INDUSTRIAL INSTRUMENTS

Industrial Instruments General Brochure

INDEX

Stereo Microscopes SMZ Series

The highly cost-effective SMZ series offer outstanding optical performance, flexible system expandability, and superb operability.

Parallel Optics Type

SMZ25

SMZ18

SMZ1270
SMZ1270i

SMZ800N

	SMZ25	SMZ18	SMZ1270 SMZ1270i	SMZ800N
Zoom Ratio	25 : 1	18 : 1	12.7 : 1	8 : 1
Zoom Range	0.63–15.75×	0.75–13.5×	0.63–8×	1–8×
Total Magnification*1 (Standard combination*2)	3.15–945× (6.3–157.5×)	3.75–810× (7.5–135×)	3.15–480× (6.3–80×)	5–480× (10–80×)
WD *3	60 mm	60 mm	70 mm	78 mm
Camera	✓	✓	✓	✓

✓ : Available / — : Not available

Greenough Type

SMZ745
SMZ745T

SMZ445
SMZ460

SMZ-2

	SMZ745 SMZ745T	SMZ445	SMZ460	SMZ-2
Zoom Ratio	7.5 : 1	4.4 : 1	4.3 : 1	5 : 1
Zoom Range	0.67–5×	0.8 –3.5×	0.7 –3×	0.8–4×
Total Magnification*1 (Standard combination*2)	3.35–300× (6.7–50×)	4–70× (8–35×)	3.5–60× (7–30×)	4–120× (8–40×)
WD *3	115 mm	100 mm		77.5 mm
Camera	✓ (SMZ745T only)	—		—

✓ : Available / — : Not available

*1: Depending on combination of Eyepiece and Objective lens. *2: Combination of Eyepiece 10× and Objective lens 10×. *3: Objective lens 1× or no Auxiliary lens.

Please refer to individual product brochures for further details.

Nikon's Industrial Microscopes utilize the CFI60-2 optical system, highly evaluated for providing a high NA combined with long WD.

Upright Microscopes (General model)

LV100ND
LV100NDA

Model offers various observation methods with reflected/transmitted illumination.

LV100ND

LV150N
LV150NA
LV150NL*

Stand and illumination units are selectable according to observation methods and purpose of use.

LV150N

	LV100ND / LV100NDA	LV150N / LV150NA / LV150NL*
Observation Method	BF: EPI ✓, EPI (LED) ✓, DIA ✓ DF: EPI ✓, EPI (LED) ✓, DIA ✓ DIC: EPI ✓, EPI (LED) ✓, DIA ✓ FL: EPI ✓, EPI (LED) —, DIA — POL: EPI ✓, EPI (LED) △, DIA ✓ 2-Beam: EPI ✓, EPI (LED) —, DIA — Ph-C: EPI —, EPI (LED) —, DIA ✓ ✓ : Available / — : Not available / △ : Simple polarizing observation	BF: EPI ✓, EPI (LED) ✓ DF: EPI ✓, EPI (LED) ✓ DIC: EPI ✓, EPI (LED) ✓ FL: EPI ✓, EPI (LED) — POL: EPI ✓, EPI (LED) △ 2-Beam: EPI ✓, EPI (LED) — ✓ : Available / — : Not available / △ : Simple polarizing observation
Illuminator	• Episcopic / Diascopic	• Episcopic
Stage	• 3×2 Stage (stroke 75×50mm) • 6×4 Stage (stroke 150×100mm) *See the "LV-N Series" brochure for other compatible stages.	• 3×2 Stage (stroke 75×50mm) • 6×6 Stage (stroke 150×150mm) *See the "LV-N Series" brochure for other compatible stages.

BF: Brightfield **DF:** Darkfield **DIC:** Differential Interference Contrast **FL:** Fluorescence **POL:** Polarizing **2-Beam:** Two-Beam Interferometry **Ph-C:** Phase-Contrast
*Only BF, DIC, and S-POL are available for LV150NL

Upright Microscopes (Large-sized stage model)

L200N
L200ND

Stage with stroke 200×200mm is available. Suitable for ø200mm wafer observation.

L200ND

L300N
L300ND

Stage with stroke 350×300mm is available. Suitable for ø300mm wafer observation.

