Leica DM2000
Leica DM2500
Leica DM3000

Operating Manual
Bedienungsanleitung
Mode d'emploi

Leica
MICROSYSTEMS

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Leica Microsystems Wetzlar GmbH
Ernst-Leitz-Straße
D-35578 Wetzlar (Germany)

Responsible for contents:
Verantwortlich für den Inhalt:
Responsable du contenu rédactionnel:
Dr. Jasna Röth, Peter Schmitt
(Clinical Microscopy, Product Management)
(Clinical Microscopy, Produktmanagement)
(Clinical Microscopy, Product Management)
Holger Grasse
(Safety Officer according to MPG §30)
(Sicherheitsbeauftragter nach MPG §30)
(responsable de la sécurité conformément à la loi relative aux dispositifs médicaux, § 30)
In case of questions, please contact the hotline:
Bei Fragen wenden Sie sich bitte an die Hotline:
Pour toute question, contacter notre service d'assistance téléphonique :

Phone +49(0)6441-292286
Fax +49(0)6441-292255
E-mail: MQM-Hotline@leica-microsystems.com

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Operating Manual

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The instructions contained in the following documentation reflect state-of-the-art technology and knowledge standards. We have compiled the texts and illustrations as accurately as possible. Nevertheless, no liability of any kind may be assumed for the accuracy of this manual's contents. Still, we are always grateful for comments and suggestions regarding potential mistakes within this documentation.

The information in this manual is subject to modification at any time and without notification.

Contents

1. Important Notes about this Manual

Caution!

This operating manual is an essential component of the microscope, and must be read carefully before the microscope is assembled, put into operation or used.

This operating manual contains important instructions and information for the operational safety and maintenance of the microscope and accessories. Therefore, it must be kept and taken care of.

Text symbols, pictograms and their meanings:

(1.2)

Numbers in parentheses, such as "(1.2)", correspond to illustrations (in the example, Figure 1, Item 2).

→ p. 20

Numbers with pointer arrows (for example → p. 20), point to a certain page of this manual.

Caution!
Special safety instructions within this manual are indicated with the triangle symbol shown here, and have a gray background.

!

Caution! The microscope and accessories can be damaged when operated incorrectly.

Explanatory note.

*

Item not contained in all configurations.

2. Intended Purpose of Microscopes

The Leica DM2000, DM2500 and DM3000 microscopes, to which this user manual belongs, are designed for biological routine and research applications. This includes the examination of samples taken from the human body with a view to provide information on physiological or pathological states or congenital abnormalities, or to determine the safety and compatibility with potential recipients, or to monitor therapeutic measures.

All the above-named microscopes comply with the Council Directive 98/79/EEC concerning in vitro diagnostics. They also conform to the Council Directives 73/23/EEC concerning electrical apparatus and 89/336/EEC concerning electromagnetic compatibility for use in an industrial environment.

Caution!

The manufacturer assumes no liability for damage caused by, or any risks arising from using the microscopes for other purposes than those for which they are intended or not using them within the specifications of Leica Microsystems Wetzlar GmbH.
In such cases the conformity declaration shall cease to be valid.

Caution!

These (IVD) devices are not intended for use in the patient environment defined by DIN VDE 0100-710. Neither are they intended for combining with medical devices according to EN 60601-1. If a microscope is electrically connected to a medical device according to EN 60601-1, the requirements defined in EN 60601-1-1 shall apply.

3. Safety Notes

3.1 General Safety Notes

This safety class 1 device is constructed and tested in accordance with
EN 61010-2-101:2002,
EN 61010-1:2001,
IEC 1010-1:2001,
safety regulations for electrical measuring, control, and laboratory devices.

Caution!

In order to maintain this condition and to ensure safe operation, the user must follow the instructions and warnings contained in this operating manual.

Caution!

The devices and accessories described in this operating manual have been tested for safety and potential hazards.
The responsible Leica affiliate or the main plant in Wetzlar, Germany must be consulted whenever the device is altered, modified or used in conjunction with non-Leica components that are outside of the scope of this manual.

Unauthorized alterations to the device or noncompliant use shall void all rights to any warranty claims!

3.2 Electrical Safety

General Specifications

Microscope

For indoor use only.

Supply voltage:	90-250 V~
Frequency:	50-60 Hz
Power input:	
DM2000	max. 40 W (90 VA)
DM2500	max. 160 W (220 VA)
DM3000	max. 48 W (110 VA)
Fuses:	F 3,15 A 250 V
Ambient temperature:	15-35°C
Relative humidity:	max. 80% to 30°C
Overvoltage category:	II
Pollution degree:	2

Caution!

The power plug may only be plugged into an outlet equipped with a grounding contact.

Do not interfere with the grounding function by using an extension cord without a ground wire. Any interruption of the ground wire inside or outside of the device, or release of the ground wire connection, can cause the device to become hazardous. Intentional ground interruption is not permitted!

Caution!

Through activating to the grounding connection (earth screw at the back of the stand) ancillary equipment with its own and/or extra power supply may be brought to the same ground wire potential. For connections without a ground connector, Leica Service must be consulted.

Caution!

Never use any fuses as replacements other than those of the types and the current ratings listed here. Using patched fuses or bridging the fuse holder is not permitted. The use of incorrect fuses may result in a fire hazard.

Caution!

The microscope's electrical accessory components are not protected against water. Water can cause electric shock.

Caution!

Protect the microscope from excessive temperature fluctuations. Such fluctuations can lead to the accumulation of condensation, which can damage the electrical and optical components.
Ambient temperature: 15-35°C.

Caution!

Before exchanging the fuses or lamps, be absolutely certain to switch off the main power switch and remove the power cable.

4. Overview of the Instrument

Specification	Leica DM2000	Leica DM2500
Contrast Method	• Transmitted Light: Brightfield, Darkfield, Phase Contrast, Polarization, Differential Interference Contrast • Incident Light: Fluorescence	
Transmitted Light Axis	Integrated halogen illumination manual adjustment of • Light intensity • Aperture diaphragm • Field diaphragm	Lamp Housing Manual adjustment of • Light intensity • Aperture diaphragm • Field diaphragm
Incident Light Axis	Incident-light fluorescence illuminator for up to eyepiece field number 22 with • 5-filter turret disk • Centerable aperture and field diaphragm • Light trap for the suppression of extraneous light • N4 neutral density filter and shutter, switchable	
Tube	optionally with • Fixed or variable viewing angle • Up to 3 switching positions • One or two camera ports • Ergotube with height-adjustable eye level and camera port	
Magnification Changer (optional)	• Manual • Magnification steps: 1x; 1.5x; 2x	
Objective Turret	• Manual • 6-fold or 7-fold for objectives with M25 thread • Objective prism slide	
X/Y Stage	• With condenser holder • Coaxial pinion, optional: telescoping stage controls • Controls mountable on left or right	

Specification	Leica DM2000	Leica DM2500
Condenser	• Condenser CL/PH 0.90/1.25 OIL with color coding (DM2500 with objectives < 10x require the diffuser slider) • Condenser CLP/PH 0.85 for polarization (DM2500 with objectives < 10x require the diffuser slider) • Condenser achr.apl. A 0.9 (P) with color coding and swivelable condenser head • UCL 0.90/1.25 OIL universal condenser (UCLP 0.85 for polarization with 5-position light ring disk) (DM2500 with objectives < 10x require the adapter lens (diffuser)) • UCL/P pol. universal condenser with interchangeable condenser head and condenser disk with 6 positions	
Focusing	• Focus wheel for coarse and fine focusing • Height adjustment • Speed switch (optional) • Focus stop and torque adjustment	

Specification	Leica DM3000
Contrast Method	• Transmitted Light: Brightfield, Darkfield, Phase Contrast, Polarization, Differential Interference Contrast • Incident Light: Fluorescence
Transmitted Light Axis	Integrated halogen illumination manual adjustment of • Aperture diaphragm • Field diaphragm • Automatic adjustment of light intensity with objective change
Incident Light Axis	Incident-light fluorescence illuminator for up to eyepiece field number 22 with • 5-filter turret disk • Centerable aperture and field diaphragm • Light trap for the suppression of extraneous light • N4 neutral density filter and shutter, switchable
Tube	optionally with • Fixed or variable viewing angle • Up to 3 switching positions • One or two camera ports • Ergotube with height-adjustable eye level and camera port
Magnification Changer (optional)	• Manual • Magnification steps: 1x; 1.5x; 2x
Objective Turret	• motorized Selection of objectives via function keys or (optionally) via foot switch • 6-fold for objectives with M25 thread • Objective prism slide
X/Y Stage	• With condenser holder • Coaxial pinion, optional: telescoping stage controls • Controls mountable on left or right

Specification	Leica DM3000
Condenser	• Condenser CL/PH 0.90/1.25 OIL with color coding • Condenser CLP/PH 0.85 for polarization • Condenser achr.apl. A 0.9 (P) with swivelable condenser head • UCL 0.90/1.25 OIL universal condenser (UCLP 0.85 for polarization with 5-position light ring disk) • UCL/P pol. universal condenser with interchangeable condenser head and condenser disk with 6 positions • motorized condenser achr. apl. A 0.9 (P), auto Automatic swiveling of condenser head for objective change
Focusing	• Focus wheel for coarse and fine focusing • Height adjustment • Speed switch (optional) • Focus stop and torque adjustment
Interfaces	USB2
Software	Leica Application Suite (LAS) for Windows™ 2000, XP for teach-in of objectives and configuration of function keys

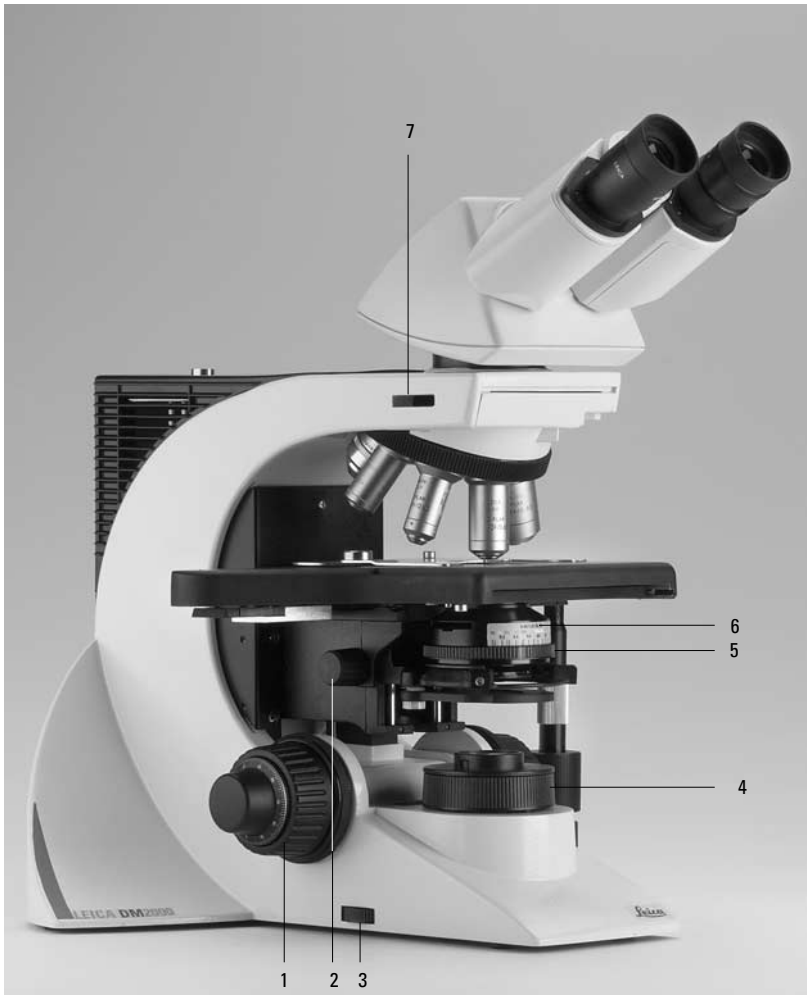


Fig. 1a Left side of the stand Leica DM2000
1 Coarse and fine focusing
2 Condenser height adjustment
3 Brightness control
4 Field diaphragm
5 Aperture diaphragm
6 Condenser
7 Analyzer slot

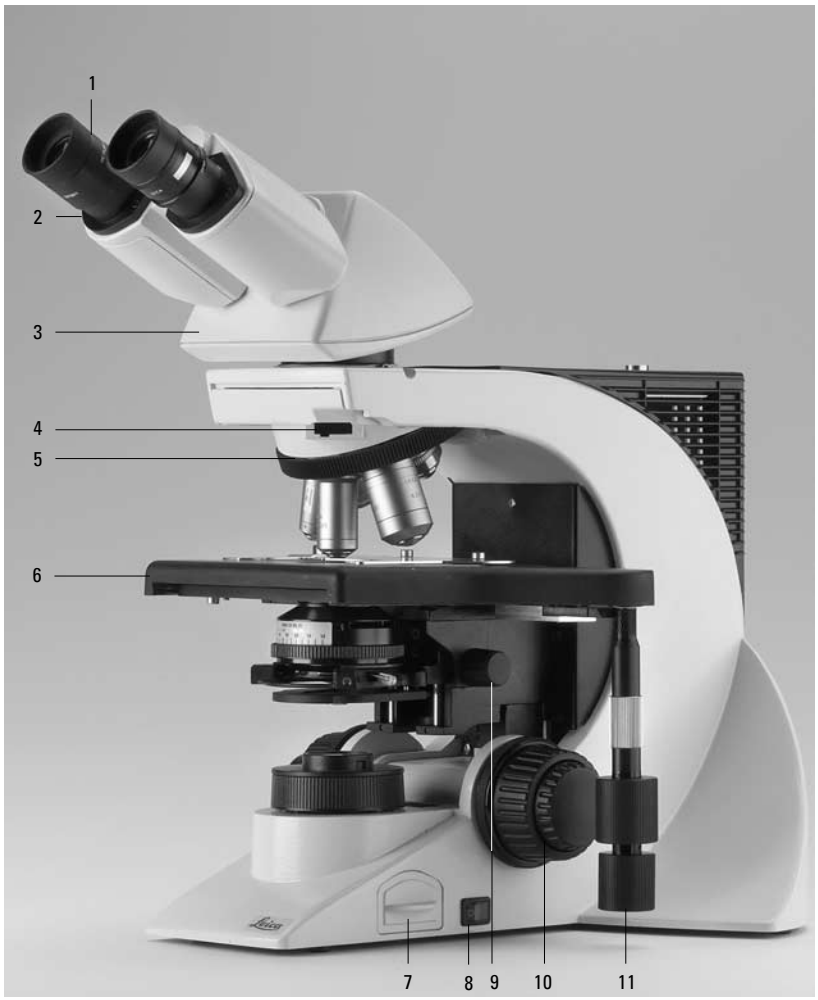


Fig. 1b Right side of the stand Leica DM2000
1 Eyepiece
2 Eyepiece tube
3 Tube
4 Slot for objective prism slide
5 Objective turret with objectives
6 Specimen stage with specimen holder
7 Integrated illumination
8 On/Off switch
9 Condenser height adjustment
10 Coarse and fine focusing
11 Coaxial pinion for x/y stage movement

