

Mitutoyo

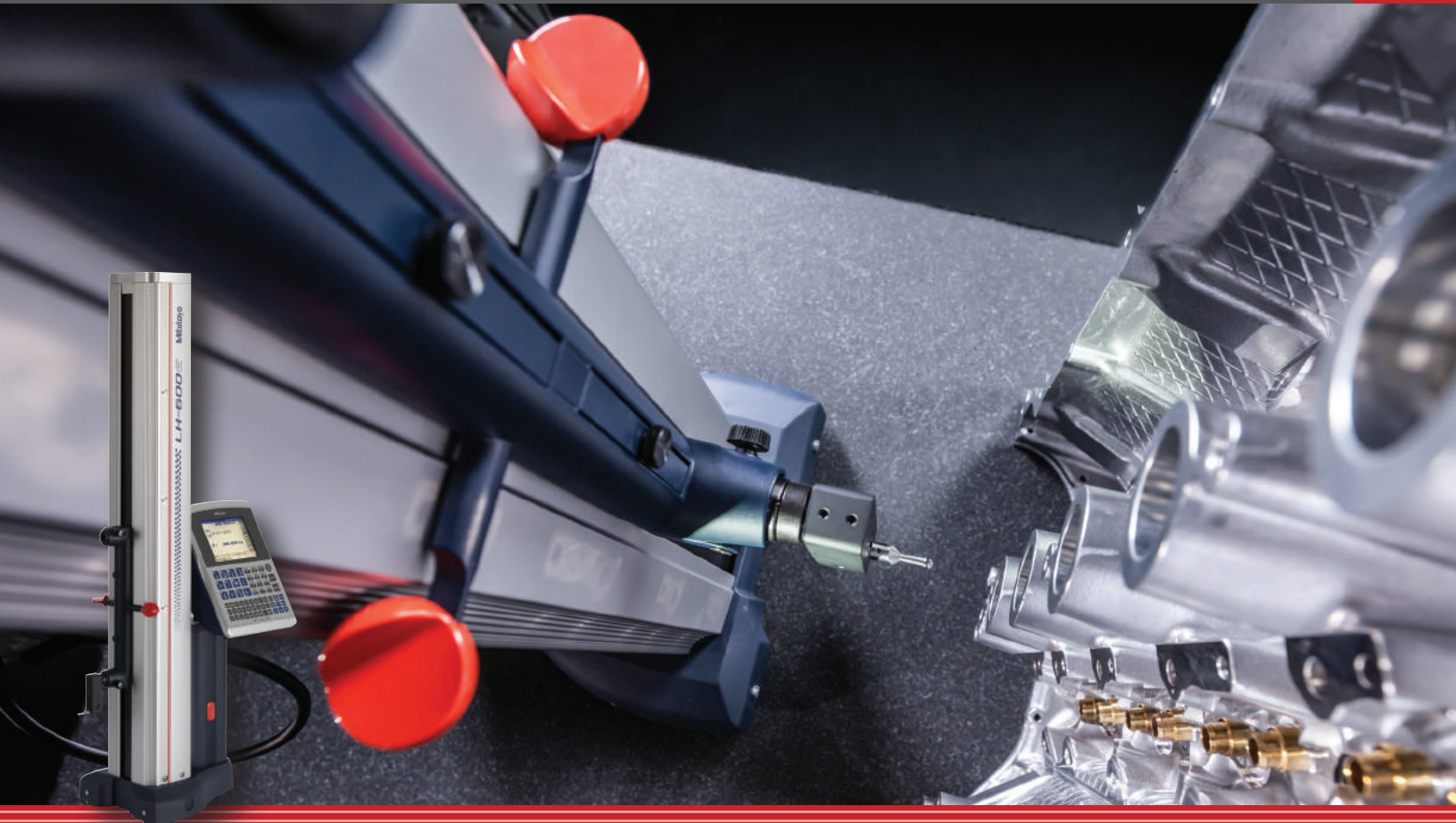
World's best-in-class accuracy 2D measurement system
A sophisticated height gage offering exceptional accuracy of $(1.1+0.6L/600)\mu\text{m}^*$
(* L = measured height in mm)



LH600E LINEAR HEIGHT

High Performance 2D Measurement System

SMALL TOOL INSTRUMENTS
AND DATA MANAGEMENT



Find Quality Products Online at:

www.GlobalTestSupply.com

sales@GlobalTestSupply.com

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

feature 1 World-Class Accuracy

- **Achieved accuracy: $(1.1 + 0.6L/600) \mu\text{m}$**

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 $\varnothing 5$ 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

