



CNC Video Measuring System NEXIV VMA series

CNC Video Measuring System

# inEXIV

## VMA Series

Wide FOV Model



# Nikon 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

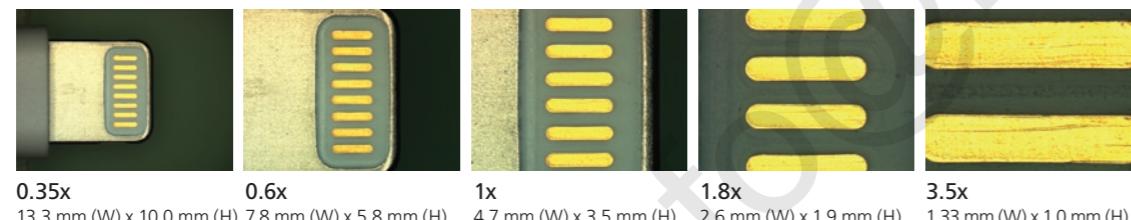
Three models in the iNEXIV VMA series are available, each with a different XY-stroke.

## 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.

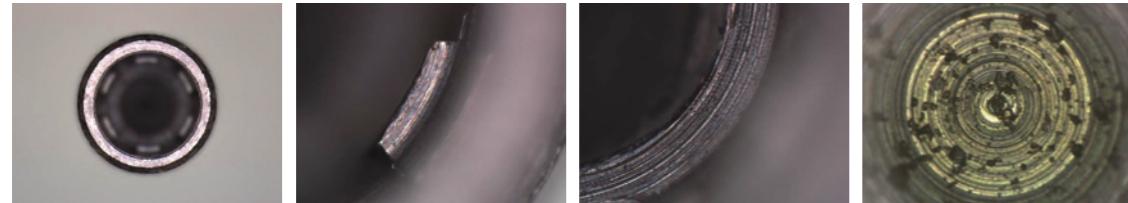
Stroke	650 (X) x 550 (Y) x 200 (Z) mm
Measuring head travel	X-Y direction (bridge type)
Stage travel	Y direction



# Features

## 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.

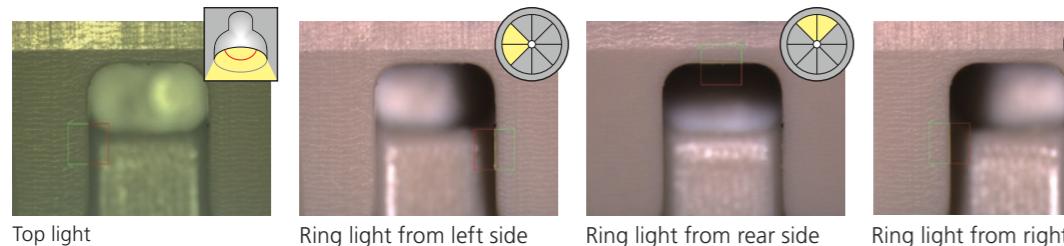


Top surface of implant Mid-depth of implant Mid-depth of implant Bottom of implant

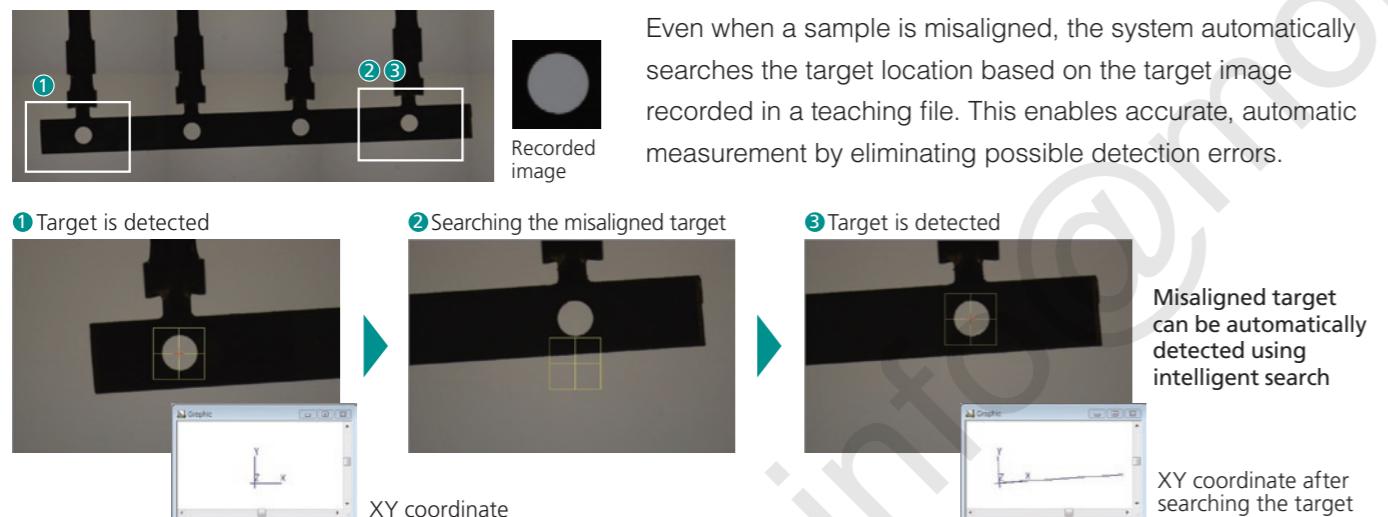
Even the bottom of a small hole can be focused.

