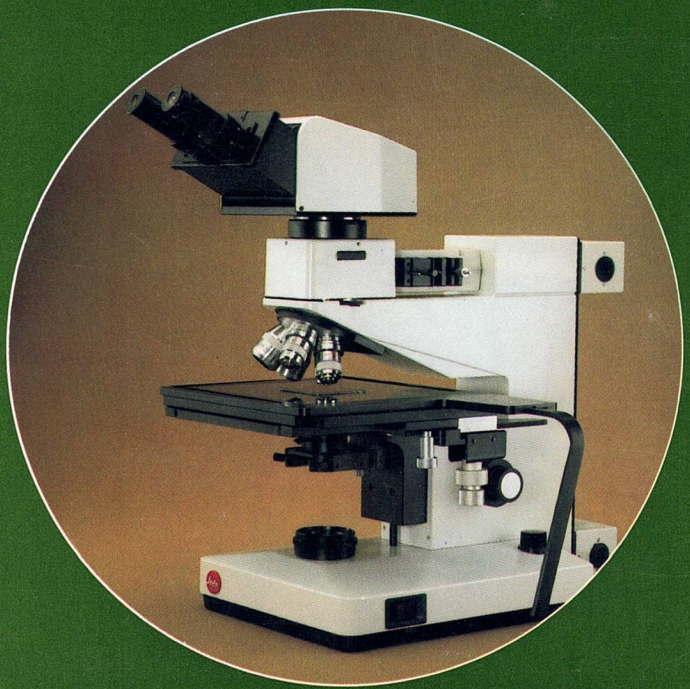
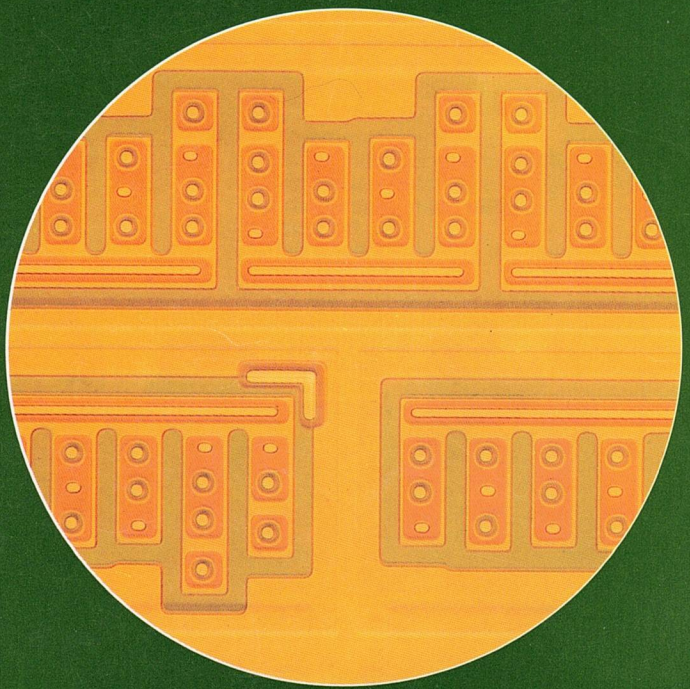
LEITZ ERGOLUX

Inspection and measuring microscope for the electronics industry

Instructions





Code-No. 933 418

With the LEITZ ERGOLUX inspection and measuring microscope you are the owner of an instrument with which you can tackle all microscopic tasks of quality assurance in the semiconductor industry without effort. Its design facilitates concentrated work for many hours. The object stage is mounted on cross roller bearings and thereby meets the increased requirements of the semiconductor industry for smooth prolonged operation and movement accuracy. For the speedy scanning of large objects the object stage can be uncoupled and freely moved within the entire travelling range.

The various illuminating devices permit the use of highly specialized methods of investigation.

With the LEITZ 3 λ PLOEMOPAK® incident-light investigations with fluorescence excitation can be carried out. For automatic photomicrography the LEITZ VARIO ORTHOMAT® camera system can be attached.

To use the many practical possibilities of the ERGOLUX you should read these instructions carefully. Even if you have many years of experience in microscopy, you are certain to find a few suggestions that will make your work easier. The Ergolux incorporates more than 125 years of experience in the manufacture and development of microscopes. The worldwide reputation of Leitz guarantees up-to-date technology and optimum performance range also in this instrument.

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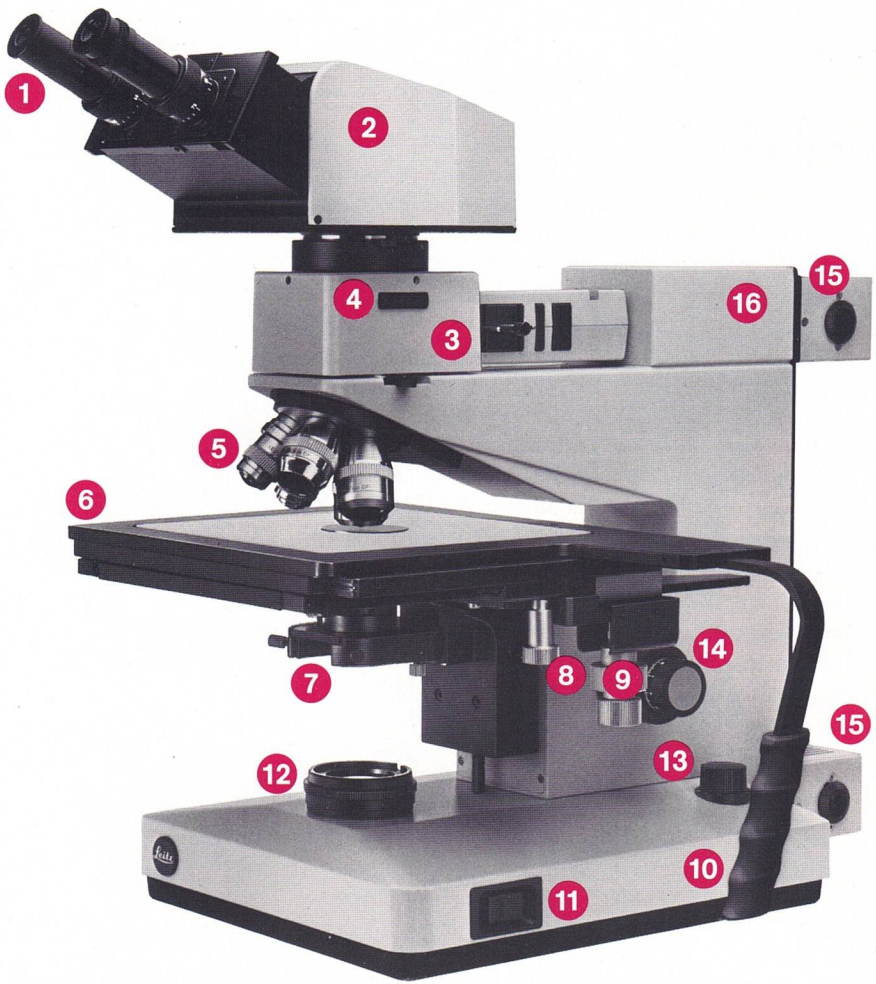

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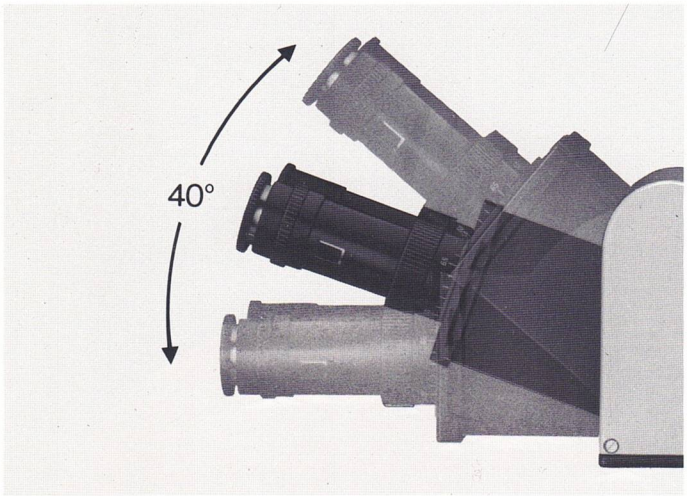
Fig. 1

2. Technical details



Binocular tube SV

Variable viewing angle

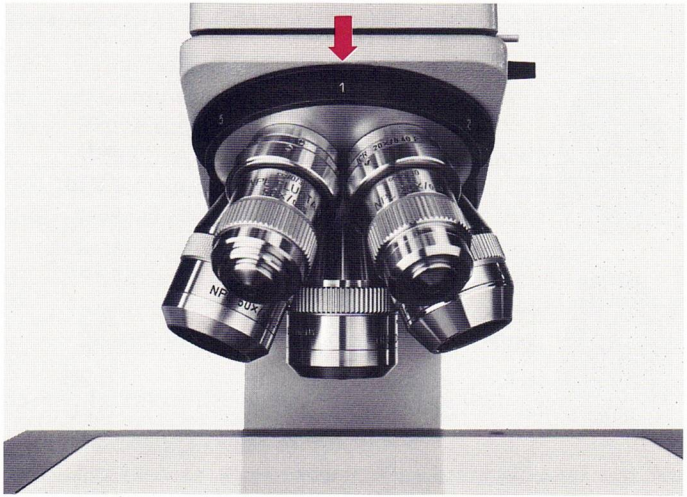
The tilting tube, whose viewing angle can be varied continuously between 0 and 40° is a special feature of the ERGOLUX. This enables the operator to choose the viewing level freely and to adjust it to his or her individual working and sitting posture.

Fig. 2

Adjustable eyepiece tube

With the mechanical compensation of the tube length the PERIPLAN® GF eyepieces are adjusted to the different interpupillary distances of the operators.

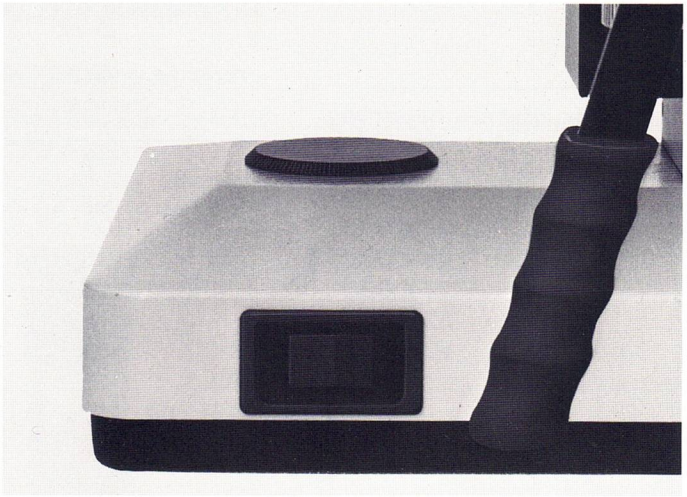
Fig. 3



Quintuple revolving nosepiece, power operated

The revolving nosepiece can be rotated by motor in both directions.
The number on the front (arrow) is associated with the objective in the optical path.

Fig. 4



Switch for the revolving nosepiece

The rotation of the revolving nosepiece by motor is triggered with a rocker switch, conveniently arranged in the foot of the stand.

