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LEITZ DIALUX 20

Laboratory and Research Microscope

Instructions

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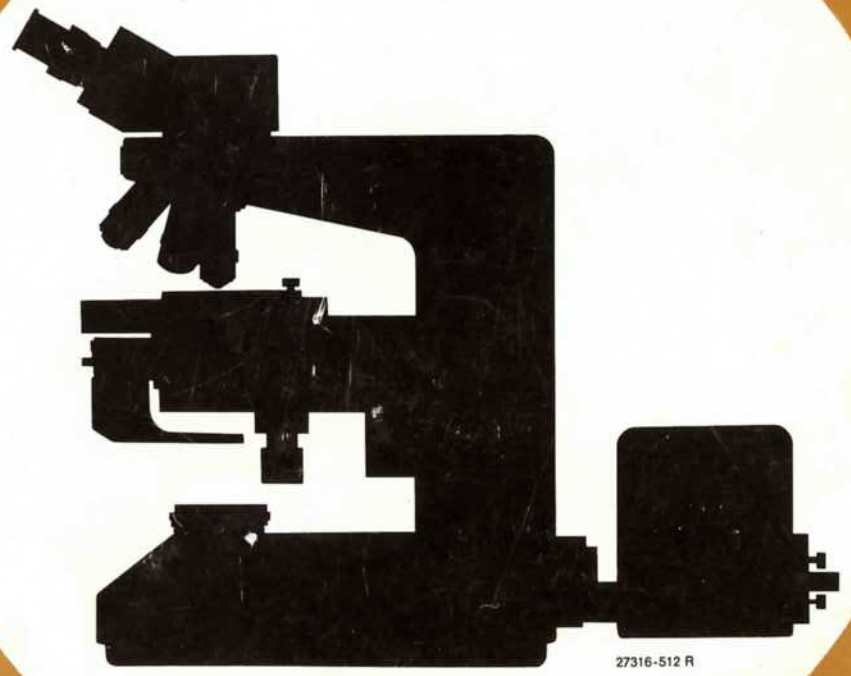

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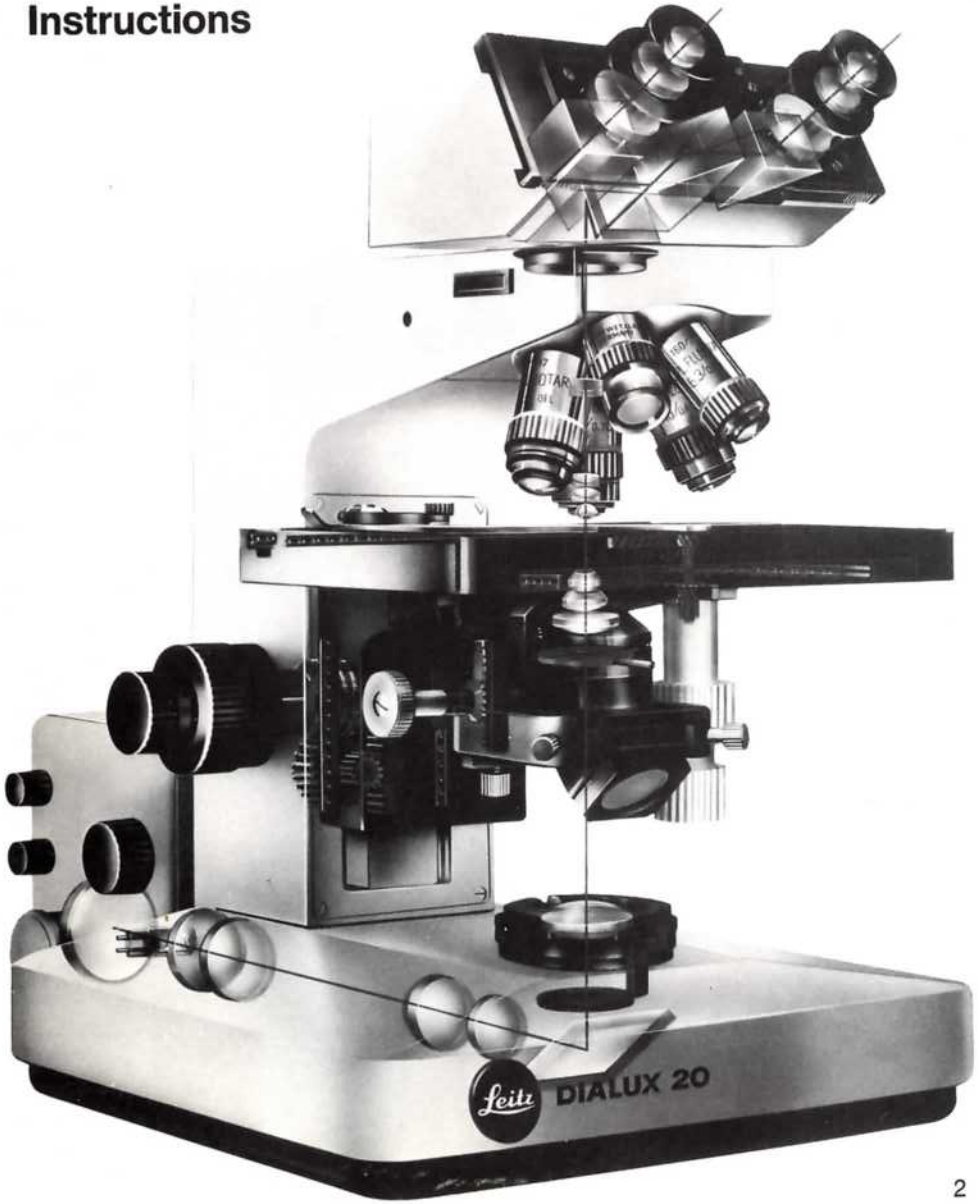
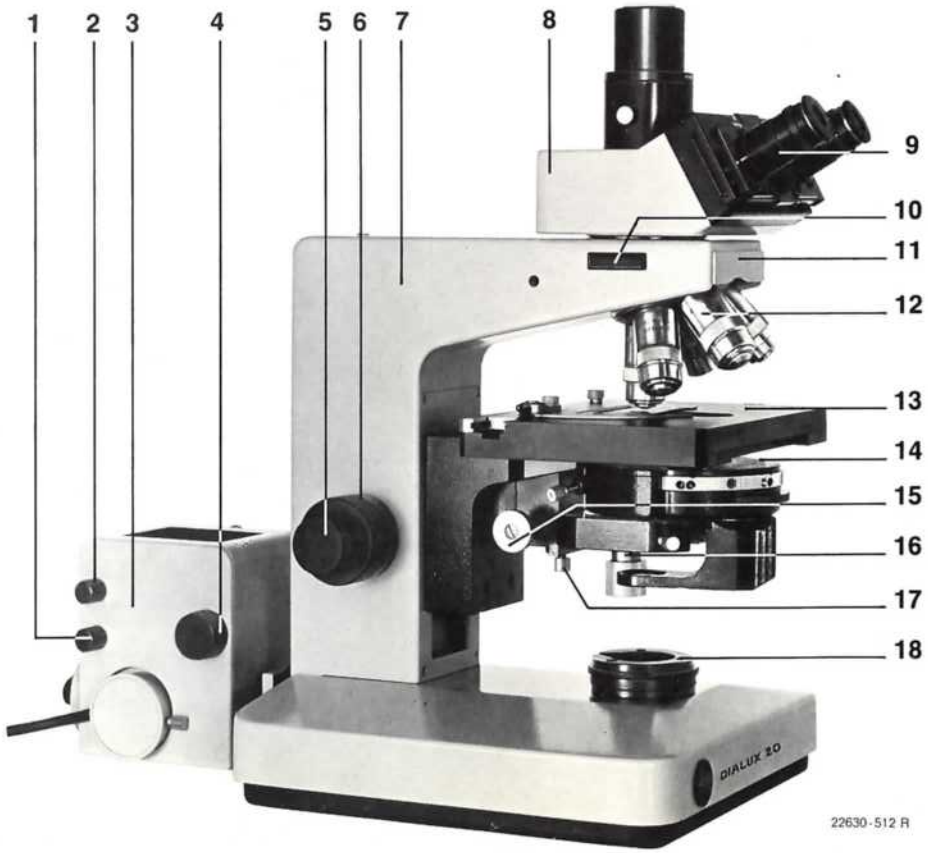
Instructions