## 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.



## Intelligent search



## Digital chart comparator

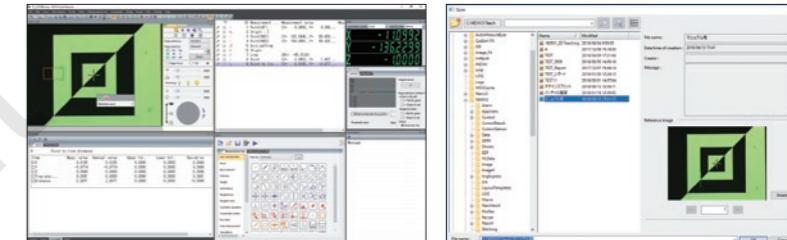
Deviation of contours can be checked by overlaying charts generated digitally from 2D CAD data onto video images. Digital charts always accompany video images.



# Software

## 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.



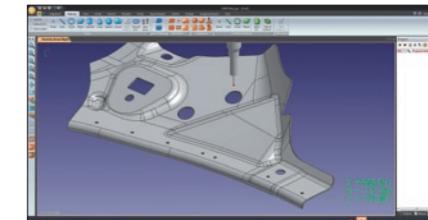
Main program layout

Teaching file selection with interactive guides

## Optional Software

### 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

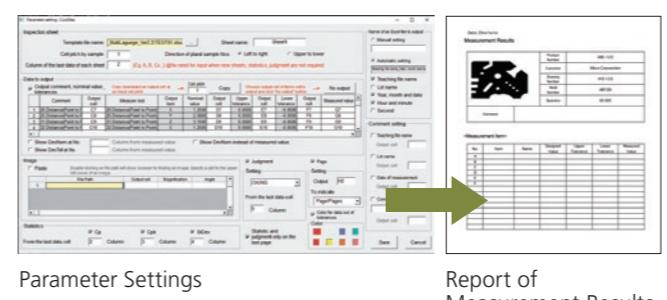
### ImageFit QC

Creates inspection reports according to any designated format. Measurement results can be automatically reflected with pass/fail results and statistical results\*. Line graphs and histograms can also be created as needed.

\*standard deviation, process capability index (Cp, Cpk)

\*Excel is required

Codeveloped by Aria Co., Ltd. (Japan)



## Other Optional software

### iNEXIV VMA Profiler/CAD Reader

2D profile shape analysis program

### iNEXIV VMA Virtual AutoMeasure

CAD interface off-line teaching support program

### Custom Fit QC

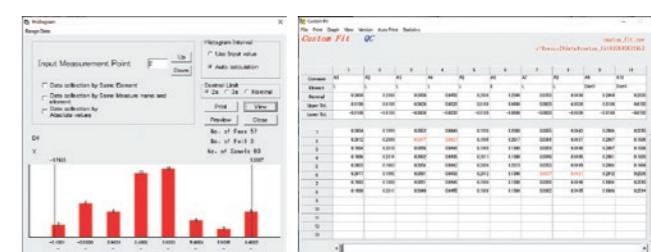
Measurement results are read into 10 different templates and pass/fail results and calculation results\*<sup>1</sup> are automatically exported. Graphs\*<sup>2</sup>, including X-R control charts and scatter diagrams, can be automatically generated to visualize measurement results.

