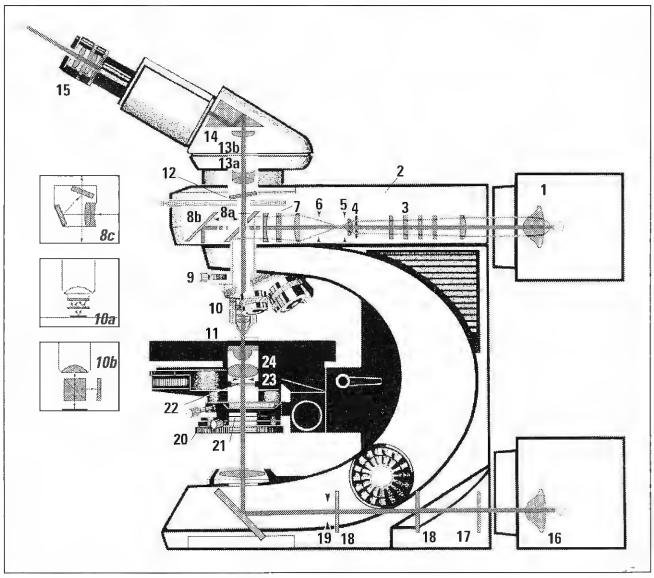

Cross-section diagram of DAS Mikroskop Leica DM LM

Reflected light path
1 Lamphousing (12 V 100 W halogen lamp[+] or Xe/Hg lamp*), **2** Universal reflected light illuminator LU[+], **3** Integrated magazine for 4* filters, **4** Diffusing screen, **5** Field diaphragm, centerable, **6** Aperture diaphragm, centerable, **7** Polarizer*, with/without λ compensator, **8** Reflectors or fluorescence filter systems (a = DF reflector*, b = BF reflector, c = Pol Smith reflector*), **9** Interference contrast prism*, **10** Objective nosepiece, objectives[+], **10a** Two-beam interference attachment, Mireau design, **10b** Two-beam interference attachment, Michelson design, **11** Stage[+] with specimen, **12** Analyser*, **13** Tube lens system, **14** Deflecting prisms in the tube, **15** Eyepiece(s), graticule*

Transmitted light illumination*
16 12 V 100 W* light source, **17** Integrateable filter, **18** Filter magazine* with 3* filter positions, **19** Field diaphragm, **20** Polarizer[+]*, **21** Slot for rotatable λ and λ/4 compensator, **22** Condenser disc[+]* with interference contrast prisms*, light rings* for darkfield/phase contrast, lens*, for 2.5x objective, λ and λ/4 compensator*, **23** Condenser aperture diaphragm, **24** Condenser lenses

[+] various possibilities; * not part of all configurations

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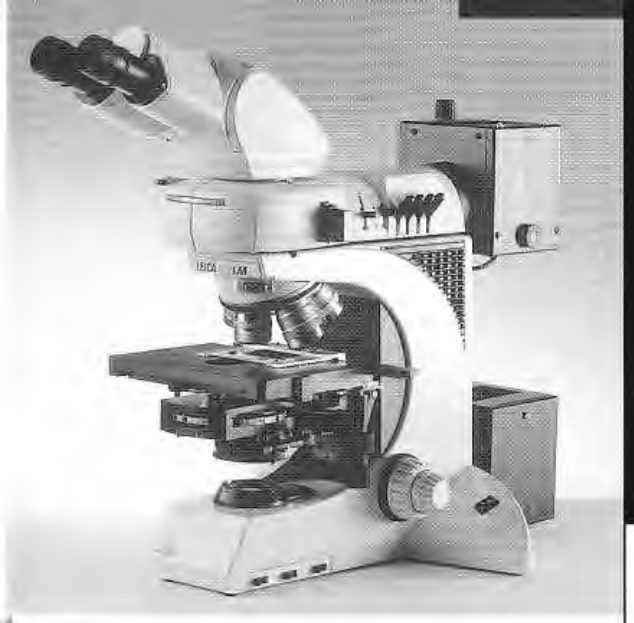


