Stereoscopic Microscopes

Optical Systems

Parallel-optics type (zooming type)

This system has a parallel optical path into which diverse intermediate equipment, including a DS series digital camera, coaxial episcopic illuminator, teaching head, drawing tube and stage level riser can be inserted.

Greenough type (zooming type)

Allows a compact body that is suited for incorporation into other devices.

N.B. Export of the products in this catalog is controlled under the Japanese Foreign Exchange and Foreign Trade Law. Appropriate export procedure shall be required in case of export from Japan.

Products: Hardware and its technical information (including software) shall be required in case of export from Japan.

N.B. Export of the products in this catalog is controlled under the Japanese Foreign Exchange and Foreign Trade Law. Appropriate export procedure shall be required in case of export from Japan.

Specifications and equipment are subject to change without any notice or obligation on the part of the manufacturer.

June 2013.

©2007-13 NIKON CORPORATION

En

Printed in Japan [1306-XX]

Code No. 2CE-TVH-4

This brochure is printed on recycled paper made from 40% used material.
The Next Revolution in Microscopy
A Giant Step Forward in Stereo Microscopy

Nikon offers a broad range of stereoscopic microscopes and accessories, including a research stereoscopic microscope system with the world's highest zoom ratio, superb resolution and bright fluorescence imaging. Also features ergonomic, user-friendly and affordable models.

<table>
<thead>
<tr>
<th>Optical system</th>
<th>SMZ25</th>
<th>SMZ18</th>
<th>SMZ1000</th>
<th>SMZ800</th>
<th>SMZ745/SMZ745T</th>
<th>SMZ660</th>
<th>SMZ445/SMZ460</th>
<th>SMZ-2</th>
<th>SM-5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zooming range</td>
<td>0.63-15.75x</td>
<td>0.75-13.5x</td>
<td>0.8-8x</td>
<td>1-6.3x</td>
<td>0.87-5x</td>
<td>0.8-5x</td>
<td>0.8-3.5/0.7-3x</td>
<td>0.8-4x</td>
<td>—</td>
</tr>
<tr>
<td>Total magnification</td>
<td>3.15-94.5x</td>
<td>3.75-81.5x</td>
<td>4-48x</td>
<td>5.375x</td>
<td>3.25-300 (6.7-50x)</td>
<td>3.89-300 (8.5-50x)</td>
<td>4-70x (3-50x)</td>
<td>4-120x (20x)</td>
<td>10-50x (20x)</td>
</tr>
<tr>
<td>Working distance</td>
<td>60mm</td>
<td>60mm</td>
<td>70mm</td>
<td>78mm</td>
<td>115mm</td>
<td>115mm</td>
<td>100mm</td>
<td>77.5mm</td>
<td>100mm</td>
</tr>
<tr>
<td>Image capture</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>System expandability</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Embedded use</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

*1 Depends on the combination of eyepiece and objective lens  
*2 With a 10x eyepiece and a 1x objective  
*3 With a 1x magnification without auxiliary objective

Index

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Accessories (for SMZ25, SMZ18)</td>
<td>Base Unit, Focus Unit, Stand/Focus Mount, Objective</td>
<td>Tubes, Nosepiece/Focus Mount Adapter, Stage, Controller, Epi-fluorescence Set</td>
<td>Fiber Illuminator Set, Coaxial Illuminator, Ring LED Illuminator, Darkfield Observation Accessory, Polarizing Observation Accessory</td>
</tr>
</tbody>
</table>

| Accessories (for SMZ1000, SMZ800, SMZ745/745T, SMZ660, SMZ445/460, SMZ-2, SM-5) | Objectives, Auxiliary Objectives, Tubes, Eye-level Risers, Beam Splitters, Teaching Head, Drawing Tube, Stage, Illumination Systems/Polarizing Attachment, Universal Table Stands/Focusing Mounts, Stand, Digital Cameras for Microscopes |

|--------------------------------|---------------------------|---------------------------|---------------------------------|----------------|

<table>
<thead>
<tr>
<th>Others</th>
<th>Digital Microscope ShuttlePix P-420R</th>
<th>Multi-purpose Zoom Microscopes MULTIZOOM AZ100/100M</th>
</tr>
</thead>
</table>

27

23
Nikon has developed an all-new stereoscopic microscope that features a large zoom ratio of 25:1, high resolution and exceptional fluorescence transmission capability. The new stereoscopic microscope meets the increasing needs for imaging systems that span spatial scales from single cells to whole organisms.

**World’s widest zoom range and highest resolution for a stereoscopic microscope**

- First stereoscopic microscope to offer a 25:1 zoom range (SMZ25)
- Both eye paths boast numerical apertures (NA) of up to 0.156, using the SHR Plan Apo 1x objective and SMZ25

**Bright, high-contrast fluorescent images**

- Fly-eye lenses ensure uniform brightness over the entire field of view even at the lowest magnifications
- Breakthroughs in optical design mean significantly improved signal to noise ratio and crystal clear fluorescent images

**Easy to use**

- User-friendly remote control (SMZ25)
- Motorized focus and zoom operation (SMZ25)
- Imaging Software NIS-Elements enables the use of multiple imaging, processing and analysis modalities, including z-stack capture, time-lapse imaging and EDF image generation

**Parallel-optics type**

**Research Stereo Microscope**

**SMZ25/SMZ18**

Evolutionary stereoscopic microscope

**Automated and digital imaging**

- Motorized focus and zoom operation (SMZ25)
- Imaging Software NIS-Elements enables the use of multiple imaging, processing and analysis modalities, including z-stack capture, time-lapse imaging and EDF image generation

**SMZ25** Motorized zoom model with the highest zoom ratio and resolution in the SMZ series

**Model | SMZ25 | SMZ18**
---|---|---
Type | Motorized zoom | Manual zoom
Observation | Brightfield/Darkfield/Fluorescent/Simple polarizing | Manual zoom
Zoom ratio | 25:1 | 18:1
Magnification range | 0.63x - 15.75x | 0.75x - 13.5x (with 0.75/1/2/3/4/5/6/8/10/13.5x click stops)
Maximum magnification | 315x | 270x
Maximum FOV/ø70mm | ø18.5mm<sup>2</sup> | ø14.2mm<sup>2</sup>
Maximum NA of | 0.312<sup>2</sup> | 0.23<sup>2</sup>

1: Using SHR Plan Apo 2x/ C-W10xB 2: Using SHR Plan Apo 0.5x/ C-W10xB 3: Using SHR Plan Apo 2x

**SMZ25** Manual zoom model providing advanced optical performance and incredibly bright fluorescence at an attractive price

**Dynamic zoom ratio of 25:1**

An innovative optical system known as “Perfect Zoom Optics” offers the world’s first zoom ratio of 25:1 (zoom range: 0.63x - 15.75x<sup>2</sup>; “as of May 2013). The SMZ25 can seamlessly capture the entire dish while simultaneously delivering microscopic details.

