Mitutoyo

Mitutoyo Quality

2-D Color Vision Measuring System
QUICK IMAGE Series

Vision Measuring System

Catalog No.E14009(2)

Mitutoyo

The 2-D measuring machine created with the ultimate Mitutoyo quality!

Powerful backup for your quality control system

Simple to operate and easy-to-perform measuring

Outstanding improvement in operational efficiency and productivity

2-D Color Vision Measuring System

QUICK IMAGE Series


Mitutoyo
QUICK IMAGE

Mitutoyo

Reliability Powerful backup for your quality control system

Lets you perform measurement stable and highly accurate measurements no matter where they are performed within the screen

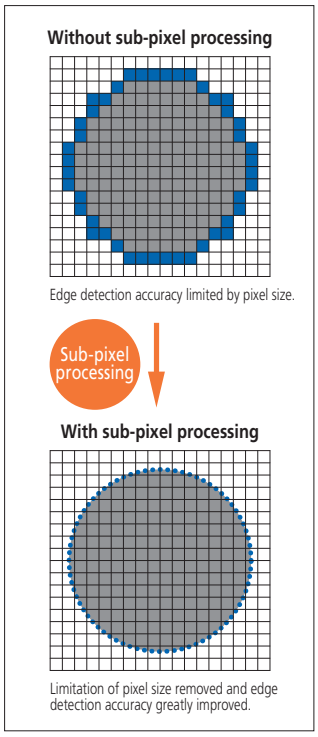
The highest level of measuring accuracy within the screen in its class

Patent registered (Japan)

- Accuracy of ±1.5µm within the screen, repeatability of ±0.7µm in high-resolution mode (QI-B Series) and the ability to focus through a wide range.

Both a wide view field and high accuracy

- Sub-pixel processing enables high-accuracy edge detection.



Sub-pixel processing image

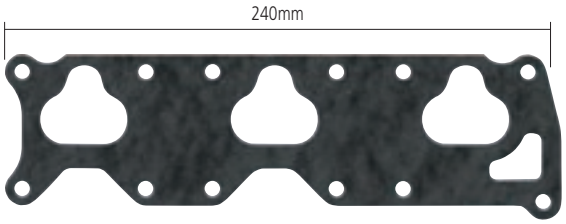
Stable and highly accurate measurement of large workpieces

Highly accurate stages

- Stages come in various sizes with an accuracy of ± (3.5 +0.02L) µm, letting you perform highly accurate and stable measurements, and obtain reliable data for any kind of workpiece.

Rigid construction

- Robust construction with a maximum load capacity of 20kg and a vertical stroke of 100mm allows large workpieces to be measured.

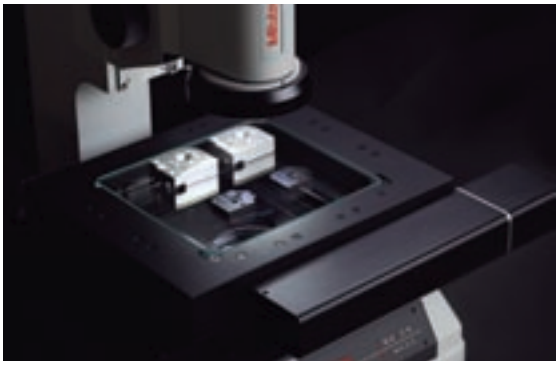


Gasket

Light alloy die-cast part

Ultra-long working distance of 90 mm

- The 90mm working distance ensures that you can focus, even with stepped workpieces, without worrying about collisions.

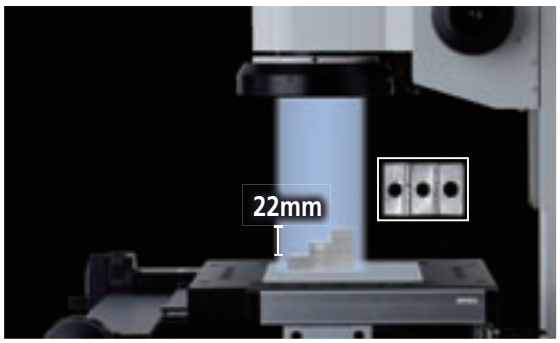


Human errors due to focusing have been eliminated

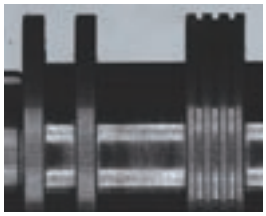
Utilizes our in-house developed Telecentric Optical System

Patent registered (Japan, the U.S.A. and Europe)

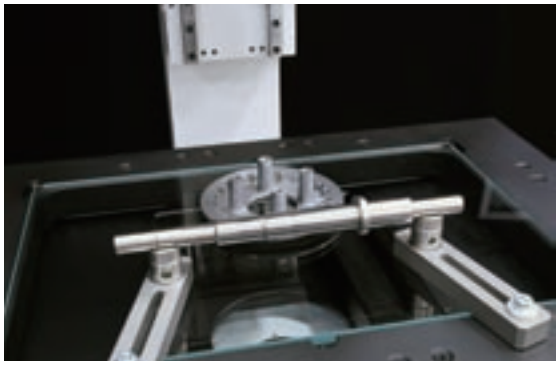
- Errors due to height are strictly minimized within a depth of focus with steps of up to 22mm, and measurements are possible in which human errors due to focusing are eliminated.