Leica DM LM

Brief instructions

Leica

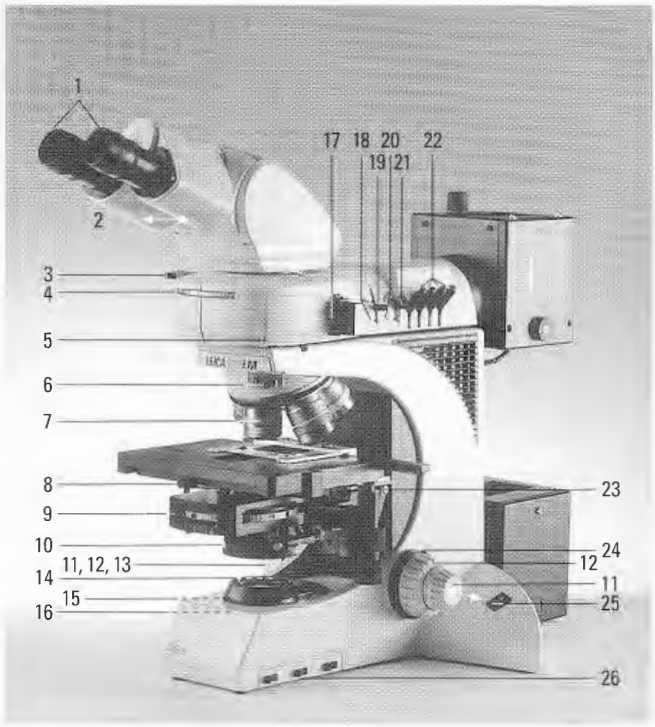


Fig. 1 DAS Mikroskop Leica DM LM for reflected and transmitted* light techniques

1 Eyepiece, with adjustable eyelens*, anti-glare protection, **2** Interpupillary distance setting, **3** Analyser slot (reflected light), **4** Turret plate (reflectors, fluorescence filter systems), **5** Opening (x = recessed grip in lid for fitting reflectors, etc.), **6** Mount for IC prisms (interference contrast), **7** Objective nosepiece with M25 or M32 (BD) thread, **8** Stage rotation clamp screw, **9** Condenser*, with centering screws on the left and right and condenser fixing screw on the right, **10** Polarizer* (transmitted light), **11** Fine focusing, (two-step*↔), **12** Coarse focusing (→ Fig. 2), **13** Torque adjustment, coarse focus, **14** Mains switch (→ Fig. 2), **15** Field diaphragm*, **16** Brightness adjustment, **17** Polarizer* (reflected light), **18** Field diaphragm centration, **19** Field diaphragm control, **20** Aperture diaphragm centration, **21** Aperture diaphragm control, **22** Filter magazine, **23** Clamp screw (stage height), **24** Stage height stop, **25** Alternating switch, reflected/transmitted light*, **26** Filter magazine* (transmitted light)

* not part of all configurations

This brief manual is a summary of the detailed German/English/French DM LM manual supplied with every microscope.

The full manual also describes the assembly of the entire microscope and the automatic adjustment to the mains voltage in a range from 90 V – 250 V/50 – 60 Hz.

Make sure to observe the safety information in the full manual when changing a lamp!

Reflected light techniques

Basic brightfield setting
Align the specimen. Release the stage height stop (1.24). Roughly adjust the vertical position of the microscope stage with the coarse focus (1.12) and stage clamp (1.23). The position of the clamp lever (1.23) can be changed by pulling it vigorously outwards (= to the right) and then rotating it. Switch on the light source (1.14) and switch to reflected light* (1.25) if necessary. Engage the **BF** (= brightfield) or the Smith reflector (1.4). Turn a 10x or 5x objective into the light path, switch the tube beamsplitter* to the observation position (if relevant). Remove the analyser* (1.3), polarizer* (1.17) and IC prism* (1.6) from the light path if present (pull out part way). Adjust lamp brightness (1.16). Eyeglass wearers: Remove or turn back the anti-glare protection (1.1). Narrow the field diaphragm (1.19), adjust the coarse focus (1.12) until the field diaphragm is roughly in focus; set the torque of the coarse focusing (1.13) if desired. Switch the fine focusing at "fine" or "medium" by sliding the focus knob (1.11) to the left* or right. Sharply focus the specimen with the fine focus. Open the field diaphragm (1.19) until the whole field of view is illuminated. Set the eyepiece eyelens (1.1) and the interpupillary distance (1.2). Adjust the contrast with the aperture diaphragm (1.21). The field diaphragm and aperture diaphragm can be centered according to the instructions in the full manual (1.18; 1.20).