L300ND

	L200N / L200ND	L300N / L300ND
Observation Method	BF: EPI ✓, DIA ✓* DF: EPI ✓, DIA — DIC: EPI ✓, DIA — S-POL: EPI ✓, DIA — FL: EPI ✓*, DIA — *L200ND only ✓ : Available / — : Not available	BF: EPI ✓, DIA ✓* DF: EPI ✓, DIA — DIC: EPI ✓, DIA — S-POL: EPI ✓, DIA ✓ FL: EPI ✓, DIA — *L300ND only ✓ : Available / — : Not available
Illuminator	• L200N : Episcopic • L200ND : Episcopic / Diascopic	• L300N : Episcopic • L300ND : Episcopic / Diascopic
Stage	• 8×8 Stage (stroke: 200×200mm)	• 14×12 Stage (stroke: 350×300mm)

BF: Brightfield **DF:** Darkfield **DIC:** Differential Interference Contrast **S-POL:** Simple Polarizing **FL:** Fluorescence

Inverted Metallurgical Microscopes

MA100N

MA100N is compact, inverted microscopes designed for brightfield and simple polarizing observations.

MA200

With its unique, solid-box structure, the MA200 offers high stability, durability, and a smaller footprint than conventional models.

	MA100N	MA200
Observation Method	BF: EPI ✓ DF: EPI — S-POL: EPI ✓ DIC: EPI — FL: EPI — ✓ : Available / — : Not available *Dedicated reflected illumination models.	BF: EPI ✓ DF: EPI ✓ S-POL: EPI ✓ DIC: EPI ✓ FL: EPI △ ✓ : Available / — : Not available △ : Only available with Halogen Lamp and Fiber Illumination *DIA illuminator is available for transmitted light observation.
Illuminator	• Episcopic	• Episcopic / Diascopic
Stage	• MA-SR-N Rectangular 3-plate Stage N (stroke 50×50mm) • MA-SP-N Plain Stage N • TS2-S-SM Mechanical Stage CH (stroke 126×78mm) *Please use in combination with MA-SP-N Plain stage N.	• MA2-SR Mechanical Stage (stroke 50×50mm)

BF: Brightfield **DF:** Darkfield **DIC:** Differential Interference Contrast **S-POL:** Simple Polarizing **FL:** Fluorescence

Polarizing Microscopes

LV100NPOL

Outstanding optical performance, perfect for a wide variety of imaging applications and polarizing techniques.

Ci POL

Compact polarizing microscope that balances optical performance and ease of use.

	LV100NPOL	Ci POL
Observation Method	BF: EPI ✓, DIA ✓ POL: EPI ✓, DIA ✓ ✓ : Available / — : Not available	BF: EPI ✓, DIA ✓ POL: EPI ✓, DIA ✓ ✓ : Available / : Not available
Illuminator	• Episcopic/ Diascopic	• Episcopic/ Diascopic
Stage	• High precision rotating stage for polarizing observation	• Rotating stage with stage clamp

BF: Brightfield **POL:** Polarizing **DF:** Darkfield **DIC:** Differential Interference Contrast **S-POL:** Simple Polarizing **FL:** Fluorescence

Digital Sight Series

Microscope Camera

Digital Sight 1000 NEW

Equipped with a 2 megapixel CMOS image sensor, it can capture full HD microscope images. By connecting a microscope to this camera and HDMI monitor, movies and images can be captured and saved onto a pre-inserted SD card in the camera.

2.0 megapixel | Color | Full HD

DS-Fi3

Three main features of the previous models, high-resolution, high sensitivity and low noise, and high-speed live display are offered in 1 camera.

5.9 megapixel | Color | High-resolution

DS-Ri2

Capable of expressing images as is, this microscope digital camera offers high resolution, color reproduction, and frame rate.

16.25 megapixel | Color | High-resolution

Frame Rate	30 fps (1920×1080)	30 fps (1440×1024)	45 fps (1636×1088)
Max Recordable Pixels	1920×1080	2880×2048	4908×3264

Imaging software NIS-Elements

Using a tablet PC

Simply installing NIS-Elements L on a tablet PC enables setting and control of Digital Sight 1000/DS-Fi3/DS-Ri2 microscope cameras, live image display, and image acquisition.

Using a desktop PC

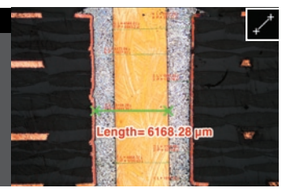
F | D | Br | Ar

A wide variety of tools

NIS-Elements L enables the conducting of simple measurements on images, with input of lines and comments. These can also be written onto and saved with the image, and measurement data can be output.