1 Technical description

Fig. 1
DIALUX 20 with Lamp Housing 102 Z, UK universal condenser, Mechanical Stage No. 78 and FSA phototube.

1, 2 Knurled knobs for lamp adjustment
3 Lamp Housing 102 Z
4 Lamp condenser adjustment
5 Rotary knob for the fine adjustment of the object stage
6 Rotary knob for the coarse vertical adjustment of the object stage
7 Stand
8 FSA phototube
9 Eyepiece tube with PERIPLAN® eyepiece
10 Filter slot
11 Revolving nosepiece for 5 objectives
12 NPL FLUOTAR® objectives
13 Mechanical Stage No. 78
14 UK universal condenser
15 Vertical adjustment of the condenser
16 Controls for the mechanical adjustment of the object stage
17 Adjustable condenser stop
18 Field diaphragm



2 Technical details

Tubes

Fig. 2
Binocular tube S

Binocular observation tube with adjustable eyepiece tubes for the mechanical compensation of the tube length with interpupillary distance adjustment.
Tube factor 1x

Fig. 3
Binocular phototube FSA

Binocular observation- and phototube with automatic interpupillary distance compensation.
→ 100 % of the light enters the eyepieces
↳ 50 % of the light enters the eyepieces, 50 % the phototube
↑ 10 % of the light enters the eyepieces, 90 % the phototube
Tube factor 1x

Fig. 4
Revolving nosepiece

The revolving nosepiece takes up to 5 objectives.
Tube lens factor 1x and 1.25x respectively.

Fig. 5
Large Mechanical Stage No. 78

The mechanical stage measures 200 x 100mm, and has coaxial controls for object movement within an area of 50 x 76mm.

Fig. 6
Condenser holder

This vertically adjustable dovetail changer has centring screws for the condenser and an adjustable vertical stop (arrow).

Fig. 7
Coarse and fine adjustment of the object stage

The coarse and fine adjustment, arranged on both sides of the stand, adjustment range 35mm, actuates the object stage. One interval on the fine-adjustment corresponds to a vertical difference of 2 μm.

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Fig. 8
Lamp Housing 102 Z

The Lamp Housing 102 Z accepts tungsten halogen lamps, ultra-high-pressure mercury lamps, and high-pressure xenon lamps of up to 100 W. Lamp and mirror are centred separately.
The lamp condenser can be horizontally adjusted.

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Fig. 9
Lamp mount with 20 W tungsten halogen lamp for the DIALUX 20 EB.

Condensers

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Fig. 10
SK standard condenser

1 Interchangeable condenser top
2 Condenser top holder
3 Lever for swinging out the condenser top. At the same time the lens 6 is swung into the illuminating beam;
4 Aperture diaphragm lever
5 Dovetail changer
6 Supplementary lens

Condenser with dovetail changer, swing-out condenser to holder (10.2) and supplementary lens (10.6). Can be adapted for special purposes with the use of different condenser tops (10.1) to be screwed into the holder.

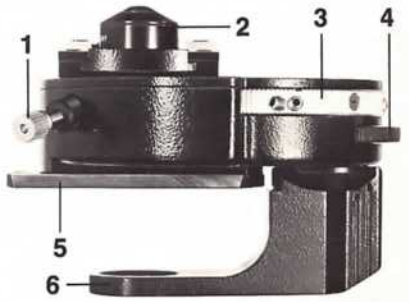

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Fig. 11
UK universal condenser

1 Two centring screws (only one visible) for the light ring adjustment
2 Interchangeable condenser top
3 Rotating turret
4 Aperture diaphragm
5 Dovetail changer
6 Supplementary lens

Condenser with dovetail changer (11.5), swing-out condenser top holder, and supplementary lens (11.6), can be adapted for special purposes. Rotary turrets (11.3) for phase contrast and interference contrast T can be inserted.

Condenser tops for the SK standard condenser and the UK universal condenser

Condenser top		Uses
0.90 S 1.1	condenser top turned out (supplementary lens turned in)	For objectives of apertures < 0.25
0.90 S 1.1	condenser top turned in (supplementary lens turned out)	For objectives of aperture > 0.25
Oil 1.32	condenser top turned in (supplementary lens turned out); immersion oil on front lens of the condenser	For use with the Oil 100/1.32 objective
0.70 S 4	condenser top turned in (supplementary lens turned out)	Intercept distance 4mm. For examination of specimens mounted on microscope slides thicker than 1mm.
0.55 S 15	condenser top turned in (supplementary lens turned out)	Intercept distance 15mm. For examination of specimens on microscope slides thicker than 6mm
0.35 S 30	condenser top turned in (supplementary lens turned out)	Intercept distance 30mm. For examination of specimens on microscope slides thicker than 10mm
D 0.80	condenser top turned in (supplementary lens turned out)	Darkground; for objectives of apertures < 0.75
D 1.19	condenser top turned in supplementary lens turned out); immersion oil on front lens of the condenser top	Darkground; for objectives of aperture < 1.10

UK Universal condenser for phase contrast

Condenser top	Light ring	Rotary turret position	Objectives engraved:	
0.90 S 1.1	– 1 S 1.1 2 S 1.1 3 S 1.1 4 S 1.1 DF S 1.1	H 1 2 3 4 5	(all objectives) Phaco 1 Phaco 2 Phaco 3 Phaco 4 (all objectives) Aperture < 0.75	Brightfield Phase contrast Phase contrast Phase contrast Phase contrast Darkground
0.70 S 4	– 1 S 4 2 S 4 3 S 4 4 S 4	H 1 2 3 4	(all objectives) Phaco 1 Phaco 2 Phaco 3 Phaco 4	Brightfield Phase contrast Phase contrast Phase contrast Phase contrast
0.55 S 15	– 1 S 15 2 S 15 4 S 15	H 1 2 4	(all objectives) Phaco 1 Phaco 2 Phaco 4	Brightfield Phase contrast Phase contrast Phase contrast
0.35 S 30	– 1 S 30 2 S 30	H 1 2	(all objectives) Phaco 1 Phaco 2	Brightfield Phase contrast Phase contrast

Objectives

Fig. 12
NPL FLUOTAR 100/1.32 OIL

Reproduction ratio	1.6:1	25:1	4:1	6.3:1
Colour	grey	brown	red	orange

10:1	16:1	25:1	40:1	63:1	100:1
yellow	bright green	dark green	bright blue	dark blue	white

