

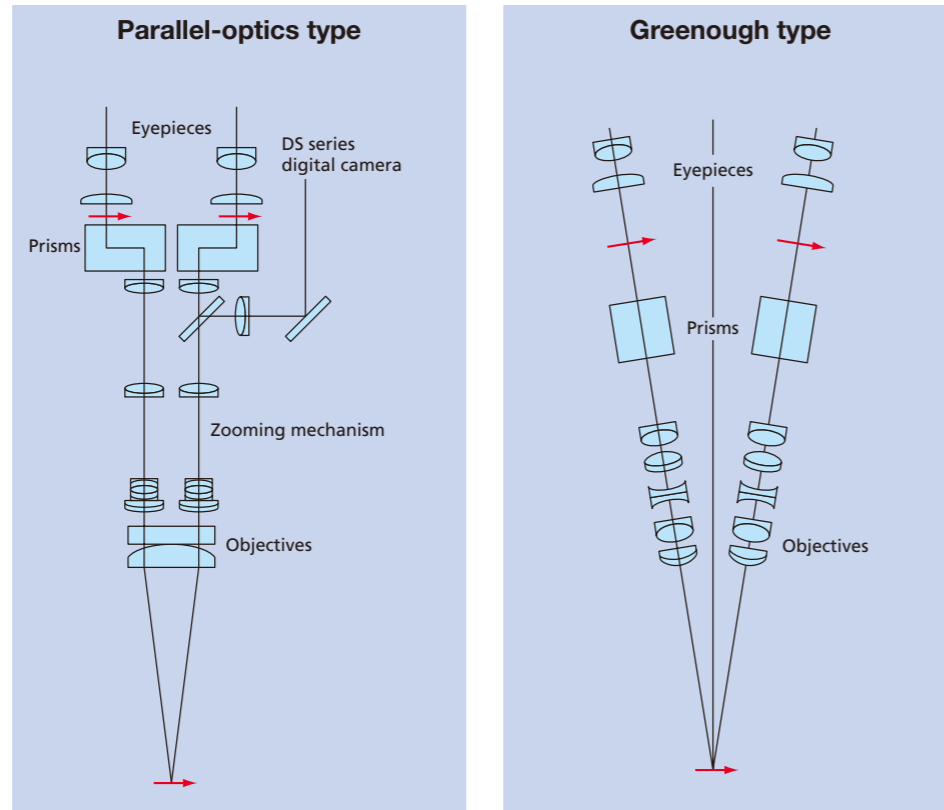
## Optical Systems

### 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 eye-level riser, can be inserted.

### Greenough type (zooming type)

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



# Stereoscopic Microscopes



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)

Specifications and equipment are subject to change without any notice or obligation on the part of the manufacturer. June 2012.

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



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ISO 14001 Certified for NIKON CORPORATION

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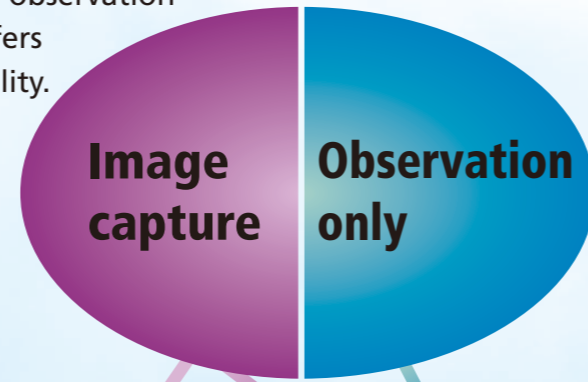
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# Complete lineup delivers optimal observation performance

Nikon's broad range of stereoscopic microscopes and accessories respond to diverse observation needs. The SMZ series, represented by the high-end 1500, 1000 and 800 models, offers outstanding optical performance, flexible system expandability and superb operability. The basic SMZ745/745T and SMZ660 are highly cost effective and the long-selling SMZ-2, SM-5 and SMZ445/460 provide ease of use. Nikon offers stereoscopic microscopes most appropriate for your specific requirements.



	System expandability	Image capture	Zoom	Embedded use	Total magnification*	Zoom ratio	Compact	Long working distance
SMZ1500	✓	✓	✓		3.75–540x	15 : 1		
SMZ1000	✓	✓	✓	✓	4–480x	10 : 1		
SMZ800	✓	✓	✓	✓	5–378x	6.3 : 1		
SMZ745			✓	✓	3.35–300x	7.5 : 1		✓
SMZ745T		✓	✓	✓	3.35–300x	7.5 : 1		✓
SMZ660			✓	✓	4–300x	6.3 : 1		✓
SMZ445/460			✓	✓	4–70x (445) 3.5–60x (460)	4.4 : 1 (445) 4.3 : 1 (460)	✓	
SMZ-2			✓	✓	4–120x	5 : 1	✓	
SM-5				✓	10–60x	—	✓	

\* Depending on combination of eyepiece and objective lens



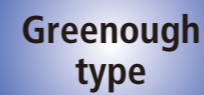
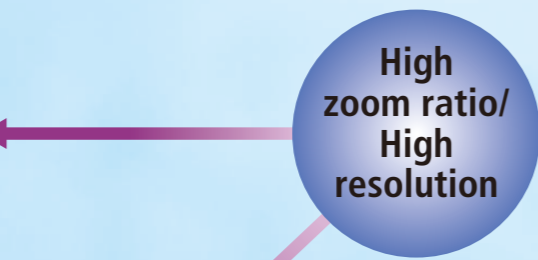
**SMZ1500**  
Pages 4, 5



**SMZ1000**  
Pages 6, 7



**SMZ800**  
Pages 8, 9



**SMZ745/745T**  
Pages 10, 11



**SMZ660**  
Pages 12



**SMZ445/460**  
Page 13



**SMZ-2**  
Page 14



**SM-5**  
Page 14

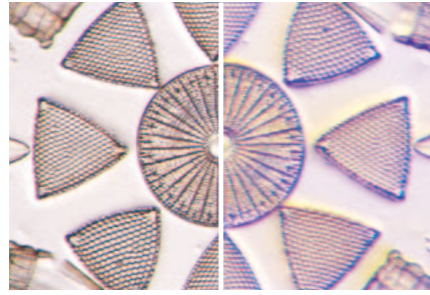
- Stereoscopic Zoom Microscope SMZ1500 ..... 4
- Stereoscopic Zoom Microscope SMZ1000 ..... 6
- Stereoscopic Zoom Microscope SMZ800 ..... 8
- Stereoscopic Zoom Microscope SMZ745/745T ..... 10
- Stereoscopic Zoom Microscopes SMZ660 ..... 12
- Stereoscopic Zoom Microscopes SMZ445/460 ..... 13
- Stereoscopic Zoom Microscope SMZ-2 ..... 14
- Stereoscopic Microscope SM-5 ..... 14
- Accessories ..... 15
  - Objectives/Auxiliary Objectives ..... 15
  - Eyepiece Tubes/Eye-level Riser ..... 16
  - Beam Splitters/Teaching Head/Drawing Tube ..... 16
  - Illumination Systems/Polarizing Attachment ..... 17
  - Stands/Stages ..... 19
  - Universal Table Stands/Focusing Mounts ..... 20
  - Epi-fluorescence Attachment ..... 21
  - Digital Cameras for Microscopes ..... 21
- Specifications ..... 22
- Accessory Compatibility ..... 22
- Optical Systems ..... 24



# A standard for stereoscopic zoom microscopes—superb optical performance and ease of operation

# SMZ1500

- Nikon has developed a series of objectives featuring higher NA and incredible resolving power. For example, the P-HR Plan Apo 1.6x objective delivers an NA of 0.21 and a resolving power of 630 lines/mm. These superb objectives feature optimum contrast and a minimum of flare across the entire view field out to the edges.



Diatom  
Left: SMZ1500 with P-HR Plan Apo objective  
Right: conventional model

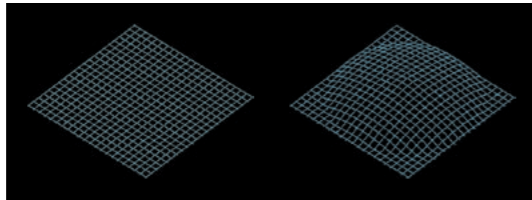


Resolving power chart  
SMZ1500 with P-HR Plan Apo 1.6x objective



SMZ1500-DSD

- Distortion that causes problems usually associated with stereoscopic microscopes, such as surface irregularities and the apparent bulging of objects, is minimized with these lenses. Now you can view stereoscopic images that appear natural-looking right out to the periphery.



Distortion causes a globular effect as shown above even when you actually observe a flat object.

- Nikon's approach to reducing chromatic aberration results in a high degree of correction for axial and lateral chromatic aberrations. Although reducing chromatic aberrations and eliminating distortion were traditionally thought to be extremely difficult, Nikon has succeeded brilliantly, producing stereoscopic images with true-to-life colors.

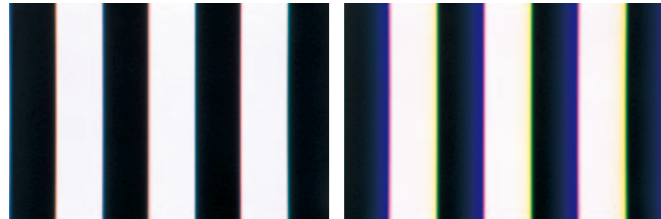


Image where chromatic aberration has been corrected in the SMZ1500  
Image that exhibits chromatic aberration  
Comparison of chromatic aberrations

- The OCC (Oblique Coherent Contrast) illuminator\*, developed by Nikon, allows high-contrast observation of specimens that are difficult to view with diascopic brightfield illumination. These include translucent biological specimens such as fertilized eggs and embryos in culture solutions, fine particles in solutions, air bubbles and foreign particles in high-polymer materials.

\*Incorporated in the C-DSD diascopic stand and the C-DSDF fiber-optic diascopic stand



Fertilized mouse eggs

- 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 eye-level riser (P-IER) to help you achieve optimum eyepoint.

- The new P-OTR is a dedicated objective nosepiece that can be added to the SMZ1500 at any time. It can incorporate two HR Plan Apo series objectives and allows one-touch objective changeover and on-axis viewing using one optical path.



P-OTR objective nosepiece for use with SMZ1500



Combination example: SMZ1500 + P-OTR objective nosepiece + HR Plan Apo 1x + HR Plan Apo 1.6x

- To maximize the high performance of SMZ1500, various accessories including illumination systems and diascopic stands are available.

