



# Leica StereoZoom<sup>®</sup>

User Manual

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## Dear Customer

Thank you for the trust you have shown in choosing one of our products. We hope you will have much enjoyment and success with your new stereomicroscope from Leica Microsystems.

With its new StereoZoom® line the Swiss Stereomicroscopy Business Unit offers a comprehensive range of stereomicroscopes for every application. The Leica L2 cold-light illuminator – also new – transforms any of the instruments into a compact, streamlined complete outfit of modern design. Possible applications range from inspection and assembly work, OEM and schools to quality assurance functions. The stereomicroscopes, cold-light source and stand are all antistatic to protect against ESD. A Terminator version is available for problematic working areas in electronics.

One of our major development goals was to make our new StereoZoom® line simple and intuitive to use. Nevertheless, please take the time to read these instructions. They will familiarize you with your stereomicroscope's advantages and enable you to use it to best effect. If you have questions at any time, please contact your Leica representative or Leica Microsystems (Switzerland) Ltd, Heerbrugg, Switzerland. We will be glad to help you. We place great emphasis on customer service – before and after purchase.

# Safety rules

- General instructions** Read the instructions for use and safety instructions before putting the stereomicroscope into operation.
- Intended application** Leica S4 E, S6 E, S6, S6 T, S6 D and S8 APO stereomicroscopes are precision optical instruments for making technical and scientific objects, object details or specimens more easily visible by means of magnification. Stands, illuminators and accessories complete the equipment.
- Improper use**
- Use of the instrument other than in the manner described in these instructions could result in personal injury or material damage.
  - Never fit other equipment connectors or dismantle optical systems and mechanical parts unless the user manual gives express instructions for doing so.
- Place of use**
- The Leica S4 E, S6 E, S6, S6 T, S6 D and S8 APO stereomicroscopes are intended primarily for indoor use.
  - If used outdoors the stereomicroscope must be protected against dust and moisture. Leica Microsystems electric illuminators and stands must not be used outdoors.
- Service work** Repair work must only be carried out by service engineers trained by Leica Microsystems. Only original spare parts from Leica Microsystems are to be used.
- Obligations of the operator**
- Make sure that personnel using this stereomicroscope have read and understood these instructions, especially the safety instructions.
  - Take steps to ensure that Leica S4 E, S6 E, S6, S6 T, S6 D and S8 APO stereomicroscopes are only operated, serviced and repaired by authorized and trained personnel.

# Safety instructions

## Electrically operated equipment

- Liquids** Handle liquids carefully.  
Liquids spilt on the instrument
- can cause the stereomicroscope and other equipment to become electrically live and injure persons,
  - can cause damage to the instrument.

- Mains cable** Check regularly to ensure that the mains cable is undamaged and avoid jerking or pulling the cable hard.  
Faulty mains cables
- can injure persons,
  - can cause the stereomicroscope and other equipment to become electrically live and injure persons.
- Ensure the cable is not in a position where someone could accidentally catch it, otherwise the instrument could tip over and fall, damaging itself or other equipment, or injuring people nearby.

- Opening the instrument** Electrical equipment may only be repaired by authorized Leica personnel.  
Disconnect the mains cable before opening the instrument. Touching the open instrument when voltage is applied may result in injury.

- Mains voltage** Make sure that the instrument is set for the correct mains voltage. Incorrect setting can damage the instrument.

**Connections** Only devices with the correct power rating may be connected to the transformers. Overloading can result in damage to the instrument.

- Changing lamps**
- Disconnect the mains cable from the mains supply before changing lamps.
  - Never put your hand in the lamp housing or transmitted-light stand when the instrument is connected to the mains.
  - Wait for filament lamps to cool down before changing. Touching hot filament lamps can result in burns.

**Statutory regulations** Observe all statutory accident prevention and environmental protection requirements.

**EC declaration of conformity** Electrically operated accessories for Leica S4 E, S6 E, S6, S6 T, S6 D and S8 APO stereomicroscopes are manufactured using state-of-the-art technology and carry an EC declaration of conformity.

# Symbols

## You will come across these symbols in this manual



### Safety warnings

This symbol denotes information that must be read and acted upon without fail.

**Disregarding safety warnings can put persons at risk!**



Disregarding safety warnings can also result in malfunctioning or damage to the instrument.



Warning against exposed hot points, e.g. filament lamps.

**Risk of burns if disregarded!**



### Important information

This symbol denotes additional information or explanations to assist understanding.

### Action

► This symbol denotes action to be taken.

### Additional information

- This symbol denotes additional information or explanations.

# Description

## **Greenough optical system**

The optical system of the Leica StereoZoom® line consists of two beam paths converging at 12°. Since the pairs of objectives are very close together, the stereomicroscopes can be constructed very “slim” towards the base. This has a number of advantages: less space required for use on bonders and machines, unimpeded working on the object, plenty of room for tools, free view of the object field.

The Greenough system provides a low-cost solution for correcting aberrations such as chromatism, curvature of the field of view and distortion. On the new Leica StereoZoom® line the optimally corrected centre of the objective is used for the image. This results in excellent optical performance with large, flat, distortion-free fields of vision and high-contrast images with maximum chromatic correction.

## **Protection against ESD**

The Leica S4 E, S6 E, S6, S6 D and S8 APO stereomicroscopes including cold-light source and stand are made of antistatic material with a surface resistance of  $2 \times 10^{11}$  ohm/square and a discharge time from 1000V to 100V of under 2 seconds.

The Leica S6 T Terminator for problematical work areas and the T incident-light stand are made of antistatic material with a surface resistance of  $10^2$ – $10^6$  ohm/square and a discharge time from 1000V to zero of under 0.1 seconds.

## **Photography**

The Leica StereoZoom® S6 D and S8 APO models are equipped with a built-in video/photo tube that allows for simple, quick setting up of digital, film and analog video cameras.

**World first** Leica StereoZoom® S8 APO is the first stereomicroscope on the market with completely apochromatic corrected Greenough system. Apochromatic optics corrects perfectly chromatic aberrations, eliminates interfering color fringes and renders even the finest details ultra sharp. Contrast, brilliance, sharpness, resolution, color fidelity and reproduction accuracy are unsurpassed. The advantage of apochromatic correction is best observed in objects that have fine, low-contrast structures such as large animal cells, cilia plants or metallic microelectronic structures.

## Features

<b>StereoZoom®</b>	<b>Zoom</b>	<b>Magnification</b>	<b>Viewing angle</b>	<b>Extras</b>
Leica S4 E	4.8:1	6.3×–30×	38°	ErgoLens
Leica S6 E	6.3:1	6.3×–40×	38°	ErgoLens
Leica S6	6.3:1	6.3×–40×	60°	ErgoLens
Leica S6 T	6.3:1	6.3×–40×	38°	Terminator ErgoLens
Leica S6 D	6.3:1	6.3×–40×	38°	Video/photo tubes Ergonomic objectives
Leica S8 APO	8:1	10×–80×	38°	Apochromatic Greenough system Apochromatic zoom Apochromatic objectives Video/photo tube

StereoZoom® is registered as a trademark in the Principal Register of the US Patent and Trademark Office