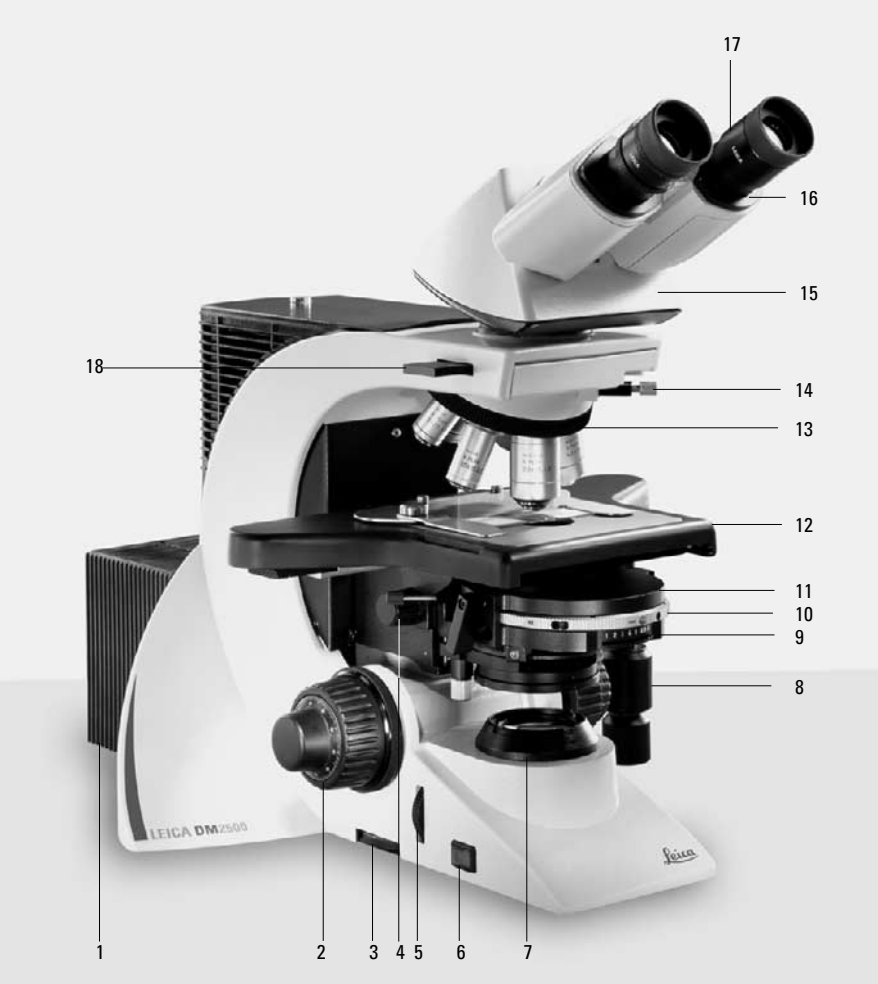


Fig. 2 Left side of the stand Leica DM2500

1 Lamp housing
2 Coarse and fine focusing
3 Brightness control
4 Condenser height adjustment
5 Field diaphragm adjustment
6 On/Off switch
7 Field diaphragm
8 Coaxial pinion for x/y stage movement
9 Aperture diaphragm
10 Condenser disk
11 Condenser
12 Specimen stage with specimen holder
13 Objective turret with objectives
14 Objective prism slide
15 Tube
16 Eyepiece tube
17 Eyepiece
18 Analyzer

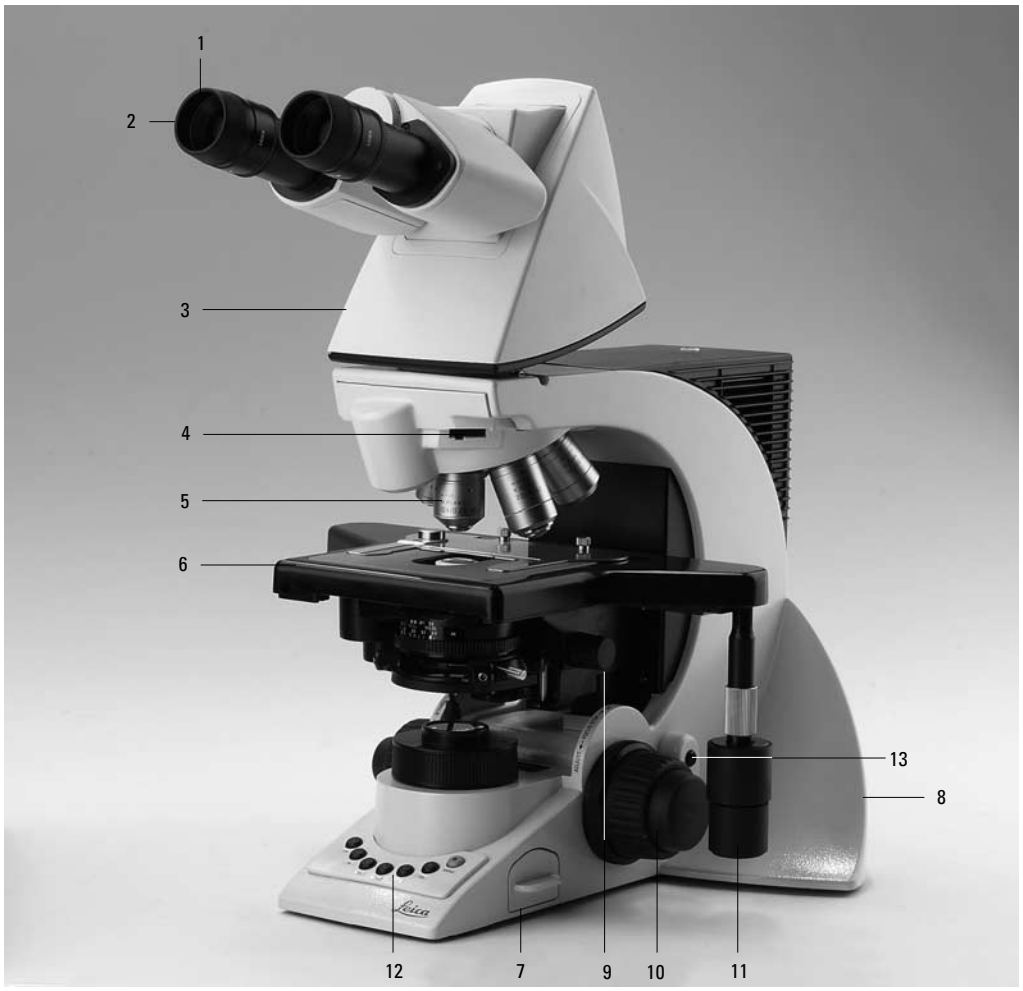


Fig. 3 Right side of Leica DM3000 stand

1 Eyepiece
2 Eyepiece tube
3 Tube
4 Slot for objective prism slider
5 Objective turret with objectives
6 Specimen stage with specimen holder
7 Integrated illumination
8 On/off switch (Backside of Stand)
9 Condenser height adjustment
10 Coarse and fine focusing
11 Coaxial pinion for x/y-stage movement
12 Front control panel with objective change keys and toggle key
13 Lateral function keys to change between two objective magnifications or for switching magnifications (larger/smaller)
Left side of stand analog

For additional controls see Fig. 1b Leica DM2000.

5. Unpacking the Microscope

First, carefully remove all components from the transportation and packaging materials.

Note:

If at all possible, avoid touching the lens surfaces of the objectives. If fingerprints do appear on the glass surfaces, remove them with a soft leather or linen cloth. Even small traces of finger perspiration can damage the surfaces in a short time. See the chapter "Care of the Microscope" → p. 70, for additional instructions.

Caution!

Do not yet connect the microscope and peripherals to the power supply at this point!

Installation Location

Work with the microscope should be performed in a dust-free room, which is free of oil vapors and other chemical vapors, as well as extreme humidity. At the workplace, large temperature fluctuations, direct sunlight and vibrations should be avoided. These conditions can distort measurements and micrographic images.

Allowable ambient conditions

Temperature	15-35°C
Relative humidity	maximum 80% up to 30°C

Microscopes in warm and warm-damp climatic zones require special care in order to prevent the build up of fungus.
See the chapter "Care of the Microscope" → p. 70, for additional instructions.

Caution!

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

Transport

For shipping or transporting the microscope and its accessory components, the original packaging should be used.

As a precaution to prevent damage from vibrations, the following components should be disassembled and packaged separately:

- Unscrew the objectives.
- Remove the condenser.
- Remove the coaxial pinion.
- Remove the lamp housings.
- Disassemble the burner of 106 z lamp housing.
- Remove all moving or loose parts.

6. Assembling the Microscope

The microscope components are logically assembled in this order:

- Stage
- Condenser
- Fluorescence*
- Intermediate systems*
- Tube
- Eyepieces
- Objectives
- Lamp housings with light sources
- Polarization*

Only one commonly used screwdriver is necessary for assembly, which is included in the delivery package.
The tool can be stored on a magnetic retainer on the underside of the stage at the right.
When using intermediate systems and optical accessories, the sequence may vary.
In this case, read Chapter
"6.10 Optional Accessories" → p. 31.

6.1 Stage

Caution:

Before completing the stage, make sure no objectives are installed!

Specimen Holder

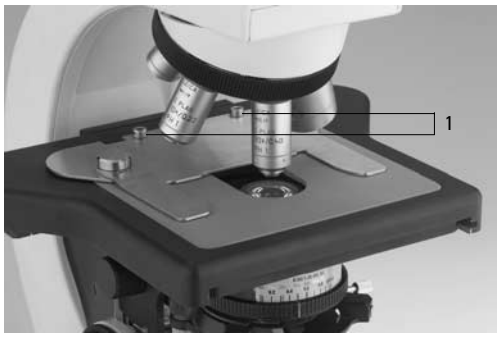
- Place the specimen holder on the stage and fasten it with the two screws (4.1).

Coaxial Pinion

Note:

The coaxial pinion can be mounted on the left- or right-hand side.

Fig. 4 Specimen stage with specimen holder
1 Lock screws for specimen holder

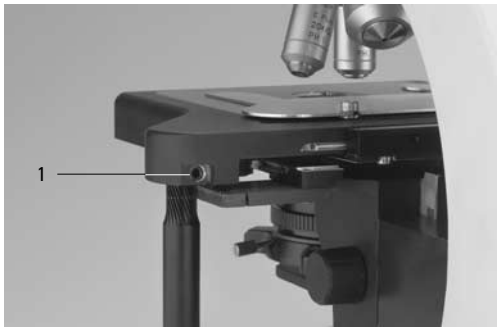


- First, place the fine focus wheel on the side to which you intend to mount the coaxial pinion. The wheel is held in place magnetically (5.1). Ensure that the button snaps into place. Attach the other focus knob on the opposite side.
- Loosen the lock screw (6.1) at the front left-hand side of the stage.
- Slide the stage as far back as possible.
- Attach the coaxial pinion with the screw (7.1).
- Pull the stage forward and retighten the lock screw.

Fig. 6 Underside of stage
1 Lock screw

Fig. 5 Focus wheel
1 Magnetic retainer for fine focus wheel

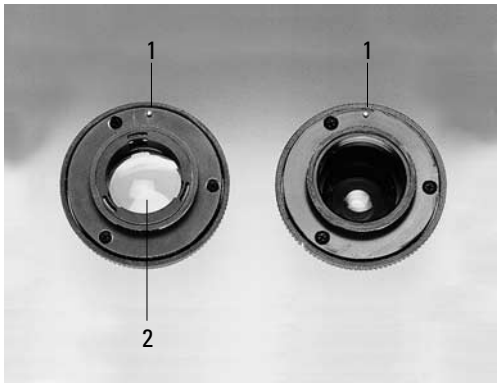
Fig. 7 Coaxial pinion installation
1 Mounting screw for coaxial pinion



6.2 Condenser

- If present, screw the condenser head into the condenser.
- Using the condenser height adjuster (10.3), turn the condenser holder (fig. 9) completely downward.
- Unscrew the clamping screw for the condenser (10.2) far enough so that the condenser can be inserted from the front.
- From the front, insert the condenser into the condenser holder as far as it will go. On the underside of the condenser, there is an orientation pin (8.1), which must be located in the guiding notch (9.1).
- Pull the condenser's clamping screw (10.2) so that the condenser is locked in place.
- For Leica DM3000 only:
  Connect the condenser cable when using the motorized condenser.

Fig. 8 Underside of condenser (example CL/PH)
1 Orientation pin
2 Auxiliary condenser lens LS (for Leica DM2000/3000)



Note:

The condenser must be centered before using the microscope.
→ Köhler illumination p. 34.

Fig. 9 Condenser holder
1 Guiding notch

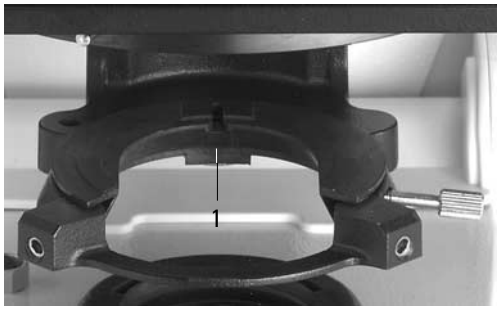
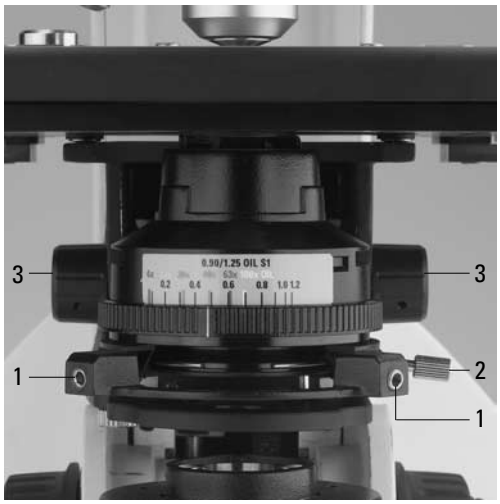


Fig. 10 Condenser holder
1 Condenser centering
2 Clamping screw for condenser
3 Condenser height adjuster



6.3 Tube and Eyepieces

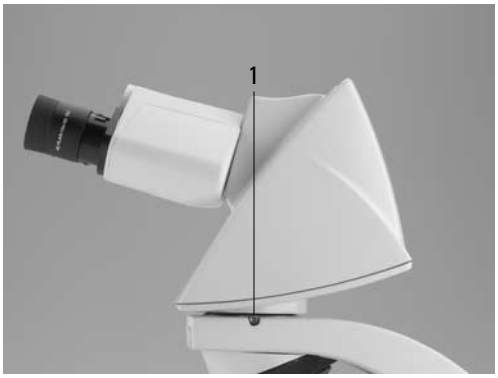
Note:

For fluorescence applications, install the fluorescence illuminator first → p. 26.