## Magnification and focal depth (focal depth when using the C-W10xB eyepiece)

Objectives	Working distance	Zoom magnification	Focal depth (mm)
P-HR Plan Apo 0.5x	136	0.75x	5.392
		4x	0.320
		8x	0.140
		11.25x	0.103
P-HR Plan Apo 1x	54	0.75x	1.348
		4x	0.080
		8x	0.035
		11.25x	0.026
P-HR Plan Apo 1.6x	24	0.75x	0.527
		4x	0.031
		8x	0.014
		11.25x	0.010

## How to calculate focal depth (mm, when wavelength is 550nm)

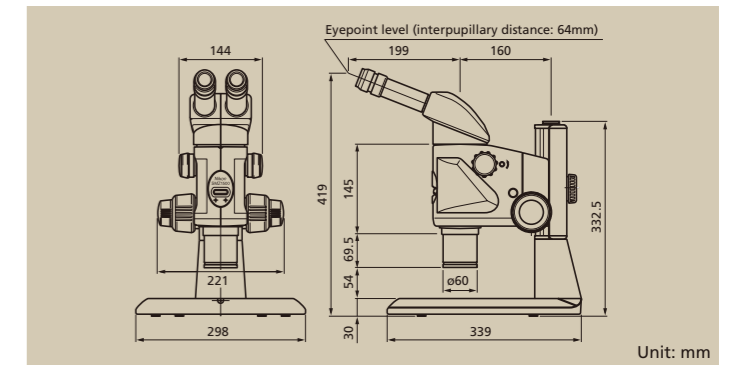
$$\frac{0.00055}{2(\text{NA})^2} + \frac{1}{7m \cdot \text{NA}} \quad m: \text{total magnification}$$

## Specifications

Optical system	Parallel-optics zoom system
Total magnification	3.75–540x (Depending on eyepiece and objective used.), 5.6–506x (When coaxial episcopic illuminator is attached.)
Eyepiece inclination	20° (Standard Binocular and Low Eye-level Binocular), 0°–30° (Tilting Binocular)
Interpupillary distance adjustment	48–75mm
Eyepieces (with diopter adjustment)	C-W10xB (F.N. 22), C-W15x (F.N. 16), C-W20x (F.N. 12.5), C-W30x (F.N. 7)
Zoom range	0.75–11.25x
Zoom ratio	15 : 1
Objectives	P-HR Plan Apo 0.5x, 1x, 1.6x P-Plan Apo 1x (Actual magnification is equivalent to 0.8x. Compatible with zoom magnifications higher than 1.25x.)

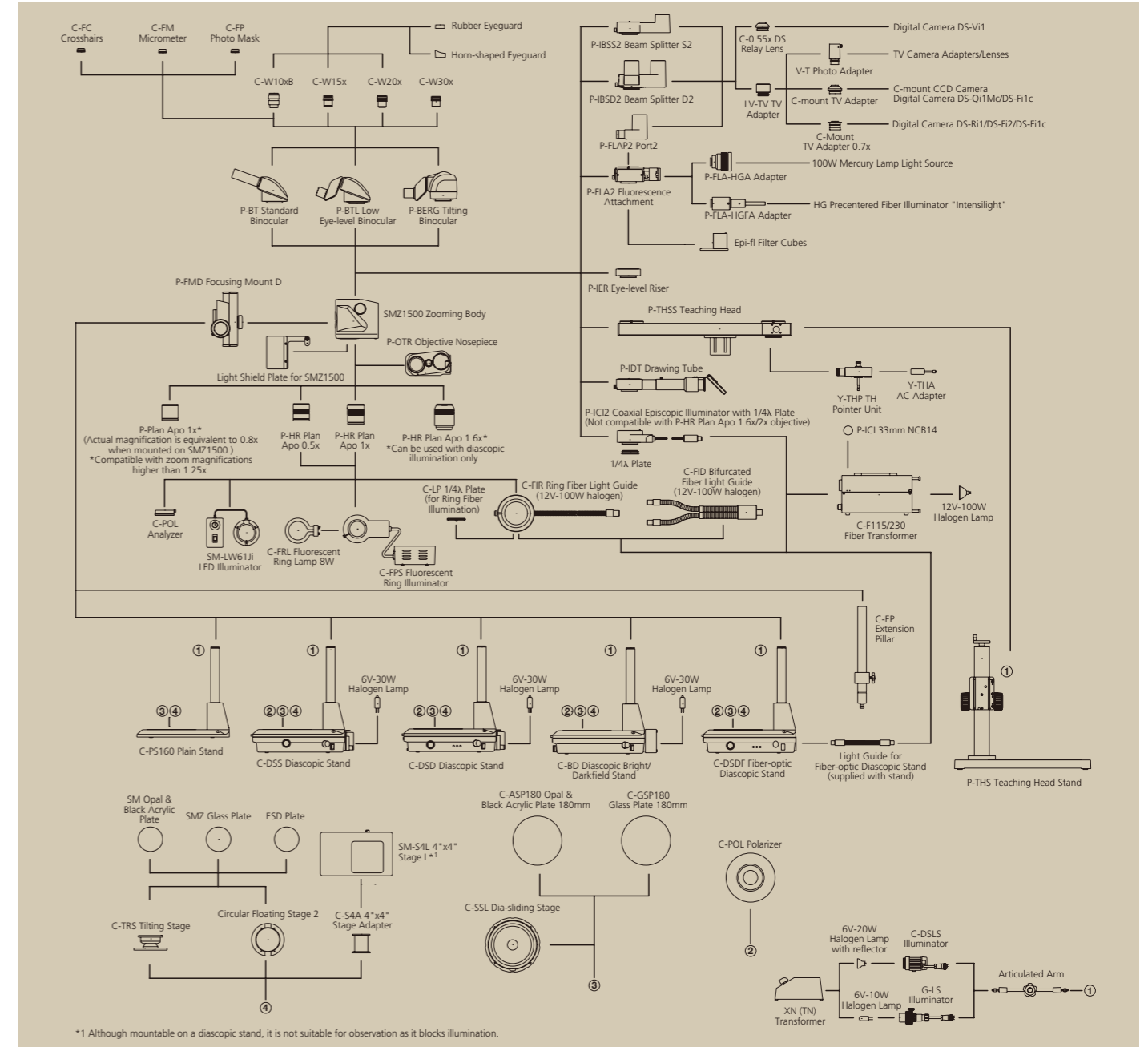
For possible combinations of accessories, please refer to the system diagram.

## Dimensions (SMZ1500-1)



Unit: mm

## System diagram

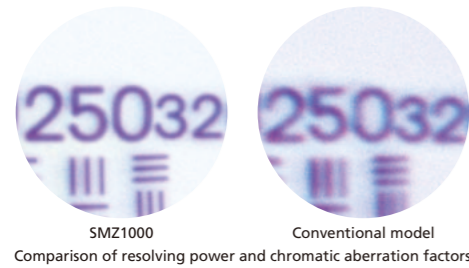


\*1 Although mountable on a diascopic stand, it is not suitable for observation as it blocks illumination.

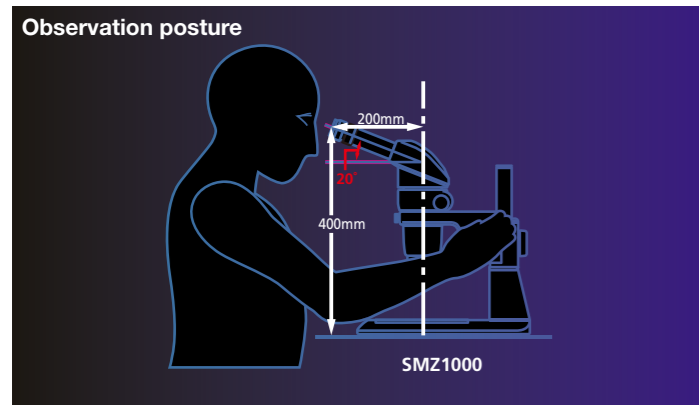
# Unrivalled optical performance, system expandability plus ergonomic design

# SMZ1000

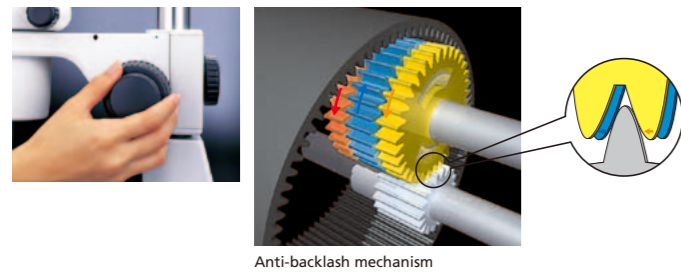
- The SMZ1000 features a large 10x zoom ratio, extending from 0.8x to 8x. This gives you a total magnification of 4x to 480x, depending on the combination of eyepiece and objective used. The 10x zoom lens eliminates the need to change lenses, allowing users to concentrate on observation.
- Nikon has developed an objective featuring a high NA of 0.1 and a high resolving power of 300 lines/mm.
- 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.



SMZ1000 Conventional model  
Comparison of resolving power and chromatic aberration factors



- The C-FMC Focusing Mount C comes with a coaxial coarse/fine focusing unit that travels smoothly along the optical axis. Its anti-backlash mechanism makes fine adjustment of focus easier and more accurate. A built-in counterbalance ensures easy movements.



Anti-backlash mechanism

- To maximize the high performance of SMZ1000, various accessories including illumination systems and diascopic stands are available.