All LEITZ objectives computed for tube length 160, as well as objectives of primary magnification greater than 16:1 computed for tube length 170 (note the engraved values) can be used on the DIALUX 20.
The following data are engraved on the objective mounts:

1 **160** (170): mechanical tube length. The distance in mm between the shoulder of the objective and the rim of the tube.
2 **0.17**: coverglass thickness. Only specimens under a coverglass (0.17mm thickness) should be observed with these objectives. If the figure 0.17 is replaced by a dash (–) specimens may be observed with or without a coverglass.
3 **N**ormal **p**lano objectives (flattened field of view of up to at least 18mm intermediate image).
Plano objectives (flattened field of view of up to 28mm intermediate image).
Ordinary achromatic objectives have no additional letters engraved. Objectives for phase contrast observation have the additional designation **Phaco** (all the NPL-FLUOTAR objectives are engraved in green throughout) and the indication of the associated position of the Phaco ring turret of the UK universal condenser (e.g. Phaco 1 = turret position 1).
4 Reproduction ratio: The dimensional ratio of intermediate image and object (e.g. **100**:1).
5 Numerical aperture: (e.g. **/1.32**).
6 The aperture indication is followed by that of the immersion medium.
7 Colour code see above table.
8 Immersion objectives have an additional black ring = oil immersion or white ring = water immersion.

Eyepieces

Fig. 13
PERIPLAN GF 10x/18

LEITZ eyepieces computed for 160mm mechanical tube length are used. They differ from conventional eyepieces in the additional indication of the field-of-view index following that of the magnification.

Fig. 14
Inserting the distance ring TL 160 (arrow)

If LEITZ eyepieces of conventional design (without indication of the field-of-view index) are to be used, an additional TL 160 distance ring (Fig. 14) must be inserted.
The field-of-view of an eyepiece is the area of the intermediate image in the tube that can be observed in it. It appears magnified by the eyepiece factor.
The diameter of the image produced by a GF 10x/18 eyepiece therefore appears as large as that of an area 10 x 18 = 180mm at a distance of 250mm from the observer.
If the diameter of the field of view is divided by the objective magnification (and any tube factor involved) (turret 1x, PLOEMOPAK® 1.25x) the diameter of the object area observed is obtained. With the previously mentioned GF 10x/18 eyepiece and a 25/0.55 objective an object area of

$$\frac{18}{25 \times 1} = 0.72\text{mm diameter}$$

can therefore be observed. The final magnification of the microscope is based on the following formula:
Reproduction ratio of the objective x eyepiece magnification (x tube factor).
Example:
Objective 25/0.55
Eyepiece 10x/18
Tube factor 1x
Total magnification 25 x 10 x 1 = 250:1

3 Assembling the microscope

Fig. 15
Inserting the tube

Press the lever for tube change in the direction of the arrow and drop the tube into the bayonet changer. Allow the lever to return to the front. After it is locked, the tube can be rotated through 360°. Insert the eyepieces in their tubes.

Fig. 16
Screwing in the objectives

Screw the objectives into the apertures on the revolving nosepiece at increasing magnification (e.g. 6.3, 16, 40 etc.).

Fig. 17
Inserting the revolving nosepiece with objectives

Lower the object stage with the coarse adjustment (1.6), release the clamping screw and fully insert the revolving nosepiece with the objectives in the horizontal dovetail guide; tighten the clamping screw.

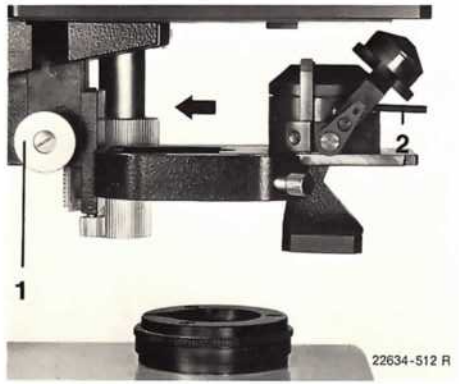


Fig. 18
Inserting the condenser

Lower the condenser dovetail guide with knob (18.1) until the condenser can be easily inserted in it as far as it will go. The aperture diaphragm lever (18.2) must face the observer. Raise the condenser fully.

Fig. 19
Removing the transport anchorage

Attention: before inserting the lamp housing remove the transport anchoring screw (arrow) of the lamp condenser on the bottom of the lamp housing.

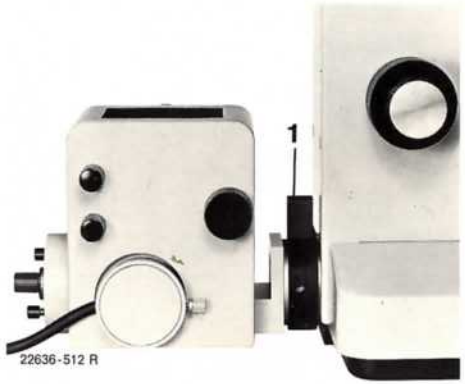


Fig. 20
Attaching the Lamp Housing 102 Z

Set the bayonet lever (20.1) of the lamp housing vertically. Insert the changing collar of the lamp housing in the bayonet fitting of the microscope and secure it.

Changing the lamp

Release the knurled screw (24.7) of the lamp mount. Pull the lamp mount (24.8) out of the lamp housing. Remove the defective lamp. Insert the new tungsten halogen lamp **before** removing its protective cover (21.2). Replace the lamp mount (21.1) and centre the lamp (Fig. 25).

Fig. 21
Inserting the tungsten halogen lamp

Fig. 22
Inserting the mount with lamp

Fully open the field diaphragm (1.18). Insert the adjustment device in the filter slot (Fig. 23).

Fig. 23
Adjustment device (with the diagrammatically represented lamp adjustment).

Centring the lamp (Lamp Housing 102 Z)

Turn the microscope sideways for easier access to all centring screws of the lamp housing.

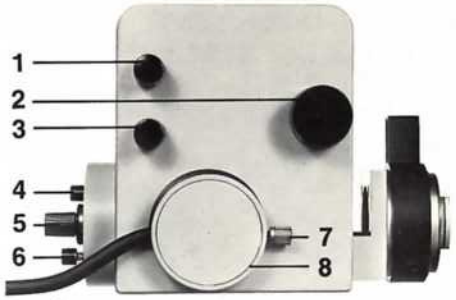


Fig. 24
Lamp Housing 102 Z

Fig. 25
Image of the lamp filament and its mirror image (diagrammatic representation)

Form a sharp image of the lamp filament by turning the lamp condenser knob (2).

Move the lamp filament image into the upper half of the illuminated field with the centring screw (1).

Adjust the lamp filament image with centring screw (3) so that it occupies the upper illuminated area completely.

By adjusting the two centring screws (4, 6) capture the mirror image of the lamp filament in the lower half of the illuminated area.

Adjust the mirror horizontally (5) so that the mirror image of the lamp filament also appears in sharp focus.

Set the mirror image with the two adjustment screws 4 and 6 so that it coincides with the primary image of the lamp filament in the lower half.

Set the two images of the lamp filament with the fine adjustment of the lamp (1) and mirror adjustment screws (4) so that their sides exactly coincide.

The two images should now just coincide in the centre.