Measurement function

- Line distance
- Area
- Circle
- Circle distance
- Pitch distance
- Angle



Annotate function

- Line
- Arrow
- Text
- Marker
- Polyline

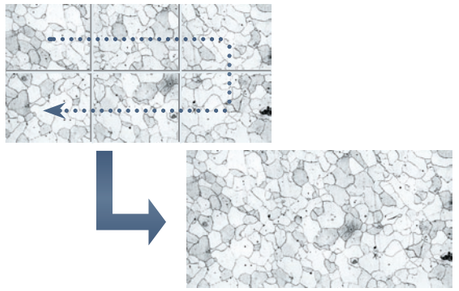
Scene Mode

Ten camera setting patterns for optimal color reproduction and contrast for each microscope light source, observation method and type of sample, as well as custom settings, can be selected.

- Wafer/IC
- Metal, Ceramic/Plastic
- Circuit board
- Flat Panel Display

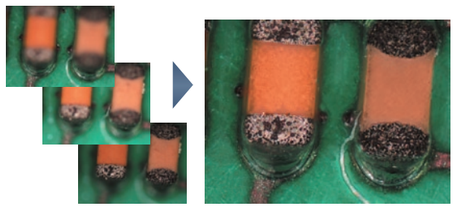
Image Stitching

Stitches together images acquired from multiple fields of view to create one image.



EDF (Extended Depth of Focus)

Create a single, all-in-focus image from images of differing focus.



Please refer to individual product brochures for further details.

BW-S500/BW-D500 Series

Nikon's proprietary scanning-type optical interference measurement technology achieves 1 pm height resolution. Nikon offers variety application, lustrous surfaces, such as silicon wafer, glass and metallic deposition surfaces.

光設計賞 OPTICAL DESIGN AWARD

	High Speed Model BW-D500 Series	High Pixel Resolution Model BW-S500 Series	
Height Resolution (algorithm)	1 pm		
Step Height Measurement Reproducibility	σ: 8 nm (8 µm Step height measurement)		
Number of Pixels	510×510	2,046×2,046	1,022×1,022
Height Measurement Time	2 s (10 µm scan)	19 s (10 µm scan)	8 s (10 µm scan)
Field of view	< 2,015×2,015 µm*	< 4,458×4,448 µm*	

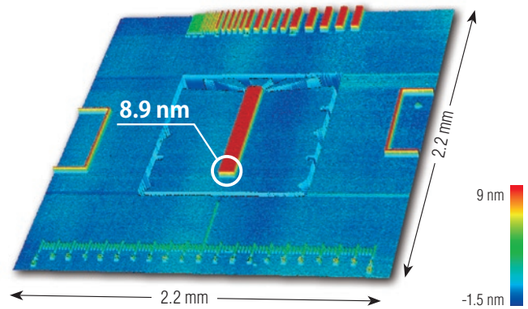
* The range can be extended by changing the relay lens or by stitching.

BW-S507

High Accuracy and Repeatability

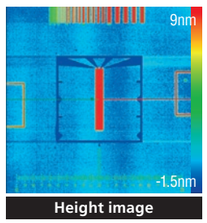
The BW-S500/BW-D500 series is calibrated by an 8 nm or 8 µm VLSI Step Height Standards sample, certified by the NIST. Achieves extremely high accuracy and repeatability as a height measurement system.

8 nm Step Height Sample

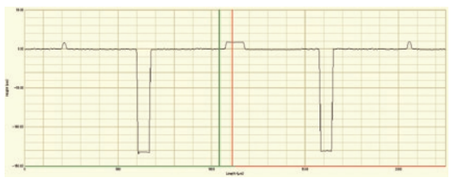


Measured value unsusceptible to variation of central wavelength of light source

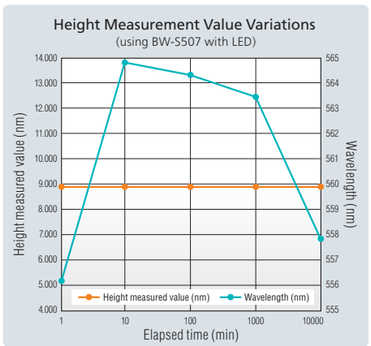
With Nikon's proprietary technology, measurement values with the BW-S500/ BW-D500 series are independent of central wavelength of light source. Measurements can be done immediately after switching on illumination source.

