Living up to Life

Leica
MICROSYSTEMS

User Manual

Leica M60 B
Leica M80 B

CE

Copyright

The instructions contained in the following documentation reflect state-of-the-art technology. We have compiled the texts and illustrations as accurately as possible. Still, we are always grateful for comments and suggestions regarding potential mistakes within this documentation.

The information included in this manual may be changed without prior notice.

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Marketing CMS

Function of the Microscopes

The Leica M60 B and Leica M80 B microscopes, for which this User Manual has been written, are designed for routine examinations of cell and tissue cultures, liquids and sediments. This includes examining specimens taken from the human body for the purpose of gaining information about physiological or pathological conditions or inborn anomalies, or testing for safety and compatibility for potential recipients, or for monitoring therapeutic measures.

IVD

The above-named microscopes comply with the Council Directive 98/79/EC concerning in vitro diagnostics.

The manufacturer assumes no liability for damage caused by, or any risks arising from, using the microscope for other purposes than those for which they are intended or not using them within the specifications of Leica Microsystems CMS GmbH. In such cases, the Declaration of Conformity shall be invalid.

These (IVD) instruments are not intended for use in the patient environment defined by DIN VDE 0100-710. Nor are they designed to be combined with medical instruments in accordance with EN 60601-1. If a microscope is electrically connected to a medical instrument in accordance with EN 60601-1, the requirements listed in EN 60601-1-1 shall apply. Not suitable for examining potentially infectious specimens. This type of instrument may be operated by trained laboratory personnel only.

Leica M60 B nameplate

Leica M80 B nameplate

General Notes

Use in clean rooms
The Leica M series can be used in clean rooms without any problems.

Cleaning
- ★ Do not use any unsuitable cleaning agents, chemicals or techniques for cleaning.

- ★ Never use chemicals to clean colored surfaces or accessories with rubberized parts. This could damage the surfaces, and products could be contaminated by abraded particles.

- ★ In most cases, we can provide special solutions on request. Some products can be modified, and we can offer other accessories for use in clean rooms.

- ★ The cleaning of glass surfaces and objectives in particular should be carried out exclusively as outlined in the brochure "Cleaning of Microscope Optics". The information can be downloaded at:
  http://www.leica-microsystems.com/products/
  . Select your product and go to the "Download" page.

For additional information, refer to page 55.

Servicing
- ★ Repairs may only be carried out by Leica Microsystems-trained service technicians. Only original Leica Microsystems spare parts may be used.

Responsibilities of person in charge of instrument
- ★ Ensure that the Leica stereomicroscope is operated, maintained and repaired by authorized and trained personnel only.

Important Safety Notes

User Manual

This User Manual describes the special functions of the individual modules of the Leica M stereomicroscopy series and contains important instructions for their operational safety, maintenance, and accessories.

You can combine individual system articles with articles from external suppliers (e.g. cold light sources, etc.). Please read the User Manual and the safety instructions from the supplier.

Before installing, operating or using the instruments, read the user manuals listed above. In particular, please follow all safety instructions.

To maintain the unit in its original condition and to ensure safe operation, the user must follow the instructions and warnings contained in these user manuals.

We guarantee the quality of our products. Our guarantee covers all faults in materials and manufacture. It does not, however, cover damage resulting from careless or improper handling.

Symbols Used

Warning! Safety hazard!

This symbol indicates especially important information that is mandatory to read and observe.

Failure to comply can cause the following:

- ★ Hazards to personnel
- ★ Functional disturbances or damaged instruments

Warning of hazardous electrical voltage

This symbol indicates especially important information that is mandatory to read and observe.

Failure to comply can cause the following:

- ★ Hazards to personnel
- ★ Functional disturbances or damaged instruments

Danger due to hot surface.

This symbol warns against touching hot surfaces, e.g. those of light bulbs.

Important information

This symbol indicates additional information or explanations that are intended to provide clarity.

Explanatory notes

- ★ This symbol within the text stands for additional information and explanations.

Figures

(1) Numbers in parentheses within the descriptions relate to the figures and the items within those figures.

Disposal

Notes on how to dispose of the microscope, its components and expendables.

China RoHS 50 year EFUP (Environment-Friendly Use Period)

IVD labeling

IVD nstrument for in vitro diagnostics.

MM/YYYY IVD manufacturing date, for example 11 / 2011 for November 2011.

Safety Instructions

Description

★ The individual modules fulfill the highest requirements for observation and documentation of Leica stereomicroscopes of the M series.

Intended use of instrument

★ Leica Microsystems microscopes are optical instruments for improving the visibility of objects or specimens through magnification. Accessories such as optical accessories, stands, illumination, cameras etc. supplement the equipment configuration.

Non-intended use

★ Using the instrument in any way contrary to the specifications in the User Manual can lead to bodily harm and damage to objects. Never use microscopes for in vivo examinations or eye surgery if they are not expressly intended for such use. Never install any other plug or unscrew optical systems and mechanical parts unless expressly instructed to do so in the instructions.

The instruments and accessories described in this User Manual have been tested for safety and potential hazards. The responsible Leica affiliate must be consulted whenever the instrument is altered, modified or used in conjunction with non-Leica components that are outside of the scope of this manual!

