

**Nikon**

**Stereoscopic Zoom Microscopes**

**SMZ1000**  
**SMZ800**





SMZ1000



SMZ800

Unrivaled optical performance, ergonomic design, and a variety of accessories to meet your requirements make the SMZ1000 and 800 the instruments of the 21st century.



At Nikon, a world leader in optical instruments, we are proud of our tireless commitment to providing the very best in optical performance.

At the same time, we realize that this philosophy means nothing if we fail to create products designed with you, the end-user, in mind. No matter how superior the technology used in a given product may be, that product has no real

value unless it serves your needs. That's why we design our products only after comprehensive market research and use the most up-to-date technologies to create microscopes that are unrivaled in the field.

Nikon's goal in designing the SMZ1000 and 800 was to create a class of stereoscopic microscopes that would fulfill all the expectations of 21st century users. Nikon took a close look at all aspects of the design and operation of these microscopes, then refined them,

boosting performance to the pinnacle in their class.

In flexible configurations that allow easy upgrades through the addition of various accessories, the SMZ1000 and 800 feature superlative optical performance that simply out-distances the competition. What's more, they are ergonomically designed to provide comfortable operation and minimize fatigue during long hours of observation.

These are the some of reasons why the SMZ1000 and 800 are the instruments for the 21st century. The SMZ1000 is excellent in both optical performance and cost-to-performance ratio, while the SMZ800 was designed to be extremely cost effective.

Why not experience them first-hand at your local Nikon dealer?





# Superior optics coupled with simple operation bring you unsurpassed performance.

## High magnification and large zoom ratio (SMZ1000)

For use at high magnifications, the SMZ1000 features a large 10X zoom ratio, extending from 0.8X to 8X. This gives you a total magnification from 4X to 480X, depending on the combination of eyepiece and objective used. The zooming knob features click-stops, eliminating the need to remove your eyes from the eyepiece while changing magnification.

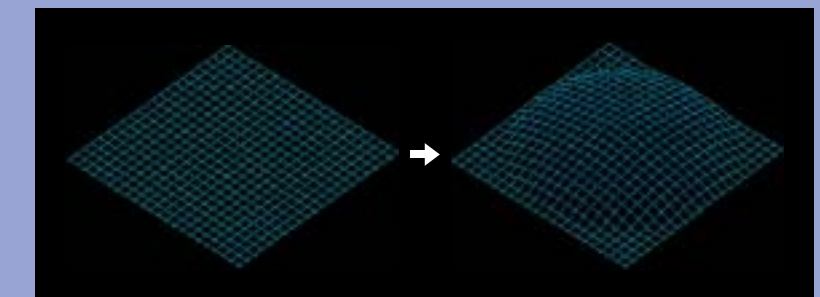


## New objectives feature high N.A.'s and high resolving power

In pursuit of sharper and brighter images, Nikon has developed a new series of objectives featuring high N.A.'s and high resolving power. For example, when used with the SMZ1000, the Plan Apo 1X objective boasts an N.A. of 0.1 and a resolving power of 300 lines/mm to produce images that are tack-sharp and display optimum contrast with a minimum of flare, right out to the periphery.

## Images appear undistorted and natural-looking

Producing images that cause less strain on your eyes was one goal of Nikon's ergonomic design. We tackled the problems usually associated with stereoscopic microscopes, namely chromatic aberration and distortion in the lens that cause surface irregularities in the image, and solved both 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 when you actually observe a flat object.



SMZ1000

Conventional model

Comparison of resolving power and chromatic aberration factors

## High-eyepoint eyepieces with built-in diopter adjustment

All eyepieces are the high eyepoint-type and have a wide field of view; for example, the standard C-W10X eyepiece has a field of view (F.O.V.) of  $\phi 22$  mm. In addition, these eyepieces have built-in diopter adjustment, so the image and the reticle are brought into focus at the same time, making viewing easy, while reducing eyestrain.