**StereoZoom®  
Leica S4 E**



**StereoZoom®  
Leica S6 E**



**StereoZoom®  
Leica S6**



Leica Design  
by Christophe Apothéloz

**StereoZoom®  
Leica S6 T**



**StereoZoom®  
Leica S6 D**



**StereoZoom®  
Leica S8 APO**



# Design

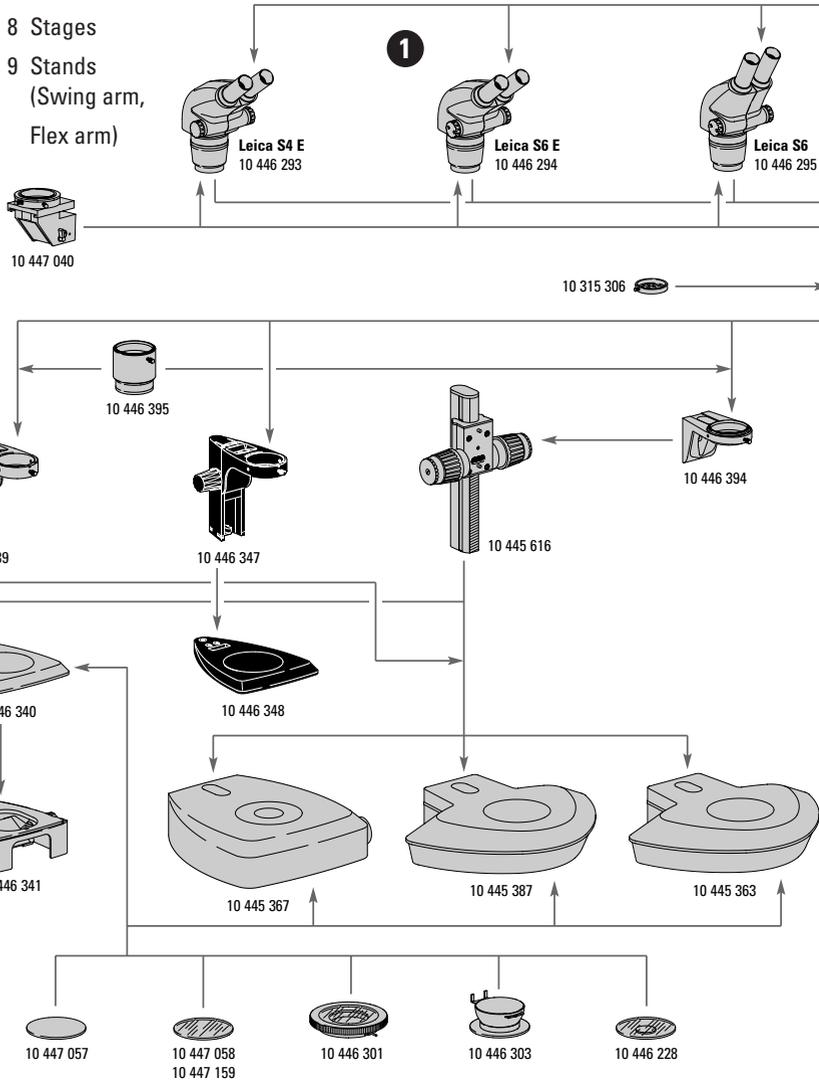
- 1 StereoZoom® Optics carriers
- 2 Objectives
- 3 Eyepieces
- 4 Carriers/ Focus arms

Detailed Descriptions see Brochure M1-188-4en.

- 5 Focus columns
- 6 Incident-light bases
- 7 Transmitted-light bases
- 8 Stages
- 9 Stands (Swing arm, Flex arm)

Low Eyepoint Eyepieces				
Eyepieces, fixed		Eyepieces, adjustable		
	10×/23	10 446 332	10×/23	10 446 333*
	16×/16	10 446 354	16×/16	10 446 355*
	20×/12	10 446 356	20×/12	10 446 357*

\* Adjustable eyepieces accept reticles, see price list



## High Eyepoint Eyepieces

### Eyepiece, fixed

10×/23 10 446 326

### Eyepieces, adjustable

10×/23 10 446 329\*  
 16×/14B 10 445 301  
 25×/9.5B 10 445 302  
 40×/6B 10 445 303

All High Eyepoint Eyepieces include Eyeguards

\* Adjustable eyepieces accept reticles, see price list

10 447 036  
 Spacing Ring required with eyepiece 10 445 301, 10 445 302, 10 445 303

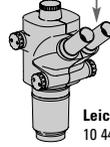
Photo / Video documentation  
 Leica DC cameras



Leica S6 T  
 10 446 296



Leica S6 D  
 10 446 297



Leica S8 APO  
 10 446 298

2

### Objectives for S4 E, S6 E, S6 T

0.32×	10 446 316
0.5×	10 446 318
0.63×	10 446 319
0.75×	10 446 320
1.6×	10 446 321
2.0×	10 446 322

Lens shield	10 446 324
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### Adjustable Lens

0.3×-0.4×	10 446 325
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### Ergolens

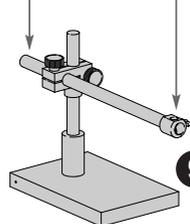
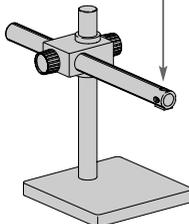
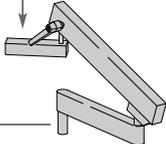
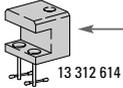
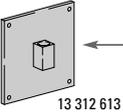
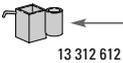
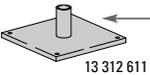
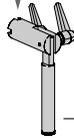
0.6×-0.75×	10 446 323
0.7×-1.0×	10 446 317

### Objective for S8 APO

0.32×	10 446 334
APO 0.63×	10 446 335
APO 1.6×	10 446 336
APO 2.0×	10 446 337



4

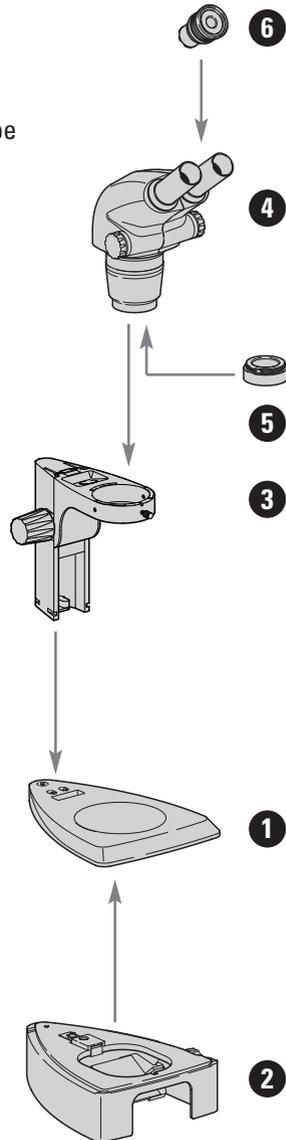


9

# Design, Basic equipment

## The components

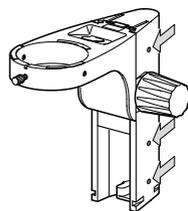
- 1 Incident-light base with stage plate
- 2 Transmitted-light base with glass stage plate
- 3 Focus column with microscope carrier
- 4 StereoZoom® optics carrier
- 5 Optional additional objective
- 6 Eyepieces, fixed and/or adjustable



# Assembly

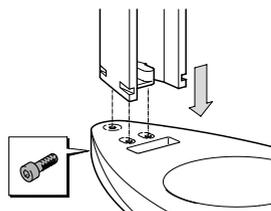


Never loosen the 3 screws on the right-hand side of the focus column.



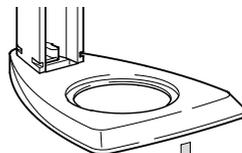
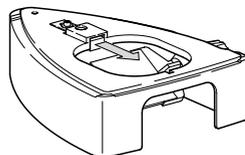
## Focus column → Incident-light base

- ▶ Remove stage plate.
- ▶ Insert 3 hexagon head screws through the underside of the baseplate and screw tight in the focus column.
- ▶ Replace stage plate.

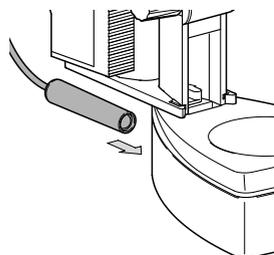


## Transmitted-light base → Incident-light base

- ▶ Remove glass stage plate.
- ▶ Undo locking device.
- ▶ Place incident-light stand on the transmitted-light base and engage in the connecting screw.
- ▶ Close locking device.
- ▶ Replace glass stage plate.



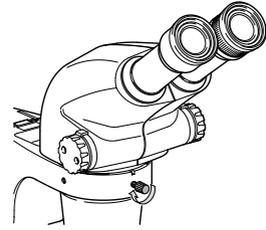
- ▶ Insert universal light guide in the socket at the back (see user manual for the Leica L2 cold-light source).



# Assembly

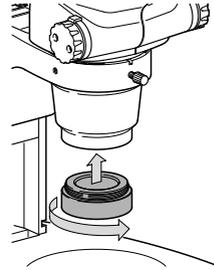
## Optics carrier → Stand

- ▶ Insert optics carrier carefully in the microscope carrier.
- ▶ Fix optics carrier in the desired position with the clamping screw.



## Additional objective (optional) → Optics carrier

- ▶ Screw selected objective tight in counterclockwise direction.

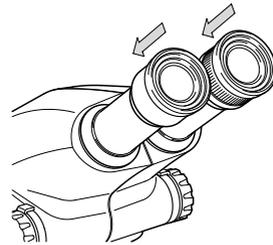


## Lens shield (optional)

- ▶ Screw the lens shield tightly into the thread on the StereoZoom® or onto the additional objective.

## Eyepieces → Eyepiece tube

- ▶ Push eyepiece into the eyepiece tube as far as it will go.
- ▶ Check that it sits firmly and snugly.



