CNC Vision Measuring System
QUICK VISION

Bulletin No. 2118

High accuracy CNC Vision Measuring Machines representing a full range of quality and precision

Mitutoyo

QUICK VISION:
Focusing on the essentials

VISION MEASURING
MACHINES

On the production line, in the quality control room or the laboratory, Mitutoyo offers innovative solutions for all your optical measurement requirements using state-of-the-art image processing technology. Even the most demanding customers will find an off-the-shelf instrument that suits their needs, or one that can be customized to do the job.

This brochure gives you a summary of Mitutoyo's versatile range of vision measuring machines and points you straight to the perfect device or system for your individual measuring tasks. In this brochure you will find all the essential facts on device specifications, configurations, add-ons and software.

This quick, sure and efficient guide will help you to find the system you need. More detailed individual product brochures will then give you further information on the system of your choice.

Whichever machine you choose, with vision measurement technology from Mitutoyo, you can be sure of the experience, competence and performance of one of the world's leading measurement technology specialist and customer-oriented service without comparison.

Mitutoyo: Right in the picture when it comes to precision

Quick Vision Series Evolving Toward Providing True Solutions

With sophisticated edge detection capabilities, an illumination wizard and advanced user-friendly software the Quick Vision Series satisfies the demand for compactness, high accuracy and high throughput in the field of non-contact dimensional measurement.

Continuous Evolution

Mitutoyo has marketed CNC vision measuring machines, including the Quick Vision Series, since the mid-1980s and is proud of its superb delivery record in the global marketplace.

Today, measurement professionals are becoming more and more sophisticated, demanding higher accuracy, compactness and a smaller footprint. Mitutoyo has recently relaunched the Quick Vision Series, which already has a good reputation, to address such demands. The new Quick Vision Series highly integrates advanced optical, sensing, software and vision measuring technologies which Mitutoyo has developed to help customers solve the challenges they face today and beyond.

Traceability

Mitutoyo provides calibration services accredited in three length fields (laser sources, end standards, and line standards).
Also, being the manufacturer of the most comprehensive range of precision measuring instruments available, Mitutoyo provides a number of measuring instruments traceable to national standards, such as coordinate measuring machines, optical measuring instruments, and form measuring instruments, as well as vision measuring machines.

Production of linear scales

Iodine absorption stabilized He-Ne (633 nm) laser for length measurement

Optical

The optical system employed in the Quick Vision Series is based on optical technology that Mitutoyo has accumulated over many years.
This is a practically ideal optical system where the image is flat across the entire view field of view with minimal flare. This is achieved with Mitutoyo designed and manufactured objectives.

Design and production of lenses

Software

Knowledge-Based Software to Control Quick Vision

QVPAK is a constantly evolving software package.
In combination with various other applications, QVPAK delivers multi-functional analysis along with high-speed processing and simple operation.

Kawasaki Research and Development Center

Laser Beam Safety Precautions

This machine uses a low-power Laser beam which conforms to the provisions of CLASS 2 (visible light) of JIS C6802 "Safety of laser products" for measurement. The CLASS 2 warning/description label as shown at right is attached to the main unit.

QV ELF 2.0 µm

Standard Accuracy

- Stage Size: 250 x 200 x 200mm (7.87" x 9.84" x 3.94")
- 0.1 µm High Resolution Glass Scales
- White LED Programmable Ring Light
- Mitutoyo High Resolution Optics Highest Range in the Industry (16x-4800x)
- Pattern Focus is Standard
- Patented automatic lighting tools

QV APEX 1.5 µm

High Accuracy

- Stage Size for the 302: 300 x 200 x 200mm (11.81" x 7.87" x 7.87")
- Stage Size for the 404: 400 x 400 x 250mm (15.75" x 15.75" x 9.84")
- Stage Size for the 606: 600 x 650 x 250mm (23.62" x 25.59" x 9.84")
- 0.1 µm High Resolution Glass Scales
- Multi-Colored LED Ring Light
- Mitutoyo High Resolution Optics Highest Range in the Industry (16x-4800x)
- Pattern Focus is Standard
- Easy to Use Windows® Interface