Fig. 5

Objectives and eyepieces

Brightfield		Free working distance in mm
		
HL	10 x/0.20	14,2
HL	20 x/0.30	4,8
HL	50 x/0.65	0,45
		
NPL	5 x/0.09	12,0
NPL	10 x/0.20	17,0
NPL	20 x/0.40	0,75
NPL	50 x/0.85 FLUOTAR	0,24
NPL	100 x/0.90	0,10
PL	8 x/0.18	13,0
PL	16 x/0.30	7,0
PL	32 x/0.50	0,38
	80 x/0.95	0,12
PL	160 x/0.95	0,08
PL Apo	160 x/1.40 OIL	0,18

Brightfield and darkground		Free working distance in mm
		
HL	20 x/0.30 DF	4,9
HL	50 x/0.65 DF	0,48
		
NPL	5 x/0.09 DF	6,3
NPL	10 x/0.20 DF	6,6
NPL	20 x/0.35 DF	0,90
NPL	50 x/0.75 DF	0,30

Brightfield and incident-light interference contrast		Free working distance in mm
		
NPL	5 x/0.09 (P)	12,0
NPL	10 x/0.20 (P)	13,5
NPL	20 x/0.40 (P)	0,90
NPL	50 x/0.85 (P) FLUOTAR	0,24
NPL	100 x/0.90 (P)	0,10
NPL	125 x/1.30 (P) OIL	0,28

Special objectives		Free working distance in mm
PL	3,2 x/0.06	12,0
L	20 x/0.40	6,6
LL	20 x/0.40	10,1
LL	20 x/0.40 (P)	10,1
H	20 x/0.40	8,3
H	32 x/0.60	5,7
L	50 x/0.60 DF	2,0

Explanation of the data engraved on the objectives

DF Brightfield/Darkground objectives
H Heating stage objectives
HL Flatfield objectives
L Objectives of long free working distance
LL Objectives of very long free working distance
NPL Normal plano objectives of flattened field of view of at least 18 mm in the intermediate image plane
(P) Strainfree objectives for interference contrast
PL Plano objectives of flattened field of view of at least 28 mm in the intermediate image plane

Explanations of the symbols on the objectives

∞ Mechanical tube length infinity
/0 Coverglass thickness 0. The objects must not be covered with a coverglass.
20x/ Reproduction ratio. The size ratio of the microscopic intermediate image to the object, for instance 20:1
/0.40 Numerical aperture

PERIPLAN eyepieces

The 10x/18 and 10x/18 👓 eyepieces are supplied as standard equipment.
If necessary other eyepieces from the Leitz microscope range can be used.

Magnification	Field-of-View Index* in mm
GF 10 x	18
GF 10 x	18 👓
GF 12,5 x	18
GF 12,5 x	18 👓

Explanations of the data and symbols engraved on the eyepieces

GF Widefield eyepieces
👓 Eyepieces for spectacle wearers, with particularly high exit pupil
10x Eyepiece magnification
/18 Field of view*. The eyepiece covers an 18mm field of view in the microscopic intermediate image plane

*Definition of field-of-view index

The field-of-view index indicates the diameter of the field diaphragm in mm. It is used to calculate the diameter of the intermediate image that can be observed in the tube. It appears magnified by the eyepiece factor.

Example: The image diameter in the GF 10x/18 eyepiece appears to be as large as the diameter of an area of 10 x 18 = 180mm viewed from a distance of 250mm.

The true diameter of the observable object area is obtained when the diameter of the field of view is divided by the objective magnification and, if applicable, by the tube factor.

Example: With the GF 10x/18 eyepiece and a 20x/0.40 objective an object area of 18:20 = 0.90mm diameter can be observed.

The final magnification of the microscope is based on the following equation:

Objective 20x/0.40 x eyepiece GF 10x x tube factor 1x = 20x10x1 = 200.

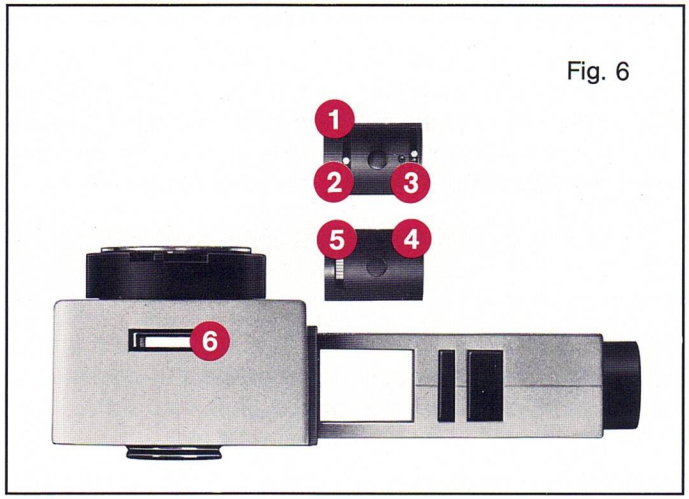


Fig. 6

MODULOPAK vertical illuminator with F- or V-diaphragm slide DF

The MODULOPAK is supplied either with a 1x or with a 0.8x tube lens. With the latter PL or NPL objectives should be used because of the larger object area (≙ SFZ 22.5mm). obtained. The vertical illuminator can be precision-adapted to the methods of investigation used. The diaphragm slides permit instant switchover from brightfield to darkground microscopy and therefore quick reaction to different object properties. The F diaphragm slide DF has a fixed, the V diaphragm slide DF a variable aperture and field diaphragm each.

1 V diaphragm slide DF
2 Field diaphragm
3 Aperture diaphragm
4 F diaphragm slide DF
5 Lever for the insertion of neutral-density screens
6 Filter slot (for analyser slide)

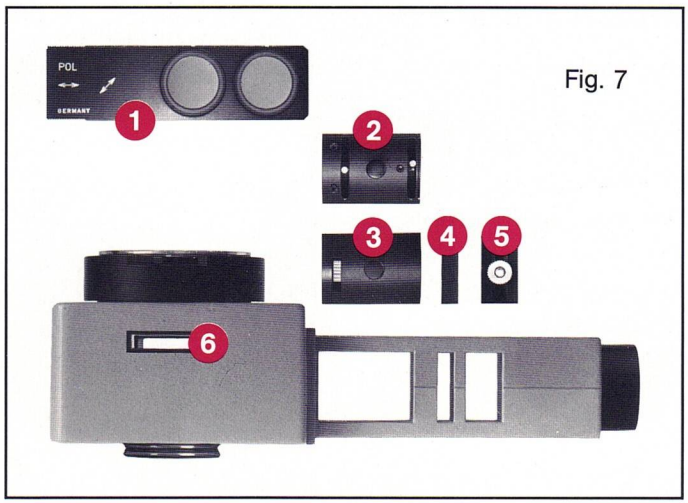


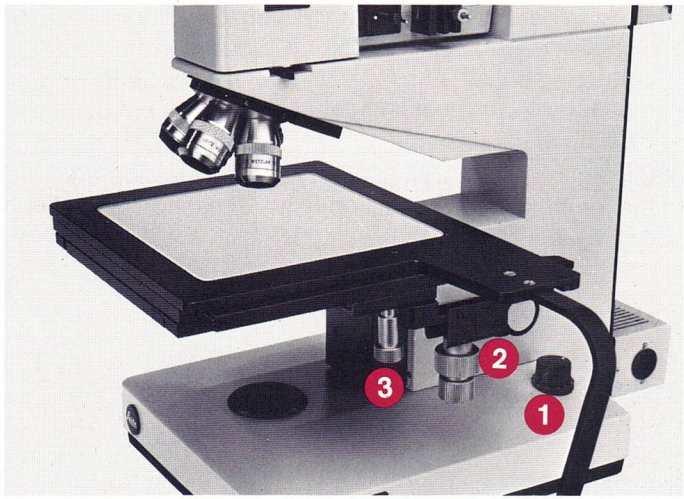
Fig. 7

MODULOPAK incident-light device with F or V diaphragm slide DF and interference contrast device R

For investigations in brightfield, darkground, and interference contrast. The interference contrast device R consists of the rotatable polariser, the λ-plate, and the analyser, which is a slide with a polarising filter each in 90° ↔ and 38° ↙↗ orientations; it is inserted in the filter slot.

The L-plate is used for interference colour contrast.

1 Analyser slide
2 V-diaphragm slide DF
3 F diaphragm slide DF
4 λ-plate
5 Polariser
6 Filter slot (for analyser slide)



Object stage, adjustment range 155 x 155mm (6⅛ x 6⅛ in)

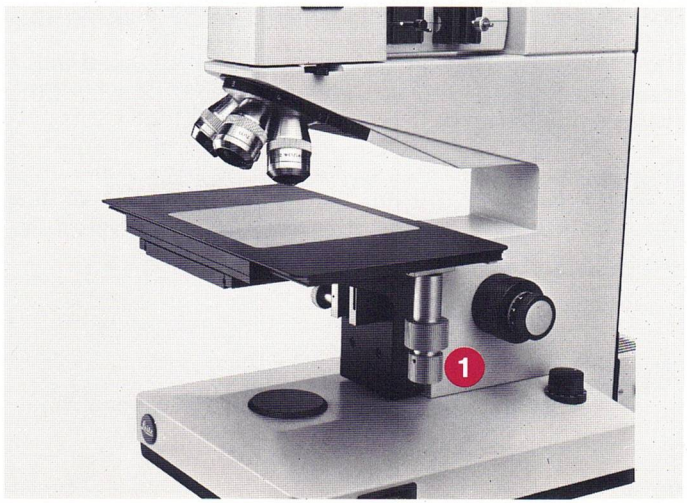
For incident-light and/or transmitted-light observation. The object stage has an adjustment range of 155 x 155mm (6⅛ x 6⅛ in); objects of up to this size can therefore be scanned. Quick inspection with the rapid positioning lever, fine adjustment with the coaxial controls.

The vertically adjustable handgrip* can be adjusted to the vertical travel of the stage used.

1 Rapid positioning lever (with handgrip)
2 Coaxial control
3 Switch knob

*Available at a later date

Fig. 8

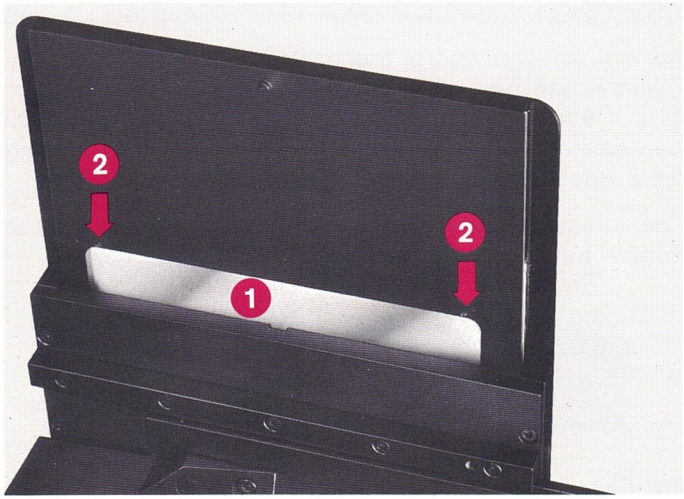


Object stage, adjustment range 108 x 108mm (4¼ x 4¼ in)

For incident-and/or transmitted-light observation. Objects of up to 108 x 108mm (4¼ x 4¼ in) can be inspected. Adjustment with coaxial controls.

