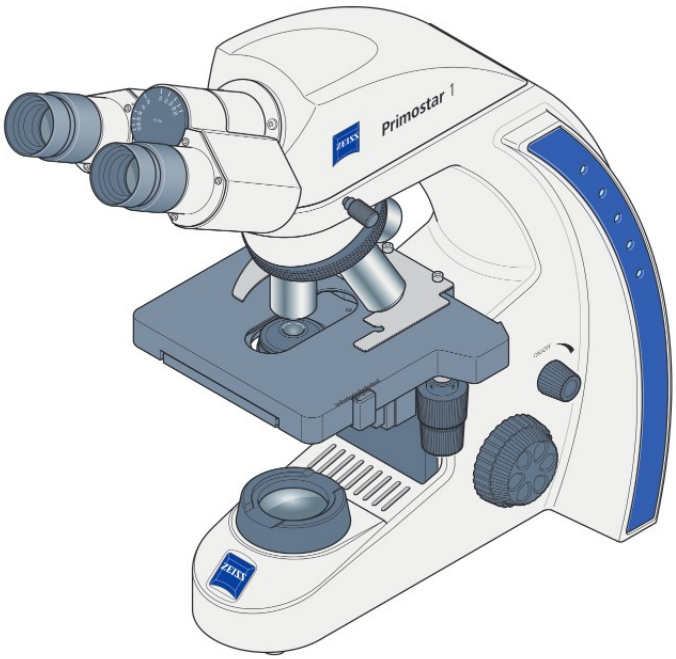

Instruction Manual

ZEISS Primostar 1

Upright Microscope for Education and Routine

ZEISS Primostar 1

Original Manual

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Table of Contents

1 About this Instruction Manual

This Instruction Manual (further called "document") is considered to be part of the Primostar 1, herein after referred to as "microscope".

This document contains basic steps and safety information that must be observed during operation and maintenance. Therefore, the document must be read by the operator prior to commissioning and must always be available at the place of use of the microscope.

This document is an essential part of the microscope and, if the microscope is resold, the document must remain with the microscope or be handed over to the new owner.

1.1 Text Conventions and Link Types

Example	Explanation
	The names of controls and important information are shown in bold letters, for instance:
Click **Start**.	Software controls and GUI elements.
Press the **Standby** button.	Hardware controls and elements.
Press **Enter** on the keyboard.	Key on the keyboard.
Press **Ctrl + Alt + Del**.	Press several keys on the keyboard simultaneously.
Select **Tools > Goto Control Panel > Airlock**.	Follow a path in the software.
Enter *example.pdf* in this field.	Text to be entered by the user.
`Programming and Macros`	Anything typed in literally during programming, including, for example, macro codes, keywords, data types, method names, variables, class names, and interface names.

Tab. 1: Text conventions

Example	Explanation
See: *Text Conventions and Link Types [▸ 5]*.	Link to further information for this topic.
https://www.zeiss.com/corporate/int/home.html	Link to a website on the internet.

Tab. 2: Link types

1.2 Explanation of Warning Messages and Additional Information

DANGER, WARNING, CAUTION, and NOTICE are standard signal words used to determine the levels of hazards and risks of personal injury and property damage. Not only the safety and warning messages in the **Safety** chapter are to be considered also all safety and warning messages in other chapters. Failure to comply with these instructions and warnings can result in both personal injury and property damage and involve the loss of any claims for damages.

The following warning messages indicating dangerous situations and hazards are used in this document.

⚠ DANGER

Type and source of danger

DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

⚠ WARNING

Type and source of danger

WARNING indicates a potentially hazardous situation which, if not avoided, may result in death or serious injury.

⚠ CAUTION

Type and source of danger

CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

NOTICE

Type and source of danger

NOTICE indicates a potentially harmful situation which, if not avoided, may result in property damage.

Info

Provides additional information or explanations to help operator better understand the contents of this document.

1.3 Explanation of Symbols

Symbol	Explanation
CE	CE marking (Conformité Européene)
C SA US	CSA label: product tested by CSA to meet U.S. and Canadian standards. CSA approval master number optionally given adjacent to this symbol
	Manufacturer
CC	Country of manufacture. "CC" is the country code, e.g. "DE" for Germany, "CN" for China. Date of manufacture optionally given adjacent to this symbol
	Importer
EC REP	Authorized representative in the European Community
IVD	In-vitro diagnostic medical device
SN	Serial number
REF	Catalogue number
III	Class III equipment according to IEC 61140
	WEEE label: Do not discard as unsorted waste. Send to separate collection facilities for recovery and recycling

Tab. 3: Explanation of symbols

1.4 Further Applicable Documents

Also take note of the following documents:

Brochures and Certificates For brochures, ISO certificates, CSA certificates, and EU declarations of conformity ask your ZEISS Sales & Service Partner.

System and third-party Components, Accessories Information about the individual components, enhancements, and accessories can be obtained from your ZEISS Sales & Service Partner. Also refer to the documentation of third-party manufacturers.

1.5 Contact

If you have any questions or problems, contact your local ZEISS Sales & Service Partner or one of the following addresses:

Headquarters

Phone:	+49 1803 33 63 34
Fax:	+49 3641 64 3439
Email:	info.microscopy.de@zeiss.com

Microscopy Courses, Training, and Education

For information on microscopy courses, training, and education contact us on our homepage (https://www.zeiss.com/microscopy/int/service-support/training-and-education.html#contact).

ZEISS Portal

The ZEISS Portal (https://portal.zeiss.com/) offers various services that simplify the daily work with your ZEISS systems (machines and software). It is constantly improved and extended to meet your needs and requirements better.

ZEISS Sales & Service Partner

You can find a ZEISS Sales & Service Partner in your area under https://www.zeiss.de/mikroskopie/website/forms/sales-and-service-contacts.html.

Service Germany

Phone:	+49 7364 20 3800
Fax:	+49 7364 20 3226
Email:	service.microscopy.de@zeiss.com

2 Safety

This chapter contains general requirements for safe working practices. Any person using the microscope or commissioned with installation or maintenance must read and observe these general safety instructions. Knowledge of basic safety instructions and requirements is a precondition for safe and fault-free operation. Operational safety of the supplied microscope is only ensured if it is operated according to its intended use.

If any work is associated with residual risks, this is mentioned in the relevant parts of this document in a specific note. When components must be handled with special caution, they are marked with a warning label. These warnings must always be observed.

Any serious incident that has occurred in relation to the microscope and its components shall be reported to these institutions:

- the competent authority of the Member State in which the user is established
- ZEISS
  - for users within the EU:
    Carl Zeiss Microscopy GmbH, Jena, Germany
  - for users outside the EU:
    Carl Zeiss Suzhou Co., Ltd., Suzhou, China

2.1 Intended Use

Improper use of the microscope and its components can easily lead to impairment of their function or even damage them. Damage caused by incorrect operation, negligence, or unauthorized intervention, in particular by removing, modifying, or replacing parts of the microscope or its components, cannot be held liable by the device manufacturer. Third-party devices or components that are not expressly approved by ZEISS may not be used.