Comparison of view fields by zoom ratio and magnification

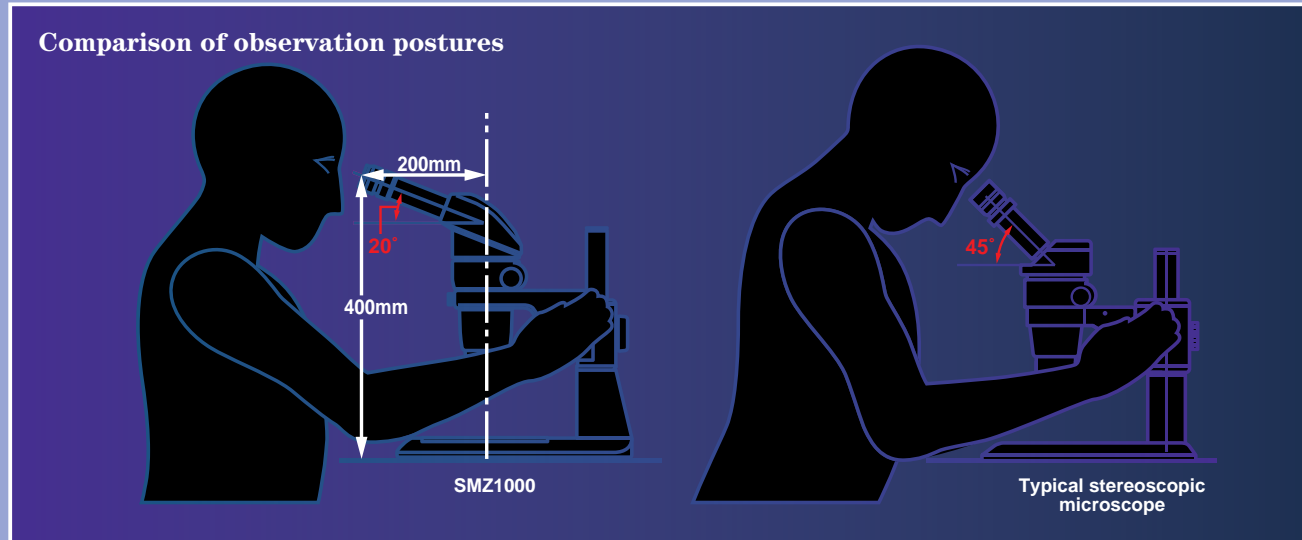
## Easy-to-use 6.3X zoom ratio (SMZ800)

With the SMZ800, the zoom ratio is 6.3X extending from 1X to 6.3X, allowing you to obtain just the right magnification for the sample quickly and easily. The zooming knob also features click-stops.



Zooming knob features convenient click-stops.

# Ergonomic design ensures comfortable and accurate operation in a natural posture.



## Eye-piece tube inclination of 20°

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.

## Observation at the optimum eyepoint

In addition to the standard type, you have the option of using a low eye-level or tilting binocular eyepiece tube. The low eye-level binocular eyepiece tube enables comfortable observation even when using a diascope stand or when an intermediate tube is inserted. The tilting binocular eyepiece tube allows adjustment of the eyepiece inclination between 0° and 30° and the eye level can be adjusted 157mm (6.2") by swinging the eyepieces up 180° as well as tilting them. You can even add eye-level risers to customize your microscope to your height—up to three risers for a total of 75mm.



① Standard binocular eyepiece tube, ② Low eye-level eyepiece tube, ③ Tilting eyepiece tube, ④ Eye-level riser

When two eye-level risers are installed. A maximum of three risers can be used at a time.



With the tilting eyepiece tube, the eye level can be adjusted a maximum of 157mm (6.2").



## Ergonomic objective\*

When using the ergonomic objective (Plan 1X ERGO), the instrument's eye level is adjusted to match your eyepoint precisely without changing the magnification or working distance.

Note: The ergonomic objective can be used with the SMZ1000 at zoom magnifications larger than 1X.

\*Patent pending in Japan



Ergonomic objective can be extended or retracted to adjust the eye level within a maximum range of 40mm (1.6").