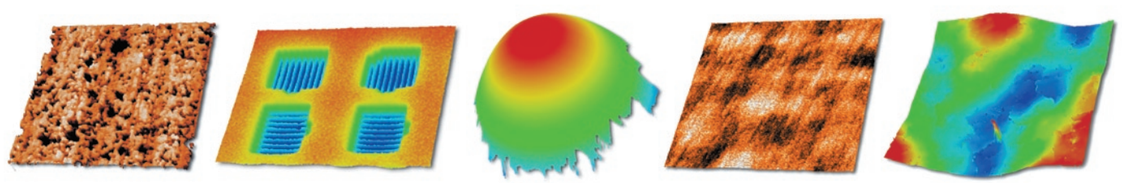


Height image



Calibrated Value (NIST) : 8.9 nm ±0.6 nm
Average Value by BW-S507: 8.906 nm(10 times/σ 0.031 nm)





Polished ceramic surface | Metal Etching Surface | Lens | Glass | Glossy paper

Please refer to individual product brochures for further details.

Objective Lenses

CFI60-2 / CFI60

Nikon's CFI60-2/CFI60 optical systems are highly evaluated for their unique concept of high NA combined with a long working distance. These lenses have been developed further and evolved achieving the apex in long working distance specifications, correct chromatic aberration, and an optimized lens weight.

NA: Numerical Aperture **BF**: Brightfield **DF**: Darkfield **POL**: Polarizing **S-POL**: Simple Polarizing **DIC**: Differential Interference Contrast **UV-FL**: UV Fluorescence **FL**: EPI Fluorescence

	Model	Magnification	NA	WD (mm)	BF	DF	POL	S-POL	DIC	UV-FL	FL
CFI60-2	T Plan EPI Plan (Semi-apochromat)	1×	0.03	3.8	✓	—	—	—	—	—	—
		2.5×	0.075	6.5	✓	—	—	—	—	—	—
	TU Plan Fluor EPI Universal Plan Fluor (Semi-apochromat)	5×	0.15	23.5	✓	—	—	✓	✓ A	✓	✓
		10×	0.3	17.5	✓	—	—	✓	✓ A	✓	✓
		20×	0.45	4.5	✓	—	—	✓	✓ A	✓	✓
		50×	0.8	1.0	✓	—	—	✓	✓ A	✓	✓
		100×	0.9	1.0	✓	—	—	✓	✓ A	✓	✓
	TU Plan Apo EPI Universal Plan Apo (Apochromat)	50×	0.8	2.0	✓	—	—	✓	✓ A	—	✓
		100×	0.9	2.0	✓	—	—	✓	✓ A	—	✓
		150×	0.9	1.5	✓	—	—	✓	✓ A	—	✓
	TU Plan Fluor EPI P Polarizing Universal Plan Fluor (Semi-apochromat)	5×	0.15	23.5	✓	—	✓	✓	✓ A	✓	✓
		10×	0.3	17.5	✓	—	✓	✓	✓ A	✓	✓
		20×	0.45	4.5	✓	—	✓	✓	✓ A	✓	✓
		50×	0.8	1.0	✓	—	✓	✓	✓ A	✓	✓
		100×	0.9	1.0	✓	—	✓	✓	✓ A	✓	✓
	TU Plan EPI ELWD Long Working Distance Universal Plan (Semi-apochromat)	20×	0.4	19.0	✓	—	—	✓	✓ B	—	✓
		50×	0.6	11.0	✓	—	—	✓	✓ B	—	✓
		100×	0.8	4.5	✓	—	—	✓	✓ B	—	✓
	T Plan EPI SLWD Super Long Working Distance Plan (Semi-apochromat)	10×	0.2	37.0	✓	—	—	—	—	—	✓
		20×	0.3	30.0	✓	—	—	—	—	—	✓
		50×	0.4	22.0	✓	—	—	—	—	—	✓
		100×	0.6	10.0	✓	—	—	—	—	—	✓
	TU Plan Fluor BD Universal Plan Fluor (Semi-apochromat)	5×	0.15	18.0	✓	✓	—	✓	✓ A	✓	✓
		10×	0.3	15.0	✓	✓	—	✓	✓ A	✓	✓
		20×	0.45	4.5	✓	✓	—	✓	✓ A	✓	✓
		50×	0.8	1.0	✓	✓	—	✓	✓ A	✓	✓
		100×	0.9	1.0	✓	✓	—	✓	✓ A	✓	✓
	TU Plan Apo BD Universal Plan Apo (Apochromat)	50×	0.8	2.0	✓	✓	—	✓	✓ A	—	✓
		100×	0.9	2.0	✓	✓	—	✓	✓ A	—	✓
		150×	0.9	1.5	✓	✓	—	✓	✓ A	—	✓
	TU Plan BD ELWD Long Working Distance Universal plan (Semi-apochromat)	20×	0.4	19.0	✓	✓	—	✓	✓ B	—	✓
		50×	0.6	11.0	✓	✓	—	✓	✓ B	—	✓
		100×	0.8	4.5	✓	✓	—	✓	✓ B	—	✓
CFI60	L Plan EPI (Achromat)	40×	0.65	1.0	✓	—	—	—	—	—	✓
	LU Plan Apo EPI / Universal Plan Apo (Apochromat)	150×	0.95	0.3	✓	—	—	✓	✓ A	—	✓
	L Plan EPI CR LCD Substrate Inspection Plan (Achromat) *Offers valid while supplies last	20×	0.45	10.9–10.0	✓	—	—	—	—	—	✓
		50×	0.7	3.9–3.0	✓	—	—	—	—	—	✓
		100×	0.85	1.2–0.85	✓	—	—	—	—	—	✓
		100×	0.85	1.3–0.95	✓	—	—	—	—	—	✓
	LE Plan EPI (Achromat)	5×	0.1	31	✓	—	—	—	—	—	✓
		10×	0.25	13	✓	—	—	—	—	—	✓
		20×	0.4	3.6	✓	—	—	—	—	—	✓
		50×	0.75	0.5	✓	—	—	—	—	—	✓
		100×	0.9	0.31	✓	—	—	—	—	—	✓
	LE Plan BD (Achromat)	5×	0.1	18	✓	✓	—	—	—	—	✓
		10×	0.25	13	✓	✓	—	—	—	—	✓
		20×	0.4	3.6	✓	✓	—	—	—	—	✓
		50×	0.75	0.5	✓	✓	—	—	—	—	✓

