Mitutoyo

World's best-in-class accuracy 2D measurement system
A sophisticated height gage offering exceptional accuracy of (1.1+0.6L/600)µm*
(* L = measured height in mm)

Mitutoyo Quality

LH600E LINEAR HEIGHT

High Performance 2D Measurement System

SMALL TOOL INSTRUMENTS
AND DATA MANAGEMENT

Bulletin No. 2104(2)

Mitutoyo

World Leading Accuracy High Performance 2D Height Series LH-600E/EG

feature 1 World-Class Accuracy

- Achieved accuracy: (1.1 + 0.6L/600) µm

Best-in-class accuracy is 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

feature 2 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 improves 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 measurements 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) improves handling operability.

feature 3 Numerous Functions and Options

- Powerful measurement/calculation functions
(See page 4 for details.)

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 in real time on measured data. Up to 60,000 pieces of data can be stored in the database which can be used to 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 are 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.

Measurement System

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

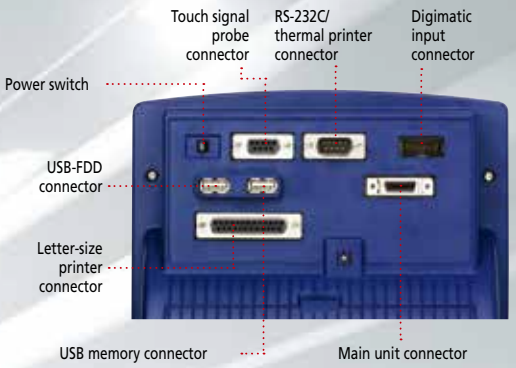
Numerous accessories compatible with many types of workpiece and measurement features provided in addition to standard ø5mm ball probes

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

Diverse Interfaces

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

[Rear Panel (Connectors)]



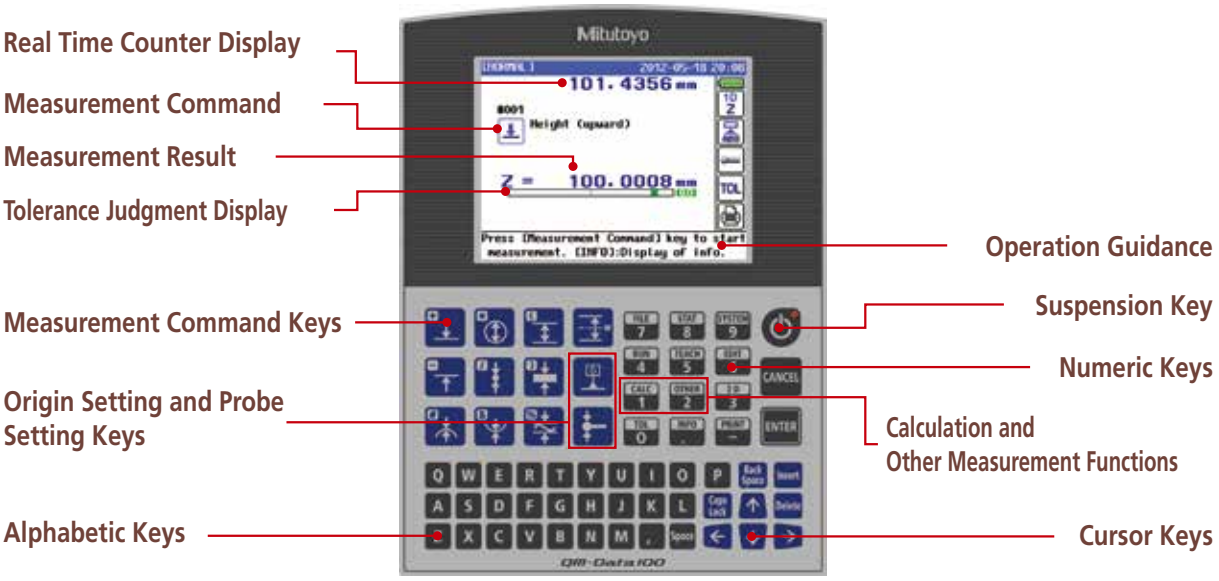
5.7 Inch color TFT LCD display

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

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

Functions

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.



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.	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 maximum height of a downward or upward-facing surface.	Measures the minimum height of a downward or upward-facing surface.	Measures the difference between maximum height and minimum height of an upward or downward facing surface.	Sets the probe type, measures the probe diameter, inputs the probe diameter, saves the probe, loads the probe and shifts the probe position.
Performs calculation, including angle.	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.	Suspends or resumes system operation.	