Unauthorized alterations to the instrument or noncompliant use shall void all rights to any warranty claims as well as product liability and the Declaration of Conformity.

Place of use

★ Only use the instruments in enclosed, dust-free rooms and between +10 °C and +40 °C. Protect the devices from oil, chemicals and extreme humidity. If using the devices outdoors, protect them from dust and moisture. Never use electrical devices outdoors.

★ Electrical components must be placed at least 10 cm away from the wall and away from flammable substances.

★ Avoid large temperature fluctuations, direct sunlight and vibrations. These conditions can distort micrographic images, for example.

★ In warm and warm-damp climatic zones, the individual components require special care in order to prevent the build-up of fungus.

Safety Instructions (continued)

Responsibilities of person in charge of instrument

★ These Safety Instructions must be available at the workplace.

Ensure that:

★ The M series of stereomicroscopes and accessories are operated, maintained and repaired by authorized and trained personnel only.

★ All operators have read, understood and observe this User Manual, and particularly the safety regulations.

Repairs, service work

★ Repairs may only be carried out by Leica Microsystems-trained service technicians.

★ Only original Leica Microsystems spare parts may be used.

★ Before opening the instruments, switch off the power and unplug the power cable.

★ Avoid contact with powered electrical circuits, which can lead to injury.

Transport

★ Use the original packaging for shipping or transporting the individual modules of the Leica M stereomicroscopy series and the accessory components.

★ In order to prevent damage from vibrations, disassemble all moving parts that (according to the user manual) can be assembled and disassembled by the customer and pack them separately.

Integration in third-party products

★ When installing Leica products into third-party products, the manufacturer of the complete system or its dealer is responsible for following all applicable safety instructions, laws and guidelines.

Disposal

★ Once the product has reached the end of its service life, please contact Leica Service or Sales about disposal.

★ Please observe and comply with the national and federal laws and regulations that are equivalent to EC directives such as WEEE.

Like all electronic devices, the microscope, its accessory components and consumables must never be disposed of with general household waste.

Safety Instructions (continued)

Legal regulations

★ Observe the generally applicable statutory and country-specific regulations for accident prevention and environmental protection.

EC Declaration of Conformity

★ Electrically operated accessories are constructed based on the state of the art of technology and are provided with an EC Declaration of Conformity. See page 54.

Health risks

Workplaces with stereomicroscopes facilitate and improve the viewing task, but they also impose high demands on the eyes and holding muscles of the user. Depending on the duration of uninterrupted work, asthenopia and musculoskeletal problems may occur. For this reason, appropriate measures for reduction of the workload must be taken:

Optimal arrangement of workplace, work assignments and work flow (changing tasks frequently). Thorough training of the personnel, giving consideration to ergonomic and organizational aspects.

The ergonomic design and construction of the Leica M stereomicroscopy series are intended to reduce the exertion of the user to a minimum.

Direct contact with eyepieces can be a potential transmission path for bacterial and viral infections of the eye.

The risk can be kept to a minimum by using personal eyepieces for each individual or detachable eyecups.

Careful handling

★ Exercise particular care when setting up the instruments. If it is specified that two or more people are required for setup, compliance with this is mandatory.

★ Never spill any liquids on electrical instruments. This could cause the stereomicroscope and other equipment to become electrically live and damage people and instruments.

★ Never clean instruments using corrosive cleaning agents or those containing acetone. For detailed information about care, refer to the User Manual for the instrument.

★ Check the power cables regularly. Defective power cables can cause injuries.

★ Wait for bulbs to cool off before changing them. Touching hot bulbs can cause burns.

Safety Instructions (continued)

Light sources: safety regulations

- ★ Light sources pose a potential irradiation risk (glare, UV radiation, IR radiation). Therefore, lamps have to be operated in closed housings and in installed condition.
- ★ Never look directly into the beam path (blinding hazard).
- ★ Do not select a white, strongly reflective background for the specimen.

External power supply for the TL5000 Ergo (Leica M80 B)

Permitted power supply:
SINPRO SPU130-110

Specifications:

Input:	100-240 V AC
	47-63 Hz
	3.2 A
Output:	33 V DC
	3.93 A
	max. 130 W

For indoor use only.

⚠ Use only the power supply specified above. Other power supplies must not be used. If the original power supply fails or is damaged, it must be replaced. Repair is not permitted. Original power supplies are available from your Leica branch office or Leica dealer.

Contents

Leica M Series

Congratulations!

The New Leica M Series

Leica Microsystems introduces the Leica M60 B and M80 B, two new high-quality routine stereomicroscopes of the CMO product line from Leica Microsystems. The optical brilliance and wide range of accessories make them the ideal stereomicroscopes for quality assurance and for in-vitro diagnostics examinations.

The Leica M60 B and M80 B stereomicroscopes can be used for a wide range of routine applications with the 6:1 and 8:1 zoom and engaged, precise click-stops at predetermined magnifications. The large working distance and brilliant imaging power show the finest details of your specimens without losing the field of view over large specimens.

