Industrial Instruments General Catalogue 2014

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Stereoscopic Microscopes SMZ Series

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

Parallel Optics Type

	SMZ25 NEW	SMZ18 NEW	SMZ1000	SMZ800
Zoom Ratio	25 : 1	18 : 1	10 : 1	6.3 : 1
Zoom Range	0.63–15.75×	0.75–13.5×	0.8–8×	1–6.3×
Total Magnification*1 (Standard combination*2)	3.15–945× (6.3–157.5×)	3.75–810× (7.5–135×)	4–480× (8–80×)	5–378× (10–63×)
W.D.*3	60mm	60mm	70mm	78mm
Camera	✓	✓	✓	✓

✓ : Available / — : Not available

Greenough Type

	SMZ745 SMZ745T	SMZ660	SMZ445 SMZ460		SMZ	SM-5 SM-6
Zoom Ratio	7.5 : 1	6.3 : 1	4.4 : 1	4.3 : 1	5 : 1	—
Zoom Range	0.67–5×	0.8–5×	0.8 – 3.5×	0.7 – 3×	0.8–4×	—
Total Magnification*1 (Standard combination*2)	3.35–300× (6.7–50×)	4–300× (8–50×)	4–70× (8–35×)	3.5–60× (7–30×)	4–120× (8–40×)	10–60× (20×)
W.D.*3	115mm	115mm	100mm		77.5mm	100mm
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 Auxilliary Objective lens.

Please refer to individual product brochures for further details.

Nikon's Industrial Microscopes utilize the CFI60-2 optical systems, highly evaluated for its unique concept of high NA combined with long W.D.

Upright Microcopes (General model)

LV150N LV150NA LV150NL

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

LV150N

LV100ND LV100DA-U

Model offers various observation methods with reflected/transmitted illumination.

LV100ND

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

BF: Brightfield **DF:** Darkfield **DIC:** Differential Interference Contrast **FL:** Flourescence **POL:** Polarizing **2-Beam:** Two-Beam Interferometry **Ph-C:** Phase-Contrast

Upright Microcopes (Large-sized stage model)

L300N L300ND

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

L300ND

L200N L200ND

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

L200ND

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

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

Inverted Metallurgical Microscopes

MA200

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

MA100 MA100L

MA100 and MA100L are compact, inverted microscopes designed for brightfield and simple polarizing observations.

MA100L

	MA200	MA100 MA100L
Observation Method	EPI: BF ✓ / DF ✓ / DIC ✓ / S-POL ✓ / FL ✓ DIA: BF ✓ / DF ✓ / DIC ✓ / S-POL ✓ / FL — ✓ : Available / — : Not available	EPI: BF ✓ / DF — / DIC — / S-POL ✓ / FL — ✓ : Available / — : Not available
Illuminator	• Episcopic / Diascopic	• Episcopic
Stage	• MA2-SR Mechanical Stage (stroke 50×50mm)	• MA-SR Rectangular 3-plate Stage (stroke 50×50mm) • MA-SP Plan Stage • Ti-SM Attachable Mechanical Stage CH (stroke 126×80mm)

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

Polarizing Microscopes

LV100NPOL Ci POL

High quality polarizing microscopes with superb optical performance that accommodate various observation needs.

LV100NPOL

Multi-purpose Zoom Microscopes

AZ100 AZ100M

Multizoom AZ100 and AZ100M combine the advantages of stereoscopic and metallographic microscopes.

AZ100

	LV100NPOL Ci POL	AZ100 AZ100M
Observation Method	BF / POL EPI: ✓ / ✓ DIA: ✓ / ✓ ✓ : Available / — : Not available	EPI: BF ✓ / DF — / DIC ✓ / S-POL — / FL ✓ DIA: BF ✓ / DF ✓ / DIC ✓ / S-POL ✓ / FL — ✓ : Available / — : Not available
Illuminator	• Episcopic/ Diascopic	• Episcopic/ Diascopic
Stage	• LV100NPOL : High precision rotating stage for polarizing observation • Ci POL : Rotating stage with stage clamp	• 6×6 Stage (stroke 150×150mm) for episcopic • 6×4 Stage (stroke 150×100mm) for diascopic

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

Please refer to individual product brochures for further details.

