



# **Nikon**

## **Stereo Microscope SMZ745/SMZ745T Instruction Manual**



ryf ag  
bettlachstrasse 2  
ch-2540 grenchen  
tel 032 654 21 00  
fax 032 654 21 09

[www.ryfag.ch](http://www.ryfag.ch)

ryf sa succursale vd/ge  
route de genève 9c  
ch-1291 commugny  
tél 022 776 82 28  
fax 022 776 82 29

[www.ryfag.ch](http://www.ryfag.ch)



## Introduction

Thank you for purchasing a Nikon product.

This instruction manual is written for users of the Nikon microscopes SMZ745/SMZ745T. To ensure correct usage, read this manual carefully before operating this product.

- No part of this manual may be reproduced or transmitted in any form without prior written permission from Nikon.
- The contents of this manual are subject to change without notice.
- The equipment described in this manual may differ from the actual product in its appearance.
- Although every effort has been made to ensure the accuracy of this manual, errors or inconsistencies may remain. If you note any points that are unclear or incorrect, please contact your nearest Nikon representative.
- Some of the equipment described in this manual may not be included in the set you have purchased.
- If you intend to use any other equipment with this product, read the manual for that equipment too.
- If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

## Symbols Used in This Manual

The following symbols are used in this manual.

### ◆ Symbols for Safety



**WARNING**

Highlights important information that should be noted for safety. Read "Safety Precautions" for details.



**CAUTION**

### ◆ Other Symbols



Indicates information you should note or comply with to prevent defects or malfunction of this product.



Indicates information you should be aware of in using this product, as well as other useful information.

# Contents

Introduction .....	i
Symbols Used in This Manual .....	i
Contents .....	ii
Safety Precautions .....	iv
WARNING and CAUTION Symbols .....	iv
Label Attached to the Product .....	iv
⚠WARNING .....	vii
⚠CAUTION .....	viii
Notes on Handling the Product .....	xi

**Chapter**  
**1**

**Nomenclature .....** **1**

1 SMZ745 System Configuration Example .....	1
2 SMZ745T System Configuration Example .....	3

**Chapter**  
**2**

**Microscopy Procedures .....** **5**

**Chapter**  
**3**

**Assembly .....** **8**

1 Assembly Procedure .....	8
2 Antistatic Feature .....	10
3 Airtight Feature .....	10

**Chapter**  
**4**

**Optional Devices .....** **11**

1 Reticles .....	11
2 Focus Mounts .....	11
2.1 C-FMAN Focus Mount .....	11
2.2 C-FMBN Focus Mount .....	12
2.3 C-FMCN Focus Mount .....	13
3 Stand .....	16
3.1 P-PS32 Plain Stand .....	16
3.2 P-DSL32 LED Diascopic Illumination Stand .....	17
3.3 P-DSF32 Fiber Diascopic Illumination Stand .....	21
4 Illuminators .....	23
4.1 C-LSL LED Epi Illuminator .....	23
4.2 C-FDF Flexible Double Arm Fiber Illumination Unit .....	23
4.3 C-FID2 Double Arm Fiber Illuminator .....	24
4.4 C-FIR Ring Fiber Illumination Unit .....	25
5 Other Devices .....	26
5.1 P-SXY64 XY Stage .....	26
5.2 C-SSL DIA Sliding Stage .....	27
5.3 Type-2 Sliding Stage .....	28
5.4 C-TRS Tilting Stage .....	28
5.5 P-DF LED Dark Field Unit .....	29
5.6 C-POL Simple Polarizing Attachment .....	29

**Chapter**  
**5**

**Maintenance and Storage.....30**

- 1 Cleaning .....30
  - 1.1 Cleaning Lenses..... 30
  - 1.2 Cleaning Parts Other than the Lens..... 30
- 2 Storage.....31
- 3 Periodic Inspection (Charged).....31

**Chapter**  
**6**

**Appendix Tables.....32**



## Safety Precautions

To ensure correct and safe operation, read this manual before using this product.

### WARNING and CAUTION Symbols

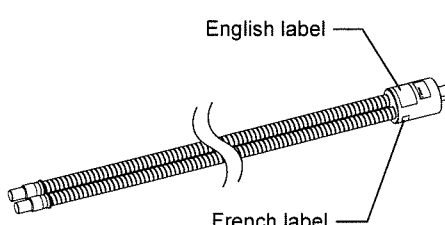
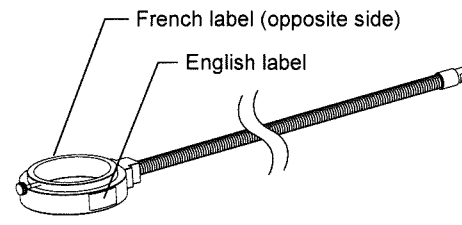
Although this product is designed and manufactured to be completely safe during use, incorrect usage or failure to follow the safety instructions provided may cause personal injury or property damage. To ensure correct usage, read this manual carefully before using this product. Do not discard this manual and keep it handy for easy reference.

Safety instructions in this manual are marked with the following symbols to indicate their importance. For your safety, always follow the instructions marked with these symbols.

Symbol	Description
 <b>WARNING</b>	Disregarding instructions marked with this symbol may lead to serious injury or death.
 <b>CAUTION</b>	Disregarding instructions marked with this symbol may lead to injury or property damage.

### Label Attached to the Product

The label attached to the products shown below indicates that attention should be paid to use of these products. Before using a product with the label attached, be sure to carefully read the manual.

<p><b>Photobiological safety label</b></p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p>IEC62471 RISK GROUP2 CAUTION Possibly hazardous optical radiation emitted from this product. Do not stare at operating lamp. May be harmful to the eyes.</p> </div> <p><b>English label</b></p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p>Groupe de risque 2 ATTENTION: possibles émissions de rayonnements optiques de cet appareil. Ne regardez pas la source de lumière, peut endommager vos yeux.</p> </div> <p><b>French label</b></p>	<p><b>Caution: Do not look into the LED light.</b> Possibly hazardous optical radiation emitted from this product. Do not stare at operating lamp. May be harmful to the eyes. RISK GROUP 2 IEC62471: 2006</p> <p style="text-align: center;"><b>Label Position</b></p> <div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;">  <p>English label</p> <p>French label</p> <p><b>C-FDF Flexible Double Arm Fiber Illumination Unit</b></p> </div> <div style="text-align: center;">  <p>French label (opposite side)</p> <p>English label</p> <p><b>C-FIR Ring Fiber Illumination Unit</b></p> </div> </div>
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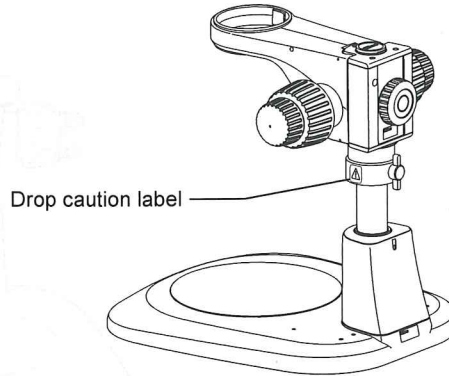
**Drop caution label**



**Caution: Use of anti-drop collar**

When using a C-FMCN Focus Mount attached in the middle of the support, be sure to use the anti-drop collar. Otherwise the zooming body may slide down when the focus mount fixing screw is loosened. This may result in injury such as pinching fingers between the end of the zoom body and the sample, or damage to the sample on the stage plate by the end of the zoom body.

**Label Position**



**Anti-drop collar for the C-FMCN Focus Mount**

**Fall caution label**

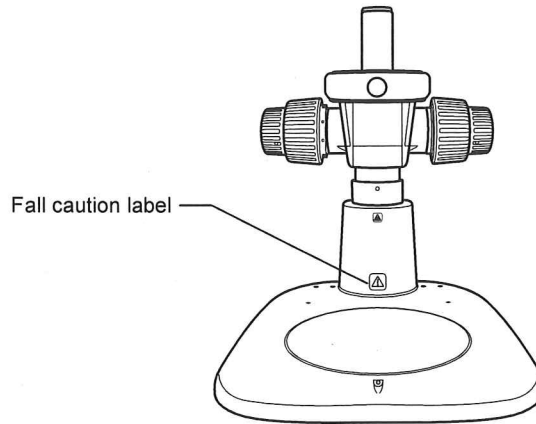


**Caution: C-FMCN Focus Mount attachment orientation**

Attach the C-FMCN Focus Mount to the stand so that the focus mount faces the front of the stand as shown in the figure.

If the focus mount is attached in the incorrect orientation, the stand may fall over. This may result in damage to the device or unexpected injury.

**Label Position**



**P-PS32 Plain Stand, P-DSL32 LED Diascopic Illumination Stand, or P-DSF32 Fiber Diascopic Illumination Stand**

**Biohazard label**

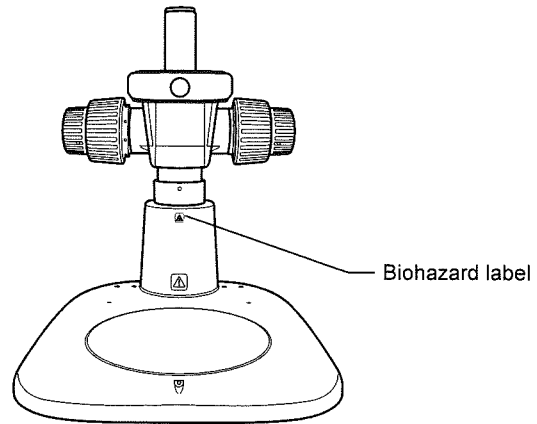


**Caution: Biohazard**

This symbol calls your attention to the following:

- The product may become biohazardous if a sample is spilled onto the product.
- To avoid exposure to biohazard, do not touch contaminated parts with your bare hands.
- Decontaminate the contaminated parts according to the standard procedures for your facility.

**Label Position**



**P-PS32 Plain Stand, P-DSL32 LED Diascopic Illumination Stand,  
or P-DSF32 Fiber Diascopic Illumination Stand**





**1 Intended use of this product**

This product is designed to be used for microscopic observation. Do not use it for other purposes.

**2 Do not disassemble.**

Disassembling this product may result in electric shock or malfunction. Malfunction and damage due to disassembling or modification are unwarranted.

Do not disassemble parts other than those described in this manual. If you experience problems with this product, contact your nearest Nikon representative.

**3 Read the instruction manuals carefully.**

To ensure safety, carefully read this manual and the manuals for other equipment to be used with this product. Particularly, all warnings and cautions given at the beginning of each manual must be observed.

Safety is a top design priority for Nikon products. Safety is ensured as long as the user observes all of the warnings and cautions given in the manuals, and uses the system only for its intended purpose. However, failure to heed the warnings and cautions given in the manuals, subjecting the system to shock or impact, or attempting to disassemble the system may result in unexpected accidents and injury.

**4 Check the input rating.**

For devices that use a power supply, check that the rating of the power supplied to the device matches the power used by the device. If the input rating does not match, do not use the power supply and contact your local representative. Using an incorrect power supply may damage the device.

**5 Notes on the power cord and the AC adapter**

Depending on the optional device, a power cord or an AC adapter may be required. Be sure to use the specified power cord and AC adapter. Use of non-specified power cord or AC adapter may result in malfunction or fire. This product is classified as having Class I protection against electric shock. Make sure this product is connected to an appropriate protective earth terminal.

- To prevent electric shock, always turn off the power switch (Press to the "O" position.) for the device before connecting or disconnecting the power cord.



**1 Power shutdown**

In the case of a microscope system using a power supply, to prevent electric shock and/or malfunction, always turn off the power switch(es) for the product and the peripheral devices (press to the "O" position) and unplug the power cord from the wall outlet before assembling the product, connecting or disconnecting cables or cleaning the product.

**2 Do not look into the LED light.**

The C-FDF Flexible Double Arm Fiber Illumination Unit and C-FIR Ring Fiber Illumination Unit use LEDs as the light source. A label indicating photobiological safety is attached to these illuminators in order to bring attention to the following. (For details about the label attachment position, see "Label Attached to the Product" on page v.)

"Possibly hazardous optical radiation emitted from this product. Do not stare at operating lamp.

May be harmful to the eyes.

RISK GROUP 2 IEC62471: 2006"

**3 Anti-drop collar for the C-FMCN Focus Mount**

When using a C-FMCN Focus Mount attached in the middle of the support, be sure to use the anti-drop collar.

Otherwise the zooming body may slide down when the focus mount fixing screw is loosened. This may result in injury such as pinching fingers between the end of the zooming body and the sample, or damage to the sample on the stage plate by the end of the zooming body.

**4 Focus mount attachment orientation**

Attach the C-FMCN focus mount to the stand so that the focus mount faces the front of the stand.

If the focus mount is attached in the incorrect orientation, the stand may fall over. This may result in damage to the device or unexpected injury.

**5 Specification of a light source**

Be sure to use the specified light source for an illuminator. Using a light source not specified can cause malfunction and induce an accident.

**6 Avoid contact with water or chemical solutions.**

Never expose this product to water or chemical solutions, and avoid using this product in circumstances where there is risk of exposure to water or chemical solutions. Exposure of electric parts (such as the light source) to liquids may cause a short circuit, resulting in malfunction or abnormal heating. If water or a chemical solution is splashed onto a device, immediately turn off the power switch for the device (press to the "O" position) and remove the power cord from the receptacle. Then wipe off moisture with a piece of dry cloth or something similar. If water or a chemical solution enters this product, stop using the product, and contact your nearest Nikon representative.

