

Mitutoyo



Mitutoyo Corporation
80th Anniversary
Since 1934

2-D Color Vision Measuring System QUICK IMAGE Series

Vision Measuring System



Catalog No. E14009

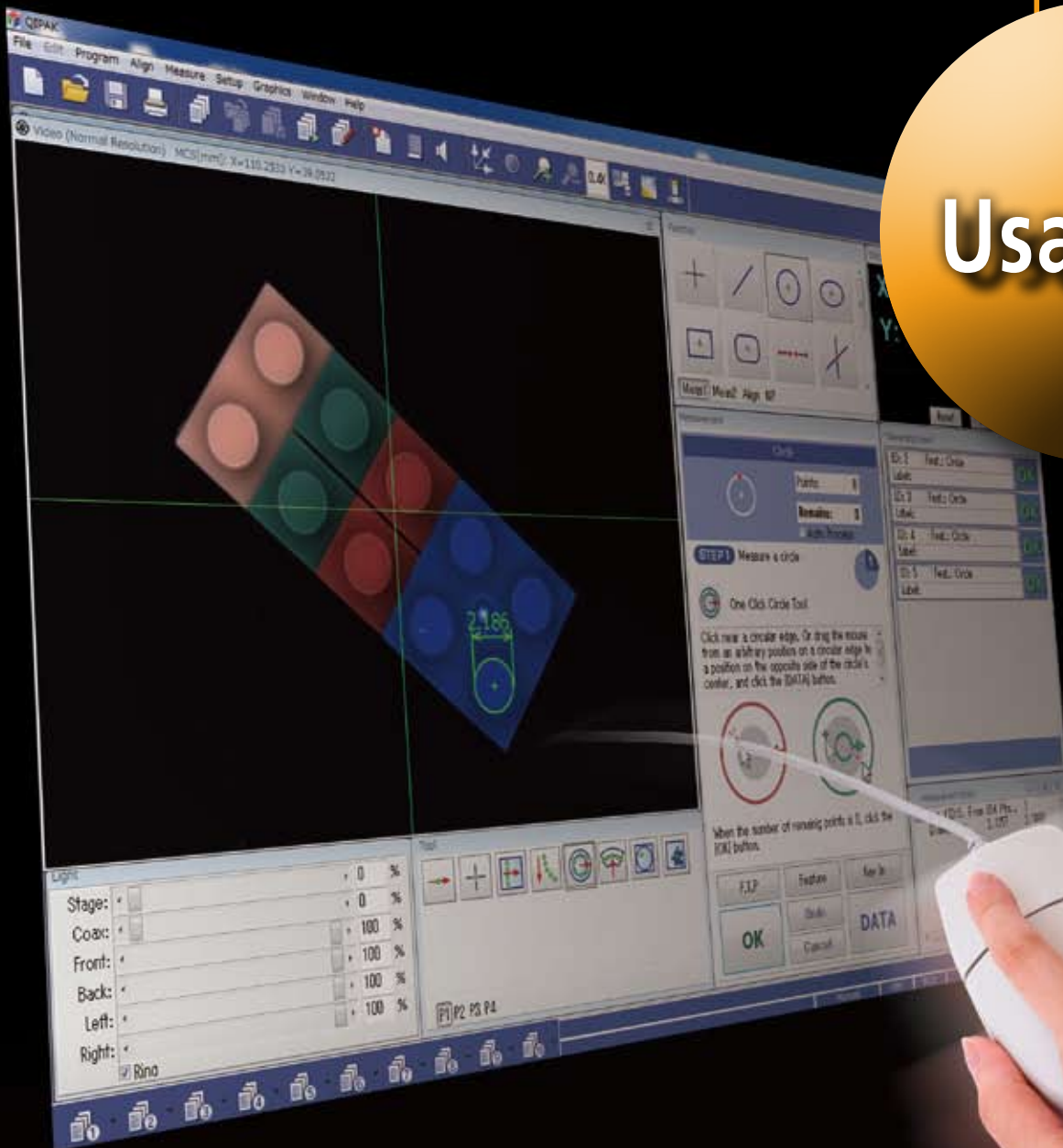
The latest 2-D measuring machine created as a result of Mitutoyo quality!