1 Coaxial control for stage movement

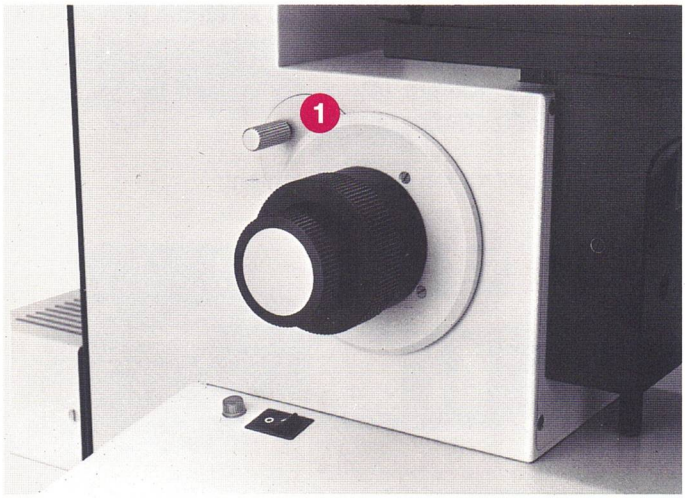
Fig. 9



In place of the glass plate an individual mask or the Leitz Universal-Waferholder code No. 573008 can be inserted in both mechanical stages; it can be aligned to the stage movement with four adjustment screws.

1 Glass plate
2 Two of the four adjustment screws

Fig. 10



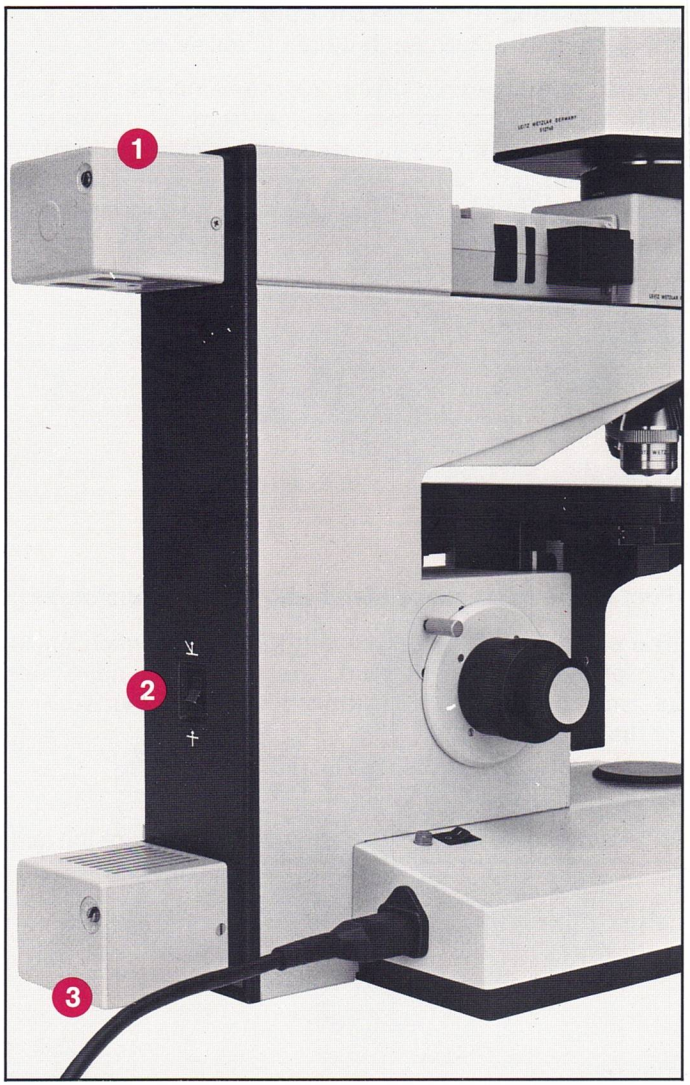
Coarse and fine adjustment with adjustable focusing stop

The sharpness of the microscopic image is adjusted with a coaxial coarse and fine adjustment. The total travel of the object stage is 25mm.

The coarse adjustment is designed as a rapid adjustment (1 turn ≙ 8.1 mm) and has a focusing stop. The vertical travel of the fine adjustment is 1mm, one interval of the fine adjustment scale ≙ 1µm.

1 Adjustable focusing stop

Fig. 11



Lamp Housing 20 for incident- or transmitted-light illumination

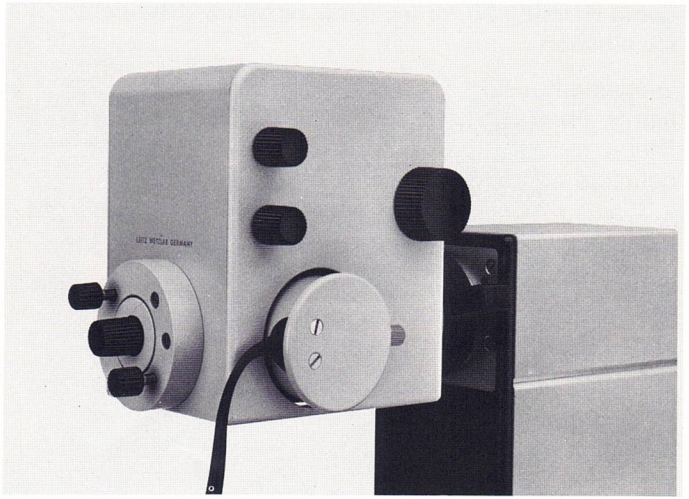
The lamp housing, fixed to the stand with a slotted screw, has a fixed reflector and a lamp condenser with heat filter in front of it. The current is supplied through two plug contacts with internal wiring.

A precentred lamp mount accepts the 6V 20W tungsten-halogen lamp.

If the microscope is equipped with two Lamp Housings 20, the selector alternately produces incident-light and transmitted-light illumination.

1 Lamp Housing 20 for incident-light illumination
2 Selector
3 Lamp Housing 20 for transmitted-light illumination

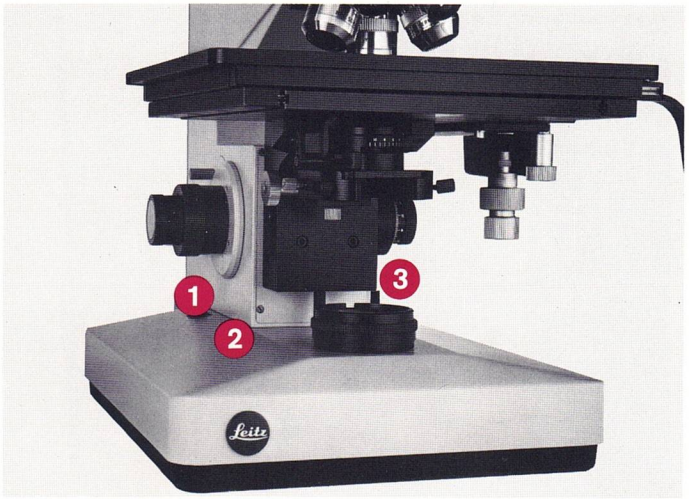
Fig. 12



Lamp Housing 102 Z with separate transformer for incident- and/or transmitted-light illumination

Instead of the Lamp Housing 20, the Lamp Housing 102 Z with separate transformer can be fixed to the bayonet changers. This will be necessary for combined incident/ transmitted-light observation, which will be possible only when at least one lamp housing with separate transformer is used.

Fig. 13

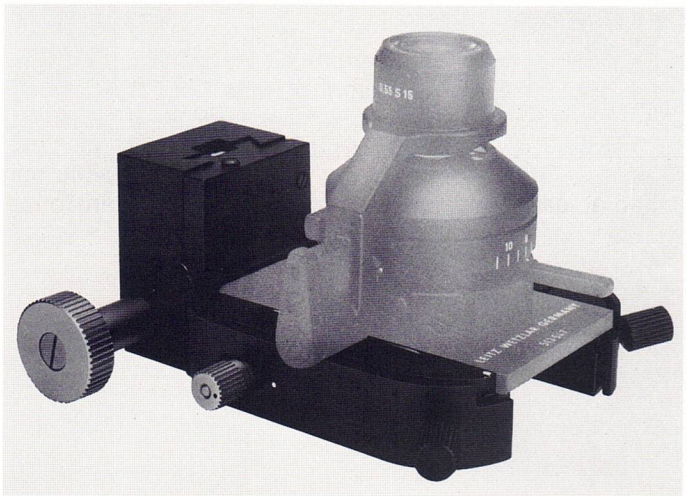


Foot of the microscope stand with built-in transformer

The current is switched on with the mains switch on the top of the foot of the stand. The continuous adjustment of lamp brightness is controlled with the knurled knob of the built-in transformer.

1 Mains warning light
2 Mains switch
3 Knurled knob for the brightness adjustment of the lamp

Fig. 14



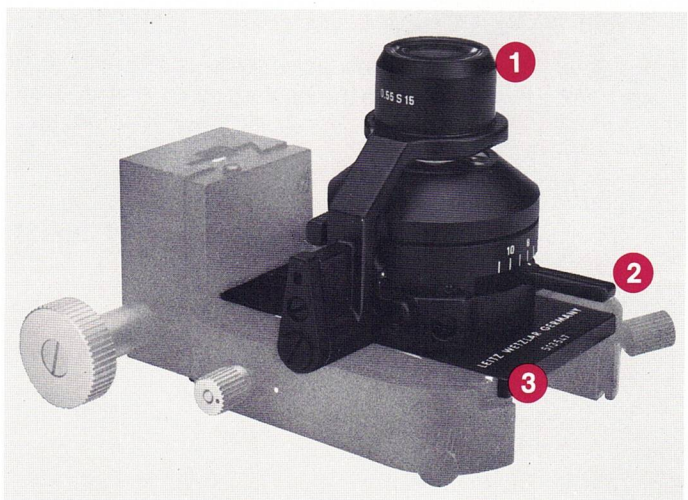
Transmitted-light device

This consists of the rack-and-pinion drive with dovetail changer, the condenser with swing-out condenser top and the field diaphragm.

Rack-and-pinion drive with dovetail changer

The rack-and-pinion drive with dovetail changer serves for the attachment and vertical adjustment of the condenser.

Fig. 15



Condenser LKS 15

This consists of the condenser base LK and the swing-out condenser top, aperture 0.55 and intercept distance 15 mm.

1 Condenser top
2 Aperture diaphragm
3 Condenser base

Fig. 16

Field diaphragm

In conjunction with the aperture diaphragm built into the condenser the field diaphragm permits the setting up of Koehler's principle of illumination (see page 34). In addition, the external mount of the field diaphragm accepts various filters.