\*<sup>1</sup>: Average, maximum value, minimum value, range, standard deviation, and process capability index (Cp, Cpk)

\*<sup>2</sup>: Line graphs, histograms, X-R control charts, scatter diagrams

\*Excel is required

Codeveloped by Aria Co., Ltd. (Japan)



### NEXIV 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.

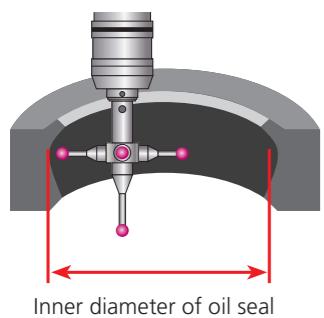
# Optional Hardware

## 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.



TP200



Inner diameter of oil seal

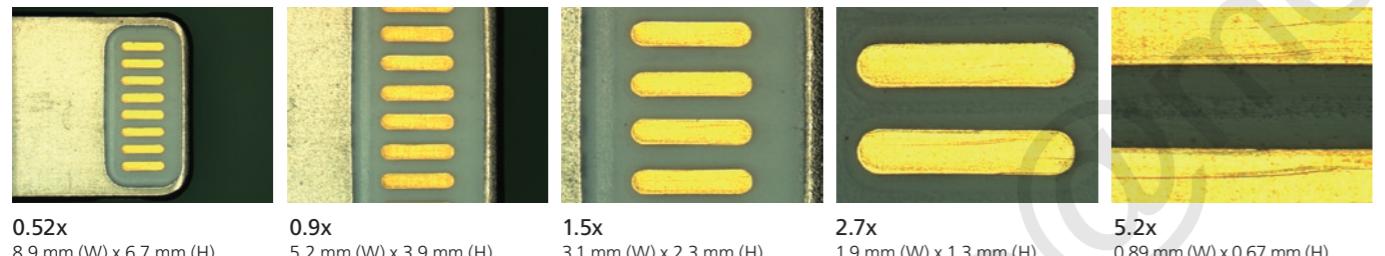


Clearance angle of insert

## Extended 1.5x high-magnification



Smartphone charger

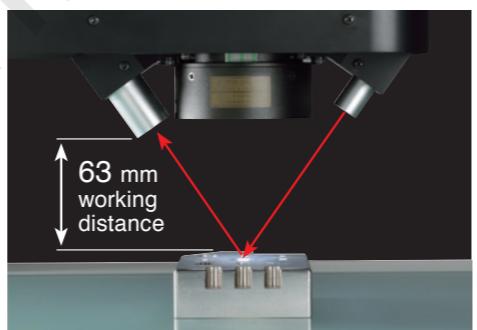


Each model can be modified before shipment to extend the magnification to 1.5x, powerful enough for precise measurement of minute electronic parts.

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

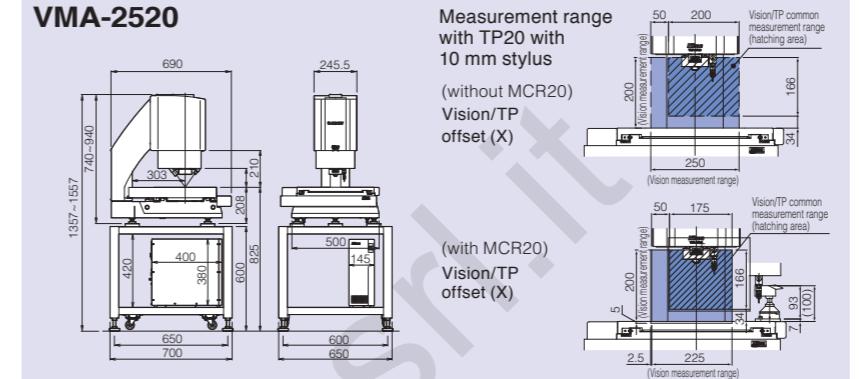
## Laser AF

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



Main body with table: 650x700x1557 mm, 110 kg

Measurement range with TP20 with 10 mm stylus

(without MCR20)

Vision/TP offset (X)

(with MCR20)

Vision/TP offset (X)

(Vision measurement range)