QUICK IMAGE

Simple to operate and easy-to-perform measuring

Reliab

Usability



Powerful backup for your quality control system

ility

Efficiency

Outstanding improvement in operational efficiency and productivity

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

For example...

- For those who want highly accurate measurements done on small-sized workpieces.
- Anyone who wants consistent measurements performed.

QUICK IMAGE...

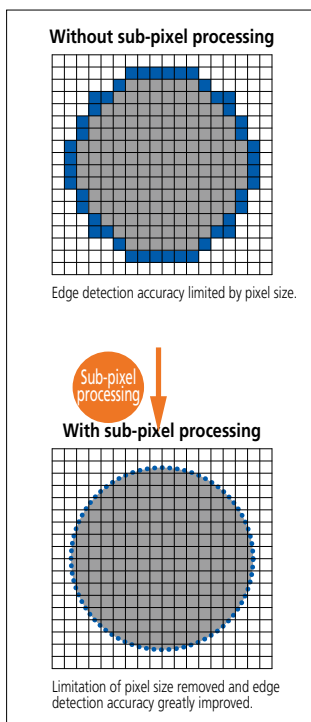
The highest level of measuring accuracy within the screen in its class

- Accuracy of $\pm 1.5\mu\text{m}$ within the screen, repeatability of $\pm 0.7\mu\text{m}$ in high-resolution mode (QI-B Series) and the ability to focus through a wide range.

QUICK IMAGE...

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

For example...

- For those who want highly accurate measurements done on long or large workpieces.
- For those who want stable focusing no matter the height of the workpiece.



Gasket

QUICK IMAGE...

Highly accurate stages

- Stages come in various sizes with an accuracy of $\pm (3.5 + 0.02L) \mu\text{m}$, letting you perform highly accurate and stable measurements, and obtain reliable data for any kind of workpiece.

QUICK IMAGE...

Rigid construction

- Its rigid construction allows for a maximum load capacity of 20Kg, and its 100mm heightwise stroke enables large-contour workpieces to be mounted on the stage.



QUICK IMAGE...

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

For example...

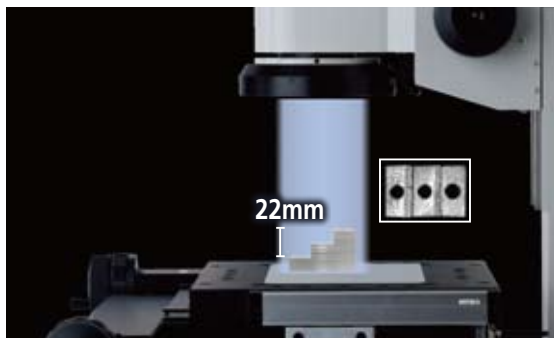
- For those who want measurements done on a stepped workpiece.
- For those who want measurements done on a cylindrical workpiece

QUICK IMAGE...

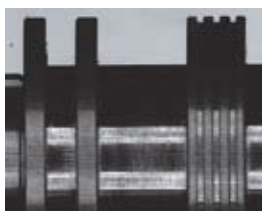
Utilizes our in-house developed Telecentric Optical System

• 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

Outstanding sense of security –Traceability to national standards–

For example...

- For those who want to earn customers' trust by having measurements traceable to national standards.

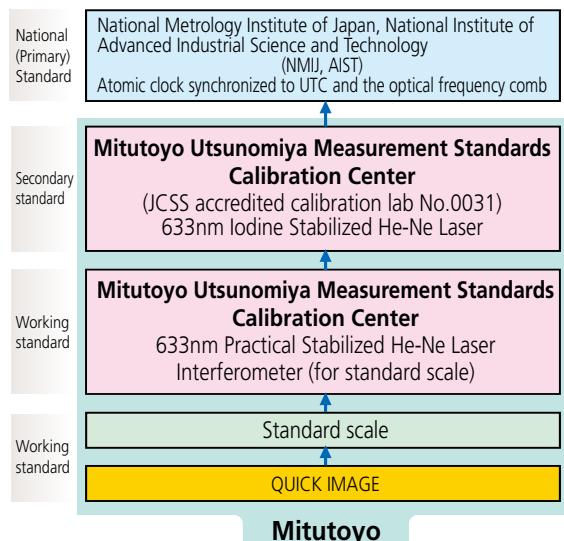
Mitutoyo...