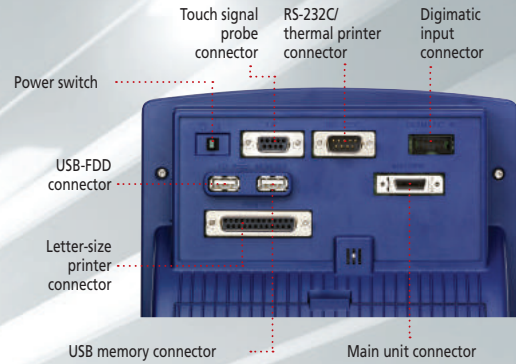
Numerous accessories compatible with many types of workpiece and measurement features provided in addition to standard $\varnothing 5\text{mm}$ ball probes

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)]



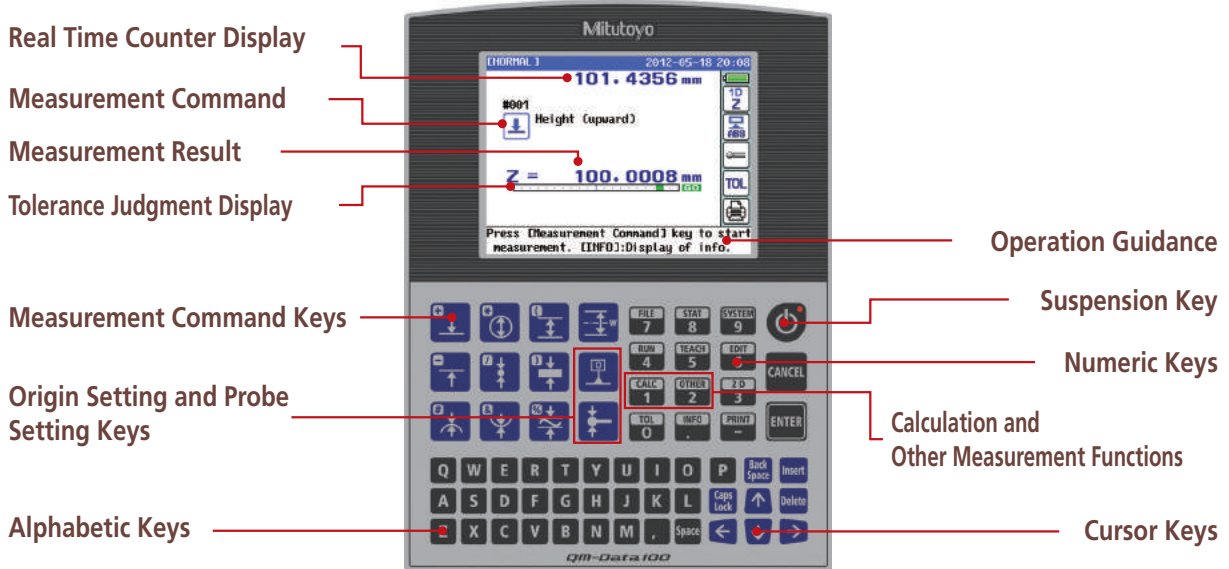
5.7 Inch color TFT LCD display

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, 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
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

```

[STATISTICS] 2012-05-18 20:03
<Statistical results>
Element [ Z ]
No. [ 11 ] [ 500 ]
No. of data [ 500 ]
Date [2012-05-18 18:12]
[2012-05-18 18:20]
Nominal 100.0000
USL 100.0100
LSL 99.9900
Max. 100.0019
Min. 99.9964
Press [CANCEL] to return to the
previous state. [PRINT]:Printing.
    
```

Histogram processing result

```

[STATISTICS] 2012-05-18 20:01
<Histogram>
Element [ Z ]
No. [ 11 ] [ 500 ]
100 ABCDEFGHIJKLMNOPQRSTUVWXYZ
50
0
Press [CANCEL] to return to the
previous state. [PRINT]:Printing.
    
```

Squareness measurement result:
Numeric display

```

[LORMAL] 2012-05-18 20:14
200.4145 mm
#002 Perpendicularity
[0.00, 5.00, 200.00]
VT = 0.0024 mm
A = 90.0004 DEG
F = 0.0016 mm
[ENTER]: Ending the command.
[→], [←]: Displaying graphs.
    
```

Squareness measurement result:
Graphical display

```

[LORMAL] 2012-05-18 20:15
200.4170 mm
Display of perpendicularity
VT=0.0024 mm A=90.0004 DEG
[ENTER]: Ending the command.
[PRINT]: Printing.
    
```

