optional probes
  - This gage is provided with various types of probes and interchangeable styli flexibly compatible with complicated workpiece profiles and various measurement features.
  - Mitutoyo's lineup of options offers various interchangeable styli for ø5 ball probes, depth probes, dial indicator holders, etc.
  - The optional probes extend their flexibility with an M2/M3 threaded shank that allows various CMM styli to be attached.
Numerous accessories compatible with many types of workpiece and measurement features provided in addition to standard ø5mm ball probes.

High-accuracy air bearing that can be operated in semi-floating mode while making highly accurate measurements and fully floating mode for frictionless travel over a surface plate.

A complete cordless system with a built-in compressor and battery, allowing frictionless movement on a surface plate.

Reflective-type linear encoder & guide achieve world-class accuracy.

5.7 inch color TFT LCD display

Diverse interfaces
- Printer
- USB
- RS-232C
- Digimatic input

Icon-type command keys provide simple one-touch operation to drive powerful functionality.

World’s Best Accuracy High Performance 2D Measurement System*
The touch of a single key automatically runs the instrument until the last result is displayed. This eliminates the need to execute key operations at each step in the measurement process, allowing you to concentrate 100% on workpiece inspection.

### Functions

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### Single-touch Basic functions

- **Measures the height of an upward-facing surface.**
- **Measures the diameter and center of a hole.**
- **Measures the width and center of an inner diameter.**
- **Measures the width and center position between two elements.**
- **Measures the height of a downward-facing surface.**
- **Measures the diameter and center of a shaft.**
- **Measures the width and center of an outer diameter.**
- **Measures the difference between maximum height and minimum height of an upward or downward facing surface.**
- **Displays a comment when operations are paused, measures the position of a hole with a tapered probe, inputs measurement from a Digimatic measuring instrument and measures perpendicularity.**
- **Performs calculation, including angle.**
- **Sets the ABS origin (absolute reference origin) or INC origin (incremental origin defined by the user), switches between ABS/INC origins and sets the offset ABS origin.**
- **Measures the width and center position between two elements.**
- **Measures the minimum height of a downward or upward-facing surface.**
- **Suspends or resumes system operation.**

### Other functions

<table>
<thead>
<tr>
<th>2D measurement</th>
<th>2D Origin setting, XY axis setting, Element recall, Polar coordinate recall, Coordinate distance calculation, 2D distance calculation, 2 elements intersection-angle calculation, 3 elements intersection-angle calculation, Pitch-circle calculation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tolerance judgment function</td>
<td>Tolerance/Nominal value setting, Tolerance judgment result output, Warning functions</td>
</tr>
<tr>
<td>User-support functions</td>
<td>Switching resolution, Power saving function, Switchable measurement speed, Semi-floating measurement</td>
</tr>
<tr>
<td>Part-program functions</td>
<td>Creating/deleting/executing a part program</td>
</tr>
<tr>
<td>Statistical processing functions</td>
<td>Basic statistical processing, Histogram</td>
</tr>
<tr>
<td>Accuracy-compensation functions</td>
<td>Temperature compensation, Scale factor</td>
</tr>
</tbody>
</table>
The measurement operation is supported with graphics on the large LCD.

A thermal printer that can be attached to the Linear Height main unit is available as an optional accessory.

Result data can also be output to a commercial letter-size printer.

To use this function, a Digimatic indicator or a lever head plus a digital Mu-checker are required.

Printer output examples

A thermal printer that can be attached to the Linear Height main unit is available as an optional accessory.

Result data can also be output to a commercial letter-size printer.
The Power Grip Type EG makes it easy to approach the workpiece.
Optional Accessories

Many kinds of optional probes enable many types of measurement.

A choice of peripherals expand functionality.

*1 CMM ball and disk hard probes are available.
*2 Styli for CMMs can be provided.

Dimension L, for contact point is the length from the side face to the center of the ball and is measured in mm. Balls without mention of material are carbide.