Common to all three microscopes is the Leica range of accessories. Whether the work requires a variety of illumination types, a wide selection of objectives, or the Leica swing-arm system – Leica Microsystems has a solution for everything!

Do you already own stereomicroscopic equipment and are thinking of switching to Leica? No problem! The Leica M60 B and M80 B fit into the same 76 mm diameter interface microscope carriers as with previous models and are therefore compatible with many suppliers. They adapt easily to existing components and add the high-quality imaging power of Leica stereomicroscopes to existing inspection processes.

Maximum Compatibility

Leica engineers were careful to ensure that the new Leica M series – like its predecessors – remains compatible with existing series. This means that objectives, bases, tubes and so on can be reused.

Objectives

All objectives of this new generation have the same reference focal length as the objectives of the MZ generation. If you prefer, you can therefore continue to use the previous Leica objective series.

Tubes

The interface between the optics carrier and the tube has remained the same, so existing tubes fit the new M series. The new tubes are designed for eyepieces with field number 23, while the predecessor models were only designed for field number 21, resulting in a smaller object field.

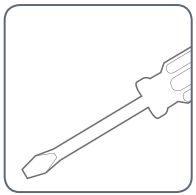
Eyepieces

The new M series eyepieces have an audible and tangible click to provide immediate feedback in case of accidental adjustment.

On We Go

If your new Leica microscope has already been assembled and commissioned by your Leica consultant, click here to skip through the installation instructions and go directly to the Quick Start Guide on page 25.

If, on the other hand, you are assembling your Leica microscope yourself, continue with the "Assembly" chapter, which begins on page 17.



Assembly

Base and Focusing Column

The first step is to connect the focusing column of the M series to the corresponding base.

Tools used

★ Allen key, 3 mm

Assembling the column adapter

1. Remove the three screws provided from the column.

2. Install the base on the column using the three screws.

Tip: Place the column on the edge of a table to attach the base and have another person help you.

Microscope Carrier

Tool

★ Allen key provided

Assembly

The microscope carrier is fastened to the column using the screw provided.

Alternative installation options

Depending on the desired working distance, the microscope carrier can be installed in the standard way or upside down (see figure below).

Optics Carrier

Tools used

★ None

Assembling the Optics Carrier

1. Unscrew the clamping screw on the holder for the optics carrier.

2. Place the optics carrier into the holder and align it in such a way that the notch in the optics carrier and the bottom clamping screw are on top of each other.

2. Tighten the clamping screw below the optics carrier.

Tube

All intermediate tubes that fit between the optics carrier and the binocular tube are fitted in the same manner, as is the IC80 HD camera module (for the Leica M80 B).

Refer also to the separately provided User Manual for the IC80 HD camera module.

The images captured with the camera may not be used for diagnosis. In this case, an evaluation with the eyepieces is required.

Tools used

★ No tools required.

Preparations

1. Unscrew the positioning screw and remove the protective cover.

Assembling the tube

2. Push the tube (for example, the inclined binocular tube) into the dovetail ring and rotate it slightly in both directions until the positioning screw meshes with the guide groove.

3. While holding the tube only slightly, carefully tighten the positioning screw. It is automatically brought to the correct position.

Eyepieces

Tools used

★ No tools required.

Magnification range

You can extend the overall magnification range using available 10×, 16×, 25× and 40× wide-field eyepieces for eyeglass wearers.

Preparation

1. If you want to use an optional graticule, insert it now (page 39).

2. Remove the plastic tube guard.

Inserting the eyepieces

3. Push the eyepieces into the tubes as far as they will go and check to ensure that they fit tightly and accurately.

4. Securely tighten the clamping screws.

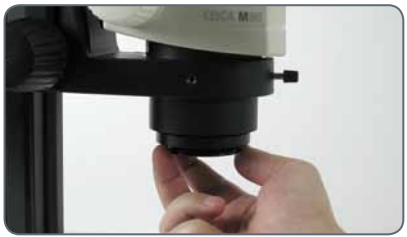
Objective

Tools used

★ No tools required.

Preparation

1. Remove the protective cap on the optics carrier by turning it.



Attaching the objective

Hold the objective firmly during assembly and disassembly so that it does not fall onto the stage plate. This applies particularly to the 2x planapochromatic objective, which is very heavy. Remove all specimens from the stage plate first.

2. Screw the objective clockwise into the optics carrier.

TL ST Transmitted Light Base (for Leica M60 B) and TL5000 Ergo Transmitted Light Base (for Leica M80 B)

Unpacking the base

The base is delivered with the adapter plate installed. Make sure the instruments are unpacked on a flat, sufficiently dimensioned, and non-slip surface.

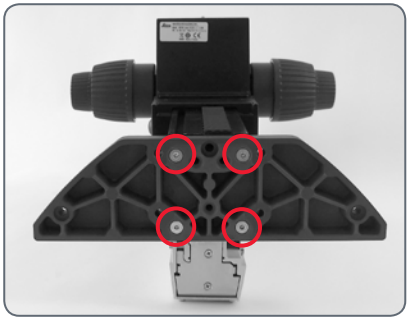
Refer also to the separately provided User Manual for the TL ST transmitted light base and the TL5000 Ergo transmitted light base.