2.1.1 Intended Purpose

Primostar 1 is an instrument for general microscopic imaging for the in vitro-examination of various biological samples including samples collected from humans or animals. This imaging provides information to further assess physiological and pathological conditions.

The microscope is intended to be used by trained professionals only.

2.1.2 Lifetime

A microscope is an opto-electronic device. Its availability for use is significantly determined by the performed maintenance. ZEISS guarantees the ability for maintenance and repair within eight years after initial operation. This is ensured by a corresponding service and spare parts concept, thus enabling the intended purpose within this duration.

2.1.3 Optical Risk Grouping

According to EN 62471 sources of optical radiation are classified into risk groups subject to their potential photobiological hazard. Sources are classified into the following four groups according to hazard, based on the emission limit as well as permissible exposure time before hazard exceeded.

Risk group	Description
Exempt	No photobiological hazard.
1	No hazard due to normal behaviourial limitations on exposure.
2	No hazard due to the aversion response to very bright light sources or thermal discomfort.
3	Hazardous even for momentary exposure.

The following table lists the risk grouping of the available light sources/illumination units according to the mentioned standard:

Light source/Illumination unit	Risk group
Primostar 1 stand	Exempt (looking into the eyepieces)

2.1.4 EMC Information

The microscope is intended to be used in a basic electromagnetic environment. The electromagnetic environment should be evaluated prior to operation of the microscope. Do not use the microscope in proximity to sources of strong electromagnetic radiation, as these can interfere with proper operation.

Use of this microscope in a dry environment, especially if synthetic materials are present (synthetic clothing, carpets, etc.), may cause electrostatic discharges that may cause erroneous results.

Electromagnetic interference (EMI) according to CISPR 11 Group 1 Class B.

If in doubt, contact a ZEISS service representative.

2.2 General Safety Information

This document must be read before commissioning in order to ensure safe and uninterrupted operation. Pay particular attention to all listed safety notes. Make sure, that

- the operating personnel has read and understood this manual, associated documents and particularly all safety regulations and instructions, and applies them.
- the local and national safety and accident prevention regulations must be observed, as well as the applicable laws and regulations in your country.
- this document is always available at the place of use of the microscope.
- the microscope is always in perfect condition.
- the microscope is secured against access by unauthorized persons.
- maintenance and repair work, retrofitting, removal or replacement of components, as well as any other intervention in the microscope not described in this document, may only be carried out by the manufacturer ZEISS or persons expressly authorized by ZEISS to do so.

2.2.1 Requirements for Operators

The microscope, components, and accessories may only be operated and maintained by authorized and trained personnel. The microscope may only be used in accordance with this document. If the microscope is not used as described, the safety of the user may be impaired and/or the microscope may be damaged.

Any unauthorized intervention or use other than within the scope of the intended use shall void all rights to warranty claims. The regional regulations on health protection and accident prevention must be observed at all times and during all work on and with the microscope.

Training Authorized ZEISS personnel will provide basic training in operating the microscope. As well as information on equipment safety and maintenance work that can be conducted by the operator. The training will be documented by ZEISS and its completion is to be confirmed by the operator.

Special application training is offered for a fee. Current training dates, additional information and the registration form can be found at https://www.zeiss.com/microscopy/int/service-support/training-and-education.html.

2.2.2 Safe Operating Condition

If circumstances occur which impair safety and cause changes in operating behavior, the microscope must be shut down immediately and a ZEISS service representative should be informed.

The microscope may only be operated if the operating conditions are adhered to.

- Do not operate the microscope until you have completely read and understood the entire documentation.
- Make sure that all protective cover panels are installed and all warning labels are available and legible.
- Ensure conditions and take measures to prevent the build up of electrostatic charge on the workplace.

2.2.3 Order and Use of Spare Parts

Using spare parts that are not provided by ZEISS can be hazardous or can lead to property damage.

- Unless authorized by ZEISS, all spare parts should be installed by a ZEISS service representative.
- Contact your ZEISS service representative for information on spare parts order.
- Only genuine parts supplied by ZEISS are to be used in servicing the microscope.

2.3 Prevention of Hazards

This section summarizes potential hazards and recommended safety precautions. Failure to follow the safety instructions and instructions may result in personal injury and property damage.

2.3.1 Mechanical Hazards

Property Damage due to Transport There is a risk of injury and property damage if the microscope is improperly handled and transported.

- Only use the handle, if applicable, for transport of the microscope. Otherwise hold the microscope with one hand and the base plate with the other hand.

2.3.2 Electrical Hazards

Voltage Hazards Risk of electric shock in case of contact with live parts.

Always use the power adapter supplied by ZEISS. When an unsuitable power adapter is used, ZEISS can no longer guarantee the electrical safety and functionality of the microscope.

- Shut down the microscope.
- Disconnect the power supply before cleaning.
- Set up and operate the microscope so that the connectors are easily accessible.
- Position the microscope stand in a way so that you can easily unplug the power cable at any time.

Safe disconnection from the mains is ensured exclusively by removing the mains plug. The switch on the rear side of the microscope only switches into standby mode.

2.3.3 Hazards Generated with the Operating Environment

Dirt, Dust, and Moisture

Dirt, dust, and moisture can impair the microscope's functionality.

- Shut down the microscope whenever it is not used and cover it with a dust protection cover.
- Always cover unused openings/ports.
- Perform regular maintenance and cleaning according to the instructions in this manual.
- Make sure that no cleaning liquid or moisture gets inside the microscope.
- Make sure that the electrical parts never come into contact with moisture.
- Never expose the microscope to inadmissible climate conditions (high humidity and temperature).

2.3.4 Ergonomic Hazards

Prevention of Musculoskeletal Disorders

Musculoskeletal disorders (MSDs) affect the muscles, nerves, blood vessels, ligaments and tendons. Workers in many different industries and occupations can be exposed to risk factors at work, such as lifting heavy items, bending, reaching overhead, pushing and pulling heavy loads, working in awkward body postures and performing the same or similar tasks repetitively. Employers are responsible for providing a safe and healthful workplace for their workers.

2.3.5 Hazards Generated by Materials and Substances

Infection Hazards

Direct contact with the eyepieces can be a potential way of passing on bacterial and viral infections.

- The risk can be lowered by using personal eyepieces or eyecups. If eyepieces need to be disinfected frequently, ZEISS recommends to use the eyepieces without eyecups.
- To avoid infections, the use of personal protective equipment (PPE), e.g. gloves, for operation, cleaning, and decontamination is highly recommended. Disposable gloves can be decontaminated with alcohol for example, if necessary, or should be changed frequently to minimize the risk of contamination.