Uses standards traceable to national standards

- Mitutoyo has a large collection of standard devices that are traceable to the national standards of Japan. Through calibration of the standard devices used in the calibration of the measuring tools and instruments, we've established and upheld traceability of all kinds of measuring tools and instruments.
- Our calibration laboratories have received JCSS-accreditation from IAJapan, an internationally recognized accreditation body accorded by the ILAC Mutual Recognition Agreement (MRA), and are recognized as having measurement technological capabilities equal to that of calibration labs abroad.



Utsunomiya Measurement Standards Calibration Center JCSS0031





Simple to operate and easy-to-perform measuring



No troublesome positioning is required

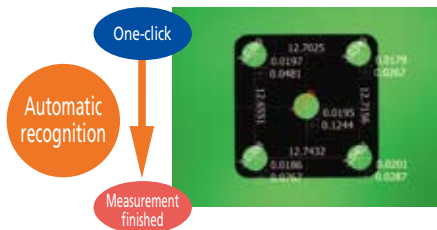
For example...

- For those who want to measure without having to perform positioning and coordinate setting.

QUICK IMAGE...

One-click execution function • Patent pending (Japan)

- After placing the workpiece within the field of view, the machine automatically recognizes the position and angle of the registered workpiece using a pattern search function and then finishes the measurements. You do not need to set the coordinate system each time.



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



Simple execution of multiple measurements

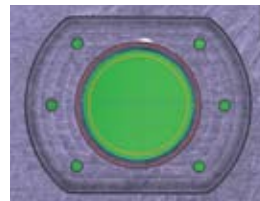
For example...

- For those who want to easily get stable measurement results from multiple measurements.

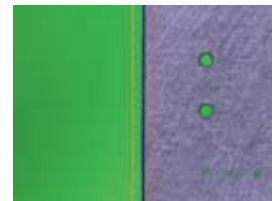
QUICK IMAGE...

One-click tool

- With just one click, anyone can easily perform multiple measurements. Multiple point measurement enables you to get accurate measurements.
- The abnormal point removal function lets you automatically remove abnormal points generated by dust or burrs.



One-click circle tool



One-click box tool

Simple focusing

For example...

- For those who find focusing troublesome.

QUICK IMAGE...

Wide focus range

- QUICK IMAGE has a depth of focus up to 22mm which means it does not require fine focusing.



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



Easy-to-operate without the manual

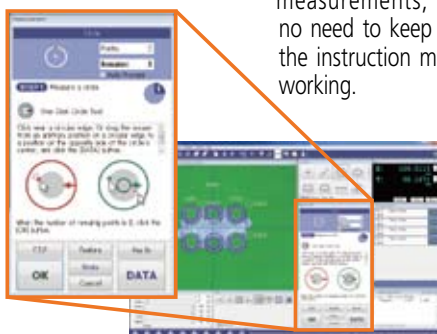
For example...

- For those who are new to the machine.

QUICK IMAGE...

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.



An intuitive OK/NG judgment of measurement is possible

For example...

- For those who want a quick judgment via comparison test.

QUICK IMAGE...

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).

Capable of visually capturing an entire image

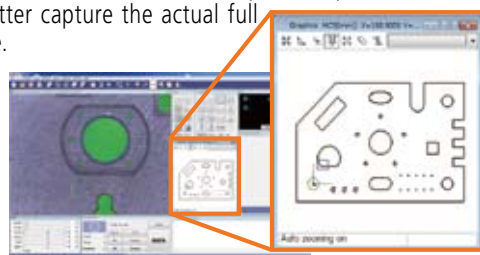
For example...

- For those who want to improve measurements and have a captured image of the entire workpiece.

QUICK 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

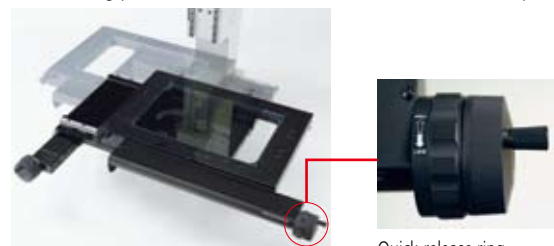
For example...