Tools used

★ Allen key, 3 mm

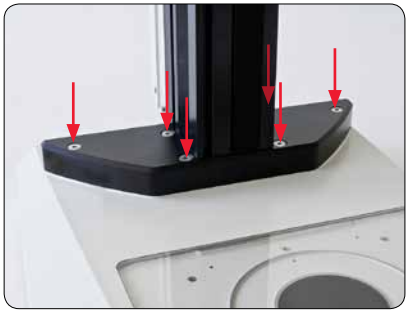
Focusing drive and column

1. Unscrew the extension plate from the base using the Allen key provided.



2. Attach your focusing drive column to the bottom using the 4 Allen screws.

3. Reattach the adapter plate to its original position using the 6 Allen screws.



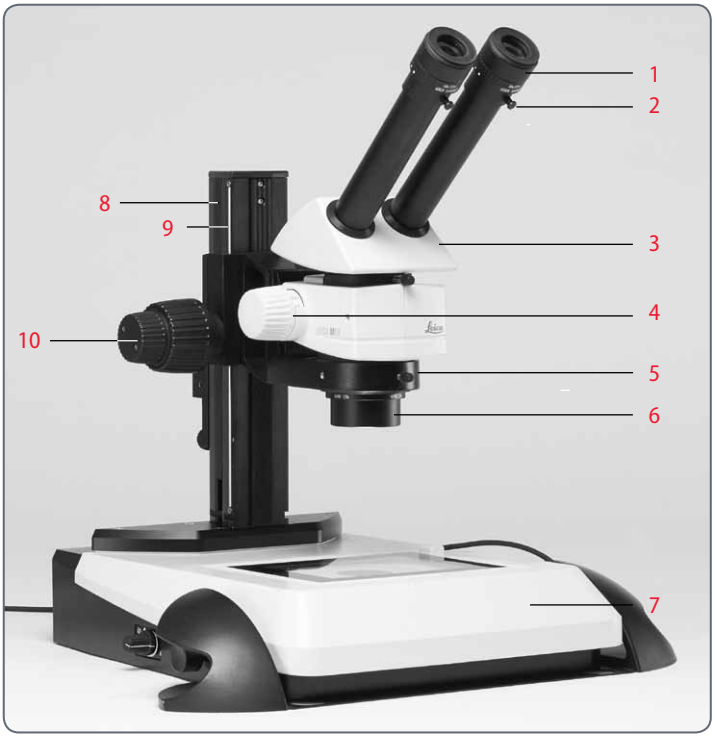
Quick Start Guide

The Reliable Route to Success

Your Leica stereomicroscope has been delivered in completely assembled condition by your Leica partner, and naturally you want to get right to work. This manual will familiarize you with the finer details of your microscope. The following pages contain important, practical information that makes using it every day easier.

Take time to read it – it's worth it!

Overview of an M Series Microscope



1 *Eyepieces for eyeglass wearers with dioptric correction and eyecups*

2 *Fastening screws for the eyepieces*

3 *Ergo tube*

4 *Magnification changer (zoom)*

5 *Optics carrier*

6 *Interchangeable objective*

7 *Transmitted light base*

8 *Column*

10 *Coarse/fine focusing*

The Correct Interpupillary Distance

The interpupillary distance is correctly set if you see a single circular image field when looking at a specimen.

If you are still a novice microscope user, you may need a short time to become accustomed to this. Not to worry – after a little while, it will become automatic.

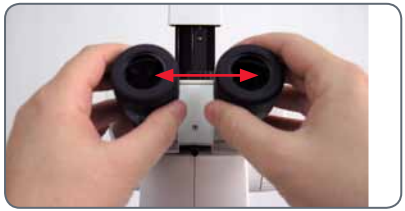
Reference values

The distance between eye and eyepiece measures approx. 22 mm for 10/23B wide-field eyepieces for eyeglass wearers.

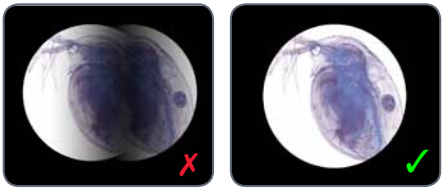
Adjusting the interpupillary distance

1. Look into the eyepieces.

2. Hold the eyepieces with both hands. Push the eyepieces together or separate them until you see a circular image.



3. Slowly approach the eyepieces with your eyes until you can see the complete image field without corner cutting.



Using the Eyepieces

The eyepieces form the connection between the tube and the eye of the observer. Simply push them into the tube and they are ready to use.

Each eyepiece offers a certain magnification factor that has a determinative effect on the total magnification. Furthermore, all Leica eyepieces can be equipped with practical graticules that enable measuring and quantifying of specimens.

Dioptric correction

A built-in dioptric correction is available for eyeglass wearers. For more information, refer to page 37.

If you do not wear glasses:

1. Hold the eyepiece firmly and rotate the eyecups forwards counterclockwise.

2. If an eyepiece is equipped with the integrated dioptric correction, turn the value to the "0" mark.

If you wear glasses:

1. Hold the eyepiece firmly and rotate the eyecups counterclockwise towards the rear, as otherwise the viewing distance is too great.