The following eyepieces are available for StereoZoom®:

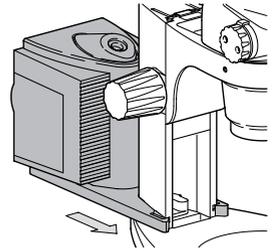
- 10×/23, 16×/16, 20×/12, fixed and adjustable with 12mm exit pupil
- 10×/23B eyepiece fixed and adjustable, for spectacle wearers, with 22mm exit pupil
- 16×/14B, 25×/9.5B, 40×/6B wide-field eyepieces, adjustable, with 22mm exit pupil. Spacing ring required for spectacle wearers



You can combine your StereoZoom® with a fixed and an adjustable eyepiece. Two adjustable eyepieces are required for equipment which has a reticle in an eyepiece for measurement or photography purposes. We recommend that you also equip the high-performance Leica StereoZoom® S8 APO with **two** adjustable eyepieces.

### **Leica L2 cold-light source → Stand**

With its fibre-optic light guides the Leica L2 cold-light source is the illumination of choice for the Leica S4 E, S6 E, S6 and S6 T stereomicroscopes. Matching adapters are available for connecting the Leica L2 cold-light source to various stereomicroscope stands and for standalone operation.



Detailed information on the construction and use of the Leica L2 can be found in the relevant user manual.



Please note that the universal light guide on the Leica S8 APO can only be used with the sideways-mounted lamp arm.

### **High-performance lighting**

For higher requirements, e.g. for photography or in combination with the Leica S8 APO, we offer a diverse, high-performance transmitted light stand and low-voltage lighting. Please ask your Leica advisor about the options.

# Assembly

## Graticule → Adjustable eyepieces

The following graticules and stage micrometers are available for calibration:

Graticule 10mm/0.1mm

Graticule 5mm/0.1mm

Graticule 5mm/0.05mm

Graticule 100 div./0.002"

Graticule 100 div./0.001"

Graticule 150 div./0.0005"

Crosshair

Stage micrometer 50mm, 0.1/0.01mm divisions

Stage micrometer 1", 0.001" divisions

For photography, a 10× format reticle is available.

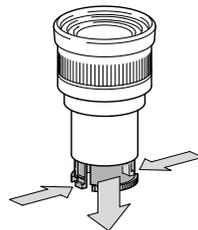


**Two** adjustable eyepieces are required for equipment which has a reticle in an eyepiece for measurement or photography purposes.

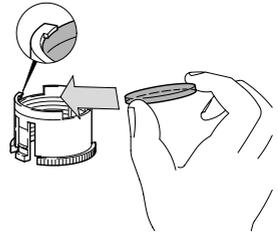
The graticules can be inserted into adjustable eyepieces and eyepieces for spectacle wearers:

► Ascertain with the aid of the stereomicroscope on which side the vacuum-metalized scale is located. The scale should be visible on the correct side.

► Pull out the insert from the bottom of the eyepiece and place it with the knurled side on the table.

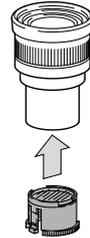


- ▶ Pick up the graticules at the edge so as not to leave fingerprints and slide into the holder from the side.



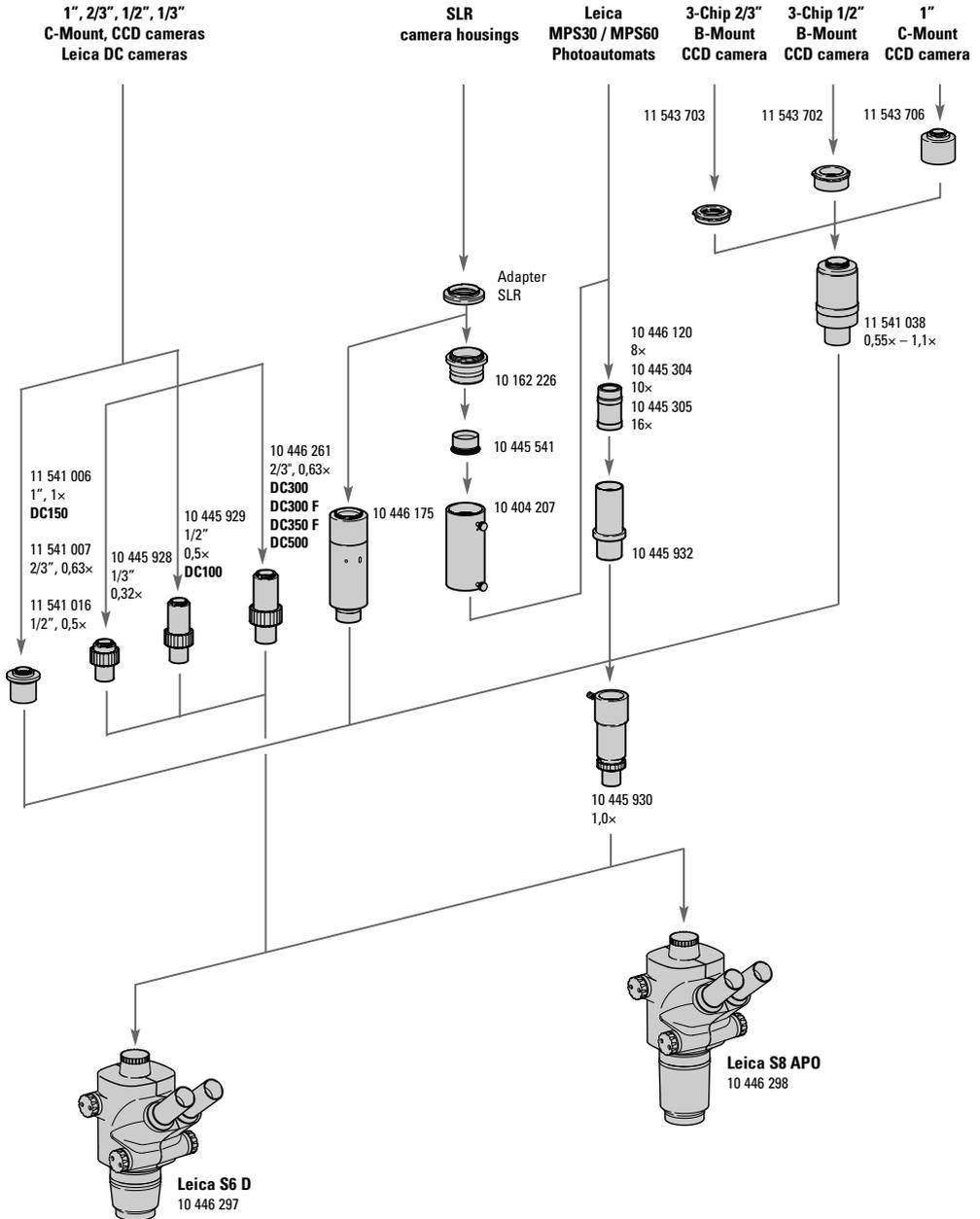
- ▶ Put the insert back into the eyepiece and press firmly in place.

- ▶ Insert the eyepiece into the eyepiece tube and line up the graticule by turning the eyepiece in the eyepiece tube.



The measuring process is described in the “Measuring” instructions.

# Assembly



**Camera assembly for  
Leica S6 D and  
S8 APO**

Leica StereoZoom® S6 D and S8 APO are equipped with a built-in video/photo tube that allows for simple, quick setting up of digital, film and analog video cameras. Please ask your Leica advisor about the options.

You can find detailed information about Leica camera systems, accessories and image management software in the corresponding manuals.

- ▶ Remove the dust cover from the video/photo output.
- ▶ Always close the video/photo output with the dust cover if there is no camera attached.
- ▶ Attach appropriate video or photo objective, according to which camera is used (see scheme p.20).

**Format reticle**

The format reticle is used to test the sharpness and picture detail. Borderlines are displayed on the reticle for all film formats.

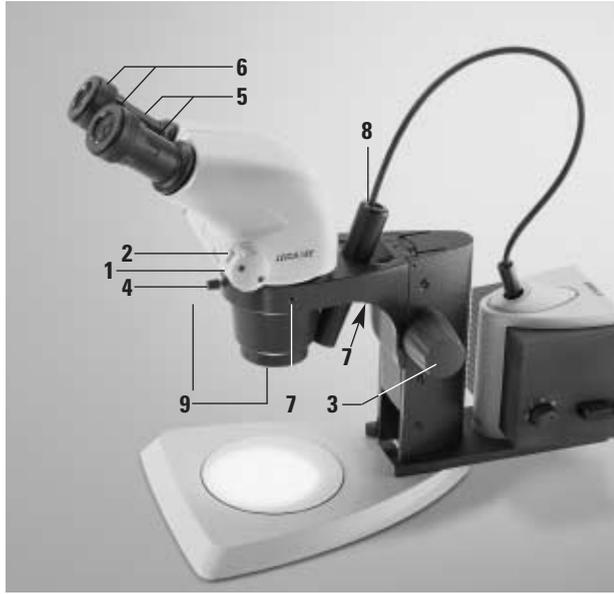


The left observation beam path and the photo output are aligned with one another. Always judge, therefore, the picture detail and the sharpness in the left eyepiece.

