MEASURING TOOLS
VISION MEASURING SYSTEMS

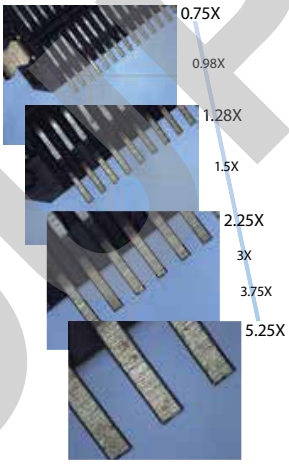
Mitutoyo

เครื่องวัดชิ้นงานละเอียด
QV Active
SERIES 363 — CNC Vision Measuring System

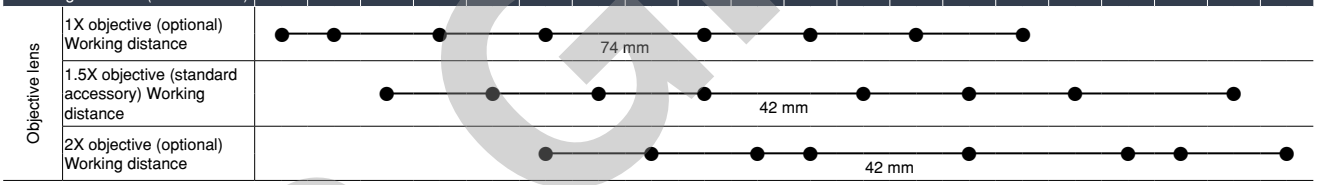
MeasurLink® ENABLED
Data Management Software by Mitutoyo

- Cost effective, multifunction, CNC Vision Measuring System.
- Usability has been improved by adopting a color camera and 8-step zoom optics.
- A touch-probe model can seamlessly perform non-contact and contact measurement.
- The zoom ratio of 7X (14X at maximum by changing the fixed-magnifi cation objective lens) enables a wide range of inspection from wide view measurement at low magnifi cation to micro-measurement at high magnifi cation.
- The 74 mm maximum working distance (1X optional objective) promotes safe working by reducing the risk of collision, and allows greater freedom in fi xture design.

QV Active 202



Optical magnifi cation		0.5X	0.65X	0.75X	0.85X	0.98X	1X	1.28X	1.3X	1.5X	1.7X	2X	2.25X	2.5X	3X	3.5X	3.75X	4X	5X	5.25X	7X
View field (mm)	Horizontal (H)	13.60	10.46	9.07	8.00	6.94	6.80	5.31	5.23	4.53	4.00	3.40	3.02	2.72	2.27	1.94	1.81	1.70	1.36	1.30	0.97
	Vertical (V)	10.80	8.31	7.20	6.35	5.51	5.40	4.22	4.15	3.60	3.18	2.70	2.40	2.16	1.80	1.54	1.44	1.35	1.08	1.03	0.77
Total magnifi cation (on the monitor)		13.20	17.10	19.80	22.40	25.80	26.40	33.70	34.30	39.50	44.80	52.70	59.30	65.90	79.10	92.30	98.90	105.50	131.80	138.40	184.50



Note: The total magnification indicates the magnification on the monitor when the size of the QVPAK video window is 178.8x143.0 mm (default).

Order No.		QV Active 202	QV Active 404
Type		Standard model	Standard model
Measuring range (XxYxZ)		250x200x150 mm (250x200x118 mm: when 1X objective is used)	400x400x200 mm (400x400x168 mm: when 1.5X objective is used)
Observation unit		Zoom unit (8 positions)	
Imaging device		Color CMOS camera	
Accuracy *	E1X, E1Y	(2+3L/1000)µm	
	E1Z	(3+5L/1000)µm	
	E2	(2.5+4L/1000)µm	
	Accuracy guaranteed with optics specified	1.5X objective and 5.25X Zoom ratio	
Touch-trigger probe measuring accuracy*	E1X, E1Y, E1Z	—	—
Accuracy guaranteed temperature range		20±1 ºC	20±1 ºC
Temperature compensation function		—	—

* Inspected to a Mitutoyo standard. L = length between two arbitrary points (mm)

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เครื่องวัดชิ้นงานละเอียด
QV Apex / Hyper QV
CNC Vision Measuring System

Mitutoyo guarantees the product quality. PROPRIETARY INSPECTION CERTIFICATE Mitutoyo guarantees the product quality.

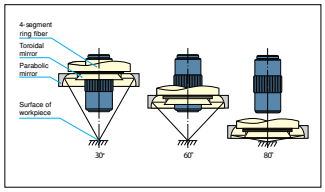
- A high-productivity CNC Vision Measuring System that can precisely and effectively perform a series of tasks from dimensional calculation to form analysis.
- The part program editing, such as changeover of the workpiece or correcting errors, is easy and straight forward.
- High specifi cations such as contour measurement or non-contact measurement are covered.
- TAF (Tracking Auto Focus) automatically follows changes in the height of the object being measured. TAF eliminates the the time that otherwise would be wasted in re-establishing focus multiple times, resulting in shorter measurement time.