## Magnification and focal depth (focal depth when using the C-W10xB eyepiece)

Objectives	Working distance	Zoom magnification	Focal depth (mm)
P-Plan Apo 0.5x	123.6	0.8x	4.886
		4x	0.378
		8x	0.181
P-Plan Apo 1x	70	0.8x	1.221
		4x	0.095
		8x	0.045
P-ED Plan 1.5x	44.5	0.8x	0.543
		4x	0.042
		8x	0.020
P-ED Plan 2x	32.5	0.8x	0.305
		4x	0.024
		8x	0.011

## How to calculate focal depth (mm, when wavelength is 550nm)

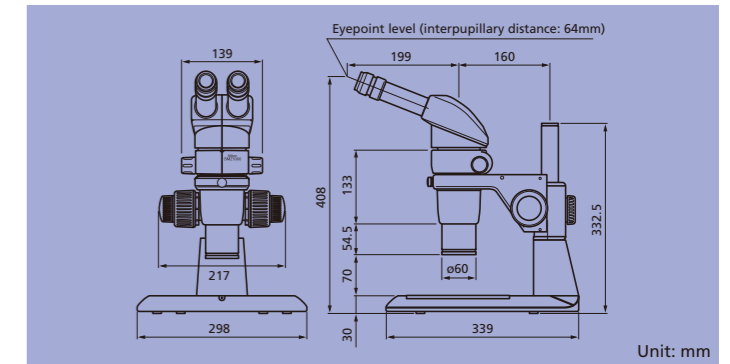
$$\frac{0.00055}{2(NA)^2} + \frac{1}{7m \cdot NA} \quad m: \text{total magnification}$$

## Specifications

Optical system	Parallel-optics zoom system
Total magnification	4-480x (Depending on eyepiece and objective used.), 6-540x (When coaxial episcopic illuminator is attached.)
Eyepiece inclination	20° (Standard Binocular and Low Eye-level Binocular), 0°-30° (Tilting Binocular)
Interpupillary distance adjustment	48-75mm
Eyepieces (with diopter adjustment)	C-W10xB (F.N. 22), C-W15x (F.N. 16), C-W20x (F.N. 12.5), C-W30x (F.N. 7)
Zoom range	0.8-8.0x
Zoom ratio	10 : 1
Objectives	P-Plan Apo 0.5x, 1x, P-ED Plan 1.5x, 2x, P-Plan 1x*, P-Achro 0.5x, P-ERG Plan 1x ERGO* *Compatible with zoom magnifications higher than 1x.

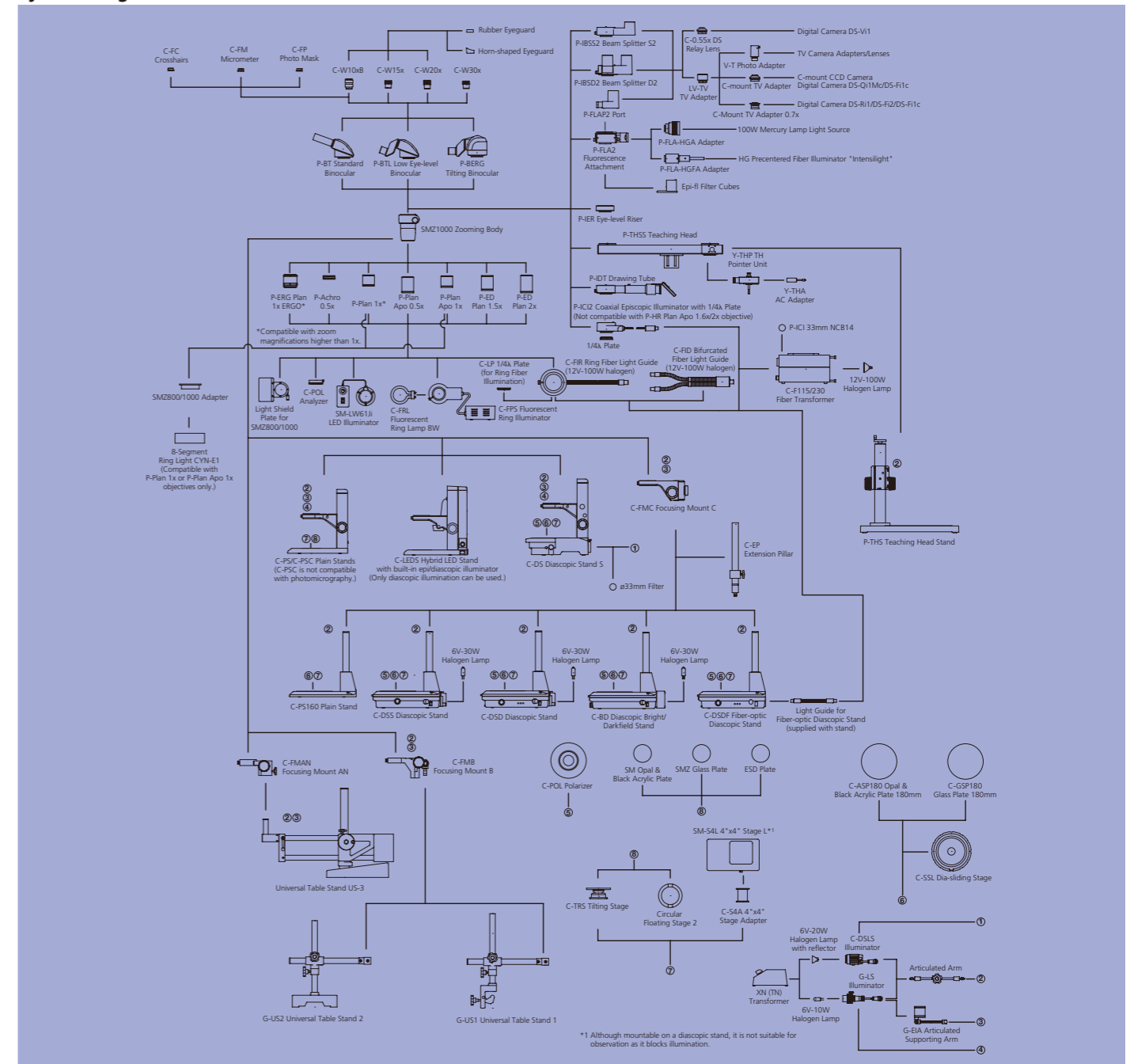
For possible combinations of accessories, please refer to the system diagram.

## Dimensions (SMZ1000-1)



Unit: mm

## System diagram



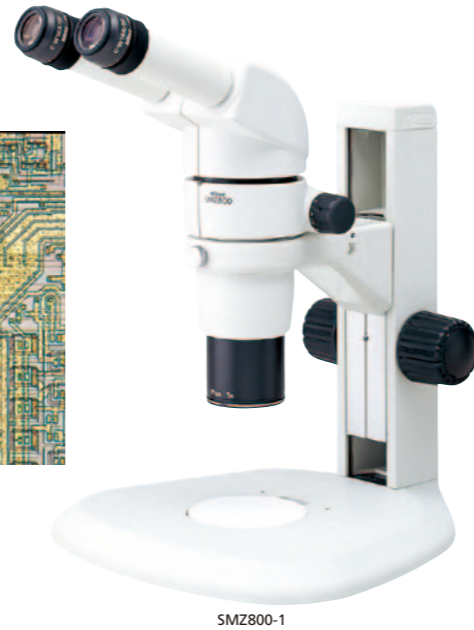
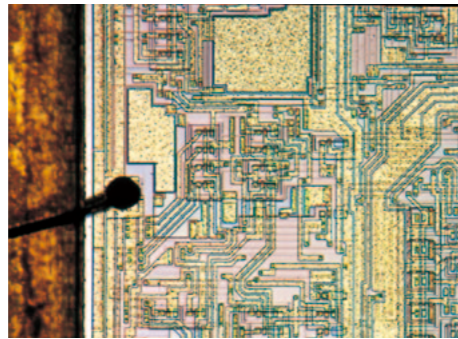
\*1 Although mountable on a diascopic stand, it is not suitable for observation as it blocks illumination.



# Pursuing ergonomic design, image clarity and low cost

# SMZ800

- Easy-to-use 6.3x zoom ratio (1–6.3x)
- Objectives feature high NA and high resolving power
- 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.
- 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), a tilting binocular eyepiece tube (P-BERG) that allows continuous adjustment of the eyepiece inclination from 0° to 30°, and an eye-level riser (P-IER) to help you achieve the optimum eyepoint.
- To maximize the high performance of SMZ800, various accessories including illumination systems and diascopic stands are available.



SMZ800-1

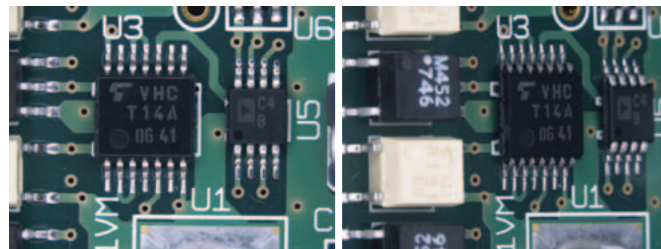
## C-TRS Tilting Stage

This stage can be manually tilted in any direction, from a horizontal position to an angle of up to 30 degrees. When the nonskid sheet is used, it can hold a sample at a slant, making it suitable for slanted position observation of electronic parts, small print circuit boards and other such samples. The tilting stage is not compatible with diascopic illumination.



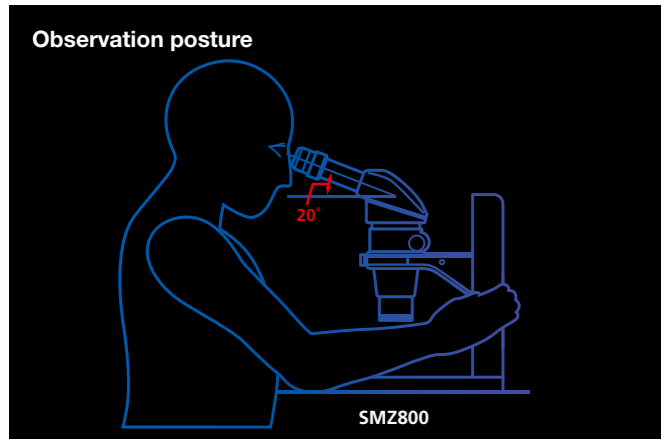
Ergonomic objective can be extended or retracted to adjust eye level.

- With the ergonomic objective (Plan 1x ERGO), the instrument's eye level is adjusted without the magnification or working distance being changed.