- ▶ Insert format reticle into an adjustable eyepiece (see p.18).
- ▶ Insert eyepiece with reticle into the left tube.

# Operating

## Overview



### Standard controls and their functions

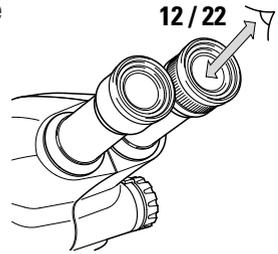
- 1 Magnification changer, right-hand pinion knob with magnification scale
- 2 S6 models: zoom limiter stop
- 3 Focusing drive
- 4 Fixing screw  
fixes the optics carrier in the microscope carrier
- 5 Adjustable eyepiece tubes:  
Interpupillary distance adjustable from 55–75mm
- 6 Eyepieces
- 7 Lamp bracket mounting thread (on both sides and at rear)
- 8 Socket for connecting for the Leica L2 universal light guide (not for Leica S8 APO)
- 9 Thread for additional objective/lens shield

### Interpupillary distance and exit pupil

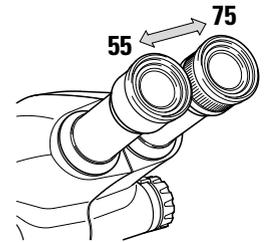
The **interpupillary distance** can be adjusted from 55–75mm.

The **exit pupil** is the distance between the eye and eyepiece. It is

- 12mm on the 10×/23, 16×/16 and 20×/12 standard eyepieces
- 22mm on the 10×/23B, fixed and adjustable, for spectacle wearers, and on the 16×/14B, 25×/9.5B and 40×/6B wide-field eyepieces for spectacle wearers



- ▶ Carefully put your eyes against the eyepieces and push the eyepiece tubes together or apart until with both eyes you can see a single shadow-free circular field.



### Eyecups

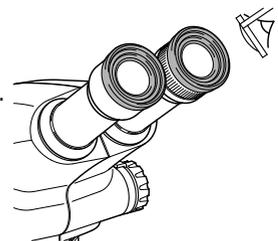
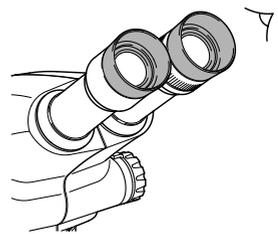
The 10×/23B, 16×/14B, 25×/9.5B and 40×/6B eyepieces for spectacle wearers are supplied with detachable eyecups.

If you do not wear spectacles and want the eyecups to fit snugly round your eyes:

- ▶ Attach the eyecups to the eyepieces.

You wear spectacles for your work.

- ▶ Fold the eyecups downwards.
  - The folded-down eyecups will protect your spectacle lenses against scratching.



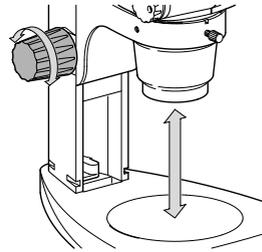
# Operating

## Setting working distance and focusing

To focus the stereomicroscope, raise or lower it using the focusing drive until the desired object segment is in focus, i.e. inside the objective's working distance. The working distances of the various objectives are listed in the tables on pages 38–40.

You can operate the focusing drive with either your right or left hand.

- ▶ Position the object under the objective.
- ▶ Select the minimum magnification.
- You should select the minimum magnification because it is easier to find the desired object segment in a large field of vision.
- ▶ Look into the eyepieces.
- ▶ Focus the object by turning the pinion knob.



## Tension adjustment

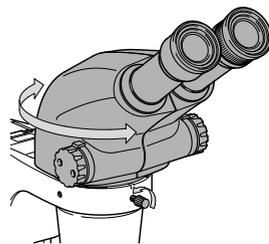
Is the focusing drive too stiff/too loose or does the set-up slip down unassisted? You can tension the focusing drive to suit the weight of the set-up and your own needs:

- ▶ Take one pinion knob in each hand and turn in opposing directions until the desired tension is reached.

### **Tilting the optics carrier to a lateral position**

The optics carrier can be tilted sideways if the user wants to work from a lateral position:

- ▶ Loosen the clamping bolt.
- ▶ Tilt the optic carrier sideways to the desired position.
- ▶ Tighten the clamping bolt.



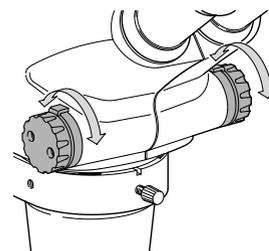
### **Zoom magnification changer**

All StereoZoom® models are equipped with a continuously adjustable magnification changer that can be operated with either the right or left hand. The right-hand pinion knob carries a magnification scale. The ranges are:  
– 0.63 to 3 on the S4 E and  
– 0.63 to 4 on the S6 models  
– for S8 APO from 1 to 8

### **Changing magnification**

The tables on pages 38 to 40 list the magnifications and field diameters as a function of magnification changer position and the eyepiece/objective combination being used.

- ▶ Look into the eyepieces.
- ▶ Bring the object into focus (p.24)
- ▶ Rotate the magnification changer until the desired magnification is achieved.



# Operating

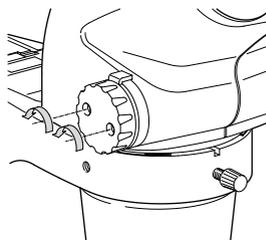
## Setting the zoom limiter

On the S6 models and for the S8 APO it is possible to fix the maximum and minimum zoom. The same function can be used to set a fixed level of magnification.

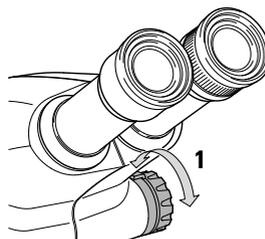
### Example: Setting a zoom range of 1 to 3.2

1. Set the minimum zoom level at 1 using the stop on the left-hand pinion knob:

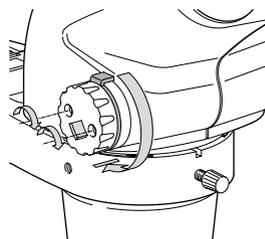
- ▶ Loosen the hexagon head screws on the left-hand pinion knob using the Allen key supplied.



- ▶ Turn the right-hand pinion knob to 1.

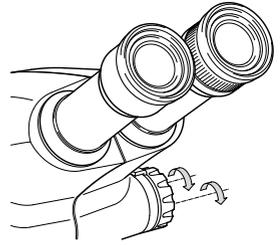


- ▶ Move the stop on the left-hand pinion knob forwards until it touches the built-in zoom stop.
- ▶ Tighten the hexagon head screws.

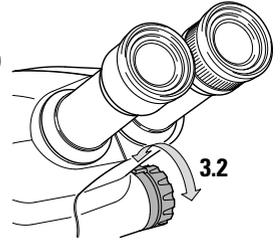


2. Set the maximum zoom level at 3.2 using the stop on the right-hand pinion knob:

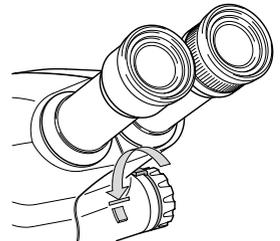
- ▶ Loosen the hexagon head screws on the right-hand pinion knob.



- ▶ Turn the right-hand pinion knob to 3.2.



- ▶ Move the stop on the right-hand pinion knob backwards until it touches the built-in zoom stop.



- ▶ Tighten the hexagon head screws.

# Operating

## **Diopter adjustment and setting parfocality**

If you adjust the diopters at the adjustable eyepiece as described below, the focus will remain constant, or parfocal, from minimum to maximum magnification. In other words, you will not have to refocus when you change magnification, but only when you want to examine a higher- or lower-positioned object segment. Make full use of this feature, which is not available on every stereo microscope.

- Diopter adjustment is possible within a range from +5 to -5.

Every user has to make the following adjustments only once.

If you are using a graticule, the diopter adjustment and parfocality setting procedure is slightly different to that described here. Please refer to the section on measurement in the graticule user manuals.