Reflected light polarization*
First set as for brightfield (see above). Use a BF or Smith reflector. Set the polarizer (1.17):

Polarizer POL*: Replug the round polarizer mount on the back so that the arrow ↔ is in a horizontal position. Insert the polarizer (1.17) as far as the second clickstop. Slot in the analyser (1.3) and rotate until the desired contrast is set.

Polarizer ICR*: Insert the polarizer so that the λ engraving (lambda) points to the **back.** Push in the analyser (1.3) as far as the second clickstop. Set the zero position (= markings coincide). Rotate the polarizer until isotropic objects (mirror) appear dark.

Polarizer with rotatable λ compensator (not illustrated): Set the analyser at the zero position. Rotate the whole-wave compensator roughly th the centre position. Rotate the polarizer until the object is as dark or as richly contrasted as possible, then turn the whole-wave compensator until you achieve colour contrast.

ICR reflected light interference contrast*
Set brightfield (see above). Cross the polarizers exactly (see above), use PL FLUOTAR* or PL APO* objectives (use of N PLAN objectives is greatly restricted). Slot the objective prism (1.6) that corresponds to the code letter in the top line of the objective engraving (e. g. "D") above the objective nosepiece (1.6). Adjust the image contrast with the setting screw on the objective prism (1.6) and adjust the aperture diaphragm (1.21). Colour contrast: slot in the polarizer with the λ sign pointing to the front.

Reflected light darkfield*
Turn in a special darkfield objective ("BD", 1.7). Turn in the **"BD"** reflector (1.4), open the field diaphragm (1.19), set the contrast with the aperture diaphragm (1.21).

Reflected light fluorescence*

Use a filter system (1.4) that is suitable for the fluorescence specimen. To obtain a brighter image: Screw the illumination booster (not illustrated) between the lamphousing and LU illuminator (not necessary for special fluorescence illuminator (LRF).

Check the lamp centration* and lamp focusing* → detailed instruction manual.

Danger of explosion if wrongly adjusted!

Open the aperture diaphragm (1.21), set the field diaphragm (1.19) to the diameter of the field of view (max. eyepiece field of view number = **20**!), center if necessary (1.18; 1.20). Disengage the polarizers (1.3; 1.17).

Transmitted light techniques*

Not possible for microscope models **without** an integrated transmitted light axis.

Basic brightfield setting

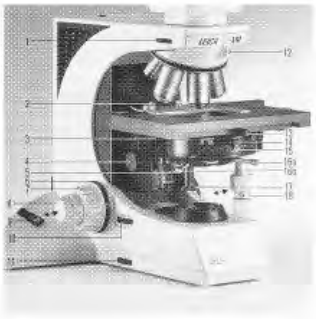
Operate mains switch (2.9) switch to transmitted light (1.25), adjust brightness (1.11); secure specimen.

Turn in 10x objective.

UCA/P condensers only (Fig. 3) and APL. ACHR. condensers 0.9 (P), without Fig.

Swing in condenser top (3.4; 3.1). Release stage height stop (1.24). Move stage (2.7; 1.23) and condenser (2.4) upwards. Set the turret plate* (2.15) at the **BF** = brightfield position or pull out light ring slide* (5.2). Set the field diaphragm (2.10) and aperture diaphragm (2.14; 3.6; 5.1) rougly at the center position. Focus the image with the coarse and fine focus (2.7; 2.8). An additional focusing sensitivity* can be obtained by sliding the focus knob to the left ↔ or right (2.8). Set the torque for the coarse focus control if desired (2.6). Adjust brightness (2.11).