**7 Remove any covers from the system before switching on.**

Do not use the system while it is covered with a piece of cloth, etc., Especially for a light source, which is heated, the disturbance of heat release may cause abnormal heat generation, causing ignition or fire. Do not cover the system with a piece of cloth or similar while in use.

**8 Do not place any object on top of the product.**

Do not place any object on top of this product.



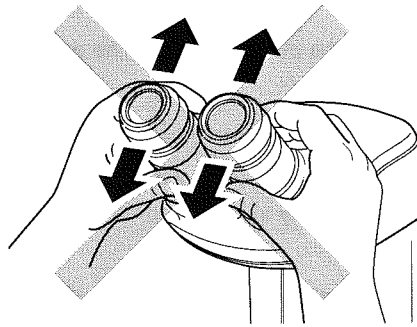
**9 Cautions on assembling and installing the product**

- Take care to avoid pinching your fingers or hands during system assembly and installation.
- Scratches or fingerprints, etc. on optical components (such as lens and filters) will degrade microscope images. Be careful to avoid scratches or direct contact with the lens and filters during system assembly.
- When moving the microscope system to another location, temporarily remove any removable devices and lift the system by placing hands under the base to firmly hold the base. Do not lift the system by holding the binocular part of the tube or placing hands under the zooming body.
- Do not place this system in a locker or cabinet.

**10 Do not move the binocular sleeves up or down.**

Do not use force to move the binocular sleeves in the direction of the arrows in the figure.

If such a force is used when handling the binocular sleeves, shifting of the left and right light axes may occur and cause eye strain or dizziness when observing a sample.



**11 Cautions on sustained observation**

To relieve fatigue resulting from long observation sessions, limit continuous observations to one hour. Take at least a 10 to 15-minute break between observation sessions. Adjust the layout of other instrument used and the height of your chair.

**12 Cautions on use, transportation, and storage**

This product must be operated, transported, and stored in accordance with the following conditions.

If the product is installed in a location with high temperature and high humidity, mold and/or condensation may form on the lenses. This may result in performance deterioration or malfunction.

- Operating conditions:
  - Temperature: 0 to +40°C,
  - Humidity: 80% RH max. (no condensation)
- Transporting/storage conditions:
  - Temperature: -20 to +60°C
  - Humidity: 90% RH max. (no condensation)

**13 Caution on the disposal of the product**

When disposing of this product, follow the rules of the facility.

**14 Caution on electromagnetic environment**

This product complies with the emission and immunity requirements described in the IEC 61326 series.

The electromagnetic environment should be evaluated prior to operation of this product.

Do not use this device in close proximity to sources of strong electromagnetic radiation (e.g. unshielded intentional RF sources), as these can interfere with proper operation of the device.

## Notes on Handling the Product

### 1 Handle the product carefully.

This product is a precision instrument. Avoid subjecting it to sudden impacts and shocks.

### 2 Scratches, dirt, and foreign particles on the lens

Scratches or fingerprints on optical components (such as lens and filters), etc. will degrade microscope images.

If these parts become dirty, clean them as described in Chapter 5, "1.1 Cleaning Lenses.

### 3 Installation location

This product is a precision optical instrument. Usage or storage of this product in an inappropriate environment may result in malfunction or a degradation in precision. Consider the following factors when selecting an installation location:

- Select a location free of vibration. Install this product on a level surface.
- Install this product at least 10 cm away from walls.
- Select a location less exposed to hazards in the event of collisions, earthquakes, or other potential disasters. To keep this product from falling, use a strong rope or other means if necessary to secure it to the working desk or other heavy, stable item.
- Select a layout that allows easy removal of the power cord from the device's AC inlet in the event of an emergency.
- Do not use a desk mat or similar.
- Avoid locations exposed to direct sunlight, locations immediately under room lights, and other bright locations.
- Light from room lights directly above this product may enter the end of the zooming body as extraneous light. Nikon recommends switching off the room lights directly above this product when observing samples.
- Select a location with minimal dust.
- The SMZ745 Zooming Body and the C-W10XB Eyepiece are made airtight as per JIS/IEC waterproof grade 1 (IPX1). However, do not use them in a place where they are splashed with water.
- Make sure the ambient temperature is 0 to + 40°C and humidity is 80% RH max. (with no condensation). When transporting or storing this product, the ambient temperature must be -20 to +60°C, with the humidity at 90% RH max (with no condensation). If the product is installed in a location with high temperature and high humidity, mold and/or condensation may be generated on the lenses. Furthermore, performance deterioration and malfunction may occur.
- Do not place this product in a locker or cabinet.

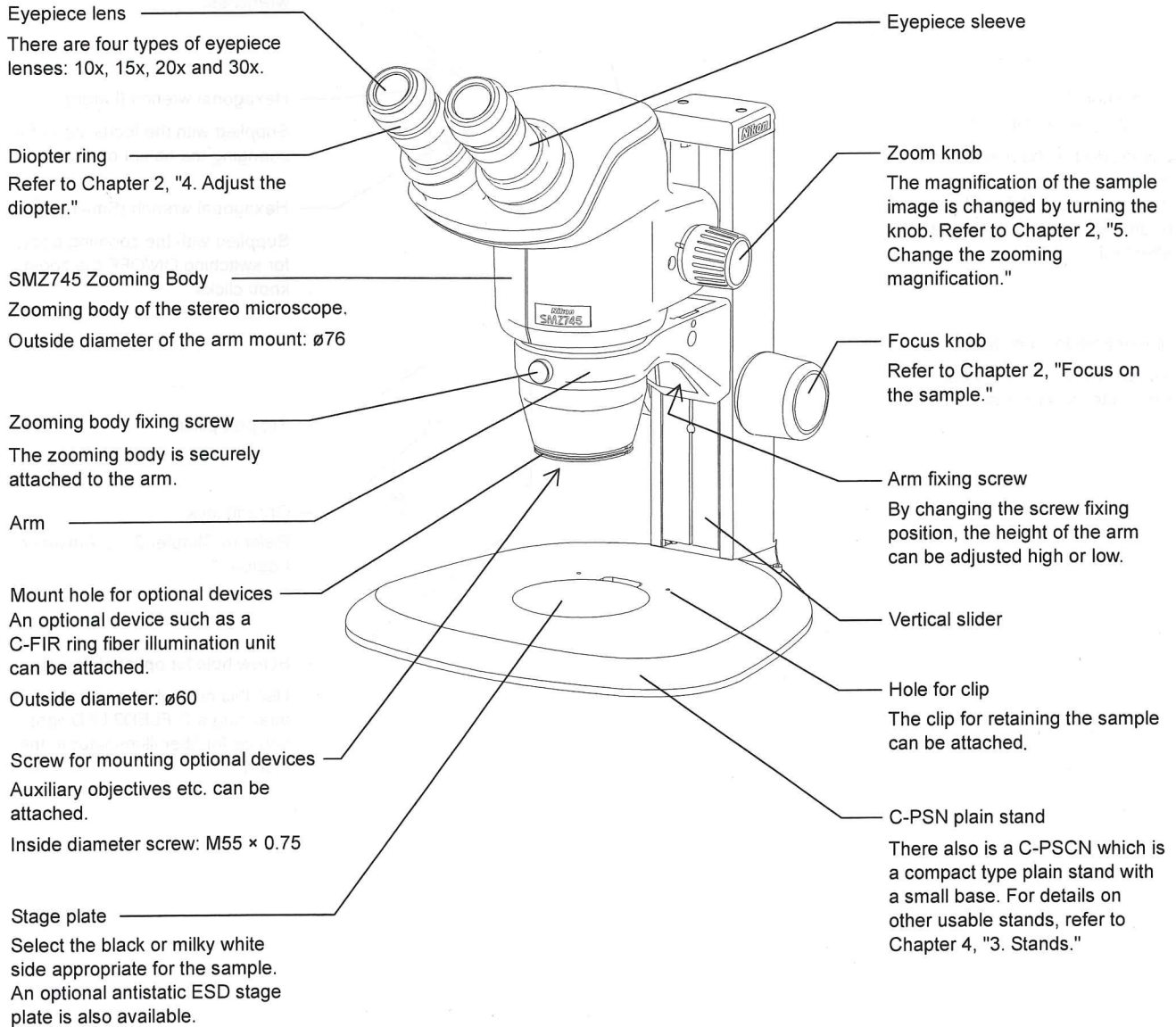
### 4 Handling a focus knob

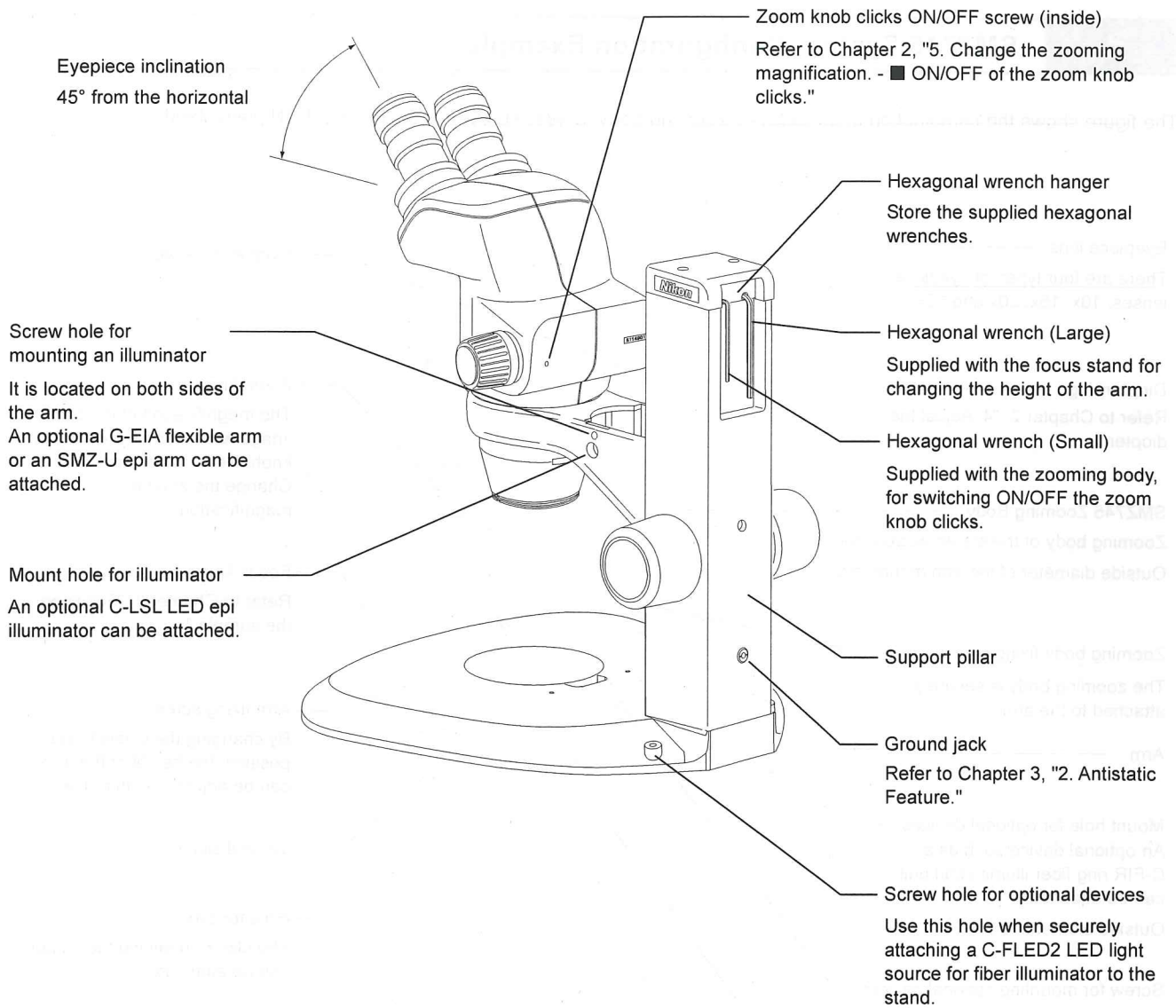
Never turn the focus knobs in opposite directions at the same time. Doing so may damage the product depending on the model. Use the focus knobs correctly by following the instructions in this manual.

### 5 Protect the ports from dust and extraneous light

If not using the vertical tube part of the tube, be sure to attach the supplied cap. Otherwise, extraneous light and dust may be trapped inside the product.

The figure shows the combination of an SMZ745 zooming body, C-W10XB eyepieces and a C-PSN plain stand.