The tube is mounted to the stand either directly or with the use of intermediate modules. It is fastened in place with the side clamping screw (11.1).

- Loosen the clamping screw (11.1) on the stand.
- Insert the tube in the circular receptacle (dovetail ring).
- Retighten the clamping screw (11.1).
- The eyepieces are inserted into the eyepiece tubes on the tube.

Fig. 11 Fastening the tube
1 Clamping screw



6.4 Objectives

Always only use Leica objectives of tube length ∞ (infinity)! The standard thread is M25. The objectives should be arranged so that the magnification increases when the objective nosepiece is rotated clockwise.

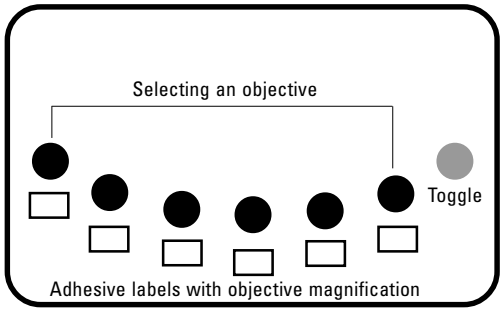
Attention:

Lower the specimen stage as far as possible before assembling the objectives. Close vacant threads in the nosepiece with dust protection caps!

For Leica DM3000 only:

According to your equipment, the individual objectives have already been assigned certain positions at the factory.
A listing of the exact positioning of the objectives is part of your supply (identification sheet).
The front control panel (Fig. 12) features six black keys for direct selection of an objective. Adhesive labels with the corresponding objective magnification are attached below the objective keys. (Additional adhesive labels are supplied.)
It is recommended to insert the objectives only after the connection to the power supply is established → p. 33.

Fig. 12 Front control panel of Leica DM3000



6.5 Light Source for the Transmitted Light Axis

Caution!

Be sure that the lamp housing is disconnected from the power supply. Unplug the power plug and the power supply during assembly.

Caution!

Light sources pose a potential irradiation risk (glare, UV-radiation, IR-radiation). Therefore, lamps have to be operated in closed housings.

Leica DM2000/3000 only:

Replacing the Lamp of the Iintegrated Illumination

The transmitted-light illumination with a low-voltage tungsten halogen lamp (Fig. 13) is integrated in the base of the microscope and is accessible from the right-hand side.

- Remove the insert (13.2).

Caution!

The lamp may still be hot!

- Remove the lamp.

Caution!

Do not remove the new lamp's dust cover until you have installed the lamp. Avoid fingerprints on the lamp.

- Insert the new lamp with the dust cover straight into the socket until it stops. Be sure that the lamp is inserted straight.
- Remove the lamp's dust cover.
- Replace the insert (13.2).

Fig. 13 Transmittedlight illumination in microscope base
1 Tungsten halogen lamp
2 Insert

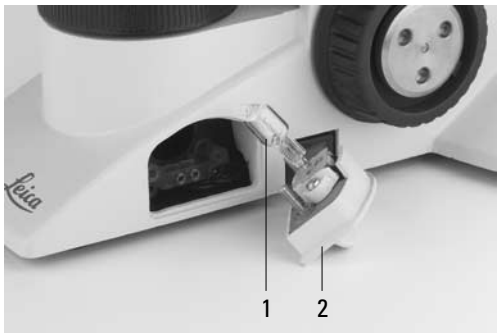


Fig. 14a Lamp housing 107/2
Releasing the fastening screw

Leica DM2500 only:

Replacing the Lamp in Lamp Housing 107/2

This lamp housing is used with a 12V 100W halogen lamp, which is already mounted.
In case the lamp has to be removed:

- Remove the fastener screw on the housing (Fig. 14a).
- Remove the housing by pulling it upward.
- Remove the lamp.

Caution!

Do not remove the new lamp's dust cover until you have installed the lamp. Avoid fingerprints on the lamp.

- Insert the new 12V 100W lamp (14b.1) with the dust cover straight into the socket until it stops. Be sure that the lamp is inserted straight.
- Remove the lamp's dust cover.
- Replace the housing and fasten it in place using the fastening screw.
- Place the lamp housing in the transmitted light lamp housing receptacle (Fig. 15) and fasten it with the clamping screw on the side.

Fig. 14b Lamp housing 107/2, opened
1 Mount with halogen lamp
2 Collector

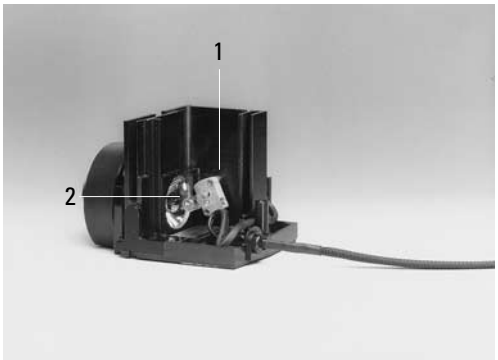


Fig. 15 Leica DM2500
1 Lamp housing for transmitted light

6.6 Components for Fluorescence Applications

6.6.1 Fluorescence Illuminator

The fluorescence illuminator is mounted in front of the tube. It is fastened in place with the side clamping screw.

6.6.2 106 z Lamp Housing

Caution!

Light sources pose a potential irradiation risk (glare, UV-radiation, IR-radiation). Therefore, lamps have to be operated in closed housings.

During assembly, always unplug the power supply unit of the 106 z lamp housing from its socket.

During assembly work on xenon burners, always wear the supplied protective gloves and face protection (Fig. 17) (risk of explosion).

Never touch the glass parts of the burner with bare hands.
Never look directly into the beam path (blinding hazard).

This 106 z lamp housing is used with various gas discharge lamps.

Caution!

Make sure to follow the instructions and safety notes of the lamp supplier.
Before changing lamps allow at least 30 minutes for cooling down!

Inserting the Gas Discharge Lamps (Hg and Xe) into the 106 z Lamp Housing

Hg and Xe lamps are powered by separate supply units.
Read the separate instruction manual provided with these supply units.

Fig. 16 Assembly of fluorescence illuminator

Fig. 17
Protective gloves and mask

The following gas discharge lamps may be used and require different supply units and lamp mounts (Fig. 19):

Type	Typical Bulb Life*
50 W high-pressure mercury burner (alternating current)	100 hours
100 W high-pressure mercury burner (direct current)	200 hours
100 W high-pressure mercury burner (direct current, type 103 W/2)	300 hours
75 W High-pressure xenon burner (direct current)	400 hours

* Please regard the data sheets for the burners.

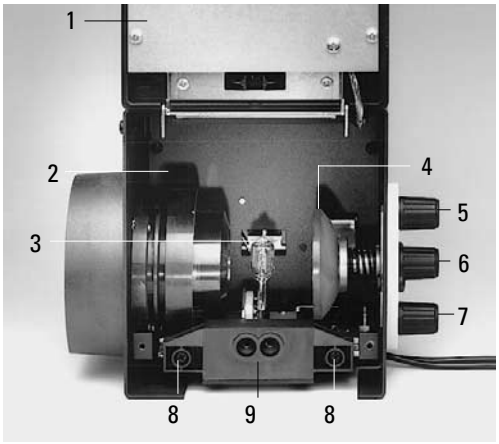
- To open the 106 z lamp housing, unscrew the fastening screws (18.8) on the cover.
- Remove the transport anchorage (red plastic rod in place of the burner) in the lamp mount. To do so, remove the lower clamp (19.1). Pull up the cooling element (19.3) and turn it to the side. Detach the lower clamp system (19.2) and remove the transport anchorage.
- Install the burner in reverse order.

Caution!

Hg 50 Burner:
After installation, the labeling must be upright. If a glass melt nipple is present (19a.4), position it by turning the burner so that the nipple does not come in the way of the beam path later, but instead is positioned sideways.

Xe 75 Burner:
Remove the burner's dust cover (19b.5) after you have installed the burner.

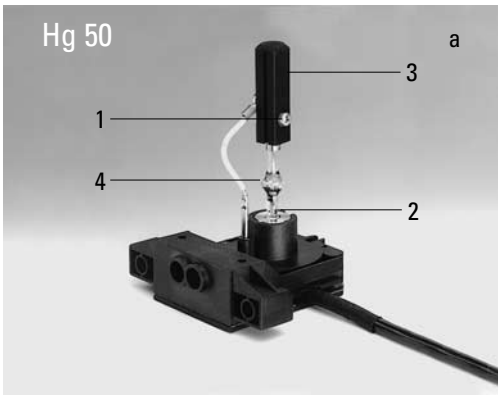
Fig. 18 106 z lamp housing (on the side, open)
1 Cover raised
2 Collector
3 Gas discharge lamp in mount
4 Reflector (mirror)
5, 6, 7 Adjusting screw for x-y reflector
8 Fastening screw for lamp mount
9 Socket for contact plug

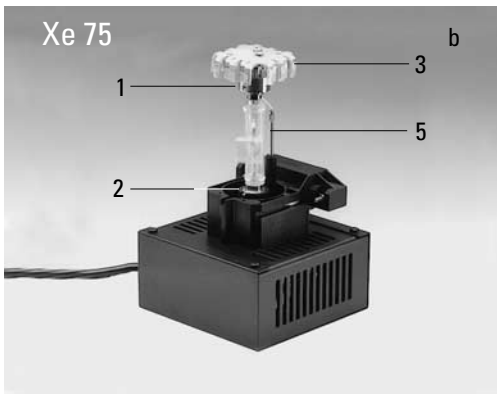


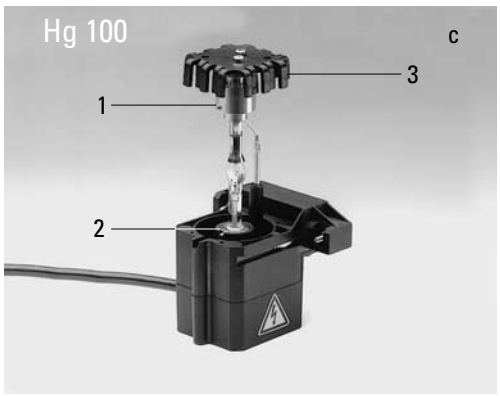
- Insert the lamp mount, with the burner installed, into the lamp housing and tighten it with the screws (18.8).
- Close the lamp housing and retighten the screws.
- Place the lamp housing in the incident light lamp housing receptacle (20.1) and fasten it with the clamping screw on the side.
- Connect the lamp housing to the external power supply.

Fig. 20 Mounting the 106 z lamp housing
1 Lamp housing receptacle

Fig. 19 a-c Lamp mounts for gas discharge lamps
1 Upper clamping system
2 Lower clamping system
3 Cooling element
4 Nipple of the mercury 50 burner
5 Dust cover of the xenon 75 burner







6.6.3 Equipping the Fluorescence Turret Disk

Insert the filter and reflector cubes in the following manner:

- Remove the Analyzer (Fig. 23.1).
- Remove the front cover (Fig. 23.2) by pulling it toward the front.
- Insert the filter or reflector cube into the mounting in front of you.
  To do so, place the filter or reflector cube on the **right** side and press it to the **left** into the mounting.

Note:

The numbering is located directly below the holder.

- Apply the included adhesive labels (Fig. 23.3) corresponding to the installed parts to the front of the fluorescence illuminator.
- When all filters and reflector cubes have been inserted, close the front cover plate again. Ensure that the cover snaps into place.

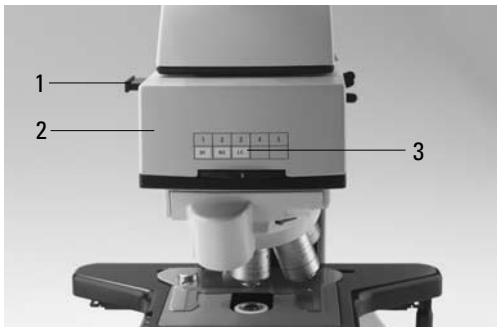


Fig. 23 Fluorescence Axis
1 Analyzer
2 Front Cover
3 Labels

Fig. 24 Fluorescence Axis without Front Cover

Fig. 25 Mounting the Filter cube

Fig. 21 Filter cube front side

Fig. 22 Filter cube back side

6.7 Analyzer and Polarizer

Analyzer

- Remove the plug cap on the left side of the stand.
- Insert the analyzer into the receptacle until it latches in place (26.1).

When using the Pol intermediate tube* or the TL analyzer slot*:

- Remove the plug cap on the left side.
- Insert the analyzer into the receptacle until it latches in place.

Polarizer

- Attach the polarizer holder to the underside of the condenser holder with the left clamp screw (26.2). Remove the flip-out blue filter if required.
- Push the polarizer with the labelled side facing **upward** into the lower opening.

Alternatively for Leica DM2000/3000:

- Raise the condenser to its upper stop position.
- Remove the DLF filter magazine from the base if present.
- Press the polarizer holder in place (Fig. 27).
- Push the polarizer with the labelled side facing **upward** into the lower opening.

Fig. 26 Assembly of polarizer holder
1 Analyzer slot
2 Clamping screw

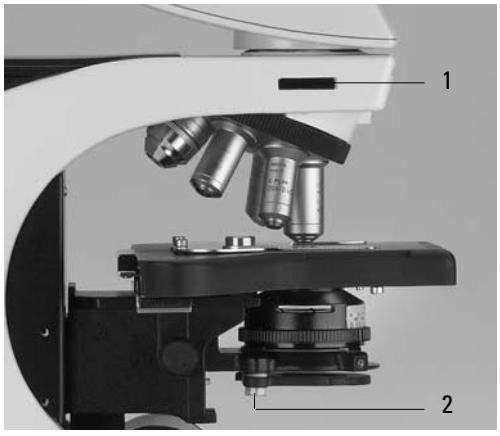
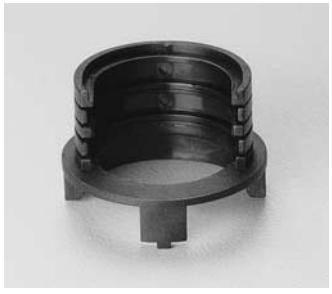


Fig. 27 Filter holder with 2 positions for Leica DM2000/3000



6.8 Lambda Plate Compensator*

- Raise the condenser to it's upper stop position.
- Remove the DLF filter magazine from the base if present.
- Attach the lambda plate compensator to the base.

6.9 DIC Prisms

The condenser prisms have already been mounted at the factory.
To adjust the condenser prisms during first use → p. 37.
To retrofit DIC prisms, see → p. 75.

6.10 Optional Accessories

Camera

A camera can be connected via an adapter.

- Attach the adapter to the top port of the tube and fasten it tightly with the side clamping screw.
- Screw on the camera.