Mitutoyo

QV HYPER 0.8 µm

Hyper Accuracy

- Stage Size for the 302: 300 x 200 x 200mm (11.81" x 7.87" x 7.87")
- Stage Size for the 404: 400 x 400 x 250mm (15.75" x 15.75" x 9.84")
- Stage Size for the 606: 600 x 650 x 250mm (23.62" x 25.59" x 9.84")
- 0.02 µm High Resolution Glass Scales
- Multi-Colored Ring Light
- Mitutoyo High Resolution Optics Highest Range in the Industry (16x-4800x)
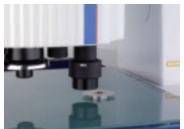- Pattern Focus is Standard
- 3-D Standard Functionality

Sensor Systems

- QV Touch Probe
- Laser Probes (LIH Type 1) or (CPS Type 4)
- UMAP Probe (micro-probe technology from 15µm - 300µm)
- White Light Interferometry (WLI)
- Points From Focus (PFF) Video based (available on all Quick Vision Systems)

QV Touch Probe

Laser Probe   UMAP Probe   White Light Interferometry (WLI)   Points From Focus (PFF)

Compact Vision Measuring Machine
Quick Vision ELF
QV-ELF

Compact device for powerful and economic vision measurement.

Accuracy:
2.0 µm

- CNC-controlled
- Triangular pattern focusing for low-contrast surfaces
- Programmable magnification changer 1X, 2X and 6X
- High-precision measurement lens system 1X, 2.5X, 5X, 10X and 25X
- High-resolution CCD black and white camera
- Resolution 0.1 µm (0.0001mm)
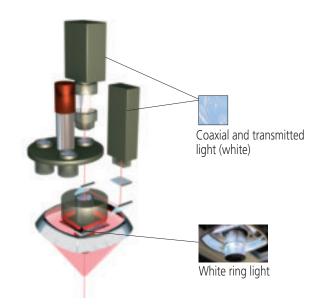- "One-click tool" technology for optimum edge detection
- User-friendly QVPAK software

Specifications

Name		Quick Vision - ELF	
Model No.		QV-E202	QV-E202 LAF
Measuring range (X × Y × Z)		9.84" x 7.87" x 7.87" (250 × 200 × 200mm)	
Resolution / scale unit		0.1µm / reflective-type linear encoder	
CCD camera		B & W	
Illumination unit	Vertical reflected stage light	White LED	
	Coaxial	White LED	
	Programmable Ring light	White LED	
Measuring accuracy	E_1X / Y axes	(2+3L / 1000) µm	
	E_1Z axis	(3+5L / 1000) µm	
LAF repeatability*[1]		–	σ : 0.4µm
Stage glass size		12.28" x 10.59" (312 x 269mm)	
Maximum stage loading		33lbs. (15kg)	
Dimensions of main unit		23.07" x 33.35" x 60.16" (586 x 847 x 1528mm)	
Mass of main unit (including mounting stand)		595lbs. (270kg)	

*1: Applicable to the LAF model only. (Optional)
Remarks: The measuring accuracy is evaluated according to a Mitutoyo inspection method. "L" indicates an
 arbitrary measuring length (unit: mm).
 The accuracy is guaranteed under the following optical conditions: (QV-HR2.5X or QV-SL2.5X) + tube lens 1X.

Coaxial and transmitted light (white)

White ring light

High Accuracy CNC Vision Measuring Machine
Quick Vision

QV-APEX

QV-APEX

Floor-standing CNC model designed for demanding tasks in vision-based measurement and featuring a choice of accuracy specifications. Incorporates four-color LED Coaxial and ring lights.

Accuracy:
1.5 μm

- CNC-controlled
- Triangular pattern focusing for low-contrast surfaces
- Programmable magnification changer 1X, 2X and 6X
- White LED transmitted stage light
- LED Coaxial light with variable light color
- Programmable 4-quadrant LED ring light with variable light color
- High-precision measurement lens system 1X, 2.5X, 5X, 10X and 25X
- High-resolution CCD black and white camera
- Resolution: 0.1 μm (0.0001 mm)
- "One-click tool" technology for optimum edge detection
- User-friendly QVPAK software

White LED transmitted light
4-color LED Coaxial light
(RGB + white)

4-color LED ring light
(RGB + white)