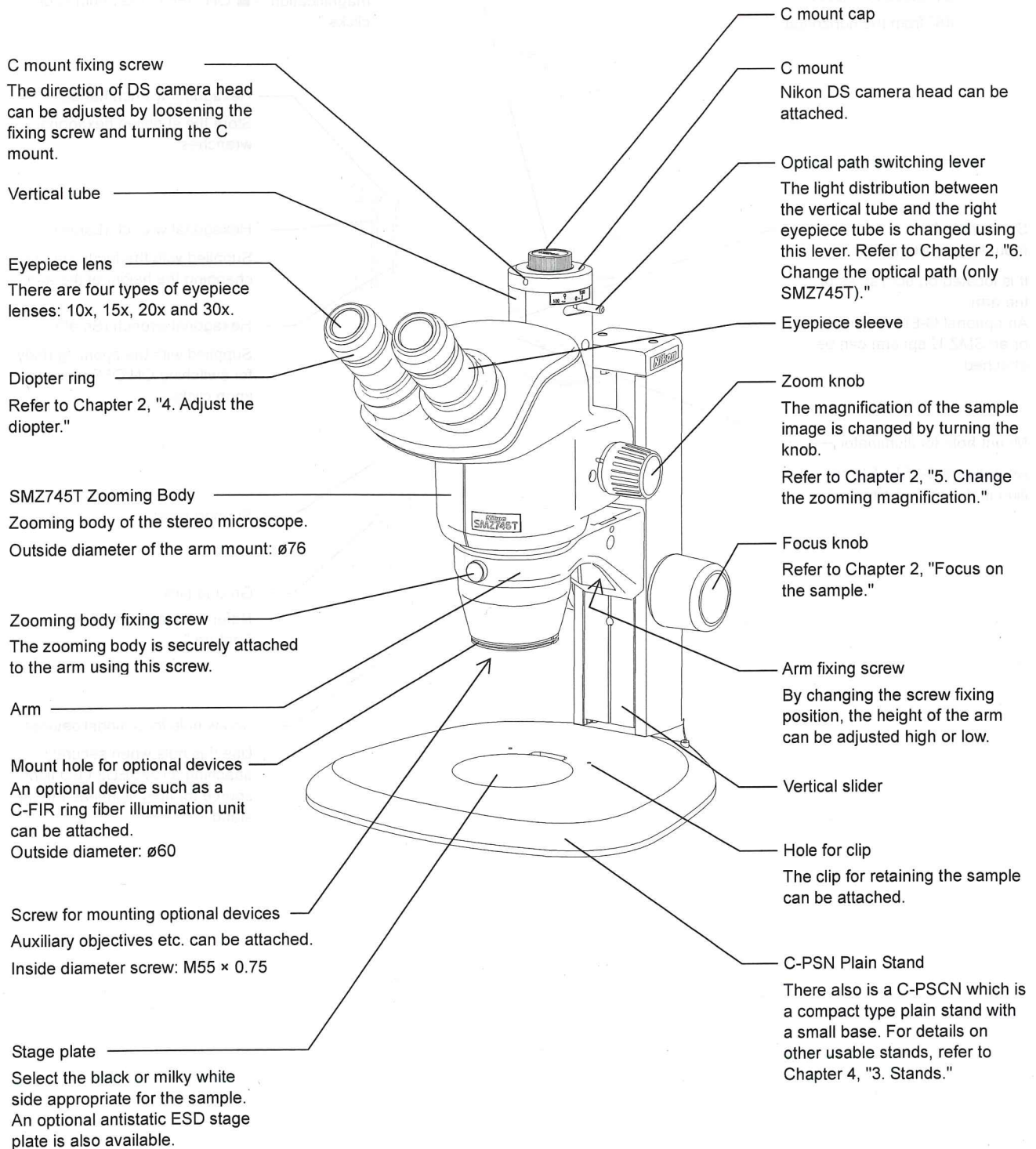


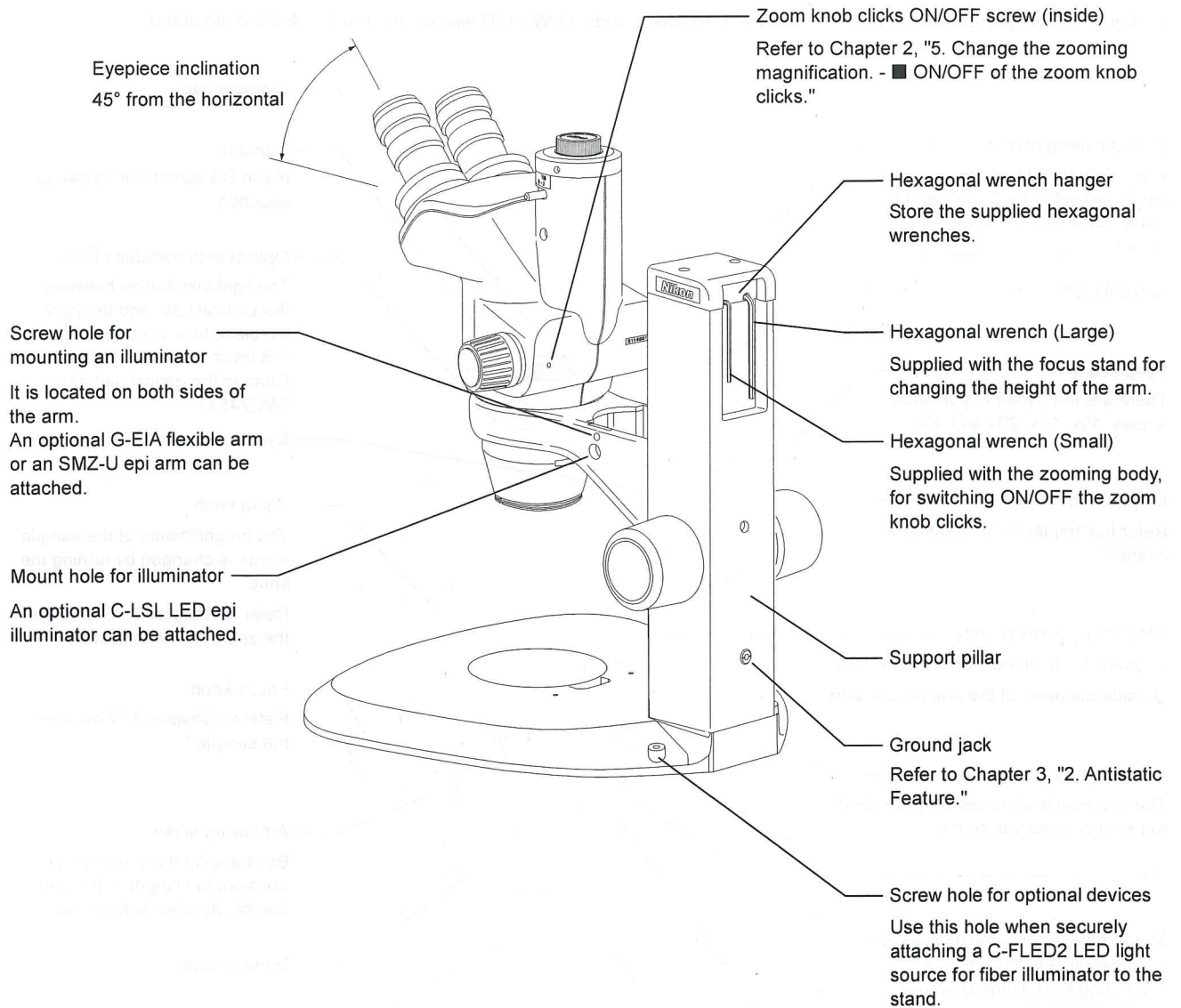


2

SMZ745T System Configuration Example

The figure shows the combination of an SMZ745T zooming body, C-W10XB eyepieces and a C-PSN plain stand.







This chapter describes procedures for using microscope systems shown in Chapter 1, "Nomenclature."

If the microscope has not been assembled, first refer to Chapter 3, "Assembly."

## 1 Place the sample

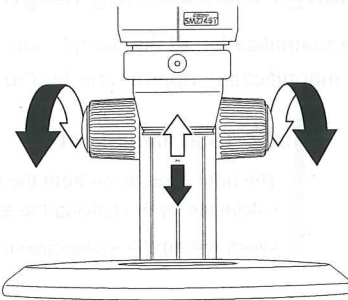
Place the sample on the stage plate of the stand.

Select the black or milky white side appropriate for the sample.

Use the stage clips to securely hold the sample, if necessary.

## 2 Focus on the sample.

Turn the right and left focus knobs in the same direction to raise or lower the arm (on which the zooming body is mounted) and focus on the sample.



The arm moves down by turning the focus knobs towards the observer.

### ✓ Working distance

The distance between the focus plane and the bottom surface of the zooming body is called "working distance."

Since the working distance of the SMZ745/SMZ745T is 115 mm, the sample is easily in focus if the zooming body is set at the position where its bottom surface is 115 mm apart from the sample surface. Refer to Chapter 6, "Table 1: Total Magnification and Real Field of Binocular Tube" for the working distance when an auxiliary objective is attached.

### ⓘ Torque of the focus knob

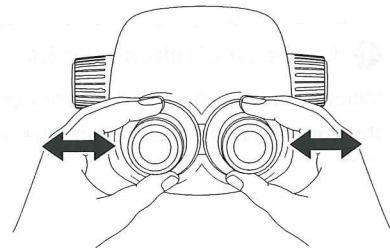
If the torque of the focus knob is too light, the zooming body slides down by its own weight. Adjust the torque to an appropriate weight. Refer to Chapter 3, "1 Assembly Procedure" - "7. Adjust the torque of the focus knobs" for details on adjusting the torque of the focus knobs on the C-PSN/C-PSCN plain stand.

## 3 Adjust the interpupillary distance.

This adjustment is for adjusting the distance between both eyes of the observer.

View through both eyepieces and adjust the interpupillary distance so that the fields of view for each eye are merged into one. Move while holding each eyepiece sleeve with both hands.

This adjustment is required for each observer since individual interpupillary distance vary.



### ⚠ CAUTION

When adjusting the interpupillary distance, do not move the binocular sleeves up or down. This may cause shifting of the left and right light axes, and observing the sample in this state may cause eye strain or dizziness.

## 4 Adjust the diopter.

Adjust the eyesight of the observer.

- (1) Turn the diopter rings on both eyepieces to set them at the 0 position (match the 0 line with the index line).
- (2) Turn the zoom knob to 5x, and focus on the sample using the focus knobs. (Refer to "2. Focus on the sample.")
- (3) Turn the zoom knob to 0.67x. Look into the left eyepiece with the left eye, and focus on the sample using the diopter ring on the left eyepiece. Then, look into the right eyepiece with your right eye and focus on the sample using the diopter ring on the right eyepiece.
- (4) Repeat steps (2) and (3) until the image is in focus even though the zooming magnification is changed. This adjustment ensures the sharp image throughout the zooming range.

This adjustment should be performed each time the observer is changed since individual eyesights vary.

## 5 Change the zooming magnification.

The magnification of the sample image will change by turning the right and left zoom knobs of the zooming body. Select the magnification appropriate for the image.

### ✔ Total magnification

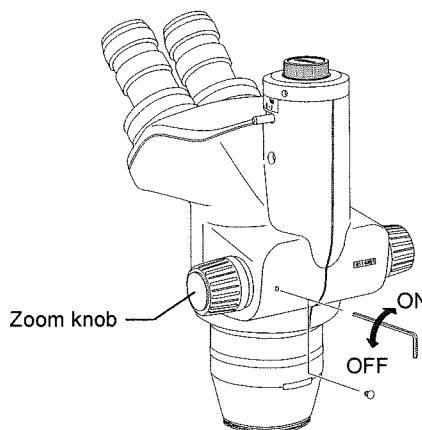
The right zoom knob from the viewing side has the indication of the zooming magnification. Total magnification can be calculated by multiplying the eyepiece lens magnification by the zooming magnification.

When the auxiliary objective is attached, multiply its magnification as well.

### ■ ON/OFFON/OFF of the zoom knob clicks

Clicks when the zoom knobs are turned can be turned on or off.

- (1) Remove the small rubber cap from the rear of the zooming body.
- (2) Insert the supplied hexagonal wrench (small) into the screw hole on the rear of the zooming body.
- (3) Zoom knob clicks can be turned on and off by turning the screw (inside).
- (4) Return the small rubber cap to its original position.



### ⚠ Notes on disabling clicks

When disabling clicks of the zoom knob (click OFF), turn the zoom knob while turning the inside screw on the rear of the zooming body. Stop turning the screw when click is disabled. Otherwise, the product may be damaged.

**6 Change the optical path. (only SMZ745T)**

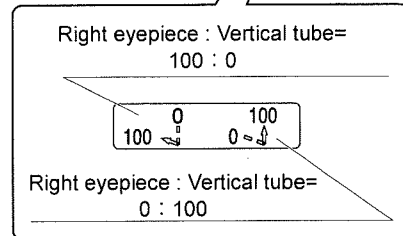
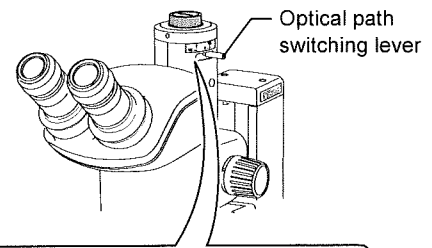
The light distribution between the vertical tube and the right eyepiece tube can be switched using the optical path switching lever.

For binocular observation, move the lever forward. When a Nikon DS camera head is mounted to the C mount of the zooming body for taking microphotographs, move the lever backward.

Refer to the instruction for the camera head for details on how to use the Nikon DS camera head.

**Reference**

Chapter 6, "Table 2: Total Magnification and Real Field of Vertical Tube"



**7 When the image cannot be in focus with the zooming body at the highest position**

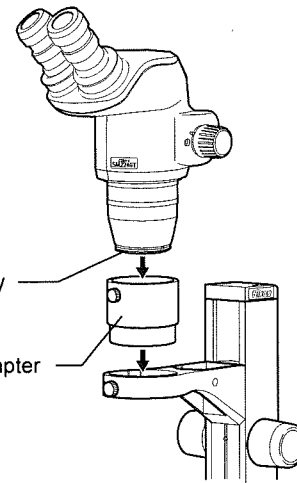
Even if the zooming body is raised to its highest position by turning the focus knobs, the sample may not be in focus when a 0.5x auxiliary objective is used or when a tall sample is observed.

In this case, use an optional C-ER auxiliary adapter.

