ZEISS

West Germany

Carl Zeiss
D-7082 Oberkochen

Standard KF 2 microscope

Operating Instructions

Standard KF 2 microscope with halogen lamp 6 V 10 W

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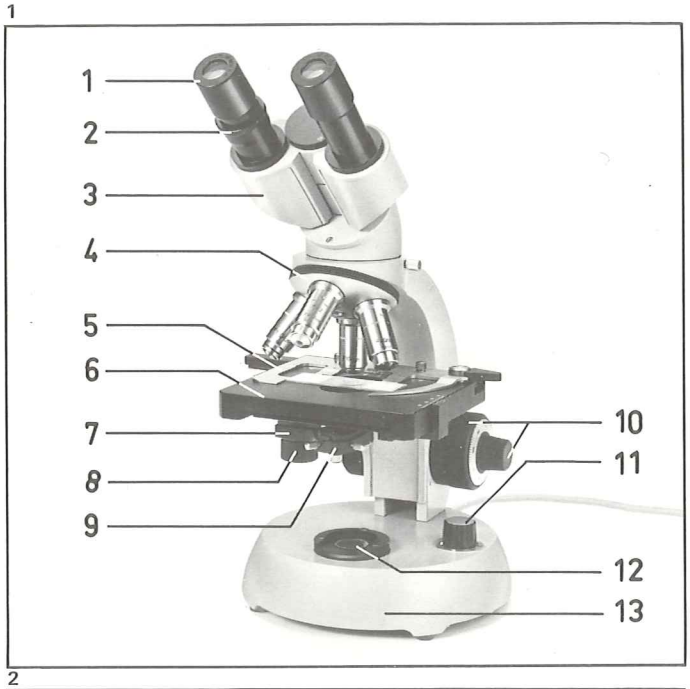

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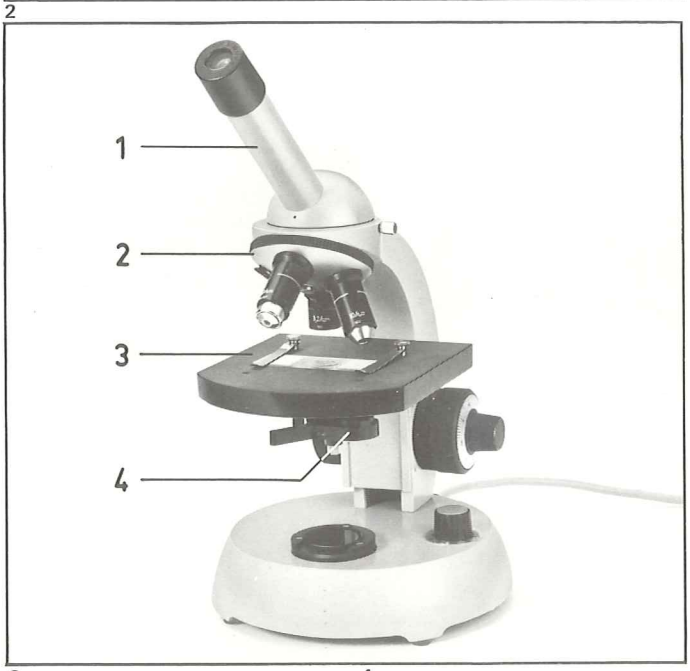

Fig. 1: Standard KF 2 microscope with halogen lamp 6 V 10 W equipped for brightfield and phase contrast

1 CPL wide-angle eyepiece 10x/18 Br[1)]
2 Adjustable tube
3 Binocular tube D 1 with 45° viewing angle, tube factor 1, rotatable through 360° and removable
4 Revolving nosepiece with objectives
5 Specimen holder with spring lever and specimen
6 Mechanical stage with 25x75 mm motion range, graduation and vernier
7 Lever to vary the condenser aperture diaphragm and switching the condenser rocker – here equipped with annular stop PH and set to free light passage
8 Low-mounted coaxial control to shift specimen
9 Condenser 0.9 AS and condenser rocker with two switch positions
10 Coarse and fine control knob to adjust the image sharpness. The coarse and fine control covers a focusing range of 16 mm.
One interval on the fine control vernier represents 4 µm = 0.004 mm in the object plane.
11 Brightness control for halogen lamp 6 V 10 W
12 Light exit aperture with holder for 32 mm dia. filter on top
13 Stand base with stabilized power supply for 220 ... 240 V, 50 ... 60 Hz (cps), 20 VA including mains cable with CEE plug
Approbation: VDE;GS (safety tested), SEV;

for 100 ... 127 V, 50 ... 60 Hz (cps), 20 VA including mains cable with US plug
Approbation: UL and CSA.