Measuring a stepped workpiece



Measuring of a cylindrical workpiece

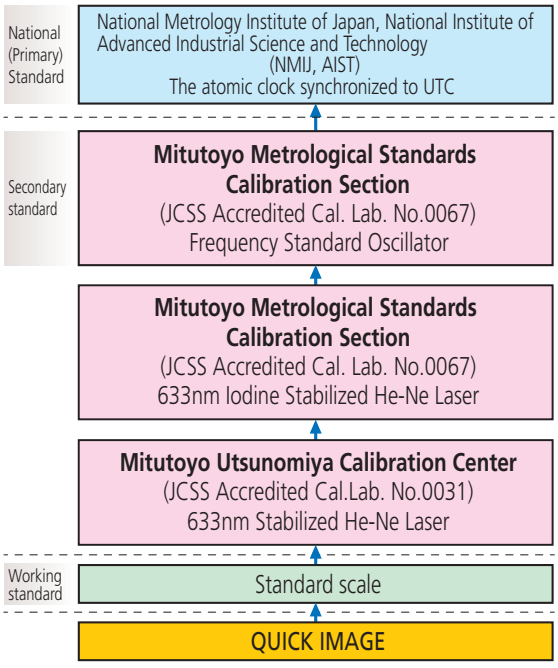


Traceability to national standards

Mitutoyo...

Uses calibration artifacts traceable to national standards

- Mitutoyo has a large collection of standard artifacts whose dimensions are traceable to the national length standards of Japan. These artifacts are used to calibrate the specialized equipment used in the calibration of Mitutoyo's measuring tools and instruments, and so traceability to international length standards is established and maintained. Mitutoyo also provides the service of temperature calibration that is absolutely essential to high-accuracy length measurement.



*This chart shows a simplified traceability system of QUICK IMAGE.

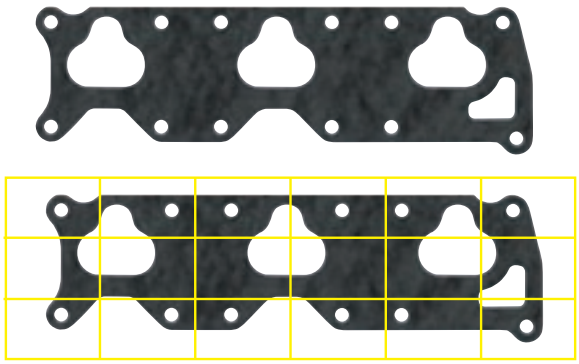
Usability Simple to operate and easy-to-perform measuring

New

Entire View of A Large Workpiece Drastically Improves Ease of Operation and Measurement Efficiency

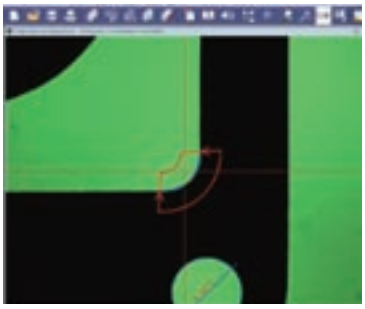
Stitching Function

- The newly-developed correction algorithm for use in stitching (multiple image-to-image coupling) achieves high-accuracy measurement. The Stitching function enables a large workpiece that extends beyond the visual field to be measured with its entire image displayed. This allows quick identification of measured and unmeasured points at a glance.
  After a stitching operation, measurement is speedily advanced without the need to move the stage.



Multiple view-field stitching image

Prompt measurement with the entire workpiece image on screen

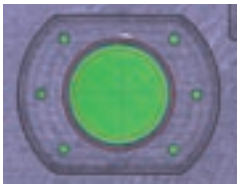


Correct measurement of a small feature is enabled by zooming in

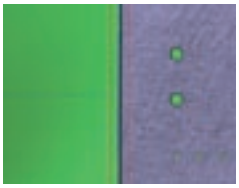
Simple execution of multiple measurements

One-click tool

- With just one click, anyone can easily perform multiple measurements. The outlier removal function automatically eliminates unnecessary measurement points, thus enabling accurate and stable multipoint measurement.



One-click circle tool

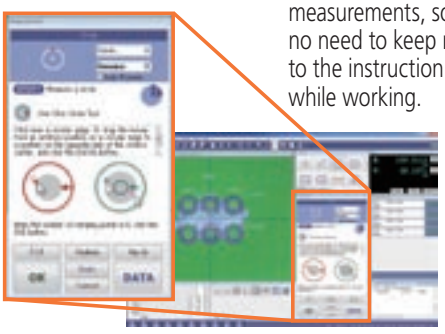


One-click box tool

Easy-to-operate without the manual

EZ mode Design application pending (Japan)

- This mode provides an operation guidance display to guide the operator even if it's their first time performing measurements, so there is no need to keep referring to the instruction manual while working.