Note) Attach the auxiliary objective first to the zooming body, then mount the zooming body on the auxiliary adapter.

**Reference**

Chapter 6, "Table 3: Observable Sample Heights"



## 1

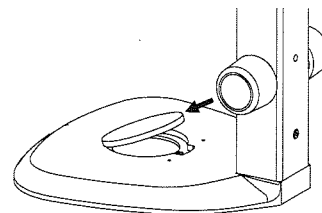
## Assembly Procedure

This chapter describes the assembly procedure of the microscope systems shown in Chapter 1, "Nomenclature."

### 1 Place the stand on the level surface.

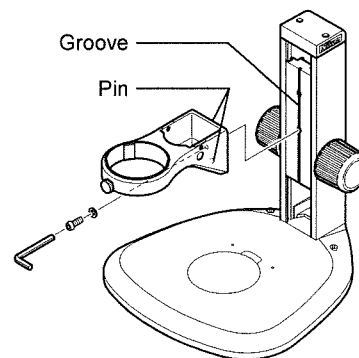
### 2 Mount the stage plate.

Press the stage plate into the stand base while pushing it against the rim in the direction shown by the arrow in the figure.



### 3 Lower the stand arm. (If not lowering the arm, jump to step 4.)

Loosen the arm fixing screw using the hexagonal wrench (large) supplied with the stand. Reattach the arm to the screw hole at the lower side of the vertical slider. The lower hole position is 55 mm lower than the standard position. Before tightening the screw, make sure that the two pins on the arm are inserted into the groove in the vertical slider.



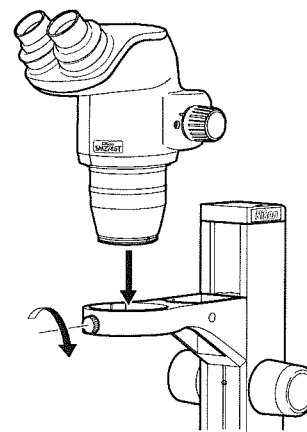
### 4 Mount the zooming body.

Lightly tighten the zooming body fixing screw to hold the zooming body on the arm.

#### ⚠ Notes on clamping the zooming body

Do not overly tighten the zooming body fixing screw.  
Doing so may cause malfunction.

The procedure for mounting a zooming body is the same as above for all focus mount types listed in Chapter 4, "2 Focus Mounts." Use the zooming body fixing screw on the focus mount to tighten the zooming body.

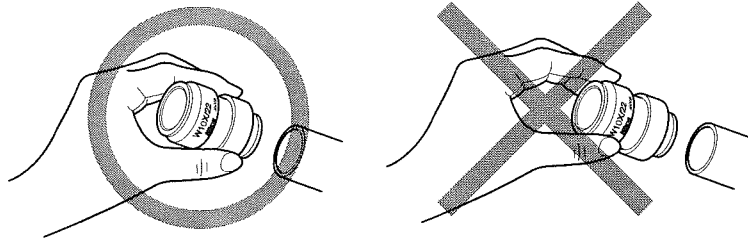


**5 Insert the eyepieces into the eyepiece sleeves.**

Attach the eyepieces of the same magnification. Insert them all the way to the end of the eyepiece sleeves.

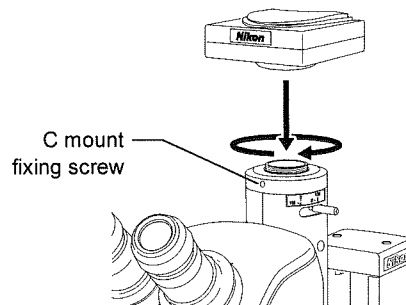
**ⓘ Notes on attaching the eyepieces**

When inserting the 10x eyepiece, assure that it reaches the end of the sleeve, because the rubber cover of the 10x eyepiece will obstruct the view of the sleeve end. When inserting, hold the rubber cover instead of the diopter ring. Otherwise, the product may be damaged.



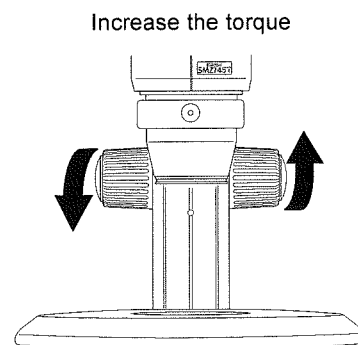
**6 Attach the camera head (optional). (only SMZ745T)**

Remove the C mount cap from the zooming body. Mount the C mount adapter to DS camera head first. Then, attach the DS camera head to the C mount of the zooming body. The direction of DS camera head can be adjusted by loosening the fixing screw and turning the C mount.



**7 Adjust the torque of the focus knobs.**

To increase the torque, turn the focus knobs in the directions as shown by the arrows in the figure. Adjust the torque so that the zooming body does not slide down by its own weight.



(To reduce the torque, turn the knobs in the directions opposite to the arrows.)

**8 Storing the tools**

The hexagonal wrenches supplied with the C-PSN/C-PSCN plain stand or zooming body can be stored at the rear of the stand's support pillar.

Insert them as shown in the figures in Chapter 1, "Nomenclature."

**2**

**Antistatic Feature**

The SMZ745/SMZ745T, the C-PSN/C-PSCN plain stand (space saving model: C-PSN with a small base) and the C-W10XB eyepieces are antistatic and they are suitable for observing static-sensitive samples. To use the microscope system on the antistatic purpose, change the stage plate to the antistatic ESD stage plate, and ground the microscope system by connecting a ground wire to the ground jack at the rear of the plain stand. The 4-mm-dia. grounding terminal can be inserted into the ground jack.

The following products are also antistatic.

- Auxiliary objectives (all types)
- C-FMBN Focus Mount
- G-US1 Universal Table Clamp Stand/G-US2 Universal Table Stand

**3**

**Airtight Feature**

The SMZ745 and the C-W10XB eyepieces are made airtight. (As per JIS/IEC waterproof grade 1 (IPX1))

This feature is suitable for using the microscope in the oilmisty environment in the factory or for soldering.

**ⓘ Maintaining airtightness**

Always attach the rubber cap on the rear of the zooming body and the rubber covers on the eyepieces to keep the airtightness.

This chapter describes optional devices that can be used with the stereo microscope SMZ745/SMZ745T.

## 1

## Reticles

Your reticles can be attached to the eyepiece.

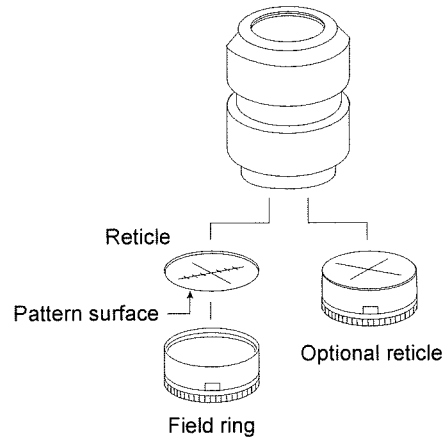
The 20x and 30x eyepieces adopt the internal focusing system, and the primary image has the magnification. Use the reticle with 1.3x pattern for a 20x eyepiece, and with 1.4x pattern for a 30x eyepiece.

An optional reticle with cross hairs or scaled cross hairs is available for a 10x eyepiece.

Remove the field ring (or lens room of the 20x and 30x) from the eyepiece, then attach the reticle with its pattern surface facing down to the eyepiece, and reattach the field ring (or lens room).

✔ **Reference**

Refer to Chapter 6, "Table 1: Total Magnification and Real Field of Binocular Tube" for details on the sizes of attachable reticles.



## 2

## Focus Mounts

The focus mount with an SMZ745/SMZ745T zooming body attached is used for focusing on samples by turning the focus knobs. There are the following three types of focus mounts.

- C-FMAN Focus Mount
- C-FMBN Focus Mount
- C-FMCN Focus Mount

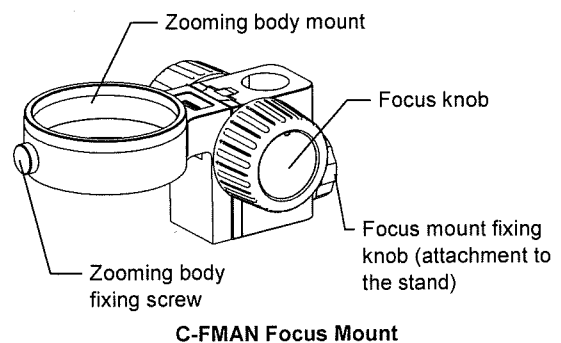
## 2.1

## C-FMAN Focus Mount

The C-FMAN focus mount is used with a P universal stand with a support of 24.5 mm dia. Refer to the instruction manual supplied with the stand.

Turn the focus knobs on the right and left side of the focus mount to move the zooming body vertically and focus on samples.

- Turning the focus knobs backward: Upward movement
- Turning the focus knobs forward: Downward movement
- Focusing stroke: 40 mm
- Stroke per focus knob rotation: 18.7 mm

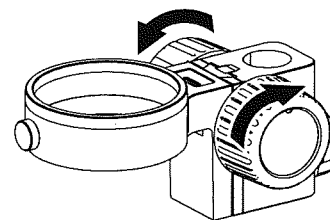


■ **Torque adjustment of the focus knobs**

To adjust the torque of the focus knobs, turn the right and left focus knobs in opposite directions. Adjust the torque to an appropriate level.

❗ **Notes on the torque adjustment**

When the torque is too low, the zooming body may slide down due to the various loads it carries. This may result in injury, such as pinching fingers, or cause damage to the sample or the lens at the end of the zooming body. Be sure to adjust the torque to an appropriate level.



**Adjusting the torque of the focus knobs**  
(The torque is increased by turning the focus knobs as shown in the figure.)

2.2

**C-FMBN Focus Mount**

The C-FMBN focus mount is used with a G-US1 universal table clamp stand or a G-US2 universal table stand. Refer to the instruction manual supplied with the relevant stand.

Turn the right and left focus knobs to move the zooming body vertically and to focus on samples.

- Turning the focus knobs backward: Upward movement
- Turning the focus knobs forward: Downward movement
- Focusing stroke: 50 mm
- Stroke per focus knob rotation: 18.7 mm

The zooming body mount can be inclined by loosening a set screw on the support. This is useful when observing an inclined sample or using the focus mount on other devices such as a wire bonder.

- Angle of inclination at the mount: 180°

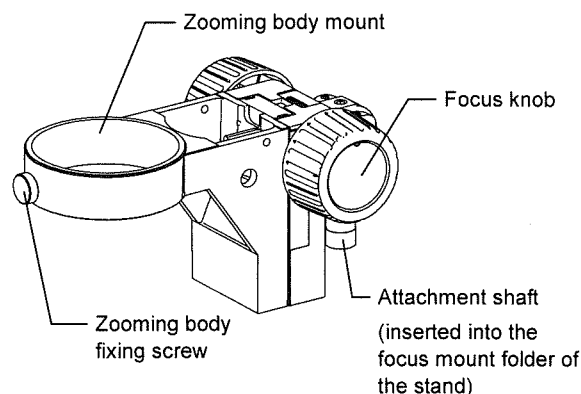
■ **Torque adjustment of the focus knobs**

To adjust the torque of the focus knobs, turn the right and left focus knobs in opposite directions. Adjust the torque to an appropriate level.

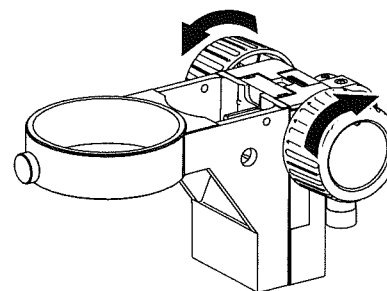
❗ **Notes on the torque adjustment**

When the torque is too low, the zooming body may slide down due to the various loads it carries. This may result in injury, such as pinching fingers, or cause damage to the sample or the lens at the end of the zooming body. Be sure to adjust the torque to an appropriate level.

- \* A C-LSL LED epi illuminator can be attached to the C-FMBN focus mount directly or via an SMZ-U epi arm or a G-EIA flexible arm.
- \* The C-FMBN focus mount has an antistatic function.



**C-FMBN Focus Mount**



**Adjusting the torque of the focus knobs**  
(The torque is increased by turning the focus knobs as shown in the figure.)



2.3

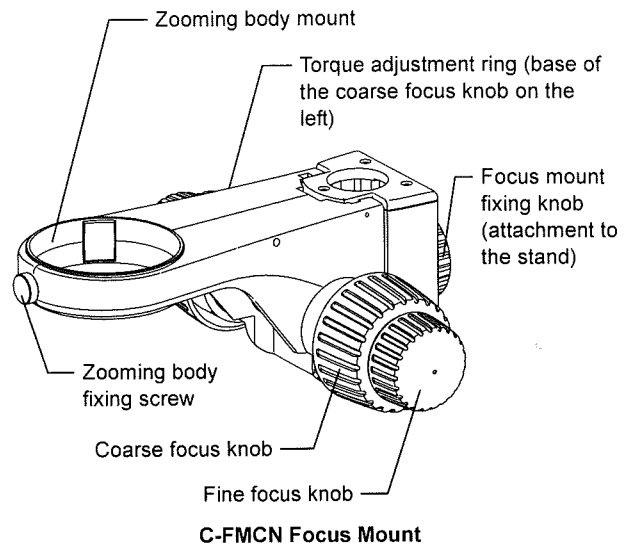
**C-FMCN Focus Mount**

The C-FMCN focus mount is used with the following three types of stands with a support of 32 mm dia.