Vertical image

Slanted image



## Observation posture

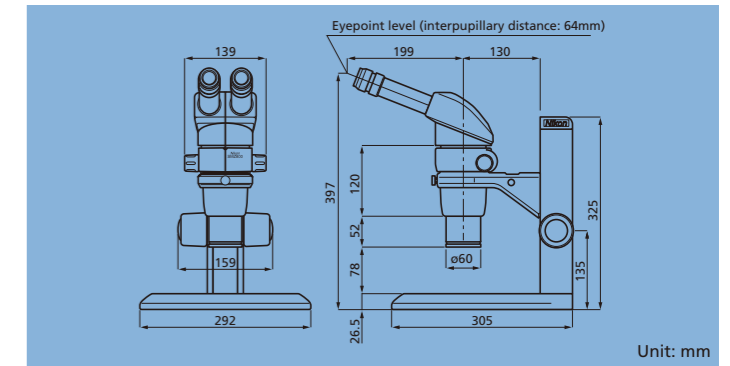
SMZ800

## Specifications

Optical system	Parallel-optics zoom system
Total magnification	5–378x (Depending on eyepiece and objective used.), 7.5–425x (When coaxial episcopic illuminator is attached.)
Eyepiece inclination	20° (Standard Binocular and Low Eye-level Binocular), 0°–30° (Tilting Binocular)
Interpupillary distance adjustment	48–75mm
Eyepieces (with diopter adjustment)	C-W10xB (F.N. 22), C-W15x (F.N. 16), C-W20x (F.N. 12.5), C-W30x (F.N. 7)
Zoom range	1–6.30x
Zoom ratio	6.3 : 1
Objectives	P-Plan Apo 0.5x, 1x, P-ED Plan 1.5x, 2x, P-Plan 1x, P-Achro 0.5x, P-ERG Plan 1x ERGO

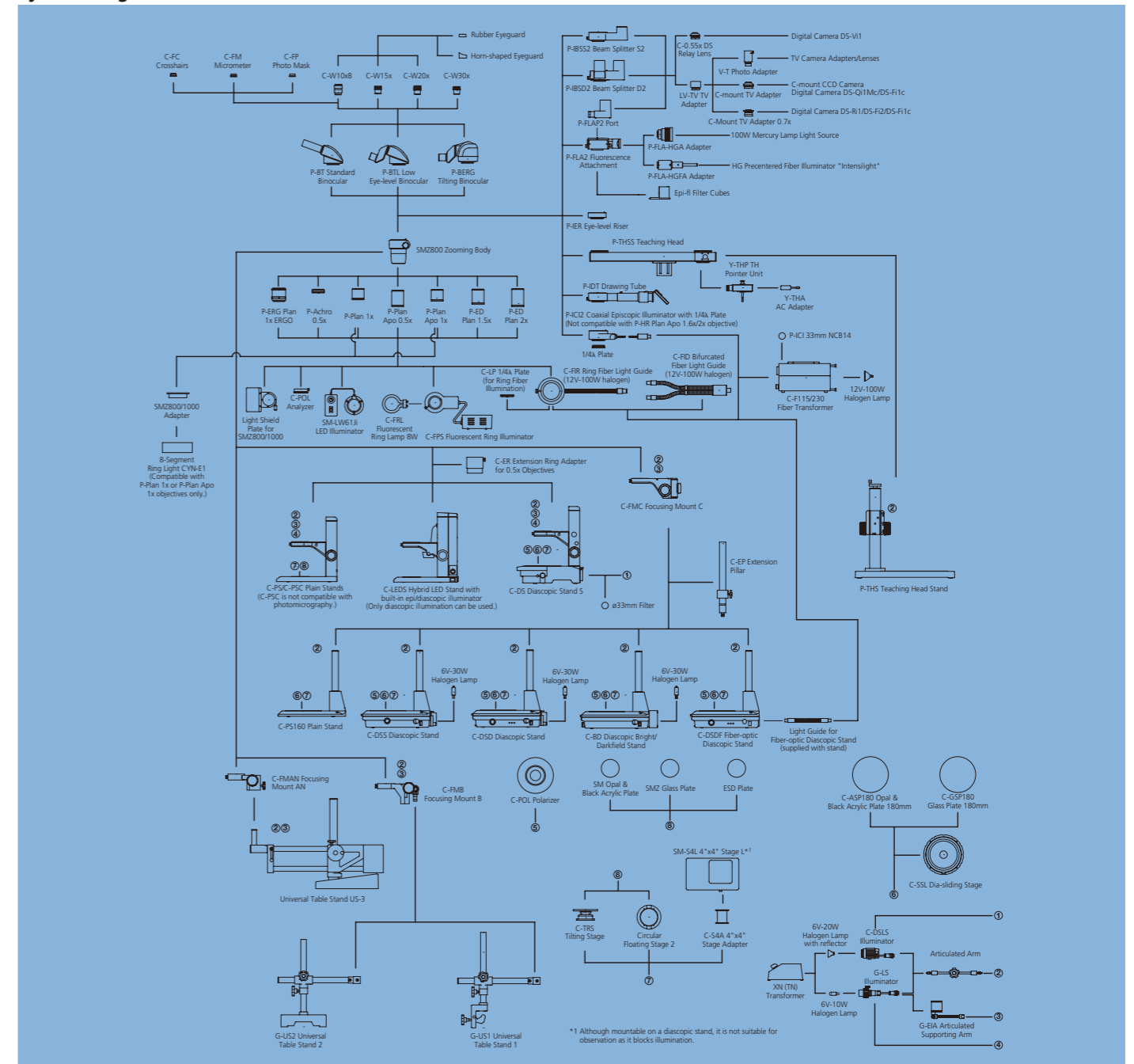
For possible combinations of accessories, please refer to the system diagram.

## Dimensions (SMZ800-1)



Unit: mm

## System diagram



## Magnification and focal depth (focal depth when using the C-W10xB eyepiece)

Objectives	Working distance	Zoom magnification	Focal depth (mm)
P-Plan 1x	78	1x	0.782
		3x	0.132
		6.3x	0.059
P-Achro 0.5x	189	1x	3.127
		3x	0.529
		6.3x	0.237

## How to calculate focal depth (mm, when wavelength is 550nm)

$$\frac{0.00055}{2(NA)^2} + \frac{1}{7m \cdot NA} \quad m: \text{total magnification}$$

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

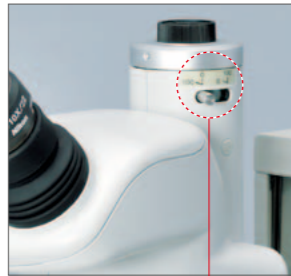
# SMZ745/745T

- 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.



Optical path switching lever  
SMZ745T has a built-in C-mount 0.55x magnification lens



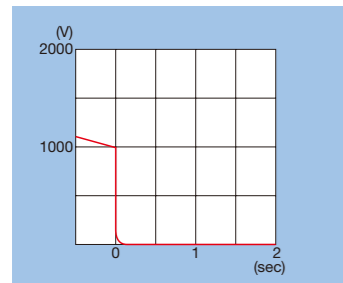
With a DS series digital camera



- Three "A" design**
  - Airtight (SMZ745)**  
By making joints airtight, contamination from dust, oil, water and other contaminants is prevented.

- Anti-mold (SMZ745/745T)**  
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-electrostatic (SMZ745/745T)**  
Static electricity built up within the microscope is discharged almost instantly, ensuring higher yields.



SMZ745

SMZ745T

- Various accessories including illumination systems and diascopic stands are available.

## Magnification and focal depth (focal depth when using the C-W10xB eyepiece)

Auxiliary objectives	Zoom magnification	Focal depth (mm)
Not used	0.67x	1.190
	3x	0.103
	5x	0.057
0.5x	0.67x	4.761
	3x	0.414
	5x	0.228
0.7x	0.67x	2.429
	3x	0.211
	5x	0.117
1.5x	0.67x	0.529
	3x	0.046
	5x	0.025
2x	0.67x	0.298
	3x	0.026
	5x	0.014

## How to calculate focal depth (mm, when wavelength is 550nm)

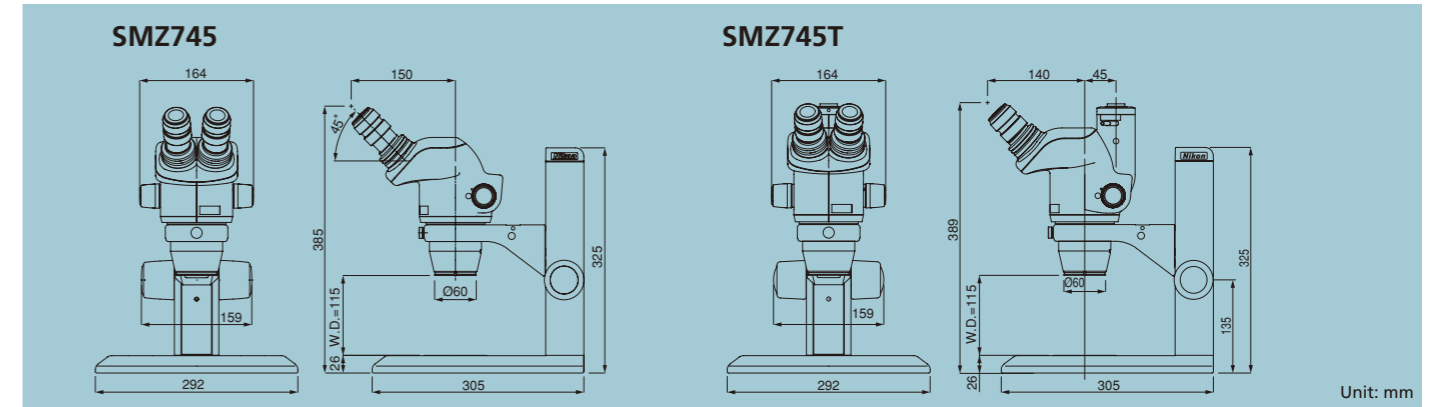
$$\frac{0.00055}{2(NA)^2} + \frac{1}{7m \cdot NA} \quad m: \text{total magnification}$$