2. If an eyepiece is equipped with the integrated dioptric correction, turn the value to the "0" mark.

By the way, one benefit of viewing with eyeglasses is a drastically lower risk of bacterial transmission (see page 36). The soft material of the eyecup also ensures that your glasses will not be scratched, even if they contact the eyepiece.

Focusing

Focusing raises or lowers the stereomicroscope using the focusing drive. The specimen detail is brought into sharp focus as soon as it is in the focal point of the objective.

★ The focusing drive can be operated either left- or right-handed.

The coarse/fine adjustment carries a load of up to 15 kg.

The resolution of the coarse/fine adjustment is 1 µm.

Adjusting the Resistance of the Focus Drive

Adjusting the resistance

Is the focusing drive too loose or too tight? Does the equipment tend to slide downwards? The resistance can be adjusted individually depending on the equipment weight and personal preferences as follows:

1. Grip the outer drive knobs with both hands and turn them towards each other until the desired resistance is reached during focusing.

Changing the Magnification (Zoom)

All M series microscopes have an integrated zoom. The name indicates the zoom range covered:

- ★ Leica M60 B = Zoom 6:1
- ★ Leica M80 B = Zoom 8:1

The rotary knob for the zoom can be used either left or right-handed.

Zooming

1. Look into the eyepieces.
2. Focus on the specimen.
3. Rotate the magnification changer until the desired magnification is configured.

Click Stops and Magnification Levels

The zoom button can optionally be operated either with or without click stops. Continuous zoom is possible when the click stops are disabled, which many users find convenient. On the other hand, when the click stops are enabled, photographs, measurement results etc. can be reproduced more accurately.

Enabling and disabling click stops

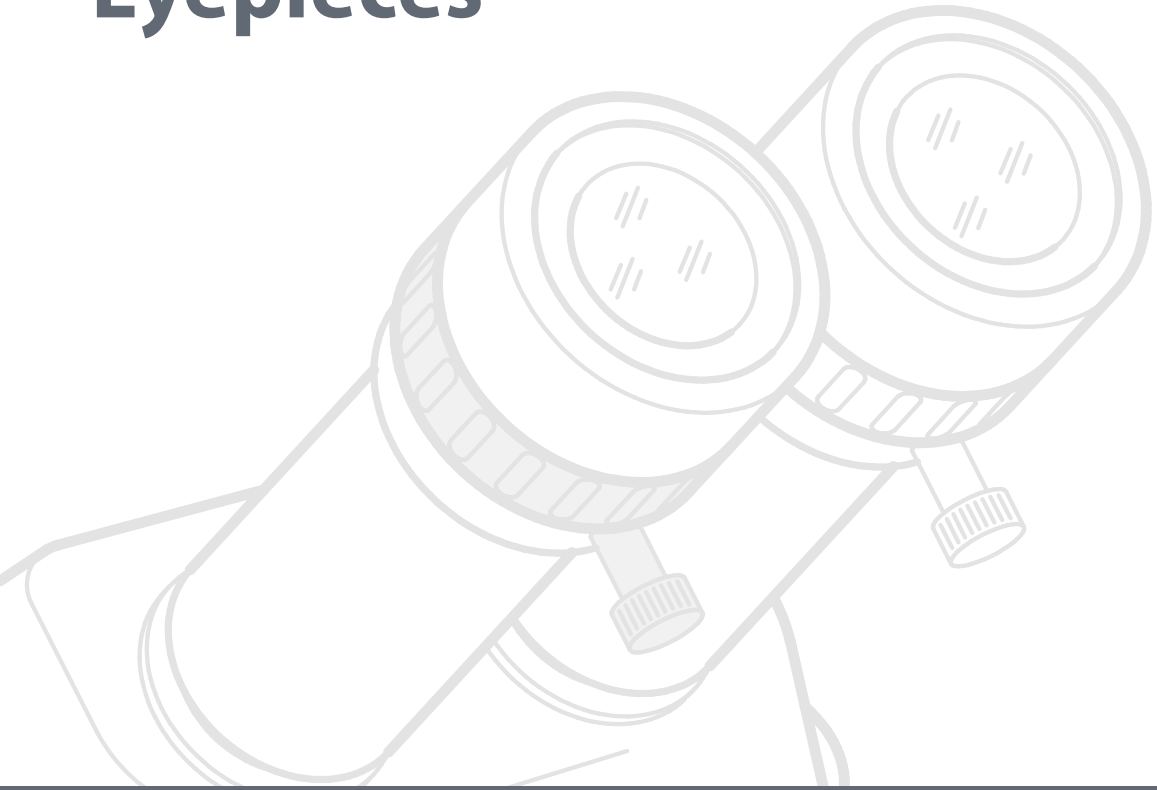
1. Push the button towards the knob to enable the click stops.

2. Push the button away from the knob to disable the click stops.

Magnification and fields of view

The formula on page 53 provides additional information about how to calculate the magnifications and field of view diameters, with consideration given to the position of the magnification changer and the eyepiece and objective combination used.