**Auto Link Zoom (ALZ) supports seamless viewing at different scales**

ALZ automatically adjusts the zoom factor to maintain the same field of view when switching objective lenses. This function enables seamless switching between whole organism imaging at low magnifications and detailed imaging at high magnifications.

**Superior resolution never before seen on a stereoscopic microscope**

Newly developed SHR (Super High Resolution) Plan Apo series objective offers a resolution of 1100LP/mm (observed value, using SHR Plan Apo 2x at maximum zoom). The 0.5x, 1x, or 1.6x lower magnification objectives deliver a bright field of view and brilliant images with true-to-life colors.

**Comparison of resolution and color aberration by resolution chart**

**Model | SMZ25 | Conventional model**
---|---|---
Resolution | 1100LP/mm | 1000LP/mm
Color aberration | Low | High

**SMZ25**

**SMZ18**
**Enhanced brightness and uniform illumination in a low magnification range**

The SMZ25 series is the first stereoscopic microscope in the world to use a fly-eye lens on an epi-fluorescence attachment. This ensures bright, uniform illumination even at low magnifications across a large field of view.

**Improved S/N ratio and crystal clear fluorescent images thanks to an improved optical system**

Nikon has succeeded in improving the signal and reducing noise in fluorescent images by using a short-wavelength, high-transmission Fluor lens. This enables observations of cell division and samples with weak fluorescence, both of which are difficult using conventional stereoscopic microscopes.

**Automation and digital imaging**

A wide range of digital imaging capabilities with the Digital Sight series and NIS-Elements imaging software

Easily obtain the information required, such as Z drive position, zoom factor, objective lens, filter cube and LED DIA brightness, by using the Digital Sight series and NIS-Elements or Digital Sight series DS-L3 together with the microscope.

**Improved observation efficiency**

**Easy-to-use OCC illumination**

The new LED DIA Base with built-in OCC illuminator generates minimal heat, consumes little power and has a long life. The illuminator also enhances the contrast of uneven surfaces, such as those of film.

**User-friendly remote control**

The all-new remote control provides easy access to zoom and focus controls and is designed for both right- and left-hand use. The remote control contains an LCD monitor with an adjustable backlight that provides at-a-glance information about zoom factor, objective lens, filter cube and LED DIA brightness.

**On-axis imaging for digital images**

Easily switch between stereo position (stereoscopic view) and mono position (on-axis view) when using the P2-RNI2 Intelligent Nosepiece by simply moving the objective lens.

**What is OCC illumination?**

OCC stands for oblique coherent contrast, a form of oblique lighting method developed by Nikon. Compared to conventional diascopic illumination that illuminates directly from below, OCC illumination applies coherent light to samples in a diagonal direction, adding contrast to colorless and transparent sample structures.
Stereoscopic Microscope

SMZ1000/SMZ800

Pursuing ergonomic design, image clarity and low cost

Optical performance

Large 10x zoom ratio, extending from 0.8x to 8x

Total magnification of 4x to 480x* and the 10x zoom lens eliminates the need to change lenses, allowing users to concentrate on observation.

* Depending on the combination of eyepiece and objective used

High NA and high resolution

Nikon has developed an objective featuring a high NA of 0.1 and a high resolving power of 300 lines/mm.

Stereoscopic image

Chromatic aberration and distortion in the lens that cause surface irregularities in the image are offset to a high degree. Now you can view stereoscopic images that appear undistorted in all their brilliant, true-to-life colors.

Distortion causes a globular effect even on a flat object.

Expandability

Illuminators can be chosen depending on specimen

Various illuminators, such as ring illuminator, coaxial illuminator and diascopic stand, are available to accommodate a wide range of specimens.

Operability

Optimum eyepoint

In addition to the standard binocular eyepiece tube (P-BT) with 20° eye-piece inclination, Nikon offers a low eye-level binocular eyepiece tube (P-BTL), a tilting binocular eyepiece tube (P-BERG) that allows continuous adjustment of the eye-piece inclination from 0° to 30°, and an eyepoint riser (P-IER) to help you achieve the optimum eyepoint.

Observation posture

SMZ1000

In addition to the standard binocular eyepiece tube (P-BT) with 20° eyepiece inclination, Nikon offers a low eye-level binocular eyepiece tube (P-BTL), a tilting binocular eyepiece tube (P-BERG) that allows continuous adjustment of the eyepiece inclination from 0° to 30°, and an eyepoint riser (P-IER) to help you achieve the optimum eyepoint.