✓ : Available / — : Not available *A: Set prism position at A / B: Set prism position at B

Please refer to individual product brochures for further details.

For Incorporation into Microscopes

Modular Focusing Units

IM-4, LV-IM/LV-IMA, LV-FM/LV-FMA

Suitable for incorporating into systems, these focusing units enable the mounting of a universal illuminator and a motorized nosepiece.

	IM-4	LV-IM/LV-IMA	LV-FM/LV-FMA
Type	Manual	Manual / Motorized	Manual / Motorized
Vertical Stroke	30 mm	30/20 mm	30/20 mm

Dynamic Auto-Focus Unit

LV-DAF

Hybrid Auto-focus features a wide focus range and fast tracking ability. A wide range of observation methods are supported, including brightfield, darkfield, and DIC. Reflective and transparent samples can both be observed.

*Not compatible with NIS-Elements imaging software

Detection System	Split Projection System/ Contrast Detection System
AF Light Source	Near Infrared LED (λ=770 nm)
Focal Time	within 0.7 sec (Obj. lens: 20×, Distance from focal position: 200 µm)
Observation	Brightfield, Darkfield, Polarizing, DIC

Compact Reflected Microscopes

CM Series

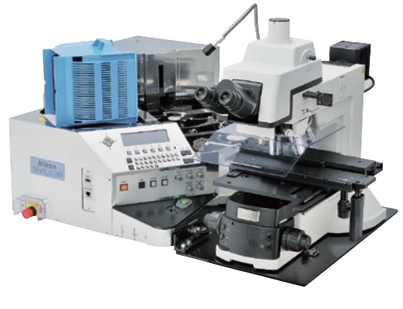
Ultra-compact reflected microscopes designed for integration into production lines to observe on monitors.

	CM-5A	CM-10A/CM-10L	CM-20A/CM-20L	CM-30A2/CM-30L2
Camera Mount	C-mount (ENG-mount possible with option)			
Tube Lens Magnification	—	1×	0.5×	1×
Compatible Objectives	A series: CF IC EPI Plan objectives / L series: CFI60-2/ CFI60 EPI Plan objectives			
Illumination Optical System	Koehler illumination (high-quality telecentric illumination)			
Attachment Surfaces	3			4

Wafer Loaders

NWL200 Series

Nikon's proprietary technology ensures reliable loading of ultra-thin 100 µm wafers. The NWL 200 series achieve highly reliable loading, suitable for inspection of next-generation semiconductors.



Wafer	Diameter	ø200 mm / ø150 mm
	Thickness (standard)	300 um
	Thickness (option)	300–100 um
Surface, back side macro inspection		✓

Please refer to individual product brochures for further details.

Wide variety of stage strokes and magnifications are available for various customer requirements.