Changing the Lamps in the DIALUX 20 EB

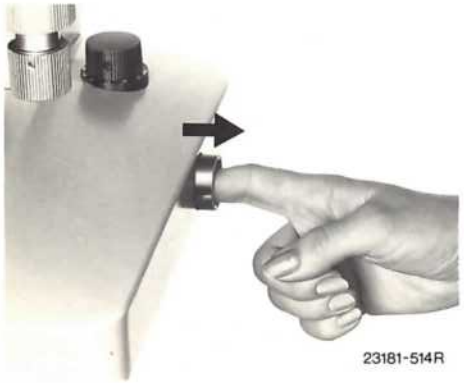


Fig. 26
Pulling out the EB lamp mount

Fig. 27
Inserting a new lamp

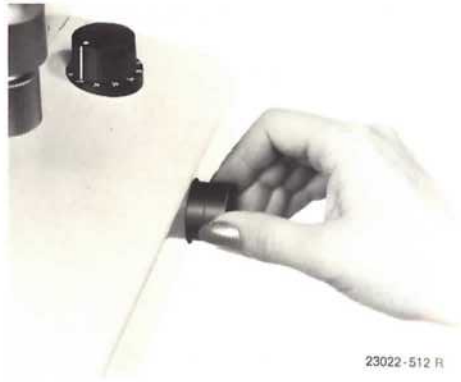


Fig. 28
Inserting the lamp mount

Pull the lamp mount out of the foot of the stand. Remove the defective lamp. Insert new tungsten halogen lamp together with its protective cover, which should be removed only after insertion. Replace the lamp mount in the foot of the stand.

4 Preparing the microscope for operation

Fig. 29

Fig. 30

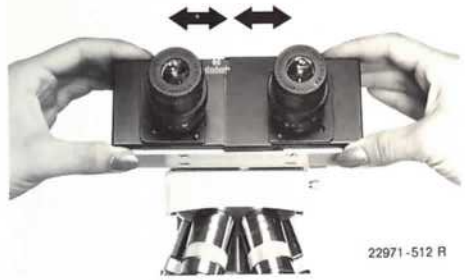


Fig. 31

Switch on the microscope illumination. Mount the specimen with object holder on the object stage.

The clamping of the specimen is adjustable: push the button (Fig. 29, arrow) on the pivot of the specimen holder, push it to the left for firmer, to the right for less firm clamping and let it click in position.

For initial observation choose an objective of medium magnification (e.g. NPL FLUOTAR 16/0.40).

Give the screw (1.17) about 5 anticlockwise turns and fully raise the condenser with knurled screw (1.15).

Turn the condenser top in. Open the aperture diaphragm (10/11.4) and the field diaphragm (1.18).

When the binocular observation tube S (Fig. 30) is used, carry out interpupillary distance adjustment (by pulling or pushing) so that both images are coincident (only one circular image is seen). Transfer the interpupillary distance determined (scale on the front plate of the tube) to the two eyepiece tubes – e.g. with a 65mm interpupillar distance set the two eyepiece tubes each at their "65" mark (Fig. 31).

Carry out the following corrections for defective vision:

Look through the right-hand eyepiece with your right eye and focus the specimen with the fine adjustment. Now look at the same area of the specimen through the left-hand eyepiece with your left eye and again focus the specimen by rotating the left-hand eyepiece tube – do not use the fine adjustment. Check this setting finally after centration of the condenser.

Centring the condenser

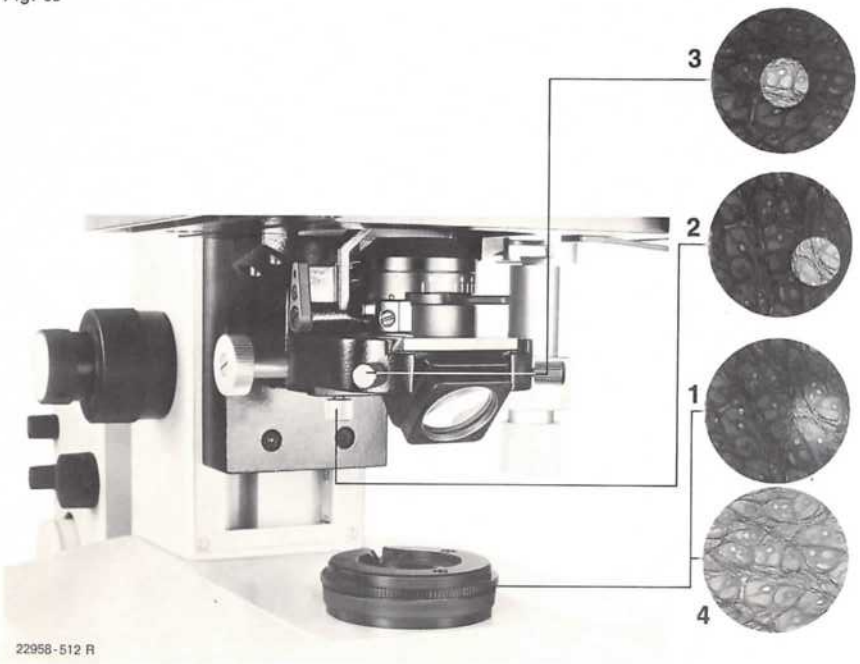
Fig. 32

Focus the specimen with the coarse and fine adjustment.
Adjust the field diaphragm so that the white ring (Fig. 32, arrow) is completely covered.

1. Close the field diaphragm.
2. By rotating the condenser stop screw lower the condenser so that the edge of the field diaphragm appears sharp.
3. Centre the image of the field diaphragm with the two centring screws.
4. Open the field diaphragm so that it just disappears beyond the edge of the field of view.

After objective change, carry out fine centration only by adjusting the field diaphragm.

Fig. 33



Use of the field diaphragm

The field diaphragm protects the specimen from heat and prevents the light not required for image formation from entering the object. The diaphragm is therefore opened just far enough for the observable field of view to be fully visible. A change of magnification therefore always calls for an adjustment of the field diaphragm.

Use of the aperture diaphragm

The setting of the aperture diaphragm is one of the factors determining the resolution and the contrast of the microscopic image. Optimum optical performance is reached when the apertures of the objective and of the condenser are identical. When the aperture diaphragm of the condenser is closed beyond the aperture of the objective the resolving power of the objective decreases but image contrast increases. A visually appreciable reduction of the resolving power occurs when the aperture diaphragm is closed beyond $\frac{1}{3}$ of the aperture of the objective and should therefore be avoided if possible.
Remove the eyepiece from the eyepiece tube. Close the aperture diaphragm so that its image just appears on the rear lens of the objective. This is regarded as the normal position. Replace the eyepiece. If the specimen lacks contrast the aperture diaphragm can be further closed so that the less contrasty structural elements, too, become clearly visible.
Settings of the aperture diaphragm, once determined, can be reproduced with the aid of the scale.

Attention:

Image brightness must never be regulated with the aperture diaphragm, but only with the transformer or with neutral-density filters.
Turn out the condenser top when using objectives of apertures < 0.25. The condenser remains in the same position as for objectives of aperture > 0.25. The aperture diaphragm always remains fully open.
Set the lamp condenser on the Lamp Housing 102 Z so that the field of view is uniformly illuminated. This setting remains unchanged for all magnifications.