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

```

ABS. orisin
#002 Height (upward)
Z = 100.0016 mm GO
#003 Height (downward)
Z = 100.0064 mm GO
#004 Circle (hole)
Z = 70.0016 mm GO
D = 40.0169 mm +HG
#005 Width (inside)
Z = 84.9737 mm +HG
W = 20.0124 mm +HG
#006 Width (outside)
Z = 62.4751 mm -HG
W = 24.9755 mm -HG
#007 Max.-Min. (upward)
ZL = 100.0074 mm GO
ZS = 100.0031 mm GO
ZD = 0.0043 mm GO
#008 Angle
[#001, #002]
A = 100.0000
15.9995 DEG GO
#009 Calculation
[#001D/2]
N = 20.0100 GO
#010 Digimatic input
W = 9.8150 mm +HG
#011 Max. height (downward)
Z = 90.0108 mm +HG
    
```

2006-10-01 15:33

```

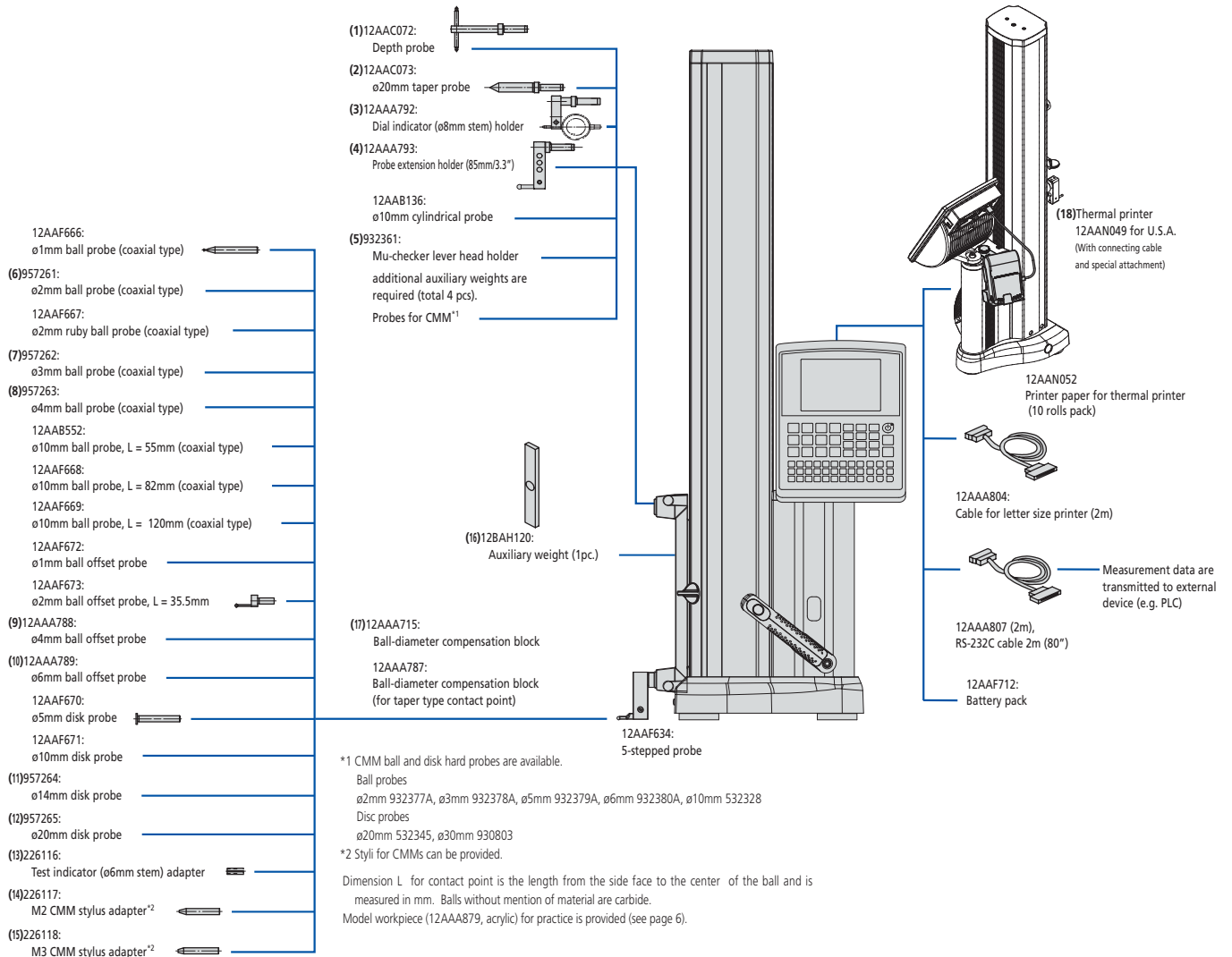
<Histogram>
Element [ N ]
No. [ 11 ] [ 500 ]
# of Data [ 500 ]
Date [1998-12-22 10:16]
[1998-12-22 13:40]
Nominal 100.0000
USL 100.0100
LSL 99.9900
MAX 100.1000
MIN 99.9000
Xbar 99.999382
Range 0.2000
S(n-1) 0.008887
Xbar+3S(n-1) 100.025724
Xbar-3S(n-1) 99.972880
Cp 0.37847
Cpk 0.35206
Cm 0.28385
Cmk 0.26485
    
```