Specifications

SMZ1000

<table>
<thead>
<tr>
<th>Objective</th>
<th>Working distance</th>
<th>Zoom magnification</th>
<th>NA</th>
<th>Actual FOV*</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-Plan Apo</td>
<td>125.6</td>
<td>0.8x</td>
<td>0.012</td>
<td>55</td>
</tr>
<tr>
<td>1x</td>
<td>70</td>
<td>0.8x</td>
<td>0.012</td>
<td>55</td>
</tr>
<tr>
<td>P-ED Plan</td>
<td>70</td>
<td>0.8x</td>
<td>0.012</td>
<td>55</td>
</tr>
<tr>
<td>1.5x</td>
<td>44.5</td>
<td>0.8x</td>
<td>0.036</td>
<td>18.3</td>
</tr>
<tr>
<td>2x</td>
<td>32.5</td>
<td>0.8x</td>
<td>0.048</td>
<td>13.75</td>
</tr>
</tbody>
</table>

*1 With C-W10xB eyepiece

SMZ800

<table>
<thead>
<tr>
<th>Objective</th>
<th>Working distance</th>
<th>Zoom magnification</th>
<th>NA</th>
<th>Actual FOV*</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-Achromatic</td>
<td>125.6</td>
<td>0.8x</td>
<td>0.015</td>
<td>44</td>
</tr>
<tr>
<td>1x</td>
<td>6.3x</td>
<td>0.8x</td>
<td>0.045</td>
<td>6.98</td>
</tr>
<tr>
<td>P-Plan 1x</td>
<td>44.5</td>
<td>0.8x</td>
<td>0.030</td>
<td>22</td>
</tr>
<tr>
<td>6.3x</td>
<td>22</td>
<td>0.8x</td>
<td>0.090</td>
<td>3.49</td>
</tr>
</tbody>
</table>

*1 With C-W10xB eyepiece

Various illuminators, such as ring illuminator, coaxial illuminator and diascopic stand, are available to accommodate a wide range of specimens.

Dimensions

SMZ1000

<table>
<thead>
<tr>
<th>Objective</th>
<th>Working distance</th>
<th>Zoom magnification</th>
<th>NA</th>
<th>Actual FOV*</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-Plan Apo</td>
<td>125.6</td>
<td>0.8x</td>
<td>0.012</td>
<td>55</td>
</tr>
<tr>
<td>1x</td>
<td>70</td>
<td>0.8x</td>
<td>0.012</td>
<td>55</td>
</tr>
<tr>
<td>P-ED Plan</td>
<td>70</td>
<td>0.8x</td>
<td>0.012</td>
<td>55</td>
</tr>
<tr>
<td>1.5x</td>
<td>44.5</td>
<td>0.8x</td>
<td>0.036</td>
<td>18.3</td>
</tr>
<tr>
<td>2x</td>
<td>32.5</td>
<td>0.8x</td>
<td>0.048</td>
<td>13.75</td>
</tr>
</tbody>
</table>

*1 With C-W10xB eyepiece

SMZ800

<table>
<thead>
<tr>
<th>Objective</th>
<th>Working distance</th>
<th>Zoom magnification</th>
<th>NA</th>
<th>Actual FOV*</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-Achromatic</td>
<td>125.6</td>
<td>0.8x</td>
<td>0.015</td>
<td>44</td>
</tr>
<tr>
<td>1x</td>
<td>6.3x</td>
<td>0.8x</td>
<td>0.045</td>
<td>6.98</td>
</tr>
<tr>
<td>P-Plan 1x</td>
<td>44.5</td>
<td>0.8x</td>
<td>0.030</td>
<td>22</td>
</tr>
<tr>
<td>6.3x</td>
<td>22</td>
<td>0.8x</td>
<td>0.090</td>
<td>3.49</td>
</tr>
</tbody>
</table>

*1 With C-W10xB eyepiece

For possible combinations of accessories, please refer to the system diagram.

For possible combinations of accessories, please refer to the system diagram.

Parallel-optics type

SMZ1000/SMZ800

Pursuing ergonomic design, image clarity and low cost

Optical performance

Large 10x zoom ratio, extending from 0.8x to 8x

Total magnification of 4x to 480x* and the 10x zoom lens eliminates the need to change lenses, allowing users to concentrate on observation.

* Depending on the combination of eyepiece and objective used

High NA and high resolution

Nikon has developed an objective featuring a high NA of 0.1 and a high resolving power of 300 lines/mm.

Stereoscopic image

Chromatic aberration and distortion in the lens that cause surface irregularities in the image are offset to a high degree. Now you can view stereoscopic images that appear undistorted in all their brilliant, true-to-life colors.

Distortion causes a globular effect even on a flat object.

Expandability

Illuminators can be chosen depending on specimen

Various illuminators, such as ring illuminator, coaxial illuminator and diascopic stand, are available to accommodate a wide range of specimens.

Operability

Optimum eyepoint

In addition to the standard binocular eyepiece tube (P-BT) with 20° eye-piece inclination, Nikon offers a low eye-level binocular eyepiece tube (P-BTL), a tilting binocular eyepiece tube (P-BERG) that allows continuous adjustment of the eye-piece inclination from 0° to 30°, and an eyepoint riser (P-IER) to help you achieve the optimum eyepoint.

Observation posture

SMZ1000

In addition to the standard binocular eyepiece tube (P-BT) with 20° eyepiece inclination, Nikon offers a low eye-level binocular eyepiece tube (P-BTL), a tilting binocular eyepiece tube (P-BERG) that allows continuous adjustment of the eyepiece inclination from 0° to 30°, and an eyepoint riser (P-IER) to help you achieve the optimum eyepoint.

Specifications

SMZ1000

<table>
<thead>
<tr>
<th>Objective</th>
<th>Working distance</th>
<th>Zoom magnification</th>
<th>NA</th>
<th>Actual FOV*</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-Plan Apo</td>
<td>125.6</td>
<td>0.8x</td>
<td>0.012</td>
<td>55</td>
</tr>
<tr>
<td>1x</td>
<td>70</td>
<td>0.8x</td>
<td>0.012</td>
<td>55</td>
</tr>
<tr>
<td>P-ED Plan</td>
<td>70</td>
<td>0.8x</td>
<td>0.012</td>
<td>55</td>
</tr>
<tr>
<td>1.5x</td>
<td>44.5</td>
<td>0.8x</td>
<td>0.036</td>
<td>18.3</td>
</tr>
<tr>
<td>2x</td>
<td>32.5</td>
<td>0.8x</td>
<td>0.048</td>
<td>13.75</td>
</tr>
</tbody>
</table>

*1 With C-W10xB eyepiece

SMZ800

<table>
<thead>
<tr>
<th>Objective</th>
<th>Working distance</th>
<th>Zoom magnification</th>
<th>NA</th>
<th>Actual FOV*</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-Achromatic</td>
<td>125.6</td>
<td>0.8x</td>
<td>0.015</td>
<td>44</td>
</tr>
<tr>
<td>1x</td>
<td>6.3x</td>
<td>0.8x</td>
<td>0.045</td>
<td>6.98</td>
</tr>
<tr>
<td>P-Plan 1x</td>
<td>44.5</td>
<td>0.8x</td>
<td>0.030</td>
<td>22</td>
</tr>
<tr>
<td>6.3x</td>
<td>22</td>
<td>0.8x</td>
<td>0.090</td>
<td>3.49</td>
</tr>
</tbody>
</table>

*1 With C-W10xB eyepiece

Various illuminators, such as ring illuminator, coaxial illuminator and diascopic stand, are available to accommodate a wide range of specimens.