- P-PS32 Plain Stand
- P-DSL32 LED Diascopic Illumination Stand
- P-DSF32 Fiber Diascopic Illumination Stand

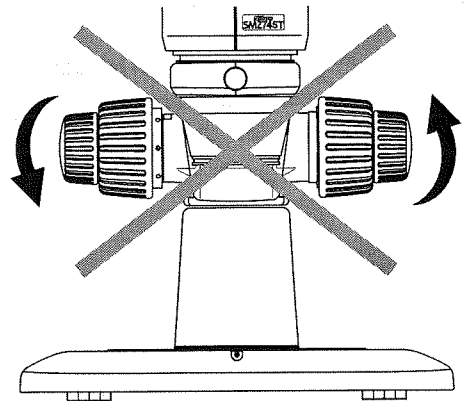
Turn the single-axis coarse and fine knobs on both sides to move the zooming body vertically and focus on samples.

- Turning the focus knobs backward: Upward movement
- Turning the focus knobs forward: Downward movement
- Focusing stroke: 50 mm  
(35 mm when attached to the stand's support without an anti-drop collar)
- Stroke per coarse focus knob rotation: 18.7 mm
- Stroke per fine focus knob rotation: 3.27 mm



**! Notes on turning the focus knobs**

- Do not turn (or twist) the right and left focus knobs in opposite directions at the same time. Doing so may cause malfunction.
- When a focus knob reaches its rotational limit for the unit's vertical movement, do not forcibly turn it further. Doing so may cause malfunction.



**Do not turn the knobs in opposite directions!**

■ **Torque adjustment of the focus knobs**

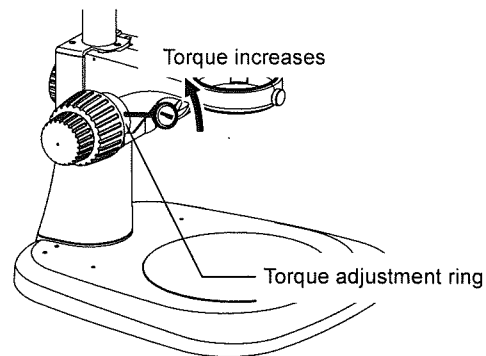
To change the torque of the focus knobs, turn the torque adjustment ring on the base of the left coarse focus knob using the tool supplied with the stand. Adjust the torque to an appropriate level.

The hex driver is fitted on top of each support of the P-PS32, P-DSL32 or P-DSF32.

❗ **Notes on the torque adjustment**

When the torque is too low, the zooming body may slide down due to the various loads it carries. This may result in injury, such as pinching fingers, or cause damage to the sample or the lens at the end of the zooming body. Be sure to adjust the torque to an appropriate level.

Note that turning the fine focus knob will cause the coarse focus knob to also turn, changing the torque of the fine focus knob.

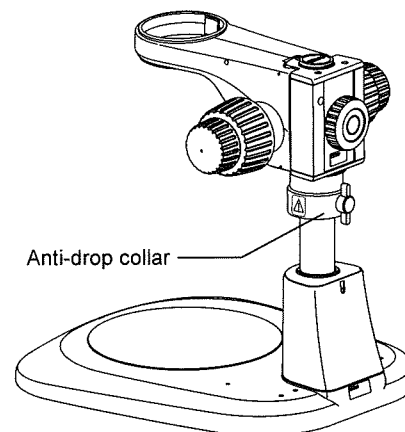


Adjusting the torque of the focus knobs

■ **Anti-drop collar**

An anti-drop collar is supplied with the focus mount. When using a focus mount attached in the middle of the support, be sure to attach the anti-drop collar under the focus mount so that it fits.

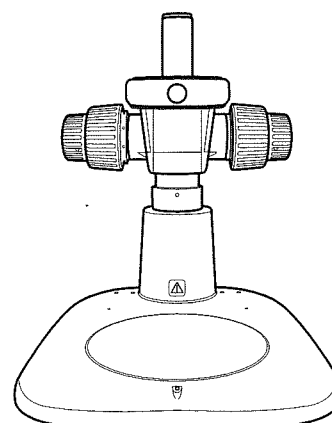
\* A C-LSL LED epi illuminator can be attached to the C-FMCN focus mount via an SMZ-U epi arm or a G-EIA flexible arm.



Anti-drop collar

■ **C-FMCN focus mount attachment to the stand**

Attach the focus mount to the stand so that the focus mount faces the front of the stand as shown in the figure.

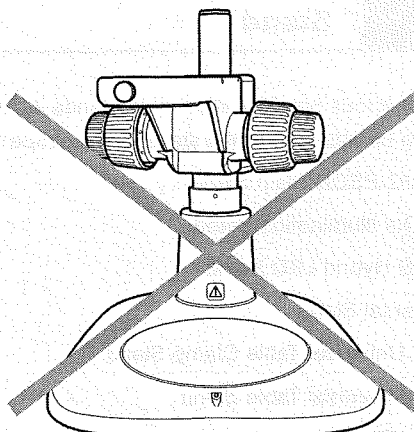


Correct orientation of the focus mount

**⚠ CAUTION**

**Incorrect orientation of the focus mount**

If the focus mount is attached in the incorrect orientation, the stand may fall over. This may result in damage to the device or unexpected injury. Do not attach the focus mount if the focus mount does not face the front of the stand as shown in the figure.

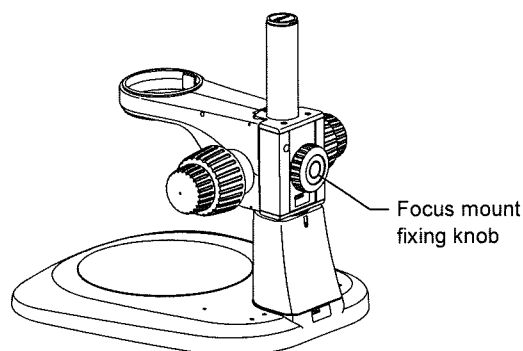


**Incorrect focus mount orientation**

**[Focus mount attachment position]**

(1) Standard position

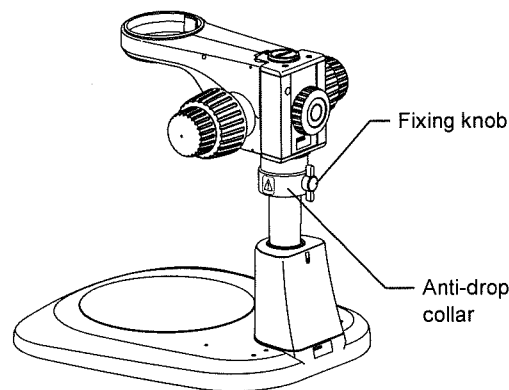
Insert the focus mount until it reaches the lower limit of the support, and tighten the focus mount fixing knob on the rear side.



**Securely attaching the focus mount**

(2) Position higher than the standard

Attach the supplied anti-drop collar so that it fits the support with the convex side up as shown in the figure, and tighten the fixing knob on the rear side at the required position. Then, insert the focus mount until it reaches the anti-drop collar, and tighten the fixing knob on the rear side of the focus mount.



**Securely attaching the anti-drop collar**

**⚠ CAUTION**

**Use of the anti-drop collar**

When using a C-FMCN focus mount attached in the middle of the support, be sure to use the anti-drop collar. Otherwise the zooming body may slide down when the focus mount fixing screw is loosened. This may result in injury such as pinching fingers between the end of the zooming body and the sample, or damage to the sample on the stage plate by the end of the zooming body.

## 3

## Stand

There are various types of attachable stands including the C-PSN/PSCN plain stand shown in the nomenclature. The following stands can be attached to the stereo microscope SMZ745/SMZ745T.

- C-PSN/C-PSCN Plain Stand
- C-DS Dia Illumination Stand
- C-LEDS Hybrid LED Stand
- P Universal Stand
- G-US1 Universal Table Clamp Stand
- G-US2 Universal Table Stand
- P-PS32 Plain Stand
- P-DSL32 LED Diascopic Illumination Stand
- P-DSF32 Fiber Diascopic Illumination Stand

An instruction manual is supplied with the C-PSN/C-PSCN, C-LEDS, P, G-US1 and G-US2 stands separately. Refer to the instruction manual supplied with the relevant stand.

Attach a C-FMCN focus mount to the P-PS32, P-DSL32 and P-DSF32 stands. A large stage plate is incorporated into the base of the stands.

To expand the stand function, remove the stage plate from the base and replace it with a stage with the XY shift knob or a sliding stage, or use together with a polarizing attachment.

## 3.1

## P-PS32 Plain Stand

This stand is a standard type of stand which is not equipped with an illumination system.

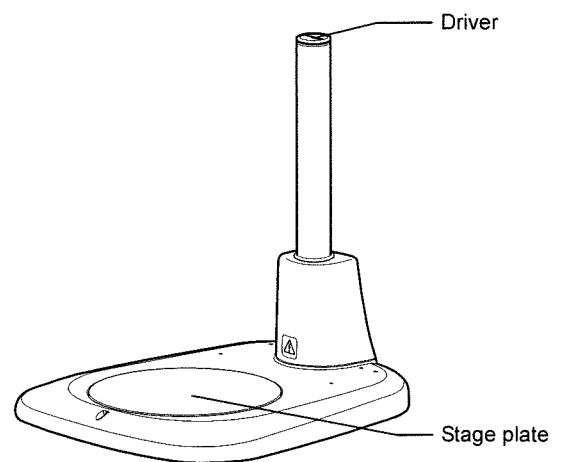
The base has a stage plate (180 mm dia.) with black and milky white surfaces. Select the surface appropriate for the sample.

A dedicated hex driver is located at the top of the support.

#### ■ Attachable optional devices

The following devices can be attached optionally to this stand. For details on how to use each device, refer to the instruction manuals supplied with the following devices or the C-FLED2 LED light source for fiber illuminator.

- P-SXY64 XY Stage
- Type-2 Sliding Stage
- C-SSL DIA Sliding Stage
- P-DF LED Dark Field Unit
- C-TRS Tilting Stage
- C-LSL LED Epi Illuminator (via an SMZ-U Epi Arm)
- C-FDF Flexible Double Arm Fiber Illumination Unit (via a C-FIDH Fiber Holder)
- C-FID2 Double Arm Fiber Illuminator

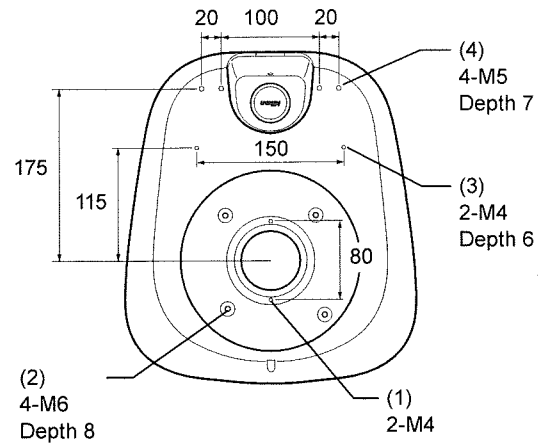


P-PS32 Plain Stand

✔ **Screw holes for attaching optional devices**

The base's top board has screw holes for attaching various devices. Screw holes (2) to (4) do not go right the way through to prevent liquid penetrating into the base.

- (1) 2-M4: Positioned under the stage plate attachment part of the base. Usable for multiple purposes. Used for attaching a Type-2 sliding stage or a C-TRS tilting stage.
- (2) 4-M6: Positioned under the stage plate attachment part of the base. Used for attaching a P-SXY64 XY stage.
- (3) 2-M4: Positioned at the center on the top surface of the base. Usable for multiple purposes.
- (4) 4-M5: Positioned at the rear on the top surface of the base. Used for attaching a C-FDF flexible double arm fiber illumination unit (via a C-FIDH fiber holder).



**Screw holes for attaching optional devices**

✔ **Exchange for a C-EP support**

The support length is 100 mm longer than standard when the original support for this stand is exchanged for a C-EP support. This is useful for attaching the focus mount to a high position.

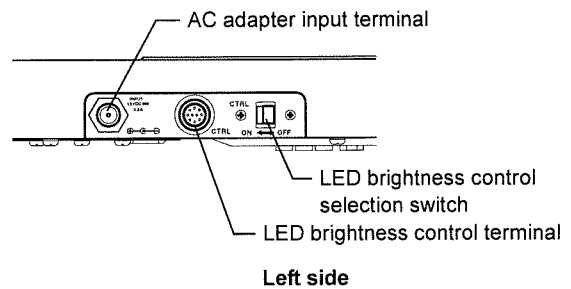
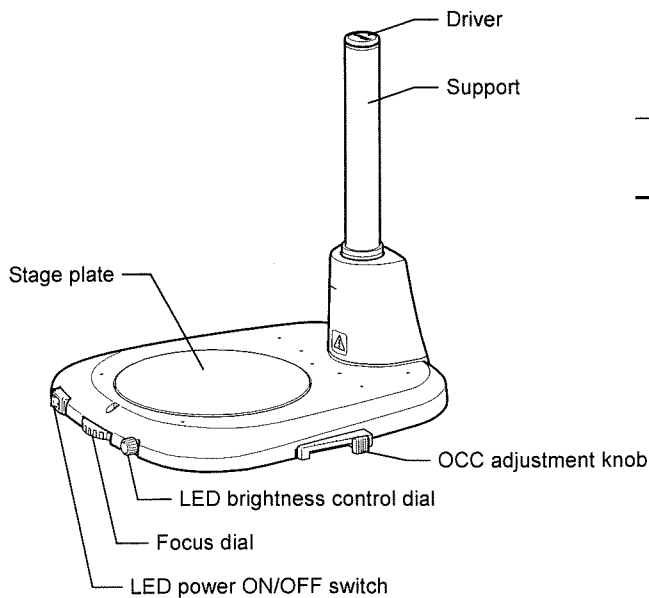
3.2

**P-DSL32 LED Diascopic Illumination Stand**

The P-DSL32 is a stand equipped with LED diascopic illumination systems and the focus mechanism of the support vertical movement type.