Eyepieces



Magnification Factor of the Eyepieces

An eyepiece not only makes it possible to look passively into the microscope, but also has a critical effect on the maximum magnification. The magnification factor is between 10× and 40×.

The following eyepieces are available for the M series:

Magnification	Dioptric correction	Order number
10×	± 5 diopter settings	10 450 023
16×	± 5 diopter settings	10 450 024
25×	± 5 diopter settings	10 450 025
40×	± 5 diopter settings	10 450 026

Health Notes

Potential sources of infection

Direct contact with eyepieces is a potential transmission method for bacterial and viral infections of the eye. The risk can be kept to a minimum by using individual eyepieces or detachable eyecups. Eyecups can be ordered separately. Please contact your Leica partner.

Separate eyecups are an effective way of preventing infections.

Dioptric Correction

All Leica eyepieces are also available with built-in dioptric correction, allowing the microscope to be used without glasses even by those with vision problems. The correction comprises ±5 diopter settings.

Using the dioptric correction

1. Set the dioptric correction of both eyepieces to the mid position ("0" diopter settings).

2. While wearing your glasses, look through the eyepieces and focus on the specimen.

3. Rotate both eyepieces to the maximum value of "+5".

4. Hold one eye closed and rotate the other eyepiece in "-" direction until the specimen appears sharp.

5. Then, open the other eye and correct the diopter settings until the image is uniformly sharp.

Dioptric Correction and Parfocality

Leica stereomicroscopes are parfocally matched. The prerequisite for this is the correct setting of the diopters and the parfocality. The following adjustments have to be carried out only once by each user.

Preparations

★ Move the lever of the video/phototube to the "observation" position and open the diaphragm.

Adjusting

1. Set the dioptric correction for both eyepieces to "0".

2. Select the lowest magnification and focus on a flat specimen.

3. Select the highest magnification and readjust the sharpness.

4. Select the lowest magnification again, but do not look into the eyepieces.

6. Rotate the eyepieces counterclockwise in the "+" direction as far as they will go (+5 diopter settings).

7. Look into the eyepieces.

8. Slowly rotate each eyepiece individually in the "–" direction until each eye sees the object sharply imaged.

9. Select the highest magnification and refocus if necessary.

Now, if you adjust the magnification from the lowest to the highest level, the specimen is always brought into sharp focus. If not, repeat the process.

Graticules

Use

Leica graticules make counting easier, particularly for workstations that are not equipped with a digital camera.

The Leica graticules for length measurements and numbering are fitted in mounts and are inserted into the eyepieces.

1. Screw the insert off of the eyepiece.

2. Clamp the graticule on the insert, applying moderate pressure. Ensure that the graticule fits tightly.

3. Screw the insert and graticule firmly into place and replace the eyepiece in the tube.

4. You can now align the graticule by rotating the eyepiece in the tube and then tightening it using the clamping screw.

Objectives and Optical Accessories

The Different Types of Objectives

To meet the various requirements regarding imaging properties, there is a choice of high-quality interchangeable planachromatic and planapochromatic objectives and also lower-priced interchangeable achromatic objectives.

- ★ Achromatic objectives are particularly suited for three-dimensional specimens with high-contrast structures.
- ★ Flat-field (planachromatic) objectives are particularly well suited for studying flat objects such as wafers and thin sections.
- ★ With planapochromatic objectives, the finest structures are visible with high contrast. The sophisticated apochromatic correction allows these objectives to attain the highest color brilliance and fidelity.

Achromatic objectives
The 0.32×, 0.5×, 0.63×, 0.8×, 1×, 1.5×, 2× achromatic objectives offer countless variants for selecting the object field diameter, magnification ranges and working distances (see page 53).

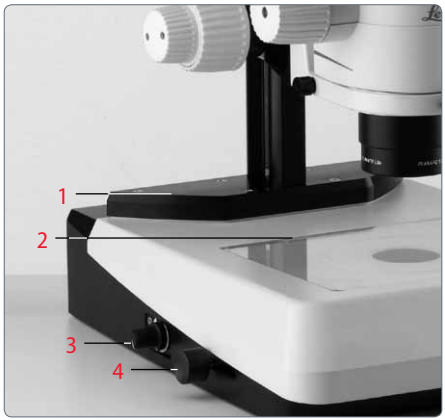
Planachromatic objective 1×
For the highest requirements for overall image quality, we recommend equipping the microscope with the 1× plan (flat-field) objective, which returns sharp, contrast-rich object fields all the way to the border.

Achromatic objectives with a long focal length
For special applications, achromatic objectives with long working distances and focal lengths of f=100 mm to 400 mm are available.