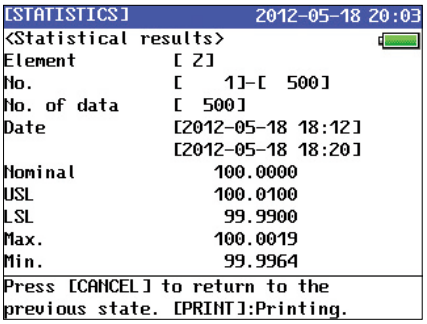
Other Functions

2D measurement	2D origin setting, X/Y 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
Tolerance judgment function	Tolerance/nominal value setting, Tolerance judgment result output, Warning functions
User-support functions	Switching resolution, Power saving function, Switchable measurement speed, Semi-floating measurement
Part-program functions	Creating/editing/executing a part program
Statistical processing functions	Basic statistical processing, Histogram
Accuracy-compensation functions	Temperature compensation, Scale factor

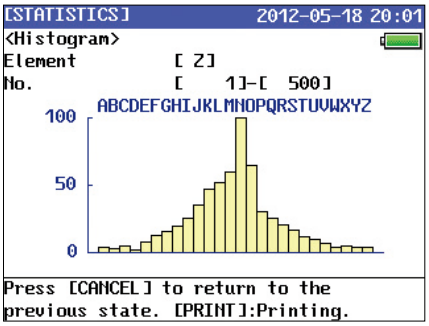
Screen Display Examples

The measurement operation is supported with graphics on the large LCD.

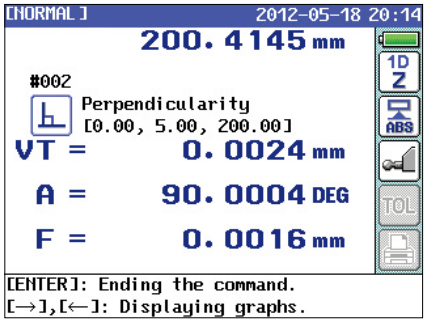
Statistical processing result ▶



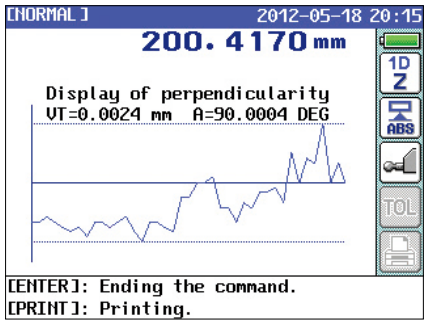
Histogram processing result ▶



Squareness measurement result: Numeric display ▶



Squareness measurement result: Graphical display ▶

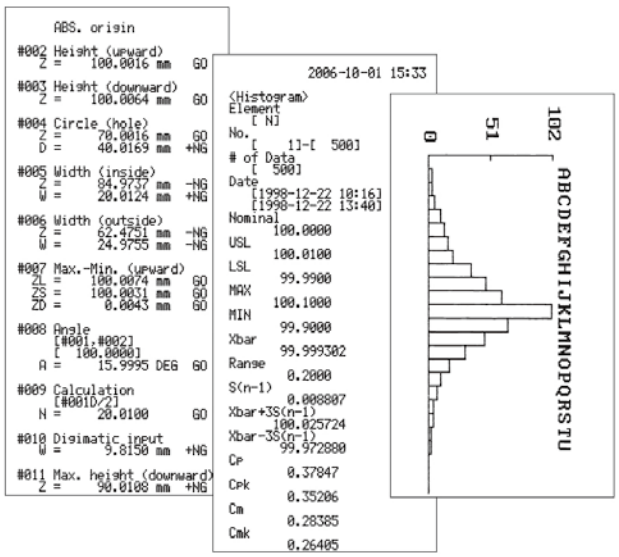


To use this function, a Digimatic indicator or a lever head plus a digital Mu-checker are required.

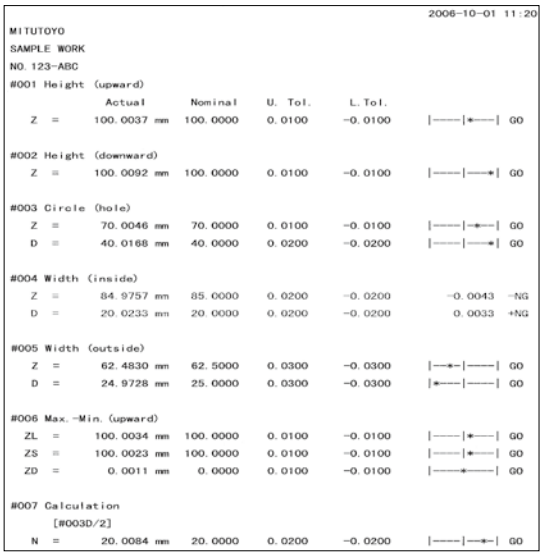
Printer Output Examples

An optional thermal printer that attaches to the Linear Height main unit is available.
Result data can also be output to a commercial letter-size printer.