- For those who want to make widely separated measurements on large workpieces.

QUICK IMAGE...

Quick release mechanism on the XY stage

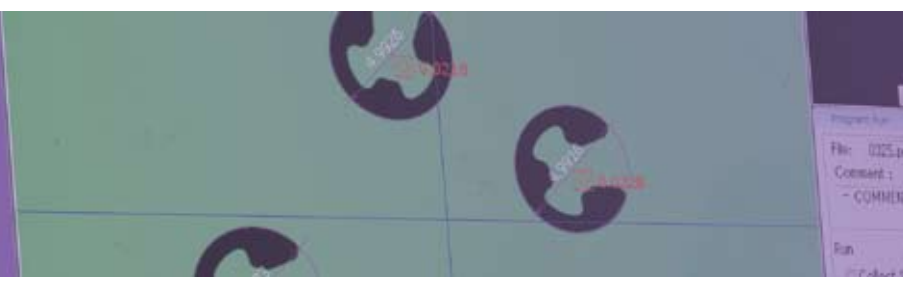
- Quick-release mechanisms are built into both fine feed controls on the XY stage.
- This allows the stage to be moved rapidly to bring the next measuring point into view no matter where it is on the workpiece.



Quick-release ring



Outstanding improvement in operation efficiency



Measure multiple workpieces for a huge boost in work efficiency

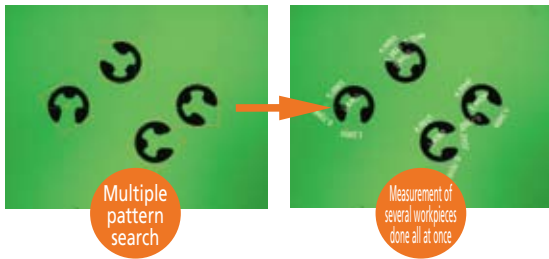
For example...

- For those who want to measure several workpieces at one setup.

QUICK IMAGE...

Measure multiple workpieces within the field of vision all at once

- Use pattern search for multiple workpieces within the screen view, and measure them all in one operation with the one-click execution function.
- Measurements can be performed very efficiently making accurate positioning unnecessary, and eliminating the need for costly holding fixtures.



Confirm measurement results quickly and easily

For example...

- For those who want to intuitively determine the measurement results and measurement position.

QUICK IMAGE...

Video window measurement result display function

- Measurement results can be understood intuitively just by looking at a measurement image.
- Change the display color of the OK/NG result to immediately perform tolerance determination as well as determine NG items.
- Paste measurement images in the inspection results report to provide visible improvements to the quality assurance function.



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

Capable of supporting a variety of workpieces

For example...

- For those who want to measure several workpieces at one setup.
- For those who want to measure larger workpieces but cannot due to size restrictions.

QUICK IMAGE...

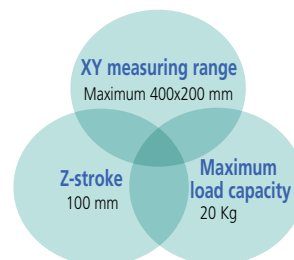
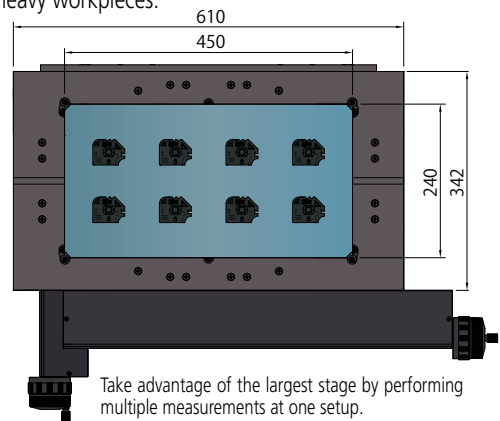
Large-stage model

- 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.

QUICK IMAGE...