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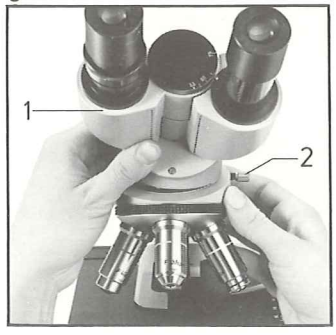

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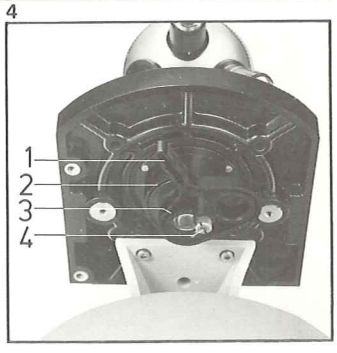

Fig. 2: Standard KF 2 microscope equipped for brightfield

1 Monocular tube (47 30 00)[2)]
2 Revolving nosepiece with Achromat objectives 3.2 – 10 – 40 and protective cap
3 Fixed square stage (47 34 20) with stage clips
4 Condenser 0.9 AS and rocker with supplementary lens for objectives < 10 (survey)

1) Eyepiece for spectacle wearers.
Eyecups are available for users who do not wear spectacles.

2) The six or ten-digit numbers in brackets are ordering numbers imprinted on components.

Microscope adjustment for brightfield

Take microscope from transport case and place it on worktable.
Check on type plate (**13.3**) whether the in-base lamp supply unit matches the mains voltage. If not, please contact your nearest Zeiss representative.
Connect the instrument to mains with power cable.
Adjust brightness with knob (**1.11**).

In addition to the illumination with the halogen lamp 6 V 10 W, illumination with mirror is possible, see page 6.

Mounting the binocular tube D:
Loosen clamping screw (**3.2**). Tilt tube (**3.1**) slightly, press its dovetail ring against the spring bolt of the tube port, attach the entire dovetail ring. Turn tube to desired viewing position and tighten the clamping screw. Insert eyepieces of the same magnification in the binocular tube. Screw the objectives into the nosepiece (**1.4**).

Condenser AS 0.9 with condenser rocker
The condenser (**4.2**) is factory-aligned and permanently mounted on the specimen stage. It contains an aperture diaphragm to adjust the image contrast. The condenser rocker (**4.3**) is mounted at the bottom of the condenser and secured with a screw. It has two click-stop positions.
Lever moved to the right:
Free light passage, for objectives $\geq$ 10x.
Lever moved to the left:
Supplementary lens switched in, for objectives $<$ 10x.
The aperture diaphragm can be operated in either position with lever (**4.1**).
Clockwise turn in click-stop position:
diaphragm is opened.
Anticlockwise turn in click-stop position:
diaphragm is closed.

This condenser rocker can be exchanged for the condenser rocker with annular stop Ph 2 (46 52 14) (**5.3**) or condenser rocker with darkfield diaphragm D 0.7 (46 52 15) (**9.2**).
To exchange rocker, loosen knurled screw (**4.4**), pull out rocker downwards, slide on the other rocker, move it to click-stop position and secure it with the knurled screw.

Place specimen with coverglass up on the specimen stage.
Switch in objective 10x.
With a 10x or higher power objective, switch condenser rocker to free light passage by moving lever (**4.1**) to the left click-stop position.

When using the binocular tube D 1, view first through the right-hand eyepiece and focus the specimen with knob (**1.10**). Then correct the image sharpness for the left eye by turning the adjustable tube (**1.2**) inwards. When using a binocular tube without adjustable tube, equip the right tube with a normal eyepiece and the left one with an eyepiece of the same magnification with a focusing eyelens. Adjust the image sharpness for the left eye by turning the eyelens. Adjust the distance between the two tubes so that both eyes see a round, sharply defined field of view.