50 200

166

250

50 175

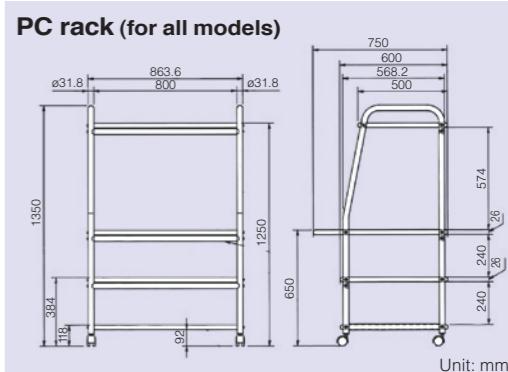
166

225

2.5

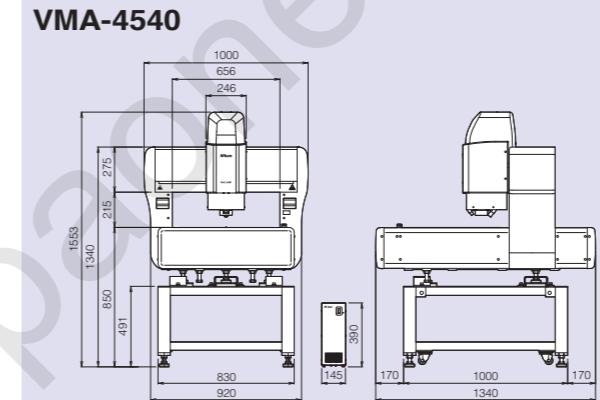
Controller: 145x400x390 mm / 14 kg

## PC rack (for all models)



Unit: mm

## VMA-4540



Main body with table: 1000x1340x1553 mm, 500 kg

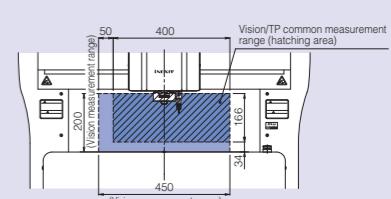
Measurement range with TP20 with 10 mm stylus

(without MCR20)

Vision/TP offset (X)

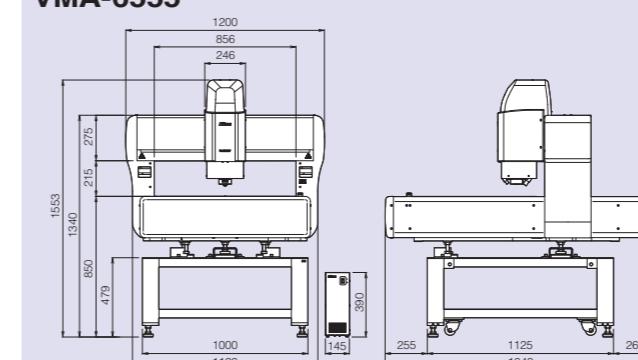
(with MCR20)

Vision/TP offset (X)



Unit: mm

## VMA-6555



Main body with table: 1200x1640x1553 mm, 665 kg

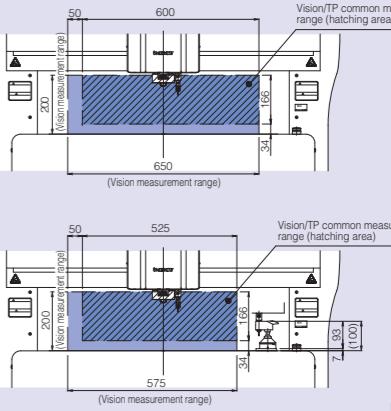
Measurement range with TP20 with 10 mm stylus

(without MCR20)

Vision/TP offset (X)

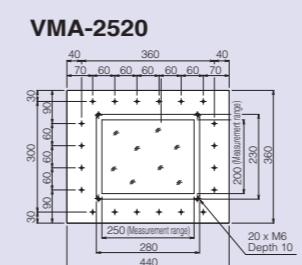
(with MCR20)

Vision/TP offset (X)

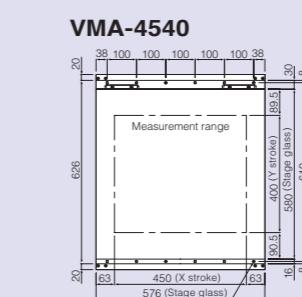


Unit: mm

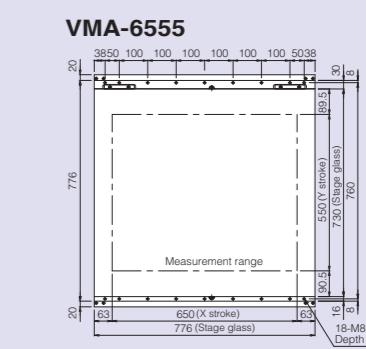
## Top view of stage



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 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	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 ≤ 420mm: 0.32 µm 420 ≤ L ≤ 1000mm : (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. March 2020 ©2014-2020 NIKON CORPORATION  
N.B. Export of the products\* in this brochure is controlled under the Japanese Foreign Exchange and Foreign Trade Law. Appropriate export procedures shall be required in case of export from Japan.  
\*Products: Hardware and its technical information (including software)  
Company names and product names appearing in this brochure are their registered trademarks or trademarks.