Main Body (Type / Stage Stroke)

Wide FOV Model

VMA

Model VMA-2520
VMA-4540
VMA-6555

iNEXIV VMA-4540

Standard Model

VMZ-R

Model VMZ-R3020/VMZ-R4540/VMZ-R6555

NEXIV VMZ-R3020 NEXIV VMZ-R4540

High-precision Model

VMZ-H

Model VMZ-H3030

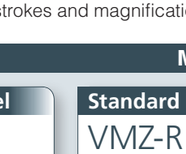
NEXIV VMZ-H3030

Model	Wide FOV			Standard			High-precision
XY Stroke	250×200 mm	450×400 mm	650×550 mm	300×200 mm	450×400 mm	650×550 mm	300×300 mm
Wide FOV Head	✓	✓	✓	✓	✓	✓	
Standard Head				✓	✓	✓	✓
High-Magnification Head				✓	✓	✓	✓
Z-axis Stroke	200 mm	200 mm	200 mm	200 mm	200 mm	200 mm	150 mm
Max. guaranteed loading capacity	15 kg	20 kg	30 kg	20 kg	40 kg	50 kg	30 kg
Maximum permissible error (EUX, MPE EUY, MPE)	2+8L/1000 µm	2+6L/1000 µm		1.2+4L/1000 µm			0.6+2L/1000 µm
Maximum permissible error (EUZ, MPE)	3+L/50 µm	3+L/100 µm		1.2+5L/1000 µm			0.9+L/150 µm

L = Length in mm

Zoom Heads

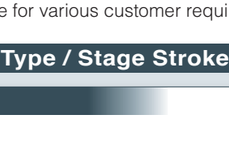
Type A



Wide FOV and long working distance enables comfortable operation. Laser AF and Touch Probe can be attached as optional accessories.

*Touch Probe is an option only for VMA series.

Type 1–4



Equipped with top, bottom, and oblique ring lights with adjustable angles. TTL (Through the Lens) Laser AF is a standard tool that can scan surfaces at 1000 points/second.

Type TZ

Equipped with 1-120x ultra high zoom ratio with 8 steps. Suitable for measurements of small targets up to several micrometers.

FOV	W(mm)× D(mm)	13.3 10.0	9.33 7.01	7.8 5.8	4.7 3.5	2.6 1.9	2.33 1.75	1.33 1.00	1.165 0.875	0.622 0.467	0.582 0.437	0.311 0.233	0.291 0.218	0.155 0.117	0.146 0.109	0.070 0.068	0.073 0.055	0.039 0.029	WD
Wide FOV Head	Type A																		73.5 mm
Standard Head	Type 1																		
	Type 2																		50 mm
	Type 3																		
High-Magnification Head	Type 4																		30 mm
	Type TZ																		9.8 mm

Please refer to individual product brochures for further details.

Simultaneous wide-area height measurements with confocal optics and 2D measurement with 15× brightfield zoom optics.

Main Body (Type /Stage Stroke)

VMZ-K3040

VMZ-K6555

	VMZ-K3040	VMZ-K6555
XY Stroke	300×400 mm	650×550 mm
Magnification (Type S)	1.5× / 3× / 7.5×	1.5× / 3× / 7.5×
Magnification (Type H)	15× / 30×	15× / 30×
Z-axis Stroke	150 mm	150 mm
Max. guaranteed loading capacity	20 kg	30 kg
Maximum permissible error (EUX, MPE EUY, MPE)	1.5+4L/1000 µm	
Maximum permissible error (EUZ, MPE)	1+L/1000 µm	

Zoom Heads

FOV	W(mm)× D(mm)	8 6	4 3	2.0 1.5	1.6 1.2	1.26 0.95	1.00 0.75	0.8 0.6	0.63 0.47	0.53 0.40	0.4 0.3	0.27 0.20	0.20 0.15	0.11 0.08	0.100 0.074	0.05 0.04	WD
Type S	1.5×																24mm
	3×																24mm
	7.5×																5mm
Type H	15×																20mm
	30×																5mm

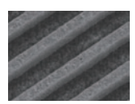
Brightfield Confocal/Brightfield

Confocal NEXIV incorporates confocal optics for fast and accurate evaluation of fine three-dimensional geometries.
Confocal Optics are designed for wide FOV height measurement.