Adjust image contrast and resolving power with the condenser (aperture) diaphragm (**4.1**). For checking, remove one eyepiece from the tube. View through the empty tube. The condenser diaphragm should illuminate about 3/4 of the visible objective aperture. When changing objectives, always adjust aperture diaphragm to objective aperture.

Adjust brightness of the image with lamp control (**1.11**) or with filters in holder (**1.12**).

When working with low power objectives (less than 10x magnification), swing the supplementary lens into the beam path using lever (**4.1**) and open the condenser diaphragm until its edge disappears from the field of view.

When working with oil immersion objectives such as the Achromat 100/1.25 oil, always connect objective front lens and specimen by a drop of immersion oil. For this purpose we supply special immersion oil in an oiler which guarantees maximum performance of the objective. In applying immersion oil avoid air bubbles between the specimen and the objective front lens in order not to impair imaging. The objective mount can be arrested in retracted position by slightly turning it, which permits moving the objective in and out of the beam path without touching a non-immersed coverglass. This avoids contamination of the front lens of dry objectives. Do not immerse condenser front lens.

Total magnification of the microscope
The total magnification of the microscope results from the following multiplication:

$$M_M = M_{obj} \times M_{eyepiece}$$

Example: $400 = 40 \times 10$

M_M = Microscope magnification
M_{obj} = Objective magnification
$M_{eyepiece}$ = Eyepiece magnification

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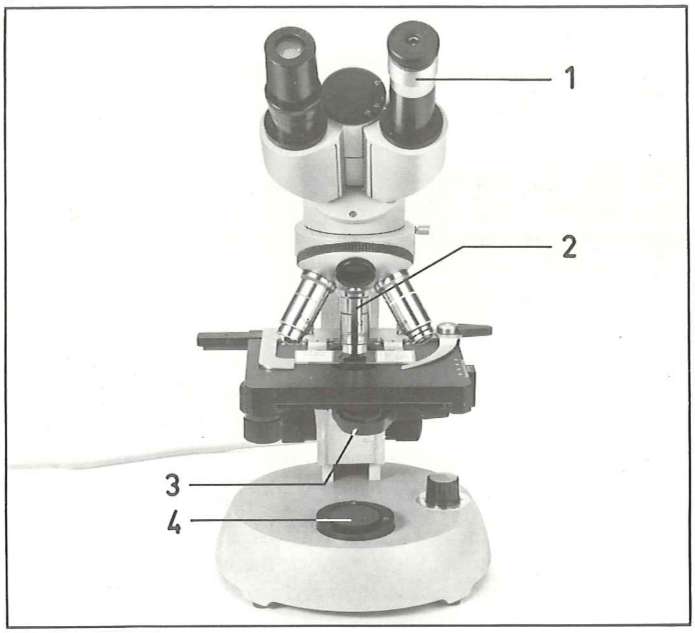

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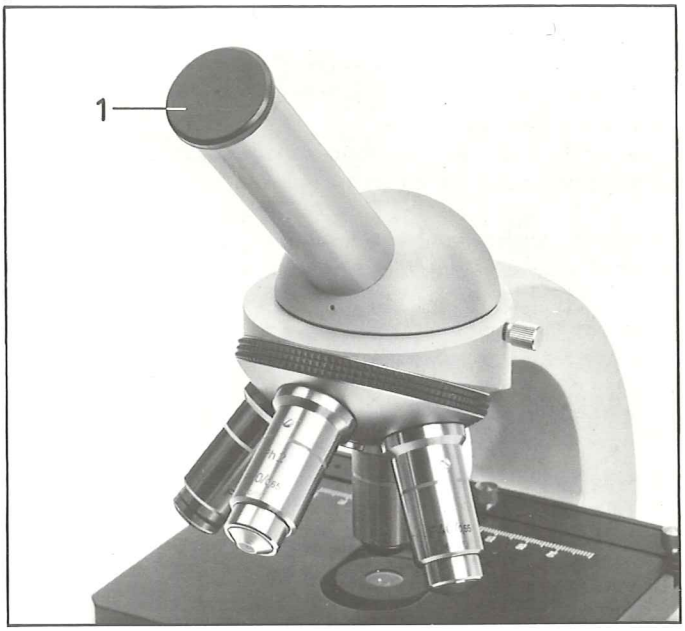