## Low-position focus knob for quick, effortless focusing

The focus knob of the C-DS Diascopic Stand S is located at a low position and is within easy reach, for comfortable operation while resting your arms on the base.



## Coaxial coarse/fine focusing

The C-FMC Focusing Mount C comes with a coaxial coarse/fine focusing unit that travels smoothly along the optical axis. Its new anti-backlash mechanism\* makes fine adjustment of focus easier and more accurate.

\* Patent pending in Japan



## Diascopic stands are easier to use

The new Diascopic Stands, models C-DSD, C-DSS, and C-BD, each have a built-in power supply in a space-saving design. These stands also feature their own fine focus knob\* at the front of the streamlined base—in addition to the one at the focusing mount—to make critical adjustment of focus much easier, especially during micromanipulations. Furthermore, their stage glass diameter is a generous 180mm (7.1"), making it possible to view samples in large Petri dishes all the way out to the periphery.

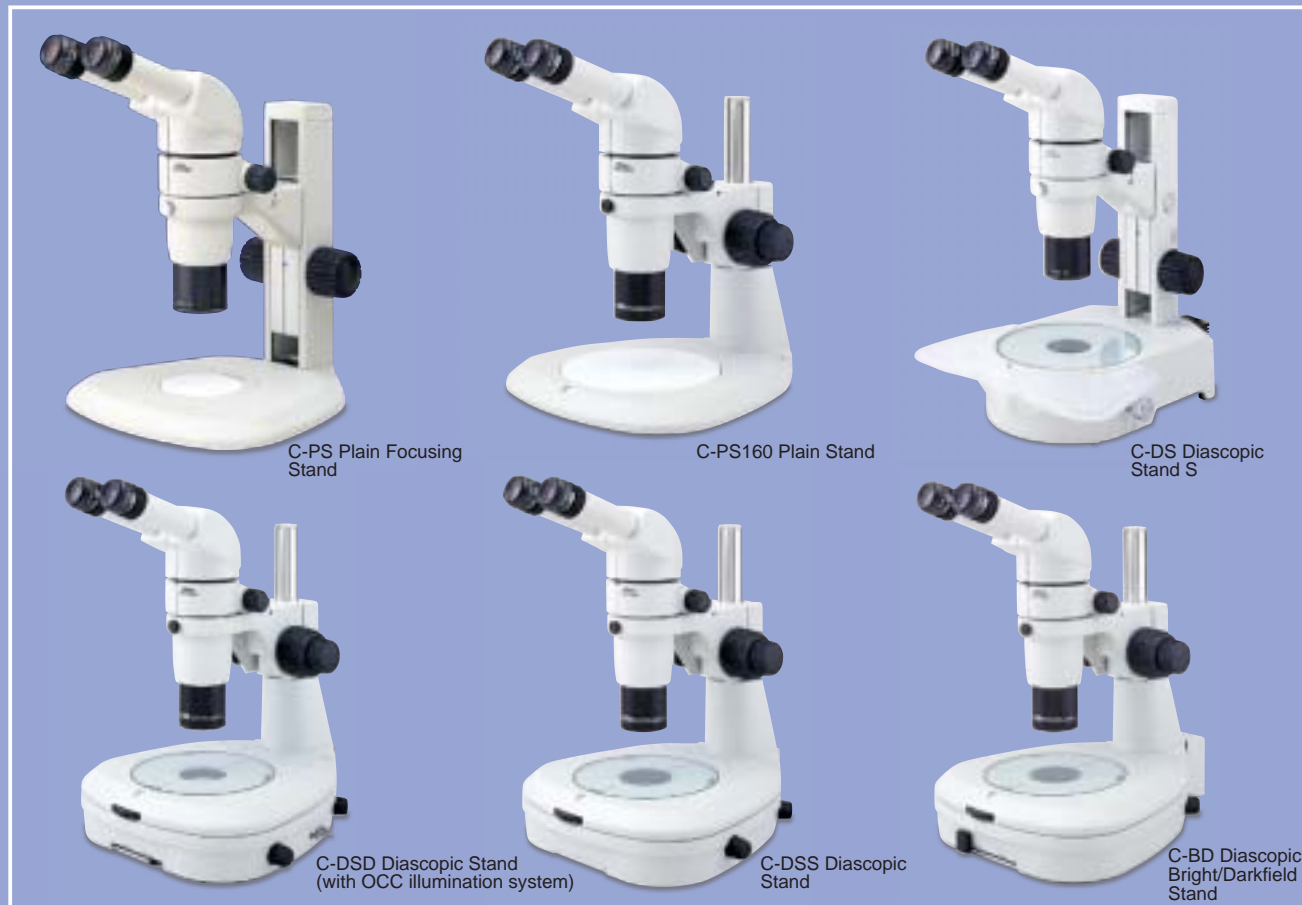
\* Patent pending in Japan

## Large, streamlined base ensures easy operation

The C-PS Plain Focusing Stand features a low profile for easy handling of samples. Moreover, the base has a wide front and smooth curves, allowing you to rest your arms while working.



# Expanded accessory lineup for greater flexibility in various applications



## Three new diascopic stands

These new diascopic stands, models C-DSD, C-DSS, and C-BD, each have a 6V-30W halogen lamp with its own built-in power supply. Although their power supplies are built in, they are designed to keep the surface temperature at a low level, creating an environment ideal for living specimens that are sensitive to rises in temperature. An adapter\* for the 12V-100W fiber-optics light source is also available.