QV Apex302

Hyper QV 404

Programmable ring light

Fine control of obliquity and direction provides illumination optimal for measurement.
Obliquity can be arbitrarily set in the range from 30° to 80°. Illumination can be controlled independently in every direction, back and forth, right and left.



The programmable ring light shows the effect of a finely stepped section and the enhanced contrast of an inclined plane.

Measurement example of IC package terminal bottom width

Image viewed with Co-axial light

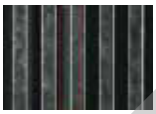
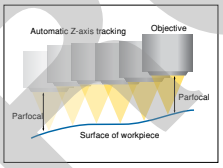


Image with programmable ring light

Tracking Auto Focus (TAF)

The TAF feature focuses continuously, adjusting to changes in the height of the object being measured. Automatic tracking of surface waves and warpage (in the Z-axis height direction) improves measurement throughput. The feature also cuts out the hassle of focusing during manual measurement, reducing the work burden for measuring system operators.
Note: Continuous measurement of displacement is not performed.

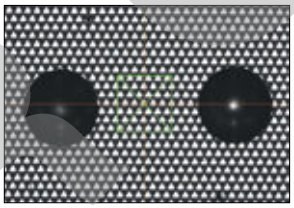


Laser source	Semiconductor laser (peak wavelength: 690 nm)
Laser safety	Class 2 (JIS C6802:2014, EN/IEC 60825-1:2014)
Auto focus system	Objective coaxial autofocusing (knife-edge method)

High-Performance Multi-Auto Focus

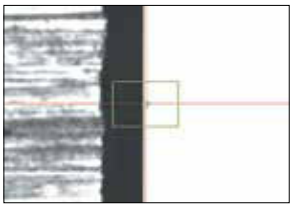
The QV Series is equipped with a high-performance image auto focus function as standard. Image auto focus is used to guarantee accuracy.
Thanks to the availability of various auto focus tools, the optimal focus for each surface texture and measured feature can be selected, which makes it possible to perform highly reliable height measurements.

Pattern Focus



The pattern focus reticule enables focusing on low contrast or mirrored surfaces, or transparent objects.

Edge Focus



Robust edge detection methods for multiple lighting techniques are available with edge focus.

Surface Focus

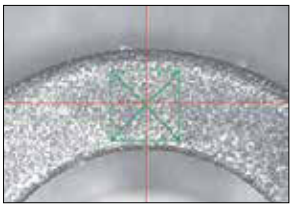


Image auto focus can be used to measure the height of a chosen area, which makes it possible to perform stable height measurements that are minimally affected by the roughness of machined surfaces and other similar surfaces.

QV Apex

Order No.		QV Apex 302	QV Apex 404	QV Apex 606
Measuring range (XxYxZ)		300x200x200 mm	400x400x250 mm	600x650x250 mm
Observation Unit		PPT1X-2X-6X		
Imaging Device		B&W CCD (1/2 inch) or 3CCD color (1/3 inch)		
Accuracy*	E1X, E1Y	(1.5+3L/1000)μm		
	E1Z	(1.5+4L/1000)μm		
	E2XY	(2+4L/1000)μm		

Hyper QV (Specifications other than as quoted in the table are the same as the QV Apex specifications.)

Order No.		Hyper QV302	Hyper QV404	Hyper QV606
Imaging Device		B&W CCD (1/2 inch)		
Accuracy*	E1X, E1Y	(0.8+2L/1000)μm		
	E1Z	(1.5+2L/1000)μm		
	E2XY	(1.4+3L/1000)μm		

* Inspected to a Mitutoyo standard. L = length between two arbitrary points (mm)

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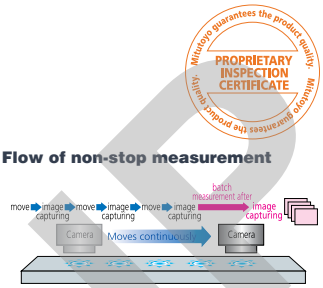
เครื่องวัดชิ้นงานละเอียด
QV STREAM PLUS
SERIES 363 — Non-stop CNC Vision Measuring System

- This non-stop CNC Vision Measuring System has achieved a reduction of measurement time compared with the normal measurement mode.
- QV STREAM PLUS employs an image capturing method that operates without stopping the stage to achieve signifi cant throughput improvement.
- In the XY measurement, the throughput has improved 5 times compared to the conventional model, achieving a major reduction in measurement time.

QV STREAM PLUS 606



Order No.		QV STREAM PLUS302	QV STREAM PLUS404	QV STREAM PLUS606
Measuring range (XxYxZ)		300x200x200 mm	400x400x250 mm	600x650x250 mm
Observation Unit		PPT1X-2X-6X		
Imaging Device		B&W CCD (1/2 inch)		
Accuracy*	E1X, E1Y	(1.5+3L/1000)μm		
	E1Z	(1.5+4L/1000)μm		
	E2XY	(2+4L/1000)μm		
Tracking auto focus device		Optional		

* Only one of the illumination functions (reflected, transmitted, and PRL illumination) can be set in STREAM mode. The 4-way PRL illumination can be set to 4-direction lighting or single-direction lighting.