Fig. 5: Standard KF 2 microscope equipped for phase contrast[1)]

1 Centering telescope (46 48 22)
2 F-Achromat 40/0.65 Ph 2 (46 07 01-9901)
3 Condenser rocker with annular stop Ph (46 52 14)
4 Green filter VG 9, 32x3 (46 78 05)

Adjustment

Focus specimen in brightfield, see page 3.
Swing in annular stop Ph 2 (**7**.2) by moving lever (**7**.3) to the right, open aperture diaphragm.
Bring objective Ph 2, e.g. F-Achromat 40/0.65 Ph 2, into light path.
Centering annular stop Ph 2 on objective Ph 2:
Replace one eyepiece by the centering telescope (**5**.1) and shift the latter's eyepiece to obtain a sharp image of the bright ring. If a centering telescope is not available, view the two Ph rings with diopter (**6**.1) or through the empty tube.
With screws (**7**.1) move the bright PH ring to lie within the black one (Fig. **8**).
Fit eyepiece in tube.
Adjust brightness with lamp control (**1**.11).
Place a green filter VG 9 (**5**.4) on the filter holder.
It will enhance contrast of the phase contrast image.

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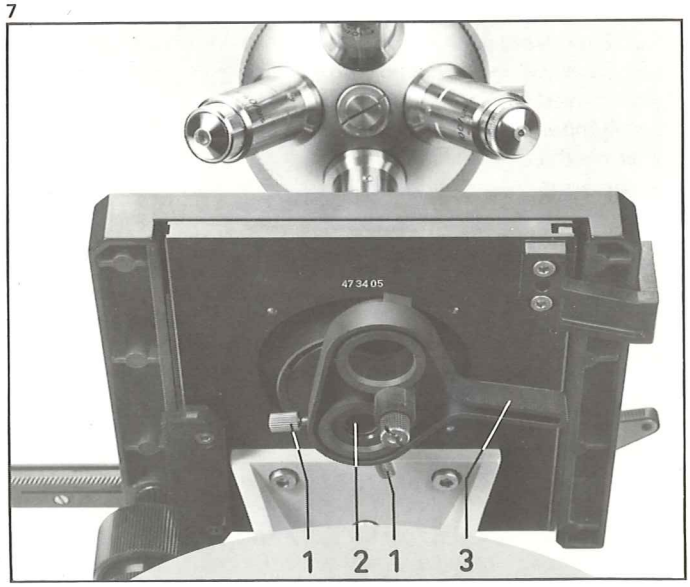

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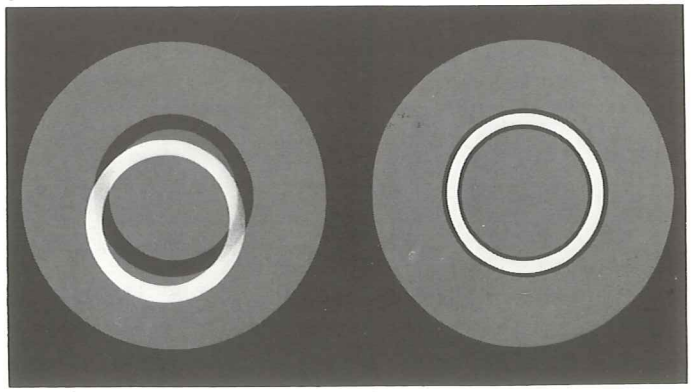