The base with a large glass plate (180 mm dia.) enhances usability and enables easier observation of samples in a container such as a petri dish.

A dedicated hex driver is located at the top of the support.



**P-DSL32 LED Diascopic Illumination Stand**

■ Power supply and illumination control

Power to the P-DSL32 LED diascopic illumination stand is supplied by connecting a P2-CTLB control box or a 12 V AC adapter. To provide diascopic illumination without using a control box, connect a 12 V AC adapter.

Turn on or off the LED diascopic illumination using the LED power ON/OFF switch at the front of the base.

Adjust illumination using the LED brightness control dial on the base. To enable adjustment using the LED brightness control dial on the base, the LED brightness control selection switch must be turned off.

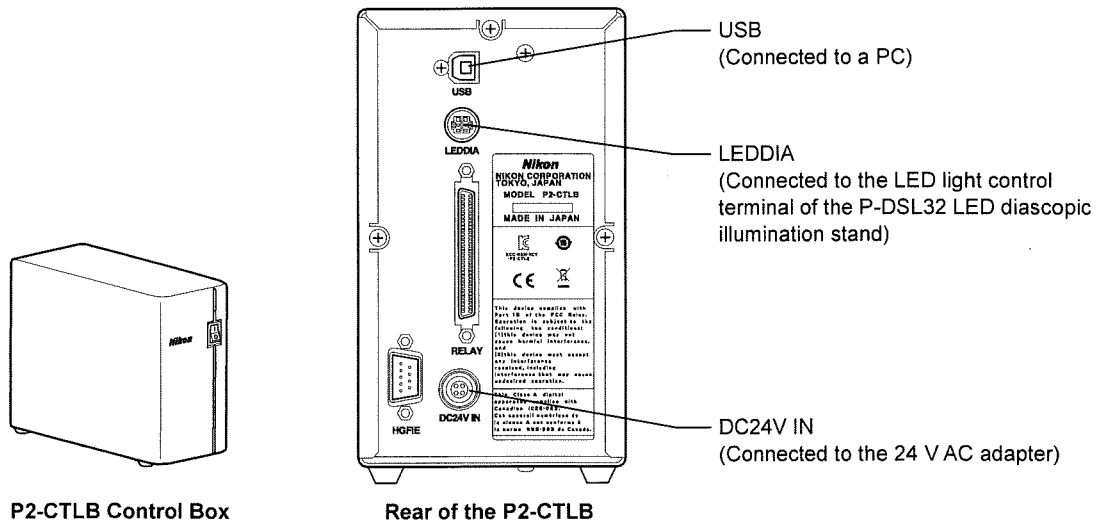
[When the power is supplied from a P2-CTLB control box]

When a P2-CTLB control box is connected to the base, turn on the LED brightness control selection switch. In this state, diascopic illumination can be turned on or off, brightness can be controlled, and light intensity can be monitored from the control box.

Actual control is carried out by the PC (software: NIS-Elements) connected to the control box.

Note that illumination cannot be controlled from the control box, even if the LED brightness control selection switch is turned on, unless the LED power ON/OFF switch on the base is turned on. Be sure to turn on the LED power ON/OFF switch.

- LED brightness control selection switch On: Assigns control to the control box.
- LED brightness control selection switch Off: Assigns control to the base.



AC adapter

Name	12 V AC Adapter	24 V AC Adapter
Model	EA1050E-120	PW-120A-1Y24GPB
Manufacturer	EDAC POWER Electronics Co., Ltd.	Power-Win Technology
Input rating	100-240 VAC±10%, 50-60 Hz, 1.8 A	100-240 VAC±10%, 50-60 Hz, 2.0 A
Output rating	12 VDC, 3.5 A Max.	24 VDC, 5.0 A Max.
External dimensions (W x H x L)	60 x 35 x 120 mm	64.8 x 38.5 x 170 mm
Weight	253 g (excluding power cable)	650 g (excluding power cable)
Safety standards	UL Listed, GS certified, CE declaration of conformity, PSE certified	UL Listed, GS certified, CE declaration of conformity, PSE certified

Power cable

Relevant device	P2-CTLB Control Box P-DSL32 LED Diascopic Illumination Stand EA1050E-120 12 V AC Adapter PW-120A-1Y24GPB 24 V AC Adapter
When used in 100-120 V regions outside Japan	UL listed detachable power cable set, 3 conductor grounding (3 conductor grounding Type SVT, No.18 AWG, 3 m long maximum, rated at 125 VAC minimum)
When used in 220-240 V regions	Detachable power cable set approved in accordance with EU/EN standards, 3 conductor grounding (3 conductor grounding Type H05VV-F, 3 m long maximum, rated at 250 VAC minimum)
When used inside Japan	PSE approved detachable power cable set, 3 conductor grounding (3 conductor grounding Type VCTF 3 x 0.75 mm <sup>2</sup> , 3 m long maximum, rated at 125 VAC minimum)

■ **OCC (oblique coherent contrast) illumination**

This stand supports OCC illumination so that a transparent sample can be observed at high contrast using diascopic illumination with a white LED. OCC illumination is an oblique illumination method suitable for observing the phase objects, where a sample is obliquely illuminated with a coherent illuminating light by shielding a part of the optical path using a shading plate. With this illumination method, a colorless transparent sample can be observed with relief and contrast.

To adjust the OCC contrast, slide the OCC adjustment knob at the right front of the base back and forth. Adjust until the optimum observation state is obtained in combination with the selected magnification and phase amount of the sample. For ordinary bright-field microscopy under diascopic illumination, set the OCC adjustment control to the farthest position. Sliding the control gradually forward from that position will cause the OCC effect to increase. Sliding the control by 46 mm will result in a completely shielded state.

In addition, the control position (knob position) can be reproduced using the OCC adjustment knob with a scale.

Usable auxiliary objectives and recommended zoom magnifications

Auxiliary objective	Zoom magnification	
	Bright-field illumination	OCC illumination
0.5x	From 2x	Contrast in the field of view is not uniform.
0.7x	From 1x	From 5x
None	Entire zoom range	From 3x
1.5x	Entire zoom range	From 2x
2x	Entire zoom range	From 2x

\* Contrast in the field of view is not uniform.

☑ **Increasing contrast of the OCC observation image**

For observations of the OCC observation image with higher contrast, remove the filter dropping ring (attached to the base optical path immediately under the glass plate). The contrast can be increased by removing the filter dropping ring that contains a diffuser plate to control excess contrast for OCC.

■ **Focusing mechanism**

The support moves vertically using the focus dial at the front of the base so that samples with height variations can easily be in focus.

- Focusing stroke: 6.2 mm
- Stroke per focus dial rotation: 3.24 mm

■ **Attachable optional devices**

The following devices can be attached optionally to this stand. Refer to the instruction manual supplied with the relevant device or the C-FLED2 LED light source for fiber illuminator.

- P-SXY64 XY Stage
- C-SSL DIA Sliding Stage
- P-DF LED Dark Field Unit
- C-TRS Tilting Stage
- C-LSL LED Epi Illuminator (via an SMZ-U Epi Arm)
- C-FDF Flexible Double Arm Fiber Illumination Unit (via a C-FIDH Fiber Holder)
- C-FID2 Double Arm Fiber Illuminator
- C-POL Simple Polarizing Attachment

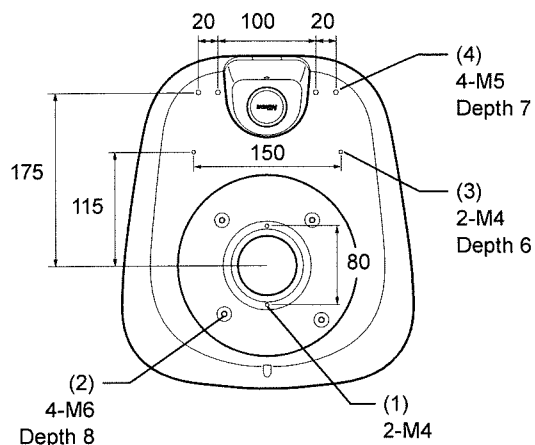
✔ **45-mm dia. filter**

A 45-mm dia. filter (no thicker than 5 mm) can be dropped onto the filter dropping ring (attached to the base optical path immediately under the glass plate).

✔ **Screw holes for attaching optional devices**

The base's top board has screw holes for attaching various devices. Screw holes (2) to (4) do not go right the way through to prevent liquid penetrating into the base.

- (1) 2-M4 : Positioned under the stage plate attachment part of the base. Usable for multiple purposes. Used for attaching a C-TRS tilting stage.
- (2) 4-M6 : Positioned under the stage plate attachment part of the base. Used for attaching the P-SXY64 XY stage.
- (3) 2-M4 : Positioned at the center on the top surface of the base. Usable for multiple purposes.
- (4) 4-M5 : Positioned at the rear on the top surface of the base. Used for attaching a C-FDF flexible double arm fiber illumination Unit (via a C-FIDH fiber holder).



**Screw holes for attaching optional devices**

✔ **Exchange for a C-EP support**

The support length is 145 mm longer than standard when the original support for this stand is exchanged for a C-EP support. This is useful for attaching the focus mount to a high position.



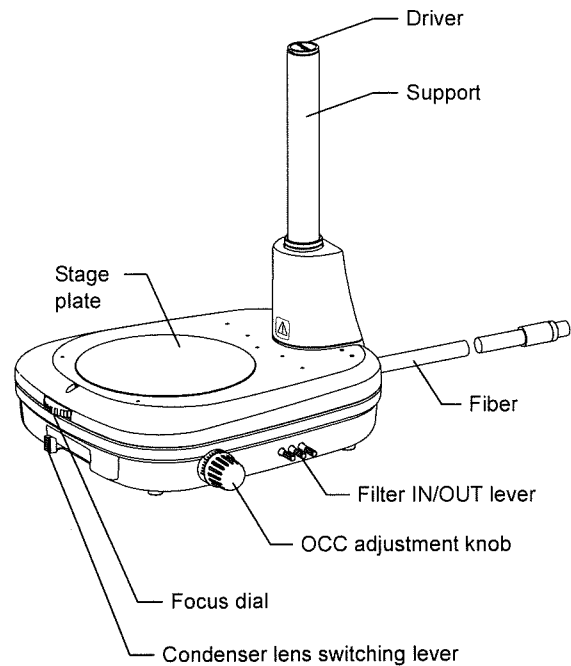
**P-DSF32 Fiber Diascopic Illumination Stand**

The P-DSF32 is a stand equipped with fiber diascopic illumination optical systems and a focus mechanism of the support vertical movement type.

The base with a large glass plate (180 mm dia.) enhances usability and enables easier observation of samples in a container such as a petri dish.

The base has indents at the right and left planes and the rear plane (three in total) for holding the base.

A dedicated hex driver is located at the top of the support.



**P-DSF32 Fiber Diascopic Illumination Stand**

■ **Illumination on/off, brightness adjustment**

Attach the C-FLED2 LED light source for fiber illuminator as the light source to the rear side of the base via a fiber. Turn the illumination on/off and adjust the brightness using the C-FLED2. For details, refer to the instruction manual supplied with the light source.

■ **OCC (oblique coherent contrast) illumination**

This stand supports OCC illumination so that a transparent sample can be observed at high contrast using diascopic illumination with a white LED. OCC illumination is an oblique illumination method suitable for observing the phase objects, where a sample is obliquely illuminated with a coherent illuminating light by shielding a part of the optical path using a shading plate. With this illumination method, a colorless, transparent sample can be observed with relief and contrast.

To adjust the OCC contrast, turn the OCC adjustment knob. Adjust until the optimum observation state is obtained in combination with the selected magnification and phase amount of the sample. In addition, the control position (knob position) can be reproduced using the adjustment knob with a scale.

■ **Condenser lens**

The base contains condenser lenses for low/high-magnification microscopy. Switch the condenser lens based on the auxiliary objective being used to ensure uniform diascopic illumination. A wide range of observation magnifications are supported. To switch the condenser lens, slide the condenser lens switching lever to the right or left.

Slide the lens switching lever to the right: For low magnification; auxiliary objective 0.5x to 2.0x or without auxiliary objective

Slide the lens switching lever to the left: For high magnification; not used in combination with SMZ745/745T

**Usable auxiliary objectives and recommended zoom magnifications**

Auxiliary objective	Zoom magnification	
	Bright-field illumination	OCC illumination
0.5x	From 3x	Contrast in the field of view is not uniform.
0.7x	From 2x	From 4x
None	From 2x	From 3x
1.5x	From 1x	From 2x
2x	From 1x	From 2x

\* Shading may occur in the low zoom magnification range.

### ■ Filter

The base is equipped with three different types of filters: NCB11, ND4, and ND16. The individual filters can be inserted into and removed from the optical path separately. To insert a filter into the optical path, push in the filter IN/OUT lever.

### ■ Focusing mechanism

The support is moved vertically by turning the focus dial at the front of the base so that samples with height variations can easily be in focus.