\* Under development

The C-DSD Diascopic Stand features condenser lenses that can be switched between low and high magnifications and allow high N.A. objectives to take advantage of the full potential of their superior resolving power. Furthermore, to answer user requests for high contrast illumination, Nikon developed the Oblique Coherent Contrast (OCC) Illumination system,\* allowing colorless and transparent samples to be observed in high relief.

\* Patent pending in Japan

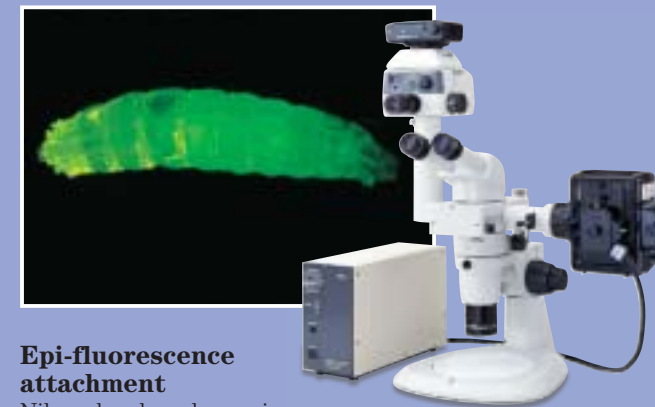
The C-BD Diascopic Bright/Darkfield Stand uses a seven-sided toroidal mirror\* to reduce stray light\*\* substantially. This stray light would ordinarily cause a decrease in contrast when using short-working distance objectives under darkfield diascope illumination. But with the C-BD stand, the resulting images have a sufficiently high S/B (signal to background) ratio.

\* Patent pending in Japan

\*\* Up to 1/5 that of conventional equipment

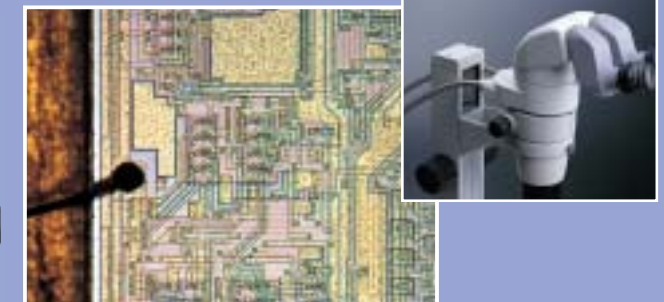


Application example of the OCC illuminator



## Epi-fluorescence attachment

Nikon developed an epi-fluorescence attachment, model P-FLA, for stereoscopic microscopes that allows easy observation of living cells under the fluorescence method such as GFP. Switching between the fluorescence method and brightfield method is quick and easy. Four filter blocks can be switched using a slide lever. If you add an optional photo port to this attachment, you can mount a photomicrographic system or a CCTV camera without using a beam splitter. Because 100% of the light is delivered to the photo port, bright images are ensured.