Fig. 17

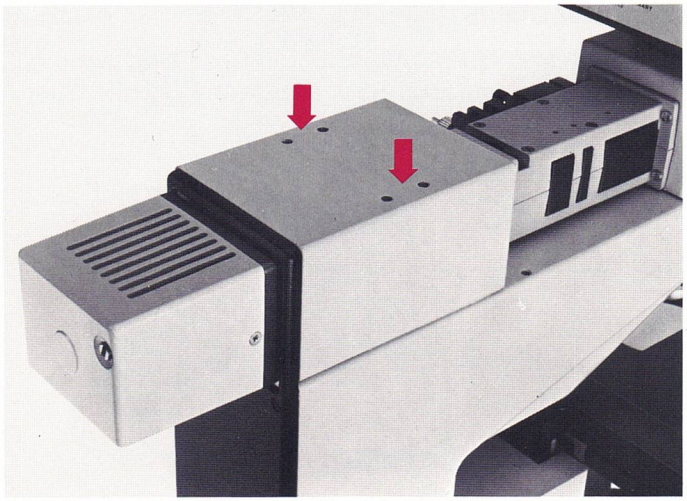
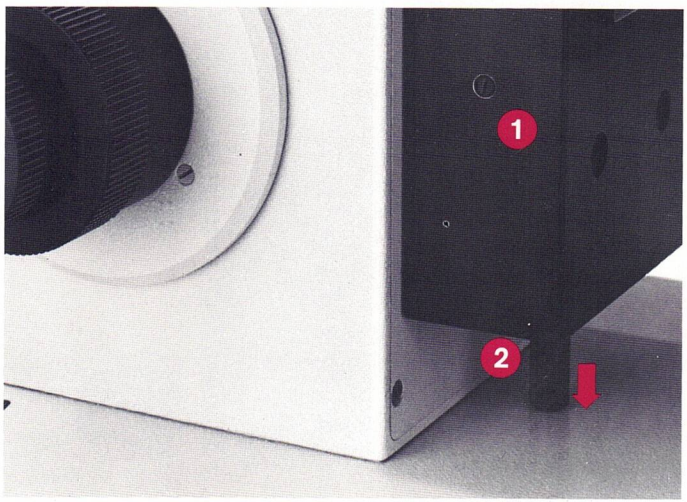


Plate for the camera carrier

This part of the stand serves as a support for a camera carrier, which is screwed into the bushes marked by arrows.

Fig. 18

3. Assembling the ERGOLUX

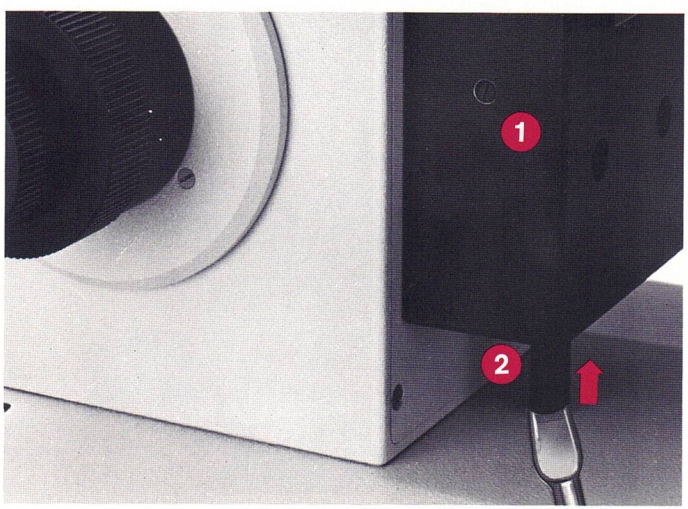


Before operating the ERGOLUX, please make sure that the voltage selector in the baseplate is set at your mains voltage.

Mounting the object stage, adjustment range 155 x 155 mm (6⅛ x 6⅛ in)

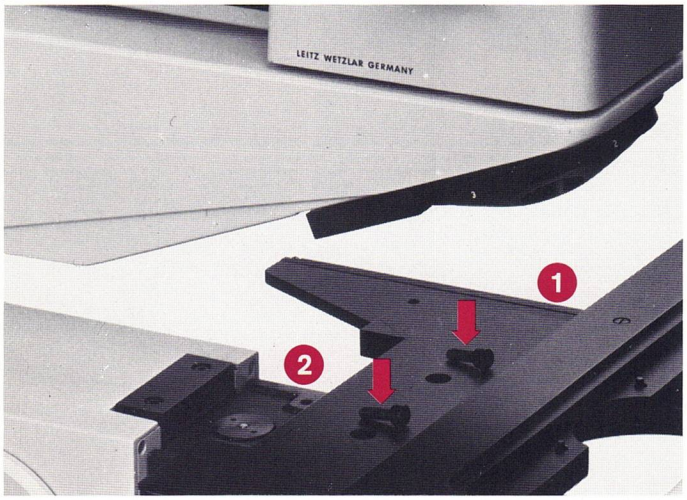
Remove the plastic block from below the stage.
If the allowed total weight of 2 kg. on the object stage is exceeded, the screw (1) can be loosened. The support (2) then takes the weight.

Fig. 19



⚠ For a major transport of the microscope the mechanical stage **must** be removed. In addition, the prop (2) must be replaced and arrested with screw (1). For raising the prop a broad screwdriver should be used.

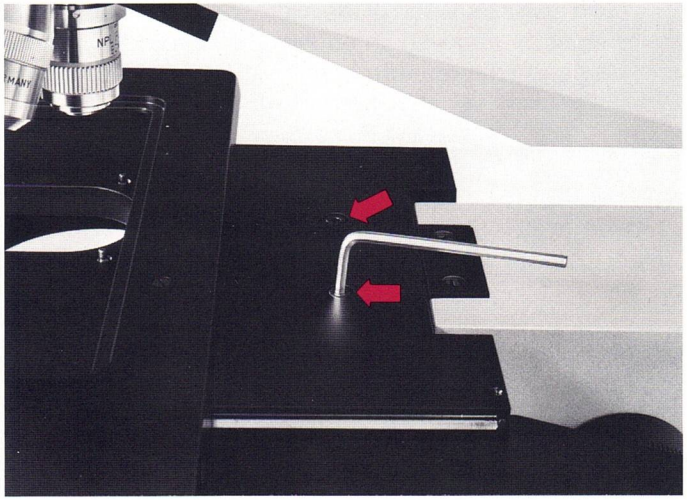
Fig. 20



Attaching the object stage

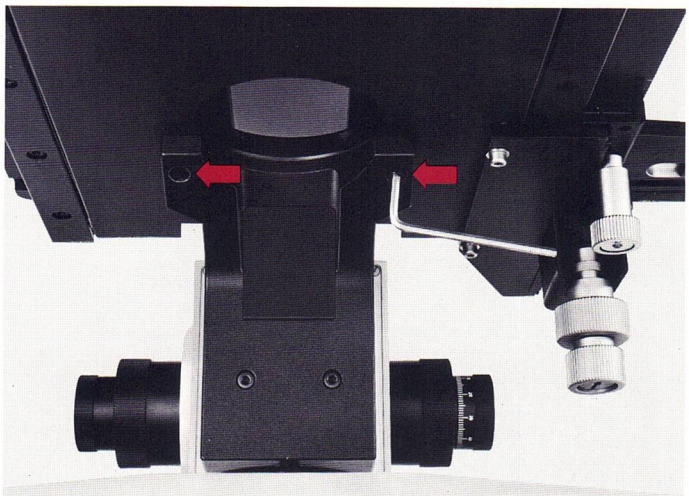
Before mounting the object stage (1) on the stage angle (2), lower the stage angle (2) with the coarse adjustment (1:14) as far as it will go.

Fig. 21



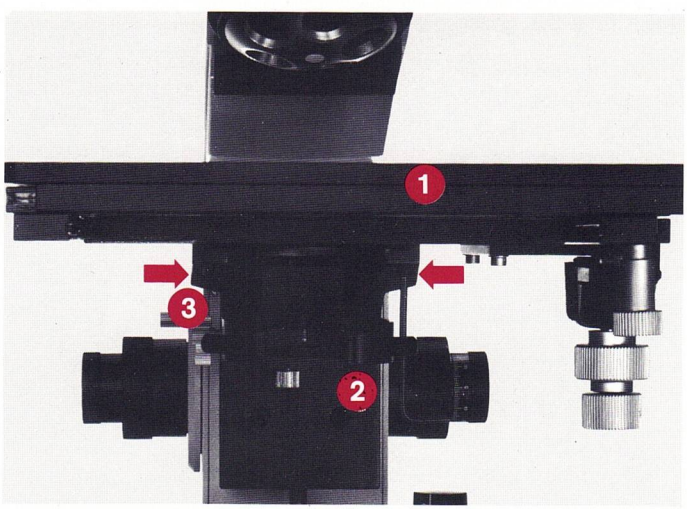
Only now should the mechanical stage (1) be mounted on the stage angle (2), where it should be secured with **four** Allen screws, two from above. . . .

Fig. 22



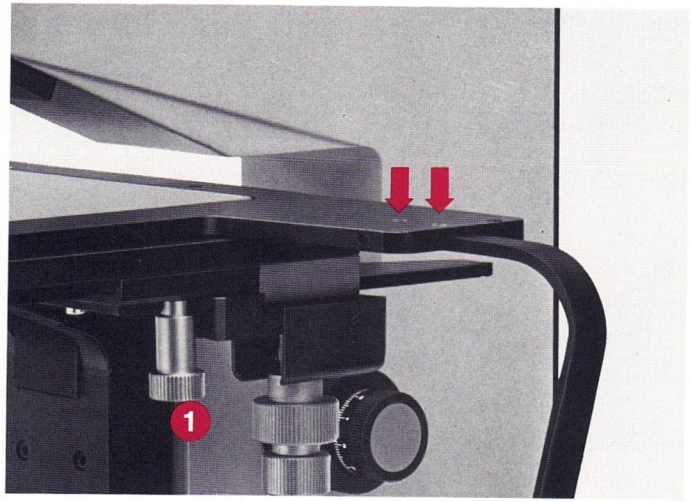
. . . and two from below.

Fig. 23



If the instrument is intended for use with transmitted light – i.e. including rack-and-pinion-drive with dovetail changer, condenser and field diaphragm – first raise the dovetail changer (2) into its topmost position with the knurled knob (3) on the side.
The object stage (1) can now be secured. See Figs. 21, 22, 24.

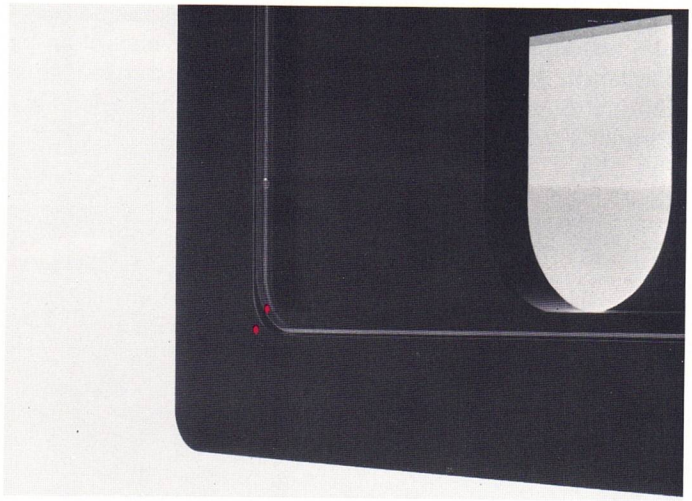
Fig. 24



Mounting the coarse adjustment lever

With the attachment of the coarse adjustment lever with the two Allen screws (arrows) to the object stage you have already completed the most important stage of the assembly.

