



CNC 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		0.35×	0.6×	1×	1.8×	3.5×
FOV size on stage	Horizontal × Vertical (mm)	13.3×10.0	7.8×5.8	4.7×3.5	2.6×1.9	1.33×1.00
1/3" CCD size	Horizontal × Vertical (mm)	4.8×3.6				
Video magnification		36				
Total magnification on Video Window (640 × 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 × 480 pixels)	0.01× (mm)	0.126	0.216	0.36	0.648	1.26
	0.1× (mm)	1.26	2.16	3.6	6.48	12.6
	1× (mm)	12.6	21.6	36	64.8	126

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



Smartphone charger



0.35x

13.3 mm (W) x 10.0 mm (H)



0.6x

7.8 mm (W) x 5.8 mm (H)



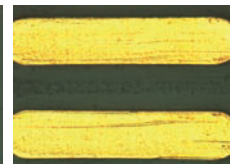
1x

4.7 mm (W) x 3.5 mm (H)



1.8x

2.6 mm (W) x 1.9 mm (H)

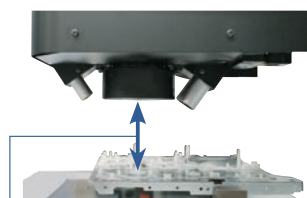


3.5x

1.33 mm (W) x 1.0 mm (H)

## 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.



Working distance **73.5 mm**

## 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) × 200 mm(Y) × 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) × 200 (Y) × 200 (Z) mm
Measuring head travel	Z direction (single column type)
Stage travel	X-Y direction



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

#### iNEXIV VMA-4540

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

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



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

#### iNEXIV VMA-6555

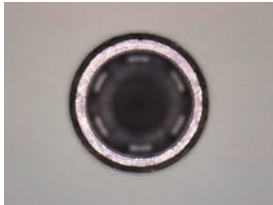
Suitable for large sample and simultaneous measurement of multiple parts.

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



## Fast and accurate vision AF (Auto Focus)

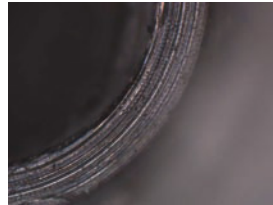
The high-speed vision AF offers high-repeatability and high-precision for height and depth measurement. Non-contact measurement using the vision AF does not damage or deform parts.



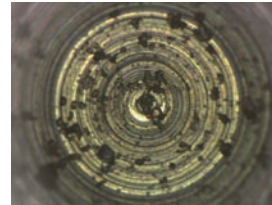
Top surface of implant



Mid-depth of implant



Mid-depth of implant

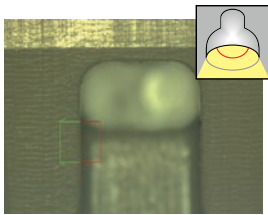


Bottom of implant

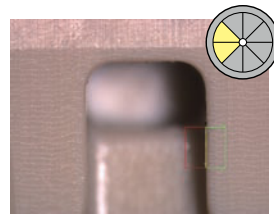
Even the bottom of a small hole can be focused.

## Versatile illuminations

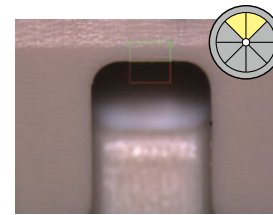
The iNEXIV VMA series is equipped with episcopic (top), diasopic (bottom) and 8-segment ring (with 18-degree oblique angle) LED illuminators. Combining these illuminators with superior optics provides accurate detection of low contrast edges.



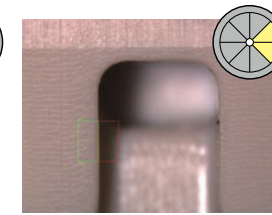
Top light



Ring light from left side



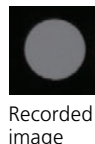
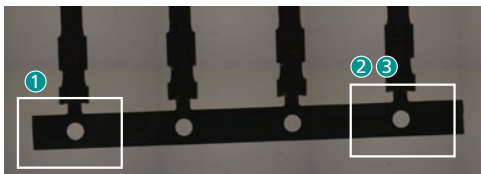
Ring light from rear side



Ring light from right side

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

## Intelligent search



Recorded image

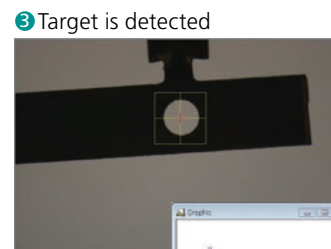
Even when a sample is misaligned, the system automatically searches the target location based on the target image recorded in a teaching file. This enables accurate, automatic measurement by eliminating possible detection errors.