## Coaxial episcopic illuminator

This illuminator uses a 12V-100W fiber-optics light source—the same light source used in fiber illuminators—to deliver bright illumination over the entire sample surface. The thickness of the  $1/4 \lambda$  plate has been reduced, minimizing spherical aberrations in high N.A. objectives.



## Various illuminators

Various kinds of illuminators can be used to meet individual applications.

## Photomicrography or monitoring

By using a beam splitter and adapter, an FX-III Series photomicrographic system, a CCTV camera, or a digital still camera can be attached. The P-IBSD Beam Splitter D has two ports allowing one photomicrographic system and one CCTV camera to be mounted at the same time. The light to the rear port can be switched between 0%, 50%, or 100%, and the light to the side port is switchable between 0% or 50%. With the P-IBSS Beam Splitter S, the light to the side port is switchable between 0% or 50%.

## Beam-split ratios

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



## 4"x4" stage

Used in combination with an optional extension pillar, the 4"x4" stage allows precise movement in the XY direction, making fine alignment easy during high magnification observations.



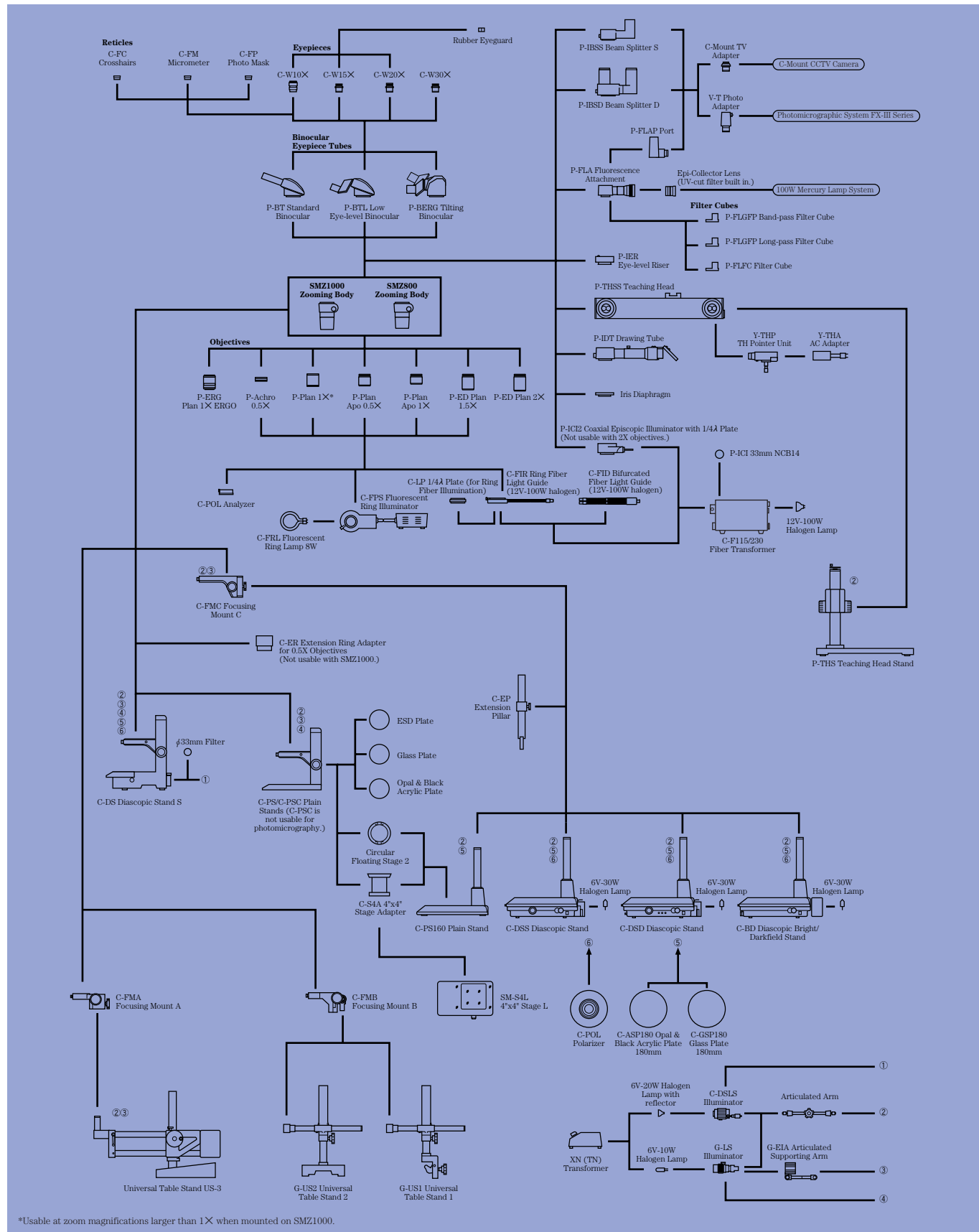
P-IBSS Beam Splitter installed in SMZ1000

