

Quick Vision Accel

CNC Vision Measuring System

Bulletin No. 1759

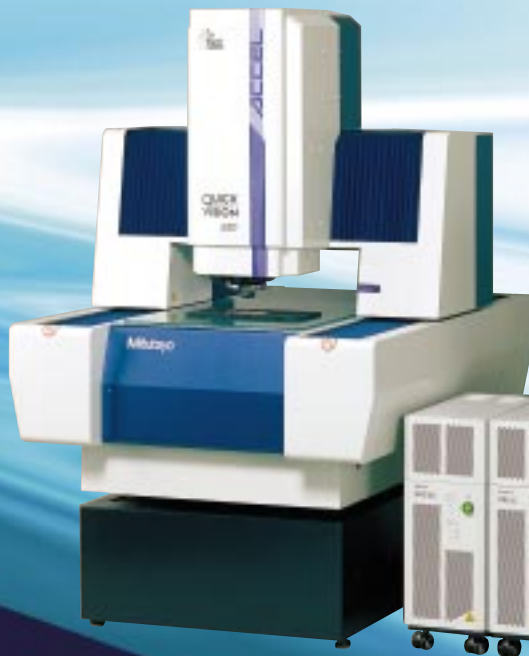


Quick Vision Accel provides the speed you need to significantly improve vision measuring system productivity.

Mitutoyo

CNC Vision Measuring System

Quick Vision



404

XYZ measuring range:
400 x 400 x 150mm (16" x 16" x 6")



Quick Vision Accel — Speed for significant measuring system productivity improvement.

Quick Vision Accel

Measurement accuracy ($E_{1\sigma}$)
Quick Vision Accel: $(1.5 + 3L/1000)\mu\text{m}$

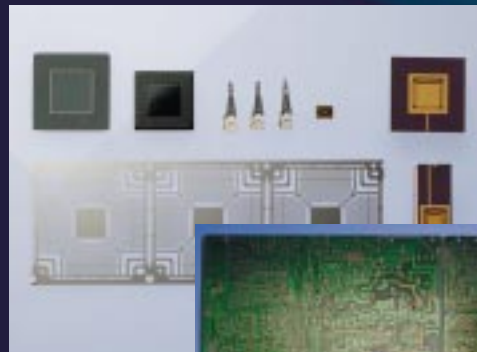
Each model has a choice of illumination/optical systems.

PRO

With programmable power turret tube lens and programmable ring light

PROIII

With programmable power turret tube lens, programmable ring light and color CCD camera