Dimensions

SMZ1000

<table>
<thead>
<tr>
<th>Objective</th>
<th>Working distance</th>
<th>Zoom magnification</th>
<th>NA</th>
<th>Actual FOV*</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-Plan Apo</td>
<td>125.6</td>
<td>0.8x</td>
<td>0.012</td>
<td>55</td>
</tr>
<tr>
<td>1x</td>
<td>70</td>
<td>0.8x</td>
<td>0.012</td>
<td>55</td>
</tr>
<tr>
<td>P-ED Plan</td>
<td>70</td>
<td>0.8x</td>
<td>0.012</td>
<td>55</td>
</tr>
<tr>
<td>1.5x</td>
<td>44.5</td>
<td>0.8x</td>
<td>0.036</td>
<td>18.3</td>
</tr>
<tr>
<td>2x</td>
<td>32.5</td>
<td>0.8x</td>
<td>0.048</td>
<td>13.75</td>
</tr>
</tbody>
</table>

*1 With C-W10xB eyepiece

SMZ800

<table>
<thead>
<tr>
<th>Objective</th>
<th>Working distance</th>
<th>Zoom magnification</th>
<th>NA</th>
<th>Actual FOV*</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-Achromatic</td>
<td>125.6</td>
<td>0.8x</td>
<td>0.015</td>
<td>44</td>
</tr>
<tr>
<td>1x</td>
<td>6.3x</td>
<td>0.8x</td>
<td>0.045</td>
<td>6.98</td>
</tr>
<tr>
<td>P-Plan 1x</td>
<td>44.5</td>
<td>0.8x</td>
<td>0.030</td>
<td>22</td>
</tr>
<tr>
<td>6.3x</td>
<td>22</td>
<td>0.8x</td>
<td>0.090</td>
<td>3.49</td>
</tr>
</tbody>
</table>

*1 With C-W10xB eyepiece

For possible combinations of accessories, please refer to the system diagram.

For possible combinations of accessories, please refer to the system diagram.
Greenough Type Stereoscopic Microscope

SMZ745/745T

Superior 7.5x zoom and 115 mm working distance
Trinocular optical head type is also available

- The SMZ745/745T boasts a 7.5x zoom that incorporates the Greenough optical system. The zoom range of 0.67x to 5x provides a broad observation range.
- As well as high zoom ratio and magnification, the SMZ745/745T offers an unrivaled 115 mm working distance.
- The SMZ745T incorporates an optical path switching lever that enables easy switchover between eyepiece and camera. A DS series digital camera can be attached.

Three “A” design

- Air-light (SMZ445, SMZ460)
  By making joints airlight, contamination from dust, oil, water and other contaminants is prevented.
  Airlight construction: JIS Degrees of protection provided by enclosures IPX1 Antistatic function: 1000-110kV; discharge within 0.2 sec.
- Anti-mold (SMZ445, SMZ460, SMZ660)
  Anti-mold design developed exclusively by Nikon ensures peace of mind when the microscope is used in environments subject to high heat or humidity.
  Anti-mold design: JIS Degrees of protection against mold resistance IP4X
- Anti-electrostatic (SMZ445, SMZ460, SMZ660)
  Static electricity built up within the microscope is discharged almost instantly, ensuring higher yields.

Specifications

<table>
<thead>
<tr>
<th>SMZ445</th>
<th>SMZ460</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optical system</td>
<td>Greenough type (zooming type)</td>
</tr>
<tr>
<td>Zoom ratio</td>
<td>4.4:1</td>
</tr>
<tr>
<td>Total magnification</td>
<td>4–70×</td>
</tr>
<tr>
<td>Zooming ratio</td>
<td>0.8–5x (with 0.8/1/2/3/4/5x stops)</td>
</tr>
<tr>
<td>Optical system</td>
<td>Greenough type (zooming type)</td>
</tr>
<tr>
<td>Working distance</td>
<td>115 mm (standard)</td>
</tr>
<tr>
<td>Auxiliary objectives</td>
<td>G-AL 0.5x (W.D. 211 mm), 0.7x (W.D. 150 mm), 1.5x (W.D. 61 mm), 2x (W.D. 43.5 mm)</td>
</tr>
<tr>
<td>Eyepieces (with diopter adjustment)</td>
<td>C-W10xB (F.N. 22), C-W15x (F.N. 16), C-W20x (F.N. 12.5), C-W30x (F.N. 7)</td>
</tr>
<tr>
<td>Tube</td>
<td>Fixed type</td>
</tr>
<tr>
<td>Eyepiece inclination</td>
<td>45°</td>
</tr>
<tr>
<td>Interpupillary distance adjustment</td>
<td>52–75 mm</td>
</tr>
<tr>
<td>Total magnification</td>
<td>4–300x (Depending on eyepiece and auxiliary objective used.)</td>
</tr>
<tr>
<td>Optical system</td>
<td>Greenough type (zooming type), trinocular tube</td>
</tr>
<tr>
<td>Working distance</td>
<td>115 mm</td>
</tr>
<tr>
<td>Auxiliary objectives</td>
<td>G-AL ERG 0.77–1.06x (W.D. 102–48mm)</td>
</tr>
<tr>
<td>Specifications</td>
<td></td>
</tr>
<tr>
<td>Dimensions</td>
<td></td>
</tr>
<tr>
<td>Dimensions</td>
<td></td>
</tr>
<tr>
<td>Weight (approx.)</td>
<td>1.7 kg (body)</td>
</tr>
</tbody>
</table>