## Specifications

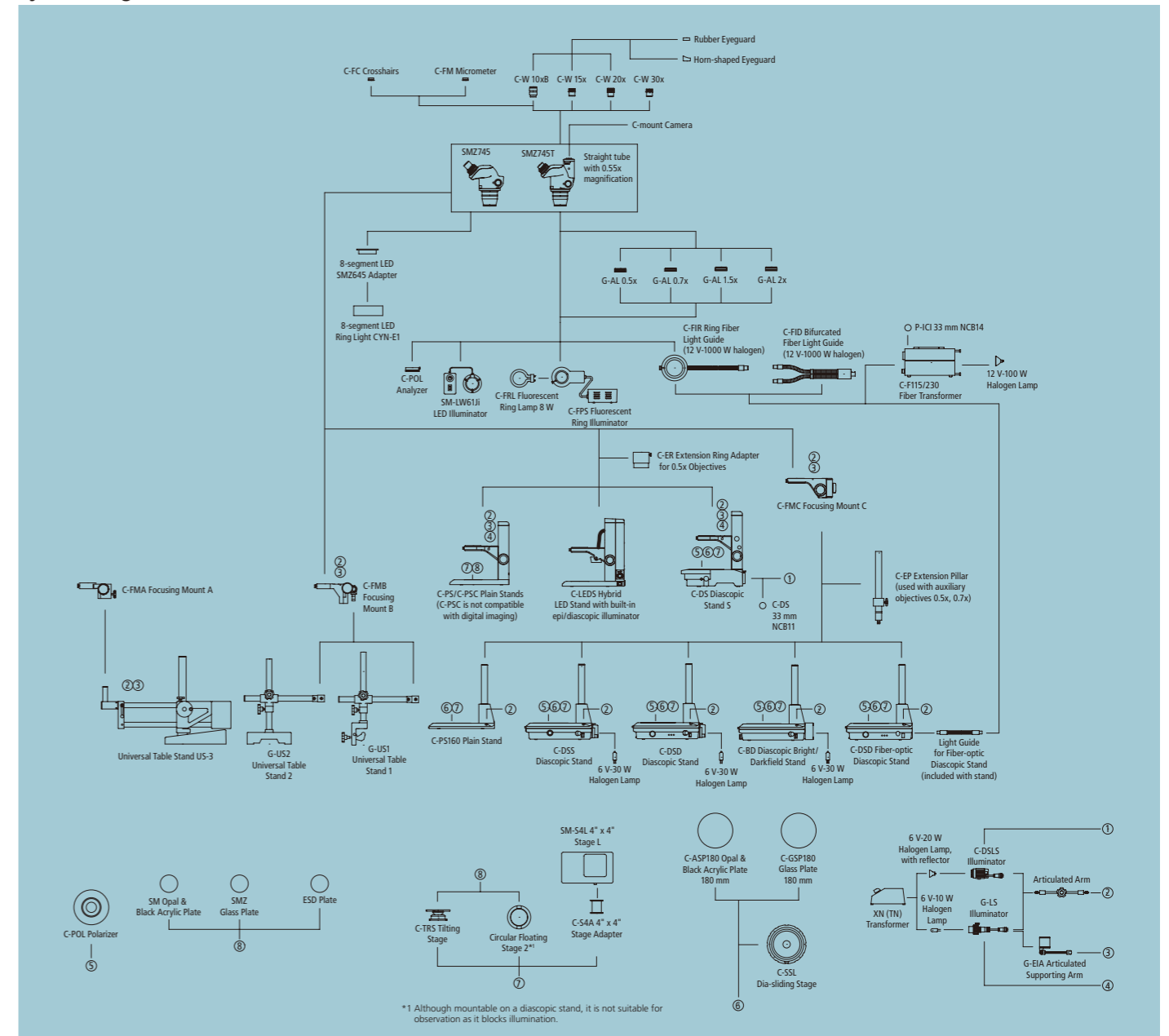
Optical system	Greenough optical system
Total magnification	3.35-300x (depending on eyepiece and auxiliary objective used)
Straight tube	Built-in C-mount 0.55x magnification lens (F.N. 11), compatible with 2/3 in. or smaller CCD
Eyepiece tube	Fixed type
Eyepiece inclination	45°
Interpupillary distance adjustment	52-75 mm
Eyepieces (with diopter adjustment)	C-W 10xB (F.N. 22), C-W 15x (F.N. 16), C-W 20x (F.N. 12.5), C-W 30x (F.N. 7)
Zoom range	0.67-5x
Zoom ratio	7.5:1
Auxiliary objectives	G-AL 0.5x (W.D. 211 mm), G-AL 0.7x (W.D. 150 mm), G-AL 1.5x (W.D. 61 mm), G-AL 2x (W.D. 43.5 mm)
Working distance	115 mm (standard)
Weight	1.8 kg

FN.: Field Number

## Dimensions



## System diagram



\*1 Although mountable on a diascopic stand, it is not suitable for observation as it blocks illumination.



# 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 long working distance of 115mm, the longest in this microscope class, is realized.
- Low-position focus knob for quick, effortless focusing
- Various accessories including illumination systems and diascopic stands are available.



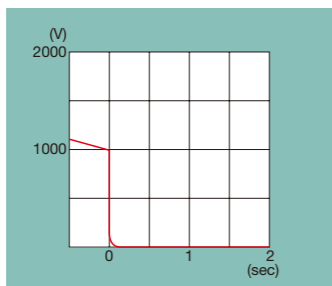
SMZ660-1

## Three "A" design

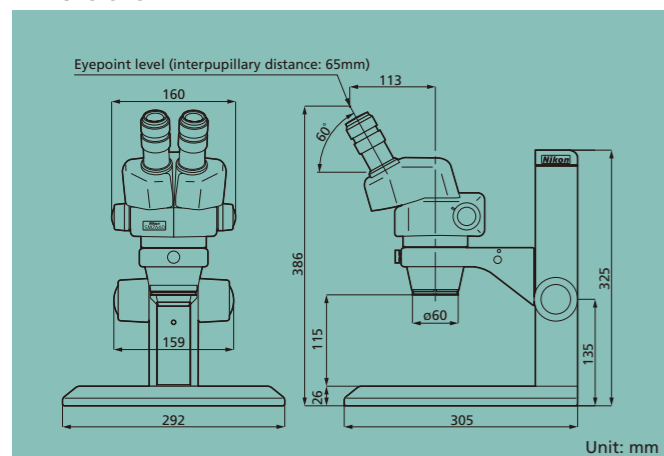
- **Airtight**  
By making joints airtight, contamination from dust, oil, water and other contaminants is prevented.

- **Anti-mold**  
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-electrostatic**  
Static electricity built up within the microscope is discharged almost instantly, ensuring higher yields.



## Dimensions



## Magnification and focal depth (focal depth when using the C-W10xB eyepiece)

Auxiliary objectives	Zoom magnification	Focal depth (mm)
Not used	0.8x	1.380
	3x	0.152
	5x	0.097
0.5x	0.8x	5.519
	3x	0.608
	5x	0.388
0.7x	0.8x	2.816
	3x	0.310
	5x	0.198
1.5x	0.8x	0.613
	3x	0.068
	5x	0.043
2x	0.8x	0.345
	3x	0.038
	5x	0.024

## How to calculate focal depth (mm, when wavelength is 550nm)

$$\frac{0.00055}{2(\text{NA})^2} + \frac{1}{7m \cdot \text{NA}} \quad m: \text{total magnification}$$

## Specifications

Optical system	Twin zooming objective
Total magnification	4–300x (Depending on eyepiece and auxiliary objective used.)
Eyeiece inclination	60°
Interpupillary distance adjustment	52–75mm
Eyeieces (with diopter adjustment)	C-W10xB (F.N. 22), C-W15x (F.N. 16), C-W20x (F.N. 12.5), C-W30x (F.N. 7)
Zoom range	0.8–5x
Zoom ratio	6.3 : 1
Auxiliary objectives	G-AL 0.5x (W.D. 211mm), 0.7x (W.D. 150mm), 1.5x (W.D. 61mm), 2x (W.D. 43.5mm) G-AL ERG 0.77–1.06x (W.D. 102–48mm)
Working distance	115mm (with standard configuration)
Antistatic function	1000–10V, discharge within 0.2 sec.
Airtight construction	JIS dew prevention standard Type 1 compliant

# Designed for excellent cost performance

# SMZ445/460

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

## Specifications

	SMZ445	SMZ460
Optical system	Twin zooming objective	
Total magnification	4x–70x	3.5x–60x
Eyeiece inclination	45°	60°
Interpupillary distance adjustment	54–75mm	
Eyeieces	SM 10xB (F.N. 21), SM 15xB (F.N. 14), SM 20xB (F.N. 12)	
Zooming range	0.8–3.5x	0.7–3x
Zooming ratio	4.4 : 1	4.3 : 1
Auxiliary objectives (option)	AL5 (0.5x), AL7 (0.7x)	
Working distance	100mm (standard)	



SMZ460

SMZ445



SMZ445 configured with LED stand

## C-LEDS Hybrid LED Stand

Both episcopic and diascopic observations are possible with this thin, lightweight stand.

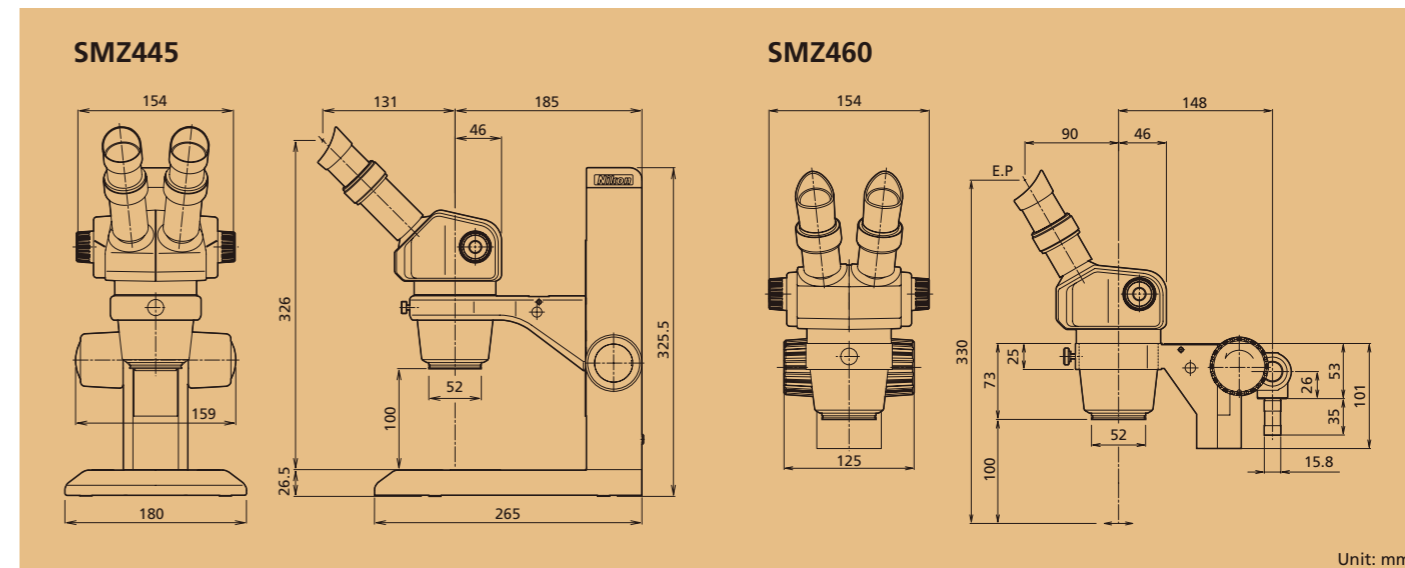


Episcopic illumination



Diascopic illumination

## Dimensions



Unit: mm

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



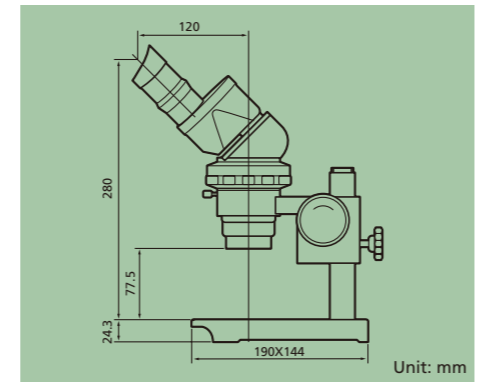
# Accessories

- 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.