Note:

The size of the camera chip and the mounting system (B-mount, C-mount, etc.) must be considered when choosing an adapter.
See table.

	Recorded picture diagonal in mm for 1 inch camera	2/3 inch camera	1/2 inch camera	1/3 inch camera
Without zoom magnification, for 1-chip cameras only:				
C-mount adapter 1 x HC	16	11	8	6
C-mount adapter 0.63 x HC	-	17.5	12.7	9.5
C-mount adapter 0.5 x HC	-	-	16	12
C-mount adapter 0.35 x HC	-	-	-	17.1
With zoom magnification (vario TV adapter) for 1-3 chip cameras:				
C-mount, 0.32-1.6 x HC	-	-	19[+)]-5	18-3.8
B-mount (ENG), 0.5-2.4 x HC (1/2-inch)	-	-	16-3.3	-
[+)] from zoom factor 0.42 x only!				
Without zoom magnification, for 1-3 chip cameras:				
C-mount adapter 1 x	-	-	16	12
B-mount adapter 1 x	-	-	16	12
B-mount adapter 1.25 x	-	17.5	-	-
F-mount adapter 1 x	-	-	16	12
F-mount adapter 1.25 x	-	17.5	-	-

Plus (Essential Requirement): TV optics 0.5 x HC

Calculation of the magnification on the monitor
The magnification M_{TV} on the monitor can be calculated with the following formula or measured with a stage micrometer and a cm scale:

M_{TV} = Objective magnification x
factor of magnification changer*x
TV adapter magnification x
monitor diameter
chip diameter of camera

Ergomodule

For raising the eye level of the tube opening, the 30 mm or 60 ergomodule mm may be used.
It is fastened in place with the side clamping screw.

Ergolift

A base for the stand featuring adjuster wheels for the base's height and angle is available to ensure an optimal working position.

Fig. 28 Magnification changer

Magnification Changer

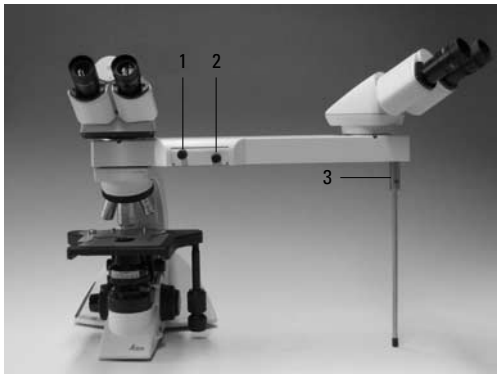
Optionally, a magnification changer (fig. 28) can be used, which is manually operated. On the knurled ring, the following magnification factors can be set:

1x; 1.5x; 2x

Viewing Attachments

Viewing attachments featuring illuminated pointers are available for groups of up to 20 viewers.
The support (29.3) must be aligned precisely.
The fade-in arrow can be moved in x and y direction (move the lever vertically or pull out/push in) (29.1) If this lever is rotated, the color of the arrow can be changed (red/yellow). Use the brightness control (29.2) to adjust the brightness of the arrow.

Fig. 29 Viewing attachment (here with Leica DM1000)
1 Movement of light pointer in x and y direction, and switchover of color filter
2 Brightness control
3 Adjustment of arm support
The external power supply (illuminated arrow) is not illustrated.



Tracing device

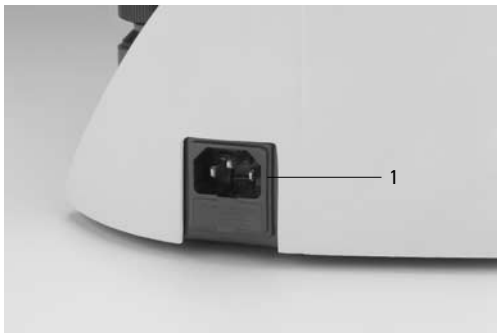
The tracing device L3/20 (fig. 30) allows an optical overlay of large objects (next to the microscope) on the microscope image. This makes it easy to draw specimens by tracing their outlines or superimposing scales.

Foot switch for Leica DM3000

A double foot switch can be connected to the Leica DM3000 stand as an option to swivel in the objectives.
The connection is located on the rear side of the stand (31b.2).

Fig. 30 Tracing device
1 Shutter

Fig. 31a Rear side of the Leica DM2000/DM2500 stand
1 Power supply connection



6.11 Connection to the Power Supply

- After completing the assembly work, connect the stand to the power supply using the power cable supplied (Fig. 31a,b.1).

- When using the lamp housing or the external power supply unit, connect them to the power supply, too.

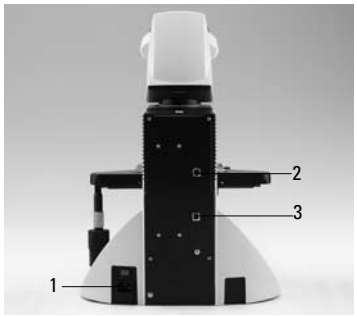
For Leica DM3000:

If necessary, insert the objectives after switching on the microscope.
Adhesive labels with the corresponding objective magnification are attached below the black objective keys on the front control panel. Pressing the corresponding key approaches the respective objective position.

Note:

The connection of a PC to the Leica DM3000 (31b.3) is only required if new objectives must be taught in or a reassignment of the lateral function keys must be performed. This is only possible using the Leica DMControl software.

Fig. 31b Rear side of Leica DM3000 stand
1 Power supply connection
2 Foot switch connection
3 PC connection



7. Start-up

Note:

Unless otherwise specified, the Leica DM3000 microscope is subject to the same operating instructions as the Leica DM2000 microscope.

7.1 Switching on the Microscope

- Switch on the microscope with the on/off switch (32.1, 33.5).

Caution!

After turning on the gas discharge lamp, the burner must be immediately adjusted. Therefore, **do not** turn on the power supply unit yet. First, work in transmitted light in order to familiarize yourself with the microscope's controls.

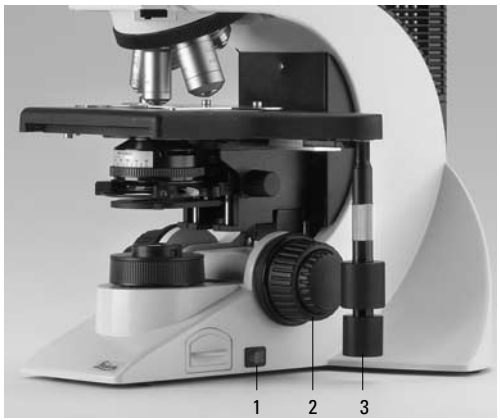
7.2 Köhler Illumination

The condenser is also pre-adjusted in the factory.
However, in some cases it may be necessary to re-adjust the condenser. Therefore, check the condenser centering.

The following procedure is provided for transmitted light-bright field illumination.

- If present: click the condenser disk* into the BF position.
- If present: pull the light ring slide* out of the condenser.

Fig. 32 Leica DM2000
1 On/Off switch
2 Focus wheel
3 Stage positioning



- Select an objective with moderate magnification (10x-20x).
  For condensers with movable condenser heads:
  Swing in the condenser top.
  (The condenser top is swung out for objective magnifications < 10x.)

  For Leica DM3000:
  To swing in the objective, press the corresponding objective key on the front control panel. If the microscope is equipped with a motorized condenser, the condenser head is automatically swung in or out depending upon the objective magnification.

- Insert the specimen in the stage's specimen holder.

- Focus on the specimen using the focus wheel (32.2).

- Set the light intensity using the brightness control (33.2, 34.2).

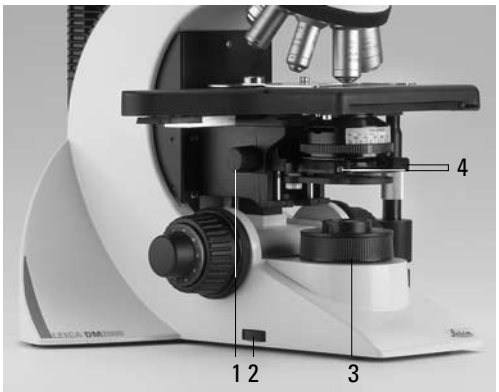
- Close the field diaphragm (33.4, 34.3) until the edge of the diaphragm appears in the specimen plane (34a).

- Using the condenser height adjuster (33.3, 34.1), adjust the condenser until the edge of the field diaphragm appears in sharp relief.

- If the image does not appear in the middle of the field of view (35c), the condenser must be moved into the middle of the field of view with the help of the two centering bolts (34.4). The tool required for this purpose is magnetically attached to the underside of the stage.

Fig. 33 Leica DM2500
1 Focus wheel
2 Brightness control
3 Condenser height adjuster
4 Field diaphragm control
5 On/off switch
6 Condenser centering
7 Stage positioning

Fig. 34 Leica DM2500
1 Condenser height adjuster
2 Brightness control
3 Field diaphragm
4 Condenser centering



- Open the field diaphragm just enough for it to disappear from the field of view (35d).

Note:

The condenser height adjustment depends on the thickness of the specimen. It may be adjusted for different specimens.

Fig. 35 Köhler Illumination
a Field diaphragm not focused, not centered
b Field diaphragm focused, but not centered
c Field diaphragm focused and centered
Diameter shown here is too small
d Field diameter (light) = Field diameter (view)
(Köhler Illumination)

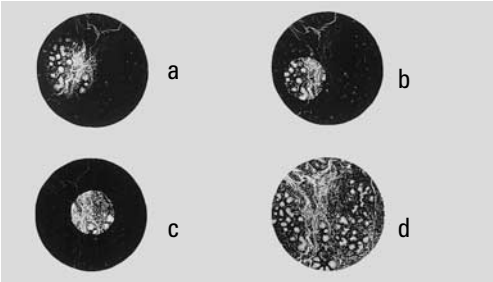


Fig. 36 Focusing Telescope
1 Adjustable eye lens
2 Clamping ring for fixing the focus position

7.3 Checking Phase Contrast Rings

If your microscope is equipped for the use of phase contrast, the light rings that fit the objectives are built into the condenser.
The light rings are already centered in the factory. However, the centering should be rechecked.

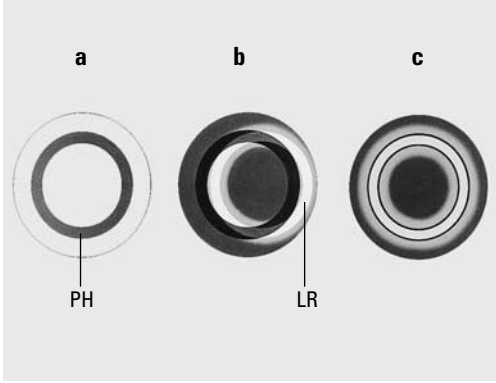
Note:

A light ring slide which is inserted into the side of the condenser is used for condensers without condenser disks. Centering is not required in this case.

Note:

When swiveling in a suitable objective for phase contrast, the corresponding light ring must be chosen.
The objective engraving (e.g. PH **1**) indicates the corresponding light ring (e.g. **1**).

Fig. 37 Phase Contrast Centering Procedure
PH=phase contrast ring, LR=light ring
a Condenser in brightfield (BF) position
b Condenser in phase contrast (PH) position
Light ring (LR) not centered
c Light ring and phase ring centered



- In the place of an eyepiece, insert the focusing telescope (Fig. 36) into the observation tube.
- Swivel in the phase contrast objective with the lowest magnification.
- Focus on the specimen with the focus wheel.
- Focus the ring structure (37.a) by slightly loosening the clamping ring (36.2) and moving the eye lens (36.1).
- Retighten the clamping ring.
- Select the corresponding ring diaphragm (light ring) in the condenser.
- If the light ring and the phase ring are not shown as arranged in Fig. 37.c, the light ring must be centered.
- Insert the centering screws into the openings provided at the rear of the condenser (38.1).

Fig. 38 Light ring centering (i.e.: condenser UCA/P)
1 Centering keys

- Turn the centering screws until the dark ring (phase ring in the objective) is congruent with the slightly narrower bright ring (light ring in condenser) (37c).
- Repeat the process for all other light rings.
- Remove the centering keys after the centering procedure.

7.4 Adjustment of Condenser Prisms

If the equipment was delivered together, the condenser prisms will already have been adjusted at the factory, but it advisable to check the adjustment from time to time, especially after transport.

- Pull out the objective prism slide (39.1) fully or partway.

Fig. 39
1 Objective prism slide

- Swivel in a suitable objective and focus on the specimen.

- If necessary, swing in the condenser top.
  The condenser top is swung out for objective magnifications < 10x.

- Set the Köhler illumination (→ p. 34).

- In place of an eyepiece, insert the focusing telescope (Fig. 36) into the observation tube.

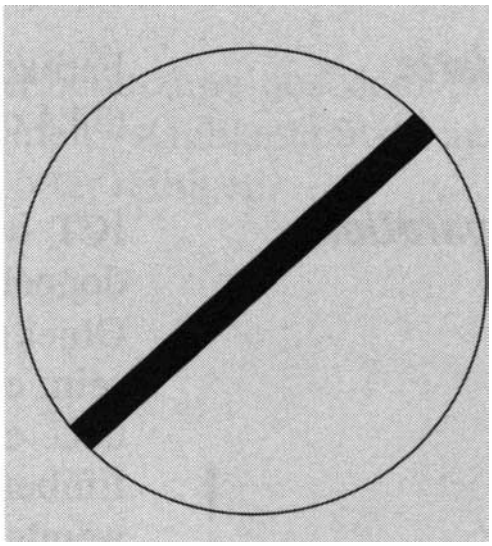
- Engage the condenser-side prisms one after the other and focus the telescope on the dark diagonal compensation stripe (40). by slightly loosening the clamping ring (36.2) and moving the eye lens (36.1). The compensator must be inactive, i.e. the engraving $\underline{\lambda}$ must be on the lower side of the analyzer or the λ and $\lambda/4$ compensator must be removed.

The dark stripe should be in the center of the brighter circular area. If not, proceed as follows:

- Make sure that the right-hand centering screw for the light rings is not turned too far inward or it may obstruct the movement of the prism with the left-hand key.

- Push in the left-hand centering key on the back of the condenser until it clicks into position and rotate it until the stripe is in the center of the circle.
  The right-hand key is not required.

Fig. 40
Objective pupil with correctly centered compensation stripe.



7.5 Adjusting the Light Sources

Centering is only required when using the 106 z lamp housing.

- When a supply unit is used, it is turned on first.

Caution!

Never look directly into the beam path!

Caution!

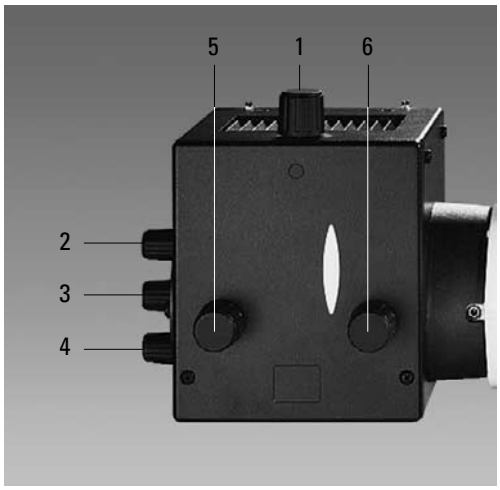
Light sources pose a potential irradiation risk (glare, UV-radiation, IR-radiation).