Extensive lineup of stages

- 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.



and productivity



Simple "OK/NG judgment" of multiple workpieces

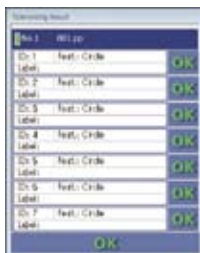
For example...

- For those who want OK/NG judgment made quickly and easily.
- For those who want OK/NG judgment made for every workpiece.

QUICK IMAGE...

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

For example...

- For those who want to complete observation and measurements on one machine.
- For those who want to attach color images to reports.

QUICK IMAGE...

High-definition color camera

- The camera not only produces high resolution color images of measurements, but is also effective for observing the workpiece surface.
- Brilliant color images can be easily saved in files and used in the measurement reports created to facilitate smooth communication with business partners.



High accuracy measurement with bright and clear images

For example...

- For those who want to precisely measure the edges of a stepped workpiece.
- For those who want clear measurements of rubber and black resin surfaces.

QUICK IMAGE...

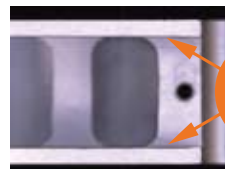
Wide field of view / high-resolution mode

- 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.

QUICK IMAGE...

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

Simple execution of measurement procedure programs

For example...

- For those who want to run measurement procedure programs simply.

QUICK IMAGE...

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

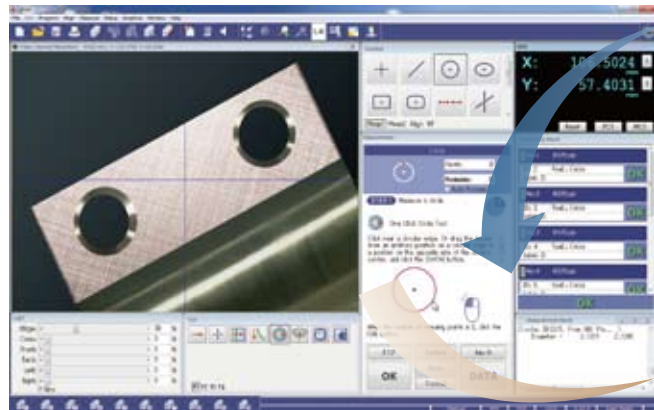


Automatic measurement procedure program storage window

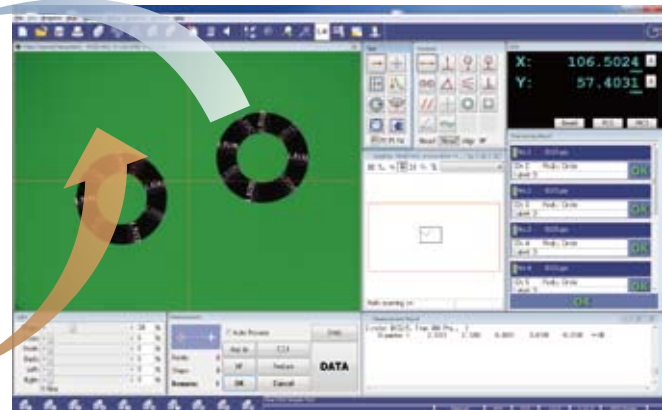
Standard software QIPAK

QIPAK (two modes) provides powerful assistance to customers in diverse conditions

EZ mode
(Simple measurement mode)



PRO mode
(General purpose measurement mode)



Simple execution and editing of measurement procedure 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.

Editing an illumination condition according to the dialog

Editing a circle tool on the video window

Editing design values and tolerances according to the dialog

Item	Nominal	Up TOL	Low TOL
Coord. X			
Coord. Y			
Diameter	2.1200	+0.0100	-0.0100
Radius			

Strong support of measurements with the full edge-detection function

Outlier removal

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

Auto trace tool

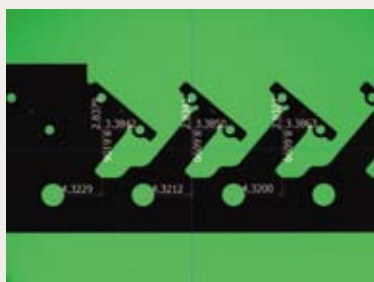
The tool automatically detects the edges of unknown contours and obtains point group data. Point group data lets you perform contour form analysis and design value comparison using FORMTRACEPAK-AP (optional).