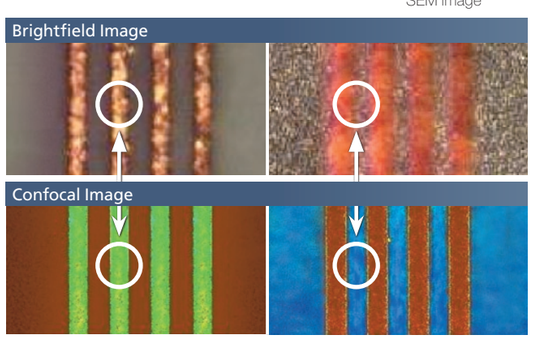
Brightfield Contour 3D view

High Contrast and Multileveled Sample (PCBs)

Brightfield observation can sometimes be difficult due to blurred lines along sample structure. These lines can be clearly observed and measured using Confocal optics.



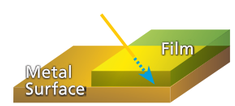
SEM image

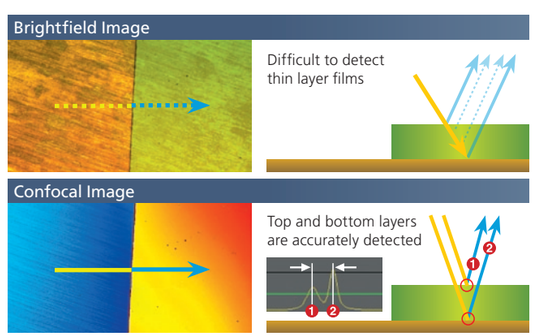


Top detected Bottom detected

Thin Transparent Samples (Metal Surface Film / Semiconductor Resist)

Top layers of both thin transparent film and metal surface can be easily detected using Confocal optics.





Please refer to individual product brochures for further details.

Measuring Microscopes

Focused on high-precision and easy operability, a wide range of MM-products are available.

		Compact Model MM-200	Basic Model MM-400	Large-Stage Model MM-800
				
Stage Size/ Loading Capacity	50×50 mm / 5 kg	✓	✓	✓
	100×100 mm / 15 kg	—	✓	✓
	150×100 mm / 15 kg	—	✓	✓
	200×150 mm / 20 kg	—	—	✓
	250×150 mm / 20 kg	—	—	✓
	300×200 mm / 20 kg	—	—	✓
Max. Sample Height		110 mm	150 mm	200 mm
Optical Head	Monocular	✓	✓	—
	Binocular	—	✓	✓
X-Y-Z	2-axis	✓	✓	✓
	3-axis	—	✓	✓
CCD		✓*	✓	✓
Obj. Magnification		1×/3×/5×/10×	1×/3×/5×/10×/20×/50×/100×	

*For simple video head only

✓ : Available / — : Not available

MM Type

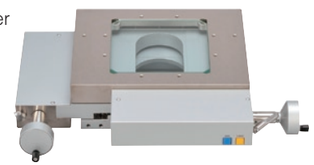
With Nikon's optical technology and highly precise stages, high-precision measurement can be achieved.

Universal Type

Offers a line-up compatible with dimensional measurement and various observation methods.

High-Precision Stages

The coarse/fine changeover lever and the RESET and SEND buttons are located near the X- and Y-axis knobs.

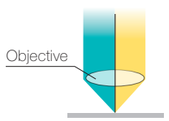


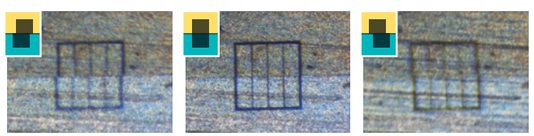
X-axis Knob

Y-axis Knob

Focusing Aid (FA)

The Split-Prism FA delivers sharp patterns to allow accurate focusing during Z-axis measurements.
FA patterns are clearly visible because they are split vertically.





Front Focus | Focused | Rear Focus

Please refer to individual product brochures for further details.

Profile Projectors

Nikon's profile projectors apply the principles of optics to the inspection of manufactured parts by projecting magnified silhouettes on a screen.

		Desktop Model V-12B	Large-Screen Model V-20B
			
Stage Size/ Loading Capacity	50×50 mm / 5 kg	✓	✓
	100×100 mm / 15 kg	✓	✓
	150×100 mm / 15 kg	✓	✓
	200×150 mm / 20 kg	✓	✓
	250×150 mm / 20 kg	✓	✓
Max. Sample Height		100 mm*2	150 mm
Screen		305 mm	500 mm
Image		Erect	Inverted
Projection Lens	Magnification	5×/10×/20×/25×/50×/100×/200×	5×/10×/20×/50×/100×
	FOV (with 10× lens)*1	30.5 mm	50 mm
Digital Protractor		✓	✓
Digital Counter		✓	✓

*1: Actual FOV = Effective diameter of screen / Lens magnification
*2: Maximum sample height is 70 mm when 200×150 mm stage is installed.

