Industrial Instruments General Catalogue
### Stereo Microscopes

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

<table>
<thead>
<tr>
<th>SMZ25</th>
<th>SMZ18</th>
<th>SMZ1270</th>
<th>SMZ1270i</th>
<th>SMZ800N</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Zoom Ratio</strong></td>
<td>25 : 1</td>
<td>18 : 1</td>
<td>12.7 : 1</td>
<td>8 : 1</td>
</tr>
<tr>
<td><strong>Zoom Range</strong></td>
<td>0.63–15.75×</td>
<td>0.75–13.5×</td>
<td>0.63–8×</td>
<td>1–8×</td>
</tr>
<tr>
<td><strong>Total Magnification</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*<em>W.D.<em>3</em></em></td>
<td>60mm</td>
<td>60mm</td>
<td>70mm</td>
<td>78mm</td>
</tr>
<tr>
<td><strong>Camera</strong></td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
</tbody>
</table>

*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 Objective lens.

---

### Greenough Type

<table>
<thead>
<tr>
<th>SMZ745</th>
<th>SMZ745T</th>
<th>SMZ445</th>
<th>SMZ460</th>
<th>SMZ2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Zoom Ratio</strong></td>
<td>7.5 : 1</td>
<td>4.4 : 1</td>
<td>4.3 : 1</td>
<td>5 : 1</td>
</tr>
<tr>
<td><strong>Zoom Range</strong></td>
<td>0.67–5×</td>
<td>0.8–3.5×</td>
<td>0.7–3×</td>
<td>0.8–4×</td>
</tr>
<tr>
<td><strong>Total Magnification</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*<em>W.D.<em>3</em></em></td>
<td>115mm</td>
<td>100mm</td>
<td>77.5mm</td>
<td></td>
</tr>
<tr>
<td><strong>Camera</strong></td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
</tbody>
</table>

*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 Objective lens.

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Rease refer to individual product brochures for further details.
**Industrial Microscopes**

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

### Upright Microscopes (General model)

<table>
<thead>
<tr>
<th>Model</th>
<th>Observation Method</th>
<th>BF</th>
<th>DF</th>
<th>DIC</th>
<th>FL</th>
<th>POL</th>
<th>2-Beam</th>
</tr>
</thead>
<tbody>
<tr>
<td>LV150N</td>
<td>EPI</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LV150NA</td>
<td>DIC</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LV150NL*</td>
<td>S-POL</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LV100N</td>
<td>DIC</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LV100ND</td>
<td>EPI</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LV100NDA</td>
<td>DIC</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

**Stage**
- 3×2 Stage (stroke 75×50mm)
- 6×4 Stage (stroke 150×100mm)

- *See the “LV-N Series” brochure for other compatible stages.

### Upright Microscopes (Large-sized stage model)

<table>
<thead>
<tr>
<th>Model</th>
<th>Observation Method</th>
<th>BF</th>
<th>DF</th>
<th>DIC</th>
<th>S-POL</th>
<th>FL</th>
</tr>
</thead>
<tbody>
<tr>
<td>L300N</td>
<td>EPI</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>L300ND</td>
<td>DIC</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Stage with stroke 350×300mm is available. Suitable for ø200mm wafer observation.

### Inverted Metallurgical Microscopes

**MA200**
- With its unique, inverted microscope design, the MA200 offers high stability, durability, and a smaller footprint than conventional models.

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

### Polarizing Microscopes

**LV100NPOL**
- High quality polarizing microscopes provide superb optical performance that accommodate various observation needs.

**AZ100**
- Multi-zoom AZ100 and AZ100M combine the advantages of stereoscopic and metallographic microscopes.

**Multi-purpose Zoom Microscopes**

Refer to individual product brochures for further details.
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.

Microscope Camera

The Stand-Alone Model is capable of high-definition image acquisition without a control unit.

Microscope Camera

DS-Fi3

Microscope Camera control unit

DS-L4

DS-Fi3 can be optionally connected to the DS-L4 tablet-style control unit, eliminating the need and space requirements of a desktop PC. DS-L4 has a large number of built-in security for network connectivity.

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.

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.

Super High Vertical Resolution Non-Contact 3D Surface Profilers

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

**ND 1**

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

**ND 2**

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

**ND 3**

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

**ND 4**

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.

**ND 5**

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

**ND 6**

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

**ND 7**

Reuse refer to individual product brochures for further details.
Objective Lenses

CFL60-2 / CFL60 / CF6IC

Nikon's CFL60-2/CFL60/CF6IC 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 aberration, and optimized lens weight.

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 weight. Suitable for Semiconductor and LCD by laser repair.

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.

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.