Immersion oil

Immersion oil irritates the skin and the eyes. When using immersion oil, always read the relevant safety data sheet first. Avoid any contact of the oil with skin, eyes, and clothing. After skin contact, wash the oil off with plenty of water and soap. After eye contact, immediately rinse the eye with plenty of water for at least five minutes. If the irritation persists, consult a medical specialist. Ensure that no immersion oil enters the surface water or the sewage system.

Consumable Hazards

Incorrect handling of consumables and cleaning agents can lead to property damage or skin and eye injuries. Consumables that are not approved by ZEISS can lead to property damage. Consult your ZEISS Sales & Service Partner to learn what consumables you can order and how to handle them.

Disinfectant Hazards

Ensure adequate ventilation in closed rooms. In case of insufficient ventilation, wear respiratory protective equipment. Remove any harmful residue. Allow the device to dry off after disinfection, particularly after disinfection of eyepieces. Do not inhale vapors. When using disinfectants, do not eat, drink or smoke. Avoid contact with eyes and skin. Remove contaminated clothing and wash before reuse.

Eye, Skin, Respiratory Tract Irritation

Exposure to chemicals and their aerosols can cause eye, skin and respiratory tract irritation. Use appropriate personal protective equipment (PPE).

2.3.6 Hazards Generated by Radiation

Optical Radiation Hazards

Gas discharge lights, LED lights and other sources of white light emit strong optical radiation (e.g. UV, VIS, IR). Optical radiation may cause damage to the skin and eyes. The extent of the damage depends on the parameters such as wavelength, exposure time, mode of operation (continuous or pulsed), etc.

- Avoid exposure of eyes and skin to radiation.
- Do not introduce reflective objects into the beam path.
- Never remove covers or cover panels during operation.
- Do not disable any interlock system elements.
- Use suitable protective equipment / protective clothing if required.

2.4 Labels and Lights

This chapter shows labels and, where applicable, indicator lights.

All parts that may pose specific hazards are marked with warning labels.

Always observe **all** warning labels!

- Check all warning labels for availability and legibility.
- Immediately replace damaged or illegible warning labels.

In case a label is missing please contact your ZEISS service representative for free of charge replacement.

2.4.1 Labels on the Primostar 1

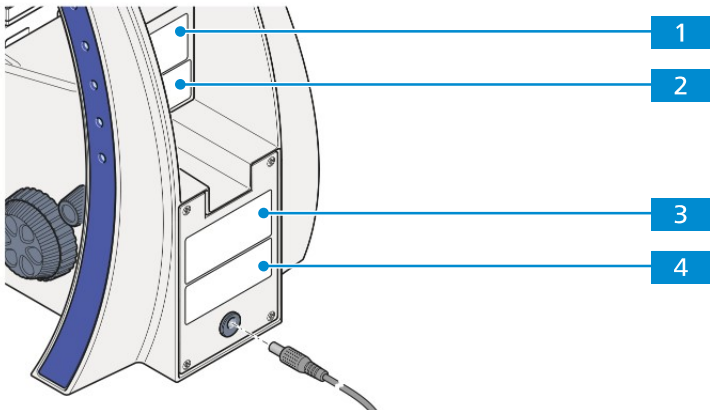


Fig. 1: Labels on the stand

Pos.	Label	Explanation
1	Carl Zeiss Suzhou Co., Ltd. Modern Industrial Square 3-B, No.333, XingPu Road SIP 215126 Suzhou, China	Microscope type label
2	⚠ CAUTION Hot surface below Operate microscope only on a stable, solid, smooth and not tinderlike surface.	CAUTION Hot surface below Operate microscope only on a stable, solid, smooth and not tinderlike (non-flammable) surface.
3	Carl Zeiss C 265366 US CE IVD 50 III	Microscope type label
4	Carl Zeiss EC REP Carl Zeiss Microscopy GmbH Carl-Zeiss-Promenade 10 07745 Jena, Germany	Primostar 1 EU representative label Carl Zeiss Microscopy GmbH Carl-Zeiss-Promenade 10 07745 Jena, Germany
*	EC REP Carl Zeiss Microscopy GmbH Carl-Zeiss-Promenade 10 07745 Jena, Germany	EU representative and importer label * Label is placed on the microscope packaging.

3 Product and Functional Description

The Primostar 1 is a transmitted-light microscope of compact design with a small footprint.

The Primostar 1 is a microscope that has been specially developed for education and routine. It features great durability in permanent use.

Typical Applications

- examination of blood and tissue samples taken from the human body, from plants, or animals
- medical examinations in laboratories, hospitals, and doctors' offices
- academic and practical education in medicine and biology
- industrial applications, e.g. in pharmacology, food technology, and wastewater examination

Info

Additional information about the hardware configuration and optional enhancements can be obtained from your ZEISS Sales & Service Partner.