Digital Camera System for Microscopes — Digital Sight Series

A range of features are available to suit every observation sample, such as color /monochromatic, cooled / non-cooled, 5.0 / 2.0 megapixel CCD. The Digital Sight (DS) camera system allows for numerous combinations with camera heads and stand-alone or PC-based control units.

Camera Heads

	High-Speed Color Camera Head	High-Definition Cooled Color Camera Head	Ultra High-Definition Cooled Color Camera Head
	DS-Vi1 	DS-Fi2 	DS-Ri1 
	2.0M pixels · Color	5.0M pixels · Color · High-Resolution	12.7M pixels · Color · Cooled · High-Resolution
Frame Rate	27fps (800×600 / L3)	21fps (1280×960 / L3)	19fps (1280×1024 / U3)
Max Recordable Pixels	1600×1200	2560×1920	4076×3116 (pixel shift mode)

*See the "Digital Sight series" catalog for other camera heads.

Control Units

Stand-Alone Unit

DS-L3

Equipped with a large touch panel monitor and a rich feature set, the DS-L3's ease of operation enables quick image acquision without a PC or computer monitor.

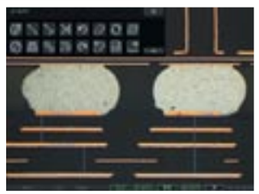
Scene Mode

Optimal imaging parameters for each sample type and observation method can easily be set through the icons.

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

Variety of Tool Features

Multiple editing functions are available and can be saved onto images. Measurement data can be easily ouputted as needed.



Measurement (two-point distance)

Measurement function

Point to line distance · Point to line distance · Circle distance · Angle · Circle Diameter, Radius · Area · Pitch distance

Position and size comparison functions · Drawing functions

Scale indication · Cross-hairs · Grid · XY scale · XY measurement · Count marking · Text input · Pen drawing (Straight/Curved)

PC Controlled unit

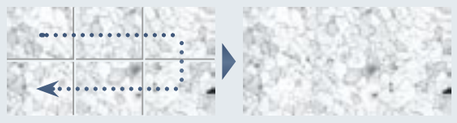
DS-U3

From displaying and acquiring live images to advanced image processing and analysis, the DS-U3 allows control of all functions from a PC and can be used for a wide range of applications.

Imaging software "NIS-Elements" series

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.

Digital Microscopes — ShuttlePix P-400Rv

An all-new, one-of-a-kind digital microscope that can either be portable to accommodate any sample size or docked on a stand to take high-magnification images and perform various measurements.

Motorized Focusing Stand + Touch Panel Monitor

Through the intuitive operation of touching icons or using the screen stylus, precise image capturing and simple measurement are now possible.

One-touch EDF

EDF images can be easily acquired by selecting the start and end positions on the sample.

Handheld Set

The lightweight, ergonomic camera head allows for easy handling for all users.

Simple Stand

This all-in-one set features a battery operated zoom camera head and a compact simple reflection stand, both of which can be taken anywhere to capture high-resolution images.

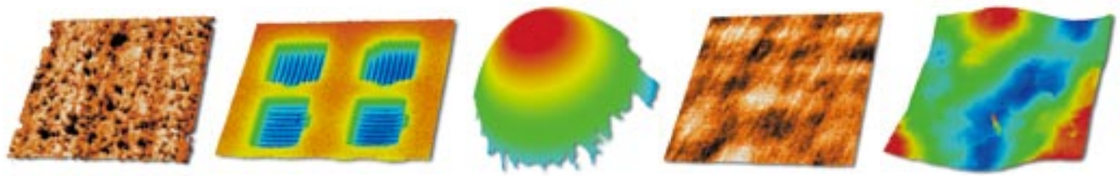
Super High Vertical Resolution Non-Contact 3D Surface Profilers — BW-D500 Series/ BW-S500 Series

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

	High Speed Model BW-D500 Series	High Pixel Resolution Model BW-S500 Series	
Height Resolution (algorithm)	1pm		
Step Height Measurement Reproducibility	σ: 8nm (8μm Step height measurement)		
Number of Pixels	510×510	2,046×2,046	1,022×1,022
Height Measurement Time	4 s (10μm scan)	38 s (10μm scan)	16 s (10μm scan)
Field of view	< 2,015×2,015μm*	< 4,458×4,448μm*	

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

BW-S507



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

Please refer to individual product brochures for further details.