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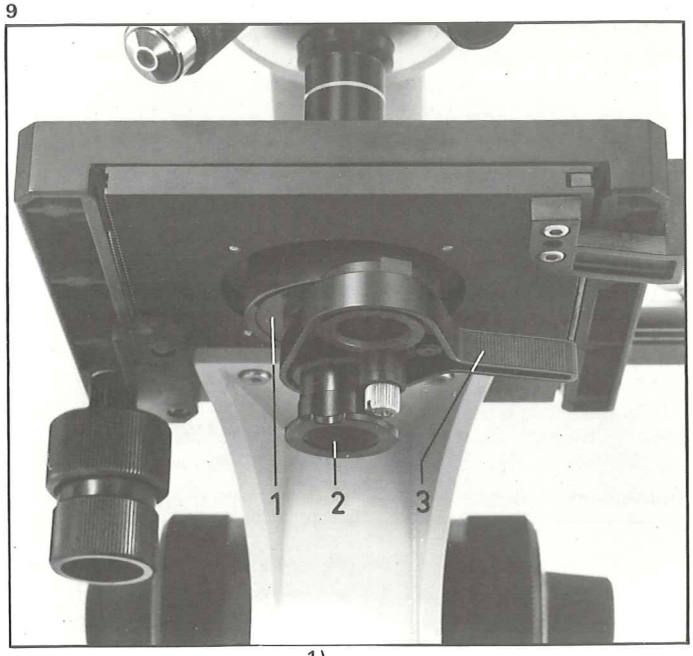

Fig. 9: Darkfield equipment[1)]

1 Condenser AS 0.9
2 Darkfield diaphragm D 0.7 (46 52 15) for objectives 10x to 40x
3 Condenser rocker

Adjustment

Move lever (**9**.3) to left stop (free light passage) and adjust specimen in brightfield. To focus, find a specimen area with less prevalent structure (at the edge of the specimen, if necessary).
Move lever (**9**.3) to right stop to bring darkfield diaphragm D 0.7 (**9**.2) on the condenser rocker into the light path, open aperture diaphragm. Look through the eyepieces and move the darkfield up and down until optimum brightness of the specimen and optimum darkness of the background are achieved. Adjust maximum brightness with lamp control (**1**.11).

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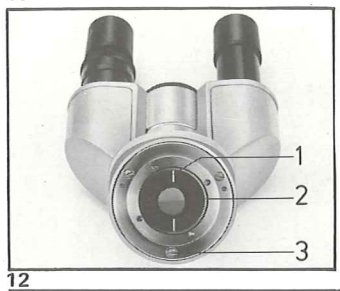

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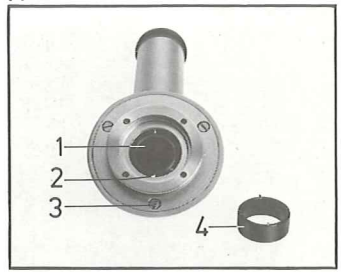

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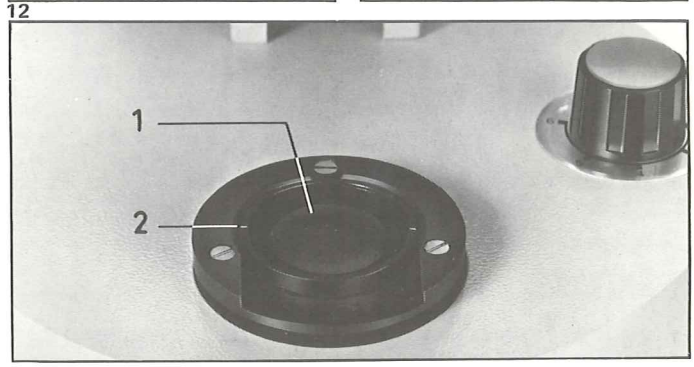

Equipment for simple examinations in polarized light (orthoscopic examinations).

Inserting analyzer in tube:
Loosen clamping screw (**3**.2) and take off the tube.

Insert analyzer (47 36 57) (**10**.2) in the mount of binocular tube D 1 (Fig. **10**).

Screw analyzer (47 36 51) (**11**.1) into threaded mount of the monocular tube (47 30 00) (Fig. 11) using tool (**11**.4) supplied. Two white index lines (**10**.1) indicate the oscillation direction of the analyzer. With attached tube it should be North-South. Tube screw (**10**.3 or **11**.3) serves as aid in orienting the analyzer. Attach tube with inserted analyzer on to microscope.

Place 32 mm dia. polarizing filter (47 36 00) (**12**.1) in filter holder above the light exit aperture. The two white index lines (**12**.2) on the mount of the polarizer indicate the oscillation direction and should lie in East-West direction, i.e. at right angles to that of the analyzer.
For exact cross position of the polarizers slightly turn polarizing filter (**12**.1) until the field-of-view background shows maximum extinction.
With lever (**4**.1) close down aperture diaphragm slightly more than for brightfield.

