



Video Measuring System

# iNEXIV

## VMA Series

Wide FOV Model



# iNEXIV VMA Series

Nikon offers the ultimate usability for a wide variety of measuring applications with the wide FOV, long XYZ stroke iNEXIV VMA series.

– Automatically measures various components, such as plastic injection molds and electronic parts, with high accuracy and repeatability

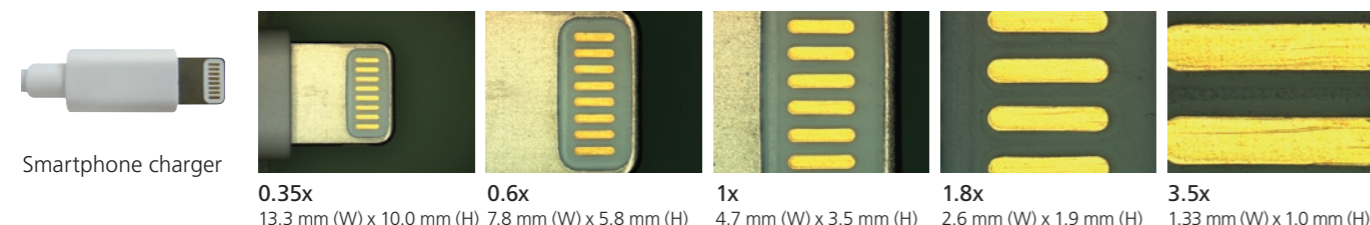
– Allows measurements of tall and uneven objects with the long working distance of 73.5 mm  
Three models in the iNEXIV VMA series are available, each with a different XY-stroke.

## Wide field of view and sharp, clear images

A wide FOV of up to 13 mm x 10 mm (at 0.35x) allows easy search and alignment of measuring targets. The 10x zoom with five specific steps provides accurate measurement as well as high-resolution images. An excellent Apochromat objective lens with high NA (0.11) and low distortion has been specially designed for the iNEXIV series, providing crisp, clear images.

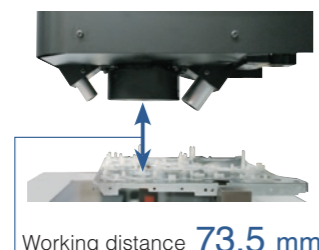
Optical magnification		0.35x	0.6x	1x	1.8x	3.5x
FOV size on stage	Horizontal x Vertical (mm)	13.3x 10.0	7.8x 5.8	4.7x 3.5	2.6x 1.9	1.33x 1.00
1/3" CCD size	Horizontal x Vertical (mm)	4.8x3.6				
Video magnification		36				
Total magnification on Video Window (640 x 480 pixels)*		12.6	21.6	36	64.8	126
Size of 1 pixel (micrometer)		21.8	12.6	7.36	4.25	2.15
Size of objects on Video Window (640 x 480 pixels)	0.01x (mm)	0.126	0.216	0.36	0.648	1.26
	0.1x (mm)	1.26	2.16	3.6	6.48	12.6
	1x (mm)	12.6	21.6	36	64.8	126

\* Total magnification is that of video window with 640 x 480 pixels on 24 inch WUXGA monitor (1920 x 1200 pixels) recommended for VMZ-R series.



## Robust 73.5 mm working distance

A long working distance minimizes the possibility of contact between the objective lens and valuable samples. Ideal for measuring large step heights and deep holes.



## Large XY stroke and long Z stroke

Three models with different XY strokes are available: 250 x 200 mm, 450 x 400 mm and 650 x 550 mm. An extended 200 mm Z-axis stroke is perfect for tall samples.

## Three models with different XY strokes to suit various sample sizes

### 250 mm(X) x 200 mm(Y) x 200 mm(Z) – Standard stroke

#### iNEXIV VMA-2520

A space-saving, low-cost model suited to measure small samples, such as electronic and die cast parts.

Stroke	250 (X) x 200 (Y) x 200 (Z) mm
Measuring head travel	Z direction (single column type)
Stage travel	X-Y direction



### 450 mm(X) x 400 mm(Y) x 200 mm(Z) – Middle stroke

#### iNEXIV VMA-4540

Suitable for mid-size samples, such as molded and pressed parts.