P-IBSD Beam Splitter installed in SMZ1000

## Teaching head and drawing tube

For teaching purposes or when two or more colleagues are working as a team, a side-by-side teaching head, the P-THSS, is available. The P-IDT drawing tube is also attachable.

# System Diagram



\*Usable at zoom magnifications larger than 1X when mounted on SMZ1000.

# Magnification, Actual Field of View, Working Distance—SMZ1000

Objectives	N.A.	Working distance (mm)	Eyepieces							
			10X eyepiece C-W10X (F.N. 22), Reticle (dia. ø25mm)		15X eyepiece C-W15X (F.N. 16), Reticle (dia. ø19mm)		20X eyepiece C-W20X (F.N. 12.5), Reticle (dia. ø19mm), Magnification 1.3X		30X eyepiece C-W30X (F.N. 7), Reticle (dia. ø12mm), Magnification 1.4X	
			Total magnification	F.O.V. (ømm)	Total magnification	F.O.V. (ømm)	Total magnification	F.O.V. (ømm)	Total magnification	F.O.V. (ømm)
P-Achro 0.5X	0.045	189	4–40X	55.0–5.5	6–60X	40.0–4.0	8–80X	31.3–3.1	12–120X	17.5–1.8
P-Plan 1X	0.09	78	8–80X	27.5–2.8	12–120X	20.0–2.0	16–160X	15.6–1.6	24–240X	8.8–0.9
P-ERG Plan 1X ERGO	0.09	50	8–80X	27.5–2.8	12–120X	20.0–2.0	16–160X	15.6–1.6	24–240X	8.8–0.9
P-Plan Apo 0.5X	0.05	123.5	4–40X	55.0–5.5	6–60X	40.0–4.0	8–80X	31.3–3.1	12–120X	17.5–1.8
P-Plan Apo 1X	0.1	70	8–80X	27.5–2.8	12–120X	20.0–2.0	16–160X	15.6–1.6	24–240X	8.8–0.9
P-ED Plan 1.5X	0.15	44.5	12–120X	18.3–1.8	18–180X	13.3–1.3	24–240X	10.4–1.0	36–360X	5.8–0.6
P-ED Plan 2X	0.2	32.5	16–160X	13.8–1.4	24–240X	10.0–1.0	32–320X	7.8–0.8	48–480X	4.4–0.4