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เครื่องวัดชิ้นงานละเอียด
QV ACCEL
Large CNC Vision Measuring System

- A large CNC Vision Measuring System suitable for measuring large, thin workpieces.
- The model best suited to the workpiececan be selected from a measuring range of 800x800 mm to 1500x1750 mm.
- In measurement, highspeed acceleration and deceleration is achieved by adopting the center drive method.
- Thanks to the moving gantry design of QV ACCEL, the stage does not need to move, therefore workpiece fi xturing can be simplifi ed.

QV ACCEL 808

Order No.		QV ACCEL808	QV ACCEL1010
Measuring range (XxYxZ)		800x800x150 mm	1000x1000x150 mm
Observation Unit		PPT1X-2X-6X	
Imaging Device		B&W CCD (1/2 inch)	
Accuracy*	E1X, E1Y	(1.5+3L/1000)μm	
	E1Z	(1.5+4L/1000)μm	
	E2XY	(2.5+4L/1000)μm	
Repeatability*	E2XY	3σ=0.2 μm	
	E2XY	3σ=0.7 μm	
Tracking auto focus device		Optional	

* Inspected to a Mitutoyo standard. L = length between two arbitrary points (mm)

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เครื่องวัดชิ้นงานละเอียด
ULTRA QV404
Ultra-High Accuracy CNC Vision Measuring System

Mitutoyo guarantees the product quality. PROPRIETARY INSPECTION CERTIFICATE Mitutoyo Guarantees the product quality.

- ULTRA QV404 PRO is an ultra-high accuracy CNC vision measuring system that offers the world's highest level of measurement accuracy, E1XY: (0.25+L/1000)µm.
- A high-rigidity, fi xed-bridge moving table design is adopted for the Y axis, and the X- and Y-axis guides have excellent wear resistance. The base is granite for high thermal stability.
- The high-precision scales are made of a crystallized glass whose expansion coeffi cient is almost zero, and feature a high resolution of 0.01 µm. A vibration absorption system and floating ball-screw mechanism ensure a highly accurate Y-axis drive.

ULTRA QV404

Order No.		ULTRA QV404
Measuring range (XxYxZ)		400x400x200 mm
Observation Unit		PPT1X-2X-6X
Imaging Device		B&W CCD (1/2 inch)
Accuracy (E1)*1	E1X, E1Y	(0.25+L/1000)µm
	E1Z (Full stroke)	(1.5+2L/1000)µm (Range 200 mm)
	E1Z (50 mm stroke)*2	(1.0+2L/1000)µm (Range 10 to 60 mm)
Accuracy (E2)*1	E2XY	(0.5+2L/1000)µm
Tracking auto focus device		Optional

*1: Inspected to a Mitutoyo standard. L = length between two arbitrary points (mm)
*2: Verified at shipment from factory.

เครื่องวัดชิ้นงานละเอียด
Hyper QV WLI
Non-contact 3D measuring system

MeasurLink® ENABLED
Data Management Software by Mitutoyo

Mitutoyo guarantees the product quality. PROPRIETARY INSPECTION CERTIFICATE Mitutoyo Guarantees the product quality.

- The best-ever effi ciency and accuracy are achieved by combining imaging with the WLI optical head.
- High accuracy, dual-head vision measuring system equipped with a white light interferometer.
- For measurement that requires dimensional measurement and height/surface texture evaluation, high efficiency is offered by performing all tasks with one machine.

Hyper QV WLI 606

Order No.		Hyper QV WLI 302	Hyper QV WLI 404	Hyper QV WLI 606
Measuring range (XxYxZ)	Vision measuring area	300x200x190 mm	400x400x240 mm	600x650x220 mm
	WLI measuring area*1	215x200x190 mm	315x400x240 mm	515x650x220 mm
WLI optical head unit				
View field (HxV)		5X lens: approx. 0.64x0.48 mm / 10X lens: approx. 0.32x0.24 mm / 25X lens: approx. 0.13x0.10 mm		
Repeatability		2σ≦ 0.08 µm		
Vision optical head unit				
Observation unit		PPT1X-2X-6X		
Imaging device		B&W CCD (1/2 inch)		
Accuracy*	E1X, E1Y	(0.8+2L/1000)µm		
	E1Z	(1.5+2L/1000)µm		
	E2XY	(1.4+3L/1000)µm		

*1: Movable range of WLI optical head.
*2: Inspected to a Mitutoyo standard. L = length between two arbitrary points (mm)