Examples of components measured using the QVA 404 model



Examples of components measured using the QVA 606 and 808 models

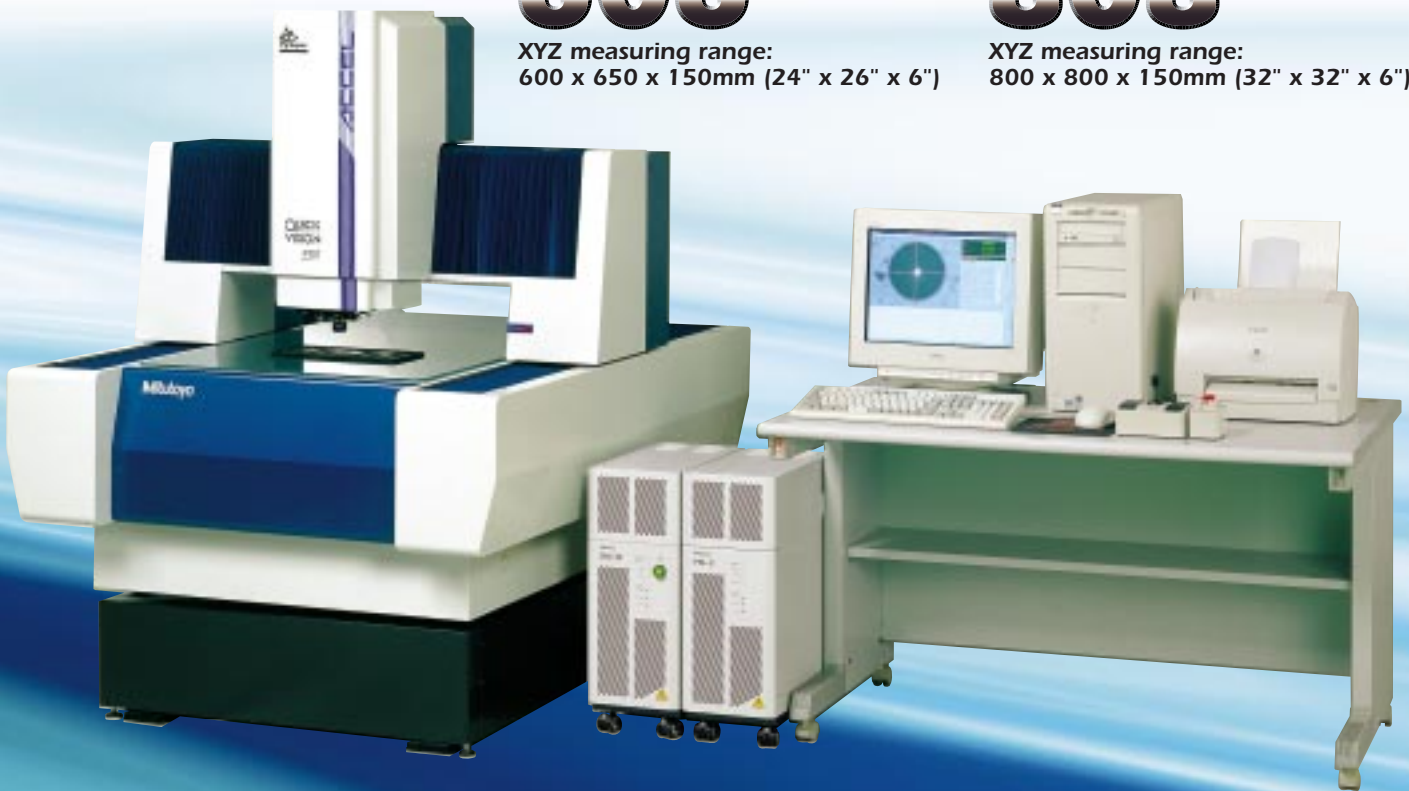
Accel

606

XYZ measuring range:
600 x 650 x 150mm (24" x 26" x 6")

808

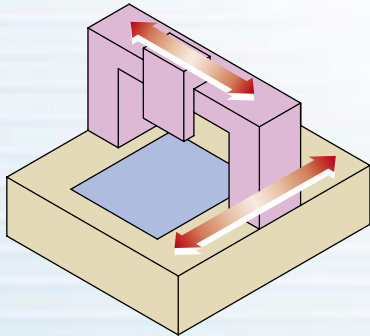
XYZ measuring range:
800 x 800 x 150mm (32" x 32" x 6")



Features of Quick Vision Accel

High-Speed Dimensional Measurement

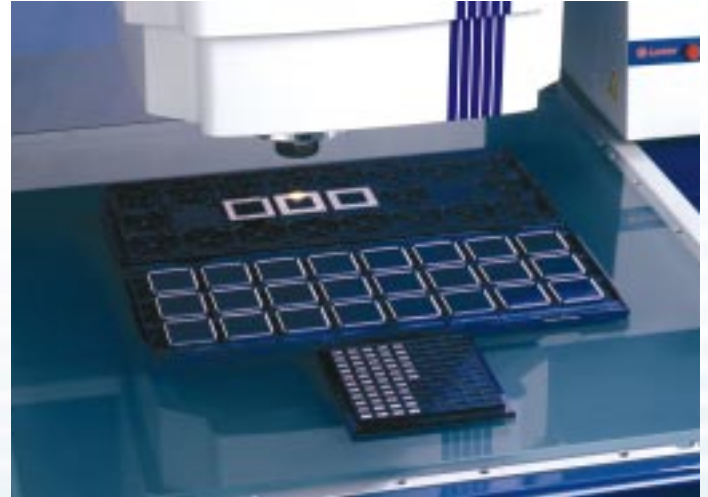
Designed with primary focus on measurement efficiency, the machine adopts a more rigid construction and drives the X and Y axes at 400 mm/s (standard model), which is approximately twice the speed of a conventional machines. In addition, accuracy of $U_{1XY} = (2.2 + 3L/1000)\mu\text{m}$ is guaranteed even during full-speed measurement, which means the efficiency of measurement increases significantly without sacrificing accuracy.