3.1 Main Components of Primostar 1

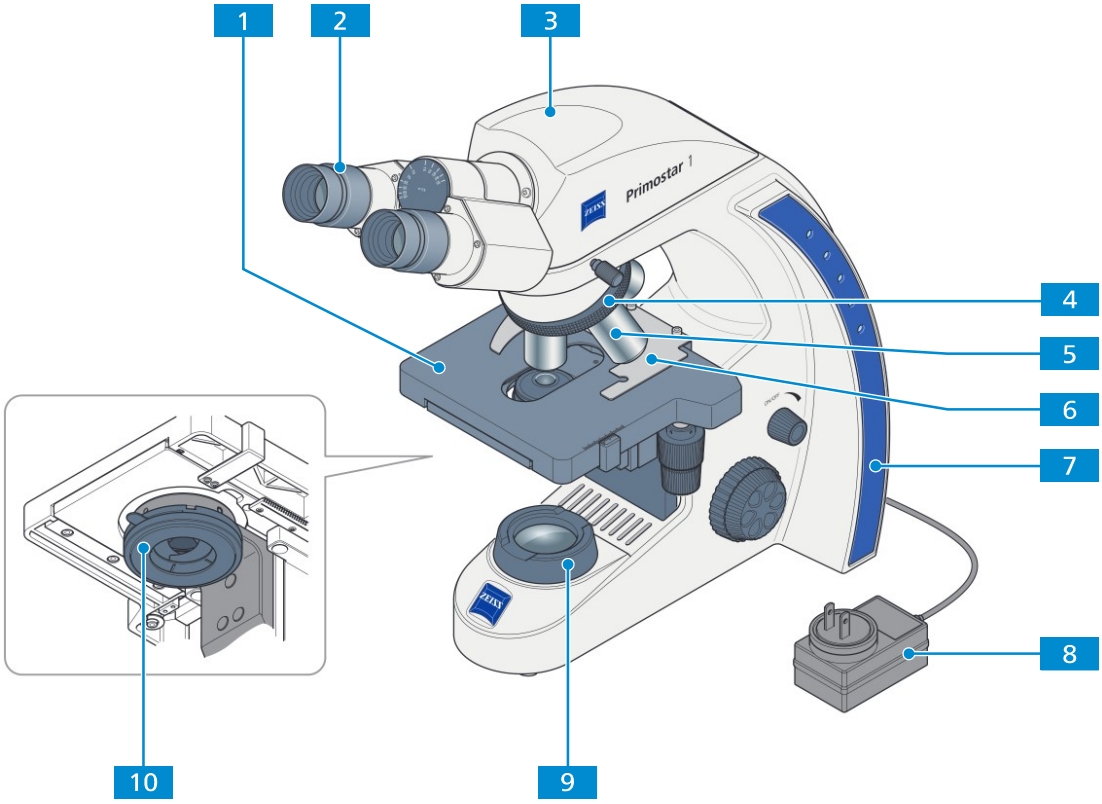


Fig. 2: Main Components of Primostar 1

1	Microscope stage	2	Eyepiece
3	Tube	4	Nosepiece
5	Objective	6	Sample holder
7	Stand	8	Power supply unit
9	Transmitted-light illumination unit	10	Abbe condenser, Fixed Köhler

3.2 Control Elements and Indicators on the Stand

Purpose The controls on the stand control the main functions of the microscope.

Position The following controls are located on the right side of the stand.

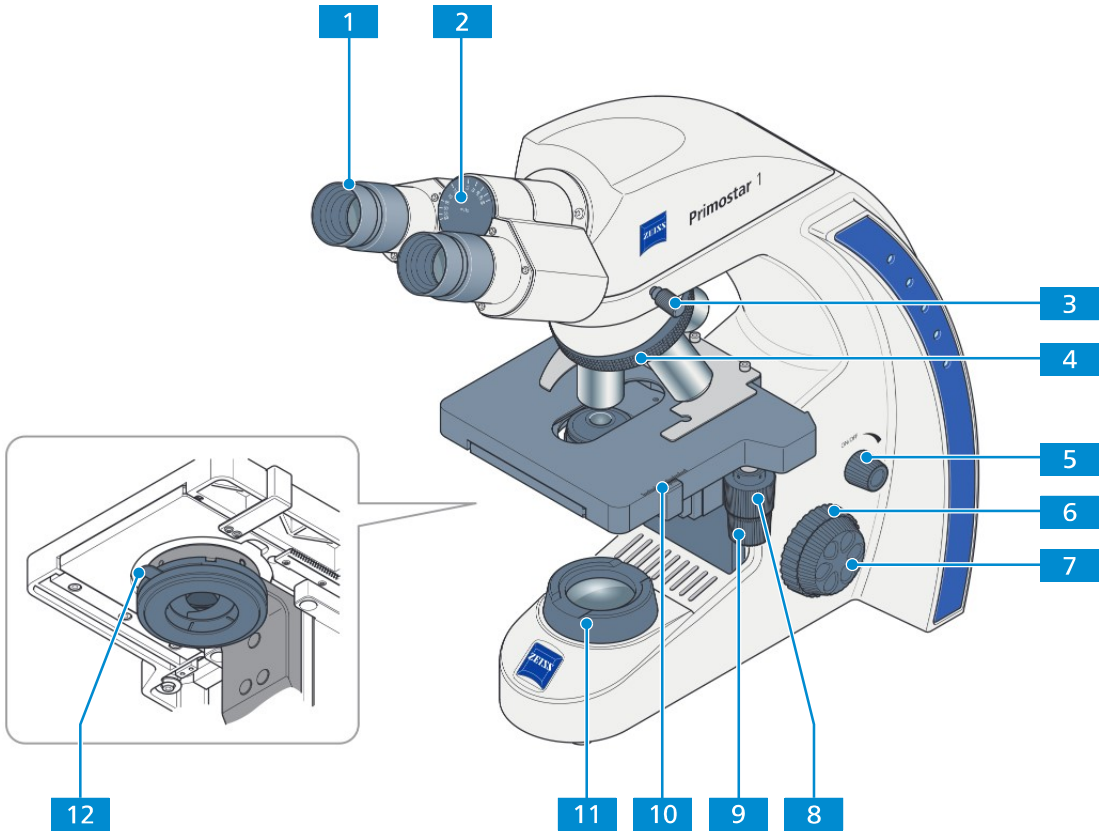


Fig. 3: Stand controls on the right side

1	Eyepiece, adjustable	2	Interpupillary distance indicator
3	Fixing screw observation tube	4	Knurled ring for turning the nosepiece
5	Light intensity knob	6	Coarse focusing drive (right side)
7	Fine focusing drive (right side)	8	Control knob for Y travel of rackless stage
9	Control knob for X travel of rackless stage	10	Vernier and scale, displaying the Y position of the stage
11	Transmitted-light illumination unit	12	Lever for adjusting the aperture diaphragm of the condenser

Position The following controls are located on the left side of the stand.

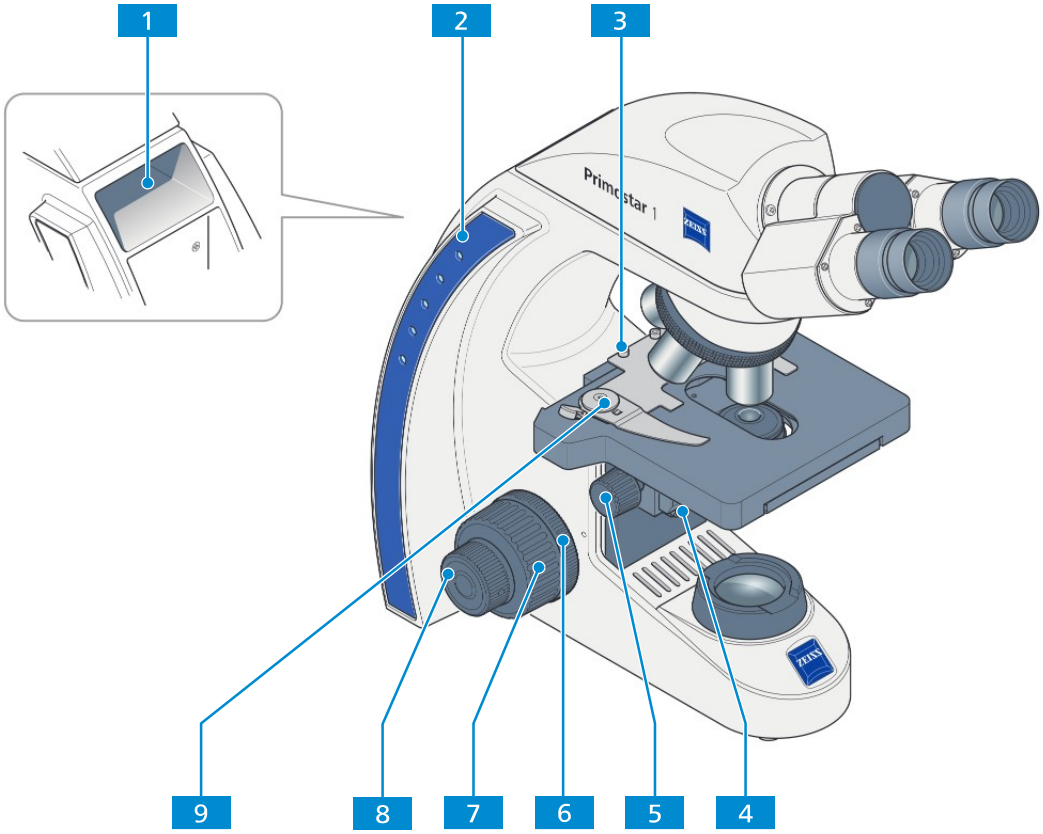
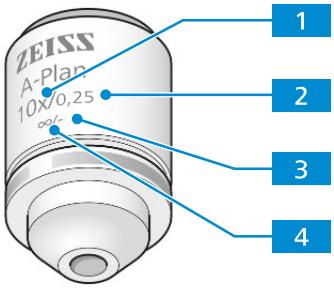