For the 106 z lamp housing, the direct arc image (for gas discharge lamps) and its mirror image are focused separately and adjusted to each other.

- Move the filter system or reflector into the light path.
- Open the shutter and remove any diffusing screens* from the light path.
- Put a piece of paper on the specimen stage and roughly focus the surface with a dry objective of low to medium magnification.
- Set the field and aperture diaphragms roughly at the center position.
- With a felt tip or ballpoint pen, make a marking at any position on the paper and slide it into the small illuminated field.
- Turn a vacant nosepiece position into the light path or remove the objective.

The light source will then be imaged onto the paper. While observing the light source, the lamp is adjusted as follows.

Fig. 41 106 z lamp housing
1 Lamp height adjustment
2,4 Mirror image height and side adjustment
3 Focusing the reflector
5 Lamp side adjustment
6 Collector (focusing of the lamp image)



Centering the Hg 50 W Mercury Lamp

- In the adjustment window, you see the direct arc image and the mirror image, which in most cases are not aligned.
- Focus the direct image with the collector (41.6).
- Use the adjusting buttons on the rear side of the lamp housing (41.2, 41.4) to pivot the arc's mirror image to the side or completely out of the beam path. The lamp filament's focused image remains visible (Fig. 42).
- Use the adjusting buttons (41.1) and (41.5) to place the direct arc image into right or left on an imaginary center line of the centering plane (Fig. 43).
- Then pivot the arc's mirror image with the adjusting knobs (41.2 and 4) and focus it using the reflector (41.3).
- Use the adjusting knobs (41.2 and 4) to orient the mirror image symmetrically to the direct image (Fig. 44).
- Defocus the image with the collector knob (41.6) until the arc image and mirror image are no longer recognizable and the image is homogeneously illuminated.

Fig. 42 Direct arc image focused but decentered (in reality, the image is less focused)

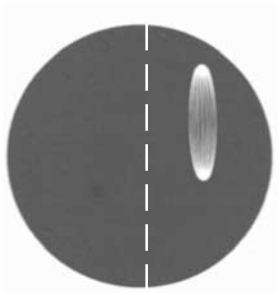


Fig. 43 Direct arc image in target position (in reality, the image is less focused)

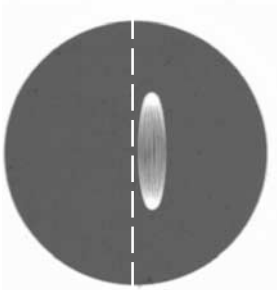
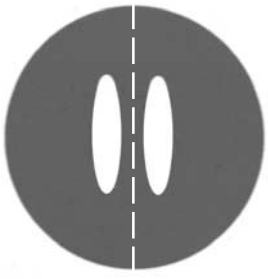


Fig. 44 Direct arc image and mirror image in target position (in reality, the image is less focused)



Centering the Hg 100 W and Xe 75 W Mercury Lamps

- On the paper, you see the direct arc image and the mirror image, which in most cases are not aligned.
- Focus the direct image with the collector (41.6).
- Use the adjusting buttons to pivot the arc's mirror image on the rear side of the lamp housing (41.2,41.4) to the side or completely out of the beam path. The arc's focused image remains visible (Fig. 45).
- Use the adjusting buttons (41.1 and 5) to place the direct arc image in the middle of the centering plane, whereby the bright tip of the arc, the focal spot, should lie slightly outside the center (Fig. 46).
- Then pivot the arc's mirror image with the adjusting knobs (41.2) and (41.4) and focus it using the reflector (41.3).
- Use the adjusting knobs (41.2 and 41.4) to orient the mirror image symmetrically to the direct image (Fig. 47).
  The V-shaped irradiation of the direct image and mirror image arcs can be superimposed.

Caution!

The bright tips of the arcs, the focal spots, must never be projected onto each other, as this results in a danger of explosion by overheating.

Fig. 45 Direct arc image focused but not centered (in reality, the image is less focused)

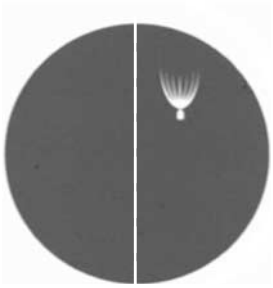


Fig. 46 Direct arc image in target position (in reality, the image is less focused)

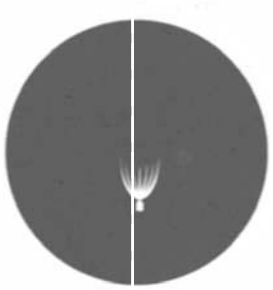
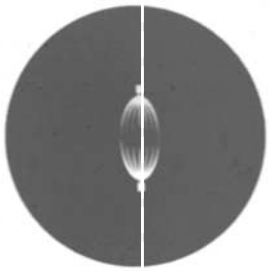


Fig. 47 Direct arc image and mirror image in target position (in reality, the image is less focused)



Caution:

In older lamps, the structure of the arc is no longer clearly recognizable. The image is then more like that of a HG 50 lamp. The image and mirror image can no longer be superimposed exactly. In this case, align both images.

- Using the collector, defocus the image with the knob (41.6) until the arc image and mirror image are no longer recognizable and the image is homogeneously illuminated.

8. Operation

8.1 Switching On

When using a gas discharge lamp, the external supply unit must be turned on separately.

Switch on the microscope with the on/off switch (48.1, for Leica DM2500 at the opposite stand side).

8.2 Stages and Object Displacement

Lengthening the Coaxial Pinion

- For lengthening, pull the lower grip (49b.1) downward. Repeat with the upper grip (49b.2).

Torque Adjustment

The torque for x and y can be individually adjusted using two knurled rings (49b.2, 49b.4).

Fig. 48
1 On/off switch
2 Coarse focusing
3 Fine focusing
4 Stage positioning
5 Stage lock screw
6 Coaxial pinion mounting screw

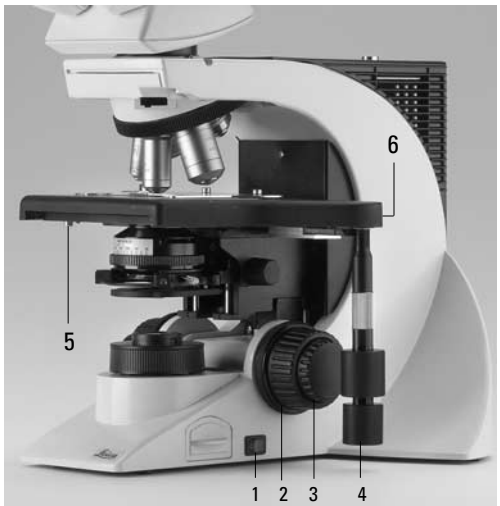
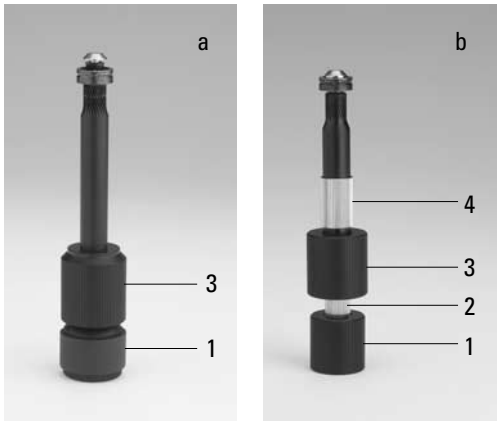


Fig. 49a Standard coaxial pinion, **b** coaxial pinion with height and torque adjustment
1 Object displacement (Y-direction)
2 Torque adjuster (X-direction)
3 Object displacement (X-direction)
4 Torque adjuster (Y-direction)



Right-/Left-hand Operation

The coaxial pinion can be attached to either side of the stage. (Also see Assembly, p. 20). To change the side, follow these steps:

- Loosen the lock screw (48.5) at the bottom left-hand side of the stage. The necessary tool is attached to the bottom of the stage on the right-hand side.

! Caution:

The condenser must be lowered!

- Slide the stage all the way back.
- Release the screw (50.6) on the coaxial pinion and pull the pinion out.
- Place the fine focus wheel on the side to which you intend to mount the coaxial pinion. The wheel is held in place magnetically. Ensure that the button snaps into place. Attach the other focus knob on the opposite side.
- Fasten the coaxial pinion to the other side of the stage by retightening the appropriate screw.
- Return the stage to the starting position and retighten the lock screw. After installation of the stage control, move object guide all the way to the left side of the instrument. Keep turning when guide has reached the end of travel until a click noise is heard.
- Readjust the condenser.

8.3 Focusing

Coarse and Fine Focusing

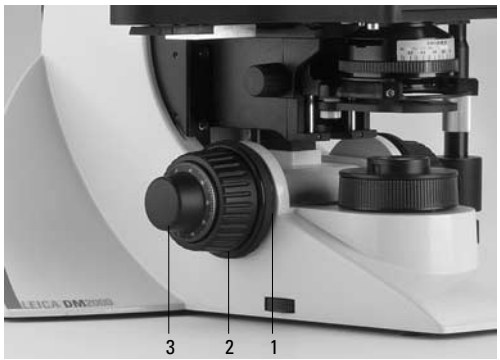
Coarse and fine focusing wheels are located on either side of the stand (Fig. 50 and 51).

The special design of the flat fine focus wheel (Fig. 51.3) allows users to enclose the coaxial pinion in their hands while operating the fine focus with one finger. The flat wheel should therefore be mounted on the appropriate side. See right-/left-hand operation of the stage.

Height Adjustment of the Focusing Wheels

- Defocus the image by moving the stage down with a full turn of the **coarse** focus wheel (50.2, 51.2).

Fig. 50 Focus knob with scale
1 Adjusting the torque
2 Coarse focusing
3 Fine focusing



- Grasp the right-hand and left-hand focus knobs at the same time and press the knobs gently upward or downward into the desired position.

- Refocus the image.

Speed Switch (optional)

Fine focusing can be adjusted in two speeds. To switch speeds, press the left focus wheel to the right or vice versa.

Fig. 51 Focus wheel with flat focus knob
1 Focus stop
2 Coarse focusing
3 Fine focusing

Setting the Focus Stop

The current position can be set as the focus stop by locking the knurled wheel (51.1) at the right-hand focus knob. It will then no longer be possible to travel past that position.

To set the stop, turn the knurled wheel clockwise. Turning it in the opposite direction releases the wheel.

Setting the Torque

The torque of the focus drive can be adjusted using the knurled wheel (50.1) at the left focus knob.

! Caution:

Ensure that the action is not too light. Otherwise, the stage can slip downward unintentionally.

! Caution:

When adjusting the focus knobs on DM3000 (height adjustment, torque and focus stop adjustment), please do not put the finger between the focus knobs and the side button mount (danger of squeezing the fingers).

8.4 Tubes

Note:

Close any unused tube openings, as otherwise stray light can interfere with observation.

Adjusting the Viewing Distance

- Adjust the viewing distances of the eyepieces so that a congruent total image is seen (Fig. 52).

Adjusting the Viewing Angle

- For the HC LVB 0/4/4 and HC -/0/4 ergonomy tubes, the viewing angle can be adjusted by tilting the binocular viewer.
  Ergotube (long, swivelable): 0° - 35°
  Ergotube (short, swivelable): 7.5° - 32.5°

- For the AET22 and EDT22 ergotubes, the viewing angle can be adjusted by tilting the binocular viewer in the range of 5° - 32° (Fig. 53).

Adjusting the Eyepiece Section to the Arm Length

- On the AET22 tube, the eyepieces can be extended up to 30 mm (Fig. 53).

Beam Splitting in Photo Tubes

EDT22 tube:
The beam splitting between the observation and documentation outputs has a definite presetting (50%:50%).

BDT25+ tube:
The beam splitting is set manually by pulling out a control bar.

Control Bar		Observation	Photo
VIS		100%	0%
50/50		50%	50%
PHOTO		0%	100%

Fig. 52 Tube setting
∩ Personal eyebase settings
1 Scale (mm), **2** Intermediate module*, in illustration: Ergo module

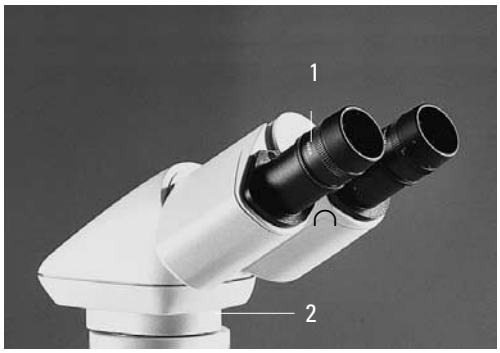
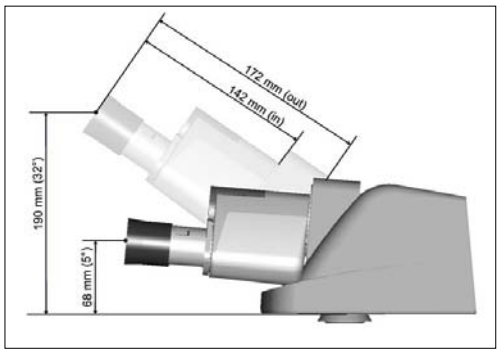


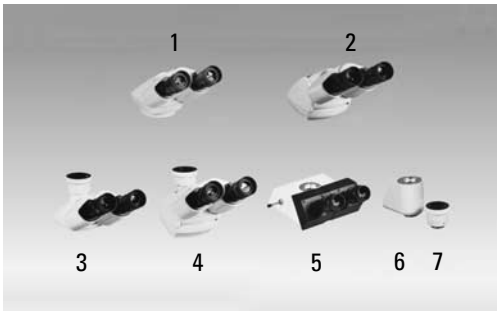
Fig. 53 With AET22 tube individual adjustments



HC L 2TU tube:
The beam splitting is set manually by pulling out a control bar.

Control Bar		Observation	Photo
VIS		100%	0%
PHOTO		0%	100%

Fig. 54 Tube range HC L
1 Binocular observation tube HC LB 0/3/4
2 Ergonomy tube HC LVB 0/4/4, binocular, viewing angle 0-35°
additional ergotube (short) HC -/0/4, swivelable 7.5°-32.5°
3 Trinocular tube H L1T 4/5/7, with fixed beamsplitter (50% / 50%)
4 HC L1VT 0/4/4 like 3, but with adjustable viewing angle of 0-35°
5 Trinocular tube HC L3TP 4/5/7 with 3 switching positions
6 Photo adapter, with 2 exits (50% / 50%)
7 Photo TV exit



8.5 Eyepieces

Note:

The eyepiece's aperture protector must be removed or folded back, during microscopy while wearing eyeglasses.
We recommend that users take off glasses with bifocal or progressive-addition lenses when working with the microscope.