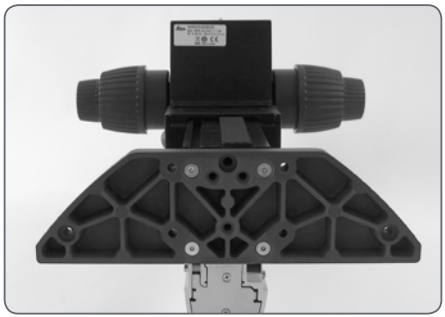
Bases

Leica TL ST Transmitted Light Base: Controls (Leica M60 B)

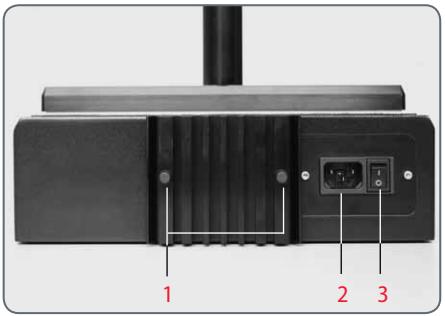
Refer also to the separately provided User Manual for the TL ST transmitted light base.



1 *Adapter plate for easy assembly of focusing drives*
2 *Removable glass plate*
3 *Controller for light intensity*
4 *Adjustment for path-folding mirror*



Extension plate of the Transmitted Light Base TL ST



Rear side of the TL ST transmitted light base
1 *Screws for changing the halogen lamp*
2 *Power connection socket*
3 *Main power switch*

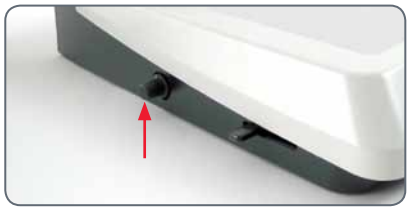
Leica TL ST Transmitted Light Base: Operation

Light intensity control
The left control adjusts the intensity of the 12 V/20 W halogen illumination.

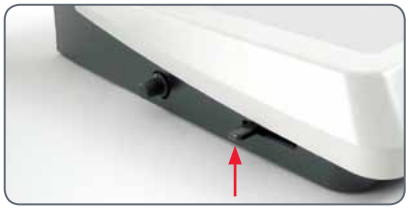
1. Switch on the illumination of the base at the power switch.

3. Focus on the specimen.

3. Set the illumination to the desired intensity using the left control.



Control of the transmitted light
The TL ST transmitted light base has a slider that automatically moves the path-folding mirror in the base when moved. The mirror is kept in the correct position at all times and permits smooth changeover between bright field and opaque transmitted light.



Bright field
Bright field is suitable for examining translucent objects featuring contrasting structures. The object is directly illuminated from below and is seen in its natural colors against a bright background.

★ Move the slider backwards until the desired effect is achieved.

Inclined transmitted light
Transmitted light that traverses the object obliquely will provide additional resolution and information when observing semitransparent, opaque objects.

★ Slowly pull the slider towards yourself until the desired effect is achieved.

Leica TL ST Transmitted Light Base: Lamp Replacement

Changing the halogen lamp

Before you change the lamp, it is absolutely necessary to unplug the power plug from the base to prevent the risk of electric shock!

The halogen lamp becomes very hot during operation. Therefore, to avoid being burned, let the base cool off for approx. 10 minutes after switching it off!

Do not touch new halogen lamps with your bare fingers – this drastically reduces the service life of the lamp!

Changing lamps

1. Unscrew the two screws on the cooling unit and pull the cooling unit out, along with the lamp.

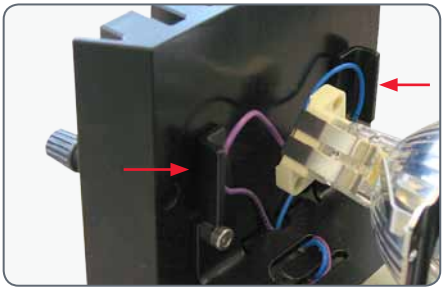
2. Carefully pull out the lamp and mount by pulling them upwards.

3. Disconnect the lamp from the mount.

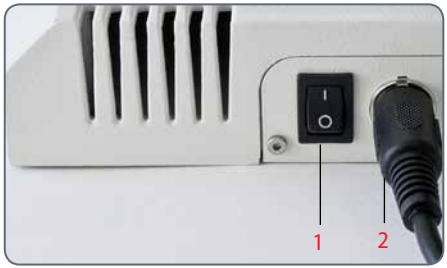
4. Insert the new lamp into the mount and reinsert the lamp holder.

Safety precautions

When inserting the lamp, ensure that the cables are inside the two metal clamps. This prevents the cables from getting caught during insertion.



Leica TL5000 Ergo Transmitted Light Base: Controls (Leica M80 B)



Rear side of the TL5000 Ergo

1 Power switch for the base
2 Power supply connection

Refer also to the separately provided User Manual for the TL5000 Ergo transmitted light base.

Left side of the TL5000 Ergo

1 LED display for opening and positioning the aperture or for balance in DF mode.
2 Control for the size of the aperture/ balance
3 "BF" button for bright field (press and hold for 2 seconds to (de)activate the automatic aperture)
4 "RC" button for Rottermann Contrast / in the RC mode, press and hold the button to define the aperture size
5 "DF" button for dark field

Right side of the TL5000 Ergo

1 On/Off switch for the light source / Press and hold for 5 seconds to reset the base to factory default settings
2 Controls for controlling the brightness intensity

Leica TL5000 Ergo Transmitted Light Base: Operation

The transmitted light base must only be connected to a grounded socket with a faultless power cable! Failure to observe these warnings may result in serious personal injury or even death!