Letter Size Printer Output

```

MITUTOYO 2006-10-01 11:20
SAMPLE WORK
NO. 123-ABC
#001 Height (upward)
Actual Nominal U. Tol. L. Tol.
Z = 100.0037 mm 100.0000 0.0100 -0.0100 |---|*---| GO
#002 Height (downward)
Z = 100.0092 mm 100.0000 0.0100 -0.0100 |---|*---| GO
#003 Circle (hole)
Z = 70.0046 mm 70.0000 0.0100 -0.0100 |---|*---| GO
D = 40.0168 mm 40.0000 0.0200 -0.0200 |---|*---| GO
#004 Width (inside)
Z = 84.9757 mm 85.0000 0.0200 -0.0200 -0.0043 -NG
D = 20.0233 mm 20.0000 0.0200 -0.0200 0.0033 +NG
#005 Width (outside)
Z = 62.4830 mm 62.5000 0.0300 -0.0300 |---|*---| GO
D = 24.9728 mm 25.0000 0.0300 -0.0300 |---|*---| GO
#006 Max.-Min. (upward)
ZL = 100.0034 mm 100.0000 0.0100 -0.0100 |---|*---| GO
ZS = 100.0023 mm 100.0000 0.0100 -0.0100 |---|*---| GO
ZD = 0.0011 mm 0.0000 0.0100 -0.0100 |---|*---| GO
#007 Calculation
[#003D/2]
N = 20.0084 mm 20.0000 0.0200 -0.0200 |---|*---| GO
    
```

Optional Accessories



Optional probes enable many types of measurement

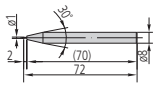


A choice of peripherals expand functionality

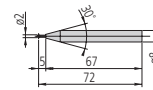


(18) Thermal printer

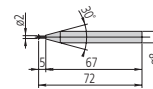
12AAF666
ø1 ball probe



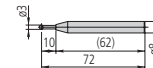
957261
ø2 ball probe



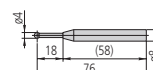
12AAF667
ø2 ruby ball probe



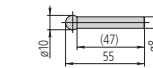
957262
ø3 ball probe



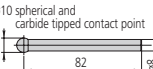
957263
ø4 ball probe



12AAB552
ø10 ball probe, L=55



12AAF668
ø10 ball probe, L=82



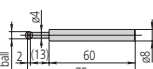
12AAF669
ø10 ball probe, L=120



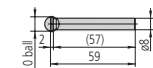
932361 Mu-checker lever head holder
CMM ball and disk hard probes
are available.

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

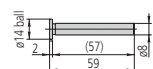
12AAF670
ø5 disk probe



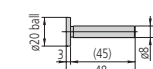
12AAF671
ø10 disk probe



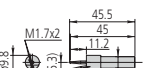
957264
ø14 disk probe



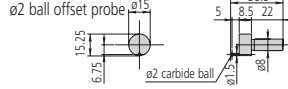
957265
ø20 disk probe



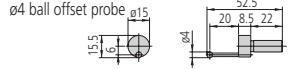
12AAF672
ø1 ball offset probe*
*test indicator stylus
(103017)



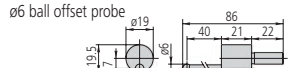
12AAF673



12AAA788



12AAA789



226117

M2 CMM stylus adapter M2

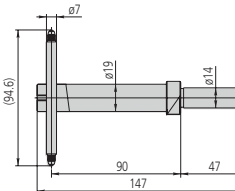


226118

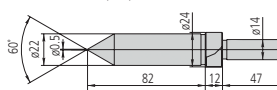
M3 CMM stylus adapter M3



12AAC072 Depth probe

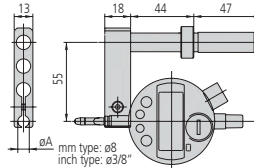


12AAC073 ø20 taper probe

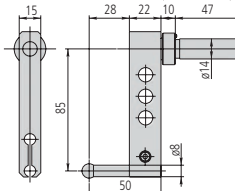


12AAA792 Dial indicator (ø8 stem) holder

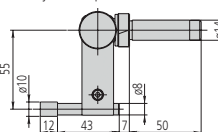
12AAA837 Dial indicator (ø3/8" stem) holder