Fig. 4: Stand controls on the left side

1	Carrying handle	2	Illumination-intensity indicators for transmitted light
3	Clamping screw for the sample holder	4	Fixing screw for lowering the condenser
5	Knurled ring for condenser height adjustment	6	Knurled ring for adjusting the smoothness of the coarse focusing drive
7	Coarse focusing drive (left side)	8	Fine focusing drive (left side)
9	Lever of the sample holder for fixing the sample		

3.3 Objectives

The functional characteristics of an objective are indicated by the respective labeling, e.g. **A-Plan 10x/0,25 ∞/-**.



Obligatory label components

1 **Magnification of the objective** (**10x**)

The magnification factor specifies the magnification of the objective. Larger magnifications allow to resolve smaller features on the sample.

The objective's magnification factor is also expressed by the objective's color ring.

The objective magnification multiplied by the eyepiece magnification gives the overall magnification.

2 **Numerical aperture** (NA, **0,25**)

The numerical aperture multiplied by 1000 represents the maximum useful magnification - above that limit no additional resolution is provided.

3 **Applicable cover glass thickness** (**-**)

- : The objective can be used without cover glass or with a cover glass with a thickness of 0.17 mm.

0: The objective should be used without cover glass.

0.17: The objective should be used with a cover glass with a thickness 0.17 mm.

4 **Mechanical tube length** (∞)

∞: The objective can be used with tubes of any length.

Additional label components

Immersion Oil (**Oil**)

The objective can be used with immersion oil.

Phase contrast objective (**Ph**)

The objective can be used in phase contrast microscopy.

Image quality (**i**)

The image quality is improved.

Info

Due to their short working distance, the following objectives have a resilient mount (sample protection):

- 40x
- 100x oil

3.4 Eyepieces

Purpose The eyepieces serve to observe the microscopic image.

Position The eyepieces are inserted into the tube.

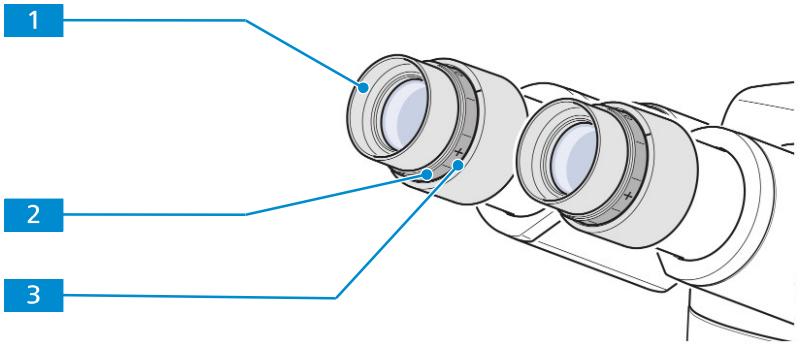


Fig. 5: Eyepiece

1 Foldover rubber eyecup

2 Focusing ring
for compensation of defective vision

3 Diopter scale
to facilitate finding the correct setting

Function Both eyepieces are suitable for spectacle wearers. Additionally, they contain a focusing ring for compensation of defective vision. The provided diopter scale helps to find the correct setting.

4 Installation

Perform only the installation work described in this document. All other installation work not described may only be carried out by an authorized ZEISS service representative.

4.1 Safety During Installation

Before installing and starting up the microscope, be sure to carefully read and observe the notes on instrument safety, see chapter Safety.

NOTICE

Pollution of the optics

Dirty optics impair the function of the microscope.

- Do not touch optical surfaces when unpacking the microscope to avoid fingerprints!

4.2 Preparing Installation

The microscope is supplied completely assembled and including accessories that are packed to commercial standards.

Additionally ordered components, such as the binocular phototube, are delivered in separate packages and must be mounted to the microscope.

Prerequisite

- ✓ The floor on which the support/table stands is subject to the least possible vibration.
- ✓ The surface of the support/table is hard and non-flammable.

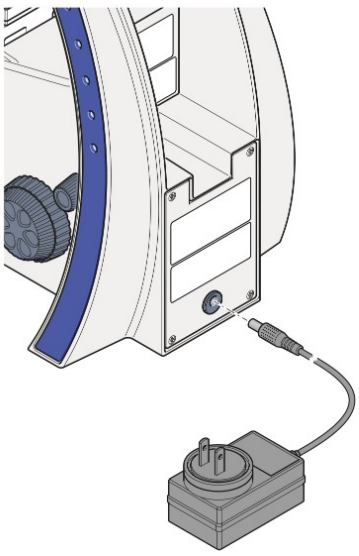
Procedure

1. Remove the microscope from the transport case and place it on the work table. The distance of the Microscope to the wall should be at least 9 cm, in order to ensure sufficient air circulation and accessibility of the cabling.
2. Retain the original packaging for longer-period non-use storage of the instrument or for return to the manufacturer.

4.3 Connecting the Microscope to the Mains Power Supply

Procedure

1. Remove the plug-in power unit from its storage fixture.
2. Connect the plug-in power unit to the mains socket of the microscope.



3. If necessary, replace the installed power outlet adapter with one of the supplied country-specific adapters.
4. Connect the plug-in power unit to the mains power supply.

5 Operation

This chapter describes switching on/off the microscope as well as the first operating steps with the microscope.