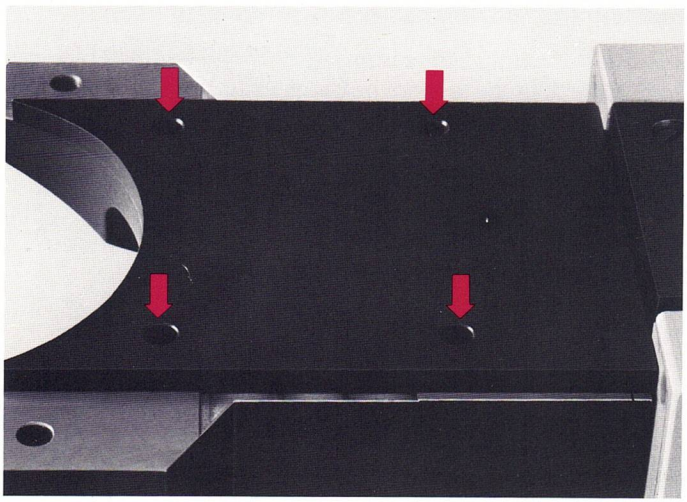
Fig. 25



Inserting the glass plate

Note the red dot front left on the object stage and on the top of the glass plate. Arrest the coarse adjustment with the switch knob Fig. 25/1 before you place the glass plate in the object stage – preferably from the right – so that the two red dots face each other and the clamping springs are evenly compressed.

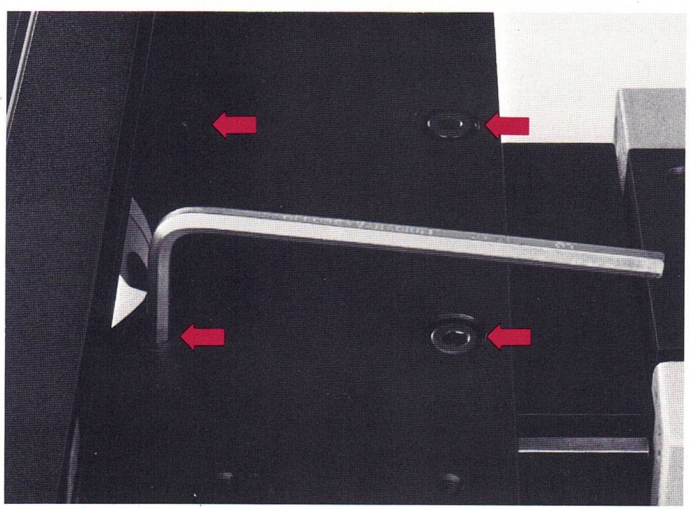
Fig. 26



Mounting the object stage, adjustment range 108 x 108 mm (4¼ x 4¼ in)

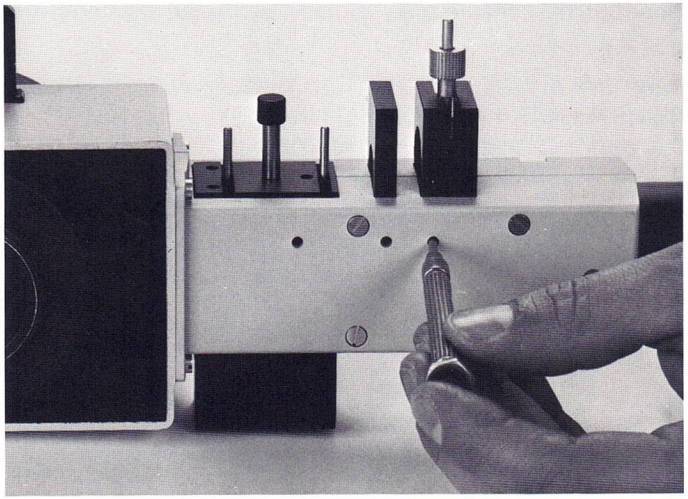
Place the intermediate plate in position, and mount the object stage as shown in figs. 19 – 22.

Fig. 27 a



Here, however, all four Allen screws are inserted from above.

Fig. 27 b

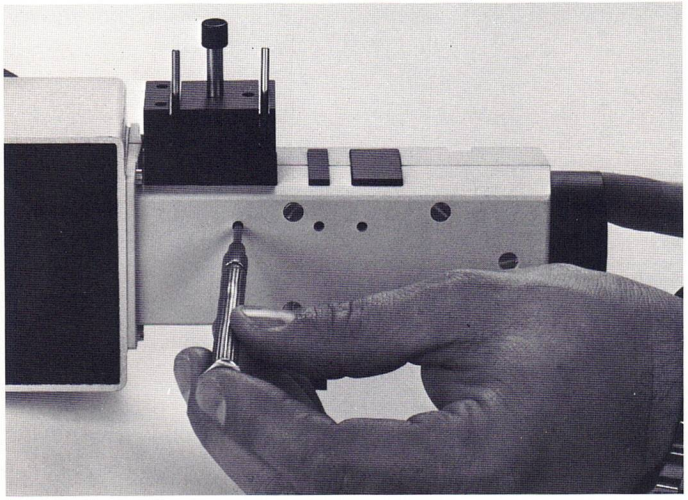


Inserting the interference-contrast modules (ICR)

Remove the empty slides from the rack apertures, replacing them by the λ-plate and polariser and screw the guide screws into the ICR modules through the apertures from below.

⚠ The threaded bushes in the ICR modules become visible only when they are exactly above the apertures.

Fig. 28

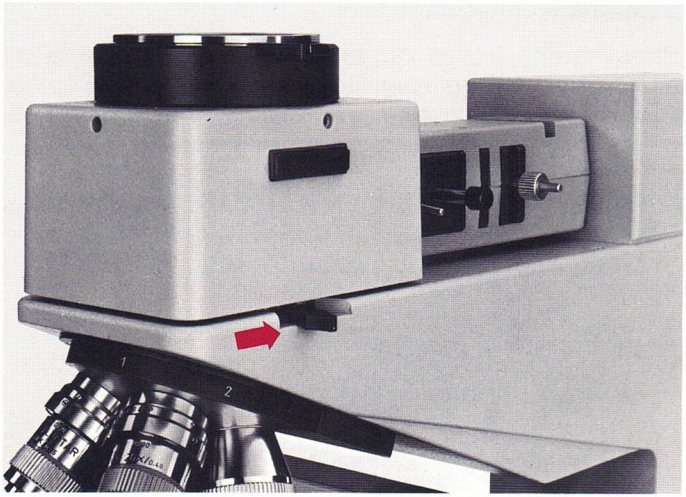


Changing the diaphragm slides DF

If you want to change the diaphragm slide, remove the MODULOPAK from the back of the stand. You can now unscrew the guide screw from the diaphragm slide through the aperture.

⚠ The guide screw will be visible only if it is exactly above the aperture (darkground position).

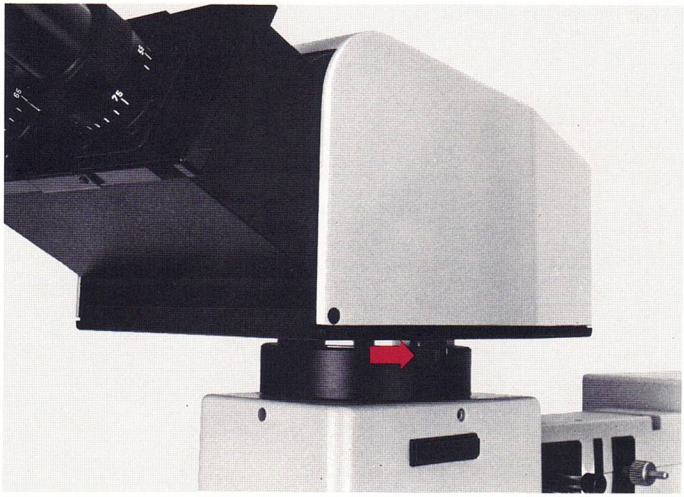
Fig. 29



Mounting the MODULOPAK

Push the lever in the direction of the arrow, and insert the MODULOPAK in the bayonet changer. Allow the lever to slide forwards and lightly tighten it.

Fig. 30



Mounting the tube

Here, too, move the lever in the direction of the arrow and insert the tube in the bayonet changer. Allow the lever to slide forwards.

The tube can be rotated through 360°. By lightly tightening the lever you can arrest the tube in any desired position. Now insert the eyepieces in the eyepiece tubes.

Fig. 31

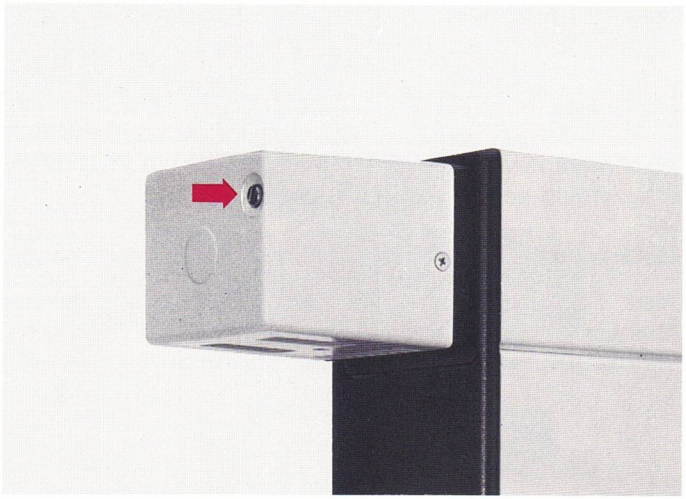
Screwing the objectives in

Screw the objectives into the revolving nosepiece in the order of ascending magnification, for instance 5x, 10x, 20x . . . The objective turned in is indicated on the front of the revolving nosepiece for your information.

If you have ordered the ERGOLUX with objectives for interference contrast-R, they are already inserted in the revolving nosepiece and aligned.

⚠ When individual interference contrast objectives are required for an existing instrument, please note the directions for adjustment on page 33.

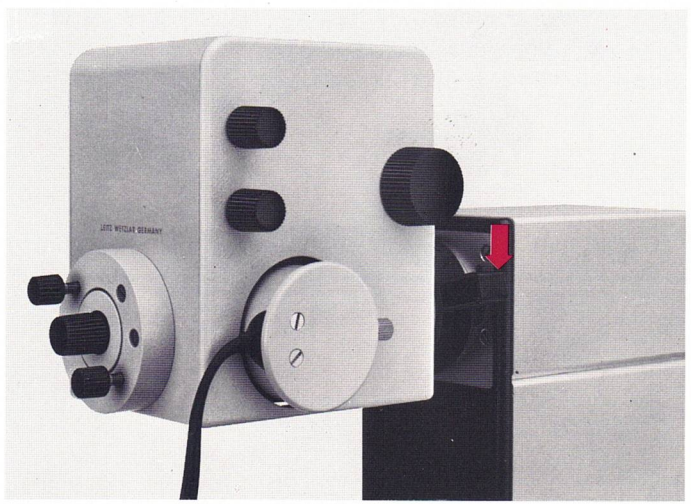
Fig. 32



Attaching the Lamp Housing 20

Remove the cover, and plug the Lamp Housing 20 into the top socket of the stand for incident light and into the bottom socket for transmitted light, and secure it to the stand with a long slotted screw (arrow) from the rear of the lamp housing.

Fig. 33



Attaching the Lamp Housing 102 Z

This lamp housing can be used both for incident- and for transmitted-light illumination. It is inserted in the appropriate bayonet changer and locked with the lever (arrow).

⚠ When the Interference Contrast Device R is used a heat filter Calflex and an edge filter K 420 should be inserted into the Lamp Housing 102 Z in any case.