1 Target is detected

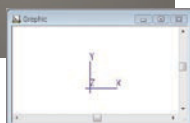


2 Searching the misaligned target

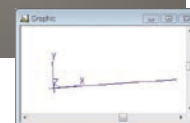


3 Target is detected

Misaligned target can be automatically detected using intelligent search



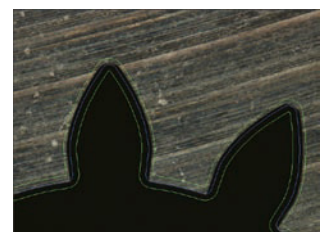
XY coordinate



XY coordinate after searching the target

## Digital chart comparator

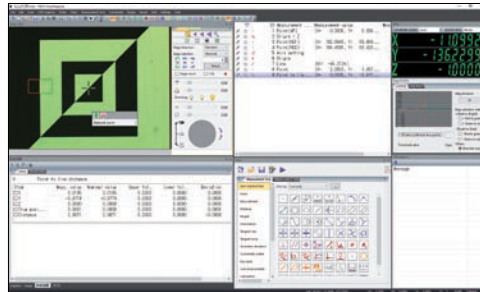
Deviation of contours can be checked by overlaying charts generated digitally from 2D CAD data onto video images. Digital charts always accompany video images.



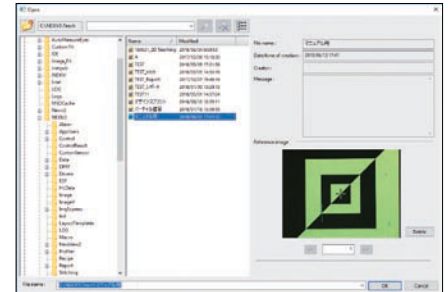


## User-friendly standard software iNEXIV VMA AutoMeasure

Provides enhanced ease of use and versatility based on Nikon's years of extensive experience in developing the NEXIV series.



Main program layout



Teaching file selection with interactive guides

## Optional software

### iNEXIV VMA Profiler/CAD Reader

2D profile shape analysis program

### iNEXIV VMA Virtual AutoMeasure

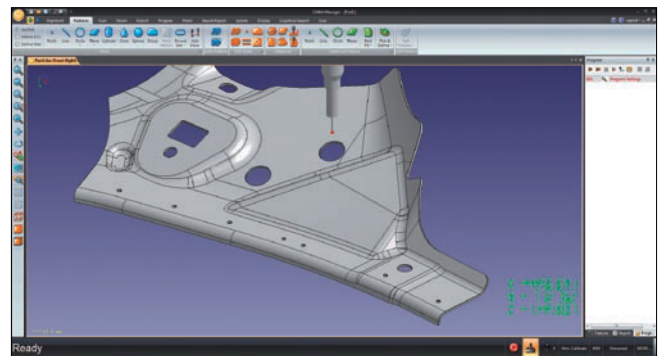
CAD interface off-line teaching support program

### iNEXIV EDF/Stitching Express

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

## CMM-Manager

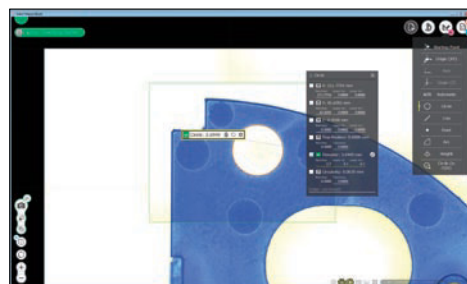
A multi-platform metrology software to create teaching files that include 2D video measurement and 3D tactile measurement, and to provide easy operation for 3D graphic window.



Accurate feature measurement

## Auto MeasureEyes

Enables easy operation for anyone and measurement programs can be created with just a few clicks.