Info

For additional information and detailed descriptions, refer to further applicable documents or ask your ZEISS Sales & Service Partner.

5.1 Prerequisites for Commissioning and Operation

The following basic prerequisites are necessary for commissioning and operation:

- The Instruction Manual was read prior to commissioning or operation and kept for further use.
- The chapter **Safety** was read and understood.
- The operator is acquainted with the general Windows®-based programs.
- If required: Basic training and safety briefing were successfully completed.

5.2 Switching On the Microscope

Prerequisite ✓ *The microscope is connected to the mains [▸ 20].*

Procedure

1. Turn the light intensity knob.
2. Adjust the illumination to the desired intensity.
   → The selected intensity is indicated by the light-emitting diodes on the stand.

5.3 Adjusting the Position of the Eyepieces

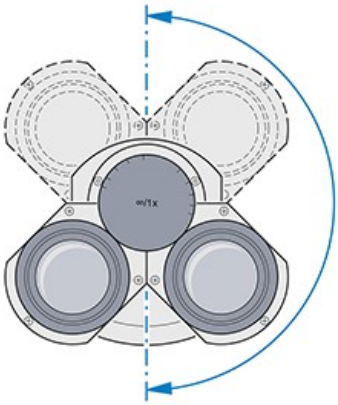
Info

The adjustment of the interpupillary distance is correct when you see only one round image while looking through the two eyepieces.

Procedure

1. Set the interpupillary distance by rotating the eyepiece tubes symmetrically toward or away from one another.

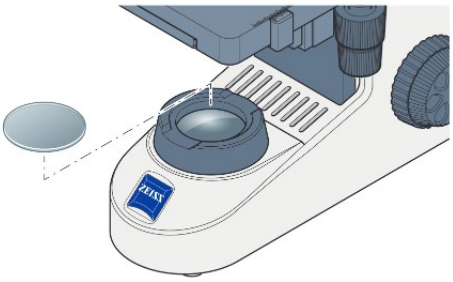
2. Set the viewing height by swivelling the eyepieces a full 180° upwards or downwards.



5.4 Installing the Blue Filter

Procedure

1. Put the blue filter onto the luminous-field diaphragm.



Proceed in the reverse order for removal.

5.5 Acquiring an Image

Info

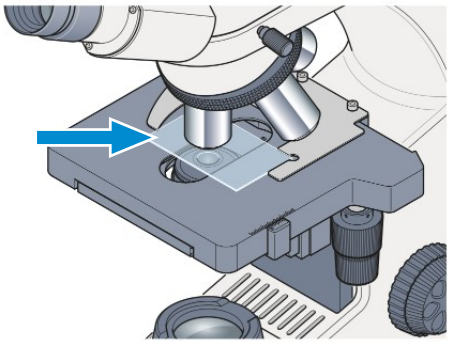
The microscope is supplied factory-adjusted.

Prerequisite

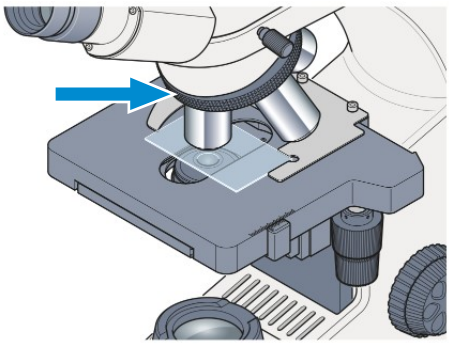
✓ *The position of the eyepieces is set [▸ 21].*

Procedure

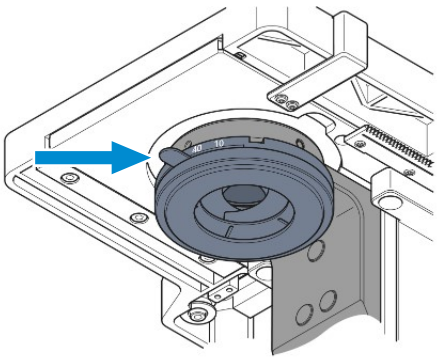
1. Place the sample in the sample holder of the mechanical stage.



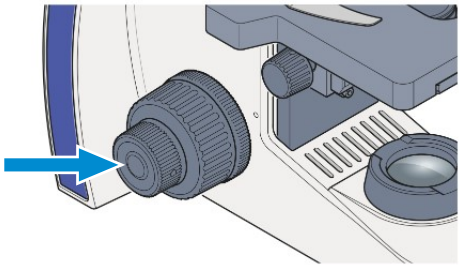
2. Select the desired magnification by placing the corresponding objective in the light path.



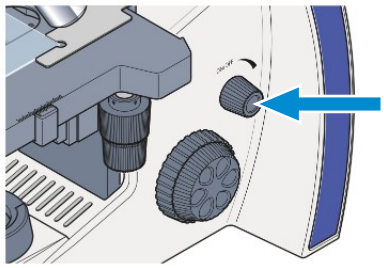
3. Set the control lever of the condenser aperture diaphragm to the value of the selected magnification (**10x**, **40x** or **100x**).



4. Focus on the sample using the focusing drive.



5. Use the rotary knob for illumination intensity to adjust the illumination to a comfortable setting.



5.6 Changing Objectives

NOTICE

Dust-sensitive components

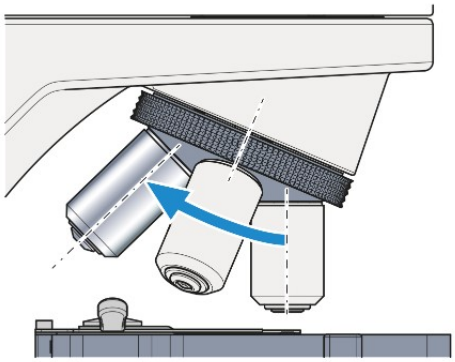
If unused nosepiece openings remain uncovered, particles may enter the microscope and may damage its optics and mechanics permanently.

- Always close unused nosepiece openings with cover caps!

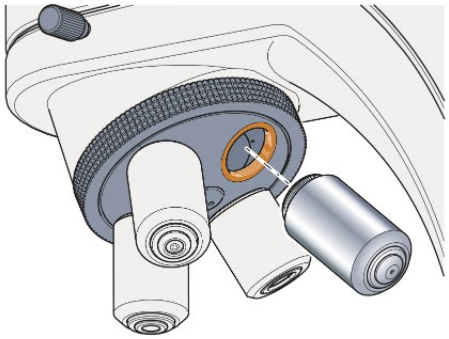
The objectives should be installed according to the direction shown in the figure in order of increasing magnification.

Procedure

1. Use the focus drive to fully lower the mechanical stage or the stage carrier.
2. Remove the cover cap or screw out the present objective from the nosepiece's relevant opening.