Specifications

Name		QV-APEX302	QV-APEX404	QV-APEX606
Optical System		**PRO/PRO LAF**	**PRO/PRO LAF**	**PRO/PRO LAF**
Measuring range (X × Y × Z)		11.81"x7.87"x7.87" (300 × 200 × 200mm)	15.75"x15.75"x9.84"(400 × 400 × 250mm)	23.62"x25.59"x9.84"(600 × 650 × 250mm)
Resolution / scale unit		0.1μm / reflective-type linear encoder		
CCD camera		B & W		
Illumination unit	Vertical reflected stage	White LED		
	Coaxial	Color LED		
	PRL (Ring Light)	Color LED		
Measuring accuracy	E_1X/Y axes	(1.5+3L / 1000) μm		
	E_1Z axis	(1.5+4L / 1000) μm		
	E_2X-Y plane	(2+4L / 1000) μm		
LAF repeatability*[1]		σ : 0.4μm		
Maximum stage loading		44lbs.(20kg)	88lbs.(40kg)	110lbs.(50kg)
Mass of main unit (including mounting stand)		794lbs.(360kg)	1,276lbs.(579kg)	3,197lbs.(1450kg)

*1: Applicable to the LAF model only. (Optional)

Remark: The measuring accuracy is evaluated according to a Mitutoyo inspection method. "L" indicates an arbitrary measuring length (unit: mm).
Accuracy is guaranteed under the following optical conditions: (QV-HR2.5X or QV-SL2.5X) + tube lens 1X for PRO.

Hyper Accuracy CNC Vision Measuring Machine
Quick Vision

QV-HYPER

QUICK VISION HYPER

Accuracy:
0.8 μm

- CNC-controlled
- Triangular pattern focusing for low-contrast surfaces
- Programmable magnification changer 1X, 2X and 6X
- A choice of measuring range similar to the QV-APEX combined with higher accuracy.
- QV-HYPER is equipped with RGB color LED illumination, a programmable power turret (PPT), and a programmable ring light (PRL) as standard. The laser auto focus (LAF) option is also available.
- A low-expansion glass scale with a linear thermal expansion coefficient of only $(0 \pm 0.02) \times 10^{-6}$/K helps provide the exceptional accuracy specification. Errors due to temperature fluctuation have been minimized. (resolution 0.02 μm)
- "One-click tool" technology for optimum edge detection
- User-friendly QVPAK software

* LAF (Laser Auto Focus) is available as an option

Conventional glass scale

Ultra-high accuracy crystallized glass scale

White LED transmitted light
4-color LED Coaxial light
(RGB + white)

4-color LED ring light
(RGB + white)

Specifications

Name		QV-HYPER302	QV-HYPER404	QV-HYPER606
Optical System		PRO/PRO LAF		
Measuring range (X × Y × Z)		11.81" x 7.87" x 7.87" (300 × 200 × 200mm)	15.75" x 15.75" x 9.84" (400 × 400 × 250mm)	23.62" x 25.59" x 9.84" (600 × 650 × 250mm)
Variable magnification unit		Programmable Power Turret 1X, 2X, 6X		
Resolution / scale unit		0.02μm / reflective-type linear encoder*1		
CCD camera		B & W		
Measuring accuracy	E_1X / Y axes	(0.8+2L / 1000) μm		
	E_1Z axis	(1.5+2L / 1000) μm		
	E_2X-Y plane	(1.4+3L / 1000) μm		
LAF repeatability*2		σ : 0.4μm		
Maximum Stage Loading		33 lbs. (15kg)	66 lbs. (30kg)	88 lbs (40kg)
Mass of main unit (including mounting stand)		794 lbs. (360kg)	1,276 lbs. (579kg)	3,197 lbs (1450kg)

*1: Low-expansion glass scale: $(0 \pm 0.02) \times 10^{-6}$/K
*2: Applicable to the LAF model only. (Optional)

Remark: The measuring accuracy is evaluated according to a Mitutoyo inspection method.
For other specifications, refer to the QV-APEX specifications.
The accuracy is guaranteed under the following optical conditions: (QV-HR2.5X or QV-SL2.5X) + tube lens 1X.
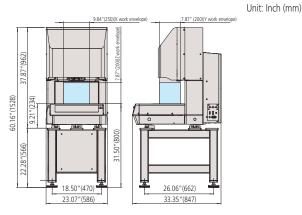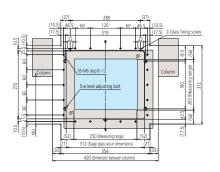
Mitutoyo