The LED illumination can be very bright! Check and adjust the intensity of the illumination to a suitable brightness before looking through the eyepieces.

Switching the transmitted light base on and off

1. Switch on the transmitted light base with the power switch on the rear side.

2. Press the on/off switch on the right side once to turn on the illumination.

Continued on next page.

Leica TL5000 Ergo Transmitted Light Base: Operation (Continued)

3. Look through the eyepiece and adjust the light intensity using the control on the right side. The intensity of the illumination is visualized by the LED scale.

4 Press the on/off switch on the right side once again to turn off the illumination on the base.

The following assumes that the power switch on the rear side of the device is always switched on. This switch is not mentioned in the remaining part of this User Manual.

Specifications for the Bases

Leica TL ST Transmitted Light Base

Light source	Halogen lamp 12 V/20 W
Quick illuminant change	Yes
Illuminated area	50 mm
Power supply	Input voltage 100 – 240 V~, frequency 50/60 Hz Energy consumption 30 W max. Ambient temperature 10 – 40 °C
Connections	Power plug
Weight	7.4 kg

Illumination modes

Bright field	Yes
Dark field	Yes (single-sided)
Oblique light	No
Relief Contrast System (RC™)	No
CCIC (Constant Color Intensity Control)	No
Internal shutter/lamp control	No
Integrated filter holder	Yes
Coated optics for increasing the color temperature	Yes
Matching of high num. aperture	No
Remote control options	No
AntiShock™ Pads	Yes
Dimensions (W×H×D)	340×430×85 mm

Leica TL5000 Ergo Transmitted Light Base

Light source	
Light source	LED
Illuminated field: Bright field ∅	65 mm
Illuminated field: Dark field ∅	40 mm
Relief Contrast System (RC™)	Yes
Internal shutter/lamp control	Yes
Integrated filter holder	Yes
Matching of high num. aperture	Yes
Remote control options	Yes
AntiShock™ Pads	Yes
Dimensions (W×H×D)	412×341×46 mm
Power supply	
Input	100–240 VAC 47 – 63 Hz 3.2 A
Output	33 VDC 3.93 A 130 W MAX
Connections	
Power supply	1

Appendix

Calculating the Total Magnification and Field of View Diameter

Parameter

MO	Magnification of objective
ME	Magnification of eyepiece
z	Magnification changer position
q	Tube factor, e.g. 1.5× for coaxial incident light, 1.6× for 45° ErgoTube™
r	Factor 1.25× if the planachromatic and planapochromatic objectives of the MZ125/MZ16 are used on the MS5, MZ6, MZ75 or MZ95
NFOV	Field number of the eyepiece. Field numbers are printed on the eyepieces: 10× = 21, 16× = 14, 25× = 9.5, 40× = 6.

Example

MO	1× objective
ME	25×/9.5 eyepiece
z	Zoom position 4
q	Coaxial incident light 1.5×, tube factor
r	Factor 1.25×

Calculation example: magnification in the binocular tube

$$MTOT\ VIS = MO \times ME \times z \times q \times r$$

or

$$1 \times 25 \times 4 \times 1.5 \times 1.25 = 187.5\times$$

Calculation example: field of view diameter in the specimen

$$\varnothing\ OF: \frac{N_{FOV}}{M_O \times z \times q \times r}$$

Care, Maintenance, Contact Persons

We hope you enjoy using your high-performance microscope. Leica microscopes are renowned for their robustness and long service life. Observing the following care and cleaning tips will ensure that even after years and decades, your Leica microscope will continue to work as well as it did on the very first day.

Warranty benefits

The guarantee covers all faults in materials and manufacture. It does not, however, cover damage resulting from careless or improper handling.

EC Declaration of Conformity

To download the EC Declaration of Conformity, use this link

http://www.leica-microsystems.com/products/stereo-microscopes-macroscopes/routine-manual/

Select the microscope type and go to the "Download" page.

Care

- ★ Protect your microscope from moisture, fumes and acids and from alkaline, caustic and corrosive materials and keep chemicals away from the instruments.
- ★ Plugs, optical systems and mechanical parts must not be disassembled or replaced, unless doing so is specifically permitted and described in this manual.
- ★ Protect your microscope from oil and grease.
- ★ Do not grease guide surfaces or mechanical parts.

Protection from dirt

Dust and dirt will affect the quality of your results.

★ Put a dust cover over the microscope when it will not be used for a long time.

★ Use dust caps to protect tube openings, tubes without eyepieces, and eyepieces.

★ Keep accessories in a dust-free place when not in use.

Cleaning polymer components

Some components are made of polymer or are polymer-coated. They are, therefore, pleasant and convenient to handle. The use of unsuitable cleaning agents and techniques can damage polymers.

Permitted measures

★ Clean the microscope (or parts of it) using warm soapy water, then wipe using distilled water.

★ For stubborn dirt, you can also use ethanol (industrial alcohol) or isopropanol. When doing so, follow the corresponding safety regulations.

★ Remove dust with a bellows and a soft paintbrush.

★ Clean eyepieces and objectives with special optics cleaning cloths and pure alcohol.

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