SMZ-2 (Clemmer is optional)

### Dimensions



### Specifications

Optical system	Twin zooming objective
Total magnification	4–120x (Depending on eyepiece and auxiliary objective used.)
Eyepiece inclination	45°
Interpupillary distance adjustment	56–75mm
Eyepieces (with diopter adjustment)	SM E10xA (F.N. 23, standard), SM E15xA (F.N. 14), SM E20xA (F.N. 12), C-W30x (F.N. 7)
Zooming range	0.8–4x
Zooming ratio	5 : 1
Working distance	77.5mm (with standard configuration)

### Magnification and focal depth (mm)

Magnification	Eyepieces			
	10x	15x	20x	30x
0.8x	0.794	0.613	0.523	0.433
1x	0.496	0.383	0.326	0.269
2x	0.183	0.145	0.126	0.107
3x	0.122	0.099	0.088	0.077
4x	0.105	0.088	0.080	0.071

# Standard stereoscopic microscope with fixed objective magnification

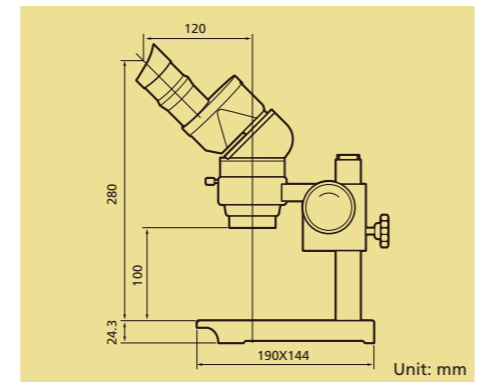


- Optical axis passes through the middle of the lens, eliminating chromatic aberration and providing sharp images.
- Objective has fixed magnification of 2x. Total magnification ranges from 10x to 60x depending on eyepiece and auxiliary objective used.
- Focal plane is positioned on distinct vision, eliminating eye fatigue during lengthy use.
- 45° eyepiece tube inclination is ideal for use on a desk or other work surface.



SMZ-2 (Clemmer is optional)

### Dimensions



### Specifications

Optical system	Fixed type
Total magnification	10x–60x (Depending on the eyepiece and auxiliary objective used.)
Eyepiece inclination	45°
Interpupillary distance adjustment	56–75mm
Eyepieces	SM E10xA (F.N. 23, standard), SM E15xA (F.N. 14), SM E20xA (F.N. 12), C-W30x (F.N. 7)
Objectives	2x
Auxiliary objectives (option)	AL5 (0.5x), AL7 (0.7x)
Working distance	100mm (standard)

### Magnification and focal depth (mm)

Auxiliary objectives	Eyepieces			
	10x	15x	20x	30x
Not used	0.181	0.142	0.123	0.104
AL5 (0.5x)	0.723	0.569	0.492	0.415
AL7 (0.7x)	0.369	0.290	0.251	0.212

## Objectives

### P-HR Plan Apo Series

This series of objectives, which feature high NA and incredible resolving power, has been developed in pursuit of sharper and brighter images. For example, the P-HR Plan Apo 1.6x objective\* delivers an NA of 0.21 and a resolving power of 630 lines/mm.  
\*Can be used with diascopic illumination only.

- P-HR Plan Apo 0.5x, working distance: 136mm
- P-HR Plan Apo 1x, working distance: 54mm
- P-HR Plan Apo 1.6x, working distance: 24mm



From left to right: P-HR Plan Apo 1x, P-HR Plan Apo 1.6x, and P-HR Plan Apo 0.5x

### P-Plan Apo Series

This series of objectives, which boasts high NA and high resolving power, provides excellent image flatness. Chromatic aberration has been corrected.

- P-Plan Apo 0.5x, working distance: 123.6mm
- P-Plan Apo 1x, working distance: 70mm

### P-ED Plan/P-Plan/P-Achro Objectives

Objectives of various magnifications and working distances are available.

- P-ED Plan 1.5x, working distance: 44.5mm
- P-ED Plan 2x, working distance: 32.5mm
- P-Plan 1x, working distance: 78mm
- P-Achro 0.5x, working distance: 189mm

### Ergonomic Objective

Eye level can be adjusted precisely without changing magnification or working distance.



P-ERG Plan 1x

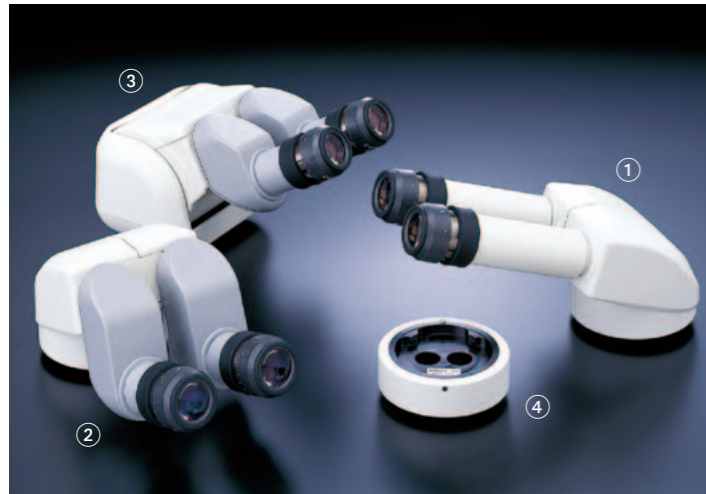
## Auxiliary Objectives

### Auxiliary Objectives

Microscopes	Auxiliary objectives	Working distance (mm)
SMZ660	G-AL ERG 0.7–1.06x	102–48
	G-AL 0.5x	211
	G-AL 0.7x	150
	G-AL 1.5x	61
SMZ-2	AL5 (0.5x)	103
	AL7 (0.7x)	95
SMZ445/460	AL5 (0.5x)	181
	AL7 (0.7x)	127.5
SM-5	AL5 (0.5x)	168
	AL7 (0.7x)	128



## Eyepiece Tubes/Eye-level Riser SMZ1500 SMZ1000 SMZ800



(1) P-BT standard binocular eyepiece tube, (2) P-BTL low eye-level eyepiece tube, (3) P-BERG tilting eyepiece tube, (4) P-IER eye-level riser

### P-BT Standard Eyepiece Tube

The standard binocular eyepiece tube is inclined 20°, allowing you to observe samples without having to lean forward. This reduces fatigue during long hours of operation by reducing strain on your neck, shoulders, and back.

### P-BTL Low Eye-level Eyepiece Tube

The low eye-level binocular eyepiece tube enables comfortable observation even when using a diascopic stand or when an intermediate tube is inserted.

### P-BERG Tilting Eyepiece Tube

The tilting binocular eyepiece tube allows continuous adjustment of the eyepiece inclination from 0° to 30°. You can also adjust the eye level a maximum of 157mm by swinging the eyepieces up 180° and tilting them.

### P-IER Eye-level Riser

Lets you increase the eyepoint height 25mm per riser for a total of 50mm.

## Beam Splitters/Teaching Head/Drawing Tube SMZ1500 SMZ1000 SMZ800

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

Using a beam splitter and adapter, a CCTV camera or a DS series digital camera can be attached. The P-IBSD2 Beam Splitter D2 has two ports.

#### Beam-split ratios

Beam splitter	Observation		Photomicrography	
	Left	Right	Rear port	Side port
P-IBSD2	100%	100%	0%	0%
	0%	100%	100%	0%
	50%	50%	50%	50%
P-IBSS2	100%	100%	—	0%
	100%	50%	—	50%

### 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.



### P-IDT Drawing Tube

The drawing tube, mounted between 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 knob to block the light path.

## Illumination Systems/Polarizing Attachment

### P-ICI2 Coaxial Episcopic Illuminator

This illuminator uses a 12V-100W fiber-optics light source to deliver bright illumination over the entire sample surface. The thickness of the 1/4λ plate has been reduced, minimizing spherical aberrations in high NA objectives.



SMZ1500 configured with P-ICI2 Coaxial Episcopic Illuminator

\*Zoom magnifications that can be used vary depending on objective. For details, consult a Nikon representative.

SMZ1500 SMZ1000 SMZ800

### C-FIR Fiber-optics Ring Illuminator (12V-100W halogen)

This illuminator incorporates a 12V-100W halogen lamp with reflection mirrors. It supplies conical-shaped light through an optical fiber from above the sample to its center, minimizing unwanted shadow.



SMZ1500 configured with C-FIR Fiber-optics Ring Illuminator

SMZ1500 SMZ1000 SMZ800  
SMZ745/745T SMZ660 SMZ-2  
SMZ445/460 SM-5

### C-FID Fiber-optics Bifurcated Illuminator (12V-100W halogen)

This illuminator incorporates a 12V-100W halogen lamp with reflection mirrors to project light beams onto the desired position via two optical-fiber arms. The direction and angle of the illumination can be changed with simple adjustments of these flexible arms.



SMZ1500 configured with C-FID Fiber-optics Bifurcated Illuminator

SMZ1500 SMZ1000 SMZ800 SMZ745/745T  
SMZ660 SMZ-2 SMZ445/460 SM-5

### C-LEDS Hybrid LED Stand

Both episcopic and diascopic observations are possible with this thin, lightweight stand. The space-saving built-in illuminator can be switched and adjusted with ease.