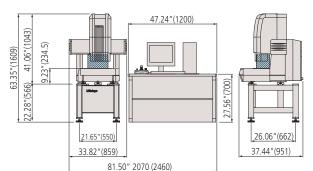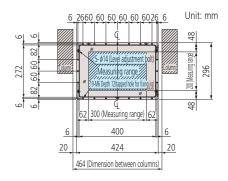# External Dimensions and Dimensions of Measuring Tables

QV-ELF

Unit: Inch (mm)

Unit: mm

QV-APEX/HYPER 302

Unit: Inch (mm)

Unit: mm
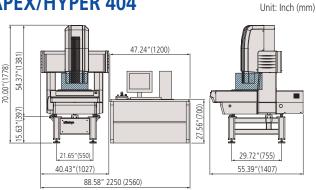

QV-APEX/HYPER 404

Unit: Inch (mm)

Unit: mm

QV-APEX/HYPER 606
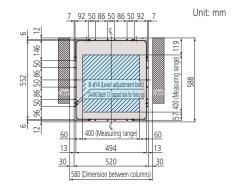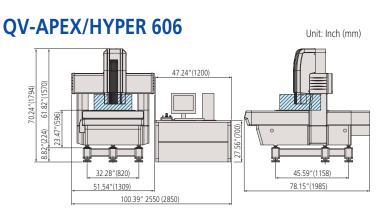
Unit: Inch (mm)

Unit: mm
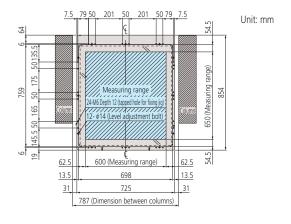
QUICK VISION Advanced Optics

Quickly change magnification without calibration or refocusing.

All QUICK Vision models feature programmable switchover between 1X, 2X and 6X magnification to let you select the optimum image size during the measurement cycle – and it's fast, with no need to calibrate and re-focus.

Depending on the magnification, the pixel size and light intensity are adapted to each new adjustment. This allows for 16x to 4800x magnification screen, depending on the objective lens used (0.5X, 1X, 2.5X, 5X, 10X, 25X).

QV Objective Lenses

Objective Lens		QV-SL0.5x	QV-HR1x	QV-SL1x	QV-HR2.5x	QV-SL2.5x	QV-5x	QV-HR10x
Code No.		02AKT199	02AKT250	02ALA150	02AKT300	02ALA170	02ALA420	02AKT650
Optical Magnification		0.5x	1x		2.5x		5x	10x
Working Distance		30.5mm	40.6mm	52.5mm	40.6mm	60mm	33.5mm	20mm
Field of View	1x	12.54×9.4mm	6.27×4.7mm		2.49×1.86mm		1.24×0.93mm	0.62×0.47mm
	2x	6.27×4.7mm	3.13×2.35mm		1.24×0.93mm		0.62×0.47mm	0.31×0.23mm
	6x	2.09×1.56mm	1.04×0.78mm		0.41×0.31mm		0.20×0.15mm	0.10×0.07mm

QV-SL0.5x QV-HR10x QV-10x QV-25x offered in addition to the system included objective.

Points From Focus Objective Lenses

Objective Lens		QV-HR2.5x	QV-5x	QV-HR10x	QV-25x
Code No.		02AKX895	02AKX900	02AKX905	02AKX910
Optical Magnification		2.5x	5x	10x	25x
Working Distance		40.6mm	33.5mm	20mm	13mm
Field of View	1x	2.49×1.86mm	1.24×0.93mm	0.62×0.47mm	0.25×0.18mm
	2x	1.24×0.93mm	0.62×0.47mm	0.31×0.23mm	0.10×0.07mm
	6x	0.41×0.31mm	0.20×0.15mm	0.10×0.07mm	0.04×0.03mm

PFF objectives are factory mapped and include compensation data.

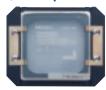Parabolic mirror of the programmable ring light

Calibration chart

(for vision optical head & WLI optical head) Used for pixel size compensation of CCDs and for compensating autofocusing accuracy and optical axis offset at various magnifications of variable magnification PPT/zooming.
Note: There are some limitations to the function of each lens. Please contact one of our sales offices for details.