- For the adjustable tubes with documentation output, choose the 100% VIS position.

Eyepieces with Inlaid Reticle

- Focus the reticle by adjusting the eye lens.
- Focus on the object through this eyepiece.
- Then, close that eye and focus on the object by adjusting only the second ocular.

Correction for Vision Problems

- With your right eye, look through the right eyepiece and bring the specimen into sharp focus.
- Then, with your left eye, view the same specimen and rotate the left eyepiece tube until the object is brought into sharp focus. Do not use the focus dial.

8.6 Objectives

Changing Objectives

For Leica DM2000 and DM2500, the objectives are manually swung into the beam path. Be sure that the nosepiece turret locks into place.
For Leica DM3000, the operation is carried out via the front control panel and via the lateral function keys → p. 49.

When you rotate the objective into position, the settings for
- field diaphragm → p. 54
- aperture diaphragm → p. 53
- light intensity → p. 52

should be checked.

Note:

For Leica DM3000, the light intensity is automatically adjusted after the objective change.

- For **immersion objectives** use the appropriate immersion medium.
  - OIL: only use optical immersion oil according to DIN/ISO standards. Cleaning → p. 70.
  - W: Water immersion.
  - IMM: Universal objective for water, glycerol, oil immersion.

Caution!

Follow safety instructions for immersion oil!

Note:

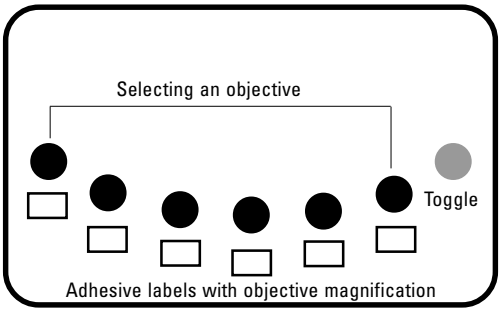
For lockable immersion objectives, lock these by pushing the front part upward until it stops (approx. 2 mm). Then, after a gentle turning motion to the right, the objective is locked (Fig. 55b).
For objectives with corrective mounts, turn the knurl to adjust the objective to the thickness of the cover glass.

Fig. 55a Immersion objective (released)

Fig. 55b Immersion objective (locked)

8.7 The function keys for Leica DM3000

The front control panel features six black keys for direct selection of an objective. Adhesive labels with the corresponding objective magnification can be attached below the objective keys. The objective key for objective 1, which is generally the objective with the lowest magnification, is located on the far left. The assignment of the keys to the objective is carried out at the factory and is dependent upon the microscope equipment.
The gray toggle key on the far right side is used to switch modes.



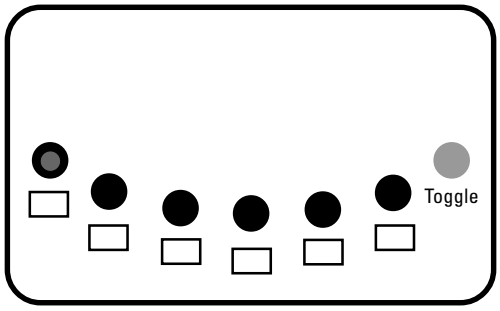
In standard mode, the two function keys on the right or the left side of the stand (Fig. 56.2) are used to sequentially approach the objective magnifications. Pressing the upper or lower keys causes the objective turret to turn clockwise or counterclockwise. The key assignment on the right and left side of the stand is identical in the standard configuration.
(See the special function of the lateral function keys → p. 51.)

In toggle mode, pressing one of the lateral function keys switches back and forth between previously learned magnifications. The factory-set objectives can easily be customized in the teach-in mode.
Green or yellow diodes indicate the current mode and/or the objective currently located in the beam path.

Fig. 56 Leica DM3000
1 Front control panel
2 Lateral function keys

Standard mode

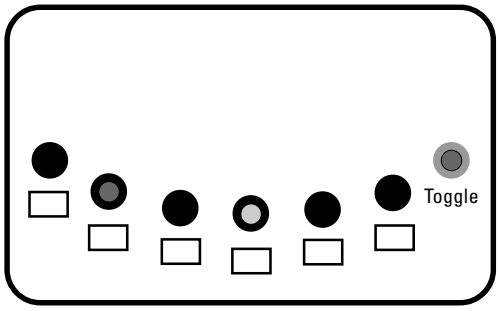
The toggle key is off.
The key for the current objective lights green. The lateral function keys can be used to sequentially swing in the objectives. If the lateral function key is pressed twice in succession, one objective is skipped and the subsequent objective is approached. The key belonging to this objective now lights green.



Standard mode active and objective 1 swung in

Toggle mode

Based on the standard mode, a brief push of the toggle key switches to the toggle mode. The toggle key now lights green.
The lower of the previously learned magnifications is selected and the corresponding key also lights green. The key of the second learned objective lights yellow.

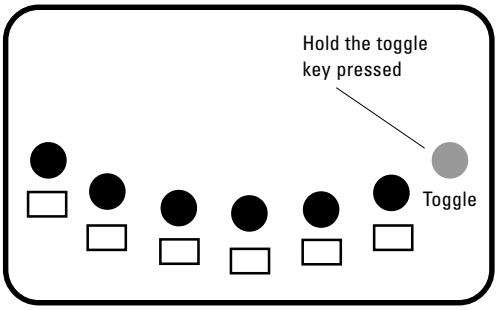


Toggle mode active, change between objective 2 and 4 possible, objective 2 swung in

The lateral function keys can now be used to toggle between these two objectives. In this case, it does not matter which one of the lateral function keys is pressed.
When changing to the other objective, the color display also changes so that the key of the current objective always lights green and the other objective key lights yellow.
Pressing the toggle key again switches back to the standard mode.
The standard mode is also activated if one of the objective keys is pressed. The corresponding objective is then approached and the objectives learned for the toggle mode are retained.

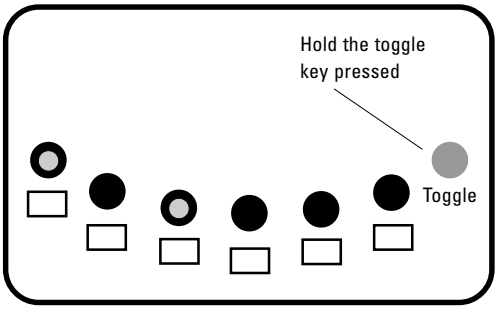
Teach-in mode

Hold the toggle key pressed.
All keys go out.



Teach-in mode active

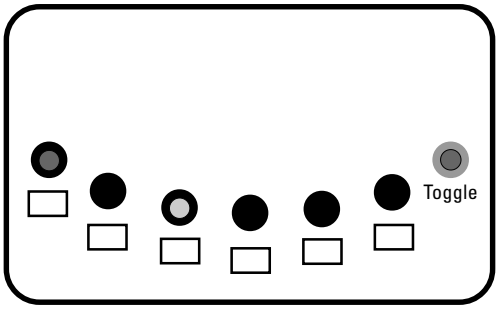
While holding the toggle key pressed, select the two objectives desired for the toggle mode by pressing the corresponding keys. These two keys now light up yellow.



Teach-in mode active, objective 1 and 3 selected for the toggle mode

Release the toggle key again. The toggle mode is now active.
The objective with the lower magnification is approached and the corresponding key lights green. The key of the second objective continues to light yellow.

The current settings are retained until the teach-in mode is activated again.



Teach-in mode finished, toggle mode active, objective 1 swung in

Objective selection via foot switch

A double foot switch can be connected to the stand as an option to swing in the objectives.
The connection is located on the rear side of the stand.
The left foot switch has the same function as the lower lateral function key, the right foot switch corresponds to the upper lateral function key.

Special function of the lateral function keys

For the motorized condenser, the condenser head is automatically swung out for objective magnifications < 10x and swung in for magnifications ≥ 10x. For special applications, the swing-out and swing-in of the condenser head can be assigned to the right or left lateral function keys so that the position of the condenser head can be set by the user.
Reassignment of the function keys is only possible via Leica DMControl software and requires the connection of a PC.

8.8 Light Sources

Transmitted Light

For Leica DM2000:

- Adjust the brightness with the dial (57.1).

For Leica DM2500:

- Adjust the brightness with the dial (58.1).

For Leica DM3000:

- For each objective, the light intensity is preset at the factory. This value can be changed by using the handwheel (parallel to 57.1 for the DM2000). The new value is stored for the respective objective and automatically set again if this objective is selected.

The numbers on the dial are not absolute values, but are intended to enable reproducible settings. The maximum value is about 12 V, the marking point of a color temperature of approx. 3200 K.

Note:

The

HI PLAN xx SL and
HI PLAN CY xx SL

(**S**ynchronized **L**ight) objective lines permit objectives to be changed without adjusting the light intensity.

Fluorescence

- Switch on the lamp at the external power unit.

Caution!

Keep the lamp housing at least **10** cm away from the wall, curtains, wallpaper, books and other combustible objects!
Fire Hazard!

Please read the separate documentation for the supply unit.

Fig. 57 Leica DM2000
1 Brightness control

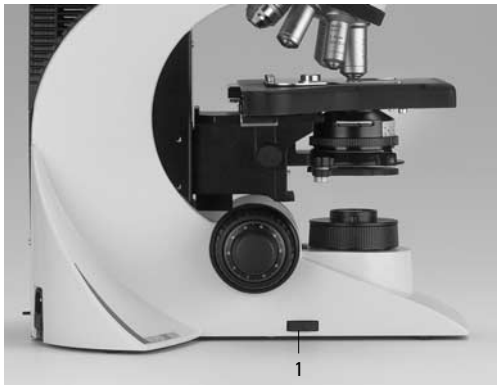


Fig. 58 Leica DM2500
1 Brightness control
2 Field diaphragm control

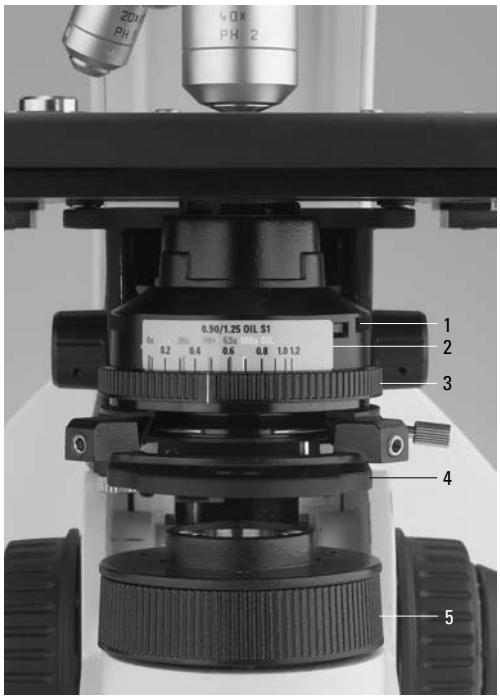
8.9 Aperture Diaphragm

The aperture diaphragm (59.3) determines the resolution, depth of field and contast of the microscope image. The best resolution is obtained when the apertures of the objective and the condenser are roughly the same.

When the aperture diaphragm is stopped down to be smaller than the objective aperture, resolving power is reduced, but the contrast is enhanced. A noticeable reduction in the resolving power is observed when the aperture diaphragm is stopped down to less than 0.6x of the objective aperture and should be avoided where possible.
In polarization microscopy, stopping down the aperture diaphragm generally results in more intense colors.

The aperture diaphragm is set according to the viewer's subjective impression of the image, the scale on the dial just serves to allow reproducible settings and does not represent absolute aperture values.

Fig. 59 CL/PH condenser
1 Slot for light rings, etc.
2 Color coding
3 Aperture diaphragm
4 Filter holder
5 Field diaphragm



Color-coded Condenser

The color markings on the condenser (59.2) correspond to the color rings of the objectives.
When changing objectives, a suitable aperture diaphragm setting can be found by setting it to the matching color marking (corresponds to 2/3 of the objective-side aperture).

Attention:

The aperture diaphragm in the **illumination light path** is **not** for setting the image brightness. Only the rotary brightness adjustment knob or the neutral density filter should be used for this.

An aperture diaphragm in the **objective** is normally fully opened. The reduction in image brightness caused by stopping down results in:

- Greater depth of field
- Less coverglass sensitivity
- Suitability for darkfield
- Change in contrast

8.10 Field Diaphragm

The field diaphragm (58.2, 59.5) protects the specimen from unnecessary warming and keeps all light not required for image formation away from the object to enable greater contrast. It is therefore only opened just wide enough to illuminate the viewed or photographed object field. A change in magnification therefore always necessitates matching of the field diaphragm.

9. Contrast Methods

9.1 Transmitted Light

Objective Magnification 2.5x*

The **CL/PH and CLP/PH condensers** can be used alone starting at **4x** magnification.
When using a diffuser slider*, **2.5x** magnification is also possible; not when using polarization, however.

Note:

The Leica DM2500 with objectives < 10x requires the diffuser slider.

The **UCL and UCLP condensers** can also be used alone starting at **4x** magnification.
The Leica DM2500 with objectives < 10x requires the adapter lens (diffuser).
When using an adapter lens* (in the condenser disk), **2.5 x** magnification is also possible.
Before using the adapter lens, set Köhler illumination (→ p. 34) with the 4x or 10x objective.
Switch over to objective 2.5x, engage the lens, open the aperture diaphragm as far as the stop and narrow the field diaphragm.
In case of arc-shaped vignetting, center the lens: Insert both centering keys into the condenser at an angle from the back and adjust until the asymmetrical vignetting disappears. Remove the centering keys and open the field diaphragm.

The lens can only be used up to an objective magnification of max. 20x. Exact Köhler illumination can no longer be obtained!

The **Achr.Apl.0.9 (P) condenser** can be used alone starting at **4x** magnification.
With the condenser head swung out, **2.5x** objective magnification is possible without a diffuse, with the head swung in, the diffuser must be in place (max. eyepiece field number 22).

Objective Magnifications 1.25x* and 1.6x for Leica DM2500

The UCA/P and Achr.Apl.0.9 (P) condensers can be used alone starting at 1.25x magnification.
The condenser head is switched off for objective magnifications from 1.25x to 5x and switched on from 10x upward.

Use the 106z lamp housing to improve the illumination. To center the lamp, follow these steps:
(for information on the controls, see p. 39)

- Swing the condenser head in and switch over to the 1.25x objective.
- Display the lamp filament as a square in the visual field by focusing the collector.
- Center the image in relation to the objective.

Magnifications of 1.6x and 2.5x

are also possible with the CL/PH or CLP/PH, UCL or UCLP condensers if the condenser is removed completely. The field diaphragm then takes over the function of the aperture diaphragm.

Note:

If the microscope is equipped for polarization, the analyzer and polarizer as well as the lambda plate compensator must be removed or swung out when using other contrast methods.