Centring the condenser

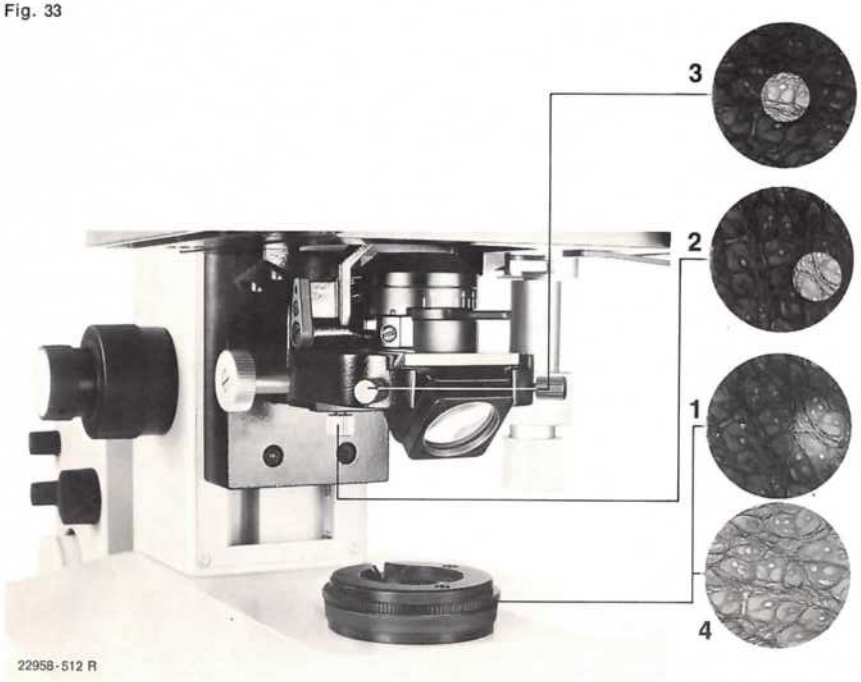
Fig. 32

Focus the specimen with the coarse and fine adjustment.
Adjust the field diaphragm so that the white ring (Fig. 32, arrow) is completely covered.

1. Close the field diaphragm.
2. By rotating the condenser stop screw lower the condenser so that the edge of the field diaphragm appears sharp.
3. Centre the image of the field diaphragm with the two centring screws.
4. Open the field diaphragm so that it just disappears beyond the edge of the field of view.

After objective change, carry out fine centration only by adjusting the field diaphragm.

Fig. 33



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Use of the aperture diaphragm

The setting of the aperture diaphragm is one of the factors determining the resolution and the contrast of the microscopic image. Optimum optical performance is reached when the apertures of the objective and of the condenser are identical. When the aperture diaphragm of the condenser is closed beyond the aperture of the objective the resolving power of the objective decreases but image contrast increases. A visually appreciable reduction of the resolving power occurs when the aperture diaphragm is closed beyond $\frac{1}{3}$ of the aperture of the objective and should therefore be avoided if possible.
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Settings of the aperture diaphragm, once determined, can be reproduced with the aid of the scale.

Attention:

Image brightness must never be regulated with the aperture diaphragm, but only with the transformer or with neutral-density filters.
Turn out the condenser top when using objectives of apertures < 0.25. The condenser remains in the same position as for objectives of aperture > 0.25. The aperture diaphragm always remains fully open.
Set the lamp condenser on the Lamp Housing 102 Z so that the field of view is uniformly illuminated. This setting remains unchanged for all magnifications.

Oil immersion

Oil immersion objectives bear the engraving "OIL" and a black ring round the bottom rim of their mount.
The immersion oil has the same refractive index $n^d = 1.518$ as the coverglass and the front lens of the objective. Focal length and working distance of an immersion objective are usually very short. This demands great care during work with such objectives. Use the coarse adjustment only until the immersion objective has entered the oil (look across the top of the slide).
Focusing must now be carried out only with the fine adjustment and constant observation through the eyepiece. Ensure that no air bubbles are present in the immersion oil. Use only LEITZ immersion oil.
Even with oil immersion objectives it is generally possible to manage with the condenser top 0.90 S 1.1. If, however, the full aperture of the immersion objective is to be utilized, for instance for the examination of very delicate structures, the aplanatic-achromatic condenser top A 1.32 should be used. Here, immersion oil should be applied also between the condenser top and the underside of the microscope slide. After the examination is completed, the immersion oil must be carefully removed from all areas of application with a soft piece of cloth soaked in petrol or methylated spirit.

Transmitted-light darkground

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Fig. 34

For investigation in darkground, the condenser top D 0.80–0.95 is used with objectives of apertures $<$ 0.75 and the condenser top D 1.19–1.44 with those of apertures $>$ 0.75. For aperture $>$ 1.10 use the funnel stop, or an objective with iris diaphragm).

Setting up the darkground image (D 1.19–1.44 and D 0.80–0.95)

Mount the specimen on the object stage. Turn the condenser stop screw fully clockwise. Insert the condenser (with the darkground top turned in) and raise it fully, cf. Fig. 19. A droplet of immersion oil should be applied to the top of the D 1.19 condenser before it is raised; the droplet of oil must make contact with the underside of the microscope slide; this is indicated by a brief flash in the microscope slide.
Focus the specimen (use the 10/0.25 or 16/0.40 objective). Close the field diaphragm. Adjust the condenser stop screw to the left and raise the condenser with its control so that the edge of the diaphragm is in optimum focus during observation of the specimen. See Fig. 33.
Move the diaphragm image into the centre of the field of view with the two centring screws. Open the field diaphragm so that is just disappears beyond the edge of the field of view.

Phase contrast

The UK universal condenser can be converted into a phase contrast condenser by insertion of the light-ring turret. Different light rings are available for the various condenser tops (see table p. 11).

Inserting and changing the light rings

All the light rings are marked for the required position in the light-ring turret and for the condenser tops to be used for them (see Fig. 35).
Release the Allen screw (2mm) so that the head of the screw is flush with the knurled screw of the light-ring turret. Push the light ring against the sprung holding pin to remove or insert it.
Screw the two centring screws in far enough for the light ring to be roughly central (cf. also Fig. 37).
The light rings must be inserted always in the aperture **opposite** their position indication (Fig. 36).
The aperture opposite the position indication "H" remains empty, and therefore has no centring screw.

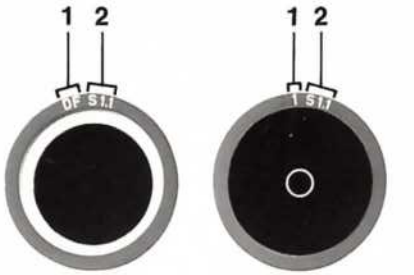

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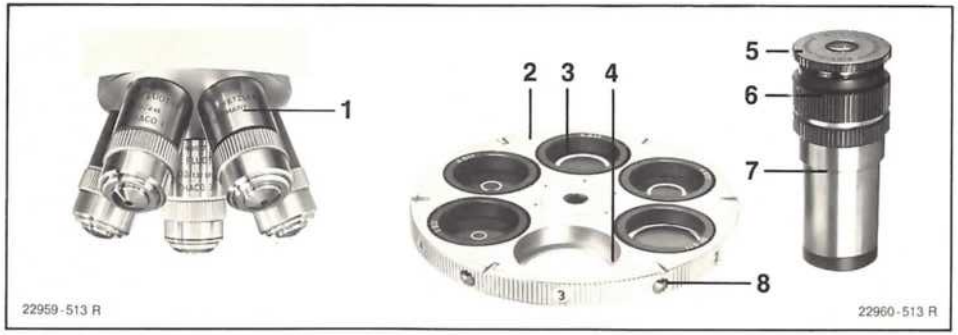
Fig. 35
1 indicates the position of the light ring in the turret (DF must be inserted in pos. 5)
2 associated condenser top, e.g. S 1.1

Fig. 36
Objectives, rotary turret and focusing telescope
1 Phase contrast objectives on the revolving nosepiece
2 Light-ring turret
3 Light ring
4 remains empty for brightfield
5 Eyelens
6 Clamping ring
7 Focusing telescope
8 Centring screws for light rings.