3. Take the objective out of its case.
4. Carefully screw the objective into the opening. Make sure it engages properly in the nosepiece's thread.



5.7 Switching Off the Microscope

Procedure

1. Turn the light intensity knob.
   → The light-emitting diodes turn off.
2. Cover the microscope with the dust cover.

6 Care and Cleaning Work

To ensure the best possible performance of the microscope, maintenance must be performed on a regular basis. Please keep the service logs for your microscope.

To maintain operational safety and reliability of the microscope, we recommend entering into a **ZEISS Protect Service Agreement**.

⚠ DANGER

Electric shock due to live parts

When the microscope is still switched on, coming in contact with live parts can lead to electric shock or burn.

- Switch off the microscope prior to opening or cleaning.
- Disconnect live parts from the power supply.

NOTICE

Functional impairment due to dirt and moisture

Dirt, dust and moisture can impair the microscope functionality and can cause short-circuits.

- Use the dust protection cover if the microscope is not used.
- The ventilation slots must be unobstructed at all times.
- Perform regular maintenance and cleaning according to the instructions in this document and according to the instructions in the applicable documents.
- Make sure that no cleaning liquid or moisture gets inside the microscope.
- In case of damage, the affected parts of the microscope must be taken out of operation.

6.1 Cleaning an Optical Surface

NOTICE

Damage of optical surfaces due to improper cleaning

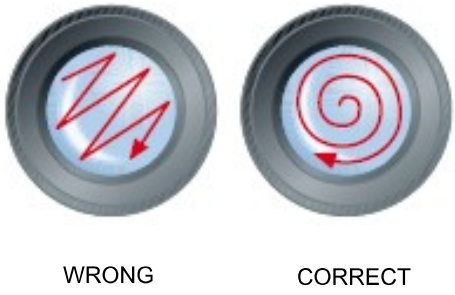
- Remove dust from the optical surface slowly and carefully.
- Remove dust on optical surfaces with a natural-hair brush or blow it off with a rubber bellows.
- Avoid touching optical surfaces with fingers.

Parts and Tools

- Clean cloth
- Cotton swab
- Optical cleaning solution (85% n-hexan and 15 vol% isopropyl alcohol (IPA))
- Lint-free cloth

Procedure

1. Moisten a cotton swab or a clean cloth with an optical cleaning solution, if necessary.
2. Wipe optical surfaces in a circular motion towards the edge of the optics with slight pressure.



3. Dry with a lint-free cloth.

6.2 Removing Water-soluble Contamination

Parts and Tools

- Clean cloth
- Lint-free cloth

Procedure

1. Moisten a clean cloth with water.
   → A mild detergent may be added to the water (no solvent!).
2. Wipe off the area with the cloth.
3. Dry with a lint-free cloth.

7 Troubleshooting

The following table provides information about solving common problems.

Info

If you cannot solve the problem or if you are unsure about a certain technical difficulty, contact your local ZEISS service representative.

Symptom	Cause	Measure
The field of view is not completely visible	Nosepiece with objective is not completely switched into the click-stop position.	Switch the nosepiece with objective into the click-stop position.
	The filter is not placed correctly on the luminous-field diaphragm.	*Place the filter correctly [▸ 22]*.
Low resolving power and poor image contrast	The aperture diaphragm is not correctly adjusted.	Set the aperture diaphragm according to the 2/3 rule or the sample features.
	The condenser is not correctly focused.	Focus the condenser.
	A wrong cover glass thickness for transmitted light objectives is used.	Use standard cover glass with a thickness of 0.17 mm if objectives are corrected for 0.17 mm cover glass thickness.
	Immersion objectives are used with no or inappropriate immersion oil.	Use immersion oil 518 N or 518 F from ZEISS.
	The immersion oil contains air bubbles.	Repeat the oiling procedure with fresh oil.
	The front lens of a dry objective is soiled with immersion oil.	Clean the front lens of the dry objective.
	Dirt or dust on the optical surfaces of objectives, eyepieces, condensers or filters.	Clean the respective optical components.
Significant difference in the focus position after changing the objective.	The focusing eyepieces re not set correctly.	Set the focusing eyepieces to the corresponding defective vision.
The LED source does not light when turning the light intensity knob.	The power plug is not plugged into the power outlet.	*Connect the power plug to the power outlet [▸ 20]*.
The stage comes down by itself, the focus is unstable.	The adjusted torque of the coarse focusing drive is too low.	Contact the ZEISS service representative.

8 Decommissioning and Disposal

This chapter contains information on the decommissioning and disposal of the microscope and its expansions/components or accessories.

8.1 Decommissioning

If the microscope and its components are not used for an extended period such as several months, they should be shut down completely and secured against unauthorized access.

NOTICE

Property damage due to short circuit

When the microscope is still switched on, coming in contact with electronic parts can lead to a short circuit.

- ▸ Switch off the microscope prior to opening or cleaning.
- ▸ Disconnect live parts from the power supply.

Procedure

1. Switch off the microscope.
2. Pull the mains plug.

8.2 Transport and Storage

The following regulations must be observed before and during transport:

- The boxes must be secured during transport.
- Avoid rocking the boxes back and forth.
- Note the weight information on the package and on the shipping document.
- Where possible, the original packaging must be used for shipping or transport.

Maximum shock resistance

- Do not drop or bump the boxes during movement or storage. Any acceleration shall be < 10 g.
- Evaluate packaging shock and tilting sensors on delivery and after internal transport.

Allowable temperature

Allowable temperature during on-site storage:

- Between -10 °C and +40 °C
- Relative humidity less than 80 % at +40 °C

Allowable temperature during transport in packaging:

- Between -40 °C and +70 °C

Info

24 hours before installation of the microscope it is required that the boxes be at recommended room temperature to avoid ingress of humidity, which is very harmful to optical paths, and to ensure effective stability of the microscope during installation and testing.

8.3 Disposal

The microscope and its components must not be disposed of as domestic waste or through municipal disposal companies. They must be disposed of in accordance with applicable regulations (WEEE Directive 2012/19/EU). ZEISS has implemented a system for the return and recycling of devices in member states of the European Union that ensures suitable reuse according to the EU Directives mentioned. The customer is responsible for decontamination.

Info

Detailed information on disposal and recycling is available from your ZEISS Sales & Service Partner.

8.4 Decontamination

A decontamination statement must be submitted before returning any used objects to the ZEISS location.

If reliable decontamination cannot be guaranteed, the hazard must be marked according to applicable regulations. In general, a well-visible warning sign must be affixed to the article itself and to the outside of the packaging, together with detailed information on the type of contamination.

9 Technical Data and Conformity

This chapter contains important technical data as well as information on the conformity.