Objective Lenses

CFI60-2 / CFI60 / CF&IC

Nikon's CFI60-2/CFI60/CF&IC optical systems are highly evaluated for its unique concept of high NA combined with long working distance. These lenses have further evolved to achieve the apex in long working distance, correct chromatic abserration, and optimized lens weight.

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

	Model	Magnification	NA	W.D. (mm)	BF	DF	POL	S-POL	DIC	UV-FL	FL
CFI60-2 NEW	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	—	✓
	LU Plan Apo BD Universal Plan Apo (Apochromat)	100×	0.9	0.51	✓	✓	—	✓	✓ A	—	✓
		150×	0.9	0.42	✓	✓	—	✓	✓ 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	✓	—	—	—	—	—	✓
CF&IC	CF IC EPI Plan Plan (achromat)	2.5×	0.075	8.8	✓	—	—	—	—	—	✓
		5×	0.13	22.5	✓	—	—	—	—	—	✓
		10×	0.3	16.5	✓	—	—	—	—	—	✓
		20×	0.46	3.1	✓	—	—	—	—	—	✓
		50×	0.8	0.54	✓	—	—	—	—	—	✓
		100×	0.95	0.3	✓	—	—	—	—	—	✓
	CF IC EPI Plan Apo Plan Apo (Apochromat)	50×	0.95	0.4	✓	—	—	—	—	—	✓
		100×	0.95	0.3	✓	—	—	—	—	—	✓
		150×	0.95	0.2	✓	—	—	—	—	—	✓
	CF IC EPI Plan ELWD Long Working Distance Plan (Achromat)	20×	0.4	11	✓	—	—	—	—	—	✓
		50×	0.55	8.7	✓	—	—	—	—	—	✓
		100×	0.8	2	✓	—	—	—	—	—	✓
	CF IC EPI Plan SLWD Super Long Working Distance Plan (Achromat)	10×	0.21	20.3	✓	—	—	—	—	—	✓
		20×	0.35	20.5	✓	—	—	—	—	—	✓
		50×	0.45	13.8	✓	—	—	—	—	—	✓
		100×	0.73	4.7	✓	—	—	—	—	—	✓
	CF IC EPI Plan TI DIC Plan	2.5×	0.075	10.3	✓	—	—	—	—	—	—
		5×	0.13	9.3	✓	—	—	—	—	—	—
	CF IC EPI Plan DI DIC Plan	10×	0.3	7.4	✓	—	—	—	—	—	—
		20×	0.4	4.7	✓	—	—	—	—	—	—
		50×	0.55	3.4	✓	—	—	—	—	—	—
		100×	0.7	2.0	✓	—	—	—	—	—	—

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

Near-infrared Objective Lenses

NIR / NIR-C

Achieves high transmission of 90% or more at visible range and 1,064 nm. Significantly improved machining accuracy at a small size with low power. Suitable for Semiconductor and LCD by laser repair.

	Model	Magnification	NA	W.D. (mm)	Wave Length (n.m)	Parfocal Distance (mm)
NIR & NIR-C	NIR,*1 Near-Infrared Plan	20×	0.40	25.0	1,064/532	95
		50×	0.42	20.0	1,064/532	95
	NIR-C*1 Near-Infrared Plan (glass thickness correction range 0.3–1.1mm)	20×	0.40	24.0*2	1,064/532	95*3
		50×	0.42	19.0*2	1,064/532	95*3

*1: Please ask us regarding transmission outside of vision range and 1064nm. *2: W.D. is measured from the object surface with 1.1mm thick cover glass.
*3: Because of a shift in parfocal position when used in conjunction with cover-less objective lens, parfocal distance is corrected by correction rings and washers.