9.1.1 Brightfield

- If present: click the condenser disk* into the **BF** position.
- If present: pull the light ring slide* out of the condenser.
- If present: switch the fluorescence illuminator into an empty position or filter system A.
- Insert a transmitted light specimen.
- Rotate an appropriate objective into place.
  - Movable condenser heads:
    The condenser top is swung out for objective magnifications < 10x.
- Bring the image into focus using the focus dial and set the brightness.
- For an optimal field diaphragm setting, check the Köhler illumination (→ p. 34).
- Use suitable transmitted light filters as applicable (Fig. 60).

Fig. 60 Filter holders

Leica DM2000/3000 only: DLF filter magazine for attachment to microscope base

Leica DM2000/3000 only: Filter holder with 2 positions or 1 position for attachment to microscope base

Filter holder for screw attachment on condenser

Leica DM2500 only: Adapter with filter holders between stand and LH 107/2

9.1.2 Phase Contrast

- Insert a transmitted light specimen.
- Rotate an appropriate objective into place. Objectives that are suitable for phase contrast are engraved with **PH**.
- Bring the image into focus using the focus dial and set the brightness.
- For an optimal field diaphragm setting, check the Köhler illumination (→ p. 34).
- Open the aperture diaphragm completely (position **PH**).
- Condensers UCL/UCLP and UCA/P:
  Set the light ring corresponding to the objective on the condenser disk.
  Example: Light ring **1** belongs to the objective with the engraving **PH 1**.
  Condensers CL/PH, CLP/PH and APL. ACHR.0.9 (P):
  Use the light ring slide.

Note:

Condensers UCL/UCLP and UCA/P: Light rings must be centered (→ p. 36).

9.1.3 Darkfield

- Insert a transmitted light specimen.
- Rotate an appropriate objective into place.
- Bring the image into focus using the focus dial and set the brightness.
- Condenser UCA/P and UCL:
  Click the condenser disk into the **BF** position.
  Condensers CL/PH, CLP/PH und APL. ACHR.0.9 (P):
  Pull out the **DF** light ring slide as far as the stop.
  Check the Köhler illumination (→ p. 34).
- Open the aperture diaphragm completely (position **PH**).
- Condenser UCA/P and UCL:
  Click the condenser disk into the **DF** position.
  Condensers CL/PH, CLP/PH und APL. ACHR.0.9 (P):
  Insert the **DF** light ring slide as far as the stop.

Note:

Condensers UCL and UCA/P: The **DF** light ring must be centered (→ p. 36).

Special darkfield condensers are available for the DM2000, DM2500 and DM3000 (Fig. 61).
The application potential of the DF condensers depends on the aperture of the objective in use. For objectives with a built-in iris diaphragm, the aperture can be adapted.

DF Condenser	Max. Objective Aperture
D 0.80 - 0.95	0.75
D 1.20 - 1.44 OIL	1.10

9.1.4 Oblique Illumination

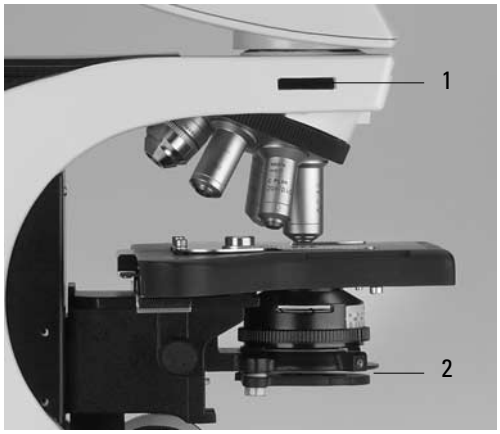
- First adjust transmitted light darkfield.
- To obtain a relief-like contrast:
  Condenser UCA/P:
  Rotate condenser disk slightly out of the **DF** position.
  Condensers CL/PH, CLP/PH und APL. ACHR.0.9 (P):
  Push **DF** slide in part way out of the **DF** position.

Fig. 61 Darkfield condensers
1 Upper part (dry)
2 Lower part
3 Orientation pin
4 Upper part (oil immersion)

9.1.5 Polarization

- Swing the lambda plate of the lambda plate compensator out if necessary.
- Insert a specimen and rotate an appropriate objective into place.
- Bring the image into focus and set the Köhler illumination (→ p. 31).
- Insert the analyzer as far as the clickstop into the left side of the stand (fig. 64). The engraving λ must be on the underside of the stand.
  When using the Pol intermediate tube*:
  Switch on the analyzer.
- Push the polarizer with the labelled side facing **upward** into the lower opening.

Fig. 62 Analyzer/polarizer
1 Analyzer slot
2 Polarizer mount



Attention!

Always use the polarizer with the labeled side facing **upward**, as otherwise the integrated heat protection filter is ineffective and the special polarizer will become useless (discolouring!).

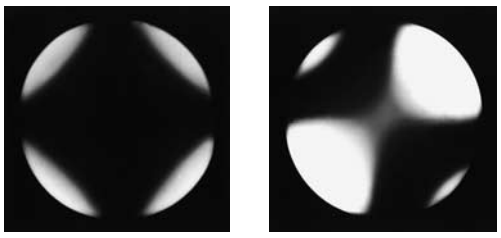
- Bring the polarizer and analyzer into cross position until they reach maximum darkness.
  - Remove the object or find an empty area of the specimen.
  - Push the analyzer into the stand as far as the 2nd clickstop or switch on the module.
  - Remove compensators from the light path.
  - Rotate the polarizer until you observe the maximum extinction position in the eyepiece (Fig. 63).
  - Fix the cross position thus determined with the clamping screw.

- If necessary:
  Insert the λ or λ/4 compensator into the filter holder integrated in the condenser holder and rotate to the left, roughly as far as the stop.
  CLP/PH condenser:
  Insert the λ or λ/4 compensator in the slot on the side of the condenser.
  Condensers UCLP and UCA/P:
  Rotate the condenser disk into position λ or λ/4.
  Alternative:
  4x20 mm compensators can be pushed into the compensator slot.

9.1.6 Differential Interference Contrast

- Insert a specimen, rotate a suitable objective into place and bring the image into focus.
- Turn the disk in the UCA/P condenser to the brightfield position.
- If present: switch the fluorescence illuminator into an empty position or filter system A.
- Pull the objective prism slide out of the tube slit.
- Set the Köhler illumination exactly (→⊇ p. 34).
- Remove the specimen or find an empty area of the specimen.
- Bring the polarizer and analyzer into cross position until they reach maximum darkness, as described at 9.1.5 Polarization.

Fig. 63
Crossing the polarizers when observing through a focusing telescope or Bertrand lens, high-aperture Pol objective
a exactly crossed, **b** not exactly crossed
Pos. a cannot be set if there is strain in the condenser or objective, Pos. b is adequate for DIC and polarization contrast.



For polarizer ICT/P*:
Turn the polarizer on the underside of the condenser in the light path. Make sure that the red index point on the front of the polarizer is aligned with 0.

- Insert the objective prism slide (fig. 64) into the tube slit. The code letter, e.g. D, must coincide with the code letter in the objective engraving. The number after the code letter only specifies one variant, e.g. D1 = also applies for pupil position D.

- Select the condenser side prism that corresponds to the magnification of the objective used, e.g. pos. 20/40 for 20x and 40x objectives.

- For fine adjustment use the knurled wheel (64.1) at the objective prism slide.

- The contrast can be optimized further with the aperture diaphragm or a λ/4 compensator.

Fig. 64 Objective prism slide
1 Fine adjustment

9.2 Fluorescence

- Insert a suitable specimen and rotate an appropriate objective into place.
- Focus the image initially in transmitted light if appropriate.
- Switch on the incident light source at the external power unit.
- Open the shutter.
- Select an appropriate fluorescence filter cube.
- Switch magnification changer, if present, to factor 1x.
- Disengage the BG 38 filter if there is no disturbing red background. Always engage the filter for photography, however.
- Open the aperture diaphragm.
- Open the field diaphragm until the whole field of view is just illuminated.
  If necessary center the field diaphragm.

Fig. 65
Fluorescence illuminator with filter block changer, shutter, BG38, field and aperture diaphragm

10. Measurements with the Microscope

10.1 Linear Measurements

The following are required for linear measurements:
- Graticule with scale division in eyepiece or HC FSA 25 PE tube with diapositive overlay device or a digital linear measuring eyepiece
- Stage micrometer for calibration.

Micrometer Value

The micrometer value of the objective-eyepiece combination used must be known before the measurement, i.e. the distance in the specimen that corresponds to the length of a division on the graticule used.

Calibration:
- Align the stage micrometer and the graticule parallel to each other by rotating the eyepiece and adjust the zero marks of both scales to exactly the same height.

- Read how many scale divisions of the stage micrometer correpond to how many on the microscope scale (graticule).

- Divide the two values. The result is the micrometer value for the total magnification that has just been used.

Example:
If 1.220 mm of the stage micrometer corresponds to 50 divisions of the measurement scale, the micrometer value is 1.220:50 = 0.0244 mm = 24.4 µm. For extremely low objective magnifications it may be that only part of the measurement scale can be used for calibration.

Notes:

Remember to take the additional magnification value into consideration! We strongly recommend you calibrate each objective separately instead of extrapolating the micrometer values of the other objectives from the calibration of one objective.

Measurement errors may occur if the eyepiece is not pushed into the tube as far as the stop.

Particularly large object structures can also be measured on the stage with the verniers (0.1 mm); the distance to be measured can be calculated from a combined x and y measurement.

10.2 Thickness Measurements

In principle, thickness measurements can be carried out if both the upper and the lower surface of the object can be clearly focused. The difference in stage height setting (fine focus knob: distance between two divisions = ca. 1 µm) gives a value for transmitted light objects that is falsified by the refractive index of the object (which has been "transfocused") and perhaps immersion oil. The true thickness of the object detail measured in transmitted light is given by the vertical stage movement (focusing difference) d' and the refractive indices n_o of the object and n_i of the medium between the coverglass and the objective (air = 1).

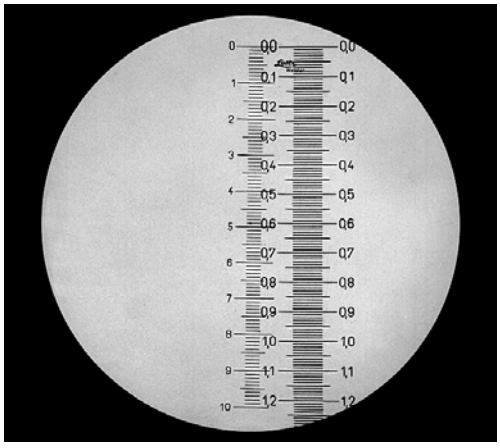
$$d = d' \frac{n_0}{n_i}$$

Example:
The upper and lower surfaces of a thin polished specimen have been focused with a dry objective (n_i = 1.0), scale readings of the mechanical fine drive (division spacing = 1 µm): 9.0 and 27.0.
Therefore d' = 18 x 1 = 18 µm.
The refractive index of the object detail was taken to be n_o = 1.5.
Thickness d = 18 x 1 x 1.5 = 27 µm.

Object Marker

The object marker is screwed in instead of an objective. When rotated, a diamond is lowered onto the coverglass or object surface, where circles of variable radii can be scribed to mark objects.

Fig. 66
Scale division of the graticule in the eyepiece (left) and image of the stage micrometer (right)



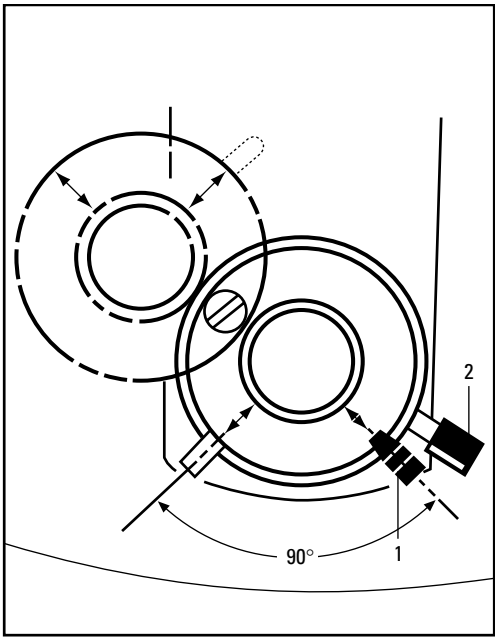
10.3 Differentiation of Gout / Pseudo Gout

The use of the lambda plate compensator is a prerequisite for this test.
Assembly → p. 31.

Orienting the Lambda Plate Compensator

- Rotate the lambda plate compensator out of the light path (Fig. 67).
- Bring the lambda plate compensator and analyzer into cross position until they reach maximum darkness (polarization → p. 59).
- Fix the cross position thus determined with the clamping screw at the side (67.2).
- Swing in the lambda plate again.

Fig. 67 Lambda plate compensator swung out
1 Orientation handle
2 Clamping screw



The following section explains the basic procedure for gout/pseudo gout differentiation. This test is made possible due to the negative birefringence of urates and positive birefringence of pyrophosphates. Both gout (monosodium urate) and pseudo gout (calcium pyrophosphate) crystals tend to be needle shaped. However, many crystals may be broken and/or irregular. To do the test, it is necessary to find at least one intact crystal orientated on same axis as orientation handle and one perpendicular to axis.

Procedure

To insure the test is being done correctly, a slide of known monosodium urate crystals should be used initially.

- Use of a 40x objective is recommended.
- Swing the lambda plate out of the path of light (fig. 67).
- Place the slide on the stage and bring the crystals into sharp focus. The needle shaped crystals will appear white regardless of orientation.
- Swing in the lambda plate and put the orientation handle (67.1) in its extreme left position. Crystals with a long dimension in the handle direction should appear yellow, and perpendicular to handle direction should appear blue (fig. 68).

- Move the orientation handle to its extreme right position. Now the aligned crystals should be blue, and perpendicular yellow (Fig. 68).

- Be sure to test crystals with the orientation handle in each position to insure positive identification.

The following is the procedure for identification of pseudo gout:

The test for pseudo gout is done identically to the test for gout. However, the color change is opposite that of Gout. That is, with the handle at the left extreme, aligned crystals are blue and perpendicular crystals are yellow, and vice versa with the level at the right side (Fig. 69).