Stroke	450 (X) x 400 (Y) x 200 (Z) mm
Measuring head travel	X-Y direction (bridge type)
Stage travel	Y direction



### 650 mm(X) x 550 mm(Y) x 200 mm(Z) – Large stroke

#### iNEXIV VMA-6555

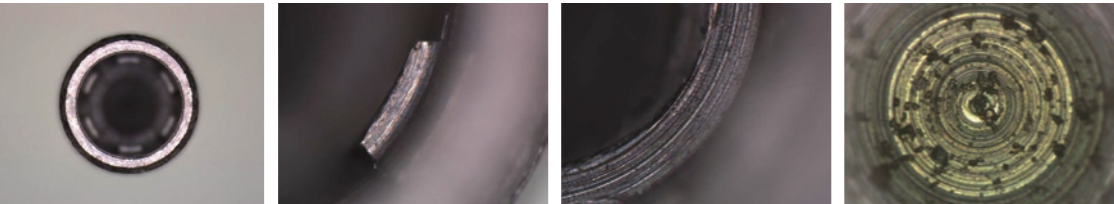
Suitable for large sample and simultaneous measurement of multiple parts.

Stroke	650 (X) x 550 (Y) x 200 (Z) mm
Measuring head travel	X-Y direction (bridge type)
Stage travel	Y direction



## Fast and accurate vision AF (Auto Focus)

The high-speed vision AF offers high-repeatability and high-precision for height and depth measurement. Non-contact measurement using the vision AF does not damage or deform parts.

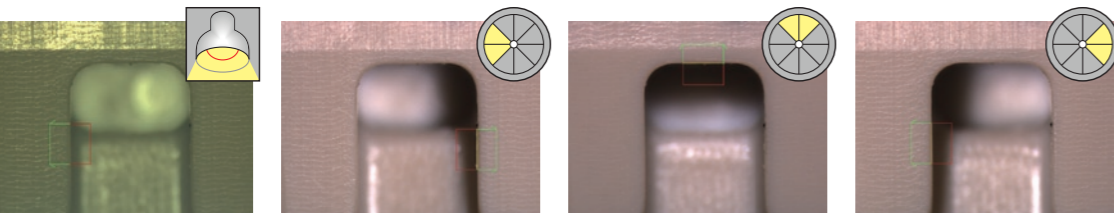


Top surface of implant    Mid-depth of implant    Mid-depth of implant    Bottom of implant

Even the bottom of a small hole can be focused.

## Versatile illuminations

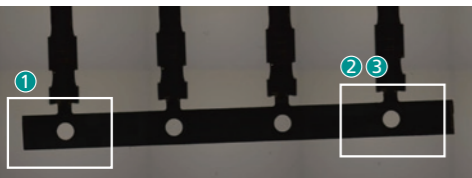
The iNEXIV VMA series is equipped with episcopic (top), diascopic (bottom) and 8-segment ring (with 18-degree oblique angle) LED illuminators. Combining these illuminators with superior optics provides accurate detection of low contrast edges.



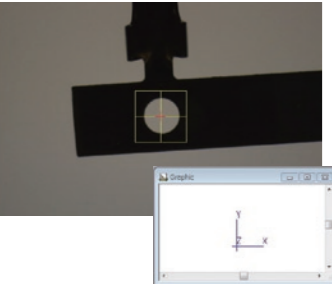
Top light    Ring light from left side    Ring light from rear side    Ring light from right side

Any 8-segment light can be selected for effective edge detection.