QV compensation chart (for vision optical head)

Glass chart designed for "in-screen compensation" to compensate for the distortion occurring in the screen caused by the optical system and for "auto-focusing compensation" to minimize auto-focusing fluctuations caused by the object' pattern and texture.

Note: There are some limitations to the function of each lens. Please contact one of our sales offices for details.

Mitutoyo

QUICK VISION Advanced Illumination

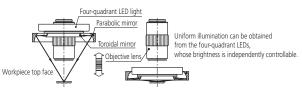## Programmable Ring Light (PRL)

Changing the positions of the two curved mirrors sets the ring light's obliquity to any chosen value between 30° and 80°.
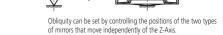This is effective for enhancing the edges of inclined surfaces or very small steps.
Furthermore, the PRL light's illumination can be controlled independently in every direction, front and back, right and left.
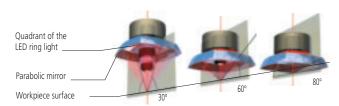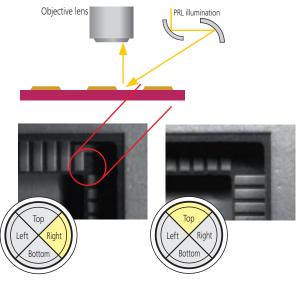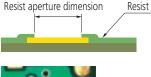This makes it possible to configure highly variable lighting settings to match measurement locations.

Four-quadrant LED light
Parabolic mirror
Toroidal mirror
Objective lens
Workpiece top face

Uniform illumination can be obtained from the four-quadrant LEDs, whose brightness is independently controllable.

Obliquity can be set by controlling the positions of the two types of mirrors that move independently of the Z-Axis.

Quadrant of the LED ring light
Parabolic mirror
Workpiece surface
30°
60°
80°

Measuring the top and bottom widths of metallization patterns on an IC package

Objective lens

PRL illumination

Top
Left   Right
Bottom

Top
Left   Right
Bottom

RGB Color LED Illumination

Changing the illumination color between red, green, blue, and white allows for the detection of edges that were not able to be viewed using conventional white light.

Color LED usage example:
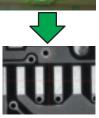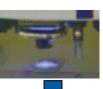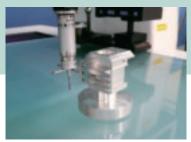Resist aperture dimensions on a printed circuit board

Resist aperture dimension   Resist

Edge enhancement

High Accuracy CNC Vision Measuring Machine with Touch Probe for ELF - APEX - HYPER

QV TP

Accuracy (TP):
2.4 µm ELF
1.8 µm APEX
1.7 µm HYPER

QV-TP

- Contact and non-contact measurement is possible with a single QV-TP series system.
- A singular coordinate system can be used between the tactile and optical systems.
- Ideal for three-dimensional measurement of press and injection molding, medical devices, electronics and automotive applications
- Available changing rack allows interchanging of probes for increased versatility.
- That provides multiple measurements utilizing several different styli.