- Focusing stroke: 6.2 mm
- Stroke per focus dial rotation: 3.24 mm

### ■ Attachable optional devices

The following devices can be attached optionally to this stand. Refer to the instruction manual supplied with the relevant device or the C-FLED2 LED light source for fiber illuminator.

- P-SXY64 XY Stage
- C-SSL DIA Sliding Stage
- P-DF LED Dark Field Unit
- C-TRS Tilting Stage
- C-LSL LED Epi Illuminator (via an SMZ-U Epi Arm)
- C-FDF Flexible Double Arm Fiber Illumination Unit (via a C-FIDH Fiber Holder)
- C-FID2 Double Arm Fiber Illuminator
- C-POL Simple Polarizing Attachment

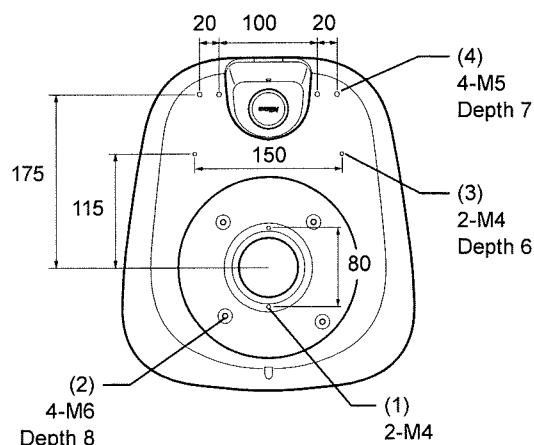
#### ✔ 45-mm dia. filter

A 45-mm dia. filter (no thicker than 2 mm) can be dropped onto the filter dropping ring (attached to the base optical path immediately under the glass plate).

#### ✔ Screw holes for attaching optional devices

The base's top board has screw holes for attaching various devices. Screw holes (2) to (4) do not go right the way through to prevent liquid penetrating into the base.

- (1) 2-M4 : Positioned under the stage plate attachment part of the base. Usable for multiple purposes. Used for attaching a C-TRS tilting stage.
- (2) 4-M6 : Positioned under the stage plate attachment part of the base. Used for attaching the P-SXY64 XY stage.
- (3) 2-M4 : Positioned at the center on the top surface of the base. Usable for multiple purposes.
- (4) 4-M5 : Positioned at the rear on the top surface of the base. Used for attaching a C-FDF flexible double arm fiber illumination Unit (via a C-FIDH fiber holder).



**Screw holes for attaching optional devices**

#### ✔ Exchange for a C-EP support

The support length is 145 mm longer than standard when the original support for this stand is exchanged for a C-EP support. This is useful for attaching the focus mount to a high position.

## 4

## Illuminators

The following illuminators can be used with the stereo microscope SMZ745/SMZ745T.

- C-LSL LED Epi Illuminator
- C-FDF Flexible Double Arm Fiber Illumination Unit
- C-FID2 Double Arm Fiber Illuminator
- C-FIR Ring Fiber Illumination Unit

## 4.1

## C-LSL LED Epi Illuminator

The C-LSL is an episcopic illuminator with a white LED light source.

Directly attach the illuminator to a focus mount or a stand, or attach via an SMZ-U epi arm or a G-EIA flexible arm. Refer to the instruction manual supplied with the C-LSL.

## 4.2

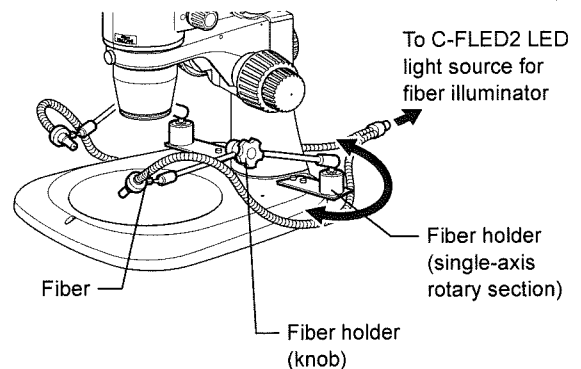
## C-FDF Flexible Double Arm Fiber Illumination Unit

This is a fiber connected to the C-FLED2 LED light source for fiber illuminator to illuminate samples.

Two fibers are held by the C-FIDH fiber holder. The orientation of the holder's arm can be adjusted so that the tips of the fibers face the samples for illumination. For details on using the fiber holder, see "■ C-FIDH Fiber Holder."

**ⓘ Important note on handling fibers**

Do not excessively bend or apply excess force to the fibers.  
Doing so may damage the fibers.



C-FDF Flexible Double Arm Fiber illumination Unit

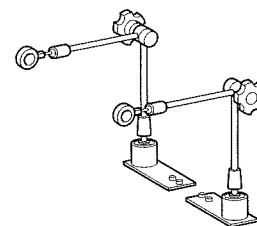
For details on the procedure for using a light source, refer to the instruction manual for the light source.

■ C-FIDH Fiber Holder

This holds the tip of the flexible double-arm fiber. Mount the base of the holder to the base (stand) of the microscope system. The holder holds the tips of the fibers with the two arms extending from its base. The arms can be freely positioned in any direction. The positions of the arms can be firmly locked by tightening the knobs at the joints of the arms. The arms are connected with a mechanism that enables the arms to be freely swung centered around a single axis (Z axis). This allows the arms to be pushed aside without having to unlock the arm joints. If the arm position is returned by rotating it on the same axis, the arm will stop at the first lock position.

The C-FIDH fiber holder can be attached to the following stands.

- P-PS32 Plain Stand
- P-DSL32 LED Diascopic Illumination Stand
- P-DSF32 Fiber Diascopic Illumination Stand

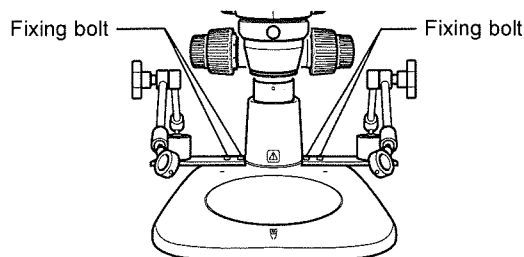


C-FIDH Fiber Holder

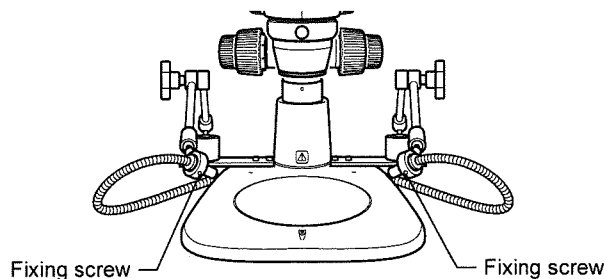
### ■ Attachment to the stand

Attach fiber holders using the tool holes on the base to hold the fiber. The procedure for attaching holders is the same for all stand types.

- (1) Attach a holder of the C-FIDH fiber holder to the right and left rear sides of the base. Two bolt holes are located on each side. Tighten four M5 hexagon socket head bolts using a hex wrench (nominal designation: 4).
  
- (2) Insert the flexible double arm fiber tip into the ring at the arm end, and tighten the M4 set screw for the fiber using a hex driver (nominal designation: 2).
  
- (3) Firmly insert the fiber source side connectors into the fiber attachment holes on the C-FLED2 LED light source. See the instruction manual for the light source for details.



**Securely attaching the fiber holder**



**Securely attaching the flexible arm fiber**

### 4.3

### C-FID2 Double Arm Fiber Illuminator

This is an illuminator (light guide) connected to the C-FLED2 LED light source for fiber illuminator to illuminate samples. The fiber is bifurcated at the mount to the light source. An interlock type covering mechanism enables adjustment of illumination position and orientation.

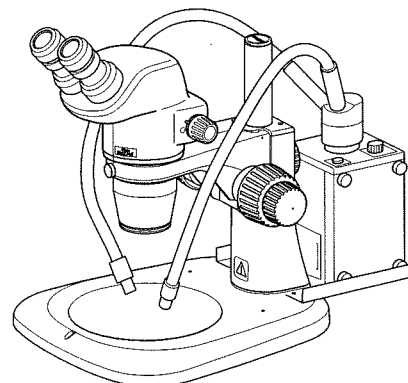
#### **ⓘ Important note on handling fibers**

Do not excessively bend or apply excess force to the fibers. Doing so may damage the fibers.

The C-FID2 double arm fiber illuminator can be attached to the following stands.

- P-PS32 Plain Stand
- P-DSL32 LED Diascopic Illumination Stand
- P-DSF32 Fiber Diascopic Illumination Stand
- C-PSN/C-PSCN Plain Stand

For details on the procedure for attaching to the stand, connecting to the light source, or using the light source, refer to the instruction manual supplied with the light source.



**C-FID2 Double Arm Fiber Illuminator**

4.4

**C-FIR Ring Fiber Illumination Unit**

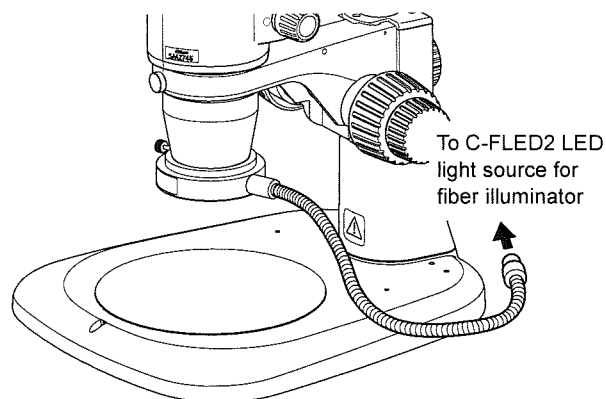
The C-FIR ring fiber illumination unit is a ring shaped fiber illuminator that attaches to the external barrel at the end of the zooming body and connects to the C-FLED2 LED light Source for Fiber Illuminator.

The edge face of the sample can be illuminated evenly using this ring-shaped fiber.

**⚠ Important notes on handling the fiber**

Do not excessively bend or apply excess force to the fibers.  
Doing so may damage the fiber.

For details on the procedure for attaching this unit to the end of the zooming body, connecting to the light source and using the light source, refer to the instruction manual supplied with the light source.



**C-FIR Ring Fiber Illumination Unit**

## 5

## Other Devices

The following devices can be attached to a stand or the end of the zooming body of the stereo microscope SMZ745/SMZ745T.

- P-SXY64 XY Stage
- C-SSL DIA Sliding Stage
- Type-2 Sliding Stage
- C-TRS Tilting Stage
- P-DF LED Dark Field Unit
- C-POL Simple Polarizing Attachment

## 5.1

## P-SXY64 XY Stage

This stage shifts the glass plate in the X and Y directions when the X/Y shift knobs are turned. Attach this stage instead of the stand base.

The height of the stage is 36.7 mm. The glass plate measures 215 mm x 154 mm x 5 mm and is detachable.

Stage adapters for AZ are usable with the stage and a 45-mm dia. filter can be slotted into the optical-path hole on the lower board of the stage.

**[Usable stands]**

- P-PS32 Plain Stand
- P-DSL32 LED Diascopic Illumination Stand
- P-DSF32 Fiber Diascopic Illumination Stand

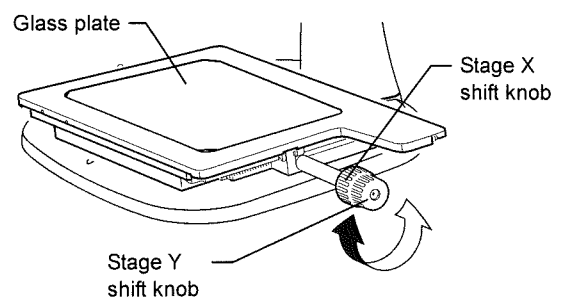
■ **XY stroke of the stage with the X/Y shift knob and stroke per knob rotation**

X: 150 mm; 37.5 mm per rotation

Y: 65 mm (from the optical path, 50 mm towards the front, 15 mm towards the rear); 24.1 mm per rotation

■ **Load weight**

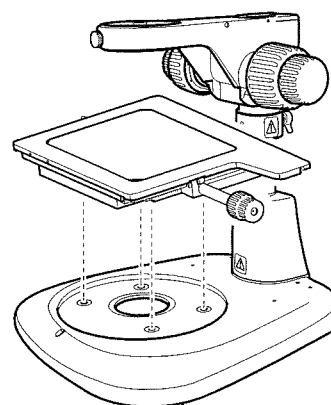
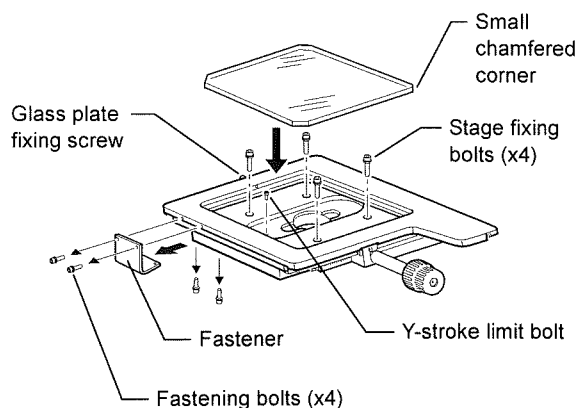
5 kg or less



**P-SXY64 XY Stage**

### ■ Attachment to the stand

- (1) Remove the fastener for the stage. Loosen the four M4 hexagon socket head bolts for the stage using a hex wrench (nominal designation: 3).
- (2) Loosen the M4 set screw for the stage plate on the base using a hex driver (nominal designation: 2) to remove the stage plate.
- (3) Screw the Y-stroke limit bolt supplied with the P-SXY64 in the stage. Use a hex wrench (nominal designation: 2.5) when tightening the M3 hexagon socket head bolt.
- (4) Attach the P-SXY64 Stage using the four screw holes that are located under the stage plate attachment position. Move the upper plate of the P-SXY64 to align the installation holes on the lower plate with the screw holes, insert the four M6 hexagon socket head bolts and firmly tighten them using a hex wrench (nominal designation: 5).
- (5) Attach the glass plate supplied with the P-SXY64 XY stage so that it fits the upper plate of the stage. The glass plate has chamfered corners including one small chamfered corner. Align the small chamfered corner with the right rear side of the stage (as viewed from the front) to fit the glass plate on the stage, and tighten the glass plate fixing screw.