Dual area contrast tool

Automatically sets the amount of illumination so that the contrast between two regions is maximized. First-time users can also set the optimum intensity.

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.

Optional application software

Easily handle sophisticated dimension and contour evaluations

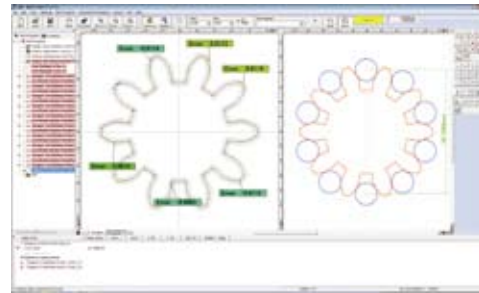
Contour evaluation and analysis software: FORMTRACEPAK-AP

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

- A contour measurement is easy to make
- The resulting analysis displayed on the screen is easy to interpret.
- 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 form analysis

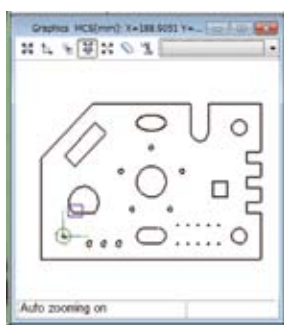


Example of gear contour matching, and an over-pin diameter analysis

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.



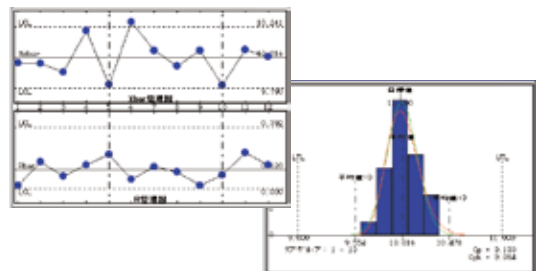
Early detection of process irregularities

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.



Optional accessories

Holder with clamp



Application: 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 to suit a particular QI model. These are available to order (see below).

V-block with clamp



Application: Clamping of cylindrical objects

Order No.: **172-378**

Maximum supportable diameter: ϕ 25mm

Center height from mounting face: 38-48mm

Dimensions: 117(H)×90(W)×45(D)mm

Mass: 0.8Kg

Note: An adapter set is required to suit a particular QI model. These are available to order (see below).

Swivel center support



Application: 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 $\pm 10^\circ$, in minimum increments of 1°

Maximum supportable dimensions:

When horizontally positioned: ϕ 80×140 mm

When tilted at 10° angle: ϕ 65×140mm

Mass: 2.5Kg

Note: An adapter set is required to suit a particular QI model. These are available to order (see below).

Stage adapter sets



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

Order No.: Stage adapter : **176-304**

Stage adapter B : **176-310**

Dimensions (1 piece): 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.

Foot switch



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



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

Application: Quick data entry while gripping the handle

Table



Order No.: **02ATE760**

Dimensions: 1800(W)×900(D)×740(H)mm

Mass: 60Kg

SPECIFICATIONS

QI-A Series

Model No.	QI-A1010C	QI-A2010C	QI-A2017C	QI-A3017C	QI-A4020C
View field	32×24mm				
Measurement mode	High resolution mode/Normal mode				
Measuring range (X, Y axes)	100×100mm	200×100mm	200×170mm	300×170mm	400×200mm
Travel range (Z axis)	100mm				
Accuracy	Measurement accuracy within the screen* ¹				
	High resolution mode: ±2μm/Normal mode: ±4μm				
	Repeatability within the screen (±2σ)* ²				
Imaging device	High resolution mode: ±1μm/Normal mode: ±2μm				
	Measurement accuracy (U1xy)* ¹				
	±(3.5+0.02L) μm, L: arbitrary measuring length (mm)				
Monitor magnification* ³	3 megapixel, 1/2", color-compatible				
Optical system	7.6X				
	Magnification (Telecentric Optical System)				
	0.2X				
Illumination	Working distance				
	90mm				
	Depth of focus				
Effective stage glass size	High resolution mode: ±0.6 mm/Normal mode: ±1.1 mm				
	Transmitted light: Green LED telecentric illumination				
	Co-axial light: White LED				
Maximum stage loading* ⁴	Ring light: quadrant white LED				
	170×170mm				
	242×140mm				
Power supply	260×230mm				
	360×230mm				
	440×232mm				
Main unit mass	Approx. 10Kg				
Accuracy guaranteed temperature	Approx. 20Kg				
	100-240VAC, 50/60HZ				
	Approx. 70Kg				
	Approx. 74Kg				
	Approx. 140Kg				
	Approx. 148Kg				
	Approx. 154Kg				
	20±1°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 Does not include extremely offset loads and concentrated loads