Compact Reflected Microscopes

CM Series

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

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.
NEXIV Series

CNC Video Measuring Systems

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

**Main Body (Type / Stage Stroke)**

<table>
<thead>
<tr>
<th>Type</th>
<th>Wide FOV</th>
<th>Standard</th>
<th>High Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>VMA</td>
<td>250×200</td>
<td>400×300</td>
<td>700x500</td>
</tr>
<tr>
<td>VMA-R</td>
<td>200×150</td>
<td>200×150</td>
<td>250×200</td>
</tr>
<tr>
<td>VMR / VMZ-R</td>
<td>200×150</td>
<td>200×150</td>
<td>250×200</td>
</tr>
<tr>
<td>VMR-H</td>
<td>200×150</td>
<td>200×150</td>
<td>250×200</td>
</tr>
</tbody>
</table>

**Zoom Heads**

<table>
<thead>
<tr>
<th>Type</th>
<th>FOV</th>
<th>W.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type A</td>
<td>1.5×</td>
<td>30mm</td>
</tr>
<tr>
<td>Type H</td>
<td>150×</td>
<td>200mm</td>
</tr>
</tbody>
</table>

**Confocal NEXIV Series**

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

**Main Body (Type / Stage Stroke)**

<table>
<thead>
<tr>
<th>Model</th>
<th>XY Stroke (mm)</th>
<th>Z-axis Stroke (mm)</th>
<th>Max. guaranteed loading capacity (kg)</th>
<th>Max. permissible error in Z axis (μm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VMZ-K3040</td>
<td>300×400</td>
<td>150</td>
<td>20</td>
<td>0.15</td>
</tr>
<tr>
<td>VMZ-K6555</td>
<td>650×500</td>
<td>150</td>
<td>30</td>
<td>0.20</td>
</tr>
</tbody>
</table>

**Zoom Heads**

<table>
<thead>
<tr>
<th>Type</th>
<th>FOV</th>
<th>W.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type S</td>
<td>1.5×</td>
<td>200mm</td>
</tr>
<tr>
<td>Type H</td>
<td>150×</td>
<td>200mm</td>
</tr>
</tbody>
</table>

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

**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.

**Thin Transparent Layers (Metal Surface Film / Semiconductor Resist)**

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

*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

<table>
<thead>
<tr>
<th>Stage Size/Loading Capacity</th>
<th>MM-200</th>
<th>MM-400</th>
<th>MM-800</th>
</tr>
</thead>
<tbody>
<tr>
<td>50x50mm / 5kg</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>100x100mm / 10kg</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>150x150mm / 15kg</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>200x100mm / 20kg</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>250x150mm / 20kg</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>300x200mm / 20kg</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Max. Workpiece Height</th>
<th>110mm</th>
<th>150mm</th>
<th>200mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optical Head</td>
<td>Monocular</td>
<td>Binocular</td>
<td></td>
</tr>
<tr>
<td>X-Y-Z</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Objective Magnification</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>CCD</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
</tbody>
</table>

*Available / Not available

**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.

**Uni-Directional Focus (FA)**

The newly developed Uni-Directional Focus (FA) delivers sharp patterns to allow accurate focusing during Z-axis measurements. FA patterns are clearly visible because they are split vertically.

**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

<table>
<thead>
<tr>
<th>Stage Size/Loading Capacity</th>
<th>V-12B</th>
<th>V-20B</th>
</tr>
</thead>
<tbody>
<tr>
<td>50x50mm / 5kg</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>100x100mm / 10kg</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>150x150mm / 15kg</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>200x100mm / 20kg</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>250x150mm / 20kg</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>300x200mm / 20kg</td>
<td>✔</td>
<td>✔</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Max. Workpiece Height</th>
<th>100mm+2</th>
<th>150mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Screen</td>
<td>300mm</td>
<td>500mm</td>
</tr>
<tr>
<td>Image</td>
<td>Erect</td>
<td>Inverted</td>
</tr>
<tr>
<td>Projection Lens</td>
<td>5x×/10×/20×/50×/100×/200×x</td>
<td>5x×/10×/20×/50×/100×/200×x</td>
</tr>
<tr>
<td>Digital Protractor</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Digital Counter</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>*Available / Not available</td>
<td>✔</td>
<td>✔</td>
</tr>
</tbody>
</table>

**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.

**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.

**Metrology Software**

**U-DP**

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

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12

Rece refer to individual product brochures for further details.

13

Rece refer to individual product brochures for further details.
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 workpiece.

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 interference fringes by placing the optical parallel in contact with the workpiece.

Optical Flat / Optical Parallel / Standard 300mm Scale
Optical Flat

**Brightfield Type**

6B-LED

- Utilizes hallmark Nikon optics to illuminate surface details.
- Optimal for measuring small, flat mirrors.

**Darkfield Type**

6D-LED

- Darkfield Type

- 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

**Optical Parallel**

- 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.

**Glass (ø130mm)**

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

- Power Source: AA batteries×2, AC adaptor

**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.

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

**DIGIMICRO**

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

**Main Unit**

**MF-1001**

- Measuring Range: 0–100mm
- Accuracy (20°C): 0.7µm
- Measuring Force:
  - Downward direction: 0.637 to 1.225N
  - Lateral: 0.441N
- Operating Temperature: 8 to 40°C

**MF-501**

- Measuring Range: 0–50mm
- Accuracy (20°C): 1µm
- Measuring Force:
  - Downward direction: 0.245N
  - Lateral: 0.637 to 1.225N
  - Upward direction: 0.294N
- Operating Temperature: 0 to 40˚C

**MH-15M**

- Measuring Range: 0–15mm
- Accuracy (20°C): 0.4µm
- Measuring Force:
  - Downward direction: 0.127 to 0.637N, lateral: 0.637 to 1.225N
- Operating Temperature: 8 to 40°C

- LED Illuminator AC-L1

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

- Power Source: AA batteries×2, AC adaptor

- External Dimensions:
  - Width: 194mm
  - Height: 194mm
  - Depth: 52mm

- Weight: 4.3kg