One-click measurement



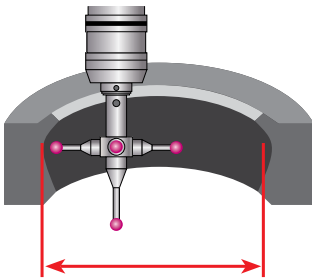
Easy programming and reporting functions

## Touch probe for measurement of imperceptible parts

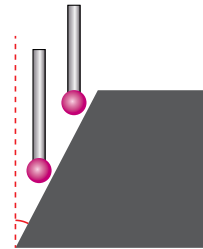
The iNEXIV VMA series can accommodate optional Renishaw® TP20 or TP200 touch probes. Touch probes provide measurements where vision AF cannot be used, such as the inner diameter of an oil seal or the clearance angle of an indexable insert. Measurement can be easily switched between video and touch probe,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



TP200



Inner diameter of oil seal



Clearance angle of insert



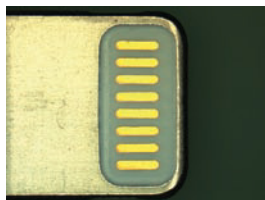
## Extended 1.5x high-magnification



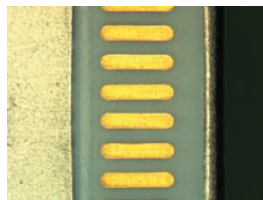
Smartphone charger

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).



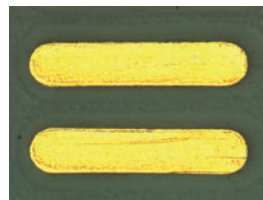
0.52x  
8.9 mm (W) x 6.7 mm (H)



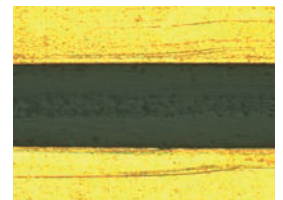
0.9x  
5.2 mm (W) x 3.9 mm (H)



1.5x  
3.1 mm (W) x 2.3 mm (H)



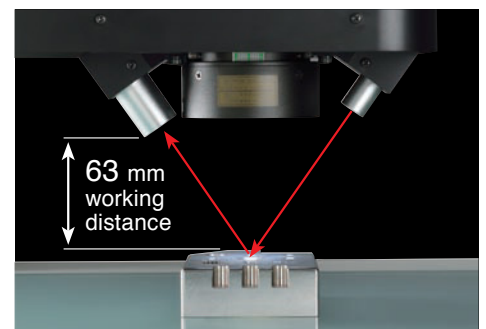
2.7x  
1.9 mm (W) x 1.3 mm (H)



5.2x  
0.89 mm (W) x 0.67 mm (H)

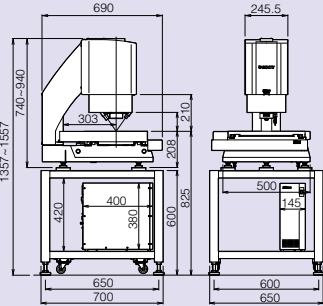
## Laser AF

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

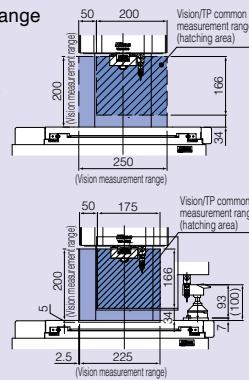
## VMA-2520



Measurement range  
with TP20 with  
10 mm stylus

(without MCR20)  
Vision/TP  
offset (X)

(with MCR20)  
Vision/TP  
offset (X)