Dramatically improved optical performance and handling comfort

SMZ660

- 6.3x zoom ratio offers magnifications of 0.8x to 5x. The zooming knob features click-stops that allow changes in magnification of 1x increments.
- Even at high magnification, a working distance of 115mm, the longest in this microscope class, is realized.
- Three “A” design

Specifications

<table>
<thead>
<tr>
<th>Specifications</th>
<th>SMZ660</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optical system</td>
<td>Greenough type (zooming type)</td>
</tr>
<tr>
<td>Zoom ratio</td>
<td>4.4:1</td>
</tr>
<tr>
<td>Total magnification</td>
<td>4–70×</td>
</tr>
<tr>
<td>Zooming ratio</td>
<td>0.8–5x</td>
</tr>
<tr>
<td>Specifications</td>
<td></td>
</tr>
<tr>
<td>Dimensions</td>
<td></td>
</tr>
<tr>
<td>Weight (approx.)</td>
<td>1.7 kg (body)</td>
</tr>
</tbody>
</table>

Designed for excellent cost performance

SMZ445/460

- The SMZ445 has a 45° eyepiece tube inclination, and the SMZ460 has a 60° eyepiece tube inclination, which is ideal for embedded use.
- Compact design with ease-of-use and high optical performance.
- ESD protection guards against electrostatic damage to samples.

Specifications

<table>
<thead>
<tr>
<th>Specifications</th>
<th>SMZ445</th>
<th>SMZ460</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optical system</td>
<td>Greenough type (zooming type)</td>
<td>Greenough type (zooming type)</td>
</tr>
<tr>
<td>Zoom ratio</td>
<td>4.4:1</td>
<td>4.3:1</td>
</tr>
<tr>
<td>Total magnification</td>
<td>4–70×</td>
<td>3.5–60×</td>
</tr>
<tr>
<td>Zooming ratio</td>
<td>0.8–5x</td>
<td></td>
</tr>
<tr>
<td>Optical system</td>
<td>Greenough type (zooming type)</td>
<td>Greenough type (zooming type)</td>
</tr>
<tr>
<td>Working distance</td>
<td>115 mm</td>
<td>100mm (standard)</td>
</tr>
<tr>
<td>Auxiliary objectives</td>
<td>G-AL 0.5x (W.D. 211 mm), 0.7x (W.D. 150 mm), 1.5x (W.D. 61 mm), 2x (W.D. 43.5 mm)</td>
<td></td>
</tr>
<tr>
<td>Eyepieces (with diopter adjustment)</td>
<td>C-W10xB (F.N. 22), C-W15x (F.N. 16), C-W20x (F.N. 12.5), C-W30x (F.N. 7)</td>
<td></td>
</tr>
<tr>
<td>Tube</td>
<td>Fixed type</td>
<td>Fixed type</td>
</tr>
<tr>
<td>Eyepiece inclination</td>
<td>45°</td>
<td>60°</td>
</tr>
<tr>
<td>Interpupillary distance adjustment</td>
<td>52–75 mm</td>
<td>54–75 mm</td>
</tr>
<tr>
<td>Total magnification</td>
<td>4–300x (Depending on eyepiece and auxiliary objective used.)</td>
<td>4–300x (Depending on eyepiece and auxiliary objective used.)</td>
</tr>
<tr>
<td>Optical system</td>
<td>Greenough type (zooming type)</td>
<td>Greenough type (zooming type)</td>
</tr>
<tr>
<td>Working distance</td>
<td>115 mm</td>
<td>100mm (standard)</td>
</tr>
<tr>
<td>Auxiliary objectives</td>
<td>G-AL ERG 0.77–1.06x (W.D. 102–48mm)</td>
<td></td>
</tr>
<tr>
<td>Specifications</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dimensions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dimensions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight (approx.)</td>
<td>1.7 kg (body)</td>
<td>1.9 kg (body)</td>
</tr>
</tbody>
</table>
Greenough Type Stereoscopic Microscope

**SMZ-2**

High-resolution optics ideal for inspection, assembly, and measurement

- Diopter of both eyes can be adjusted individually, providing a clear image when zooming.
- Twin zooming objective optical system maintains focus when magnification is changed. Focus point movement and magnification difference between eyes are minimal.
- Compact design with horizontally positioned zooming ring (rotation: 90°)
- Eyepiece inclination of 45° for comfortable observation

**Specifications**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Optical System</strong></td>
<td>Greenough Type (fixed type)</td>
</tr>
<tr>
<td><strong>Working distance</strong></td>
<td>77.5mm (with standard configuration)</td>
</tr>
<tr>
<td><strong>Objective</strong></td>
<td>P2-SHR Plan Apo Objective Series</td>
</tr>
<tr>
<td><strong>Interpupillary distance adjustment</strong></td>
<td>56–75 mm</td>
</tr>
<tr>
<td><strong>Total magnification</strong></td>
<td>4–120x (Depending on eyepiece and auxiliary objective used.)</td>
</tr>
<tr>
<td><strong>Zooming range</strong></td>
<td>0.8–4x</td>
</tr>
<tr>
<td><strong>Zooming ratio</strong></td>
<td>5:1</td>
</tr>
</tbody>
</table>

**Dimensions**

- **Height:** 100mm (standard)
- **Weight:** (approx.) 1.5 kg (body), 1.9 kg (stand)
Both single and double nosepieces are available. The stage features an XY stroke of 6x4 inches (150 mm x 100 mm) and can be attached to any of the bases, making it effective for capturing large images when used in combination with imaging software NIS-Elements. A sliding stage and tilting stage are also available. Limited Y travel with 32 mm column bases.

Flexible Double Arm Fiber Illumination Set
The direction and angle of illumination can be changed to suit the sample by making adjustments with these double arms. The fiber holder position can also be changed to obtain the optimal position for illuminating samples.

Motorized Epi-fluorescence Set
The fluorescent turret can be operated using the remote control or imaging software NIS-Elements.