Fig. 34

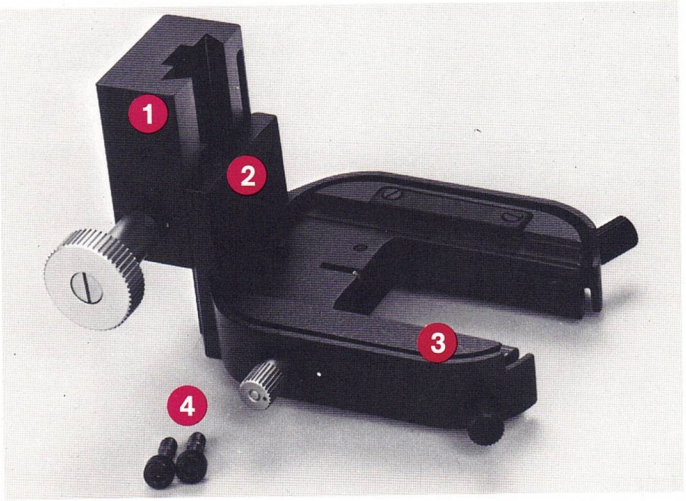


Fig. 35

Mounting the transmitted-light device on an existing instrument

If the transmitted-light components of the rack-and-pinion drive with dovetail changer, condenser, and field diaphragm have not already been installed in the factory, they should be mounted as follows:

Mounting the rack-and-pinion drive with dovetail changer

After slackening the guide screw (2) pull the dovetail changer (3) downwards out of the rack-and-pinion drive (1). (4) Fixing screws for the rack-and-pinion drive.

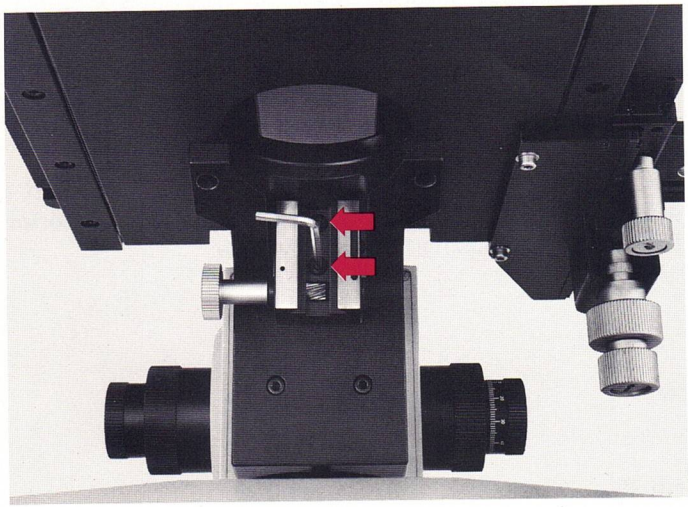
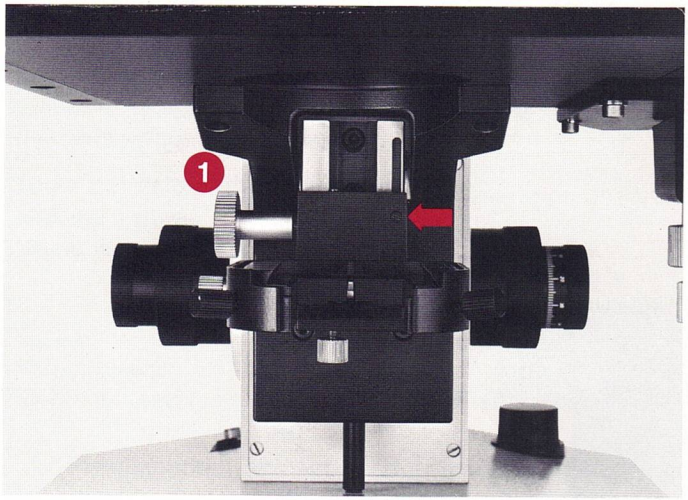


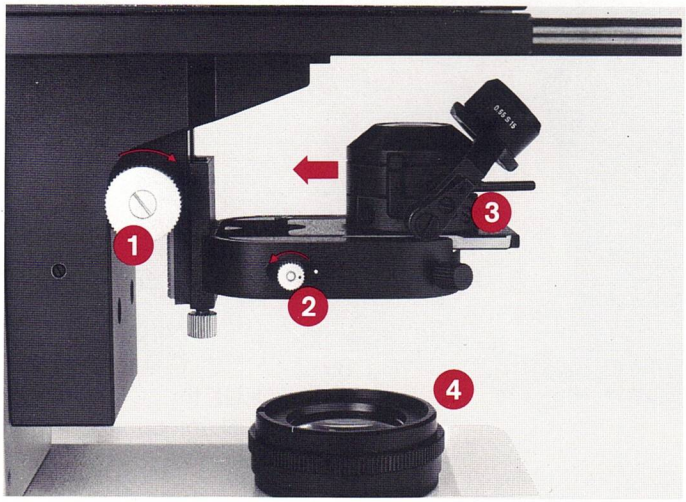
Fig. 36

Now remove the cover of the stage angle and insert the rack-and-pinion drive in the angle with the guide pins. Secure it with two Allen screws (35.4).



Push the dovetail changer into the rack-and-pinion drive from below, turn it up with the knurled knob (1) and secure it with the guide screw (arrow).

Fig. 37



Inserting the condenser

Screw the condenser top into the condenser. Lower the dovetail changer with the knurled wheel (1). Set knurled knob (2) so that the two marking dots are facing each other. Now push the condenser fully in and arrest it by turning the knob (2) to the left. The condenser top can be swung in and out with the lever (3).

Inserting the field diaphragm

Remove the cover from the field diaphragm aperture and screw the field diaphragm (4) in.

Fig. 38

4. Preparing the ERGOLUX for operation

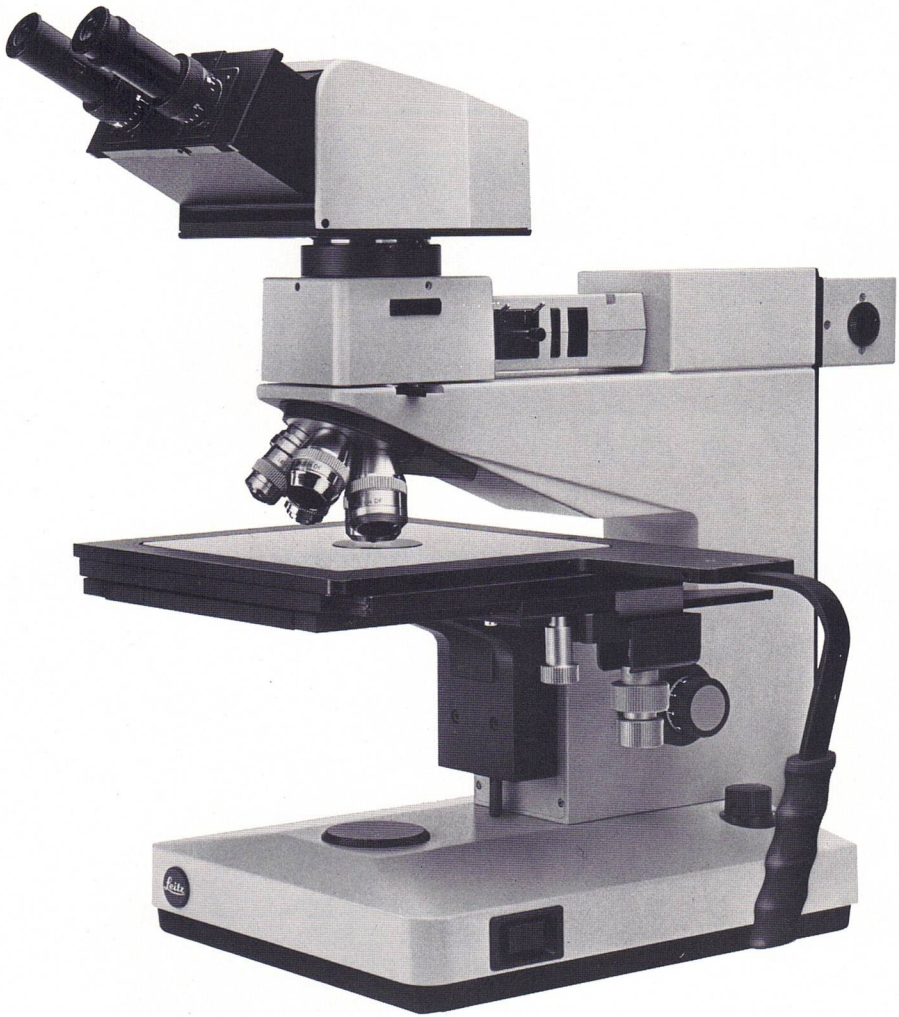


Fig. 39
LEITZ ERGOLUX for
incident-light illumination

Mains connection

Plug the connecting cable (1) into the mains and switch the microscope on with the mains switch (2). The transformer supplies current either to the incident-light or to the transmitted-light lamp position.

Technical data of the transformer

Maximum power consumption:	30W
Mains voltage:	110/120–130 V or 220/230–240/250 V, 50–60 Hz adjustable
Fuses:	Two fuses T 125 mA
Safety class:	I
Electrical test:	to VDE specifications

⚠ Simultaneous incident- and transmitted-light illumination is possible only if a Lamp Housing 102 Z is attached with a separate transformer.

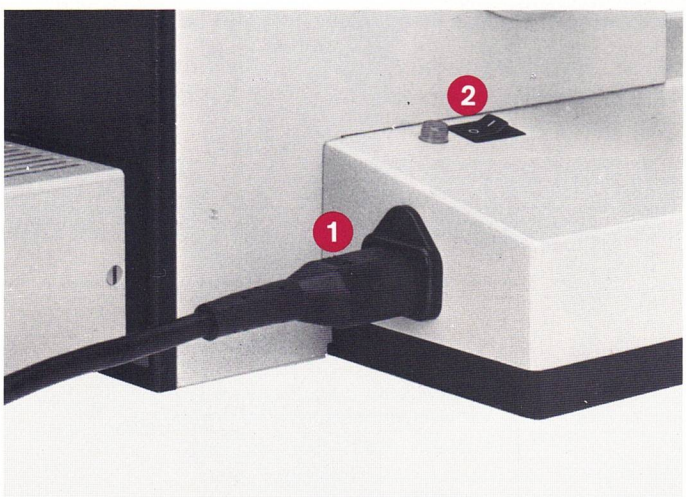
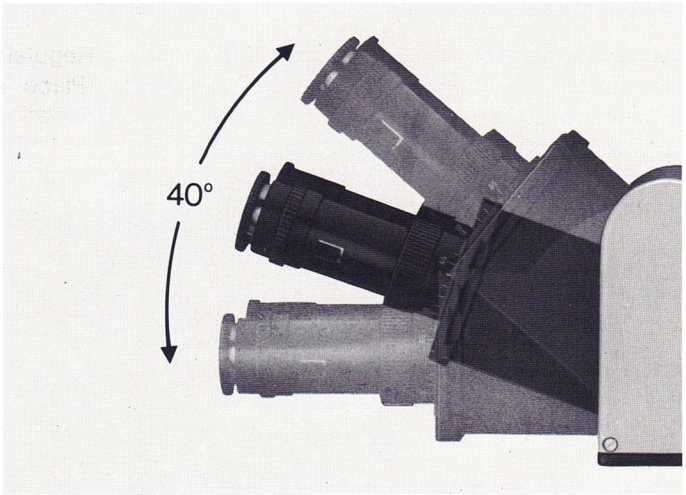


Fig. 40

Incident-light observation

Move the selector to the incident-light position. Regulate the lamp brightness with the knurled knob. Place a specimen on the mechanical stage. For first observation choose an objective of medium power, for instance NPL 20x. Operate the revolving nosepiece switch to turn the chosen objective into the optical path.