QI-B Series

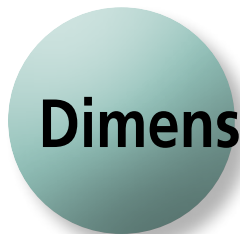
Model No.	QI-B1010C	QI-B2010C	QI-B2017C	QI-B3017C	QI-B4020C
View field	12.8×9.6mm				
Measurement mode	High resolution mode/Normal mode				
Measuring range (X, Y axes)	100×100mm	200×100mm	200×170mm	300×170mm	400×200mm
Travel range (Z axis)	100mm				
Accuracy	Measurement accuracy within the screen* ¹				
	High resolution mode: ±1.5μm/Normal mode: ±3μm				
	Repeatability within the screen (±2σ)* ²				
Imaging device	High resolution mode: ±0.7μm/Normal mode: ±1μm				
	Measurement accuracy (U1xy)* ¹				
	±(3.5+0.02L) μm, L: arbitrary measuring length (mm)				
Monitor magnification* ³	3 megapixel, 1/2", color-compatible				
Optical system	18.9X				
	Magnification (Telecentric Optical System)				
	0.5X				
Illumination	Working distance				
	90mm				
	Depth of focus				
Effective stage glass size	High resolution mode: ±0.6 mm/Normal mode: ±1.8 mm				
	Transmitted light: Green LED telecentric illumination				
	Co-axial Light: White LED				
Maximum stage loading* ⁴	Ring light: quadrant white LED				
	170×170mm				
	242×140mm				
Power supply	260×230mm				
	360×230mm				
	440×232mm				
Main unit mass	Approx. 10Kg				
Accuracy guaranteed temperature	Approx. 20Kg				
	100-240VAC, 50/60HZ				
	Approx. 70Kg				
	Approx. 74Kg				
	Approx. 140Kg				
	Approx. 148Kg				
	Approx. 154Kg				
	20±1°C				

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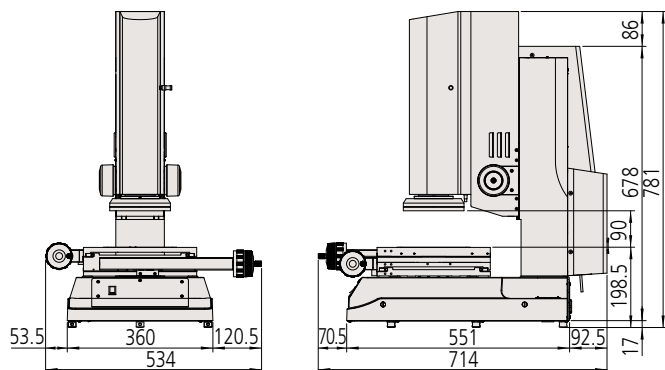
*3 For 1x digital zoom (when using the 22-inch wide monitor)