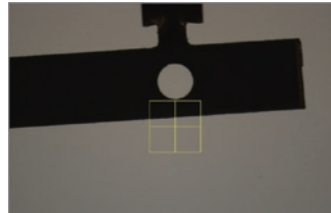
## Intelligent search



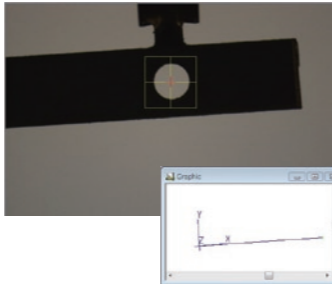
1 Target is detected



2 Searching the misaligned target



3 Target is detected

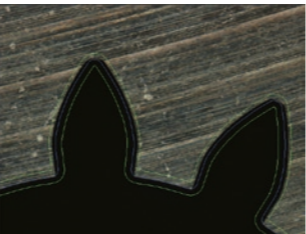


Misaligned target can be automatically detected using intelligent search

XY coordinate after searching the target

## Digital chart comparator

Deviation of contours can be checked by overlaying charts generated digitally from 2D CAD data onto video images. Digital charts always accompany video images.



## User-friendly standard software NEXIV AutoMeasure

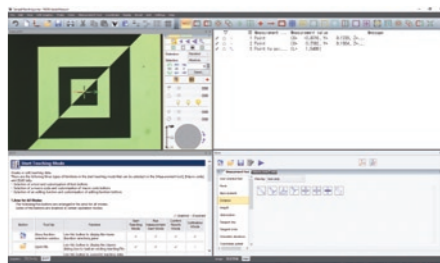
NEXIV AutoMeasure, dimensional measurement software for the ever-evolving NEXIV series. Support functions to create measurement programs have been further enhanced, making fast, highly accurate dimensional measurements easier than ever before.

### Graphical user interface to efficiently create programs with intuitive operation and easy-to-understand guide

Measurement programs can be created by selecting the icon for edge detection and that which should be measured.

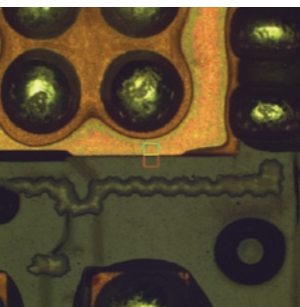


Edge detection and AF icon    Various measurement icons

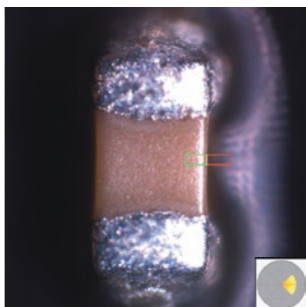


### Lighting optimization function

Automatically optimizes the type of lighting, direction of ring illumination, and light intensity according to features of object measured. Makes it possible to reduce the amount of time and effort spent creating measurement programs.



Result of lighting optimization, detecting edge of height variations in the patterned area of a PCB. (Optimization with epi-illumination)

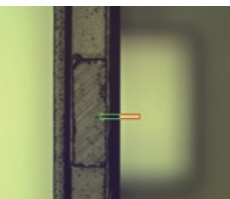


Result of lighting optimization, detecting edge of condenser component mounted on a PCB. (Optimization of light source direction and intensity with ring illumination)

\*Optimizations may not be possible depending on shape of object measured.

### Automated edge setting function < NEW

Edge detection conditions are automatically set by simply selecting the target edge from an image or profile. This reduces setup time and improves efficiency.



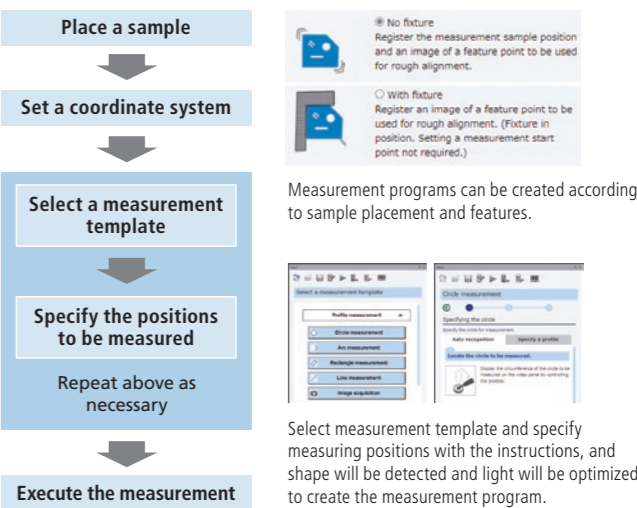
Select the target edge from an image.