Manual Epi-fluorescence Set
An easy-to-use manual model for Nikon's newly developed high-performance epi-fluorescence attachment.

Choose from two types of tilting trinocular tube and one type of low eyelevel trinocular tube. All tubes have a camera port for seamless integration with the Digital Sight line.

Remote Control
Nikon offers a remote control unit that can be used to operate the microscope and capture images by hand. A footswitch is also available, allowing the user to operate the microscope and capture images by foot, freeing the hands for sample manipulation.

Nosepiece/Focus Mount Adapter
Both single and double nosepieces are available.

Polarizing Observation Accessory
The analyzer is attached to the objective and the polarizer to the base or stand to enable polarized viewing.

Darkfield Observation Accessory
Darkfield viewing is possible simply by attaching the darkfield unit to the base.

P2-RC Remote Controller
P2-PCR Photo Release
P2-FSW Foot Switch

Coaxial Illuminator
The coaxial light illuminator makes it possible to view light reflected from the surface of a sample. It is ideal for shooting shadow-less images of thick samples.

Ring LED Illuminator
Ring LED illuminator is equipped with high-intensity, long-life (20,000 hours) LEDs. The illuminator's dial adjusts the intensity of the white LED.

Fiber Illuminator Set
This ring fiber illumination set features an episcopic illumination unit that effectively captures images (can be used with 1x and 0.5x objective lenses).

Combinations with SMZ25
Combinations with SMZ18

Combinations with SMZ25
Combinations with SMZ18

Combinations with SMZ25
Combinations with SMZ18

Combinations with SMZ25
Combinations with SMZ18
A variety of accessories are available for stereoscopic observations

### Objectives

<table>
<thead>
<tr>
<th>Type</th>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-Plan-Apo 0×</td>
<td></td>
</tr>
<tr>
<td>P-Plan-Apo 5×</td>
<td></td>
</tr>
</tbody>
</table>

### Beam Splitters

<table>
<thead>
<tr>
<th>Beam Splitter</th>
<th>Observation</th>
<th>Photomicrography</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-IBSS2</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>P-IBSD2</td>
<td>100%</td>
<td>0%</td>
</tr>
</tbody>
</table>

### Auxiliary Objectives

<table>
<thead>
<tr>
<th>Accessory</th>
<th>SMZ1000</th>
<th>SMZ800</th>
<th>SMZ745/745T</th>
<th>SMZ660</th>
<th>SMZ445/460</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beam Splitters/Teaching Head/Drawing Tube</td>
<td>SMZ1000</td>
<td>SMZ800</td>
<td>SMZ745/745T</td>
<td>SMZ660</td>
<td>SMZ445/460</td>
</tr>
</tbody>
</table>

### Beam Splitters (P-IBSS2, P-IBSD2)

Using a beam splitter and adapter, a CCTV camera or a DSI series digital camera can be attached. The P-IBSD2 Beam Splitter 02 has two ports.

### P-IDT Drawing Tube

The drawing tube, mounted between the microscope body and eyepiece tube, enables the drawing of images while viewing. Within the visual field, the drawing is overlaid on top of the image, allowing the user to draw the image simply by tracing it. The drawing can be removed from view by using the knobs to block the light path.

### P-THSS Teaching Head

This teaching head enables the simultaneous observation of the same sample by two persons, making it ideal for teaching and educational purposes. The side-by-side configuration places less restriction on installation space and allows comfortable operation.

### Stages

#### C-SSL Dia-sliding Stage

Used for diascopic observation, this sliding stage can be easily moved in the desired direction simply with a light push. Travel range is within ø8mm.

#### C-TRS Tilting Stage

This stage has a nonslip sheet and can be tilted 30° from its horizontal position.

### Sliding Stage 2

Loaded with a sample, the stage can be easily moved in the desired direction simply with a light push to its edges. Travel range is within ø40mm.

### SM-S4L 4 x 4 Stage

Used in combination with an optional extension pillar, the 4 x 4 Stage allows precise movement in the XY direction, facilitating fine alignment during high-magnification observations under episcopic illumination. (Although mountable on a diascopic stand, it is not suitable for observation as it blocks illumination.)
**Illumination Systems/Polarizing Attachment**

### Ring Illuminator

**Purpose**: Provides conical-shaped light through an optical fiber from above the sample to its center, minimizing unwanted shadows. Suitable for observation of electronic substrates.

**Model**
- C-RLS Fiber-optic Ring Illuminator
- SM-4500 × 4500 LED Ring Illuminator
- SM-L1005 LED Ring Illuminator
- C-RPL Flexible Ring Illuminator

**Features**
- Illuminator is located away from microscope. It enables bright observation with high-intensity light without damaging sample with the heat
- Color temperature is adjustable to 5000K to provide stable illumination. Two types of covers are available. Anti-electrostatic type
- Three types of covers are available (clear, diffuser and opaque white). Anti-electrostatic type
- Ring Illuminator provides uniform illumination to the entire view field

**Microscopes**
- SMZ-1000
- SMZ-2
- SMZ-445/460
- SMZ-660
- SMZ-745/745T
- SMZ-800

---

### Episcopic Arm Illuminator

**Purpose**: The direction and angle of the illumination can be changed with simple adjustments of the flexible arms.

**Model**
- C-FLD Fiber-optics Bifurcated Illuminator
- G-CFLD Flexible Illuminator (W-10W halogen)
- SMZ-U Episcopic Arm
- G-FLK Flexible Arm

**Features**
- Illuminator is located away from microscope. It enables bright observation with high-intensity light without damaging sample with the heat
- The direction and angle of illumination can be changed using the flexible arms

**Microscopes**
- SMZ-1000
- SMZ-2
- SMZ-445/460
- SMZ-660
- SMZ-745/745T
- SMZ-800

---

### Coaxial Illuminator

**Purpose**: Suitable for brightfield observation for high-reflectance flat surface samples such as polished metals and wafer substrates.

**Model**
- P-202A Coudé Coaxial Illuminator
- SM-Z660 Coudé Coaxial Illuminator

**Features**
- Illuminator is located away from microscope. It enables bright observation with high-intensity light without damaging sample. Flexible change of direction and angle of illumination is possible.