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



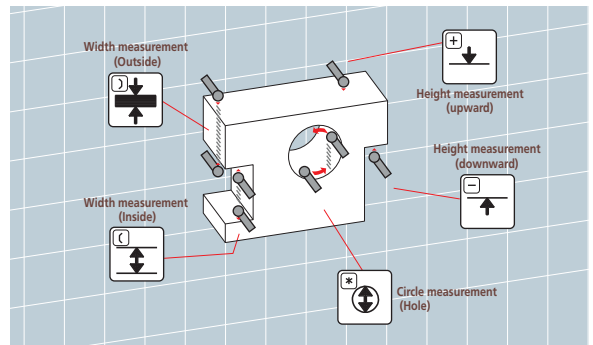
12AAB136 ø10 cylindrical probe



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 w/power grip
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 $\phi 5$ 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.

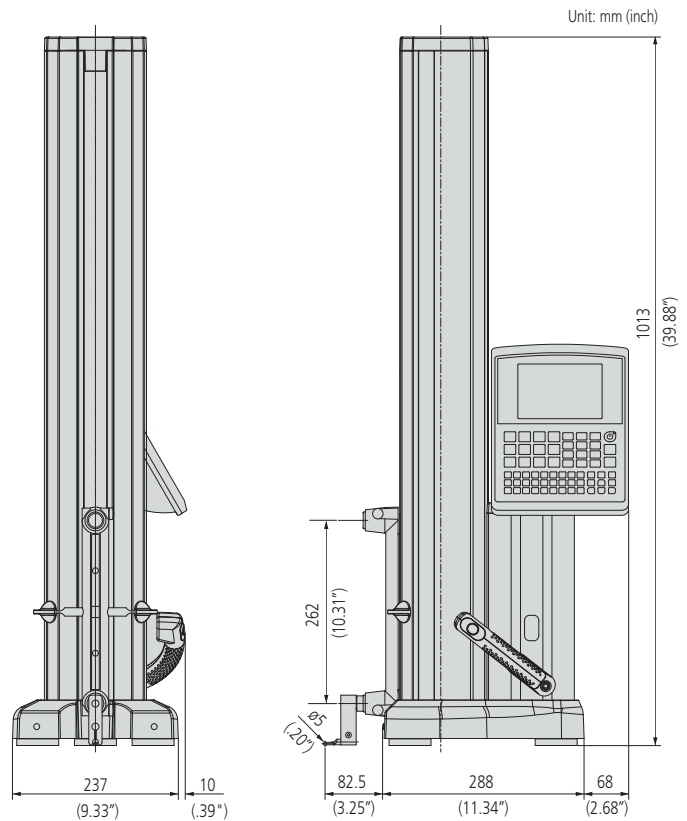
*3 Optional large-capacity battery pack (12AAF675) for longer battery-powered operation (8 hours when operated and 16 hours on standby).

*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



Standard Accessories

- $\phi 5$ mm probe
- Ball-diameter compensation block
- Auxiliary weight (2pcs.)
- Battery pack
- AC adapter
- Power cable for AC adapter
- Clear cover
- Carrying handle
- Cap
- Hex wrench
- Manual set
- Inspection certificate

Note: All information regarding our products, and in particular the illustrations, drawings, dimensional and performance data contained in this printed matter as well as other technical data are to be regarded as approximate average values. We therefore reserve the right to make changes to the corresponding designs. The stated standards, similar technical regulations, descriptions and illustrations of the products were valid at the time of printing. In addition, the latest applicable version of our General Trading Conditions will apply. Only quotations submitted by ourselves may be regarded as definitive. Specifications are subject to change without notice.

Mitutoyo products are subject to US Export Administration Regulations (EAR). Re-export or relocation of our products may require prior approval by an appropriate governing authority.

Trademarks and Registrations

Designations used by companies to distinguish their products are often claimed as trademarks. In all instances where Mitutoyo America Corporation is aware of a claim, the product names appear in initial capital or all capital letters. The appropriate companies should be contacted for more complete trademark and registration information.