⚠ If the V diaphragm slide is in your ERGOLUX, open the aperture diaphragm and the field diaphragm.



Setting the tube

The requirements for relaxed and concentrated work for many hours are met in the ERGOLUX with, among other features, the adjustable tube.

Setting the viewing angle

Because the viewing angle can be adjusted through tilting the front part of the tube between 0 and 40° the operator can set his viewing level individually.

Fig. 41

Adjustment for the interpupillary distance

To set the interpupillary distance adjust the two eyepiece tubes by pulling them apart or pushing them together until you see only one circular image.

Read the interpupillary distance off the index on the front plate of the tube (for instance 65) and transfer it to the two eyepiece tubes by rotating the knurled rings.

Fig. 42

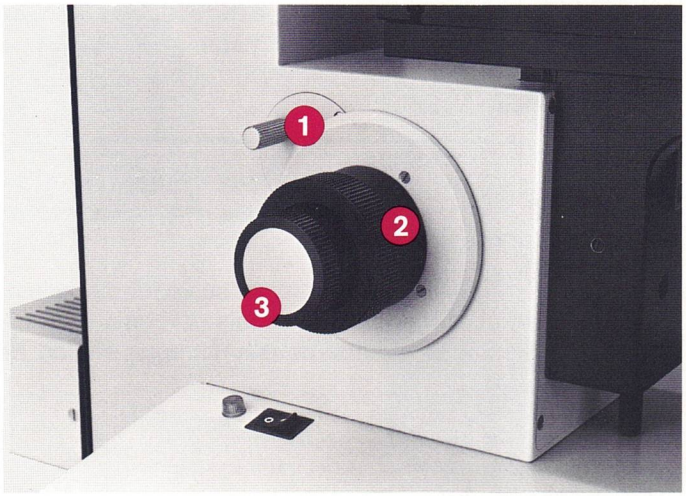


Fig. 43

Focusing and setting the focusing stop

After slackening the knurled srew (1) for the focusing stop, focus the object with the coarse drive (2). Now fix the focusing stop.

Attention: This determines the focusing plane reproducibly when the objectives are changed.

If necessary, correct focusing with the fine adjustment (3).

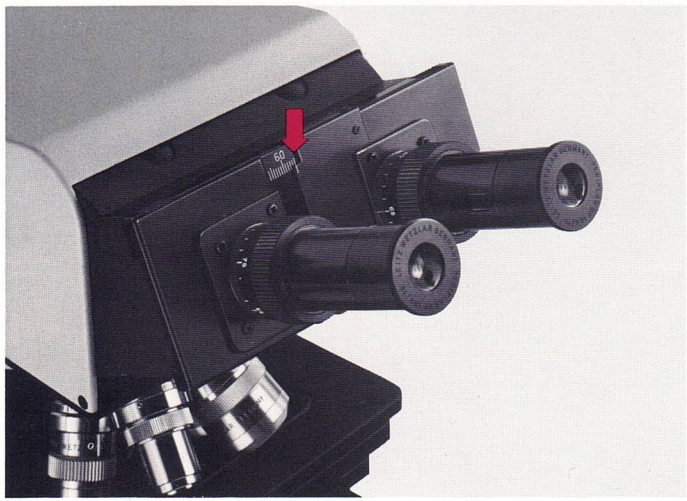


Fig. 44

Correction of defective vision

Look through the left-hand eyepiece with the left eye and focus the specimen with the fine adjustment. Now look at the same area of the specimen with your right eye and turn the knurled wheel on the right-hand eyepiece tube until the same object area is also in sharp focus; do not operate the fine adjustment during this procedure.

If you use an eyepiece with a focusing eyelens, correct defective vision with this.

Use of the aperture diaphragm

The aperture diaphragm contributes to both the resolution and the contrast of the microscopic image. The best optical performance is obtained when the apertures of objective and condenser are identical. If the aperture diaphragm of the condenser is closed more than the objective aperture, the resolving power of the objective will be reduced, but the contrast increased. The resolution will be noticeably reduced when the aperture diaphragm is closed more than one third of the objective aperture. This should therefore be avoided.

To control the normal setting, remove the eyepiece from the eyepiece tube and observe the image of the aperture diaphragm in the rear focal plane of the objective. Close it as far as shown in Fig. 45.

Replace the eyepiece.
For objects of low contrast the aperture diaphragm can be closed further so that the less contrasty structures will also be clearly visible.

⚠ The aperture diaphragm does not serve for the adjustment of the image brightness. For this purpose, only the transformer setting or neutral-density screens should be used.

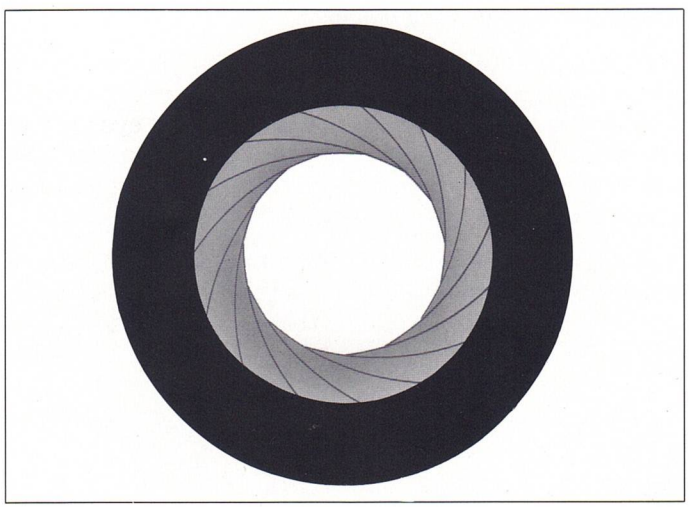
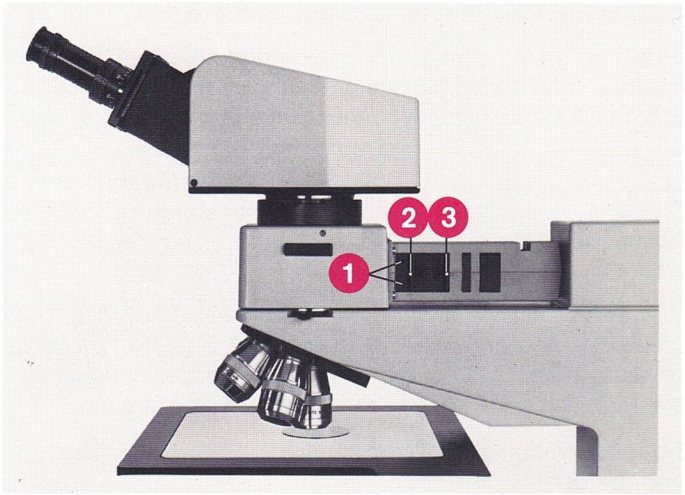


Fig. 45

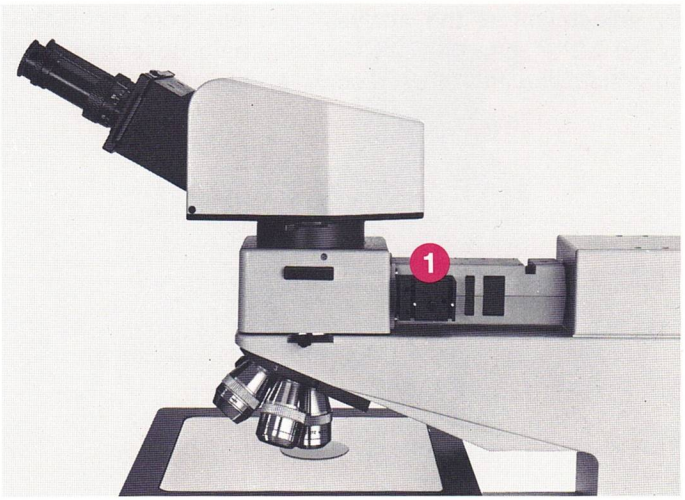


Brightfield setting

In the F diaphragm slide DF the illuminating beam is adjusted to the objectives by means of fixed diaphragms. In the V diaphragm slide DF the field diaphragm (2) and the aperture diaphragm (3) (see page 30) must be adjusted. The field diaphragm (2) has already been precentred* and should be opened so that it just disappears beyond the edge of the field of view.

*If the field diaphragm is not central it can be centred with the two Allen screws (1).

Fig. 46



Darkground setting

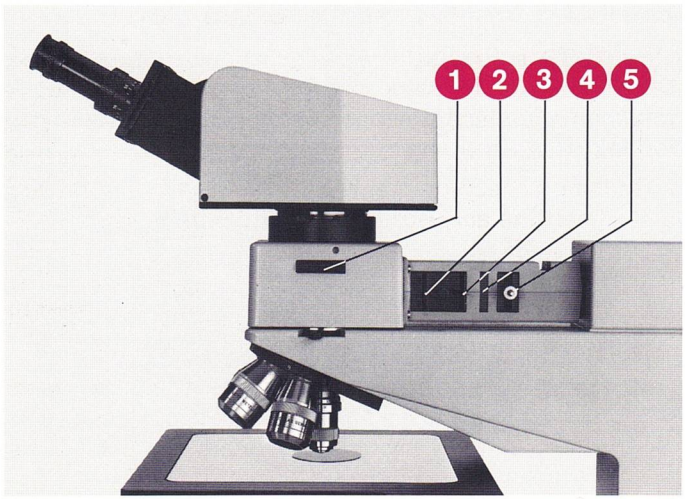
Ensure that all filters such as analyser, polariser, λ-plate are removed from the optical path.

Turn in a darkground objective such as the NPL 20 x/0.40 DF. Now move the diaphragm slide* DF into the darkground position by pulling it out and allowing it to engage. Now set maximum light intensity with the setting knob.

With the F diaphragm slide DF the neutral-density screen (Fig. 6.5) can be turned in. It serves for brightness adjustment during the change between brightfield and darkground illumination and makes readjustment of the light intensity unnecessary.

*In the darkground position both diaphragms are without function in the V diaphragm slide DF.

Fig. 47



Setting the interference contrast device R

After turning in an interference contrast objective push the analyser into the filter slot (1) so that the filter position with the 90° ↔ oriented polarising filter is in the optical path.

Push the polariser (5) into the optical path and the diaphragm slide into the brightfield position.