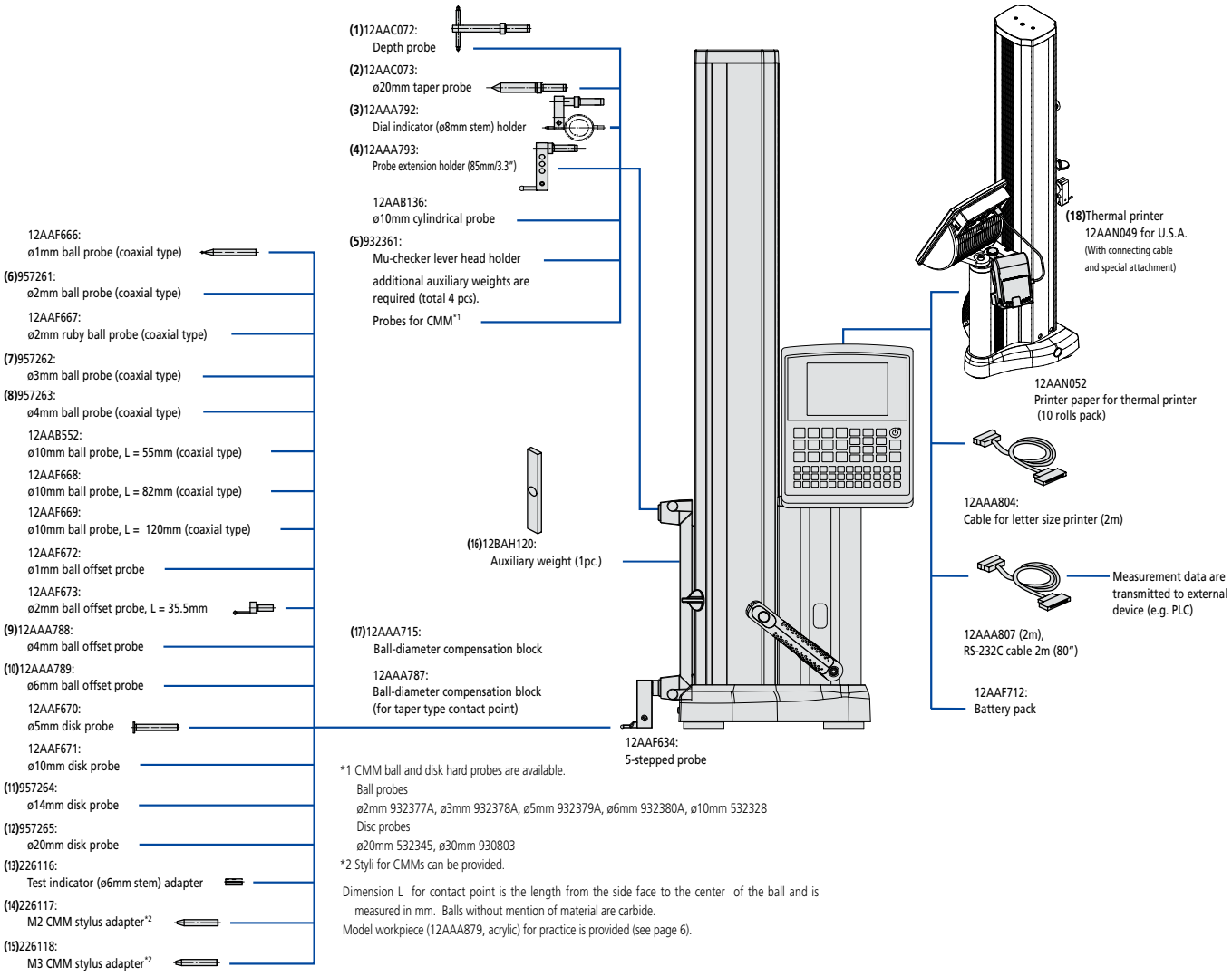
Thermal Printer Output



Letter Size Printer Output



Optional Accessories



*1 CMM ball and disk hard probes are available.
Ball probes
ø2mm 932377A, ø3mm 932378A, ø5mm 932379A, ø6mm 932380A, ø10mm 532328
Disc probes
ø20mm 532345, ø30mm 930803
*2 Styli for CMMs can be provided.