9.1 Performance Data and Specifications

The microscope must only be operated in closed rooms. It is recommended to install the microscope in a dark room where artificial illumination, sunlight or other light sources cannot interfere with image acquisition. The microscope should not be installed near windows with direct sunlight or radiators. Compliance with the installation requirements of the microscope and the availability of the requested supplies is the responsibility of the customer and has to be provided at the time of installation. Due to continuous development, we reserve the right to change specifications without notice.

The microscope must be plugged into a properly installed power socket with protective earth contact using the supplied mains cable. The protective earth connection must not be impaired by the use of extension cables.

Info

Your ZEISS Sales & Service Partner will provide you with the detailed installation requirements.

Weight and Sizes

Main Components	Length (mm)	Width (mm)	Height (mm)	Weight (kg)
Stand with binocular tube	410	190	395	7.7

Air Conditioning and Quality

Temperature range for operation	5 to 40 °C
Relative humidity	< 80 % at 35 °C
Atmospheric pressure / altitude	800 to 1060 hPa / ≤ 2000 m above sea level
Pollution degree	2

Plug-in power unit

Nominal AC voltage	L/N 100 to 240 V ± 10 %
Nominal frequency	50 / 60 Hz
Main Power Plug	Local mains plug will be supplied.
Power consumption	max. 0.8 A
Output	12 V DC, max. 2.5 A

Mains connection

Stand rated input	12 V DC, 2.5 A
Protection class	IP20 (IEC 60529)
IEC earth class	Class III of IEC 61140
Overvoltage Category	II

9.2 Performance Data and Specifications of the Optional Components

The customer is responsible for ensuring that the installation conditions for the microscope are met and that the required equipment is already available at the time of installation. Changes are reserved due to continuous technical developments.

LED illumination	LED	white light
	Peak wavelength	440 nm
	LED class	1
	Constant, brightness-independent color temperature	3200 K
	Homogeneous field illumination	20 mm (diameter)
	Suitable for objectives with magnifications of	4x to 100x
	Analogous brightness adjustment from	approx. 15 to 100 %
Stand with stage focusing	Coarse focusing drive	42 mm / rev.
	Fine focusing drive	0.2 mm / rev.
	Total stage lift	15 mm
Nosepiece	Objective change	manual via quadruple objective nosepiece
	Objectives	infinity-corrected objective range
	Mounting thread	W 0.8
Eyepieces	Tube size	30 mm
	Field-of-view number	20 or 22
	Magnification	10x
	Suitable for spectacle wearers	Br.
	Focusable	Foc.
Sample stage	Type	Rackless
	Dimensions (width x depth)	140 x 140 mm
	Stage travel (X x Y)	75 x 40 mm
	Coaxial drive	optional right or left
	Vernier scales	readable from the right
	Sample holder	with spring lever, left

Condenser	Abbe condenser 0.9; Fixed-Köhler	for V_{obj} 4x to 100x
Illuminating mirror	Plane surface and spherical surface with f'	75 mm
Binocular tube 30°/20	Maximum field-of-view number	20
	Interpupillary distance	adjustable from 50 to 75 mm
	Tube angle	30°
	Viewing height	380 to 415 mm
	Viewing port, tube factor	1x

9.3 Applicable Standards and Regulations

Observe all general and country-specific safety regulations as well as applicable environmental protection laws and regulations.

The microscope is in compliance with the requirements of the following regulations and directives:

2011/65/EU 2015/836/EU	European Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS)
2017/746 EU	European Regulation on in-vitro diagnostic medical devices (IVDR)
EN 61010-1 IEC 61010-2-101	safety requirements for electrical equipment for measurement, control, and laboratory use
EN 61326-1 EN 61326-2-6	electrical equipment for measurement, control, and laboratory use – EMC requirements / IVD requirements
EN 62471	photobiological safety of lamps and lamp systems

According to directive 2011/65/EU (RoHS) the microscope and its accessories have been classified as instrument category 9 (Monitoring and control instruments including industrial monitoring and control instruments). They also fall under 2012/19/EU (WEEE).

European and International Directives / Standards: For more information on ISO and CSA certificates or CE Declarations of Conformity, contact your ZEISS Sales & Service Partner.

ZEISS works according to a certified Environment Management System according to ISO 14001. The microscope and its components were developed, tested, and produced in accordance with the valid regulations and guidelines for environmental law of the European Union.

10 Accessories and Optional System Expansions

Only the following accessories may be used with the microscope as their safe use has been confirmed by ZEISS. Only original parts from ZEISS may be used. Check in advance whether your microscope can be retrofitted with a system expansion or accessories.

After installation or conversion it must be carefully checked whether the microscope and its system expansions/accessories are in a safe operational state and whether unused ports are closed. For details and safety measures please refer to the associated documents.

Info

For additional information and detailed descriptions, refer to further applicable documents or ask your ZEISS Sales & Service Partner.

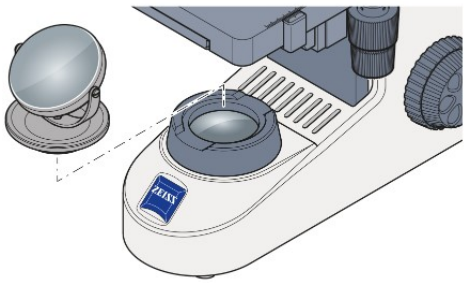
Name	Description/Info
Objectives	The performance of the microscope objectives affects the image quality of your microscope like no other system component. Whether you work with histological samples, cell samples or entire organisms – the suitability of microscope objectives for your application depends on various factors. More detailed information on available and recommended objectives can be found at https://www.micro-shop.zeiss.com/de/de/shop/objectives or ask your ZEISS Sales & Service Partner.
Mirror	When no power outlet is available, the mirror serves to illuminate the sample.
Tube	Binocular phototube 30°/20 (50:50)

10.1 Installing the Mirror

Function The mirror serves to illuminate the sample if no power outlet is available.

Procedure

1. Place the mirror onto the mount of the luminous-field diaphragm.



2. Rotate and incline the mirror until the daylight is reflected homogeneously into the light path.

Proceed in the reverse order for removal.

Revision History

Revi-sion	Date of Issue	Introduced Modifications
3	05/2022	Implementation of revision history Adaptation to Regulation (EU) 2017/746 (IVDR)

Tab. 4: Revision History

Glossary

NA

Numerical Aperture

User

Person examining a sample under the microscope.

ZEISS

ZEISS is an internationally leading technology enterprise operating in the fields of optics and optoelectronics. Further information about ZEISS can be found at www.zeiss.com.

ZEISS Sales & Service Partner

The Sales & Service Partner is generally in the field for customer support in a regional area and / or a clearly defined customer group.

ZEISS service representative

Specially trained service expert, either ZEISS staff or authorized service partner of ZEISS.

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Instruction Manual ZEISS Primostar 1
en-US | Rev. 3 | 05/2022

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