**Microscopes**
- SMZ-1000
- SMZ-2
- SMZ-445/460
- SMZ-660
- SMZ-745/745T
- SMZ-800

---

### Polarizing Attachment

**Purpose**: Enable simple polarizing observation, making it possible to observe areas of focus, micro- or double refraction images of samples.

**Model**
- C-POL Polarizing Attachment

**Features**
- The polarizer is on the stage while the analyzer is on the objective lens cover

**Microscopes**
- SMZ-1000
- SMZ-2
- SMZ-445/460
- SMZ-660

---

**Universal Table Stands/Focusing Mounts**

### Universal Table Stands G-US1/G-US2

These stands are handy in microscopy with large samples not loaded onto the standard stand. The microscope unit is mounted to the stand arm via a focusing mount. The G-US1 is a table clamp type (table top thickness: 10 to 60 mm).

- Used in conjunction with the C-FMB Focusing Mount B on the SMZ745/745T/660/445/440/460.
- Used in conjunction with the G-USA SM US Adapter on the SM-5.
- Can not be used with the SM1000/900 when photomicrographic equipment is mounted on these models.

### Universal Table Stand P

Not only can it be used for a large sample, but this extremely stable stand also easily accommodates a DS series digital camera.

- Used in conjunction with the C-FMAN Focusing Mount AN on the SMZ745/745/660/445/460.
- Used in conjunction with the G-USA SM US Adapter on the SM-5.

### Universal Stand P

Can be installed on the top or bottom edge

**Specifications**

<table>
<thead>
<tr>
<th>Universal Table Stand</th>
<th>Universal Table Stand P</th>
<th>Universal Stand P</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Model</strong></td>
<td><strong>Model</strong></td>
<td><strong>Model</strong></td>
</tr>
<tr>
<td>C-FMAN Focusing Mount AN</td>
<td>C-FMB Focusing Mount B</td>
<td>G-USA Adapter</td>
</tr>
<tr>
<td>C-FMC Focusing Mount C</td>
<td>C-FMB Focusing Mount B</td>
<td>G-USA Adapter</td>
</tr>
<tr>
<td>C-FMM Focusing Mount M</td>
<td>C-FMB Focusing Mount B</td>
<td>G-USA Adapter</td>
</tr>
</tbody>
</table>

**Compatible microscopes**

<table>
<thead>
<tr>
<th>Universal Table Stand</th>
<th>Universal Table Stand P</th>
<th>Universal Stand P</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMZ-1000/900</td>
<td>SM1000/900</td>
<td>SM-5</td>
</tr>
</tbody>
</table>

---

**Focusing Mounts**

Various types of focusing mounts are available depending on use. They are used to incorporate stereoscopic microscope bodies into IC bonders or other devices (SM Focusing Mount is for SMZ-2 and SM-5). These mounts can also be used when attaching microscopes to Universal Table Stands.

### G-US1 Universal Table Stand 1

The image is a configuration sample with the SMZ745.

### G-US2 Universal Table Stand 2

- Unit: mm

### G-USA Adapter

The image is a configuration sample with the SMZ745.

---

**Antistatic function**

〇 〇 - -
Digital Cameras for Microscopes

Cooled Digital Cameras for Microscopes

Features:
- 6V-20W halogen lamp. Operation. Used in conjunction with C-PS160 and C-PSC Compact color camera head.
- Ultra high-definition resolution (5.0 mega-pixels)
- Images captured in single frame or time-lapse imaging.
- Hudson Medical School / University of Cambridge

Scene mode (microscopy)
- Scene mode (industrial)
- Measurement function
- Scale display/penetrating function
- Drawing functions

Various tools
- Simple measurements of acquired image are possible, allowing lines and comments to be added to image data. In addition, data storage and output functions for a wide range of applications are available.
- Scene mode
- Measurement function
- Scale display/penetrating function
- Drawing functions

Camera Heads
- Ultra-high-definition imaging
- High-definition imaging
- High-sensitivity cooled camera head

PC-use Control Unit

DS-U3 + NIS-Elements

Enables a wide range of advanced digital imaging capabilities using a PC

Multichannel (multicolor)
- Multiple fluorescent channels can be captured in conjunction with other imaging methods, such as C-DS Diascopic and C-PSC Compact color camera head.
- Images captured in single frame or time-lapse imaging.
- Hudson Medical School / University of Cambridge

Time lapse
- NS-Elements makes it easy to set up a time-lapse imaging experiment.
- Calcium imaging: Time-lapse imaging of GCaMP6F-expressing neurons inside a live zebrafish embryo expressing an antibody that can be used to quickly capture images without the use of a PC or monitor.

Scene mode
- Optimal imaging parameters for each sample type and observation method can easily be set using the icons.
- Various tools
- Simple measurements of acquired image are possible, allowing lines and comments to be added to image data. In addition, data storage and output functions for a wide range of applications are available.

UV/UVC sterilizing light (UV-UVC sterilizing light is compatible)
- Scene mode
- Measurement function
- Scale display/penetrating function
- Drawing functions

Standalone control unit
- Offers an easy-to-use high-definition, large-touch panel monitor that can be used to quickly capture images without the use of a PC or monitor.
- Various tools
- Simple measurements of acquired image are possible, allowing lines and comments to be added to image data. In addition, data storage and output functions for a wide range of applications are available.

Scene mode
- Various tools
- Simple measurements of acquired image are possible, allowing lines and comments to be added to image data. In addition, data storage and output functions for a wide range of applications are available.

Scene mode (microscopy)
- Various tools
- Simple measurements of acquired image are possible, allowing lines and comments to be added to image data. In addition, data storage and output functions for a wide range of applications are available.

Scene mode (industrial)
- Various tools
- Simple measurements of acquired image are possible, allowing lines and comments to be added to image data. In addition, data storage and output functions for a wide range of applications are available.