Model workpiece (12AAA879, acrylic) for practice is provided (see page 6).
Specifications

<table>
<thead>
<tr>
<th>Type</th>
<th>LH600E</th>
<th>LH600EG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Order No.</td>
<td>518-351A-21</td>
<td>518-352A-21</td>
</tr>
<tr>
<td>Measuring range (Stroke)</td>
<td>0 - 972mm (600mm)</td>
<td>0 to 38” (24”)</td>
</tr>
<tr>
<td>Resolution</td>
<td>0.0001/0.0005/0.001/0.0010/0.0011 (selectable)</td>
<td>0.000001/0.00001/0.0001/0.001 (selectable)</td>
</tr>
<tr>
<td>Accuracy (at 20°C)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indication accuracy*1</td>
<td>(1.1 x 10^-6/0.02µm, L = Measured length (mm))</td>
<td></td>
</tr>
<tr>
<td>Repeatability*1</td>
<td>Plane: 0.4µm (2σ), Hole: 0.9µm (2σ)</td>
<td></td>
</tr>
<tr>
<td>Perpendicularity forward and backward*2</td>
<td>5µm (after compensation)</td>
<td></td>
</tr>
<tr>
<td>Straightness forward and backward*2</td>
<td>4µm (mechanical accuracy)</td>
<td></td>
</tr>
<tr>
<td>Guiding method</td>
<td>Roller bearing</td>
<td></td>
</tr>
<tr>
<td>Driving method</td>
<td>Motor-driven (5, 10, 15, 20, 25, 30, 40mm/s: 7 steps)/Manual</td>
<td></td>
</tr>
<tr>
<td>Scale unit</td>
<td>Reflective-type linear encoder</td>
<td></td>
</tr>
<tr>
<td>Measuring force</td>
<td>1N (automatic constant-force function)</td>
<td></td>
</tr>
<tr>
<td>Balancing method</td>
<td>Counter weight balance</td>
<td></td>
</tr>
<tr>
<td>Main unit moving mode</td>
<td>Full-floating(moving) / Semi-floating(measuring) air bearing</td>
<td></td>
</tr>
<tr>
<td>Air source</td>
<td>Built-in compressor</td>
<td></td>
</tr>
<tr>
<td>Monitor</td>
<td>5.7 inch COLOR TFT LCD (320 x 240 dots, with LED backlight)</td>
<td></td>
</tr>
<tr>
<td>Max. number of programs</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Max. number of measured data</td>
<td>65,000 (Max. number of data is 30,000 / one program)</td>
<td></td>
</tr>
<tr>
<td>Power supply</td>
<td>AC adapter / Battery (Ni-MH)</td>
<td></td>
</tr>
<tr>
<td>Battery endurance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating*3</td>
<td>Approx. 5 hours (compressor duty cycle 25% max.)</td>
<td></td>
</tr>
<tr>
<td>Standby*3</td>
<td>Approx. 10 hours</td>
<td></td>
</tr>
<tr>
<td>Battery charging time</td>
<td>Approx. 3 hours (usable during charge)</td>
<td></td>
</tr>
<tr>
<td>Dimensions (WxDxH)</td>
<td>237x448x1013mm</td>
<td>247x448x1013mm</td>
</tr>
<tr>
<td>Mass</td>
<td>24kg</td>
<td>24.5kg</td>
</tr>
<tr>
<td>Operating temperature range</td>
<td>5 – 40°C/ 20 – 80% RH (without condensation)</td>
<td></td>
</tr>
</tbody>
</table>

*1 Guaranteed when using the standard eccentric 5 probe.

*2 Guaranteed when using the Lever Head (MHL-521), Mu-Checker (M-511).

*3 Optional large-capacity battery pack (12AAFP675) for longer battery-powered operation (8 hours when operated and 16 hours on standby).

*4 Mitutoyo does not guarantee the operation of all commercial USB memories except for the following. Mitutoyo recommends those USB memories made by SanDisk Corporation or IO DATA DEVICE, INC. and that meet the following requirements.

Those that are not compliant with USB3.0
Those that have no security function such as encryption and fingerprint authentication
Those that have no write-protect switch function

It is recommended to use the Linear Height on a surface plate of high flatness accuracy.

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