Fig. 68 Identification of gout

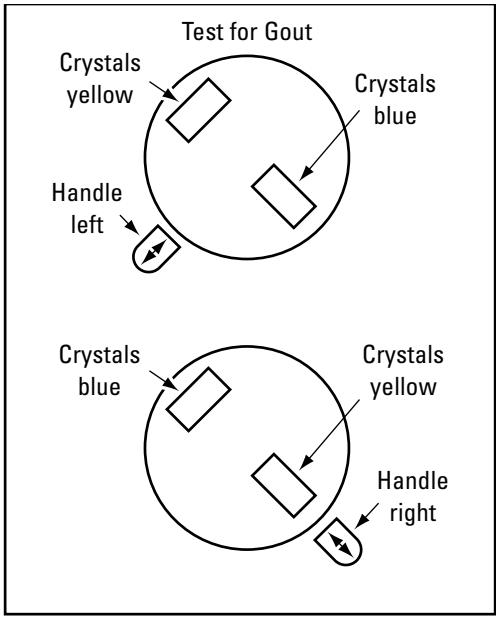
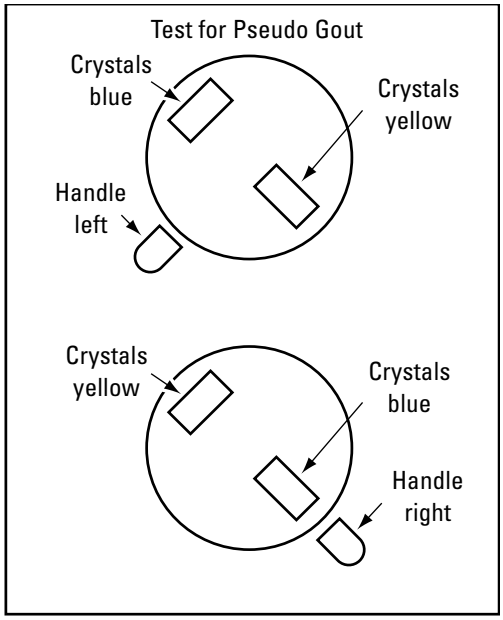


Fig. 69 Identification of pseudo gout



11. Trouble Shooting

Problem	Cause/Remedy
Stand	
The microscope does not respond.	▸ Make sure that voltage is available. ▸ Make sure that the stand is connected to the power supply. ▸ Check the cable connections. ▸ Check whether the fuse is defective and replace it if necessary (→ p. 71).
Illumination	
The image is completely dark.	Transmitted light: ▸ Ensure that the lamp in the integrated transmitted light illumination or in the 107/2 lamp housing (DM2500) is not defective. Lamp replacement → p. 24f Fluorescence: ▸ Open the shutter (→ p. 61). ▸ Make sure that the lamps are connected to the power supply and that they are not defective. Lamp replacement → p. 26ff ▸ Inform Leica Service and have the supply unit fuse checked.
The image is unevenly or not uniformly illuminated.	▸ Remove all unneeded filters from the light path. ▸ Center the lamp (106 z lamp housing) (→ p. 39ff). ▸ Replace the old lamp (→ p. 24ff).
The illumination "flickers."	▸ Be sure that there is no loose connection at the power supply. ▸ Replace the old lamp (→ p. 24ff).

Problem	Cause/Remedy
Fluorescence: The lamp does not illuminate immediately upon being switched on.	‣ The external power supply must be switched on repeatedly. ‣ Hot Hg lamps should cool down before switching on again.
Brightfield	
The specimen can not be brought into focus.	‣ Use the correct immersion medium. ‣ Lay the specimen with the cover glass toward the top. ‣ Make sure that the cover glass thickness is correct and that it suits the indication on the objective.
Darkfield	
No definite DF contrast is possible.	‣ Be sure that a DF objective is being used. ‣ The objective aperture setting is too high (maximum 0.75/1.10). If necessary, reduce the objective aperture using the iris diaphragm on the objective. ‣ Check the condenser centering. ‣ Open the aperture diaphragm completely.
The image is unevenly or not uniformly illuminated.	‣ The magnification is too weak. Use a higher magnification.
Undesirable stray light.	‣ Clean the specimen and neighboring lenses (→ p 71).

Problem	Cause/Remedy
Phase Contrast	
No phase contrast is possible.	▸ The specimen is too thick, too thin or too brightly stained. ▸ Refractive indiceses of the mounting medium and specimen are identical, so that there is no phase jump. ▸ The cover glass is not placed planar. ▸ Check the right light ring (→ p. 57). ▸ Check the centering of the light rings (→ p. 36f). ▸ Check the condenser centering. ▸ Open the aperture diaphragm completely.
Polarization	
No polarization contrast is possible.	▸ Bring the polarizer and analyzer into cross position until they reach maximum darkness (without specimen) (→ p. 59).
Transmitted Light Interference Contrast	
No transmitted light interference contrast is possible.	▸ The specimen is too thick or too thin. ▸ The embedding medium or specimen are of birefringent material. Rotate the specimen. ▸ The difference in the refractive indices of the specimen and the embedding medium is too small. ▸ The cover glass is too thick. ▸ Check the right condenser prism (→ p. 59). ▸ Check the centering of the condenser prisms (→ p. 37). ▸ Check the Köhler illumination (→ p. 34). ▸ Bring the polarizer and analyzer into cross position until they reach maximum darkness (without specimen) (→ p. 59).

Problem	Cause/Remedy
Fluorescence	
The image is completely dark (no fluorescence).	▸ Open the shutter (→ p. 61). ▸ Check the antigen-antibody combination. ▸ Insert a new lamp (→ p. 26ff).
The fluorescence is too weak.	▸ Center the lamp (→ p. 39ff) ▸ Insert a new lamp (→ p. 26ff).

12. Care of the Microscope

Caution!

Unplug the power supply before performing cleaning and maintenance work!
Protect electrical components from moisture!

Microscopes in warm and warm-damp climatic zones require special care in order to prevent fungus contamination.
The microscope should be cleaned after each use, and the microscope optics should be kept extremely clean.

12.1 Dust Cover

Note:

To protect against dust, cover the microscope and accessories with the dust cover after each use.

Caution!

Let lamps cool down before covering the stand with a dust cover. The dust cover is not heat-resistant. In addition, condensation may occur.

12.2 Cleaning

Caution:

Residual fiber and dust can create unwanted background fluorescence.

Cleaning Coated Parts

Dust and loose dirt particles can be removed with a soft brush or lint-free cotton cloth.

Clinging dirt can be cleaned with all commercially available water solutions, benzine or alcohol.
For cleaning coated parts, use a linen or leather cloth that is moistened with one of these substances.

Caution:

Acetone, xylene or nitro-containing thinner can harm the microscope and thus may not be used.

Test clean solutions of unknown composition first on a less visible area of the unit. Be sure that coated or plastic surfaces do not become matted or etched.

Cleaning Glass Surfaces

Remove dust on glass surfaces with a fine, dry and lint-free brush, or by blowing with a blow bag or vacuum suction.

Carefully remove stubborn dirt on glass surfaces with a clean cloth moistened with distilled water. If the dirt still can not be removed, use pure alcohol, chloroform or benzine.

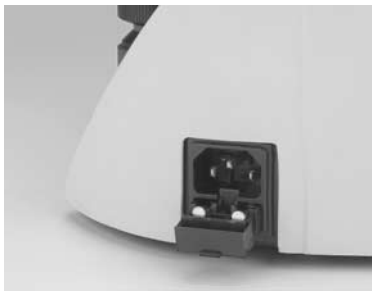
Cleaning Objectives

Caution!

The objective may not be unscrewed during cleaning. If damage appears on inner surfaces, the objectives must be sent to your local Leica dealer for repair. We also advise against cleaning the inside surfaces of the eyepieces.

The front lenses of the objectives are cleaned as described under "Cleaning Glass Surfaces". The upper lens is cleaned by blowing with a pneumatic pump.

Fig. 70
Fuse module



Removing Immersion Oil

Caution!

Follow safety instructions for immersion oil!

First, wipe off the immersion oil with a clean cotton cloth, and then re-wipe the surface several times with ethyl alcohol.

12.3 Handling Acids and Bases

For examinations using acids or other aggressive chemicals, particular caution must be taken.

Caution:

Never allow the optics and mechanical parts to come into contact with these chemicals.

12.4 Changing Fuses

The fuse module (fig. 70) at the back of the stand can be removed with a sharp object.
Fuse data → p. 8.
Order no. → p. 72.

Caution!

Never use any fuses as replacements other than those of the types and the current ratings listed here. Using patched fuses or bridging the fuse holder is not permitted. The use of incorrect fuses may result in a fire hazard.

13. Essential Wear and Spare Parts

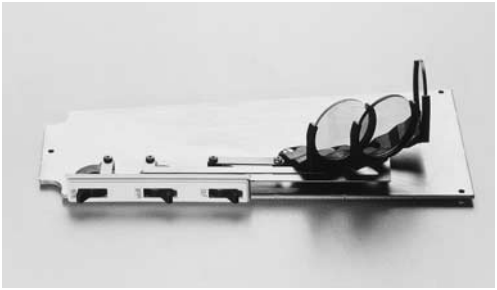
Order No. Material No.	Name	Used for
Replacement Lamp		
11 500 319	Halogen lamp 12 V 30 W	Integrated illumination
11 500 974	Halogen lamp 12 V 100 W	107/2 lamp housing
11 500 137	High-pressure mercury burner 50 W	106 z lamp housing
11 500 138	High-pressure mercury burner 100 W	106 z lamp housing
11 500 321	High-pressure mercury burner 100 W (103 W/2)	106 z lamp housing
11 500 139	High-pressure xenon burner 75 W	106 z lamp housing
Screw cap for unused objective receptacles		
020-422.570-000	Screw cap M 25	Objective turret
Replacement eyecup (diaphragm protection) for HC PLAN eyepiece		
021-500.017-005	HC PLAN eyecup	10x/25 eyepiece
021-264.520-018	HC PLAN eyecup	10x/22 eyepiece
021-264.520-018	HC PLAN eyecup	10x/20 eyepiece
Immersion Oil conforming to DIN/ISO standards, fluorescence-free		
11 513 787	10 ml	OIL and IMM objectives
11 513 522	100 ml	and oil condenser heads
11 513 788	500 ml	
Fuses		
11 826 365	F 3,15 A 250 V	Fuse for microscope stand

14. Retrofitting Components

14.1 Fitting the Filter Magazine (Transmitted Light)

- Remove the tube and intermediate systems where applicable.
- Turn the microscope stand upside down, loosen the fastening screws at the bottom and lift off the base plate.
- Insert the filters into the semicircular mounts. This does not have to be done in any particular order.
- Put the filter magazine back in position.

Fig. 71 Filter magazine (transmitted light) for Leica DM2500



14.2 Equipping the Condenser Disk

- Turn the stage upward and lower the condenser.
- Remove the condenser. Therefore loosen the condenser's clamping screw.

Condenser UCL/UCLP

- Remove the screw (72.1) completely.
- Turn back the centering screws until the light rings, λ- and λ/4-compensator* and lens* 2.5x can be inserted.
  The largest hole is for brightfield observation (= BF), the slightly smaller ones for light rings or λ- and λ/4-compensator or lens* 2.5x.

Fig. 72 Condenser UCL
1 Fixing screw for condenser disk

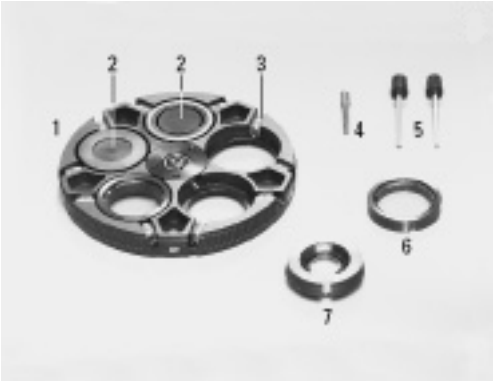
Notes:

If you use a smaller hole for brightfield, the maximum illumination aperture cannot be used.

The lettering (e.g. DF, PH 1 ....., λ) must point **upward**, the λ or λ/4 compensators must be inserted with the correct orientation: The notch must point towards the center of the disk! The lettering of the components should correspond the marking at the opposite position (outer edge of the disk).

- Tighten the centering screws until the components are roughly in the center of the holes.

Fig. 73 UCL condenser disk
1 Condenser disk
2 Light ring or λ- or λ/4-compensator
3 Centering screws
4 Axis
5 Centering keys
6 λ- oderλ/4-Platte
7 2.5 x...20 auxiliary lens



Attention:

Before fitting the disk into the condenser, make sure that neither of the centering screws is sticking out at the side.

- Fasten the condenser disk with the axis screw, check that the disk rotates properly through 360°.

- Affix the condenser with the condenser's clamping screw.

Condenser UCA/P

- Unscrew the fastening screw of the disk. This is to be found on the underside of the condenser and must be fully screwed out.

- Turn back the centering screws until the light rings, λ- and λ/4-compensator* and lens* 2.5x can be inserted.

  The largest hole is for brightfield observation (= BF), the slightly smaller ones for light rings or λ- and λ/4-compensator or lens* 2.5x.

Notes:

If you use a smaller hole for brightfield, the maximum illumination aperture cannot be used.

The lettering (e.g. DF, PH 1 ....., λ) must point **upward**, the λ or λ/4 compensators must be inserted with the correct orientation: The notch must point towards the center of the disk! The lettering of the components should correspont the marking at the opposite position (outer edge of the disk).

Inserting DIC condenser prisms:
Insert prisms K_2, K_3, etc into the large holes as follows:

- Turn back the centering screws slightly.
- Prism labeling upward, the name K_2 ,... must be near the dot marking on the edge of the hole.

Note:

ICT (transmitted light interference contrast) will not be possible if the prism is inserted rotated by 180°!

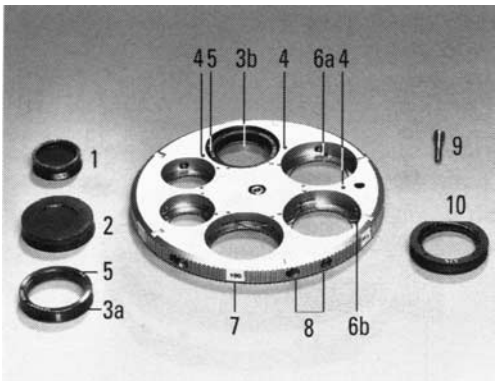
- The 2 catches on the underside of the prism must click **exactly** into the guide slit.
- Screw in the centering screws slightly, checking that all prisms can be moved properly in direction and are close to the lower edge of the hole.
- Stick self-adhesive labels on to the smooth areas on the opposite side (i.e. on the other side of the axis of rotation) from the light ring or prism.

Attention:

Before fitting the disk into the condenser, make sure that neither of the centering screws is sticking out at the side.

- Fasten the condenser disk with the axis screw, check that the disk rotates properly through 360°.
- Affix the condenser with the condenser's clamping screw.

Fig. 74 UCA/P condenser disk
1 Light ring "small, PH"
2 Light ring "large" for large holes
3 a, b DIC condenser prism
4 Marking for assembly of DIC condenser prisms
5 Marking K on the prism mount
6 Guide groove for prism
7 Adhesive label
8 Centering screws
9 Rotatable axis
10 λ or λ/4 compensator



15. Index

16. EU Declaration of Conformity

Download:

DM2000:
http://www.light-microscopy.com/down_ce-declaration_dm2000

DM2500:
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