Select the target edge from a profile.

### Teaching navigation

Simply follow the on-screen instructions and the required measurement settings are entered automatically. Even first-time users can create basic measurement programs.



### Profiler/CAD Reader

5D profile shape analysis program

### Virtual AutoMeasure

CAD interface off-line teaching support program

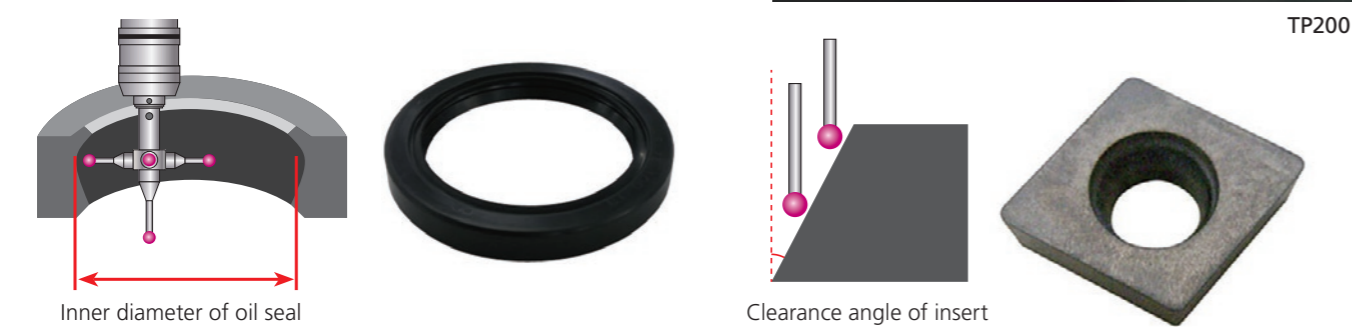
### EDF/Stitching Express (option)

Image analysis and archiving program for creating an all-in-focus EDF (Extended Depth of Focus) image from multiple images at different height. This also generates a stitched image on the same XY plane.

# Optional Hardware

## Touch probe for measurement of imperceptible parts

The iNEXIV VMA series can accommodate optional Renishaw® TP20 or TP200 touch probes. Touch probes provide measurements where vision AF cannot be used, such as the inner diameter of an oil seal or the clearance angle of an indexable insert. Measurement can be easily switched between video and touch probe, and both can be controlled by one teaching file.



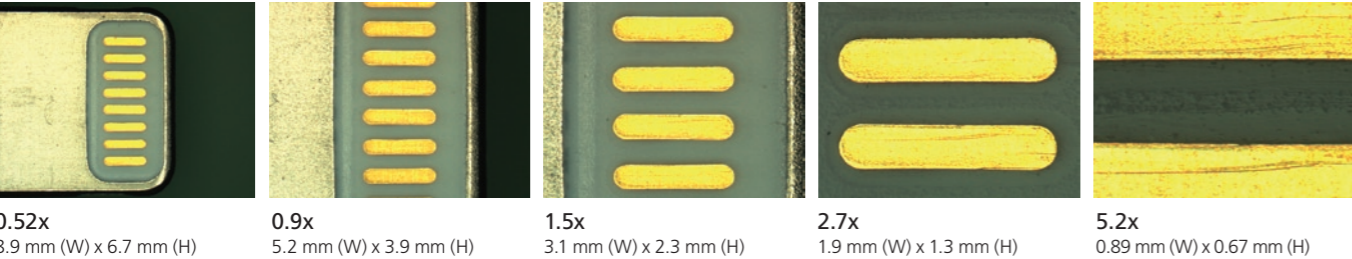
## Extended 1.5x high-magnification



Smartphone charger

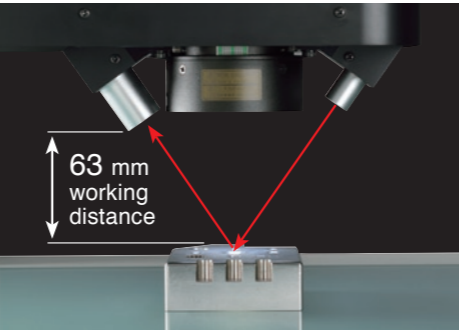
Each model can be modified before shipment to extend the magnification to 1.5x, powerful enough for precise measurement of minute electronic parts.