# Magnification, Actual Field of View, Working Distance—SMZ800

Objectives	N.A.	Working distance (mm)	Eyepieces							
			10X eyepiece C-W10X (F.N. 22), Reticle (dia. ø25mm)		15X eyepiece C-W15X (F.N. 16), Reticle (dia. ø19mm)		20X eyepiece C-W20X (F.N. 12.5), Reticle (dia. ø19mm), Magnification 1.3X		30X eyepiece C-W30X (F.N. 7), Reticle (dia. ø12mm), Magnification 1.4X	
			Total magnification	F.O.V. (ømm)	Total magnification	F.O.V. (ømm)	Total magnification	F.O.V. (ømm)	Total magnification	F.O.V. (ømm)
P-Achro 0.5X	0.045	189	5.0–31.5X	44.0–7.0	8–47.3X	32.0–5.1	10.0–63.0X	25.0–4.0	15.0–94.5X	14.0–2.2
P-Plan 1X	0.09	78	10.0–63.0X	22.0–3.5	15–94.5X	16.0–2.5	20.0–126.0X	12.5–2.0	30.0–189X	7.0–1.1
P-ERG Plan 1X ERGO	0.09	50	10.0–63.0X	22.0–3.5	15–94.5X	16.0–2.5	20.0–126.0X	12.5–2.0	30.0–189X	7.0–1.1
P-Plan Apo 0.5X	0.05	123.5	5.0–31.5X	44.0–7.0	8–47.3X	32.0–5.1	10.0–63.0X	25.0–4.0	15.0–94.5X	14.0–2.2
P-Plan Apo 1X	0.1	70	10.0–63.0X	22.0–3.5	15–94.5X	16.0–2.5	20.0–126.0X	12.5–2.0	30.0–189X	7.0–1.1
P-ED Plan 1.5X	0.15	44.5	15.0–94.5X	14.7–2.3	22.5–141.8X	10.7–1.7	30.0–189.0X	8.3–1.3	45.0–283.5X	4.7–0.7
P-ED Plan 2X	0.2	32.5	20.0–126.0X	11.0–1.7	30–189X	8.0–1.3	40.0–252.0X	6.3–1.0	60.0–378X	3.5–0.6

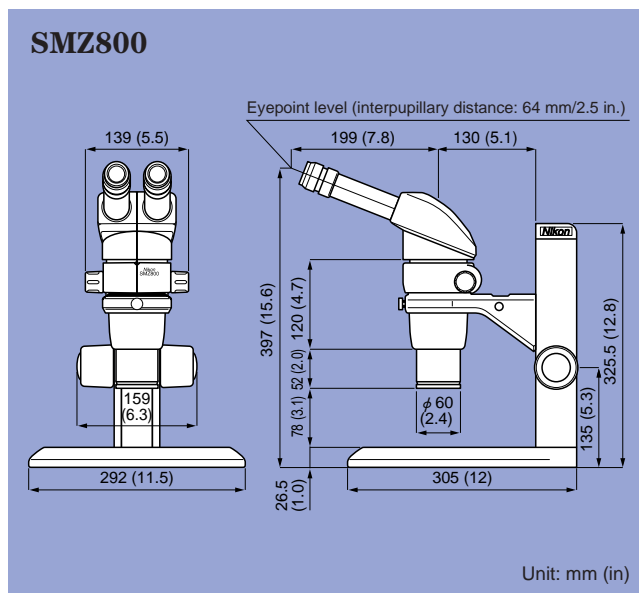
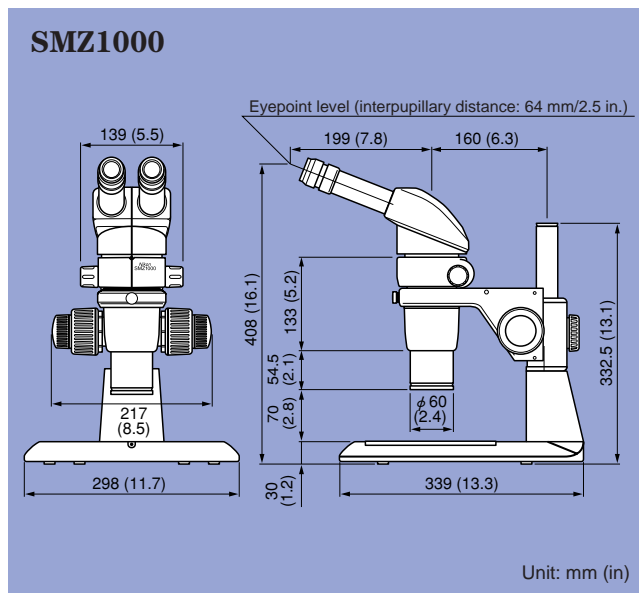
# Specifications