Fig. 2 Transmitted light controls (for example with UCL condenser)
1 Analyser slot (TL only)
2 Specimen holder screw
3 Hole for centering key (UCL condenser)
4 Condenser height adjustment (bilateral controls)
5 Settable condenser height stop
6 Torque setting for coarse focus
7 Coarse focusing
8 Fine focusing (two-step* ↔)
9 Mains switch and pilot lamp
10 Field diaphragm
11 Brightness adjustment
12 Mount for IC prisms and compensators (tube slit)
13 Stage rotation clamp screw
14 Aperture diaphragm
15 Condenser turret plate*, → Fig. 9
16a, b Condenser centration
17 Stage height stop
18 x, y stage adjustment



In the case of adjustable eyepieces* (1.1): adjust the eyelens until the edge of the field of view or the two images appear optimally focused. Set the interpupillary distance* on the tube (1.2).

Koehler illumination

Narrow (4a) the field diaphragm (1.10). Sharply focus (4b) the edge of the field diaphragm with the condenser height adjustment (2.4) and/or the condenser height stop (2.5).

Center (4c) the image of the field diaphragm with the two centering keys (2.16a/b). Open the field diaphragm (2.10) until it just disappears from the field of view (4d). Adjust the aperture diaphragm (6.2; 5.1; 3.6) until you obtain optimum contrast.

* not part of all configurations!

One of the following contrasting techniques should be used for colourless specimens:

Darkfield* DF and phase contrast* PH

Focusing: To make it easier to find the specimen plane, pull out the light ring slide* (5.2) or turn the condenser turret plate* (6.3; 3.5) to the **BF** position and close the aperture diaphragm (3.6; 5.1; 6.2).

Koehler illumination setting (→ p. 5 and Fig. 4).

Open aperture diaphragm (3.6; 5.1; 6.2) **fully.**

UCA and APL. ACHR. 0.9 (P) condensers only:

Swing in the condenser top (3.1; 3.4).

CL/PH*, CLP/PH* and APL. ACHR. 0.9 (P) condensers:

DF: Push the DF slide (5.3) into the condenser as far as the stop (5.2). Maximum objective aperture 0.75!

PH: Swing in a phase contrast objective and slot in the corresponding light ring slide (5.2 and 5.3), e. g. PH 2, as far as the stop.

Fig. 3 UCA/P condenser

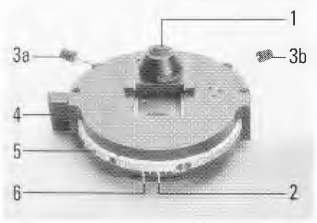
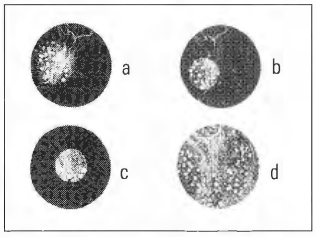