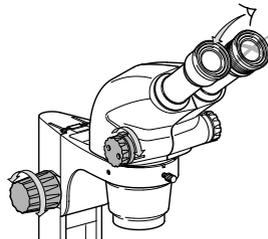
## **Setting up diopter with an adjustable and a fixed eyepiece**

### **Preparations**

- ▶ Set up illuminator.
- ▶ Set interpupillary distance (p.23).
- ▶ Set approximate working distance using the focusing drive (see p.38–40 for the working distances of the various objectives).

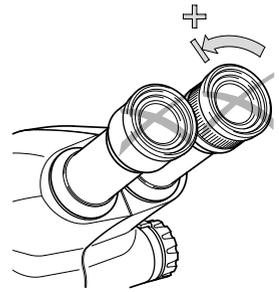
### **Bring the test object into focus**

- ▶ Position a flat test object beneath the objective.
- ▶ Set the microscope to minimum magnification.
- ▶ Close the eye that is looking into the adjustable eyepiece and look into the fixed eyepiece with the other eye.
- ▶ View the test object and bring into focus with the focusing drive.

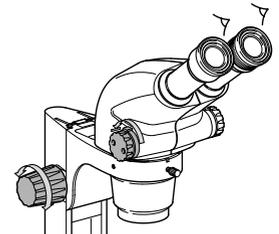
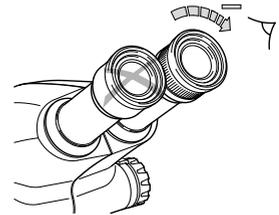


## Diopter adjustment at the adjustable eyepiece

- ▶ Without looking into the eyepieces, turn the eyelens of the adjustable eyepiece as far as possible in the “+” direction.



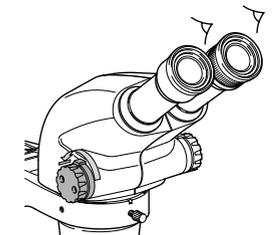
- ▶ Close the eye that is looking into the fixed eyepiece and look into the adjustable eyepiece with the other eye.
- ▶ View the test object and slowly turn the eyelens clockwise (the “-” direction) until the object is in focus.
- ▶ Set the microscope to maximum magnification.
- ▶ View the test object with both eyes and bring it into sharp focus with the focusing drive.



## Checking parfocality

View the object while zooming from minimum to maximum magnification.

- The object should remain in constant focus (parfocal) at all times. If it does not, please repeat the procedure above.

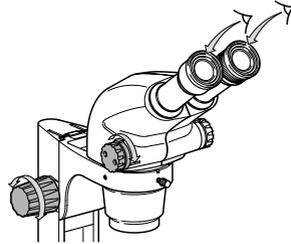


# Special notes

## Setting up diopter with two adjustable eyepieces

- Preparations**
- ▶ For Leica S6 D and S8 APO, set pinion knob to Vis position.
  - ▶ Set approximate working distance by means of focusing drive (working distances of various objectives see p.38–40).
  - ▶ Set up lighting
  - ▶ Set viewing distance (p.23).
  - ▶ Set '0' diopters on both eyepieces.

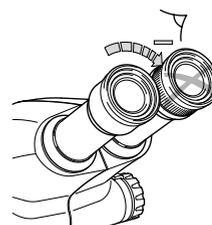
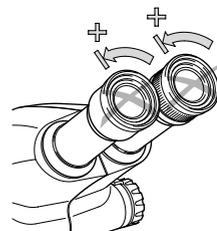
- Focusing on test object**
- ▶ Place flat test object under the objective.
  - ▶ Set lowest magnification.
  - ▶ View test object through the eyepiece and focus using the focusing drive.



- ▶ Set highest magnification.
- ▶ Optimize sharpness using the focusing drive.

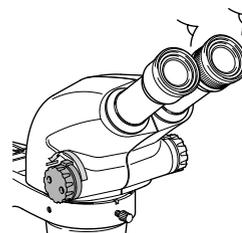
## Regulating diopters

- ▶ Set lowest magnification.
- ▶ Do not look into the eyepiece!
- ▶ Turn lens counterclockwise in the '+' direction until it stops.
- ▶ Now look into the eyepiece.
- ▶ Close one eye.
- ▶ With the other eye, observe the test object and turn the lens slowly clockwise in the '-' direction, until this eye sees the object clearly.
- ▶ Set the diopter for the other eye in the same way.



## Testing parfocality

- ▶ Select highest magnification.
- ▶ View object and, if necessary, gently refocus.
- ▶ Adjust magnification changer from the lowest to the highest magnification.
- When doing this, the sharpness must remain constant over the entire zoom range (parfocal). Otherwise, please repeat the procedure.

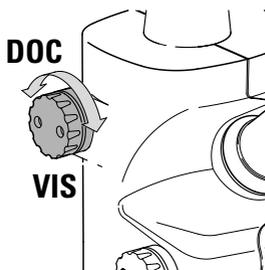


# Operating

## Photography with Leica S6 D and S8 APO

It is possible to switch between the observation and photo beam paths. Light distribution:

- in 'Vis' position: 100% light in both eyepieces/no light in the video/photo beam path
- in 'Doc' position: 100% light in the right eyepiece/no light in the left eyepiece/100% light in the video/photo beam path



- ▶ When the picture detail and sharpness are set to your satisfaction, switch to the 'Doc' position and take your photo.

# Special notes

**What do I do if ...** ... the field of vision is in shadow?

- Remedy**
- Adjust interpupillary distance and ensure that it is correct (p.23).
  - Check pupil position (p.23).

... the image will not stay in focus?

- Remedy**
- Insert eyepieces correctly (p.16).
  - Correct diopter adjustment exactly as described (p.28–31).

... the focusing drive slides down or is difficult to turn?

- Remedy**
- Adjust tension (p.24).

If you encounter problems with electrically powered equipment, first check:

- that the voltage selector is set to the correct voltage.
- that the mains power switch is in the 'on' position.
- that the mains power cable is correctly connected.
- that all connector cables are correctly connected.
- that none of the fuses have blown.

... the image is too dark?

- Remedy**
- Set regulating knob high enough.

Photographs are blurred.

- Remedy**
- Focus precisely (p.24).
  - Focus on reticles and carry out diopters-correction exactly according to the instructions (p.30).
  - Insert eyepieces all the way in (p.16).
  - Check that the reticles are firmly placed in the eyepiece (p.18).

No image on the film

- Remedy**
- Switch light divider on the photo tube to the 'Doc' position (p.32).

# Care

In this section we would like to explain how you can take care of your microscope and give you a few tips on cleaning.

- Protect your microscope**
- against moisture, vapours, acids, alkalis and caustic substances.

Never keep chemicals close to your microscope.

- against improper handling.

Never fit other equipment connectors or dismantle optical systems and mechanical parts unless the user manual gives express instructions for doing so.

- against oil and grease.

Never grease guides and mechanical parts.

- Dust and dirt impair your results.**
- Therefore:**
- Cover your microscope with its dust cover during breaks.
  - Put dust covers over tube openings, eyepieces, and eyepiece tubes without eyepieces.
  - Remove dust with a rubber blower and soft brush.
  - Clean eyepieces and objectives with special optical cleaning cloths and pure alcohol.
  - Keep accessories in a dust-free environment when not in use.

**Cleaning plastic parts**

Various components are made of plastic or are plastic-coated to make them pleasant to touch and handle. However, incorrect cleaning with unsuitable detergents can damage the plastic. Please observe the following do's and don'ts:

**Never clean plastics**

- in an ultrasonic cleaner. The plastic may become brittle and eventually break.
- with caustic or acetone-containing substances such as ether substitute.
- with any other solvents except ethanol and isopropanol.

**To clean plastics safely use**

- warm soapy water, rinsing the plastic afterwards with distilled water.
- ethanol (industrial alcohol) and isopropanol.



Always take appropriate safety precautions when using ethanol and isopropanol.

## Special notes

**We guarantee quality**    **You are working with a high-performance precision instrument, whose quality we guarantee.**

**The warranty covers manufacturing and materials faults, but not damage resulting from negligence or incorrect handling.**

If you treat your valuable optical instrument with due care, it will repay you with the decades of reliable precision for which Leica instruments are renowned.

However, should you encounter problems with your microscope at any time, please contact your local Leica representative or Leica Microsystems Ltd, Heerbrugg, Switzerland.