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1) Attention: Optimum phase contrast and good darkfield require extreme cleanliness! Clean off any grease thoroughly from front lens of objective being used, visible condenser lens surface, and top surface of coverglass and underside of specimen slide.

Exchange and adjustment of halogen lamp 6 V 10 W

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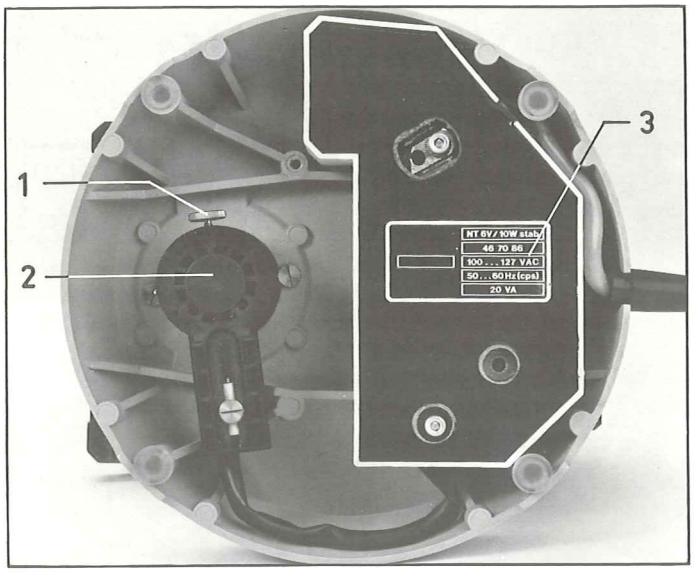

To change halogen lamp 6 V 10 W (38 61 08):
Lay the microscope on its side (Fig. **13**).
Loosen knurled screw (**13**.1) and pull out lamp socket (**13**.2).
Remove halogen lamp (**14**.1) from the two metal clips. Holding the new lamp in the plastic cover in which it is supplied, insert lamp into socket. Wipe off finger marks to prevent burning in.

To adjust halogen lamp:
When optimally adjusted, the filament and its reflection must be parallel and match in size, looking at lamp and concave mirror. To achieve this, loosen screw (**15**.1) and shift halogen lamp in socket (Fig. **16**) to obtain setting (Fig. **17**).
Tighten screw (**15**.1).
Now turn screw (**18**.1) until filament and reflection are the same size (Fig. **19**). After completing adjustment, insert lamp housing and screw down with knurled screw (**13**.1).

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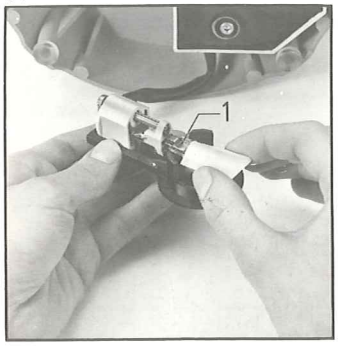

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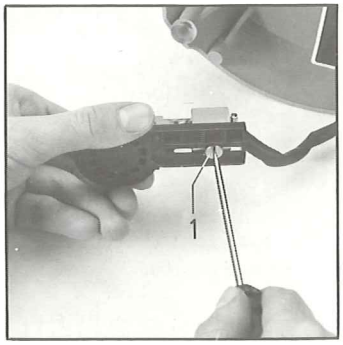

Illumination with mirror and condenser 0.9 AS (Fig. 20)
Align plane surface of illuminating mirror (**20**.1) (rotate and tilt) so that diffuse daylight or the light of a separate light source evenly illuminates the specimen.
Adjust specimen as described in Section "Brightfield".

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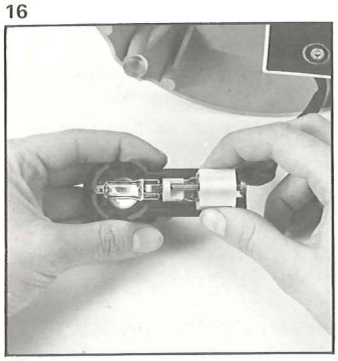