SMZ445 configured with C-LEDS Hybrid LED Stand

SMZ1000 SMZ800 SMZ745/745T  
SMZ660 SMZ445/460

### C-FPS Fluorescent Ring Illuminator

A ring-shaped fluorescent tube provides uniform illumination over the entire visual field without shadows. This illuminator lights up immediately after switching ON.



SMZ745 configured with C-FPS Fluorescent Ring Illuminator

SMZ1500 SMZ1000 SMZ800 SMZ745/745T  
SMZ660 SMZ-2 SMZ445/460 SM-5

### SM-LW61Ji3 LED Illuminator

This is a high-intensity illuminator incorporating 60 long-life white LEDs. Flickering is suppressed by adjusting the intensity control.



SMZ745 configured with SM-LW61Ji LED Illuminator

SMZ1500 SMZ1000 SMZ800 SMZ745/745T  
SMZ660 SMZ-2 SMZ445/460 SM-5

## Illumination Systems/Polarizing Attachment

### C-DSLS Lamphouse (6V-20W halogen)



SMZ1500 SMZ1000 SMZ800  
SMZ745/745T SMZ660 SMZ445/460

### G-LS Episcopic Illuminator (6V-10W halogen)



SMZ1500 SMZ1000 SMZ800  
SMZ745/745T SMZ660 SMZ445/460

### 8-Segment LED Ring Light CYN-E1

Because the optimum direction of illumination can be selected from eight directions, it is now possible to clearly see the edges of plastic mold parts and drills.

SMZ1000 SMZ800 SMZ745/745T  
SMZ660

### C-POL Polarizing Attachment

The polarizer is set on the stage while the analyzer is fitted on the objective lens cover, through which diascope illumination light passes, making it possible to observe flakes of rock or mined ore, or double refraction images of samples.

SMZ1500 SMZ1000 SMZ800  
SMZ745/745T SMZ660

## Stands

### C-PS160 Plain Stand

This stand features a thin design, a large ø180mm stage plate and a long 160mm distance between the pillar and optical axis to boost your working efficiency.



SMZ1500 configured with C-PS160 Plain Stand

SMZ1500 SMZ1000 SMZ800 SMZ745/745T  
SMZ660 SMZ445/460

### C-PS/C-PSC Plain Stands

The narrow design offers a comfortable work area and allows easy handling of samples. The C-PSC stand has a small base that saves desk space.



SMZ745 configured with C-PSC Plain Stand

SMZ1000 SMZ800 SMZ745/745T  
SMZ660 SMZ445/460

### C-DS Diascopic Stand

This stand features a hand rest that ensures comfortable operation and a large-diameter stage glass for observation of large samples. Used in conjunction with 6V-20W halogen lamp.



SMZ745 configured with C-DS Diascopic Stand

SMZ1000 SMZ800 SMZ745/745T  
SMZ660 SMZ445/460

## Stands

### C-DSD Diascopic Stand

The high-end C-DSD Diascopic Stand features condenser lenses that can be switched between low and high magnifications. Furthermore, the Oblique Coherent Contrast (OCC) Illumination system has been developed in response to user requests for high-contrast illumination. The system allows colorless and transparent samples to be observed in high relief.



SMZ1500 configured with C-DSD Diascopic Stand

SMZ1500 SMZ1000 SMZ800 SMZ745/745T  
SMZ660 SMZ445/460

Light source	6V-10W halogen lamp
Illumination	Brightfield illumination, OCC (high contrast) illumination
Built-in filter	NCB11, ND4/16
Magnification	Observable with all objectives; observable at all zoom ranges (0.5x objective is compatible with zoom magnifications higher than 1.5x.)
Fine focus knob	Equipped

### C-DSS Diascopic Stand

This stand accommodates a light source and power supply in a simple design. The angle of the built-in mirror can be easily adjusted with the knob.



SMZ1500 configured with C-DSS Diascopic Stand

SMZ1500 SMZ1000 SMZ800 SMZ745/745T  
SMZ660 SMZ445/460

Light source	6V-10W halogen lamp
Illumination	Brightfield illumination, oblique (high contrast) illumination
Built-in filter	Not equipped *ø45mm filter slot provided
Magnification	Observable with all objectives; observable at all zoom ranges (0.5x objective is compatible with zoom magnifications higher than 1.5x.)
Fine focus knob	Equipped

### C-BD Diascopic Bright/Darkfield Stand

This stand uses a seven-sided toroidal mirror to substantially reduce stray light that causes a decrease in contrast when using short-working distance objectives under darkfield diascope illumination. Consequently, it enables high S/B ratio darkfield images.



SMZ1500 configured with C-BD Diascopic Bright/Darkfield Stand

SMZ1500 SMZ1000 SMZ800 SMZ745/745T  
SMZ660 SMZ445/460

Light source	6V-10W halogen lamp
Illumination	Brightfield illumination, darkfield illumination
Built-in filter	NCB11 (brightfield only, insertion/detachment impossible) *ø45mm filter slot provided
Magnification	Observable with all objectives; observable at all zoom ranges (0.5x objective is compatible with zoom magnifications higher than 1.5x.)
Fine focus knob	Equipped

The C-DSDF Fiber-optic Diascopic Stand is also available.

## Stages

### C-SSL Dia-sliding Stage

Used for diascope observation, this sliding stage can be easily moved in the desired direction simply with a light push. Travel range is within ø38mm.



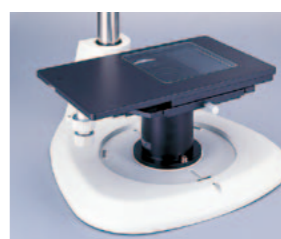
SMZ1500 SMZ1000 SMZ800 SMZ745/745T  
SMZ660 SMZ445/460

### 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 diascope stand, it is not suitable for observation as it blocks illumination.)

SMZ1500 SMZ1000 SMZ800 SMZ745/745T  
SMZ660 SMZ445/460



SM-S4L 4 x 4 Stage

### C-TRS Tilting Stage

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

SMZ1500 SMZ1000 SMZ800 SMZ745/745T  
SMZ660 SMZ445/460

### 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.

SMZ1500 SMZ1000 SMZ800  
SMZ745/745T SMZ660 SMZ SMZ445/460  
SM-5





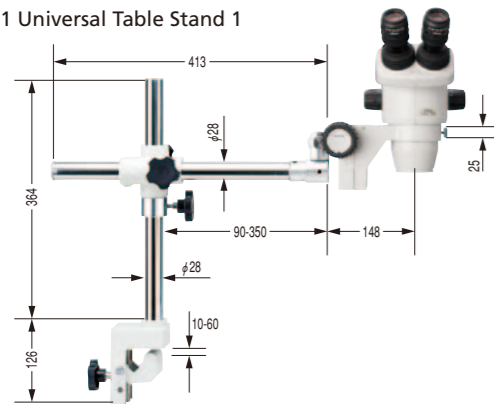
## Universal Table Stands/Focusing Mounts

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

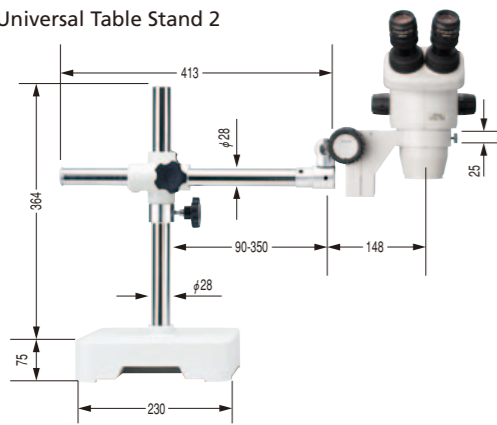
These stands are handy in microscopy with large samples not loaded onto the standard stand. The microscope unit is mounted to the stand arm via a focusing mount. The G-US1 is a table clamp type (table top thickness: 10 to 60 mm).

- Used in conjunction with the C-FMB Focusing Mount B on the SMZ745/745T/660/445/460.
- Used in conjunction with the SM Focusing Mount and the G-USA SM US Adapter on the SM-5.
- Can not be used with the SMZ1000/800 when photomicrographic equipment is mounted on these models.

#### G-US1 Universal Table Stand 1



#### G-US2 Universal Table Stand 2



Unit: mm

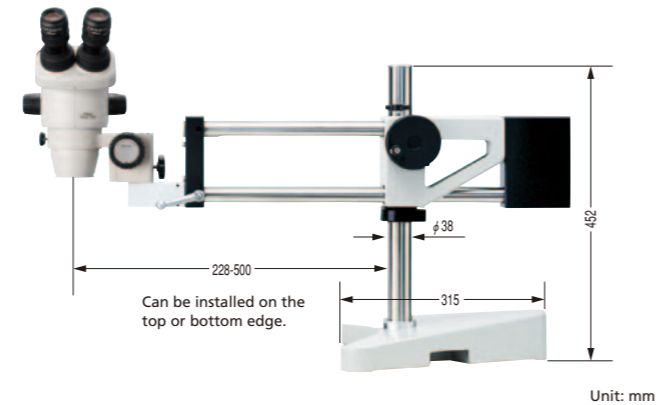
The image is a configuration sample with the SMZ745.

### 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 SMZ1000/800/745/745T/660/445/460.
- Used in conjunction with the SM Focusing Mount on the SM-5.

#### Universal Stand P



Unit: mm

The image is a configuration sample with the SMZ745.

### Specifications

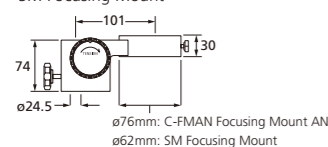
Model	G-US1	G-US2	P
Vertical cross travel	245mm	229mm	229mm
Horizontal cross travel	260mm	272mm	272mm
Weight (approx.)	4.4kg	23.0kg	30.5kg
C-FMAN Focusing Mount AN	—	—	○
C-FMB Focusing Mount B	○	—	—
C-FMC Focusing Mount C	—	—	—
SM Focusing Mount	○*	—	○
Use of photomicrographic equipment	—	—	○

○ : Possible \* G-USA Adapter is required

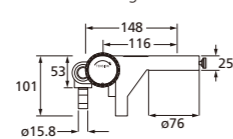
### Focusing Mounts

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.