Specifications

Name	QVTP 202	QVTP 302		QVTP 404		QVTP 606	
Optical System	**ELF/ELF LAF**	**PRO/PRO LAF**	**HYPER/HYPER LAF**	**PRO/PRO LAF**	**HYPER/HYPER LAF**	**PRO/PRO LAF**	**HYPER/HYPER LAF**
Measuring range (X × Y × Z)	9.84"x 7.87"x 7.87" (250 × 200 × 200mm)	11.81"x7.87"x7.87" (300 × 200 × 200mm)		15.75"x15.75"x9.84"(400 × 400 × 250mm)		23.62"x25.59"x9.84"(600 × 650 × 250mm)	
Variable magnification unit	Programmable Power Turret 1X, 2X, 6X						
Resolution / scale unit	0.1 µm (0.02 µm for HYPER) / reflective-type linear encoder						
CCD camera	B & W						
Illumination unit — Coaxial Light	White LED	—	—	—	—	—	—
Illumination unit — Stage Light	White LED	—	—	—	—	—	—
Illumination unit — Vertical reflected	—	Color LED	Color LED	Color LED	Color LED	Color LED	Color LED
Illumination unit — Contour	—	White LED	White LED	White LED	White LED	White LED	White LED
Illumination unit — PRL (Ring Light)	White LED	Color LED	Color LED	Color LED	Color LED	Color LED	Color LED
Measuring accuracy — E_1X/Y axis	(2.0+3L/1000) µm	(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
Measuring accuracy — E_1Z axis	(3.0+5L/1000) µm	(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
Measuring accuracy — E_2 X/Y axis	—	(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
TP — E, X-Y-Z plane	(2.4+3L/1000) µm	(1.8+3L / 1000) µm	(1.7+3L / 1000) µm	(1.8+3L / 1000) µm	(1.7+3L / 1000) µm	(1.8+3L / 1000) µm	(1.7+3L / 1000) µm
QV Objective lenses	2.5 QV-HR 2.5x QV-SL2.5x						
LAF repeatability*[1]	σ : 0.4µm						
Stage glass size	12.28"x10.59" (312 × 269mm)	15.71"x10.67"(399 × 271mm)		12.41"x21.69"(493 × 551mm)		27.44"x29.84"(697 × 758mm)	
Maximum stage loading	33 lbs.(15kg)	44 lbs.(20kg)	33 lbs.(15kg)	88 lbs.(40kg)	66 lbs.(30kg)	110 lbs.(50kg)	88 lbs.(40kg)
Dimensions of main unit	23.07"x33.35"x60.16"(586×847×1528mm)	33.82"x37.44"x63.35"(859×951×1609mm)		40.43"x55.39"x70.00"(1027×1407×1778mm)		51.54"x78.15"x70.63"(1309×1985×1794mm)	
Mass of main unit (including mounting stand)	595 lbs.(270 kg)	794 lbs.(360kg)		1,276 lbs.(579kg)		3,197 lbs.(1450kg)	

*1: Applicable to the LAF model only. (Laser Auto Focus) Optional

Remark: The measuring accuracy is evaluated according to a Mitutoyo inspection method. "L" indicates an arbitrary measuring length (unit: mm).
Accuracy is guaranteed under the following optical conditions: (QV-HR2.5X or QV-SL2.5X) + tube lens 1X for PRO.

Note: This machine incorporates a startup system (relocation detection system), which disables operation when an unexpected vibration is applied or the machine is relocated.
Be sure to contact your nearest Mitutoyo prior to relocating this machine after initial installation.

Optional Accessories
Laser Auto Focus
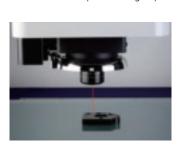Rotary Index

TTL Laser AF

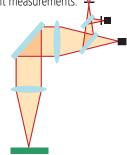### Laser autofocus system for fast and accurate measurement in the Z-axis

Except for HYBRID models, all QUICK VISION models can be equipped with a laser autofocus system for much faster and more repeatable Z-axis measurements compared to conventional autofocus technology. A TTL (through the lens) technique is used in which measuring range losses due to adjacent sensors are avoided. In addition, the visible laser point can also be used for fast and simple workpiece positioning.

Laser autofocus system.

The Coaxial laser auto focus that uses the double pinhole method and has low directivity, the Quick Vision Series is suited to perform high-speed height measurements.

Laser auto focus (LAF)

Mitutoyo offers models featuring the LAF system which enables high-speed Z axis focusing. This system allows focusing at 20 mm/second and thus is optimal for high-speed height measurement. Measurement efficiency is greatly increased when there are many measurement points such as when measuring the heights of connector terminals, for example.

*Factory-installed option

QV Index

Software-controlled rotary indexer for QUICK VISION machines

The horizontal QV Index rotary table turns the measured parts in 0.1 degree increments and thereby allows measurement of several workpiece sides without re-chucking. The software enables fully-automatic CNC operation of the additional axes. Consecutive measurements of the sides and bottom of a workpiece can be made without having to perform refixturing.This leads to a decrease in the production costs related to fixturing, which results in an improvement in measurement efficiency.
Supported models: QV302, 404, 606

Item	Specifications
Maximum workpiece size	ø140mm (Max)
Maximum faceplate loading	2kg (Max)
Resolution	0.1˚
Rotational positioning accuracy	±0.5˚
Rotational speed	10 r.p.m
External dimensions (W×D×H)	118×150×105mm