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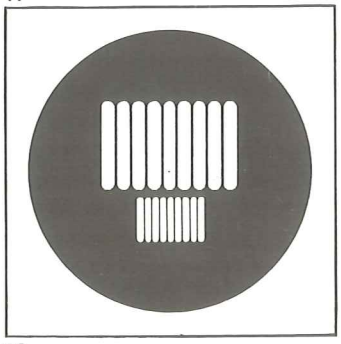

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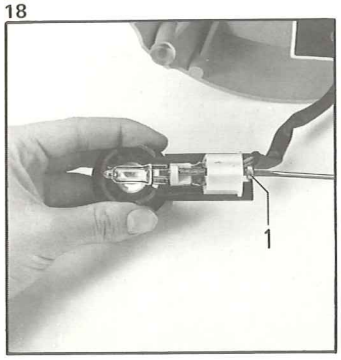

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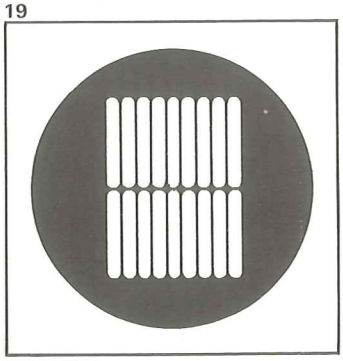

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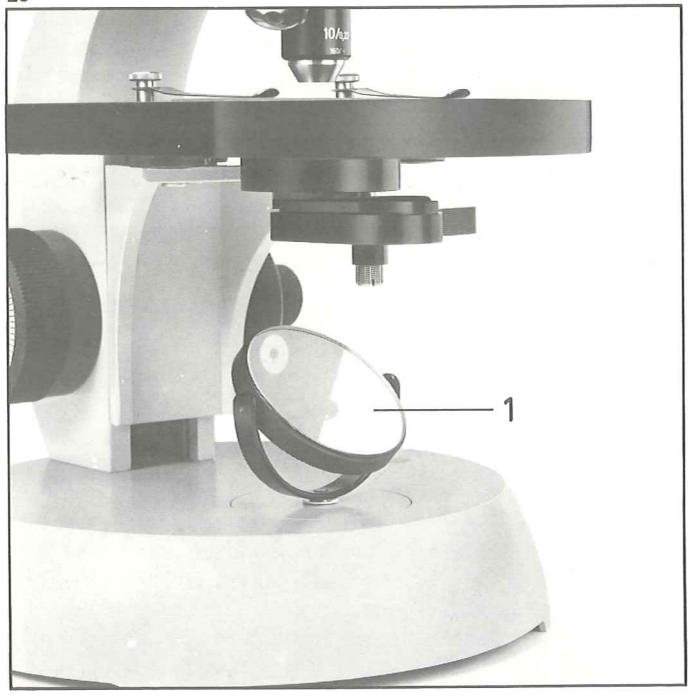

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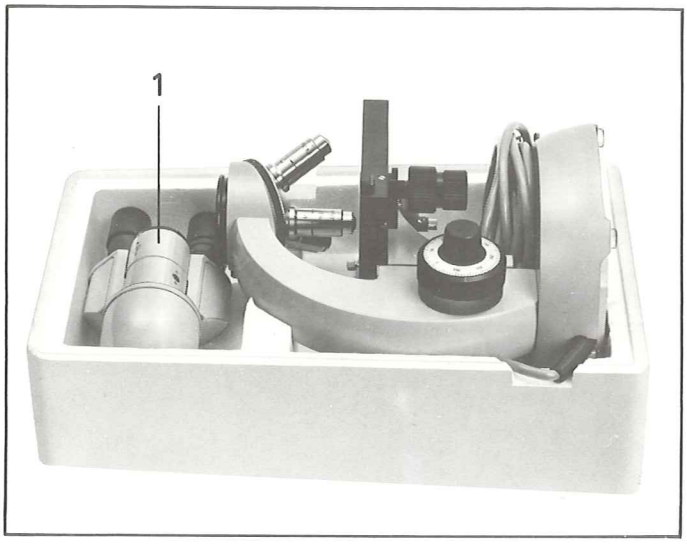