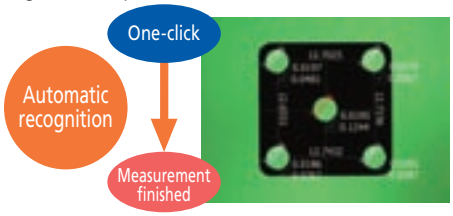


No troublesome positioning is required

One-click execution function

Patent pending (Japan)

- After placing the workpiece within the field of view, the machine automatically recognizes the position and angle using a pattern search function and then finishes the measurements. There is no need for positioning and axially-aligning the workpiece.

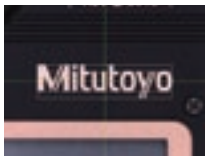


The position and inclination of a workpiece can be measured even if it has moved

An intuitive OK/NG judgment of measurement is possible

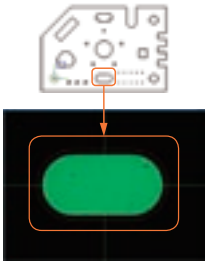
Template comparison test function

- Use the function to compare workpieces against their templates to enable OK/NG judgments to be made at a glance.
  The function lets you utilize any drawing and CAD model for templates, with the exception of standard templates.



Enhanced rectangle template

User template



CAD user template
Note: QS-CAD I/F is required (available as an option).

Simple focusing

Wide focus range

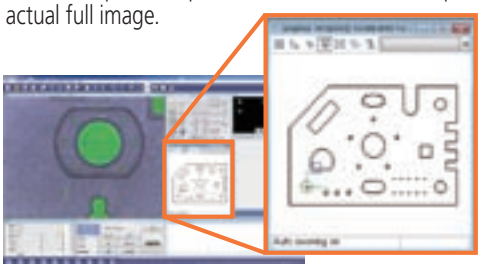
- Our specifically-designed optical system has achieved the long focal depth of 22mm. This allows measurement virtually without the time-consuming focusing task, supporting an efficient measurement operation.

Focusing in on a workpiece like the one shown above is unnecessary.

Capable of visually capturing an entire image

Graphics function

- The current position, coordinate system, measuring item and measurement result are automatically displayed in a graphics window. The graphics window prevents omissions and errors with the measurements from occurring. 2-D CAD model data can be imported (optional) in order to better capture the actual full image.

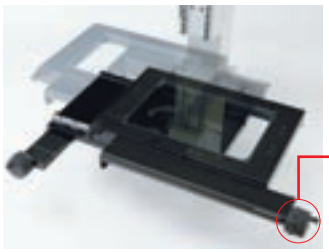


Perform quick measurements even on large workpieces

Quick release mechanism on the XY stage

*QI-A series, QI-B series

- Quick-release mechanisms are built into both fine feed controls on the XY stage.
- This allows the stage to be moved rapidly to bring the next measuring point into view no matter where it is on the workpiece.



Quick-release ring

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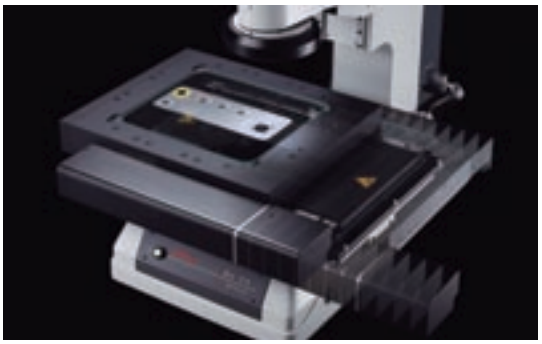
Efficiency Outstanding improvement in operation efficiency and productivity

New User-friendly and Convenient XY Stage Movement

New Lineup of Motor-driven Stage Models *QI-C series

- The joystick provides an easy, convenient control for coarse and fine feed of the stage. This effortlessly moving XY stage demonstrates outstanding performance in long-length measurement. The motor-driven stage automatically moves for stitching but only by specifying its start and end points.

Dedicated remote box

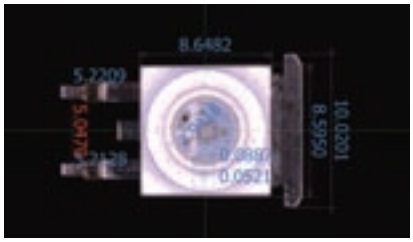


Motor-driven stage

Confirm measurement results quickly and easily

Video window measurement result display function

- Measurement results can be understood intuitively just by looking at a measurement image. Any out-of-tolerance result data is easily identified by changing its display color. A graphic image with measurement data also leads to creation of a user-friendly report.
  Each OK/NG result is color-coded with its display color freely selectable.

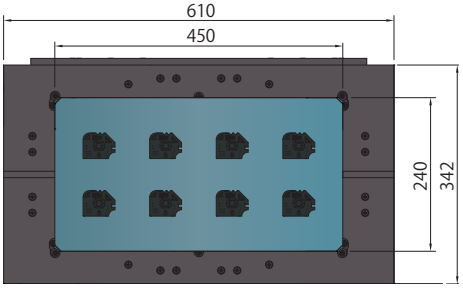


The measurement results display for OK/NG can be color-coded to meet your requirements.