Mitutoyo

Standard Software

More Powerful, User Friendly Windows® Interface Software

Integrated dual and large monitor support

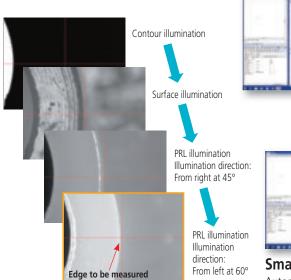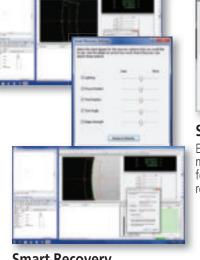Brightness   Dual Area Contrast

Patented automatic lighting tools
Automatically sets optimal light intensity

Enhanced Toolbar

Graphic-View

Program List
(Easy Editor)

Measurement Result

Contour illumination

Surface illumination

PRL illumination
Illumination direction:
From right at 45°

PRL illumination
Illumination
direction:
From left at 60°

Edge to be measured

Lighting Illumination Wizard
Sets up the optimal illumination conditions

Smart Recovery
Automatically adjusts part program
parameters to enhance program
robustness. Greatly reduces part to part
workpiece variation concerns.

Step and Repeat
Easily programs
multi-part/multi-
features using graphical
representations

Easy Editor
Intuitive graphical tree style part
programming

Optional Software

Online Teaching

QV3DCAD-OnLine

QV3DCAD-OnLine uses 3D CAD models to easily create QVPAK part programs. QV measurements can be performed by specifying an element in the CAD data. This improves program creation efficiency more than using a joystick to perform teaching.

Primary display: QVPAK   Secondary display: QV3DCAD-OnLine

Offline Teaching

EASYPAG/PRO   `DXF` `IGES` `GERBER data`

EASYPAG/PRO creates measurement part programs for QVPAK using 2D CAD data. It reduces the number of man-hours for creating part programs, thus allowing a decrease in lead time.

Line-to-arbitrary point distance measurement

Off-line teaching operation display

QV-CAD I/F   `DXF` `IGES`

Displays CAD Data on graphic window to enhance ease-of-measurement and nominal value extraction.

CAD Export function

Drawing a graphic of the measurement result

Generated CAD data

3D CAD Import function

3D CAD data display

Illustrating flatness using 3D CAD data

Form Evaluation and Analysis Software

FORMPAK-QV

FORMPAK-QV performs contour tolerancing and form analysis from data obtained with the QVPAK edge detection tools and laser probe data points.

Tolerancing example

Example of using QV-WLI to perform line and space and conductor thickness measurements on a printed circuit board
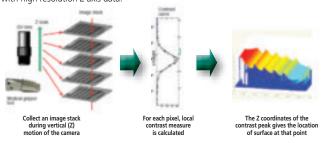
Measuring Support

MeasurLink®

A real-time display of measurement results and statistical analysis on the shop floor, with data saved in a database. Includes SPC and statistical analysis, data filtering and reporting systems for complete control of your manufacturing processes. MeasurLink includes modules for shop floor data collection, QC room data analysis and reporting, gage R&R studies, and gage tracking.
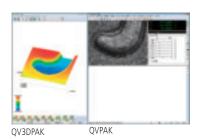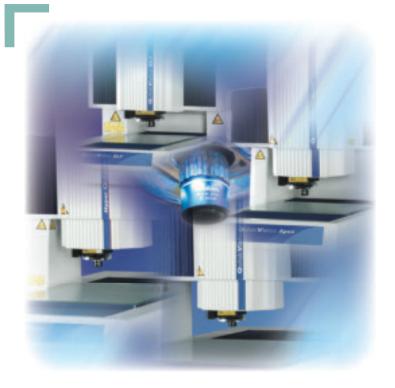

PFF (Points from Focus)

Mitutoyo developed optical data collection method that stitches images together with high resolution Z axis data.

Collect an image stack during vertical (Z) motion of the camera

For each pixel, local contrast measure is calculated

The Z coordinates of the contrast peak gives the location of surface at that point

QV3DPAK

QV3DPAK is a software application that composes 3D forms from PFF (points from focus) or WLI (white light interferometer) data.

QV3DPAK   QVPAK

- Coordinate Measuring Machines
- Vision Measuring Systems
- Form Measurement
- Optical Measuring
- Sensor Systems
- Testing Equipment and Seismometer
- Digital Scale and DRO Systems
- Small Tool Instruments and Data Management

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