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	30mm	30/20mm	30/20mm

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.

Detection System	Split Projection System/ Contrast Detection System
AF Light Source	Near Infrared LED (λ=770nm)
Focal Time	within 0.7 sec (Obj. lens: 20×, Distance from focal position: 200μm)
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-30A/CM-30L
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 100μm wafers. The NWL 200 series achieve highly reliable loading, suitable for inspection of next-generation semiconductors.

Wafer	Diameter	ø200mm / ø150mm / ø125mm
	Thickness (standard)	300um
	Thickness (option)	300–100um
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 Type

VMA

Model VMA-4540 Series NEW
VMA-2520 Series

iNEXIV VMA-4540

Standard Type

VMR / VMZ-R NEW

Model VMR: VMR-1515/VMR-3020/VMR-6555/VMR-10080/VMR-12072
VMZ-R: VMZ-R3020/VMZ-R4540/VMZ-R6555

NEXIV VMZ-R3020

NEXIV VMZ-R4540

High Accuracy Type

VMR-H

Model VMR-H3030

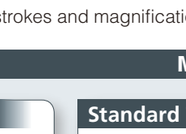
NEXIV VMR-H3030

Type	Wide FOV		Standard						High Accuracy
XY Stroke (mm)	250×200	450×400	150×150	300×200	450×400	650×550	1000×800	1200×720	300×300
Wide FOV Head	✓	✓		✓	✓	✓			
Stardard Head			✓	✓	✓	✓	✓	✓	✓
High-Magnification Head			✓	✓	✓	✓	✓	✓	✓
Z-axis Stroke (mm)	200	200	150	200	200	200	150	150	150
Max. guaranteed loading capacity (kg)	15	20	20	20	40	50	40	40	30
Max. permissible errors (μm) E_{UX}, M_{PE}:	1.5+4L/1000	2+6L/1000	1.5+4L/1000	1.2+4L/1000	1.2+4L/1000	1.2+4L/1000	2+4L/1000	2.2+4L/1000	0.6+2L/1000
Max. permissible errors in Z axis (μm) E_{UZ}, M_{PE}:*1	1.5+L/150	3+L/100	1.5+L/150	1.2+5L/1000	1.2+5L/1000	1.2+5L/1000	1.5+L/150	1.5+L/150	0.9+L/150

L = Length in mm *1: with Laser AF or Touch Probing

Zoom Heads

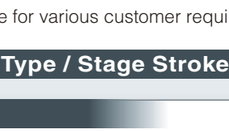
Type A



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	W.D.
Wide FOV Head	Type A																		73.5mm
Stardard Head	Type 1																		
	Type 2																		50mm
	Type 3																		
High-Magnification Head	Type 4																		30mm
	Type TZ																		9.8mm

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

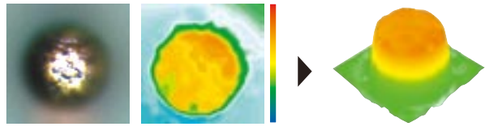
	VMZ-K3040	VMZ-K6555
XY Stroke (mm)	300×400	650×550
Magnification (Type S)	1.5× / 3× / 7.5×	1.5× / 3× / 7.5×
Magnification (Type H)	15× / 30×	15× / 30×
Z-axis Stroke (mm)	150	150
Max. guaranteed loading capacity (kg)	20	30
Max. permissible error U1x, U1Y (μm)	1.5+2.5L / 1000	1.5+2.5L / 1000
Max. permissible error of Z axis (μm)	1+L / 1000	1+L / 1000

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	0.30 0.23	0.27 0.20	0.20 0.15	0.11 0.08	0.100 0.074	0.05 0.04	W.D.
Type S	1.5×																	24mm
	3×																	24mm
	7.5×																	5mm
Type H	15×																	20mm
	30×																	5mm

Confocal Optics Brightfield Optics Both brightfield and 3D images are available

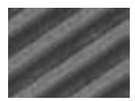
Confocal NEXIV incorporates confocal optics for fast and accurate evaluation of fine three-dimensional geometries.
Confocal Optics are designed for wide FOV height measurement.