Capable of supporting a variety of workpieces

Large-stage model and Extensive line up of stages

- The large stage allows you to arrange multiple workpieces and measure them in a single setup, thereby saving valuable time that would otherwise be spent in loading and unloading the stage.
- XY measurement range: Measure workpieces up to 400x200mm.
- 100mm Z-stroke allows you to measure tall workpieces.
- A maximum load capacity of 20Kg allows you to measure heavy workpieces.

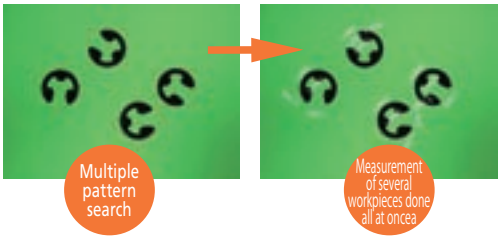


Take advantage of the largest stage by performing multiple measurements at one setup.

Measure multiple workpieces within the field of vision all at once

Locate and measure multiple workpieces with just one click

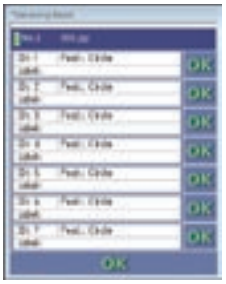
- Use pattern search for multiple workpieces within the screen view, and measure them all in one operation with the one-click execution function. This eliminates the need for accurate positioning of workpieces and cumbersome setup of fixtures.



Simple "OK/NG judgment" of multiple workpieces

Tolerance judgment result display function

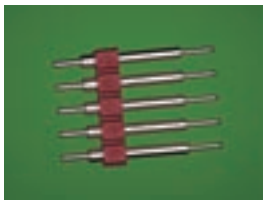
- OK/NG judgment can be seen at a glance, for faster operation.
- OK/NG judgment can be done for each measurement item, and judgment can be passed on each workpiece.
- Prevents NG data omissions.



Generate reports and observe, all on one machine

High-definition color camera

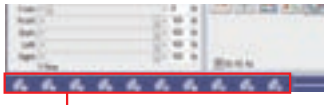
- This camera provides high-resolution color images for effective use in high-accuracy measurement and workpiece surface observation. Bright color measurement images are easily stored as a file and can be used for creating an easily understood measurement report.



Simple execution of measurement procedure programs

Program launcher

- A measurement procedure program can be stored under a dedicated icon along with a photo and comments to enable the required programs to be started easily.
- 10 icons are available and programs can be managed for each operator or workpiece.


Program launcher icons


Automatic measurement procedure program storage window

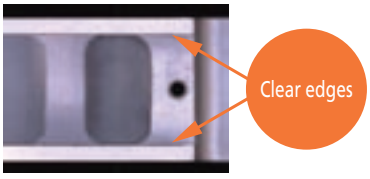
High accuracy measurement with bright and clear images

Wide field of view / high-resolution mode

- The high resolution mode produces the same wide field of view as the normal mode that operates with a deep focal depth and can therefore share a single measurement procedure so that you can execute seamless measurements.
- The shallow depth of focus in high resolution mode shows the edges of stepped workpieces more clearly, making measurements highly accurate.

Enhanced illumination Patent registered (Japan)

- The enhanced illumination function of the high-resolution mode enables measurements of low reflectivity workpieces like rubber and black resin moldings to be performed with a clear image.

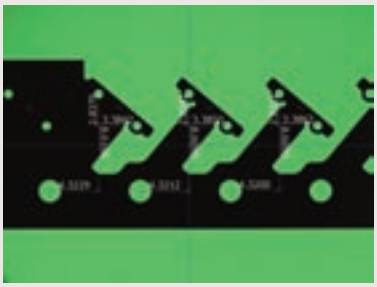


Edge measurement of a stepped workpiece (high resolution mode)


Surface observation of black rubber

Measurement examples

Progressive-die pressed parts



Measure the diameter and difference in coordinates of each hole.

O-ring

Enhanced illumination is very effective for low reflectivity materials such as rubber and black resin.
(Use ring illumination in high-resolution mode + enhanced illumination

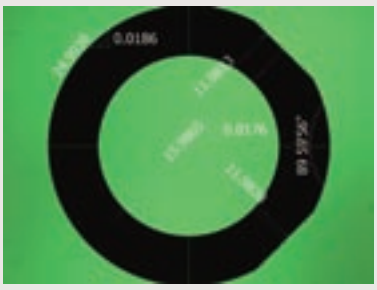
Weatherstrip

Execute a pattern search unrelated to position and finish measuring in one click.

Measuring a tiny stepped workpiece

You can see and measure edges easily with just one quadrant of the ring light providing illumination.

Measuring a stepped workpiece



Measure with simple focusing.