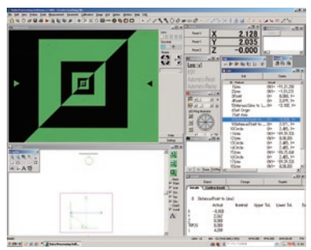
✓ : Available / — : Not available

Data Processing Systems for Measuring Microscopes and Profile Projectors

Data Processing Software

E-MAX

Provides the user with various advanced measurements and processing functions. Automated edge detection with sub-pixel processing enables more precise and repeatable measurements.

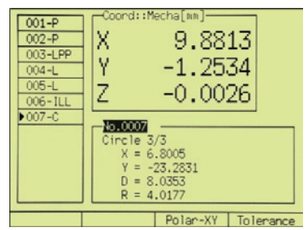


Connected with profile projector, data processing functions only

Data Processor

DP-E1A

Effectively used with a measuring microscope / profile projector, it quickly calculates and processes measurement data. Feature Oriented Operation of the DP-E1A allows the user to conduct measurements with the graphics, providing a seamless measuring environment.



Connected with profile projector, retrofit counter and DP units are required.

Please refer to individual product brochures for further details.

Autocollimators

Autocollimator is an easy-to-use but precise metrology instrument for angularity, parallelism, perpendicularity, straightness of precision components machine guide-way and many other applications.

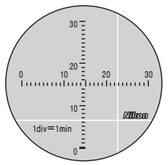
Brightfield Type

6B-LED

Utilizes hallmark Nikon optics to illuminate surface details.

Darkfield Type

6D-LED



Optimal for measuring small, flat mirrors.

Observation Method	6B-LED: Brightfield, 6D-LED: Darkfield
Readout System	Adjustment in viewfield and reading on micrometer
Measuring Range	30 minutes of arc (both vertical and horizontal axes)
Minimum Range	0.5 seconds of arc

Plane Mirror C

Both sides are perfectly parallel, permitting its use as a reference for non-reflective surface. Also useful for measuring extremely small angles where a smaller mirror is desirable.

*Wooden case provided.

Outer Diameter	30 mm
Thickness	12 mm
Parallelism	2 seconds of arc

LED Illuminator AC-L1

LED illumination unit for retrofitting onto Autocollimator 6B/6D illumination unit.

Power Source	AA batteries×2, AC adaptor

DIGIMICRO

With built-in photoelectric digital length measuring systems, DIGIMICRO offers flawless contact measurements of dimension, thickness, and depth.

Main unit MF-1001 + Counter MFC-101A + Stand MS-21

Main unit MF-501 + Counter TC-101A + Stand MS-11C

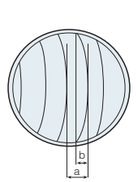
Main Unit	MF-1001	MF-501	MH-15M
Measuring Range	0–100 mm	0–50 mm	0–15 mm
Accuracy (20°C)	3 µm	1 µm	0.7 µm
Measuring Force	Downward direction 1.225 to 1.813N (variable to about 0.441N), lateral 0.637 to 1.225N	Downward direction 1.127 to 1.617N (variable to about 0.294N), lateral 0.637 to 1.225N	Upward direction 0.245N, downward 0.637N, lateral 0.441N *With lifting release
Operating Temperature	0 to 40˚C		

Please refer to individual product brochures for further details.

Optical Flat / Optical Parallel / Standard 300 mm Scale

Optical Flat

The optical flat is used to check the flatness level of a surface provided with mirror-smooth finish.
Flatness level can be measured by observing interference fringes by placing the optical flat in contact with the sample.



Diameter	Glass (ø60 mm)	Glass (ø130 mm)
Thickness	15 mm	27 mm
Flatness	0.1 µm	0.1 µm

Optical Parallel

Both planes of the optical parallel have been precisely finished flat and parallel.
It is used to check the flatness and parallel levels of a sample by observing interference fringes by placing the optical parallel in contact with the sample.

Diameter	30 mm
Thickness	12 mm / 12.12 mm / 12.25 mm / 12.37 mm
Flatness	within 0.1 µm
Parallelism	within 0.2 µm

*Optical flats and parallels with greater precision are available by custom orders.

Standard 300mm Scale

Gauges stage travel accuracy up to 300 mm. Both 10 mm-interval sensor patterns and calibrations are provided. Made of the glass with low coefficient of thermal expansion, for minimizing thermal influence.

*Within 1 µm against compensation values.

Please refer to individual product brochures for further details.

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

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