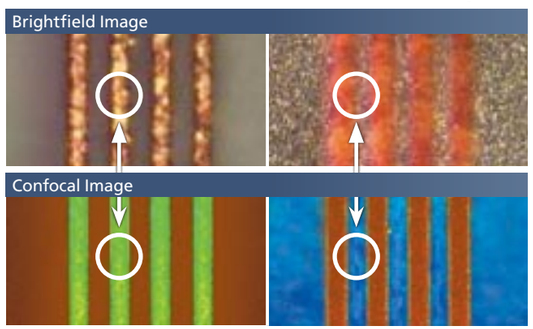
Brightfield Contour 3D view

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.



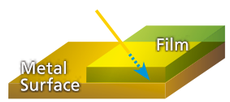
SEM image

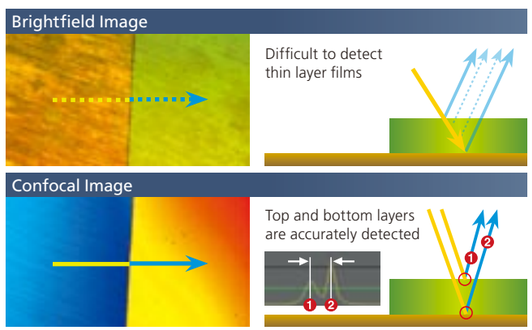


Top detected Bottom detected

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	50×50mm / 5kg	✓	✓	✓
	100×100mm / 15kg	—	✓	✓
	150×100mm / 15kg	—	✓	✓
	200×150mm / 20kg	—	—	✓
	250×150mm / 20kg	—	—	✓
	300×200mm / 20kg	—	—	✓
Max. Workpiece Height		110mm	150mm	200mm
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 newly developed stages, high-precision measurement can be achieved.

Universal Type

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

Newly Developed High-Precision Stages

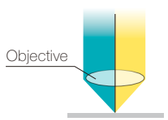
The coarse/fine changeover lever and the RESET and SEND buttons are located near the X- and Y-axis knobs.

X-axis Knob

Y-axis Knob

Focusing Aid (FA)

The newly developed 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	Large-Screen Model V-24B
				
Stage Size/ Loading Capacity	50×50mm / 5kg	✓	✓	—
	100×100mm / 15kg	✓	✓	—
	150×100mm / 15kg	✓	✓	—
	200×150mm / 20kg	✓	✓	—
	250×150mm / 20kg	✓	✓	—
	225×100mm / 30kg	—	—	✓
Max. Workpiece Height		100mm*2	150mm	250mm
Screen		305mm	500mm	600mm
Image		Erect	Inverted	Inverted
Projection Lens	Magnification	5×/10×/20×/25×/50×/100×/200×	5×/10×/20×/50×/100×	5×/10×/20×/50×/100×
	FOV (with 10× lens)*1	30.5mm	50mm	60mm
Digital Protractor		✓	✓	—
Digital Counter		✓	✓	✓(External)

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

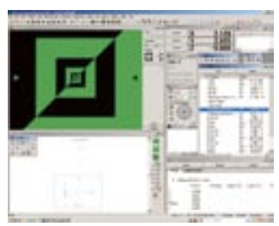
✓ : Available / — : Not available

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.

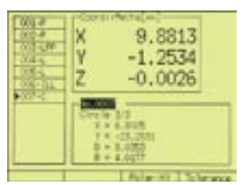


Connected with profile projector, data processing functions only

Data Processor

DP-E1

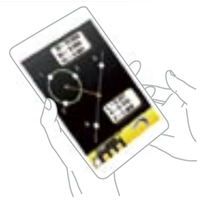
Effectively used with a measuring microscope /profile projector, it quickly calculates and processes measurement data. Feature Oriented Operation of the DP-E1 allows the user to conduct measurements with the graphics, providing a seamless measuring environment.