Sheet Switch Measurement

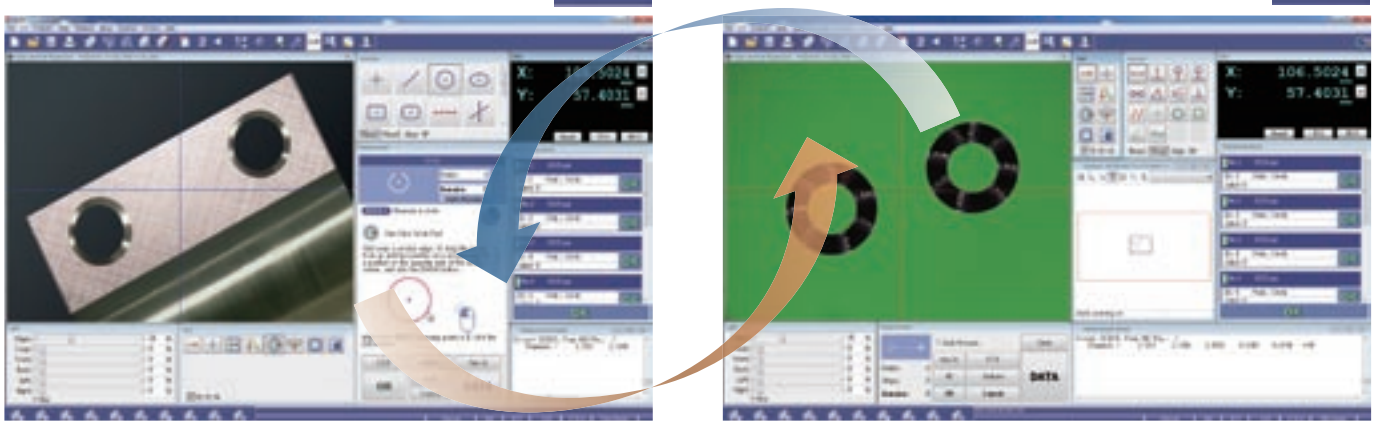
The color camera allows enhanced observation and measurement of workpieces. It is best suited to the inspection of print matter and creation of a report.

Standard software QIPAK

QIPAK (two modes) enables quick and easy measurement

EZ mode
(Simple measurement mode)

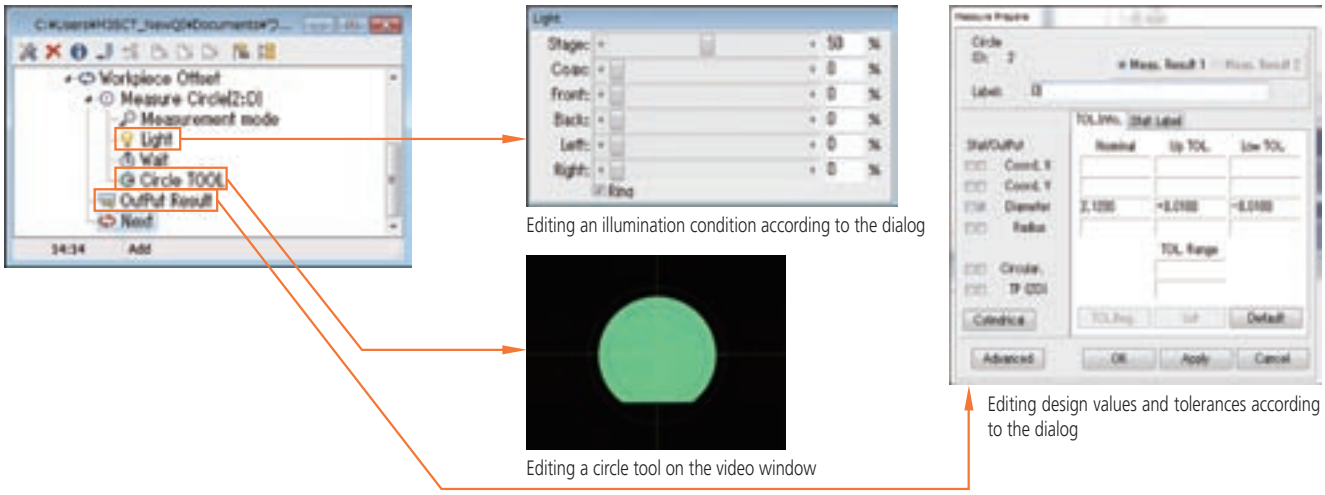
PRO mode
(General purpose measurement mode)



Simple execution and editing of programs

Smart editor

This function allows XY-stage target position, illumination condition, etc., to be separately displayed as icons or labels in the list of part programs (automatic measurement procedure programs), thereby simplifying program editing.



Powerful edge-detection functionality enables fast measurement

Outlier removal

Removes outliers caused by anomalies such as debris, burrs and chips.

Auto trace tool

Automatically detects the edges of unknown contours and obtains point group data.
Point group data lets you perform contour form analysis and design value comparison using FORMTRACEPAK-AP (optional).

Dual-area contrast tool

Automatically sets the amount of illumination so that the contrast between two regions is maximized.
Users can also set the optimum intensity to suit the workpiece.

Mitutoyo

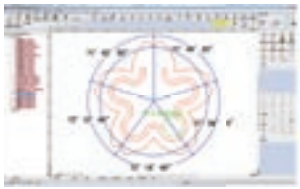
Optional accessories

Easily handle sophisticated dimension and contour evaluations

Contour evaluation and analysis software: FORMTRACEPAK-AP

Data processing software for advanced form analysis that carefully reads point group date acquired via tools such as the auto trace tool.