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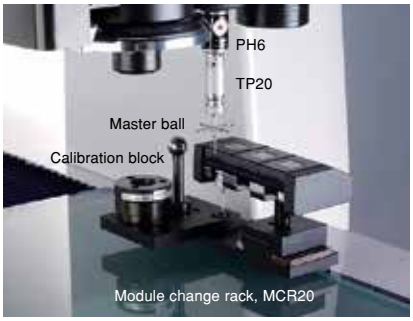
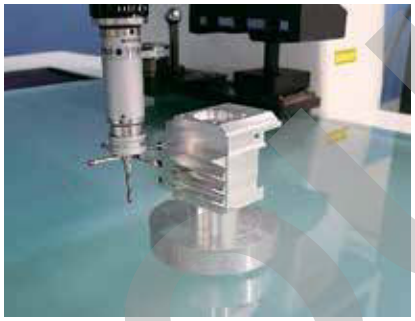
เครื่องวัดชิ้นงานละเอียด
QV TP
CNC Vision Measuring System equipped with a Touch Trigger Probe

Non-contact and contact measurement on one machine
QV touch-trigger probe unit enables both vision measurement and touch-trigger probe measurement.

3D workpiece measurement
Measures three-dimensional workpieces such as molded products resin molded products, machined products, and more.

Module change rack available
Easily change between vision and touch probe measurement with a module change rack.





Specifications with touch probe options mounted

Order No.		QVTP Active 202	QVTP Apex302 Hyper QVTP302	QVTP Active 404	QVTP Apex404 Hyper QVTP404	QVTP Apex 606 Hyper QVTP606
Measuring Accuracy*1	Vision	250x200x150 mm	300x200x200 mm	400x400x200 mm	400x400x250 mm	600x650x250 mm
(XxYxZ)	Common to Touch Trigger Probe	184x200x150 mm	234x200x200 mm	334x400x200 mm	334x400x250 mm	534x650x250 mm
Measuring accuracy*2 (Touch probe)	E1X, E1Y, E1Z	(2.4+3L/1000)μm	QVTP Apex: (1.8+3L/1000)μm Hyper QVTP: (1.7+3L/1000)μm	(2.4+3L/1000)μm	QVTP Apex: (1.8+3L/1000)μm Hyper QVTP: (1.7+3L/1000)μ m	

*1: When a module change rack, a master ball, and a calibration ring are mounted, the measurement ranges are smaller than those in the table. Other specifications are the same as those for QV Apex, Hyper QV, and QV ACCEL.
Please contact our sales office for more details.
*2: Inspected by Mitutoyo standard. L = length between two arbitrary points (mm)

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เครื่องวัดชิ้นงานละเอียด
QVH Apex / Hyper QVH / QVH ACCEL / QVH STREAM PLUS
CNC Vision Measuring System equipped with Non-contact displacement sensor

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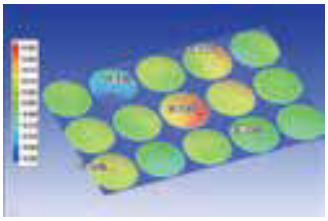
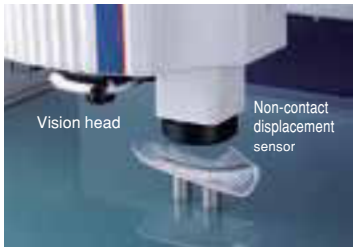
- A multi-sensor measuring machine equipped with an imaging optical head and non-contact displacement sensor. Both vision measurement and non-contact form measurement are possible.
- The laser probe equipped HYBRID TYPE1 and CPS probe equipped HYBRID TYPE4 are available.

Example of 3D form comparison






QVH4 606

Features: HYBRID TYPE1
- The focusing point method minimizes the difference in the measuring face reflectance and achieves high measurement reproducibility.
- Capable of measuring detailed shapes in high resolution.

Features: HYBRID TYPE4
- Enables detection of high inclination angles for both mirror and diffused Surfaces.
- The automatic lighting adjustment function allows for high accuracy measurements.
- Surface roughness or thickness measurement of thin and transparent objects such as film.

COMMON SPECIFICATIONS for TYPE1/TYPE4

Apex / Hyper / STREAM PLUS (Specifications other than as described below are the same as for models: QV Apex, Hyper QV, and QV STREAM PLUS.)

Order No.			QVH Apex302 QVH STREAM 302	Hyper QVH302	QVH Apex404 QVH STREAM 404	Hyper QVH404	QVH Apex606 QVH STREAM 606	Hyper QVH606
Measuring Accuracy (XxYxZ)	by vision probe		300x200x200 mm		400x400x250 mm		600x650x250 mm	
	by displacement sensor	TYPE1	180x200x200 mm		280x400x250 mm		480x650x250 mm	
		TYPE4	176x200x200 mm		276x400x250 mm		476x650x250 mm	
Measuring accuracy* (Touch probe)	E1	E1X, E1Y	(1.5+3L/1000)μm	(0.8+2L/1000)μm	(1.5+3L/1000)μm	(0.8+2L/1000)μm	(1.5+3L/1000)μm	(0.8+2L/1000)μm
		E1Z	(1.5+4L/1000)μm	(1.5+2L/1000)μm	(1.5+4L/1000)μm	(1.5+2L/1000)μm	(1.5+4L/1000)μm	(1.5+2L/1000)μm
	E2	E2XY	(2.0+4L/1000)μm	(1.4+3L/1000)μm	(2.0+4L/1000)μm	(1.4+3L/1000)μm	(2.0+4L/1000)μm	(1.4+3L/1000)μm
Displacement sensor accuracy*	E1	E1Z	(1.5+4L/1000)μm	(1.5+2L/1000)μm	(1.5+4L/1000)μm	1.5+2L/1000)μm	(1.5+4L/1000)μm	(1.5+2L/1000)μm