クラス1レーザ製品  
CLASS 1 LASER PRODUCT



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



**NIKON CORPORATION**

Shinagawa Intercity Tower C, 2-15-3, Konan, Minato-ku, Tokyo 108-6290, Japan  
phone: +81-3-6433-3701 fax: +81-3-6433-3784  
<https://www.nikon.com/products/industrial-metrology/>

ISO 14001 Certified  
for NIKON CORPORATION

ISO 9001 Certified  
for NIKON CORPORATION  
Industrial Metrology Business Unit

**NIKON METROLOGY EUROPE NV**  
Geldenaaksebaan 329, 3001 Leuven, Belgium  
phone: +32-16-74-01-00 fax: +32-16-74-01-03  
E-mail: [Sales.Europe.NM@nikon.com](mailto:Sales.Europe.NM@nikon.com)  
<http://www.nikonmetrology.com/en-gb>

**NIKON METROLOGY UK LTD.**  
UNITED KINGDOM phone: +44-1332-811-349 fax: +44-1332-639-881  
E-mail: [Sales.UK.NM@nikon.com](mailto:Sales.UK.NM@nikon.com)

**NIKON METROLOGY SARL**  
FRANCE phone: +33-1-60-86-09-76 fax: +33-1-60-86-57-35  
E-mail: [Sales.France.NM@nikon.com](mailto:Sales.France.NM@nikon.com)

**NIKON METROLOGY GMBH**  
GERMANY phone: +49-6023-91733-0 fax: +49-6023-91733-229  
E-mail: [Sales.Germany.NM@nikon.com](mailto:Sales.Germany.NM@nikon.com)

**NIKON INSTRUMENTS S.p.A.**  
ITALY phone: +39-055-300-96-01 fax: +39-055-30-09-93

**NIKON METROLOGY, INC.**  
12701 Grand River Avenue, Brighton, MI 48116 U.S.A.  
phone: +1-810-220-4360 fax: +1-810-220-4300  
E-mail: [Sales.NM-US@nikon.com](mailto:Sales.NM-US@nikon.com)  
<http://www.nikonmetrology.com/en-us>

**NIKON CANADA INC.**  
CANADA phone: +1-905-602-9676 fax: +1-905-602-9953

**NIKON MEXICO- Metrology Showroom**  
MEXICO phone: +52 (442) 688 5073  
E-mail: [Sales.NM-MX@nikon.com](mailto:Sales.NM-MX@nikon.com)

**NIKON INSTRUMENTS (SHANGHAI) CO., LTD.**  
CHINA (Shanghai branch) phone: +86-21-6841-2050 fax: +86-21-6841-2060  
(Beijing branch) phone: +86-10-5831-2028 fax: +86-10-5831-2026  
(Guangzhou branch) phone: +86-20-3882-0551 fax: +86-20-3882-0580

**NIKON INSTRUMENTS KOREA CO., LTD.**  
KOREA phone: +82-2-2186-8400 fax: +82-2-555-4415

**NIKON SINGAPORE PTE LTD.**  
SINGAPORE phone: +65-6559-3651 fax: +65-6559-3668  
E-mail: [NSG.Industrial-sales@nikon.com](mailto:NSG.Industrial-sales@nikon.com)

**NIKON MALAYSIA SDN BHD**

MALAYSIA phone: +60-3-7809-3688 fax: +60-3-7809-3633

**PT. NIKON INDONESIA**

INDONESIA phone: +62-267-864-3949 fax: +62-267-864-3950

E-mail: [PTN.Instruments@nikon.com](mailto:PTN.Instruments@nikon.com)

**NIKON SALES (THAILAND) CO., LTD.**

THAILAND phone: +66-2633-5100 fax: 66-2633-5191

**NIKON INDIA PRIVATE LIMITED**

INDIA phone: +91-124-4688500 fax: +91-124-4688527