- A contour measurement is easy to make. Perform contour matching against the design value data.
- You can define virtual circles of a given diameter enabling over-pin diameter analysis to be performed.



Example of gear contour matching, and an over-pin diameter analysis

Effective use of CAD model

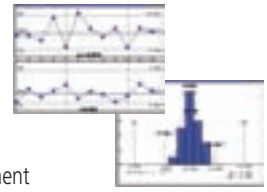
Measurement support software: QS-CAD I/F

2-D CAD model data (DXF-, or IGES-formatted) can be imported into QIPAK. Conversely, QIPAK measurement results can be converted into 2-D CAD model data. The design value for each measurement item is automatically entered. Since the graphics window makes the present location easy to identify, the operator can quickly move the stage a given point in the 2D CAD model.

Early detection of process irregularities

Centralized process management software: MeasurLink

Statistical data can be displayed in real-time, making early detection of process irregularities possible. Early identification of an out-of-control situation enables rapid remedial action to be taken when necessary.

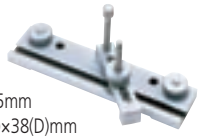


Examples of remedial action

- Mold repair or cycle-timing change
- Cutting tool adjustment or replacement

Holder with clamp

Clamping of thin workpieces such as PCBs and pressed parts.



Order No.: **176-107**
Maximum clamp length: 35mm
Dimensions: 62(H)×152(W)×38(D)mm
Mass: 0.4kg

Note: An adapter set is required.

V-block with clamp

Clamping of cylindrical objects

Order No.: **172-378**
Max. supportable diameter: ø25mm
Center height from mounting face: 38-48mm
Dimensions: 117(H)×90(W)×45(D)mm
Mass: 0.8kg

Note: An adapter set is required.

Swivel center support

Clamping of the workpiece between centers for effective thread diameter and depth measurements.

Order No.: **172-197**
Can be set to an inclination angle of ±10°, in minimum increments of 1°
Max. supportable dimensions:
When horizontally positioned: ø80×140mm
When tilted at 10°angle: ø65×140mm
Mass: 2.5kg

Note: An adapter set is required.

Stage adapter sets

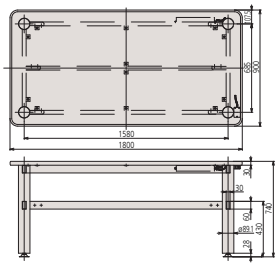
These are used when connecting some optional peripherals to the measuring device.

Order No.: **Stage adapter : 176-304**
Stage adapter B : 176-310
Dimensions (1piece): 50(W)×340(D)×15(H)mm
Note: The stage adapter B is 280(D).
Mass: Stage adapter: 1.5Kg
Stage adapter B: 1.2Kg

		Stage size	
		1010 2010	2017 3017 4020
176-304	Stage adapter	—	○
176-310	Stage adapter B	○	—

Note: One set consists of two adapters.

Table

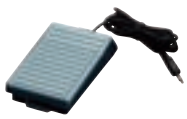


Order No.: **02ATE760**
Dimensions: 1800(W)×900(D)×740(H)mm
Mass: 60kg

Foot switch

Quick data entry while gripping the handle.

Standard type
Order No.: **937179T**



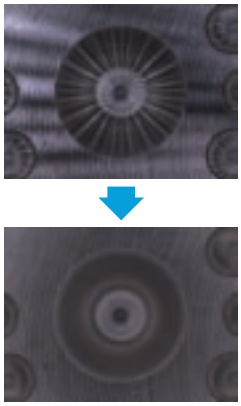
Rigid type
Order No.: **12AAJ088**

Optional accessories

Ring Light Diffusion Plate

Order No.: **02ATE760**

Effective on a diffusely reflective workpiece such as a machined surface. This plate makes the surface appear smooth to obtain an image suited to measurement. The working distance is 76mm.



Mounting Stand

Order No.: **02ATX190**

Dedicated to the QI main unit.
This stand allows increased freedom of system layout by separating the main unit from the PC.

Specifications

		Manual stage model					Motorized stage model		
0.2X	Model	**QI-A1010D**	**QI-A2010D**	**QI-A2017D**	**QI-A3017D**	**QI-A4020D**	**QI-C2010D**	**QI-C2017D**	**QI-C3017D**
0.5X	Model	**QI-B1010D**	**QI-B2010D**	**QI-B2017D**	**QI-B3017D**	**QI-B4020D**			
Measuring range (X×Y)		100×100mm	200×100mm	200×170mm	300×170mm	400×200mm	200×100mm	200×170mm	300×170mm
Effective stage glass size		170×170mm	242×140mm	260×230mm	360×230mm	440×232mm	242×140mm	260×230mm	360×230mm
Maximum stage loading *1		Approx. 10kg		Approx. 20kg		Approx. 15kg	Approx. 10kg	Approx. 20kg	
Main unit mass		Approx. 65kg	Approx. 69kg	Approx. 150kg	Approx. 158kg	Approx. 164kg	Approx. 72kg	Approx. 153kg	Approx. 161kg