**Calculating total magnification and field diameter**

- M<sub>O</sub>** Objective magnification
- M<sub>E</sub>** Eyepiece magnification
- z** Magnification changer setting
- N<sub>FOV</sub>** Eyepiece field number. Field numbers are printed on the eyepieces:  
10×/23, 16×/16, 20×/12, 10×/23B, 16×/14B, 25×/9.5B, 40×/6B

**Example:**

- M<sub>O</sub>** 1.6× objective
- M<sub>E</sub>** 20×/12 eyepiece
- z** Zoom position 4.0

**Magnification in the binocular tube:**

$$M_{TOT\ VIS} = M_O \times M_E \times z \quad 1.6 \times 20 \times 4 = 128$$

**Field diameter in the object:**

$$\varnothing_{OF} = \frac{N_{FOV}}{M_O \times z} = \frac{12}{1.6 \times 4} = 1.9\text{mm}$$

# Optical Data, Leica S4 E, S6 E, S6, S6 T, S6 D

		with additional objectives											
		0.32×		0.5×		0.63×		0.75×		1.6×			
Working distance		110mm		300mm		200mm		155mm		130mm		55mm	
Eyeieces	Zoom position *4.0: S6	Total magnification	Field diameter mm	Total magnification	Field diameter mm	Total magnification	Field diameter mm	Total magnification	Field diameter mm	Total magnification	Field diameter mm	Total magnification	Field diameter mm
10 446 332 10 446 333 10×/23 10×/23B 10 446 326 10 446 329	0.63	6.3	36.5	2.0	115.0	3.2	71.9	4.0	57.5	4.7	48.9	10.1	22.8
	0.8	8.0	28.8	2.6	88.5	4.0	57.5	5.0	46.0	6.0	38.3	12.8	18.0
	1.0	10.0	23.0	3.2	71.9	5.0	46.0	6.3	36.5	7.5	30.7	16.0	14.4
	1.25	12.5	18.4	4.0	57.5	6.3	36.5	7.9	29.1	9.4	24.5	20.0	11.5
	1.6	16.0	14.4	5.1	45.1	8.0	28.8	10.1	22.8	12.0	19.2	25.6	9.0
	2.0	20.0	11.5	6.4	35.9	10.0	23.0	12.6	18.3	15.0	15.3	32.0	7.2
	2.5	25.0	9.2	8.0	28.8	12.5	18.4	15.8	14.6	18.8	12.2	40.0	5.8
	3.2	32.0	7.2	10.2	22.5	16.0	14.4	20.2	11.4	24.0	9.6	51.2	4.5
	4.0*	40.0	5.8	12.8	18.0	20.0	11.5	25.2	9.1	30.0	7.7	64.0	3.6
	16×/16 10 446 354 10 446 355	0.63	10.1	25.3	3.2	80.0	5.0	51.2	6.4	40.0	7.6	33.7	16.1
0.8		12.8	20.0	4.1	62.4	6.4	40.0	8.1	31.6	9.6	26.7	20.5	12.5
1.0		16.0	16.0	5.1	50.2	8.0	32.0	10.1	25.3	12.0	21.3	25.6	10.0
1.25		20.0	12.8	6.4	40.0	10.0	25.6	12.6	20.3	15.0	17.1	32.0	8.0
1.6		25.6	10.0	8.2	31.2	12.8	20.0	16.1	15.9	19.2	13.3	41.0	6.2
2.0		32.0	8.0	10.2	25.1	16.0	16.0	20.2	12.7	24.0	10.7	51.2	5.0
2.5		40.0	6.4	12.8	20.0	20.0	12.8	25.2	10.2	30.0	8.5	64.0	4.0
3.2		51.2	5.0	16.4	15.6	25.6	10.0	32.3	7.9	38.4	6.7	81.9	3.1
4.0*		64.0	4.0	20.5	12.5	32.0	8.0	40.3	6.4	48.0	5.3	102.4	2.5
20×/12 10 446 356 10 446 357		0.63	12.6	19.0	4.0	60.0	6.3	38.1	7.9	30.4	9.5	25.3	20.2
	0.8	16.0	15.0	5.1	47.1	8.0	30.0	10.1	23.8	12.0	20.0	25.6	9.4
	1.0	20.0	12.0	6.4	37.5	10.0	24.0	12.6	19.0	15.0	16.0	32.0	7.5
	1.25	25.0	9.6	8.0	30.0	12.5	19.2	15.8	15.2	18.8	12.8	40.0	6.0
	1.6	32.0	7.5	10.2	23.5	16.0	15.0	20.2	11.9	24.0	10.0	51.2	4.7
	2.0	40.0	6.0	12.8	18.8	20.0	12.0	25.2	9.5	30.0	8.0	64.0	3.8
	2.5	50.0	4.8	16.0	15.0	25.0	9.6	31.5	7.6	37.5	6.4	80.0	3.0
	3.2	64.0	3.8	20.5	11.7	32.0	7.5	40.3	6.0	48.0	5.0	102.4	2.3
	4.0*	80.0	3.0	25.6	9.4	40.0	6.0	50.4	4.8	60.0	4.0	128.0	1.9
	16×/14B 10 445 301	0.63	10.1	22.2	3.2	70.0	5.0	44.8	6.4	35.0	7.6	29.5	16.1
0.8		12.8	17.5	4.1	54.6	6.4	35.0	8.1	27.7	9.6	23.3	20.5	10.9
1.0		16.0	14.0	5.1	43.9	8.0	28.0	10.1	22.2	12.0	18.7	25.6	8.8
1.25		20.0	11.2	6.4	35.0	10.0	22.4	12.6	17.8	15.0	14.9	32.0	7.0
1.6		25.6	8.8	8.2	27.3	12.8	17.5	16.1	13.9	19.2	11.7	41.0	5.5
2.0		32.0	7.0	10.2	22.0	16.0	14.0	20.2	11.1	24.0	9.3	51.2	4.4
2.5		40.0	5.6	12.8	17.5	20.0	11.2	25.2	8.9	30.0	7.5	64.0	3.5
3.2		51.2	4.4	16.4	13.7	25.6	8.8	32.3	6.9	38.4	5.8	81.9	2.7
4.0*		64.0	3.5	20.5	10.9	32.0	7.0	40.3	5.6	48.0	4.7	102.4	2.2
25×/9.5B 10 445 302		0.63	15.8	15.0	5.0	47.5	7.9	30.1	9.9	24.0	11.8	20.1	25.2
	0.8	20.0	11.9	6.4	37.1	10.0	23.8	12.6	18.8	15.0	15.8	32.0	7.4
	1.0	25.0	9.5	8.0	29.7	12.5	19.0	15.8	15.0	18.8	12.6	40.0	5.9
	1.25	31.3	7.6	10.0	23.8	15.6	15.2	19.7	12.1	23.4	10.1	50.0	4.8
	1.6	40.0	5.9	12.8	18.6	20.0	11.9	25.2	9.4	30.0	7.9	64.0	3.7
	2.0	50.0	4.8	16.0	14.8	25.0	9.5	31.5	7.5	37.5	6.3	80.0	3.0
	2.5	62.5	3.8	20.0	11.9	31.3	7.6	39.4	6.0	46.9	5.1	100.0	2.4
	3.2	80.0	3.0	25.6	9.3	40.0	5.9	50.4	4.7	60.0	4.0	128.0	1.9
	4.0*	100.0	2.4	32.0	7.4	50.0	4.8	63.0	3.8	75.0	3.2	160.0	1.5
	40×/6B 10 445 303	0.63	25.2	9.5	8.1	29.6	12.6	19.0	15.9	15.1	18.9	12.7	40.3
0.8		32.0	7.5	10.2	23.5	16.0	15.0	20.2	11.9	24.0	10.0	51.2	4.7
1.0		40.0	6.0	12.8	18.8	20.0	12.0	25.2	9.5	30.0	8.0	64.0	3.8
1.25		50.0	4.8	16.0	15.0	25.0	9.6	31.5	7.6	37.5	6.4	80.0	3.0
1.6		64.0	3.8	20.5	11.7	32.0	7.5	40.3	6.0	48.0	5.0	102.4	2.3
2.0		80.0	3.0	25.6	9.4	40.0	6.0	50.4	4.8	60.0	4.0	128.0	1.9
2.5		100.0	2.4	32.0	7.5	50.0	4.8	63.0	3.8	75.0	3.2	160.0	1.5
3.2		128.0	1.9	41.0	5.9	64.0	3.8	80.6	3.0	96.0	2.5	204.8	1.2
4.0*		160.0	1.5	51.2	4.7	80.0	3.0	100.8	2.4	120.0	2.0	256.0	0.9