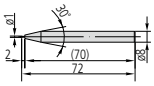
Dimension L for contact point is the length from the side face to the center of the ball and is measured in mm. Balls without mention of material are carbide.
Model workpiece (12AAA879, acrylic) for practice is provided (see page 6).

Optional probes enable many types of measurement

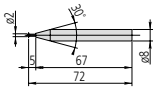
A choice of peripherals expand functionality

(18) Thermal printer

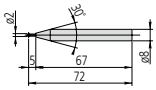
12AAF666
ø1 ball probe



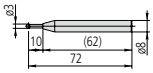
957261
ø2 ball probe



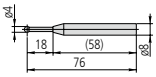
12AAF667
ø2 ruby ball probe



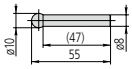
957262
ø3 ball probe



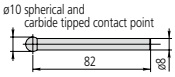
957263
ø4 ball probe



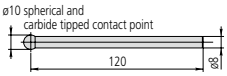
12AAB552
ø10 ball probe, L=55



12AAF668
ø10 ball probe, L=82



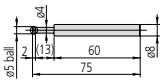
12AAF669
ø10 ball probe, L=120



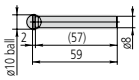
932361
———
Mu-checker lever head holder
CMM ball and disk hard probes are available.

12AAA787 Block for calibrating probe diameter (applicable to taper probe)

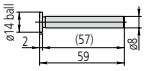
12AAF670
ø5 disk probe



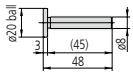
12AAF671
ø10 disk probe



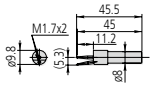
957264
ø14 disk probe



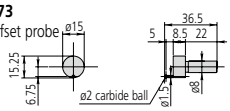
957265
ø20 disk probe



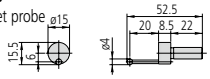
12AAF672
ø1 ball offset probe*
*test indicator stylus (103017)



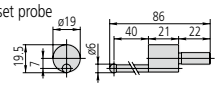
12AAF673
ø2 ball offset probe



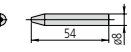
12AAA788
ø4 ball offset probe



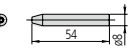
12AAA789
ø6 ball offset probe



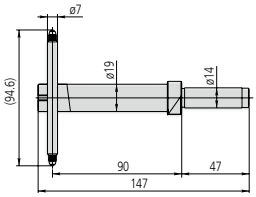
226117
M2 CMM stylus adapter



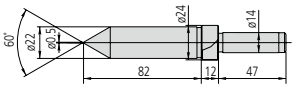
226118
M3 CMM stylus adapter



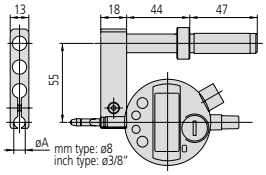
12AAC072 Depth probe



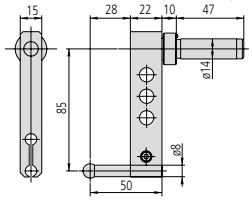
12AAC073 ø20 taper probe



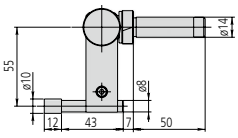
12AAA792 Dial indicator (ø8 stem) holder
12AAA837 Dial indicator (ø3/8"stem) holder



12AAA793 Probe extension holder (85mm/3.3")

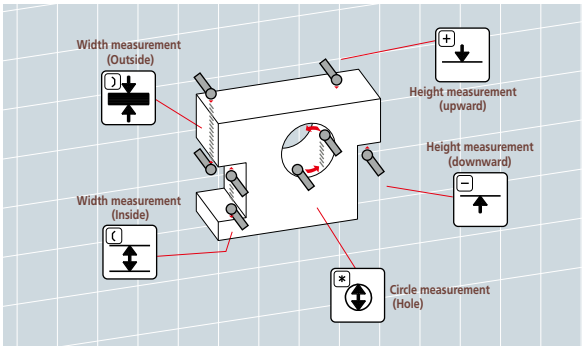


12AAB136 ø10 cylindrical probe



The Power Grip Type EG makes it easy to approach the workpiece.