* Inspected to a Mitutoyo standard. L = length between two arbitrary points (mm)

CLASS 1 LASER PRODUCT

Safety precautions regarding QV HYBRID TYPE1
This product uses a low-power visible laser (780 nm) for measurement. The laser is a CLASS 1 EN/IEC 60825-1 device. A warning and explanation label, as shown above, is attached to the product as appropriate

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เครื่องวัดชิ้นงานละเอียด
UMAP Vision System TYPE2
SERIES 364 — Micro Form Measuring System

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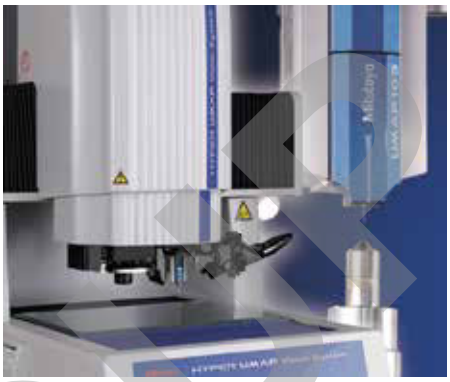
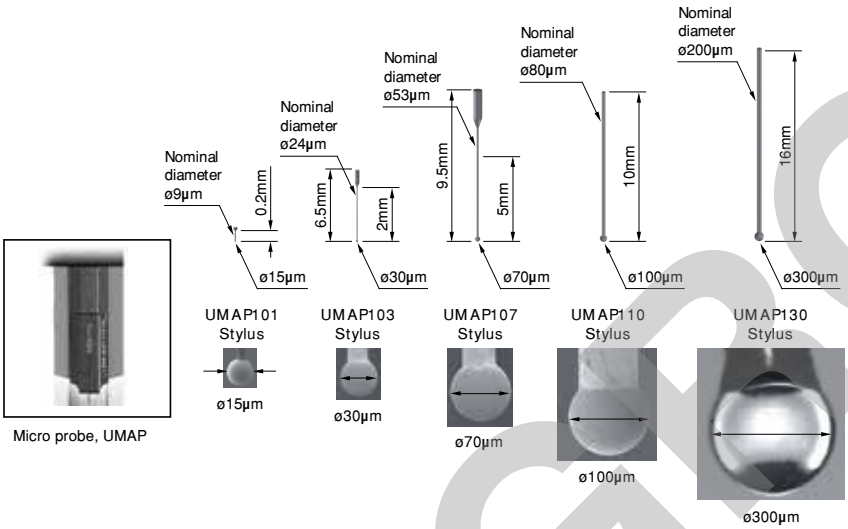
- **Ultrasonic micro probe, UMAP**
  The ultrasonic micro probe (UMAP) has the ability to sense the amplitude variability in a micro area and the optional contact points (15 to 300µm diameter) offer a large range of high accuracy measurement meeting awide variety of specifications.
- **Both high-accuracy sophisticated non-contact and contact measurement capabilities with one machine**
  This unit includes the UMAP and the non-contact type vision head. Until now, it was difficult to measure micro areas, but it is now possible with both contact and non-contact.