Fig. 4 Setting Koehler illumination



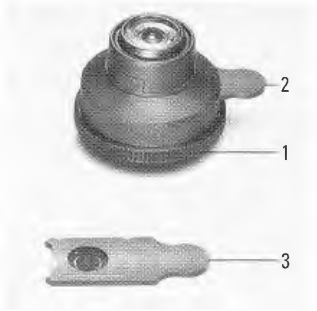


Fig. 5 CL/PH or CLP/PH condenser

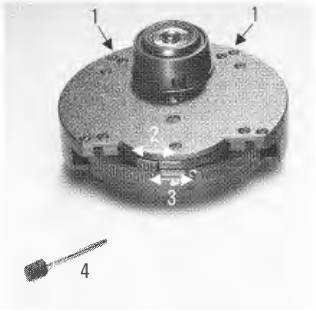


Fig. 6 UCL/UCLP condenser

Special DF condenser*
→ full manual.
UCL*/UCLP*/UCA/P* condensers
DF: Maximum objective aperture 0.75. Turn the condenser turret (3.5; 6.3) to the DF position. Insert the centering keys (3.3a/b; 6.4) into the condenser turret (3.3a/b; 6.1) at an angle from the back and adjust, with a low-magnification objective (4x to 10x) in the light path, until illumination or fall-off in brightness towards the edge is homogeneous.
PH: Set the PH position (3.5; 6.3) corresponding to the PH objective in use, e. g. PH 1.
Put an auxiliary telescope in place of an eyepiece and focus the annular structures (7a – c) after loosening and adjusting the front piece. Insert the centering keys (3.3a/b; 6.4) from the back (5.1), and make the images of the light ring LR (condenser) and the phase ring PH (objective) coincide (7c).

Transmitted light polarisation*
Put the analyser (8.1) into its slot. If using a rotatable analyser, turn it into the middle position.
Put the polarizer (8.5a/b) into the holder (8.4) and rotate until the maximum extinction position is obtained without a specimen (Alternative: as in Fig. 9.8).
Colour contrast: insert the λ or λ/4 compensator (8.6b) **above** the polarizer (8.6a; 9.4) and rotate. Possible alternatives: λ compensator integrated in condenser turret and compensators for tube slit (8.8).

Transmitted light interference contrast ICT
Pull the objective prism (9.6) out of the light path. Turn the condenser turret plate (9.2) to the **BF** position. Insert the analyser (9.1), and set the zero position if necessary. Pull out the λ compensator* (8.6b) from above the polarizer (9.1) if present.

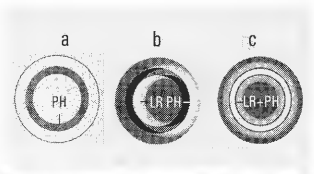


Fig. 7 Setting phase contrast

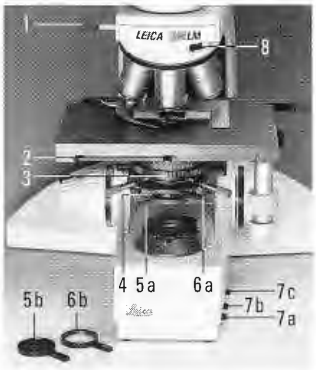


Fig. 8 Transmitted light polarization

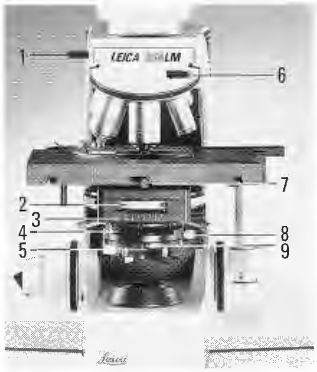


Fig. 9 Transmitted light interference contrast

Turn the polarizer (9.9) until the maximum extinction position is reached without a specimen. Engage the condenser top (3.1; 3.4), set Koehler illumination
→ p. 3.
Slide in the objective prism **A, B, C, D** (9.6, depending on the objective engraving), turn the condenser turret plate (9.2) to the position corresponding to the objective magnification (e. g. 10/20x). Adjust the contrast with the setting screw on the objective prism (9.6) and aperture diaphragm (9.3).
Colour contrast: Insert λ compensator (8.6b) above the polarizer (9.4) and rotate.

Changing 12 V 100 W halogen lamps

Unplug from the mains!

Open the right-hand side of the lamphousing with a coin.

Caution, hot lamp!

Put in the replacement lamp (12 V 100 W) **without tilting.**

Do not touch the new lamp with your fingers, leave the protective covering on until the new lamp is in place!

Close the lamphousing again, reconnect to the mains.
Centerable lamphousing only*: see full manual for centering instructions.

Changing Hg and Xe lamps

Caution! Only exchange xenon and mercury burners when they are cold. Wear protective clothing (gloves and face mask) when assembling Xe burners! Never look directly into the lamp light! Check the lamp centration immediately after ignition. See full manual for further details!