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Inserting the light-ring turret

Turn in the condenser top of the UK condenser. Release the fixing screw in the bottom part of the condenser (Fig. 39). Pull the dust cap out of the condenser. Insert the light-ring turret (Fig. 38) so that the light rings can be dropped into their apertures and fixed with the fixing screws (Fig. 39).

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Fig. 37

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Fig. 38

Fig. 39

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Setting up phase contrast

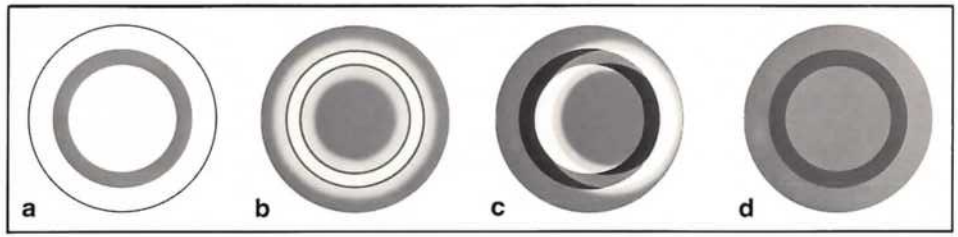


Fig. 40
Phase ring and light ring as seen in the focusing telescope in

a brightfield
b phase contrast, centred
c phase contrast, off-centre
d darkground

Screw phase contrast objectives into the revolving nosepiece, insert this in its dovetail changer and secure it with the fixing screw. Insert the UK universal condenser complete with light-ring turret in the condenser fitting and fully raise it with the condenser screw. Set the aperture diaphragm at the "10" index. Mount the specimen on the object stage. Turn in objective 10/0.30 Phaco 1 or 16/0.40 Phaco 1. Set the light-ring turret at position 1. Focus the specimen with the coarse and fine adjustment.
Close the field diaphragm. Set the condenser with the condenser knob and stop screw so that the edge of the field diaphragm is in sharp focus. Centre the field diaphragm image with the two centring screws. Open the field diaphragm so that its edge just disappears beyond the edge of the field of view. Remove the eyepiece from the eyepiece tube and insert focusing telescope (36.7). Release the knurled clamping screw (36.6) on the focusing telescope and adjust the eyelens (36.5) so that sharp images are obtained of the light and phase rings. Set the light ring with the light-ring centring screws (11.1) (depress and turn) so that it precisely coincides with the phase ring of the objective (Fig. 40). Centration should be carried out once and for all for all objective light-ring combinations, and should be maintained for all settings.

Microscopic measurement

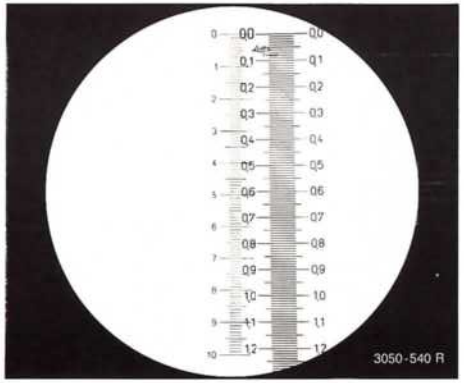


Fig. 41
Graduation of the graticule in the eyepiece and image of the stage micrometer.

Linear measurements of microscopic objects are carried out in conjunction with a measuring eyepiece (graduation usually 10mm = 100 intervals). The micrometer value of the objective used must be known before the beginning of measurements. It represents the distance in the object plane which just coincides with an interval of the graticule division in the measuring eyepiece when this objective is used. Because the optical constants of the objectives are subject to slight variations, it is advisable to determine the micrometer values with the aid of a stage micrometer once and for all.
Examples:
Determination of the micrometer value with the aid of a stage micrometer 2mm = 200 intervals and a measuring eyepiece with graticule 10mm = 100 intervals.
Make the zero lines of measuring eyepiece and stage micrometer coincide in the microscope. The micrometer value is read at the end of the measuring eyepiece scale with the setting unchanged.
If 1.220mm on the stage micrometer coincides with 100 intervals of the measuring eyepiece, the micrometer value will be 1.220 : 100 = 0.01220mm = 12.20 μm. With objectives of low magnification, which do not form an image of the graduation of the stage micrometer along the whole length of the scale in the measuring eyepiece, only 10 intervals of the latter are used for this determination. If, for instance, 0.36mm on the stage micrometer coincides with 10 intervals of the measuring eyepiece, the micrometer value will be 0.36:10 = 0.036mm = 36 μm. The screw-micrometer eyepiece is used for very fine measurements in the microscope. Our List 513-17 contains detailed information about this eyepiece.

Centring the 50 W ultra-high-pressure mercury lamp

Remove all filters from the filter slot. Fully open the field diaphragm in the microscope. Insert neutral-density screen in the optical path to reduce the lighting intensity. Place the adjustment device on the dustglass of the microscope.

Fig. 45

The lamp image

Adjust the knurled knob for the lamp condenser until a sharp image of the discharge arc is formed on the adjustment disc.

Turn the knob for vertical adjustment until the image of the discharge arc is at the right level according to the illustration.

Rotate the knob for horizontal adjustment until the discharge arc is at the same spot as shown above.

The lamp image and its mirror image

Adjust the focusing knob for the concave mirror in the direction of the optical axis until the mirror image of the discharge arc is in focus.

Adjust the knob for vertical adjustment until the mirror image is at the same level as the image of the discharge arc.

Adjust the horizontal adjustment knob until both images (discharge arc and mirror image) are side by side.

Now adjust the lamp condenser (46.2), observing it through the eyepiece tube, until the rear focal plane of the objective is evenly illuminated. Remove the neutral-density screen from the optical path and turn the diffusion disc into it.

Insert the exciting filter in the filter slot of the Lamp Housing 102 Z, and the suppression filter in the filter slot of the stand.

Attention: Never look into the microscope whilst the mercury vapour lamp is burning and no suppression filters are in the filter slot.

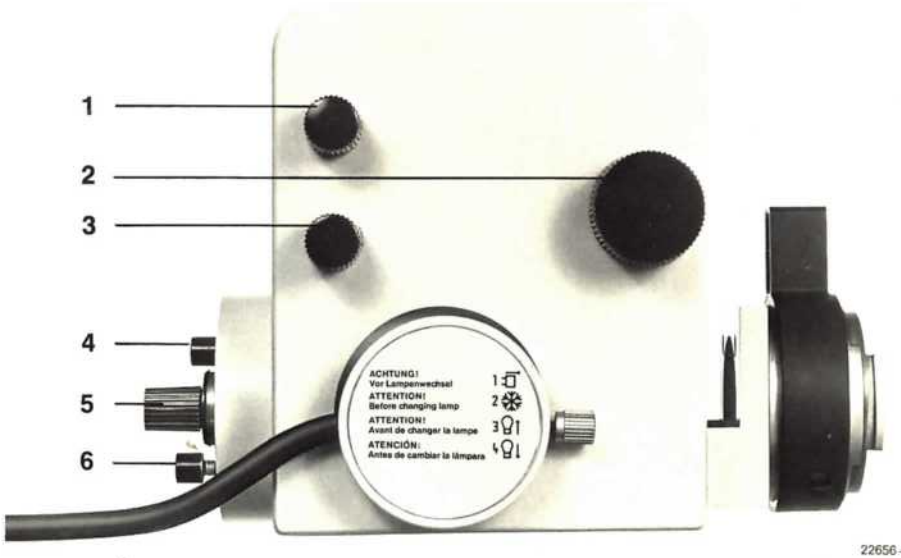
Filter combinations

Exciting filters	Suppression filters
UG 1	K 430 – K 460
BG 3	K 470 – K 490
BG 12	K 510 – K 530

For red suppression the use of a BG 38 blue filter combined with an exciting filter is recommended.