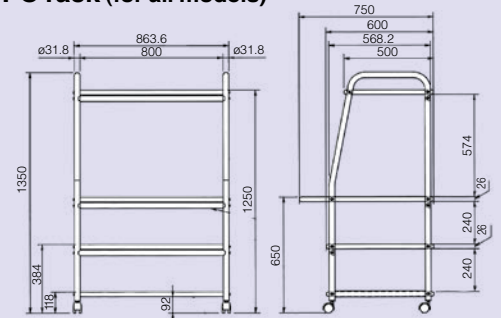


Main body with table: 650×700×1557 mm, 110 kg

Unit: mm

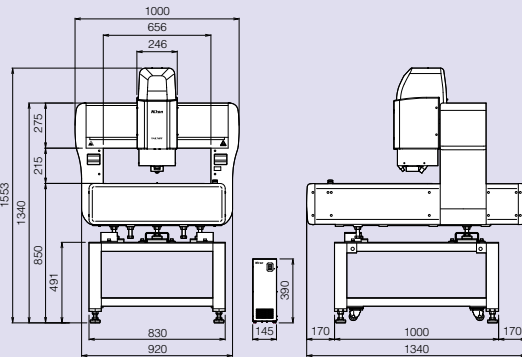
Controller: 145×400×390 mm / 14 kg

## PC rack (for all models)



Unit: mm

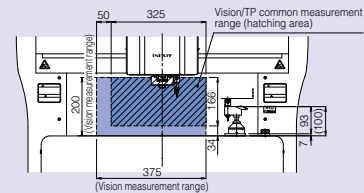
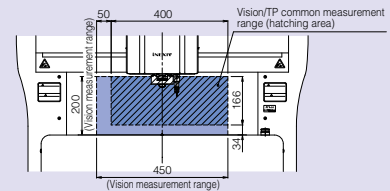
## VMA-4540



Measurement range  
with TP20 with  
10 mm stylus

(without MCR20)  
Vision/TP offset (X)

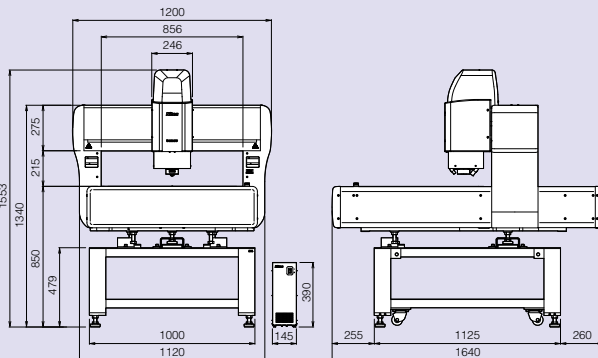
(with MCR20)  
Vision/TP offset (X)



Main body with table: 1000×1340×1553 mm, 500 kg

Unit: mm

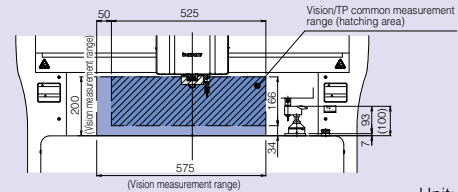
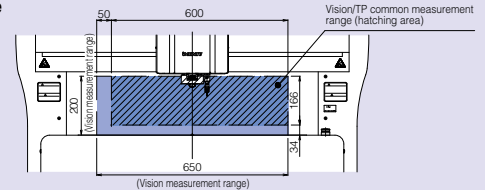
## VMA-6555



Measurement range  
with TP20 with  
10 mm stylus

(without MCR20)  
Vision/TP  
offset (X)

(with MCR20)  
Vision/TP  
offset (X)

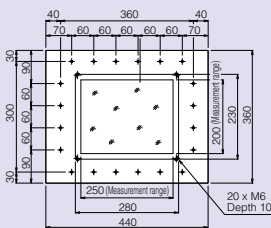


Main body with table: 1200×1640×1553 mm, 665 kg

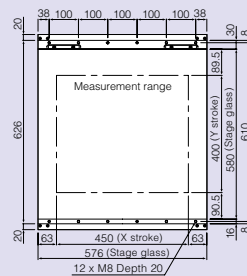
Unit: mm

## Top view of stage

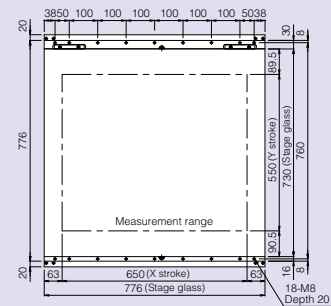
### VMA-2520



### VMA-4540



### VMA-6555



Unit: mm

# 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 EUX,MPE*3: 3+L/50 µm	EUX,MPE EUY,MPE: 2+6L/1000 µm EUXY,MPE: 3+6L/1000 µm EUX,MPE*3: 3+L/100 µm	
Camera	Black & white 1/3" CCD, Color 1/3" CCD (option)		
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 CNC 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:	CS Promotion Department 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)]	$L \leq 420\text{mm}: 0.32 \mu\text{m}$ $420 \leq L \leq 1000\text{mm}: (0.29 + 0.64 \times L/1000) \mu\text{m}$

Specifications and equipment are subject to change without any notice or obligation on the part of the manufacturer. April 2019 ©2014-2019 NIKON CORPORATION  
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クラス1レーザ製品  
CLASS 1 LASER PRODUCT



**WARNING**

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



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