\*Video measuring images are slightly darker with the 1.5x high-magnification option, even with the same light intensity setting (0 - 100).

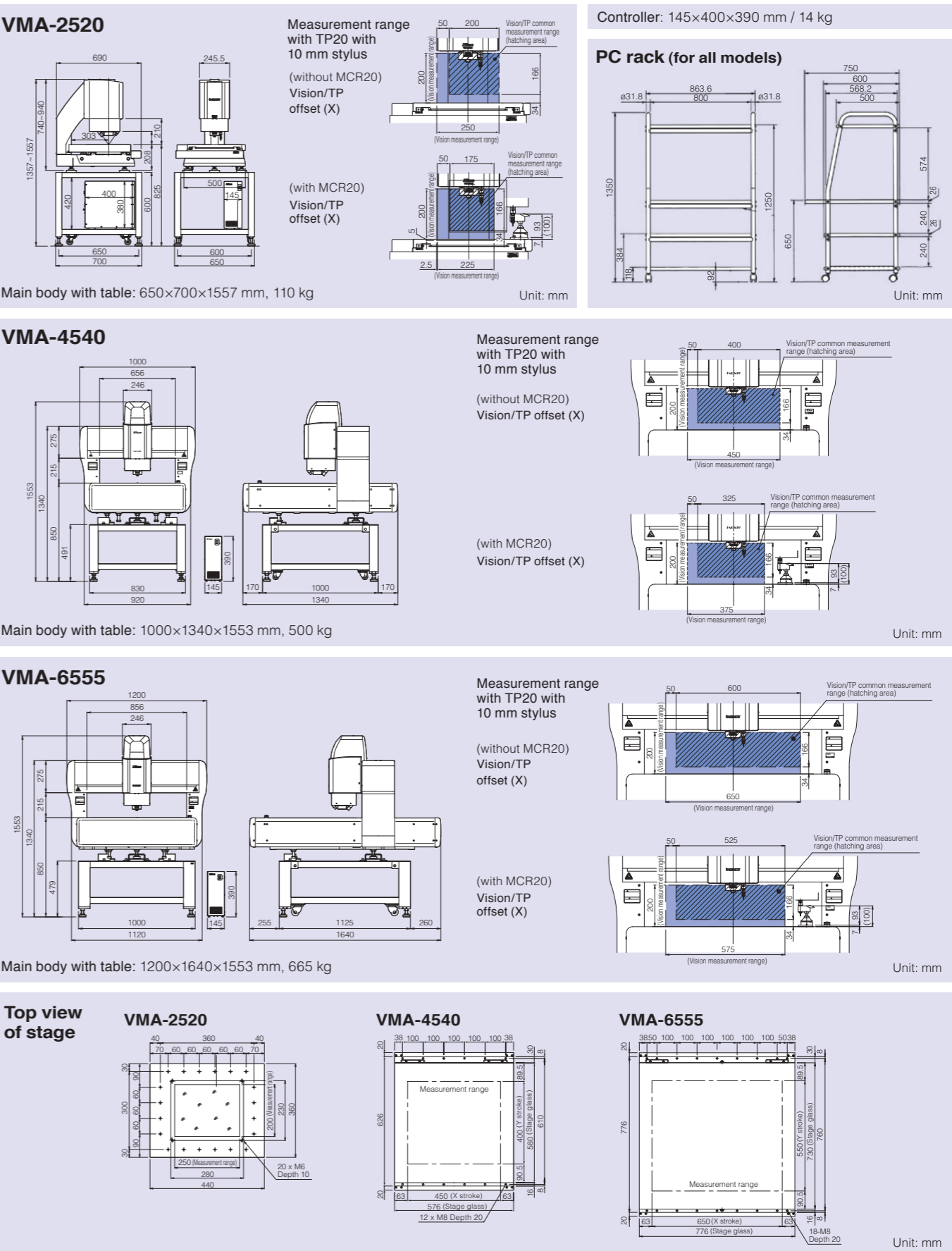


## Laser AF

With a working distance of 63 mm, the optional Laser AF enables height measurement of flat surfaces with high repeatability, while keeping a wide FOV at low magnification.