Moving-bridge type structure

Simple Workpiece Fixture

The moving-bridge type structure eliminates the need for a moving stage. This facilitates a simpler design of the workpiece fixture, resulting in a significant reduction in time required for fixture fabrication and inspection.



Specifications

Measurement range (X x Y x Z)

404 size model:
400 x 400 x 150mm (16" x 16" x 6")
606 size model:
600 x 650 x 150mm (24" x 26" x 6")
808 size model:
800 x 800 x 150mm (32" x 32" x 6")

Resolution

0.1 μm

Length standard

Reflective linear encoder

Measuring accuracy (at 20°C)

Quick Vision Accel:
 $U_{1XY} = (1.5+3L/1000)\mu\text{m}/$
 $U_{2XY} = (2.5+4L/1000)\mu\text{m}$
 $U_{1Z} = (3+4L/1000)\mu\text{m}^*$
* when using the CCD camera.

Repeatability

Quick Vision Accel:
 $3\sigma = 0.2\mu\text{m}^*/0.7\mu\text{m}^{**}$ (X/Y-axis)
 $\sigma = 0.4\mu\text{m}$ (Z-axis)^{***}
* on-screen repeatability (short distance).
** Repeatability involving X-Y movement (long distance).
*** with Laser Auto Focus

Maximum drive speed

Quick Vision Accel:
400mm/s (X/Y-axis)
150mm/s (Z-axis)

Tube lens

1x/2x/6x (programmable power turret)

Objectives (optional)

1x, 2.5x and 5x are available.

Magnification on 17" monitor

Using 1x objective: 32x (32x/64x/192x)
Using 2.5x objective: 80x (80x/160x/480x)
Using 5x objective: 160x (160x/320x/960x)

Sensor unit

PRO: High-resolution black & white
CCD camera
PRO III: High-resolution color CCD camera

Illumination system

Surface Illumination
Coaxial and 4-quadrant PRL system
PRO: RGB LED
PRO III: Halogen
Contour Illumination
Stage light
PRO: White LED
PRO III: Halogen

Maximum workpiece load

Height: 150mm (5.90")
Weight: 10kg (22 lbs.)

Power supply (depending on type of model)

100~120/200~240V AC \pm 10%
808: 200~240V AC \pm 10%
50/60 Hz

Power consumption* (depending on type of model)

	PRO	PRO III
404 size model:	600VA	1700VA
606 size model:	600VA	1700VA
808 size model:	800VA	1900VA

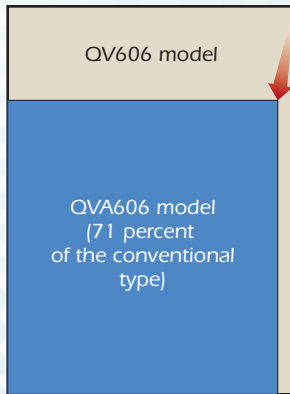
*Needs PC system

Mass (machine proper)