Diascopic Diascopic Diascopic Diascopic Diascopic
- Various tools
- Simple measurements of acquired image are possible, allowing lines and comments to be added to image data. In addition, data storage and output functions for a wide range of applications are available.
### Specifications

<table>
<thead>
<tr>
<th>Field</th>
<th>SMZ-25</th>
<th>SMZ10</th>
<th>SMZ1000</th>
<th>SMZ800</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optical system</td>
<td>Greenough type (zooming type)</td>
<td>Greenough type (zooming type)</td>
<td>Greenough type (zooming type)</td>
<td>Greenough type (zooming type)</td>
</tr>
<tr>
<td>Zoom range</td>
<td>0.67–5x</td>
<td>0.8–5x</td>
<td>0.8–3.5x</td>
<td>0.7–3x</td>
</tr>
<tr>
<td>Zoom ratio</td>
<td>7.5:1</td>
<td>6.3:1</td>
<td>4.4:1</td>
<td>4.3:1</td>
</tr>
<tr>
<td>Tubes</td>
<td>P2-TERG 100 Trinocular Tilting Tube, P2-TL100 Trinocular Tilting Tube, P2-SHR Plan Apo 1x (NA 0.05), P2-SHR Plan Apo 0.5x (NA 0.04), P2-TERG Plan Apo 1x ERGO* (NA 0.04), P2-TERG Plan Apo 0.5x ERGO* (NA 0.04)</td>
<td>P2-TERG 100 Trinocular Tilting Tube, P2-TERG 50 Trinocular Tilting Tube, P2-SHR Plan Apo 1x (NA 0.05), P2-SHR Plan Apo 0.5x (NA 0.04), P2-TERG Plan Apo 1x ERGO* (NA 0.04), P2-TERG Plan Apo 0.5x ERGO* (NA 0.04)</td>
<td>P2-TERG 100 Trinocular Tilting Tube, P2-TERG 50 Trinocular Tilting Tube, P2-SHR Plan Apo 1x (NA 0.05), P2-SHR Plan Apo 0.5x (NA 0.04), P2-TERG Plan Apo 1x ERGO* (NA 0.04), P2-TERG Plan Apo 0.5x ERGO* (NA 0.04)</td>
<td>P2-TERG 100 Trinocular Tilting Tube, P2-TERG 50 Trinocular Tilting Tube, P2-SHR Plan Apo 1x (NA 0.05), P2-SHR Plan Apo 0.5x (NA 0.04), P2-TERG Plan Apo 1x ERGO* (NA 0.04), P2-TERG Plan Apo 0.5x ERGO* (NA 0.04)</td>
</tr>
<tr>
<td>Auxiliary objectives</td>
<td>P2-SHR Plan Apo 0.5x (NA 0.075), P2-SHR Plan Apo 1x (NA 0.15), P2-SHR Plan Apo 1.6x (NA 0.24), P2-SHR Plan Apo 2x (NA 0.2), P2-SHR Plan Apo 2x (NA 0.2)</td>
<td>P2-SHR Plan Apo 0.5x (NA 0.075), P2-SHR Plan Apo 1x (NA 0.15), P2-SHR Plan Apo 1.6x (NA 0.24), P2-SHR Plan Apo 2x (NA 0.2), P2-SHR Plan Apo 2x (NA 0.2)</td>
<td>P2-SHR Plan Apo 0.5x (NA 0.075), P2-SHR Plan Apo 1x (NA 0.15), P2-SHR Plan Apo 1.6x (NA 0.24), P2-SHR Plan Apo 2x (NA 0.2), P2-SHR Plan Apo 2x (NA 0.2)</td>
<td>P2-SHR Plan Apo 0.5x (NA 0.075), P2-SHR Plan Apo 1x (NA 0.15), P2-SHR Plan Apo 1.6x (NA 0.24), P2-SHR Plan Apo 2x (NA 0.2), P2-SHR Plan Apo 2x (NA 0.2)</td>
</tr>
<tr>
<td>Objectives</td>
<td>C-W10xB (F.N. 22), C-W15x (F.N. 16), C-W20x (F.N. 12.5), C-W30x (F.N. 7) (with diopter adjustment)</td>
<td>C-W10xB (F.N. 22), C-W15x (F.N. 16), C-W20x (F.N. 12.5), C-W30x (F.N. 7) (with diopter adjustment)</td>
<td>C-W10xB (F.N. 22), C-W15x (F.N. 16), C-W20x (F.N. 12.5), C-W30x (F.N. 7) (with diopter adjustment)</td>
<td>C-W10xB (F.N. 22), C-W15x (F.N. 16), C-W20x (F.N. 12.5), C-W30x (F.N. 7) (with diopter adjustment)</td>
</tr>
<tr>
<td>Weight (approx.)</td>
<td>1.8kg (SMZ745T body)</td>
<td>1.4kg (SMZ745 body)</td>
<td>1.1kg (SMZ18) 1.2kg (SMZ25 body)</td>
<td>1.0kg (body)</td>
</tr>
</tbody>
</table>

### Related Products

**Digital Microscope ShuttlePix**

ShuttlePix provides 20x optical zoom. Its magnification information is also linked to ShuttlePix’s scale and simple measurement functions.

**One touch EDF imaging**

1. Begin imaging from a low sample area on the screen.
2. Finish imaging at a high sample area on the screen.

**Easy imaging**

1. Turn on the power.
2. Adjust magnifications and focusing while observing the monitor.
3. Press the image capture button.

**Others**

- Handy set
  - A cordless body (built-in illuminator, compatible with SD card, battery-powered)
  - Easy operation
- Simple stand set
  - Simple reflection stand that requires no battery
  - Diascopic LED stand enables diascopic imaging
  - Automatically uploads images to a PC

**Wide magnification range**

0.5x, 1x, 2x, 4x and 5x objectives are available. Used in combination with the AZ-W10x eyepiece and a coaxial episcopic illuminator, the AZ100 series covers the full range of 5x to 500x magnifications.

**Various observation methods**

The AZ series mono-zoom mechanism enables true on-axis image capture in the macro region. The AZ series supports a wide array of observation methods, including epifluorescence, reflected/transmitted light brightfield, simple POL and differential interference contrast.