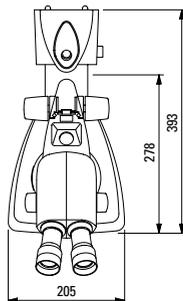
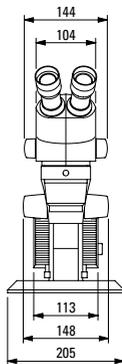
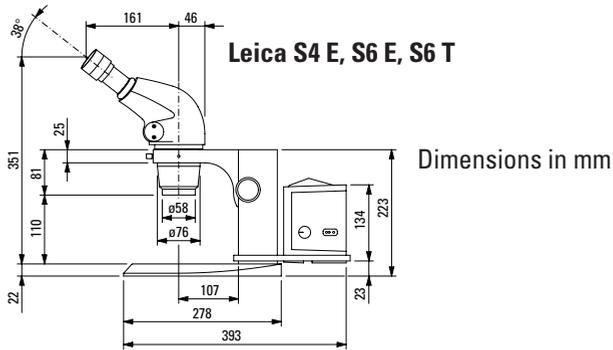
with additional objectives													
2.0x		0.3x-0.4x		0.3x-0.4x		0.6x-0.75x		0.6x-0.75x		0.7x-1.0x		0.7x-1.0x	
35mm		200mm		350mm		77mm		137mm		48mm		98mm	
Total magnification	Field diameter mm	Total magnification	Field diameter mm	Total magnification	Field diameter mm	Total magnification	Field diameter mm	Total magnification	Field diameter mm	Total magnification	Field diameter mm	Total magnification	Field diameter mm
12.6	18.3	2.5	92.0	1.8	127.8	4.7	48.9	3.5	65.7	6.2	37.1	4.5	51.1
16.0	14.4	3.1	74.2	2.2	104.5	6.0	38.3	4.5	51.1	7.9	29.1	5.7	40.4
20.0	11.5	3.9	59.0	2.8	82.1	7.5	30.7	5.6	41.1	9.9	23.2	7.1	32.4
25.0	9.2	4.9	46.9	3.5	65.7	9.4	24.5	7.0	32.9	12.4	18.5	8.9	25.8
32.0	7.2	6.2	37.1	4.5	51.1	12.0	19.2	9.0	25.6	15.8	14.6	11.4	20.2
40.0	5.8	7.8	29.5	5.6	41.1	15.0	15.3	11.2	20.5	19.8	11.6	14.2	16.2
50.0	4.6	9.8	23.5	7.0	32.9	18.8	12.2	14.0	16.4	24.8	9.3	17.8	12.9
64.0	3.6	12.5	18.4	9.0	25.6	24.0	9.6	17.9	12.8	31.7	7.3	22.7	10.1
80.0	2.9	15.6	14.7	11.2	20.5	30.0	7.7	22.4	10.3	39.6	5.8	28.4	8.1
20.2	12.7	3.9	65.6	2.8	91.4	7.6	33.7	5.6	45.7	10.0	25.6	7.2	35.6
25.6	10.0	5.0	51.2	3.6	71.1	9.6	26.7	7.2	35.6	12.7	20.2	9.1	28.1
32.0	8.0	6.2	41.3	4.5	56.9	12.0	21.3	9.0	28.4	15.8	16.2	11.4	22.5
40.0	6.4	7.8	32.8	5.6	45.7	15.0	17.1	11.2	22.9	19.8	12.9	14.2	18.0
51.2	5.0	10.0	25.6	7.2	35.6	19.2	13.3	14.3	17.9	25.3	10.1	18.2	14.1
64.0	4.0	12.5	20.5	9.0	28.4	24.0	10.7	17.9	14.3	31.7	8.1	22.7	11.3
80.0	3.2	15.6	16.4	11.2	22.9	30.0	8.5	22.4	11.4	39.6	6.5	28.4	9.0
102.4	2.5	20.0	12.8	14.3	17.9	38.4	6.7	28.7	8.9	50.7	5.0	36.4	7.0
128.0	2.0	25.0	10.2	17.9	14.3	48.0	5.3	35.8	7.2	63.4	4.0	45.4	5.6
25.2	9.5	4.9	49.0	3.5	68.6	9.5	25.3	7.1	33.8	12.5	19.2	8.9	27.0
32.0	7.5	6.2	38.7	4.5	53.3	12.0	20.0	9.0	26.7	15.8	15.2	11.4	21.1
40.0	6.0	7.8	30.8	5.6	42.9	15.0	16.0	11.2	21.4	19.8	12.1	14.2	16.9
50.0	4.8	9.8	24.5	7.0	34.3	18.8	12.8	14.0	17.1	24.8	9.7	17.8	13.5
64.0	3.8	12.5	19.2	9.0	26.7	24.0	10.0	17.9	13.4	31.7	7.6	22.7	10.6
80.0	3.0	15.6	15.4	11.2	21.4	30.0	8.0	22.4	10.7	39.6	6.1	28.4	8.5
100.0	2.4	19.5	12.3	14.0	17.1	37.5	6.4	28.0	8.6	49.5	4.8	35.5	6.8
128.0	1.9	25.0	9.6	17.9	13.4	48.0	5.0	35.8	6.7	63.4	3.8	45.4	5.3
160.0	1.5	31.2	7.7	22.4	10.7	60.0	4.0	44.8	5.4	79.2	3.0	56.8	4.2
20.2	11.1	3.9	57.4	2.8	80.0	7.6	29.5	5.6	40.0	10.0	22.4	7.2	31.1
25.6	8.8	5.0	44.8	3.6	62.2	9.6	23.3	7.2	31.1	12.7	17.6	9.1	24.6
32.0	7.0	6.2	36.1	4.5	49.8	12.0	18.7	9.0	24.9	15.8	14.2	11.4	19.6
40.0	5.6	7.8	28.7	5.6	40.0	15.0	14.9	11.2	20.0	19.8	11.3	14.2	15.8
51.2	4.4	10.0	22.4	7.2	31.1	19.2	11.7	14.3	15.7	25.3	8.9	18.2	12.3
64.0	3.5	12.5	17.9	9.0	24.9	24.0	9.3	17.9	12.5	31.7	7.1	22.7	9.9
80.0	2.8	15.6	14.4	11.2	20.0	30.0	7.5	22.4	10.0	39.6	5.7	28.4	7.9
102.4	2.2	20.0	11.2	14.3	15.7	38.4	5.8	28.7	7.8	50.7	4.4	36.4	6.2
128.0	1.8	25.0	9.0	17.9	12.5	48.0	4.7	35.8	6.3	63.4	3.5	45.4	4.9
31.5	7.5	6.1	38.9	4.4	54.0	11.8	20.1	8.8	27.0	15.6	15.2	11.2	21.2
40.0	5.9	7.8	30.4	5.6	42.4	15.0	15.8	11.2	21.2	19.8	12.0	14.2	16.7
50.0	4.8	9.8	24.2	7.0	33.9	18.8	12.6	14.0	17.0	24.8	9.6	17.8	13.3
62.5	3.8	12.2	19.5	8.8	27.0	23.4	10.1	17.5	13.6	30.9	7.7	22.2	10.7
80.0	3.0	15.6	15.2	11.2	21.2	30.0	7.9	22.4	10.6	39.6	6.0	28.4	8.4
100.0	2.4	19.5	12.2	14.0	17.0	37.5	6.3	28.0	8.5	49.5	4.8	35.5	6.7
125.0	1.9	24.4	9.7	17.5	13.6	46.9	5.1	35.0	6.8	61.9	3.8	44.4	5.3
160.0	1.5	31.2	7.6	22.4	10.6	60.0	4.0	44.8	5.3	79.2	3.0	56.8	4.2
200.0	1.2	39.0	6.1	28.0	8.5	75.0	3.2	56.0	4.2	99.0	2.4	71.0	3.3
50.4	4.8	9.8	24.5	7.1	33.8	18.9	12.7	14.1	17.0	24.9	9.6	17.9	13.4
64.0	3.8	12.5	19.2	9.0	26.7	24.0	10.0	17.9	13.4	31.7	7.6	22.7	10.6
80.0	3.0	15.6	15.4	11.2	21.4	30.0	8.0	22.4	10.7	39.6	6.1	28.4	8.5
100.0	2.4	19.5	12.3	14.0	17.1	37.5	6.4	28.0	8.6	49.5	4.8	35.5	6.8
128.0	1.9	25.0	9.6	17.9	13.4	48.0	5.0	35.8	6.7	63.4	3.8	45.4	5.3
160.0	1.5	31.2	7.7	22.4	10.7	60.0	4.0	44.8	5.4	79.2	3.0	56.8	4.2
200.0	1.2	39.0	6.2	28.0	8.6	75.0	3.2	56.0	4.3	99.0	2.4	71.0	3.4
256.0	0.9	49.9	4.8	35.8	6.7	96.0	2.5	71.7	3.3	126.7	1.9	90.9	2.6
320.0	0.8	62.4	3.8	44.8	5.4	120.0	2.0	89.6	2.7	158.4	1.5	113.6	2.1