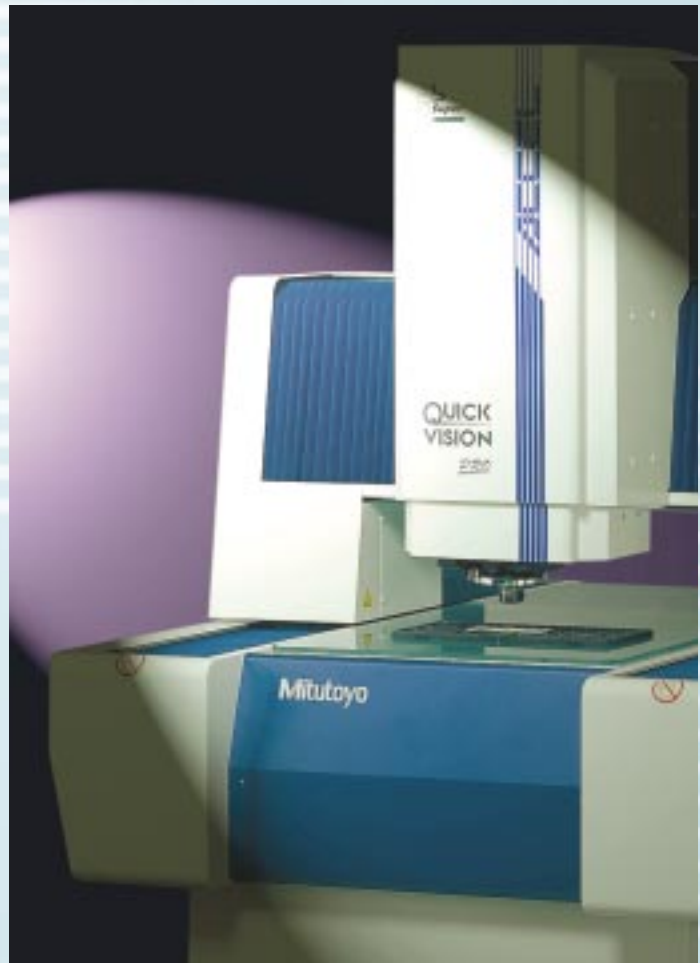
404 size model:	665kg (1466 lbs.)
606 size model:	958kg (2112 lbs.)
808 size model:	2570kg (5666 lbs.)

Smaller Installation Envelope

Incorporating a space-saving design, QVA404 model uses only 87 percent of the installation space required by its QV predecessors. Moreover, the QVA606 and QVA808 models occupy 71 percent and 75 percent of the QV space, respectively.



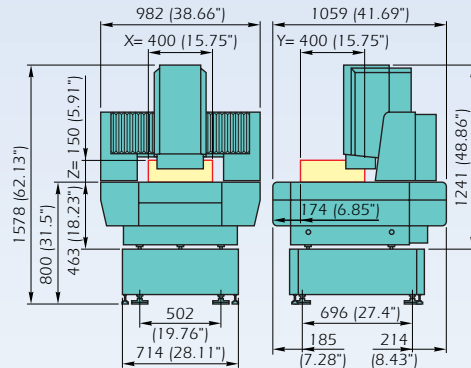
Comparison of installation space with the moving-stage type



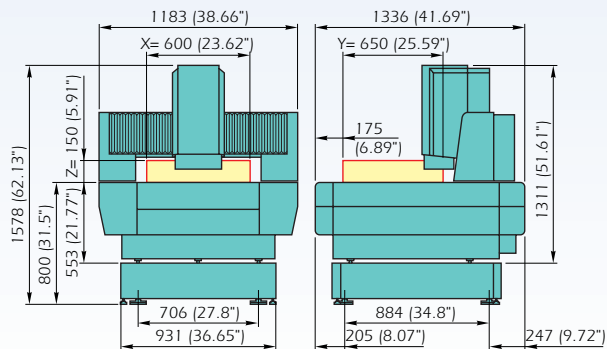
Dimensions

Quick Vision Accel 404

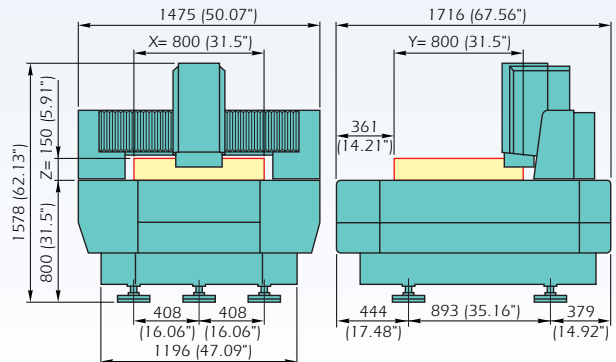
Unit: mm (inch)



Quick Vision Accel 606



Quick Vision Accel 808



Laser Auto-Focus* for High-Speed Height Measurement

▪ Patent pending (Japan)

The machine can be equipped with a laser auto-focus that enables the stable, quick measurement of height during high-speed movement. The laser auto-focus uses the objective-lens coaxial reflected illumination method, therefore, even a small area of the workpiece can be brought into focus. Additionally, a visible-light laser beam allows you to check the measuring point with ease.