Frequently Used Measurements



Linear Height Styli Kit M3

K650986

Contents	Description	ø S	L
1x Part No. K681867	Adapter block		
1x Part No. K651223	Pin wrench ø 1.2 mm		
1x Part No. K651157	Extension steel M3		20
1x Part No. K651156	Extension steel M3		10
1x Part No. K651172	Disk stylus steel M3	12.7	33
1x Part No. K651151	Stylus steel-ruby M3	4	31
1x Part No. K651148	Stylus steel-ruby M3	3	21
1x Part No. K651147	Stylus steel-ruby M3	2	21
1x Part No. K651146	Stylus steel-ruby M3	1	21

Specifications

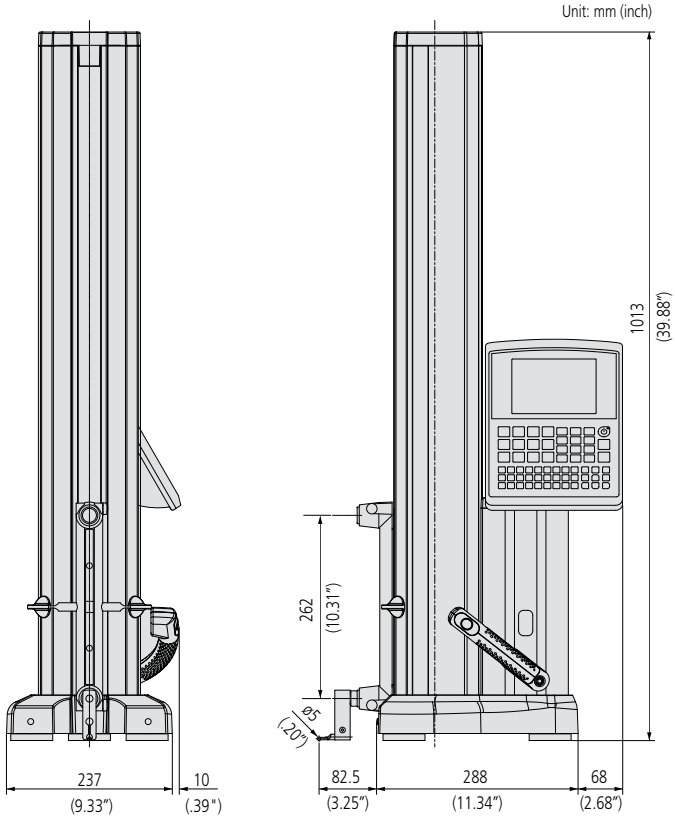
Type		LH600E	LH600EG
Order No.		518-351A-21	518-352A-21
Measuring range (Stroke)		0 - 977mm (600mm) 0 to 38" (24")	
Resolution		0.0001/0.001/0.01/0.1mm (selectable) .000001/.00001/.0001/.001"(selectable)	
Accuracy (at 20°C)	Indication accuracy*1	(1.1 + 0.6L/600)μm, L = Measured length (mm)	
	Repeatability*1	Plane: 0.4μm (2σ), Hole: 0.9μm (2σ)	
	Perpendicularity (forward and backward)*2	5μm (after compensation)	
	Straightness (forward and backward)*2	4μm (mechanical accuracy)	
Guiding method		Roller bearing	
Driving method		Motor-driven (5,10,15,20,25,30,40mm/s: 7 steps)/Manual	
Scale unit		Reflective-type linear encoder	
Measuring force		1N (automatic constant-force function)	
Balancing method		Counter weight balance	
Main unit moving mode		Full-floating(moving) / Semi-floating(measuring) air bearing	
Air source		Built-in compressor	
Monitor		5.7 inch COLOR TFT LCD (320 x 240 dots, with LED backlight)	
Max. number of programs		50	
Max. number of measured data		60,000 (Max. number of data is 30,000 / one program)	
Power supply		AC adapter / Battery (Ni-MH)	
Battery endurance	Operating*3	Approx. 5 hours (compressor duty cycle 25% max.)	
	Standby*3	Approx. 10 hours	
Battery charging time		Approx. 3 hours (usable during charge)	
Dimensions (WxDxH)		237x448x1013mm	247x448x1013mm
Mass		24kg	24.5kg
Operating temperature range		5 – 40°C/ 20 – 80% RH (without condensation)	

*1 Guaranteed when using the standard eccentric φ5 probe.
*2 Guaranteed when using the Lever Head (MLH-521), Mu-Checker (M-511).
Perpendicularity for horizontal direction is not defined. If the workpiece is cylindrical, measurement error may be observed.
*3 Optional large-capacity battery pack (12AAF675) 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.

Dimensions

Unit: mm (inch)



Standard Accessories

- Ø5mm probe
- Battery pack
- Clear cover
- Hex wrench
- Ball-diameter compensation block
- AC adapter
- Carrying handle
- Manual set
- Auxiliary weight (2pcs.)
- Power cable for AC adapter
- Cap
- Inspection certificate

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www.mitutoyo.com

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