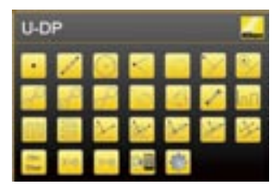
Connected with profile projector, retrofit counter and DP units are required.

Metrology Software

U-DP



The browsered geometric dimensioning software can be effortlessy connected via Ethernet or Wifi to electronic devices. Interactive navigation enables immediate operation, while the simple screen layout enables easy measurement results confirmation.



[Operating environment]
OS: Windows®XP, Windows®7
Required memory: 2GB (min.)
Recommended browsers: Windows® Internet Explorer Ver6.0.2.9 or later

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	30mm
Thickness	12mm
Parallelism	2 seconds of arc

LED Illuminator AC-L1

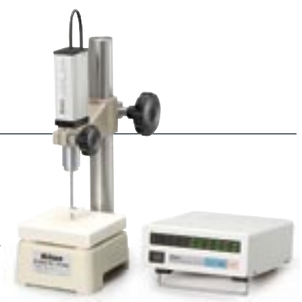
LED illumination unit for retrofitting onto Autocollimator 6B/6D illumination unit.

Power Source	AA batteries×2, AC adaptor

DIGIMICRO

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

Mainunit MF-1001 + Counter MFC-101 + Stand MS-21



Mainunit MF-501 + Counter MFC-101 + Stand MS-11C

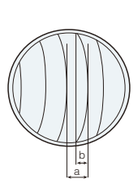
Main Unit	MF-1001	MF-501	MH-15M
Measuring Range	0–100mm	0–50mm	0–15mm
Accuracy (20°C)	3μm	1μm	0.7μm
Measuring Force	Downward direction 1.225 to 1.813N (variable to about 0.441N), lateral 0.637 to 1.225N	Downward direction 1.127 to 1.617N (variable to about 0.294N), lateral 0.637 to 1.225N	Upward direction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

Please refer to individual product brochures for further details.

Optical Flat / Optical Parallel / Standard 300mm 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 inteference fringes by placing the optical flat in contact with the workpiece.



Diameter	Glass (ø60mm)	Glass (ø130mm)
Thickness	15mm	27mm
Flatness	0.1μm	0.1μm

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 workpiece by observing intereference fringes by placing the optical parallel in contact with the workpiece.

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

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

Standard 300mm Scale

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

*Within 1μm against compensation values.

Please refer to individual product brochures for further details.

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

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*Products: Hardware and its technical information (including software)

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

NIKON CORPORATION
Shin-Yurakucho Bldg., 12-1, Yurakucho 1-chome
Chiyoda-ku, Tokyo 100-8331 Japan
phone: +81-3-3216-2384 fax: +81-3-3216-2388
http://www.nikon.com/instruments/

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ISO 9001 Certified
for NIKON CORPORATION
Instruments Company

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ISO 14001 Certified
for NIKON CORPORATION
Yokohama Plant

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.US.NM@nikon.com
http://www.nikonmetrology.com/

NIKON METROLOGY EUROPE NV
Geldenaaksebaan 329, 3001 Leuven, Belgium
phone: +32-16-74-01-00 fax: +32-16-74-01-03
Email: Sales.Europe.NM@nikon.com
http://www.nikonmetrology.com/

NIKON INSTRUMENTS (SHANGHAI) CO., LTD.
CHINA 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: +86-20-3882-0550 fax: +86-20-3882-0580

NIKON SINGAPORE PTE LTD.
SINGAPORE phone: +65-6559-3618 fax: +65-6559-3668

NIKON MALAYSIA SDN. BHD.
MALAYSIA phone: +60-3-7809-3688 fax: +60-3-7809-3633

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

NIKON INDIA PRIVATE LIMITED
INDIA phone: +91-124-4688500 fax: +91-124-4688527

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

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

NIKON METROLOGY UK LTD.
UNITED KINGDOM phone: +44-1332-811-349 fax: +44-1332-639-881
E-mail: 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

NIKON METROLOGY GMBH
GERMANY phone: +49-6023-91733-0 fax: +49-6023-91733-229
E-mail: Sales.Germany.NM@nikon.com

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