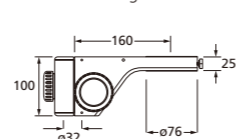
C-FMAN Focusing Mount AN  
SM Focusing Mount



C-FMB Focusing Mount B



C-FMC Focusing Mount C



Unit: mm

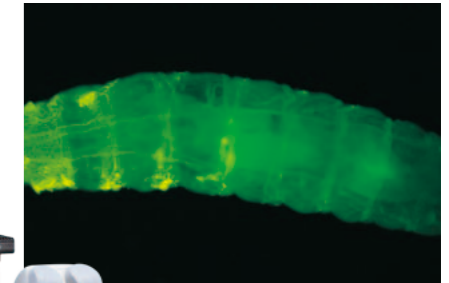
	C-FMAN Focusing Mount AN	C-FMB Focusing Mount B	C-FMC Focusing Mount C	SM Focusing Mount
Focusing area	40mm	50mm	50mm	40mm
Weight (approx.)	0.6kg	0.8kg	1.6kg	0.6kg
Compatible microscopes	SMZ1000/800/745/745T/660/445/460			SMZ-2, SM-5

## Epi-fluorescence Attachment SMZ1500 SMZ1000 SMZ800

### P-FLA2 Epi-fluorescence Attachment

Nikon developed the P-FLA2 Epi-fluorescence Attachment for stereoscopic microscopes to allow easy observation of living cells under fluorescence methods such as GFP. Switching between the fluorescence method and brightfield method is quick and easy. If you add an optional photo port to this attachment, you can mount a DS series digital camera or a CCTV camera without using a beam splitter. Because 100% of the light is delivered to the photo port, bright images are ensured.

Magnification	1x
Mountable filter blocks	Max. 4
Light source	100W mercury lamp 130W mercury lamp (C-HGFI Intensilight)
Filter blocks	2 dedicated types (Not compatible with biological microscopes.) P-FL GFP-B (EX460-500, DM505, BA510-560) P-FL GFP-L (EX460-500, DM505, BA510) P-FL CFP-B (EX440/21, DM455, BA480/30) P-FL YFP-B (EX500/25, DM525, BA545/35) P-FL TRITC (EX525/45, DM560, BA565) P-FL RFP (EX540/30, DM570, BA575)
Light path of dedicated side port (option)	Left eyepiece : right eyepiece : output port = 100 : 100 : 0, 0 : 50 : 100



SMZ1500 configured with P-FLA2 Epi-fluorescence Attachment and DS-F1c-L3

## Digital Cameras for Microscopes SMZ1500 SMZ1000 SMZ800

Numerous digital cameras and control units are available for biological and industrial applications ranging from advanced research to capturing inspection images.



DS-Vi1



DS-Fi2



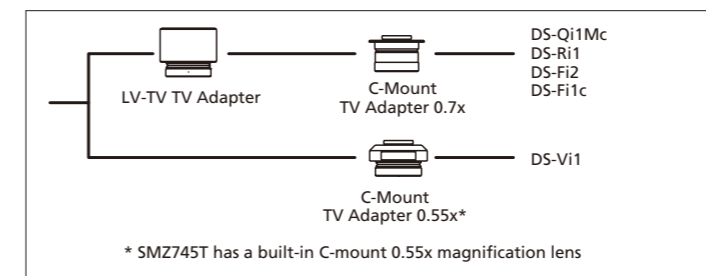
DS-Fi1c



DS-Ri1



DS-Qi1Mc



SMZ800 configured with P-IBS22 Beam Splitter S2, DS-Vi1 digital camera and DS-L3 control unit

# Specifications

Model	SMZ1500	SMZ1000	SMZ800	SMZ745/745T	SMZ660	SMZ445/460	SMZ-2	SM-5	
<b>Optical system</b>	Parallel-optics type (zooming type)			Greenough type (zooming type)				Fixed type	
<b>Total magnification (Depending on eyepiece and objective used)</b>	3.75–540x	4–480x	5–378x	3.35–300x	4–300x	4–70x (SMZ445), 3.5–60x (SMZ460)	4–120x	10–60x	
<b>(When coaxial episcopic illuminator is attached)</b>	5.6–506x	6–540x	7.5–425x						
<b>Eyepiece tube</b>	P-BT Standard Binocular, P-BTL Low Eye-level Binocular, P-BERG Tilting Binocular			Fixed					
<b>Eyepiece inclination</b>	20° (Standard Binocular and Low Eye-level Binocular), 0°–30° (Tilting Binocular)			45°	60°	45° (SMZ445), 60° (SMZ460)	45°		
<b>Interpupillary distance adjustment</b>	48–75mm			52–75mm		54–75mm	56–75mm		
<b>Eyepieces</b>	C-W10xB (F.N. 22), C-W15x (F.N. 16), C-W20x (F.N. 12.5), C-W30x (F.N. 7) (with diopter adjustment)				SM 10xB (F.N. 21), SM 15xB (F.N. 14), SM 20xB (F.N. 12)		SM E10xA (F.N. 23, standard), SM E15xA (F.N. 14), SM E20xA (F.N. 12), C-W30x (F.N. 7)		
<b>Zoom range</b>	0.75–11.25x	0.8–8.0x	1–6.3x	0.67–5x	0.8–5x	0.8–3.5x (SMZ445), 0.7–3x (SMZ460)	0.8–4x	—	
<b>Zoom ratio</b>	15 : 1	10 : 1	6.3 : 1	7.5 : 1		4.4 : 1 (SMZ445), 4.3 : 1 (SMZ460)	5 : 1	—	
<b>Objectives</b>	P-HR Plan Apo 0.5x (NA 0.066), 1x (NA 0.131), 1.6x (NA 0.210) P-Plan Apo 1x (NA 0.105) (Actual magnification is equivalent to 0.8x. Compatible with zoom magnifications higher than 1.25x.)	P-Plan Apo 0.5x (NA 0.050), 1x (NA 0.100) P-ED Plan 1.5x (NA 0.150), 2x (NA 0.200) P-Plan 1x* (NA 0.100) P-Achro 0.5x (NA 0.050) P-ERG Plan 1x ERGO* (NA 0.100) *Compatible with zoom magnifications higher than 1x.	P-Plan Apo 0.5x (NA 0.045), 1x (NA 0.090) P-ED Plan 1.5x (NA 0.135), 2x (NA 0.180) P-Plan 1x (NA 0.090) P-Achro 0.5x (NA 0.045) P-ERG Plan 1x ERGO (NA 0.090)	—					2x (fixed)
<b>Auxiliary objectives</b>	—			G-AL 0.5x (W.D. 211mm), 0.7x (W.D. 150mm), 1.5x (W.D. 61mm), 2x (W.D. 43.5mm)	G-AL 0.5x (W.D. 211mm), 0.7x (W.D. 150mm), 1.5x (W.D. 61mm), 2x (W.D. 43.5mm) G-AL ERG 0.77–1.06x (W.D. 102–48mm)	AL5 (0.5x, W.D. 181mm), AL7 (0.7x, W.D. 127.5mm)	AL5 (0.5x, W.D. 103mm), AL7 (0.7x, W.D. 95mm)	AL5 (0.5x, W.D. 168mm), AL7 (0.7x, W.D. 128mm)	
<b>Working distance (with standard configuration or 1x objective)</b>	54mm	70mm	78mm	115mm		100mm	77.5mm	100mm	
<b>Weight (approx.)</b>	7.5kg (with P-BT Standard Binocular and C-PS160 Plain Stand)	6.5kg (with P-BT Standard Binocular and C-PS160 Plain Stand)	5kg (with P-BT Standard Binocular and C-PS160 Plain Stand)	1.8kg	4.5kg	1.0kg (body), 1.9kg (C-PSC Plain Stand)	2.1kg (body), 1.9kg (C-PSC Plain Stand)	1.5kg (body), 1.9kg (C-PSC Plain Stand)	

# Accessory Compatibility

		SMZ1500	SMZ1000	SMZ800	SMZ745/745T	SMZ660	SMZ445/460	SMZ-2	SM-5
<b>Illumination systems</b>	P-IC12 Coaxial Episcopic Illuminator (12V-100W halogen)	○	○	○					
	C-FIR Fiber-optics Ring Illuminator	○	○	○	○	○	△	△	△
	C-FID Fiber-optics Bifurcated Illuminator (12V-100W halogen)	○	○	○	○	○	○	○	○
	C-DSLS Lamphouse (6V-20W halogen)			○	○	○			
	G-LS Episcopic Illuminator (6V-10W halogen)			○	○	○		△	△
	C-FPS Fluorescent Ring Illuminator	○	○	○	○	○	△	△	△
	SM-LW61Ji LED Illuminator		○	○	○	○	△	△	△
	8-Segment LED Ring Light CYN-E1		○*	○*	○**	○**			
<b>Epi-fluorescence attachment</b>	P-FLA2 Epi-fluorescence attachment	○	○	○					
<b>Polarizing attachment</b>	C-POL Polarizing Attachment	○	○	○	○	○			
<b>Iris diaphragm</b>	SMZ-10A Iris Diaphragm		○	○					
<b>Stands</b>	C-PS160 Plain Stand	○	○	○	○	○	○		
	C-PS/C-PSC Plain Stands		○	○	○	○	○		
	C-DS Diascopic Stand		○	○	○	○	○		
	C-DSS Diascopic Stand	○	○	○	○	○	○		

		SMZ1500	SMZ1000	SMZ800	SMZ745/745T	SMZ660	SMZ445/460	SMZ-2	SM-5
<b>Stands</b>	C-DSD Diascopic Stand	○	○	○	○	○	○		
	C-BD Diascopic Bright/Darkfield Stand	○	○	○	○	○	○		
	C-DSDF Fiber-optic Diascopic Stand	○	○	○	○	○	○		
<b>Stages</b>	SM-S4L 4 x 4 Stage (for episcopic illumination only)	○	○	○	○	○	○		
	Sliding Stage 2	○	○	○	○	○	○	○	
	C-SSL Dia-sliding Stage	○	○	○	○	○	○		
	C-TRS Tilting Stage	○	○	○	○	○	○		
<b>Stands</b>	Universal Table Stands G-US1/G-US2		○	○	○	○	○	○	
	Universal Table Stand P		○	○	○	○	○	○	
<b>Others</b>	P-THSS Teaching Head	○	○	○					
	P-IDT Drawing Tube	○	○	○					
	P-IBSS2 Beam Splitter	○	○	○					
	P-IBSD2 Beam Splitter	○	○	○					
<b>Digital cameras</b>	See page 21	○	○	○					

○ : compatible  
△ : adapter is required

\* Can be used with P-Plan 1x or P-Plan Apo 1x objective only.  
\*\* Can not be used with auxiliary objective.