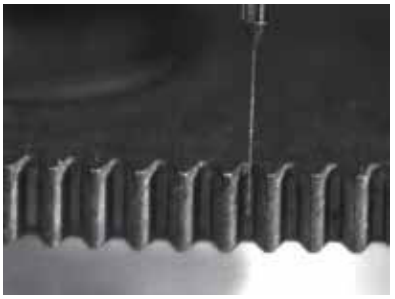




Micro probe, UMAP

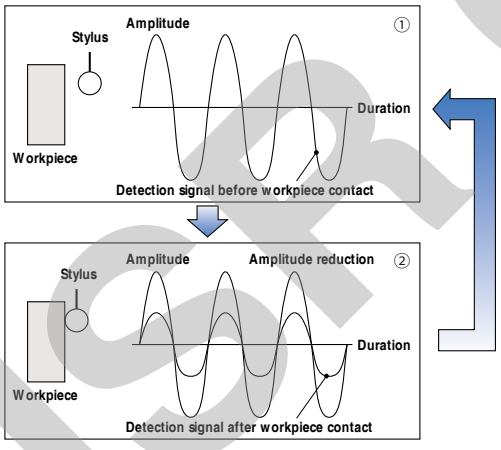
Application example

Contour measurement of a ø0.125 hole



Measuring form of micro gear teeth

Detection of surface principle



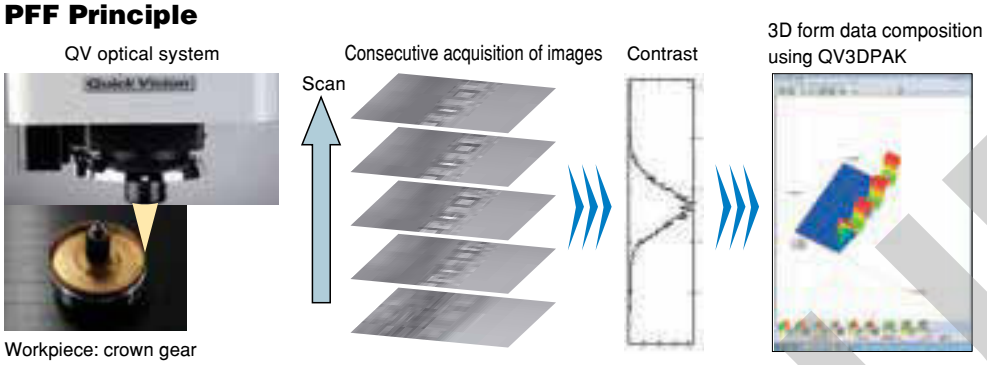
1. In this drawing, the stylus is vibrating with a micro amplitude. When it does not come into contact with the workpiece as shown, the vibration state is maintained.
2. As the stylus comes into contact with the workpiece surface the vibration amplitude decreases as the contact increases. When the decreasing amplitude falls below a certain level, a touch-trigger signal is generated.

		TYPE2	
		Hyper UMAP302	ULTRA UMAP404
Measuring range (common to vision and UMAP)	X-axis Y-axis	185x200mm	285x400mm
	Z-axis	175mm: UMAP101/103 180mm: UMAP107/110 185mm: UMAP130	
Measuring accuracy (Vision)	E1X, E1Y	(0.8+2L/1000)µm	(0.25+L/1000)µm
	E1Z	(1.5+2L/1000)µm	
Repeatability	UMAP 101/103/107	σ = 0.1 µm	σ = 0.08µm
	UMAP 110/130	σ = 0.15 µm	σ = 0.12 µm

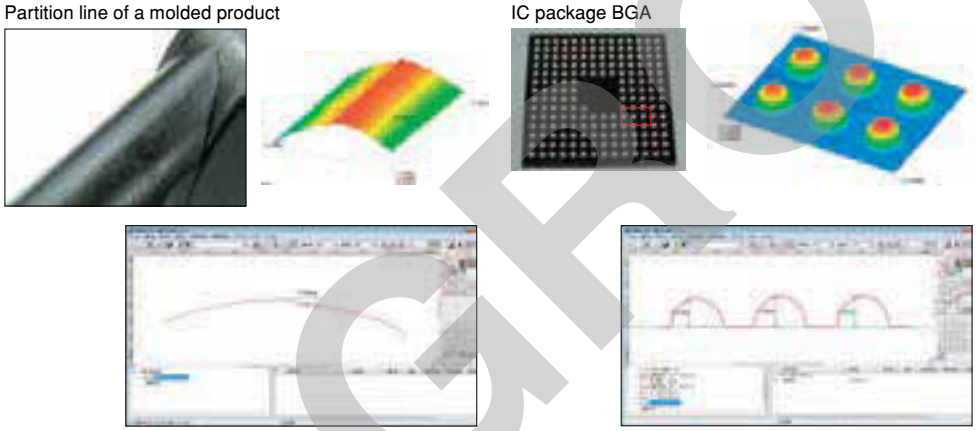
About the PFF (Points From Focus) Function

• PFF (Points From Focus) is an application that can use the image contrast of the Quick Vision Series to perform non-contact 3D form measurements. The Mitutoyo inspection method guarantees the Z-direction repetition accuracy, so it is possible to perform highly accurate form measurements.

PFF Principle



PFF Measurement Example



PFF Measurement Performance

PFF guarantees, by way of the Mitutoyo inspection method, the Z-direction repetition accuracy.

Order No.	QV Apex/QV ACCEL	Hyper QV	ULTRA QV
Z-direction repetition accuracy	2σ≦1.5 μm	2σ≦1.5 μm	2σ≦0.7 μm
Optical magnification guaranteed to be accurate	QV-HR2.5X + PT2X	QV-HR2.5X + PT2X	QV-5X + PT2X

Note 1: When using the PFF function, employ the QV3DPAK software and a PFF-compatible objective.
Note 2: The PFF-compatible models are the PRO versions of the machines listed in the table above (including TP, HYBRID and UMAP machines).

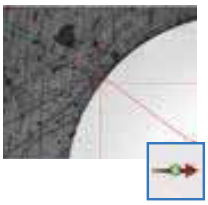
ซอฟแวร์
Data Processing Software for QUICK VISION QVPAK

MeasurLink® ENABLED
Data Management Software by Mitutoyo

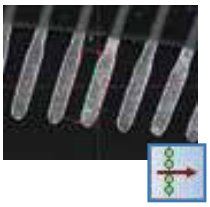
MiCAT
the standard in world metrology software
VISION

• The X, Y, and Z position data is detected from the measurement data gathered by the Quick Vision system and the arithmetic processing of coordinates and dimensions is performed immediately.