*1 Does not include extremely offset or concentrated loads

			QI-A / QI-C	QI-B
View field			32×24mm	12.8×9.6mm
Measurement mode			High resolution mode / Normal mode *4	
Travel range (Z axis)			100mm	
Accuracy	Measurement accuracy within the screen *1	High resolution mode	±2μm	±1.5μm
		Normal mode	±4μm	±3μm
	Repeatability within the screen (±2σ) *2	High resolution mode	±1μm	±0.7μm
		Normal mode	±2μm	±1μm
	Measurement accuracy (E1xy) *1		±(3.5+0.02)μm L: arbitrary measuring length (mm)	
Monitor magnification *3			7.6X	18.9X
Optical system	Magnification (Telecentric Optical System)		0.2X	0.5X
	Depth of focus	High resolution mode	±0.6mm	±0.6mm
		Normal mode	±11mm	±1.8mm
	Working distance		90mm	
Camera			3 million pixels, 1/2", full color	
Illumination			Transmitted light: Green LED telecentric illumination Co-axial light: White LED Ring light: 4-quadrant white LED	
Power supply			100-240VAC 50/60Hz	
Accuracy guaranteed temperature range			19-21°C	

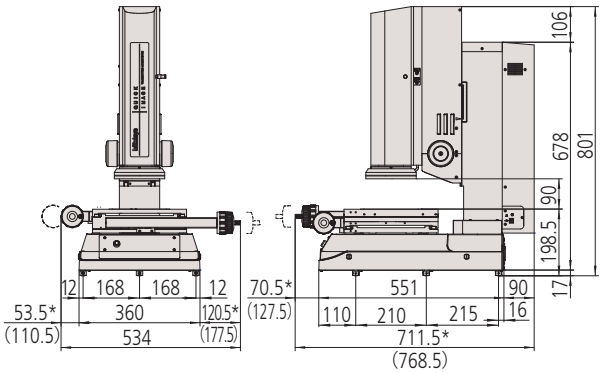
*1 Inspected to Mitutoyo standards by focus point position.
*2 The measuring accuracy is guaranteed to be accurate within the depth of focus.
*3 For 1X digital zoom (when using the 22-inch-wide monitor)
*4 Patent registered (Japan)