	SMZ1000	SMZ800
<b>Optical system</b>	Parallel-optics zoom system	
<b>Total magnification</b> Varies depending on eyepiece and objective used.	4X-480X	5X-378X
When coaxial episcopic illuminator is attached.	6X-540X	7.5X-525X
<b>Eyepiece tubes</b>	P-BT Standard Binocular, P-BTL Low Eye-level Binocular, P-BERG Tilting Binocular	
<b>Eyepiece inclination</b>	20° (Standard Binocular and Low Eye-level Binocular), 0°-30° (Tilting Binocular)	
<b>Interpupillary distance adjustment</b>	48-75mm (1.9-3.0 in.)	
<b>Eyepieces (with diopter adjustment)</b>	C-W10X (F.N. 22), C-W15X (F.N. 16), C-W20X (F.N. 12.5), C-W30X (F.N. 7)	
<b>Zoom range</b>	0.8X-8.0X	1X-6.3X
<b>Zoom ratio</b>	10 : 1	6.3 : 1
<b>Objectives</b>	P-Plan Apo 0.5X, 1X; P-ED Plan 1.5X, 2X; P-Plan 1X*; P-Achro 0.5X; P-ERG Plan 1X ERGO* *Usable at zoom magnifications larger than 1X when mounted on SMZ1000.	
<b>Working distance</b>	Please refer to the table on the previous page	
<b>Illumination systems</b>	P-ICI2 Coaxial Episcopic Illuminator (12V-100W halogen) (Intermediate magnification is 1.5X.) G-LS 6V-10W Illuminator G-LS 6V-10W Illuminator (with Articulated Arm or G-EIA Articulated Supporting Arm) C-DSLS 6V-20W Illuminator (with Articulated Arm) C-FPS Fluorescent Ring Illuminator C-FIR Plastic Fiber-optic Ring Illuminator (12V-100W halogen) C-FID Plastic Fiber-optic Bifurcated Illuminator (12V-100W halogen)	
<b>Stands</b>	C-PS Plain Focusing Stand C-PSC Compact Plain Focusing Stand C-DS Diascopic Stand S C-PS160 Plain Stand C-DSS Diascopic Stand C-DSD Diascopic Stand C-BD Diascopic Bright/Darkfield Stand P-THS Teaching Head Stand Large Stage Stand	
<b>Focusing mount</b>	C-FMC Focusing Mount C C-FMA Focusing Mount A C-FMB Focusing Mount B	
<b>Photomicrographic/CCTV system</b>	Nikon Photomicrographic System FX-III Series or CCTV camera can be attached through Beam Splitter and Adapter. Photo-tube beam-split ratio: please refer to the table on page 9.	
<b>Power consumption</b>	Diascopic stands: 80W C-FPS115 Fluorescent Ring Illuminator: 24W C-FPS230 Fluorescent Ring Illuminator: 16W Fiber Transformer: 135W	

Note: For possible combinations of accessories, please refer to the system diagram on page 10.

Specifications and equipment are subject to change without any notice or obligation on the part of the manufacturer. September 2002. ©2000-02 NIKON CORPORATION

# Dimensions



	<b>WARNING</b>	TO ENSURE CORRECT USAGE, READ THE CORRESPONDING MANUALS CAREFULLY BEFORE USE.
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