*4 Does not include extremely offset loads and concentrated loads



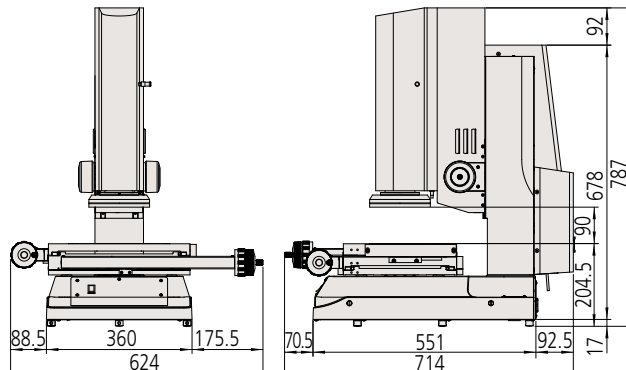
Dimensions chart

QI-A1010C/B1010C

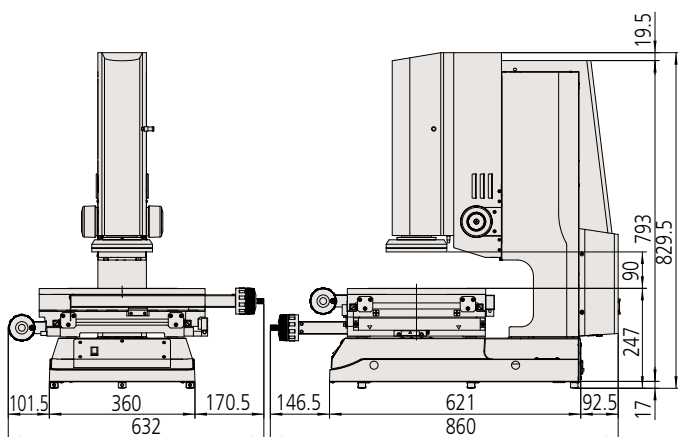


QI-A2010C/B2010C

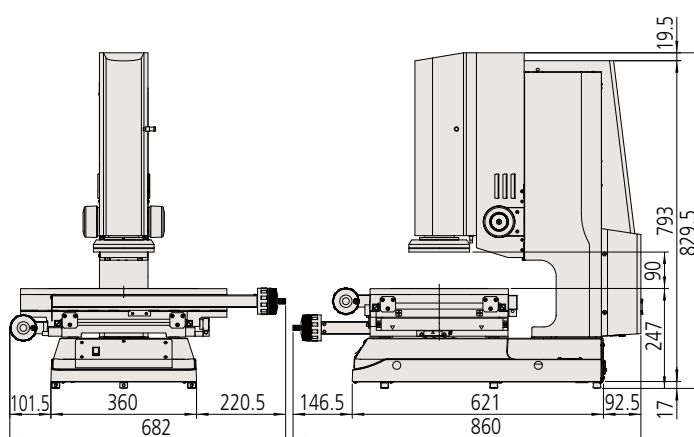
Units: mm



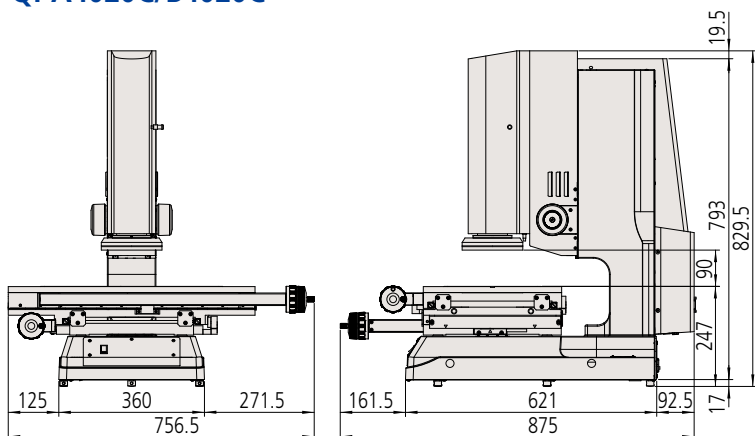
QI-A2017C/B2017C



QI-A3017C/B3017C



QI-A4020C/B4020C



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

Whatever your challenges are, Mitutoyo supports you from start to finish.

Mitutoyo is not only a manufacturer of top quality measuring products but one that also offers qualified support for the lifetime of the equipment, backed up by comprehensive services that ensure your staff can make the very best use of the investment.

Apart from the basics of calibration and repair, Mitutoyo offers product and metrology training, as well as IT support for the sophisticated software used in modern measuring technology. We can also design, build, test and deliver bespoke measuring solutions and even, if deemed cost-effective, take your critical measurement challenges in-house on a sub-contract basis.



Find additional product literature
and our product catalogue

<http://www.mitutoyo.co.jp/global.html>

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