Dimensions chart

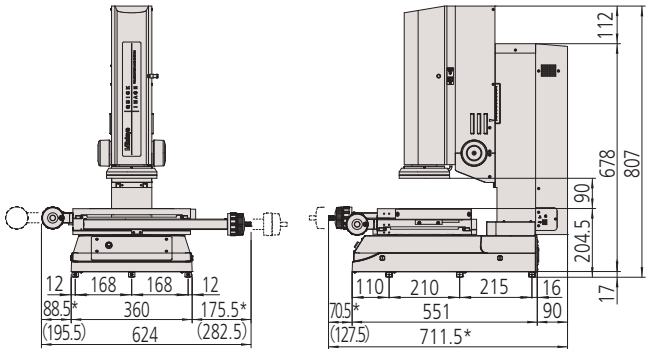
Manual stage model

Unit: mm

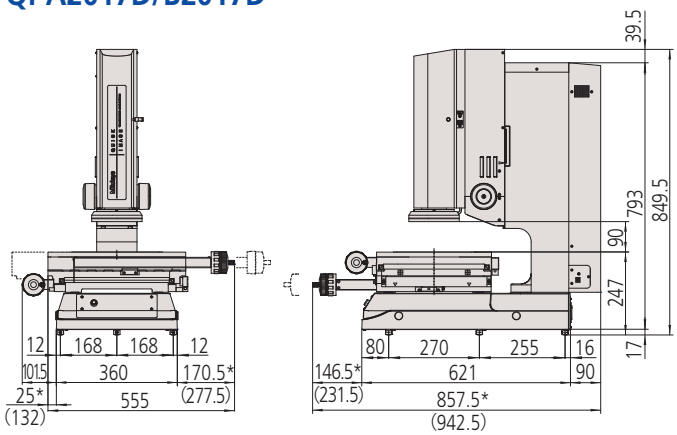
QI-A1010D/B1010D



QI-A2010D/B2010D



QI-A2017D/B2017D



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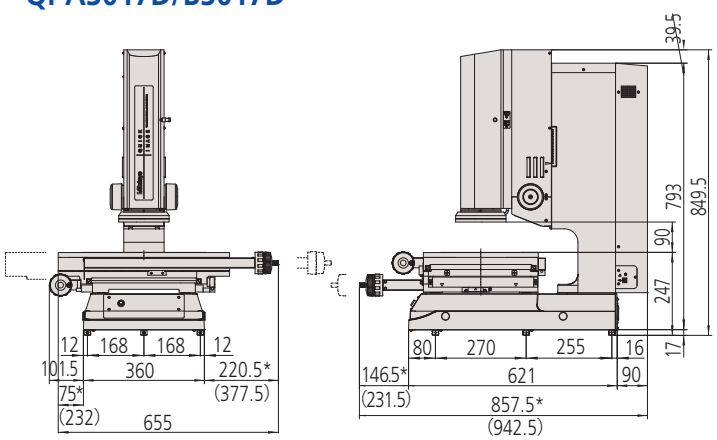
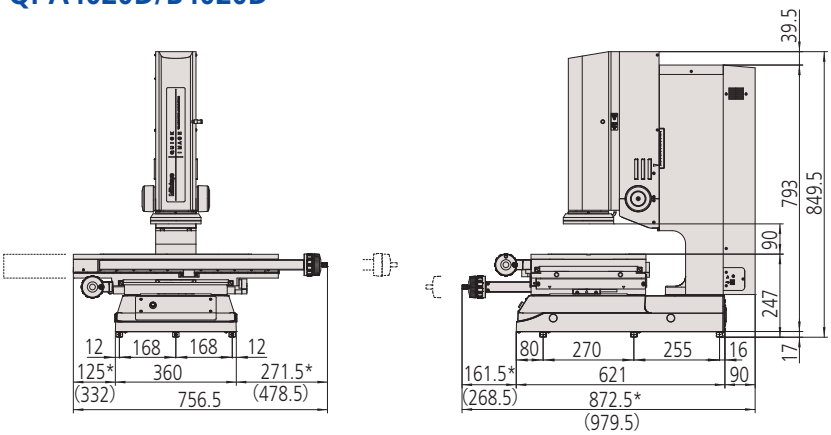


QI-A4020D/B4020D



QI-A series
QI-B series
QI-A4020D
Manual stage model

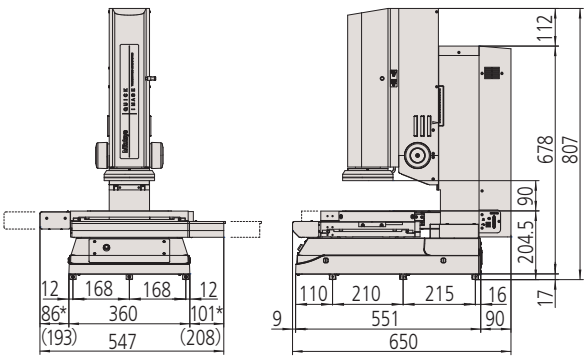
The mounting stand (02ATX190) is optional.

*Varies depending on position of XY stage.
Values in parentheses indicate maximum size.

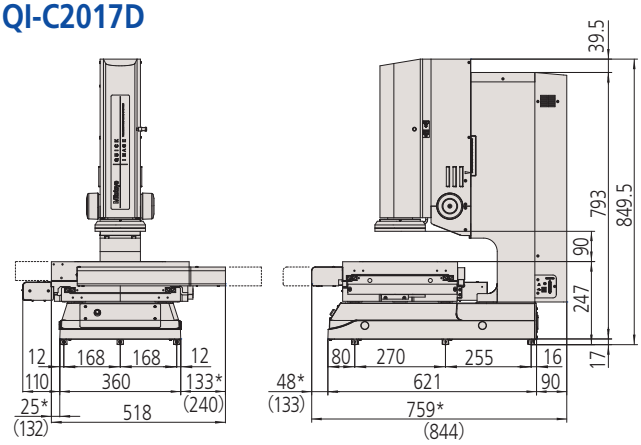
Motorized stage model

Unit: mm

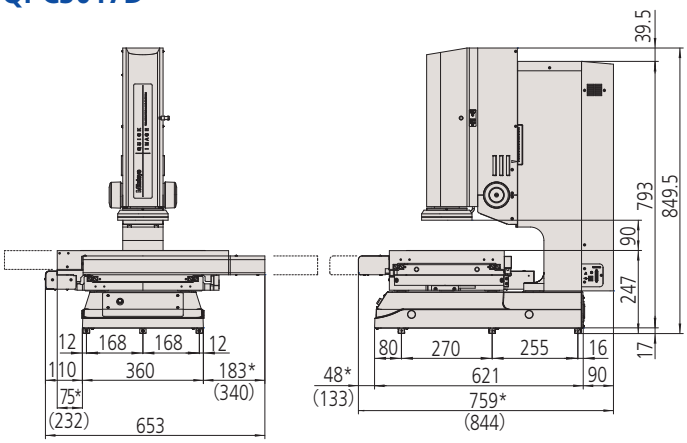
QI-C2010D



QI-C2017D



QI-C3017D



*Varies depending on position of XY stage.
Values in parentheses indicate maximum size.

QI-C series
QI-C2017D
Motorized stage model

The mounting stand
(02ATX190) is optional.

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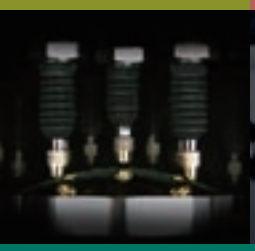
Coordinate Measuring Machines

Vision Measuring Systems

Form Measurement

Optical Measuring

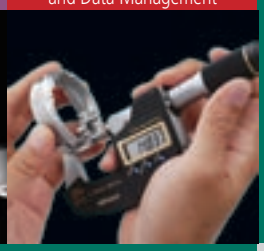
Sensor Systems



Test Equipment and Seismometers

Digital Scale and DRO Systems

Small Tool Instruments and Data Management



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