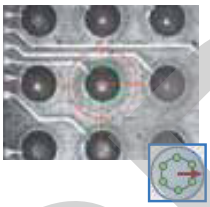
Edge Detection Tools



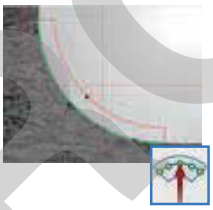
Point Tool
This is a basic tool for detecting one point.



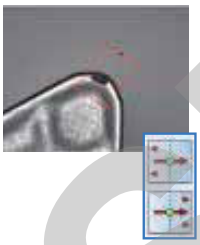
Line Tool
This tool detects linear edges with a minimum of one pixel space. Compared to the point tool, the line tool can perform averaging and remove abnormal points, which enables stable measurements.



Circle Tool
This tool detects circular edges with a minimum of one pixel space. Edges can be specified easily with a single click.

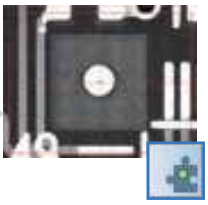


Arc Tool
This tool is suited to detection of arcs and corner radii.

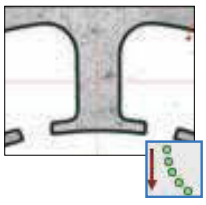


Maximum / Minimum Tool
This tool detects the maximum or minimum point within the range.

Area Centroid Tool
This tool detects the position of a form's centroid, and is suited to the positioning of different forms.



Pattern Search Tool
This tool performs pattern matching to detect a position, and is optimal for positioning alignment marks and similar tasks.



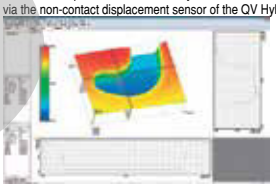
Auto Trace Tool
This is a shape-measuring tool that automatically tracks a contour with input consisting only of a start point and end point.

Application software (Options)

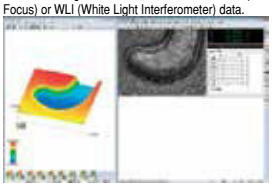
QV PartManager
The QV PartManager is execution program management software for multiple workpieces arranged on the measuring stage.

Form assessment/analysis software
FORMTRACEPAK-AP
Verification of designed value and form analysis are performed on the basis of the contour data obtained via the QV auto trace tool, non-contact displacement sensor, PFF, and WLI.I.

FORMTRACEPAK-PRO
This software performs 3D form analysis from the data obtained via the non-contact displacement sensor of the QV Hybrid series.



QV3DPAK
This software generates 3D forms from the PFF (Points From Focus) or WLI (White Light Interferometer) data.



Measurement support software
QV3DCAD-OnLine
This software creates QVPAK measurement procedure programs using 3D CAD data. This allows users to reduce the program creation manhours needed and shorten lead times.

QV-CAD I/F
This software displays CAD data in the graphic window to improve measurement operability.

Off-line teaching software
EASYPAG PRO
This software creates QVPAK measurement procedure programs using 2D CAD data. This allows users to reduce the program creation man-hours needed and shorten lead times.

Test chart software/Statistical processing software
MeasureReportQV
This software creates an inspection report from the QV measurement results.

MeasurLink
This software enables statistical arithmetic processing of measurement results.

External control software
QVEio
This is client application software that can externally control QVPAK or provide the operating status of QVPAK by connecting a PLC or remote software on an external PC. This software can be used for connecting an automatic transfer robot to a signal tower.

Mitutoyo

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Data Management Software by Mitutoyo

Vision Measuring System
เครื่องวัดชิ้นงานละเอียด
Micro Form Measuring System
เครื่องวัดชิ้นงานละเอียด
Data Processing Software
ซอฟแวร์
Quick Scope Series
เครื่องวัดชิ้นงานละเอียด
Quick Image Series
เครื่องวัดชิ้นงานละเอียด

เครื่องวัดชิ้นงานละเอียด
QS-LZ / AFC
Manual Vision Measuring System

- This is a manual vision measuring machine equipped with a color camera and zoom lens.
- The Quick Release System on the stage enables rapid relocation and fine adjustment of the measuring point, which is a real time saver when working with large dimensions.
- A control box provides convenient access to the frequently used functions including illumination setting, zero-clear of the counter and auto focusing.
- An auto-focus system is fitted and noncontact height measurement is possible.
  Accuracy of E1z (4.5+6L/1000) μm is guaranteed.