# Dimensional Diagram



# Specifications

Model	VMA-2520	VMA-4540	VMA-6555
XYZ Strokes	250×200×200 mm	450×400×200 mm	650×550×200 mm
Measurement range with TP (Touch Probe)	200×200×166 mm (TP20) 200×200×170 mm (TP200) 250×200×200 mm (with Vision AF)	400×400×166 mm (TP20) 400×400×170 mm (TP200) 450×400×200 mm (with Vision AF)	600×550×166 mm (TP20) 600×550×170 mm (TP200) 650×550×200 mm (with Vision AF)
Measurement range with TP & MCR20*1	175×200×166 mm (TP20) 175×200×170 mm (TP200) 225×200×200 mm (with Vision AF)	325×400×166 mm (TP20) 325×400×170 mm (TP200) 375×400×200 mm (with Vision AF)	525×550×166 mm (TP20) 525×550×170 mm (TP200) 575×550×200 mm (with Vision AF)
Minimum readout	0.1 µm		
Maximum sample weight	15 kg	40 kg	50 kg
Maximum sample weight (accuracy guaranteed)	5 kg	20 kg	30 kg
Maximum permissible error*2 (L = Length in mm)	EUX,MPE EUY,MPE: 2+8L/1000 µm EUXY,MPE: 3+8L/1000 µm EUZ,MPE*3: 3+L/50 µm	EUX,MPE EUY,MPE: 2+6L/1000 µm EUXY,MPE: 3+6L/1000 µm EUZ,MPE*3: 3+L/100 µm	
Camera	1/3" Black and White CCD, 1/3" Color CCD		
Working distance	73.5 mm (63 mm with Laser AF)		
Magnification	Optical: 0.35 to 3.5x (0.52x to 5.2x high magnification is available as an option) On screen: 12.6 to 126x with 24-inch WUXGA (1920×1200 pixels) monitor		
FOV size on stage	13.3×10 mm to 1.33×1 mm (8.9×6.7 mm to 0.89×0.67 mm with high-magnification option)		
Autofocus	Vision AF, Laser AF (option)		
Illumination	Contour illumination and Surface illumination: White LED diascopic illumination Oblique illumination: 8-segment white LED ring illumination		
Video resolution	640×480 pixels		
Touch probe (optional)	Renishaw® TP200/TP20		
Power source	100 V-240 V, 50/60 Hz		
Power consumption	5 A (100 V) - 2.5 A (240 V)		

\*1: The iNEXIV-dedicated MCR20 can be used for both TP20 and TP200. \*2: Nikon's in-house test at 20°C ±0.5K \*3: With TP or Laser AF

Nikon Corporation Industrial Metrology Business Unit is certified as an ISO/IEC 17025 accredited calibration laboratory for video measuring systems by the IAJapan (International Accreditation Japan) as Accreditation No.JCSS0241.

**ISO/IEC 17025:** International standard, which specifies the general requirements to ensure that a laboratory is competent to carry out specific tests and/or calibrations

Date of initial accreditation:	July 1, 2009
Scope of accreditation:	Coordinate measuring instruments
Accredited section:	Industrial Metrology Business Unit
Calibration site:	Customer's laboratory (field service)
Calibration and Measurement Capability (CMC), (K=2, Level of Confidence Approximately 95%) [L=measurement length (mm)]	L ≤ 420 mm: 0.32 µm 420 ≤ L ≤ 1000 mm : (0.29 + 0.64 × L/1000) µm

Specifications and equipment are subject to change without any notice or obligation on the part of the manufacturer. June 2023 ©2014-2023 NIKON CORPORATION

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CLASS 1 LASER PRODUCT



**WARNING** TO ENSURE CORRECT USAGE, READ THE CORRESPONDING MANUALS CAREFULLY BEFORE USING THE EQUIPMENT.



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