# Optical Data, StereoZoom® S8 APO

				Apochromats						Achromate	
				0.63×		1.6×		2.0×		0.32×	
Working distance		75mm		101mm		37mm		25mm		200mm	
Eyeieces	Zoom position	Total magnification	Field diameter mm								
10 446 332 10 446 333  10×/23 10×/23B  10 446 326 10 446 329	1.0	10.0	23.0	6.3	36.5	16.0	14.4	20.0	11.5	3.2	71.9
	1.25	12.5	18.4	7.9	29.1	20.0	11.5	25.0	9.2	4.0	57.5
	1.6	16.0	14.4	10.1	22.8	25.6	9.0	32.0	7.2	5.1	45.1
	2.0	20.0	11.5	12.6	18.3	32.0	7.2	40.0	5.8	6.4	35.9
	2.5	25.0	9.2	15.8	14.6	40.0	5.8	50.0	4.6	8.0	28.8
	3.2	32.0	7.2	20.2	11.4	51.2	4.5	64.0	3.6	10.2	22.5
	4.0	40.0	5.8	25.2	9.1	64.0	3.6	80.0	2.9	12.8	18.0
	5.0	50.0	4.6	31.5	7.3	80.0	2.9	100.0	2.3	16.0	14.4
	6.3	63.0	3.7	39.7	5.8	100.8	2.3	126.0	1.8	20.2	11.4
	8.0	80.0	2.9	50.4	4.6	128.0	1.8	160.0	1.4	25.6	9.0
16×/16  10 446 354 10 446 355	1.0	16.0	16.0	10.1	25.3	25.6	10.0	32.0	8.0	5.1	43.9
	1.25	20.0	12.8	12.6	20.3	32.0	8.0	40.0	6.4	6.4	35.0
	1.6	25.6	10.0	16.1	15.9	41.0	6.2	51.2	5.0	8.2	27.3
	2.0	32.0	8.0	20.2	12.7	51.2	5.0	64.0	4.0	10.2	22.0
	2.5	40.0	6.4	25.2	10.2	64.0	4.0	80.0	3.2	12.8	17.5
	3.2	51.2	5.0	32.3	7.9	81.9	3.1	102.4	2.5	16.4	13.7
	4.0	64.0	4.0	40.3	6.4	102.4	2.5	128.0	2.0	20.5	10.9
	5.0	80.0	3.2	50.4	5.1	128.0	2.0	160.0	1.6	25.6	8.8
	6.3	100.8	2.5	63.5	4.0	161.3	1.6	201.6	1.3	32.3	6.9
	8.0	128.0	2.0	80.6	3.2	204.8	1.3	256.0	1.0	41.0	5.5
25×/9.5B  10 445 302	1.0	25.0	9.5	15.8	15.0	40.0	5.9	50.0	4.8	8.0	29.7
	1.25	31.3	7.6	19.7	12.1	50.0	4.8	62.5	3.8	10.0	23.8
	1.6	40.0	5.9	25.2	9.4	64.0	3.7	80.0	3.0	12.8	18.6
	2.0	50.0	4.8	31.5	7.5	80.0	3.0	100.0	2.4	16.0	14.8
	2.5	62.5	3.8	39.4	6.0	100.0	2.4	125.0	1.9	20.0	11.9
	3.2	80.0	3.0	50.4	4.7	128.0	1.9	160.0	1.5	25.6	9.3
	4.0	100.0	2.4	63.0	3.8	160.0	1.5	200.0	1.2	32.0	7.4
	5.0	125.0	1.9	78.8	3.0	200.0	1.2	250.0	1.0	40.0	5.9
	6.3	157.5	1.5	99.2	2.4	252.0	0.9	315.0	0.8	50.4	4.7
	8.0	200.0	1.2	126.0	1.9	320.0	0.7	400.0	0.6	64.0	3.7
40×/6B  10 445 303	1.0	40.0	6.0	25.2	9.5	64.0	3.8	80.0	3.0	12.8	18.8
	1.25	50.0	4.8	31.5	7.6	80.0	3.0	100.0	2.4	16.0	15.0
	1.6	64.0	3.8	40.3	6.0	102.4	2.3	128.0	1.9	20.5	11.7
	2.0	80.0	3.0	50.4	4.8	128.0	1.9	160.0	1.5	25.6	9.4
	2.5	100.0	2.4	63.0	3.8	160.0	1.5	200.0	1.2	32.0	7.5
	3.2	128.0	1.9	80.6	3.0	204.8	1.2	256.0	0.9	41.0	5.9
	4.0	160.0	1.5	100.8	2.4	256.0	0.9	320.0	0.8	51.2	4.7
	5.0	200.0	1.2	126.0	1.9	320.0	0.8	400.0	0.6	64.0	3.8
	6.3	252.0	1.0	158.8	1.5	403.2	0.6	504.0	0.5	80.6	3.0
	8.0	320.0	0.8	201.6	1.2	512.0	0.5	640.0	0.4	102.4	2.3

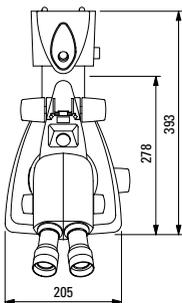
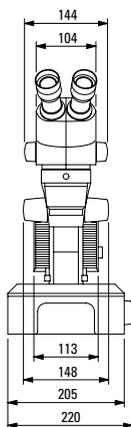
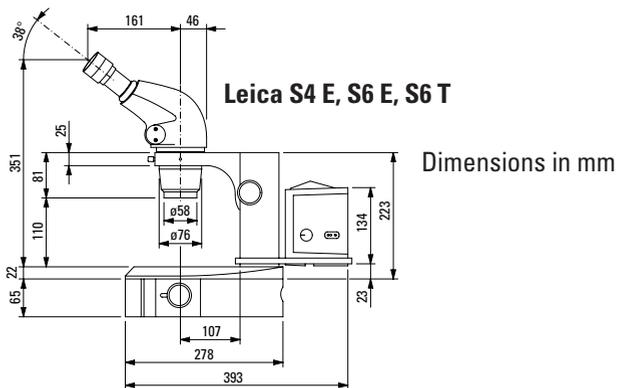
# Dimensions, Leica S4 E, S6 E, S6 T

with incident-light stand



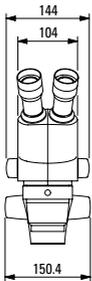
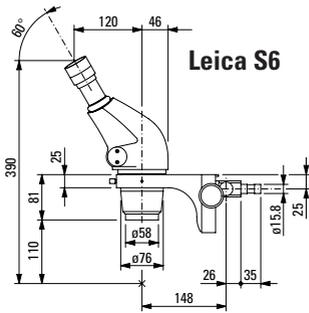
# Dimensions, Leica S4 E, S6 E, S6 T

with transmitted-light stand



# Dimensions, Leica S6

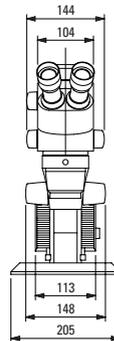
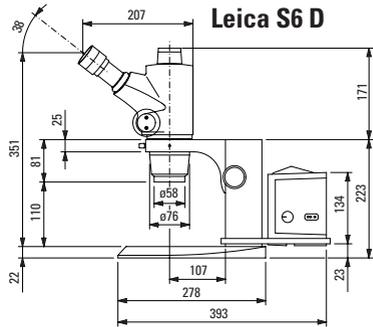
with inclining focusing drive



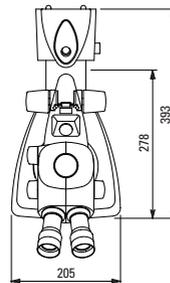
Dimensions  
in mm

# Dimensions, Leica S6 D

with incident-light stand



Dimensions  
in mm

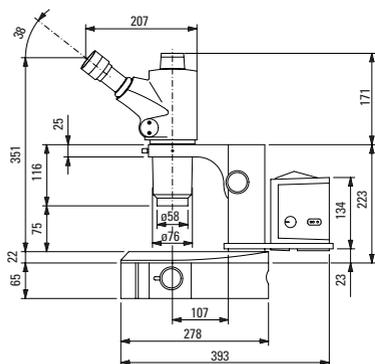






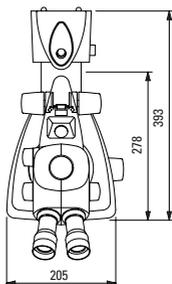
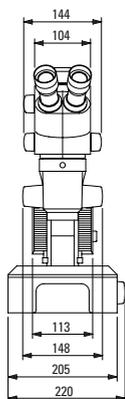
# Dimensions, Leica S8 APO

with transmitted-light stand



Leica S8 APO

Dimensions in mm



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