Fig. 46
1 Centring screw for the lamp filament
2 Lamp condenser adjustment
3 Centring screw for lamp filament
4, 6 Centring screws for mirror image adjustment
5 Horizontal adjustment of the mirror

Attention: Before changing the lamp
1 Pull out mains plug
2 Allow the lamp to cool
3 Take out lamp
4 Insert new lamp

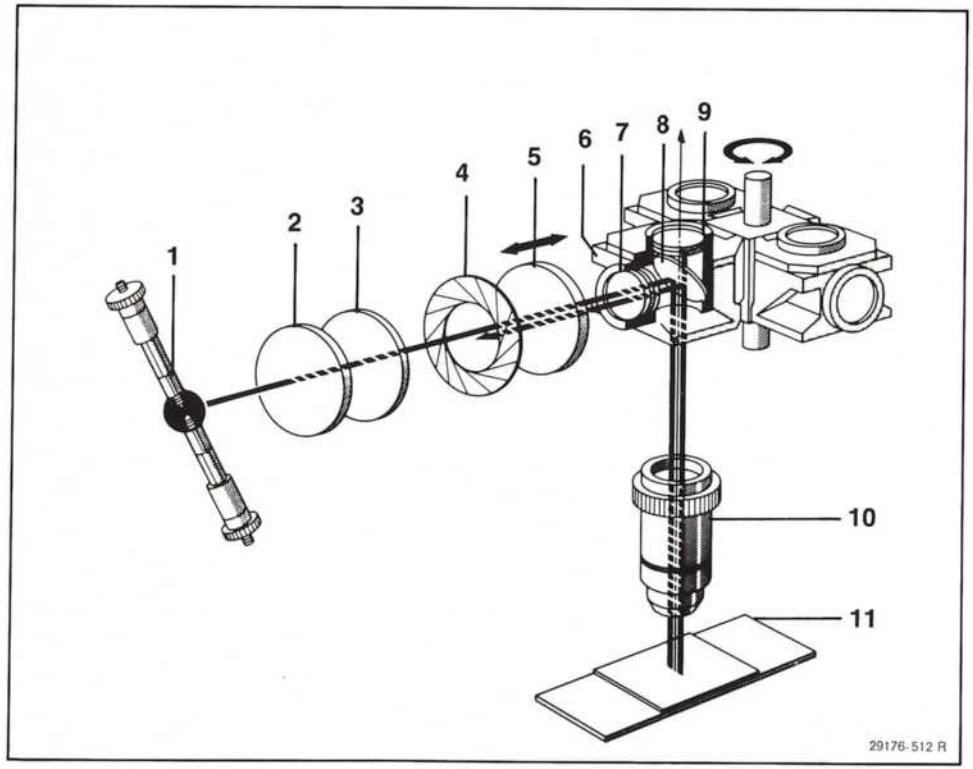


22656-514 R

Incident-light fluorescence with PLOEMOPAK 2.4 fluorescence vertical illuminator

Inserting the lamp
Centring the lamp
See "Transmitted light"

Fig. 47
1 Light source
2 Heat filter
3 Red suppression filter
4 Field diaphragm
5 Lens
6 Filter system with exciting filter, dichroic beam-splitting mirror and suppression filter
7 Exciting filter
8 Dichroic beam-splitting mirror
9 Suppression filter
10 Objective
11 Specimen



Assembling the device

Screw the lamp holder (48.2) onto the PLOEMOPAK (48.1). The bracket on the lamp housing engages in the recess on the PLOEMOPAK.
Unlock the observation tube and remove it from the stand. Place the PLOEMOPAK in its position, ensure that the holding pin on the lamp holder engages in the clamping device in the stand.
Push the lever on the changing device of the PLOEMOPAK to the rear, insert the observation tube in the changing device; release the lever.
Introduce the lamp housing in the lamp fitting (the grip of the bayonet lock is vertical) and lock it in position by turning it anticlockwise (cf. Fig. 20). Remove the condenser and replace it with a light trap (Fig. 50).

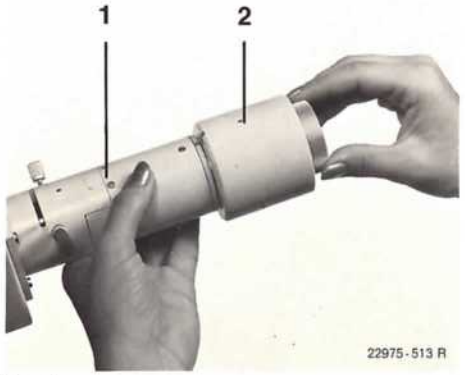


Fig. 48

Fig. 50

Fig. 49

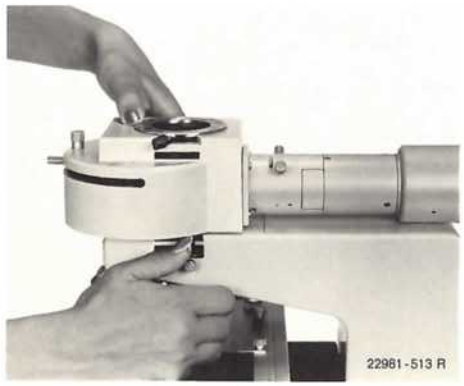
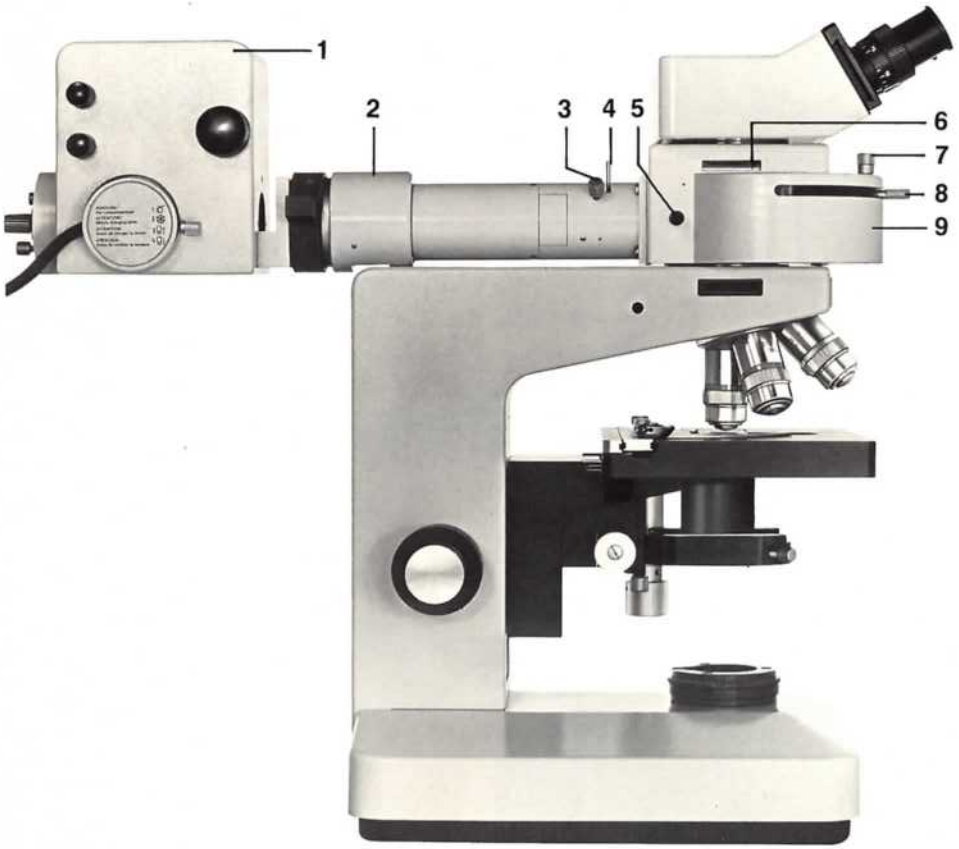