* Factory-installed option (including a 25x objective) for the P/T and PRO models



Retrofit Touch-Probe System

A retrofit touch-probe system allows you to integrate the touch-probe measurement function into Quick Vision Accel*. The measurement can be continued by automatically switching the detecting sensor from video camera to touch probe and vice versa in CNC mode. The stylus-module changeover system is also available to further expand the range of measurement application. Mitutoyo offers a special master ball unit and offset ring to produce a seamless measurement between the video camera and touch probe in one coordinate system.

*Quick Vision Accel P/T and Pro 404/606/808

Accessories

- 02ANT840:** PH6 Set
- 54SAA338:** TP20 Set
- 02ANT720:** Masterball with Attachment
- 02ANL920:** Calibration Ring
- 02ANT730A:** Stylus-Module Changer Rack MCR20: 2 port
- 02ANT730B:** Stylus-Module Changer Rack MCR20: 3 port
- 02ANT770:** MCR Attachment

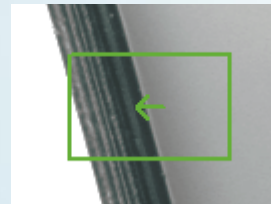


PH6 probe head with TP20 touch-signal probe

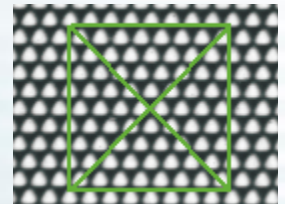
Three Focusing Methods Accomodate Even the Toughest Imaging Situations

▪ Patented (Japan and U.S.A.)

- Surface focus utilizes contrast on the surface.
- Edge focus utilizes contrast at the edge.
- Pattern focus accentuates the naturally weak contrast of certain workpieces such as glass surfaces, by projecting a chart on the measuring surface.



Edge focus



Pattern focus

Objective & Calibration Glass Chart



Calibration glass chart

Coating process in hi-house lens production

Technical Data

- On-monitor magnification and view field

	1x tube lens	2x tube lens*	6x tube lens*
1x objective	32x6.27x4.7mm	64x3.13x2.35mm	192x1.04x0.78mm
2.5x objective	80x2.5x1.88mm	160x1.25x0.94mm	480x0.41x0.31mm
5x objective	160x1.25x0.94mm	320x0.62x0.47mm	960x0.2x0.15mm

- Focal depth and working distance

- 1x objective: 91 μ m/34mm (SL type*: 91 μ m/52.5mm)
- 2x objective: 14 μ m/34mm (SL type*: 14 μ m/60mm)
- 5x objective: 3.5 μ m/33.5mm

*Super-long working distance type

Order No.

- 02ALA400:** 1x objective
- 02ALA150:** 1x objective (SL type)
- 02ALA410:** 2.5x objective
- 02ALA170:** 2.5x objective (SL type)
- 02ALA420:** 5x objective
- 02AKN020:** Calibration glass chart



Features of Quick Vision Accel

Guaranteed Repeatability for Long and Short Dimensions

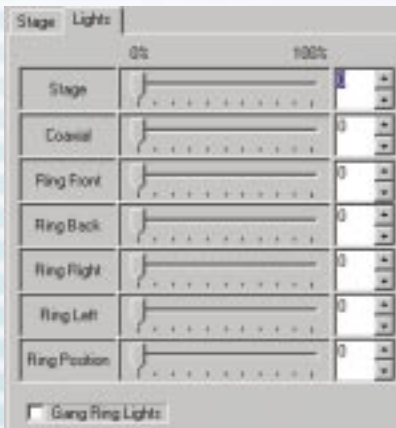
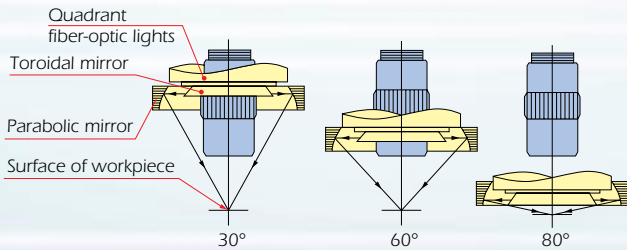
The machine guarantees an on-screen repeatability (short dimension) of $3\sigma = 0.2\mu\text{m}$, and a repeatability involving stage movement (long dimension) of $3\sigma = 0.2\mu\text{m}^*$. This facilitates highly stable and reliable measurement.