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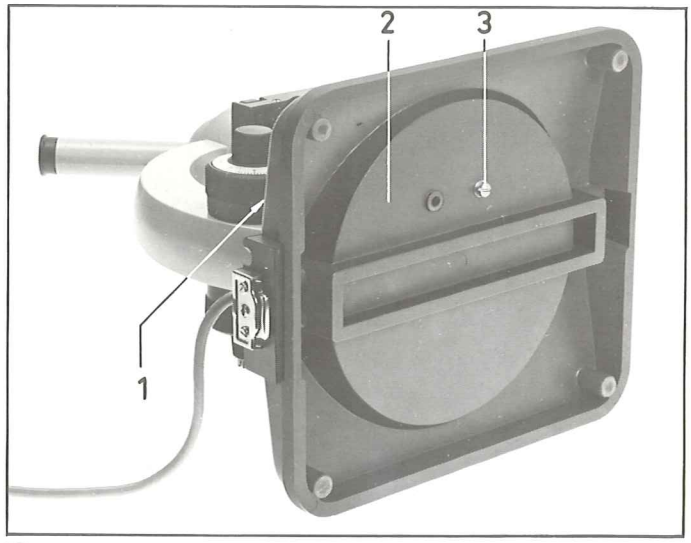

The Standard KF 2 microscope is factory-assembled for immediate use by the user, packed in the Styropor case (Fig. **21**) and shipped. All the user has to do is attach the binocular tube D 1 (**21**.1).

For storage and transport of the microscope we recommend plastic case (47 94 64) (Fig. **25**).

To fasten microscope base to the bottom of the case, place bottom plate (**22**.2) against microscope base (**22**.1) and insert screw (**22**.3) from below.

In the plastic case, first loop the power cable and then guide through groove (**23**.2) along the bottom of the case to the outside or roll it up and place on the microscope base (Fig. **24**).

Fig. **25** shows the plastic case with closed hood with instrument cable guided along the outside.

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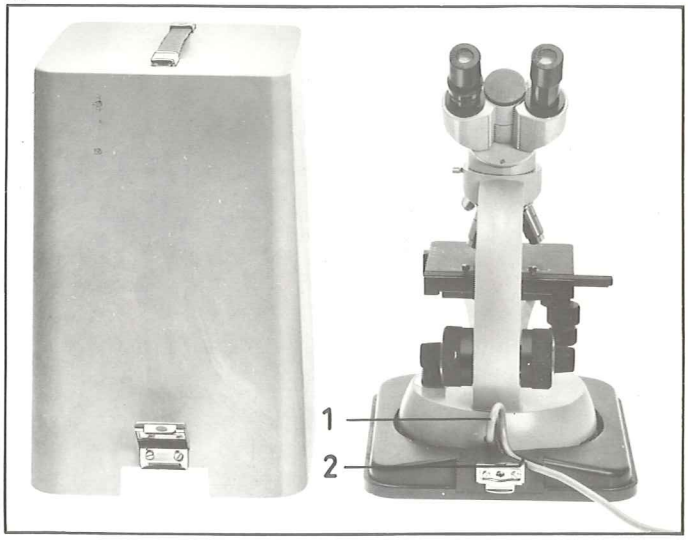

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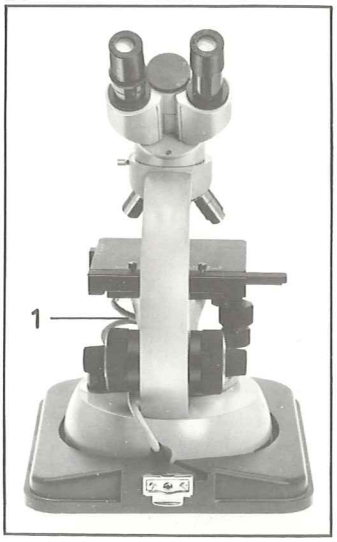

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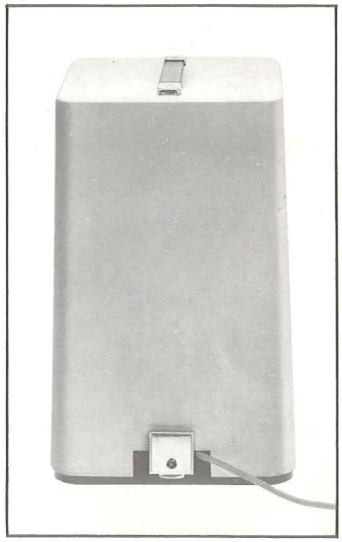

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