Fig. 51
PLOEMOPAK 2.4 on the DIALUX 20

1 Lamp Housing 102 Z
2 Lamp holder
3 Centring screws for the field diaphragm
4 Field diaphragm
5 Exciting light suppression
6 Slot for additional suppression filters
7 Clamping device of the switch lever for the two-wave-lengths method
8 Changing lever for the exciting-filter systems
9 PLOEMOPAK 2.4



22670-512 R

Exchanging the filter systems

Fig. 52
Opening the cover of the PLOEMOPAK 2.4 housing for changing the filter system.

22977-513 R

Fig. 53
PLOEMOPAK 2.4 with the housing cover removed and key (arrow) for releasing the filter system.

22978-513 R

Fig. 54
Releasing the filter system.

22979-513 R

Fig. 55
Taking out the filter system.

22980-513 R

The two-wave-lengths method

Allow the stop (56.1) to engage. It is now possible to change only between two filter systems (in Pos. 1 and 2). To change between all three positions, pull up the stop and arrest it with a slight turn.

Fig. 56
The figure indicates the filter system in use

6 Accessories

Heating Stages 80, 350, and 1350 (not illustrated)

Fig. 58
WILD MPS 50 photo-automatic system

Fig. 59
LEITZ system camera
The knurled screw 1 must be released for swivelling the camera attachment for upright and horizontal format

Fig. 60
Projection attachment

Fig. 61
LEITZ COMBIPHOT® AUTOMATIC system camera – a universal camera system with fully automatic exposure control for formats from 35mm to 4 x 5in.

Fig. 62
ORTHOMAT®-W
Fully automatic microscope camera for the 35mm format

Fig. 60

Fig. 58

Fig. 61

Fig. 59

Fig. 62

5 Care and maintenance

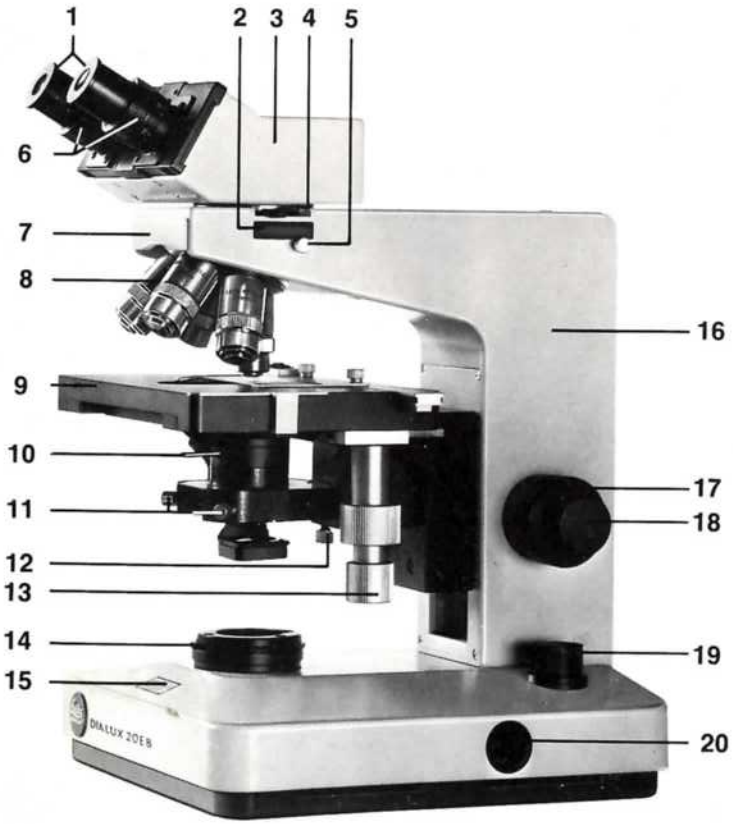
After use the microscope should be covered with the flexible dust cover. The stand should be cleaned from time to time with a piece of linen or chamois leather. No methylated spirit must be used because it attacks the enamel. Petrol is eminently suitable for the cleaning of enamel surfaces.
Light stains on the object stage can be removed by means of rubbing it with liquid paraffin or acid-free vaseline.
Special care is indicated during investigation with acids or other corrosive chemicals. Direct contact of optical systems and stand with these chemicals must be avoided at all times and all parts carefully cleaned after use.
The optical components of the microscope must be kept scrupulously clean. Dust on glass surfaces is removed with a fine, dry sable brush; lightly blow across the glass surface whilst using the brush. Resistant dirt should be removed with a piece of clean linen or soft chamois leather moistened with a little distilled water. If even this treatment fails, petrol or methylated spirit should be used. Objectives must not be dismantled for cleaning. If damage inside the objectives becomes evident, the objective should be returned to the factory for repair. Special care is recommended for the cleaning of anti-reflection coatings.
The coating of the external surfaces of the eyepieces and of the front lenses of the objectives is about as hard as glass. But some of the coatings used for internal surfaces of objectives and eyepieces are very soft indeed, and you must remove dirt very gently by blowing across them. You therefore are advised never to clean internal surfaces yourself, nor to dismantle objectives for this purpose.

Proper treatment preserves the performance of a LEITZ microscope for many years. If however, examination or repair of a damaged instrument should become necessary, one of our agencies or our main factory should be contacted.
Dimensions:
Width 25cm, depth 44cm, height 40cm (with Lamp Housing 102 Z).
Weight: approx. 11kg.

Technical description

Fig. 57
DIALUX 20 EB with built-in illuminator, SK standard condenser, Mechanical Stage No. 78 and binocular tube S.

1 PERIPLAN eyepieces
2 Filter slot
3 Binocular tube S
4 Lever for tube attachment
5 Knurled screw for arresting the revolving nosepiece
6 Adjustable eyepiece tubes
7 Revolving nosepiece
8 NPL FLUOTAR objectives
9 Large Mechanical Stage No. 78
10 Aperture diaphragm
11 Centring screws for the condenser
12 Adjustable condenser stop
13 Controls for the mechanical adjustment of the object stage
14 Field diaphragm
15 Voltmeter
16 Stand
17 Rotary knob for the coarse vertical adjustment of the object stage
19 Rotary knob for brightness adjustment
20 Lamp mount



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