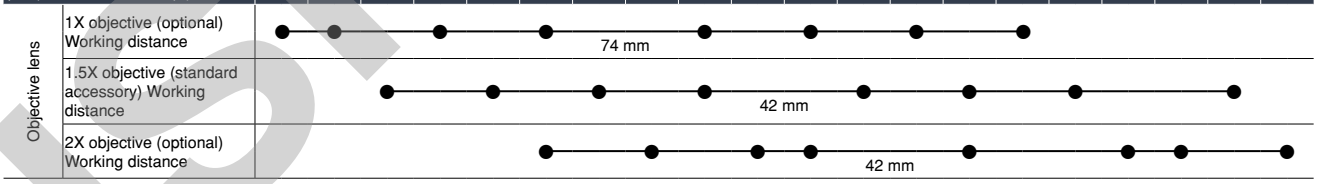
QS-L2010Z/AFC

Model No.		QS-L2010Z/AFC	QS-L3017Z/AFC	QS-L4020Z/AFC
Drive method		Autofocus equipped, X-, Y-axis: manual; Z axis: motor-operated		
Optical magnification		Zoom 0.5X to 3.5X (8 steps with 1.5X and 2X objectives)		
Total magnification *1		Co-axial light, stage light, 4-quadrant ring light, white LED		
Measuring range (X Y Z)		200x100x150 mm	300x170x150 mm	400x200x150 mm
Image detection method		3 megapixel, Color CCD camera		
Indication accuracy *1	X axis, Y axis	(2.2+20L/1000)µm		
	Z axis	(4.5+6L/1000)µm		

*1: Specification applicable to 20°C, zoom magnification 2.5X.

From wide view measurement to micro-measurement

Optical magnifi cation		0.5X	0.65X	0.75X	0.85X	0.98X	1X	1.28X	1.3X	1.5X	1.7X	2X	2.25X	2.5X	3X	3.5X	3.75X	4X	5X	5.25X	7X
View field (mm)	Horizontal (H)	13.60	10.46	9.07	8.00	6.94	6.80	5.31	5.23	4.53	4.00	3.40	3.02	2.72	2.27	1.94	1.81	1.70	1.36	1.30	0.97
	Vertical (V)	10.80	8.31	7.20	6.35	5.51	5.40	4.22	4.15	3.60	3.18	2.70	2.40	2.16	1.80	1.54	1.44	1.35	1.08	1.03	0.77



เครื่องวัดชิ้นงานละเอียด
Quick Image
Non-contact 2D Vision Measuring System

MeasurLink® ENABLED
Data Management Software by Mitutoyo

- This series of manual 2D vision measuring machines offers high-efficiency measurement by employing a telecentric optical system that has a deep focal depth and a wide view monitor.
- The stitching function enables the entire display of a large workpiece so that highly accurate and speedy measurement can be performed.
- A model equipped with a motorized stage has been added to the series to offer easy and comfortable stage operation.
- A single click enables multiple measurements in one display. A batch measurement can be applied to multiple workpieces in the display after executing a pattern search based on the workpiece position.
- This series is equipped with a megapixel color camera. Even with low magnification, high repeatability can be obtained.
- The choice of five stage sizes makes it easy to choose a machine to suit the users's application.
- The video window automatically displays the measuring machine, which enables quick verification.

QI-C2017D

A motorized stage

		Manual stage model					Motorized stage model		
0.2X	Order No.	QI-A1010D	QI-A2010D	QI-A2017D	QI-A3017D	QI-A4020D	QI-C2010D	QI-C2017D	QI-C3017D
0.5X	Order No.	QI-B1010D	QI-B2010D	QI-B2017D	QI-B3017D	QI-B4020D			
Measuring range (X Y)		100x100 mm	200x100 mm	200x170 mm	300 170 mm	400x200 mm	200x100 mm	200x170 mm	300x170 mm
Effective stage glass size		170x170 mm	242x140 mm	260x230 mm	360x230 mm	440x232 mm	242x140 mm	260x230 mm	360x230 mm
Maximum stage loading *		Approx. 10 kg		Approx. 20 kg		Approx. 15 kg	Approx. 10 kg	Approx. 20 kg	
Main unit mass		Approx. 65 kg	Approx. 69 kg	Approx. 150 kg	Approx. 158 kg	Approx. 164 kg	Approx. 72 kg	Approx. 153 kg	Approx. 161 kg

* Does not include extremely offset or concentrated loads

Order No.			QI-A / QI-C	QI-B
View field			32 24 mm	12.8 9.6 mm
Measurement mode			High resolution mode / Normal mode *4	
Travel range (Z axis)			100 mm	
Accuracy	Measurement accuracy within the screen *1	High resolution mode	±2 μm	±1.5 μm
		Normal mode	±4 μm	±3 μm
	Repeatability within the screen (±2σ) *2	High resolution mode	±1 μm	±0.7 μm
		Normal mode	±2 μm	±1 μm
	Measurement accuracy (E1xy) *1		(3.5+0.02) m 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	±0.6 mm	±0.6 mm
		Normal mode	±11 mm	±1.8 mm
	Working distance		90 mm	
Camera			3 megapixel, 1/2 inch, full color	
Illumination			Transmitted light: Green LED telecentric illumination Co-axial light: White LED Ring light: 4-quadrant white LED	
Power supply			100-240 VAC 50/60 Hz	
Accuracy guaranteed temperature range			20±1 ºC	

*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 a 22-inch-wide monitor)
*4: Patent registered (Japan)