* Values of the Super model. The long-dimension repeatability of the standard model is $3\sigma = 0.7\mu\text{m}$.

Reliably Captured Edges via Programmable Ring Light*

Besides vertical reflected illumination and contour illumination, you can also use programmable ring light (PRL illumination). Since the illumination angles can be independently controlled in four directions between 30 and 80 degrees, the edge section—the most important element in image measurement—can be clearly captured. This function makes it possible to measure a wide range of workpieces.

* Only for the PRL and PRO models



Measurement examples of the printed circuit board's lead bottom width

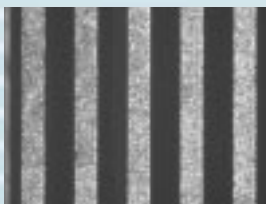


Image viewed under vertical reflected illumination

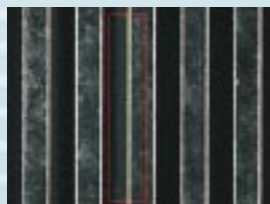


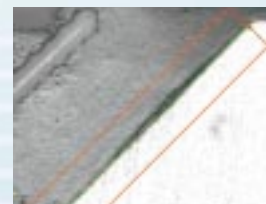
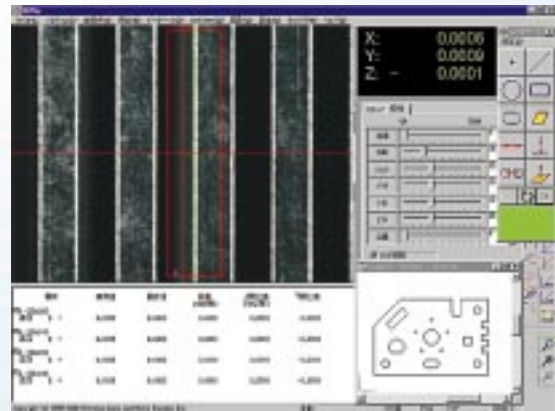
Image viewed under PRL illumination

QVPAK® Provides Multiple Functions

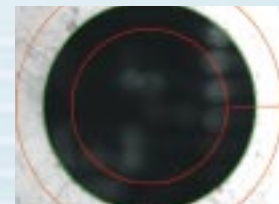
An important aspect of any software used in an image-measuring machine is provision of reliable image-detection capability.

QVPAK® incorporates various innovations to ensure that the detection of images is consistently stable. Position detection can be performed with any of 13 types of measuring tools such as a point, line and circle, selected to fit the shape of the measuring point. The "All Tools" function allows you to perform edge detection with just a single click of the mouse near the edge.

▪ Patent pending (Japan)



Line tool



Circle tool

Two types of AI-aided illumination tools are available. (Patent pending, filed in Japan and the U.S.)

- The Brightness Tool automatically corrects the light volume (brightness) set during teaching.
- The Dual Area Contrast Tool automatically adjusts light volume to maximize the contrast between the two edge-detection areas.



Brightness Tool



Dual Area Contrast Tool

Coordinate Measuring Machines

Vision Measuring Systems

Surface, Form and Contour
Measurement

Optical Measuring

Sensor Systems

Hardness Measuring

Digital Scale and DRO Systems

Small Tool Instruments and
Data Management

Mitutoyo America Corporation

www.mitutoyo.com

M³ Solution Center

Michigan
(734) 459-2810

Massachusetts
(978) 692-8765

Illinois
(630) 978-5385

Indiana
(317) 577-6070

California
(626) 961-9661

No. Carolina
(704) 875-8332

Mitutoyo

Precision is our Profession