**Securely attaching the P-SXY64**

## 5.2

### C-SSL DIA Sliding Stage

This stage is movable in the range of  $\pm 19$  mm in the radial direction by pressing the stage's side.

The height of the stage is 11.5 mm.

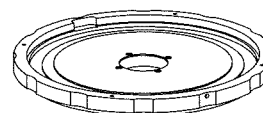
Attach the stage to the position where the stage plate was removed from the stand base. Attach the removed stage plate on the sliding stage.

#### [Usable stands]

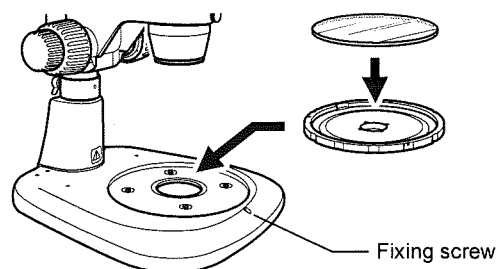
- P-PS32 Plain Stand
- P-DSL32 LED Diascopic Illumination Stand
- P-DSF32 Fiber Diascopic Illumination Stand
- C-DS Dia Illumination Stand

### ■ Attachment to the stand

- (1) Loosen the M4 set screw for the stage plate on the base using a hex driver (nominal designation: 2) to remove the stage plate.
- (2) Attach the sliding stage to the base so that it fits, and tighten the stage plate fixing screw.
- (3) Place the stage plate removed in step (1) on the sliding stage.
- (4) Tighten the stage plate fixing screw for the sliding stage.



**C-SSL DIA Sliding Stage**



**Securely attaching the DIA sliding stage**

### 5.3 Type-2 Sliding Stage

This stage is movable in the range of  $\pm 20$  mm in the radial direction.

The height of the stage is 17.7 mm.

Attach the stage to the position where the stage plate was removed from the stand base. Attach the removed stage plate on the sliding stage.

When this stage is used with a P-PS32 plain stand, a 90-dia. SM acrylic plate (optional) is required separately. In this case, the height of the stage is 16.7 mm. The stage is securely attached to the P-PS32 using bolts. For details, see "■ Attachment to the stand."

Diascopic illumination is not supported.

#### [Usable stands]

- C-PSN/C-PSCN Plain Stand
- P-PS32 Plain Stand

#### ■ Attachment to the stand

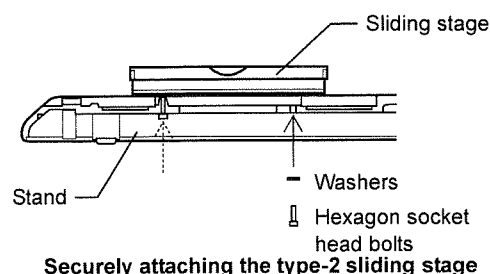
- (1) Remove the stage plate from the stand.
- (2) Alternatively, place a type-2 sliding stage so that it fits the stand, and then securely attach it by tightening two M2.5 hexagon socket head bolts and washers from the base surface of the stand using a hex wrench (nominal designation: 2) or a hex driver (nominal designation: 2).
- (3) Attach the removed stage plate to the type-2 sliding stage. When using a P-PS32 plain stand, use a 90-dia. stage plate separately.

#### ✔ Type-2 sliding stage attachment

The type-2 sliding stage can be attached by fitting it into the base of the C-PSN/C-PSCN. Nikon recommends securely attaching the stage by tightening bolts.



Type-2 Sliding Stage



### 5.4

### C-TRS Tilting Stage

This stage can be tilted within  $\pm 30^\circ$  of the tilt range to observe samples. The rotation center of the tilt is positioned in the center on the upper plane of the stage.

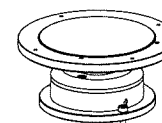
Attach the stage to the position where the stage plate was removed from the stand base. Attach the removed stage plate or a 90-dia. SM acrylic plate (optional) on the sliding stage.

The height of the stage is 48 mm. (when horizontal)

For details on the procedure for attaching to the stand, refer to the instruction manual supplied with the C-TRS tilting stage.

#### [Usable stands]

- P-PS32 Plain Stand
- P-DSL32 LED Diascopic Illumination Stand
- P-DSF32 Fiber Diascopic Illumination Stand
- C-PSN/C-PSCN Plain Stand
- C-DS Dia Illumination Stand
- C-LEDS Hybrid LED Stand



C-TRS Tilting Stage



**5.5 P-DF LED Dark Field Unit**

This dark-field illumination unit has LEDs that are tilted and positioned like a ring. The unit is attached to the base of the stand. For details, refer to the instruction manual supplied with the P-DF LED dark field unit.

**5.6 C-POL Simple Polarizing Attachment**

This is a simple polarizing device that consists of a polarizer section and analyzer section.

Polarizing microscopy is performed by changing the directions of the polarizer incorporated into the stand's base and the analyzer attached to the end of the zooming body.

The polarizer and analyzer have indicators which show the orientation of the polarizing plate. Use the screw head at the bottom plane of the analyzer rotating dial as the analyzer's indicator.

The C-POL simple polarizing attachment can be attached to the following stands.

- P-DSL32 LED Diascopic Illumination Stand
- P-DSF32 Fiber Diascopic Illumination Stand

**Attachment**

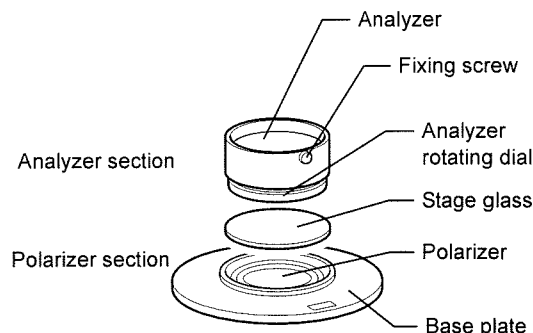
- (1) Loosen the M4 set screw for the stage plate of the base using a hex driver (nominal designation: 2) to remove the stage plate, and alternatively place the base plate of the polarizer so that it fits the base.
- (2) Determine the orientation of the polarizer and tighten the stage plate fixing screw.
- (3) Place the stage glass (90 mm dia.) supplied with the polarizer attachment on the polarizer. The stage glass is rotatable.
- (4) Loosen the fixing screw of the analyzer. Insert the analyzer into the objective end until it reaches the limit, and tighten the fixing screw.

**Directly placing the polarizer**

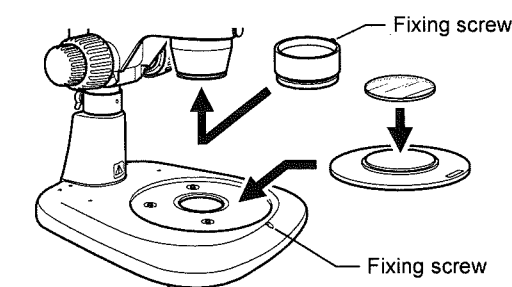
When a polarizing attachment is used, the periphery becomes dark in the low zoom magnification range. To reduce limb darkening, remove the stage glass and directly place the polarizer.

The polarizer can be directly placed on the P-DSL32 LED diascopic illumination stand only.

Drop the polarizer removed from the polarizer section into the position where the diffuser was removed from the base of the stand. Use the original stage plate supplied with the base.



**C-POL Simple Polarizing Attachment**



**Securely attach a simple polarizing attachment**

**Usable auxiliary objectives and recommended zoom magnifications**

Auxiliary objective	Zoom magnification
0.5x	From 2x
0.7x	From 1x
None	From 1x
1.5x	Entire zoom range
2x	Entire zoom range

## 1

## Cleaning

Clean and disinfect the microscope and lenses as described in the procedures below.

**■ Tools used for cleaning**

- Blower
- Soft brush
- Soft cotton cloth, lens tissue, gauze, etc.
- Pure alcohol (ethyl or methyl alcohol), medical alcohol

**⚠ CAUTION**

- Pure alcohol used for cleaning is highly flammable. Be careful when handling these materials particularly around open flames or when turning the power switch on or off.
- Follow the instructions provided by the manufacturer when using pure alcohol.
- When cleaning the product, do not use organic solvents (alcohol, ether, thinner, etc.) on the coated, plastic, or printed areas. Doing so will result in discoloration or peeling of the printed characters.

## 1.1

## Cleaning Lenses

Keep the lens free of dust and fingerprints. Any contamination on the lenses or filters will reduce the image quality. If the lenses have become dirty, clean them as follows:

**■ Cleaning light dirt (dust)**

- (1) Use an air blower to blow off any dust.
- (2) If any dust remains, brush the dust off using a soft brush or gently wipe the dust off using a piece of gauze.

**■ Cleaning tough dirt (fingerprints or grease)**

Use a soft, clean cotton cloth, lens tissue, or gauze lightly dampened with pure alcohol (ethyl or methyl alcohol) to wipe the dirt off.

**✔ Tips on wiping**

Do not reuse cotton cloth, lens tissue, or gauze that has already been used.

## 1.2

## Cleaning Parts Other than the Lens

**■ Cleaning light dirt (dust)**

Use a silicon cloth to clean the part.

**■ Cleaning tough dirt (fingerprints or grease)**

Lightly dampen a piece of gauze with a neutral detergent and gently wipe the dirt off.

**2**

**Storage**

- Store this product in a dry location free of mold or mildew.  
The storage conditions are as follows: temperature (-20°C to +60°C), humidity (90% RH max., no condensation).
- Place a cover over this product to protect it from dust.
- Switch off the device (press the switch to the "O" position). If the device is warm, wait for it to cool before covering it with a cover.

**3**

**Periodic Inspection (Charged)**

To maintain the performance of this product, Nikon recommends periodic inspection (chargeable service). Contact your nearest Nikon representative for details.

Table 1: Total Magnification and Real Field of Binocular Tube

Auxiliary objective	Working distance [mm]	Eyepieces							
		10x Field number 22 Reticle diameter $\varnothing 25$		15x Field number 16 Reticle diameter $\varnothing 19$		20x Field number 12.5 Reticle diameter $\varnothing 19$ Magnification 1.3x		30x Field number 7 Reticle diameter $\varnothing 12$ Magnification 1.4x	
		Total magnification	Real field [mm]	Total magnification	Real field [mm]	Total magnification	Real field [mm]	Total magnification	Real field [mm]
None	115	6.7 to 50x	32.8 to 4.4	10.1 to 75x	23.9 to 3.2	13.4 to 100x	18.7 to 2.5	20.1 to 150x	10.4 to 1.4
AL 0.29x	311	1.9 to 14.5x	113.2 to 15.2	2.9 to 21.8x	82.3 to 11.0	3.9 to 29x	64.3 to 8.6	5.8 to 43.5x	36.0 to 4.8
AL 0.5x	211	3.4 to 25x	65.7 to 8.8	5 to 37.5x	47.8 to 6.4	6.7 to 50x	37.3 to 5.0	10.1 to 75x	20.9 to 2.8
AL 0.7x	150	4.7 to 35x	46.9 to 6.3	7 to 52.5x	34.1 to 4.6	9.4 to 70x	26.7 to 3.6	14.1 to 105x	14.9 to 2.0
AL 1.5x	61	10.1 to 75x	21.9 to 2.9	15.1 to 112.5x	15.9 to 2.1	20.1 to 150x	12.4 to 1.7	30.2 to 225x	7.0 to 0.9
AL 2x	43.5	13.4 to 100x	16.4 to 2.2	20.1 to 150x	11.9 to 1.6	26.8 to 200x	9.3 to 1.3	40.2 to 300x	5.2 to 0.7

Table 2: Total Magnification and Real Field of Vertical Tube

Auxiliary objective	Working distance [mm]	Vertical tube	
		0.55x Field number 11	
		Total magnification	Real field [mm]
None	115	0.37 to 2.75x	29.9 to 4.0
AL 0.29x	311	0.11 to 0.80x	102.9 to 13.8
AL 0.5x	211	0.18 to 1.38x	59.7 to 8.0
AL 0.7x	150	0.26 to 1.93x	42.6 to 5.7
AL 1.5x	61	0.55 to 4.13x	19.9 to 2.7
AL 2x	43.5	0.74 to 5.50x	14.9 to 2.0

Table 3: Observable Sample Heights

(C-PSN/C-PSCN plain focusing stand + C-DS diascope stand)

[mm]

Auxiliary objective	Arm normal position	Arm lower position	When using auxiliary adapter
None	0 to 91	0 to 36	42 to 147
AL 0.29x	–	–	–
AL 0.5x	–	–	0 to 36
AL 0.7x	0 to 42	–	0 to 98
AL 1.5x	25 to 129	0 to 74	81 to 185
AL 2x	43 to 147	0 to 92	99 to 203