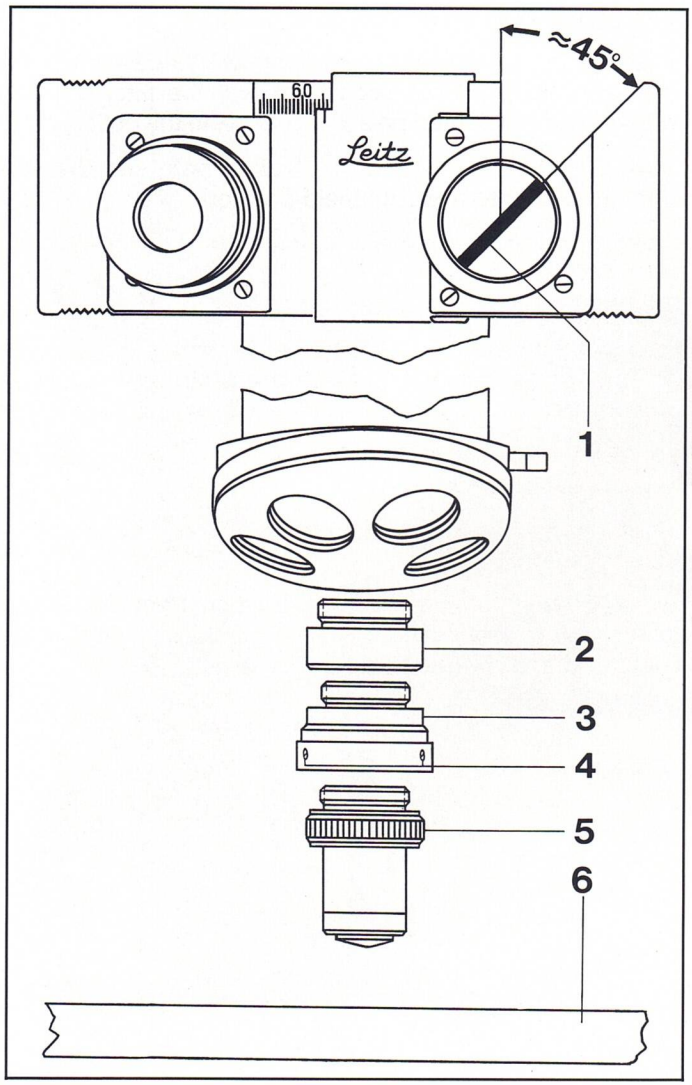
Note: Turn out neutral-density screen in the F diaphragm slide DF.

With the V diaphragm slide DF set the field diaphragm (2) (see brightfield setting). Now turn the polariser (5) upwards or downwards with the lever until the object appears at the required contrast and a relief-like image is seen.

For observations in colour contrast push the λ-plate (4) into the optical path.

Finally, image contrast can be optimised with the aperture diaphragm (3).

By adjustment of the analyser position from the 90° ↔ to the 38° ↙↗ oriented pol filter alternate observation of brightfield and interference contrast is possible.



Adjustment of the interference contrast objectives

If the ERGOLUX is initially ordered with interference contrast objectives, these are already screwed in and aligned in the revolving nosepiece. If individual ICR objectives are supplied for an existing instrument they must be adjusted as follows:

Push the polariser for interference contrast into the optical path. Insert the analyser in the filter slot (90° position).

Turn the empty aperture on the revolving nosepiece into the optical path; place a highly reflecting object on the object stage and orient the polariser for optimum extinction position. The λ-plate is turned out.

Screw objective (5) into the adapter (3) with Wollaston prism. The Wollaston prisms are rotatable and fixed by means of three grub screws (4) (two are visible) in the adapters.

Screw the objective with adapter into the revolving nosepiece. Slacken the grub screws and align the object: when looking into the eyepiece tube (without eyepiece and without object) you will see a dark compensating band (1) in the rear focal plane of the objective. This must be oriented in the 45° position by rotation of the objective.

Tighten the grub screws.

(If the NPL 5x/0.09 is used, the objectives must be fitted with the adapter ring (2) to have the same adjustment length as the 5x objective.)

Fig. 49
1 Compensating band 2 Adapter ring 3 Adapter with Wollaston prism 4 Grub screws (one is not visible)
5 Objective 6 Object

Transmitted-light observation in brightfield

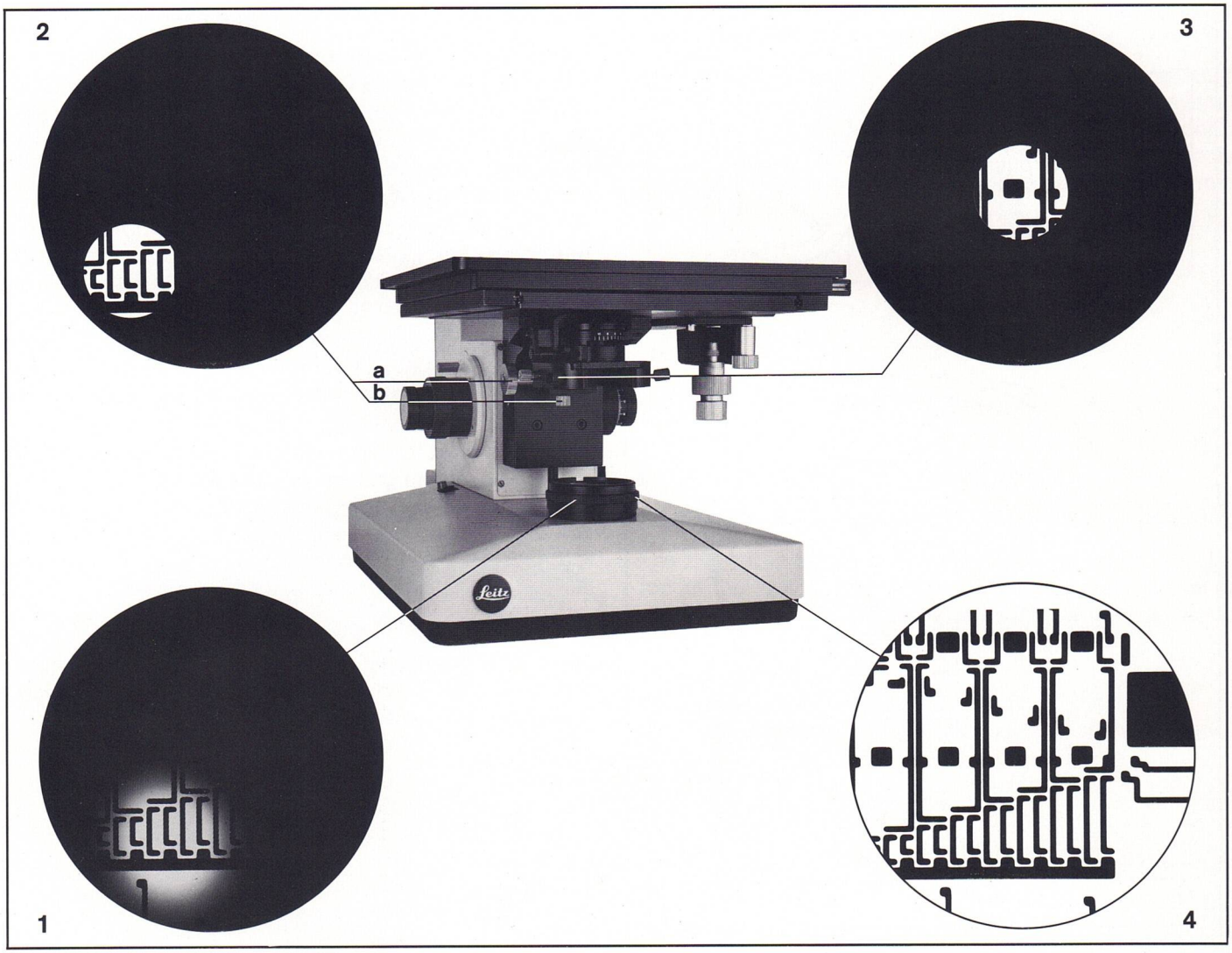


Fig. 50

Centring the condenser and setting the field diaphragm

Set the switch in the back of the stand at transmitted light. Now focus the specimen with coarse and fine adjustment.

1 Close the field diaphragm

2 Produce a sharp image of the field diaphragm with the vertical condenser adjustment a). Reproducibly determine the focusing position of the field diaphragm by adjusting the condenser stop screw b).

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.

Change of objectives requires an adjustment of the field diaphragm.

Now adjust the aperture diaphragm (see incident-light observation in brightfield).

5. Care and maintenance

Protect the microscope against dust by covering it with the flexible dustcover after use. From time to time clean the stand with a linen rag or piece of chamois leather. Do not use methylated spirit because this attacks the enamel. Petrol, on the other hand, is eminently suitable for the cleaning of enamel surfaces. You can remove bright patches on the object stage by rubbing the stage with liquid paraffin or acid-free vaseline.

Special care is essential during investigations involving the use of acids or other corrosive chemicals. Direct contact of the optical system and the stand with these chemicals must be strictly avoided. Cleaning of all parts after use is therefore urgently recommended.

The optical components of the microscope must be kept scrupulously clean.

Dust on glass surfaces is removed with a fine, dry sable brush, and blowing lightly across the glass surface at the same time. If the dirt is resistant, use a clean cloth wetted with some distilled water. If the dirt does not yield to this treatment, clean with pure methylated spirit.

The objectives must never be dismantled for cleaning.

All Leitz instruments have been manufactured and tested with the greatest care according to the latest standards of technology. In the unlikely event of complaints please do not interfere with the instruments and their accessories, but contact your national Leitz agency or our central servicing department direct,

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Department Technical Service Instruments (TSI)
P.O.B. 2027
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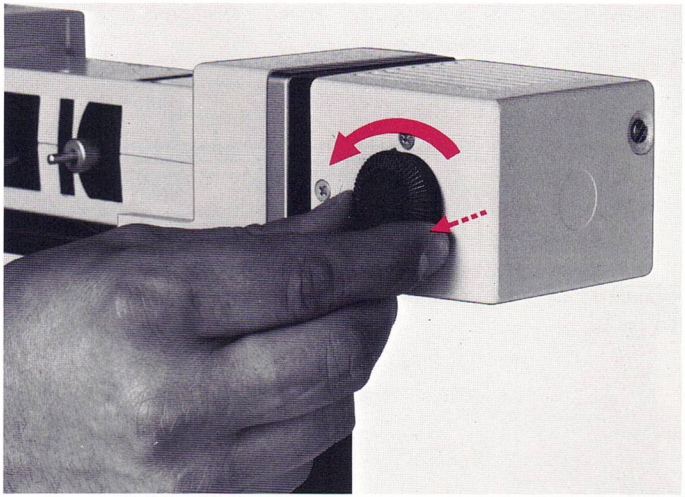
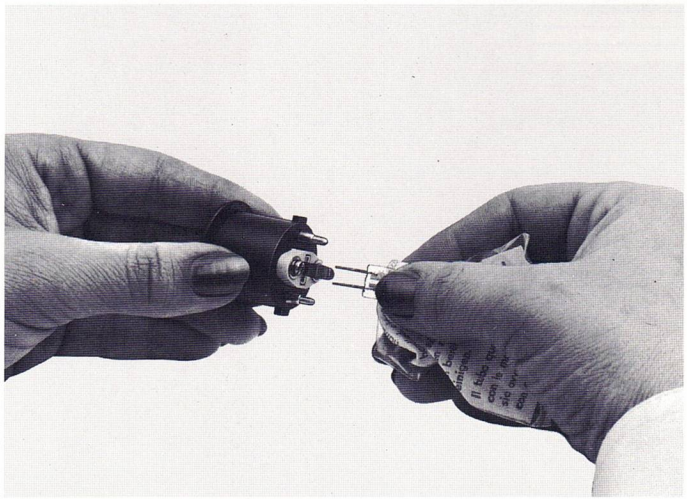
Germany



Changing the 6V 20W tungsten-halogen lamp

Slightly press the lamp socket with the knurled knob, turn it in the direction of the arrow and pull it out.

Fig. 51



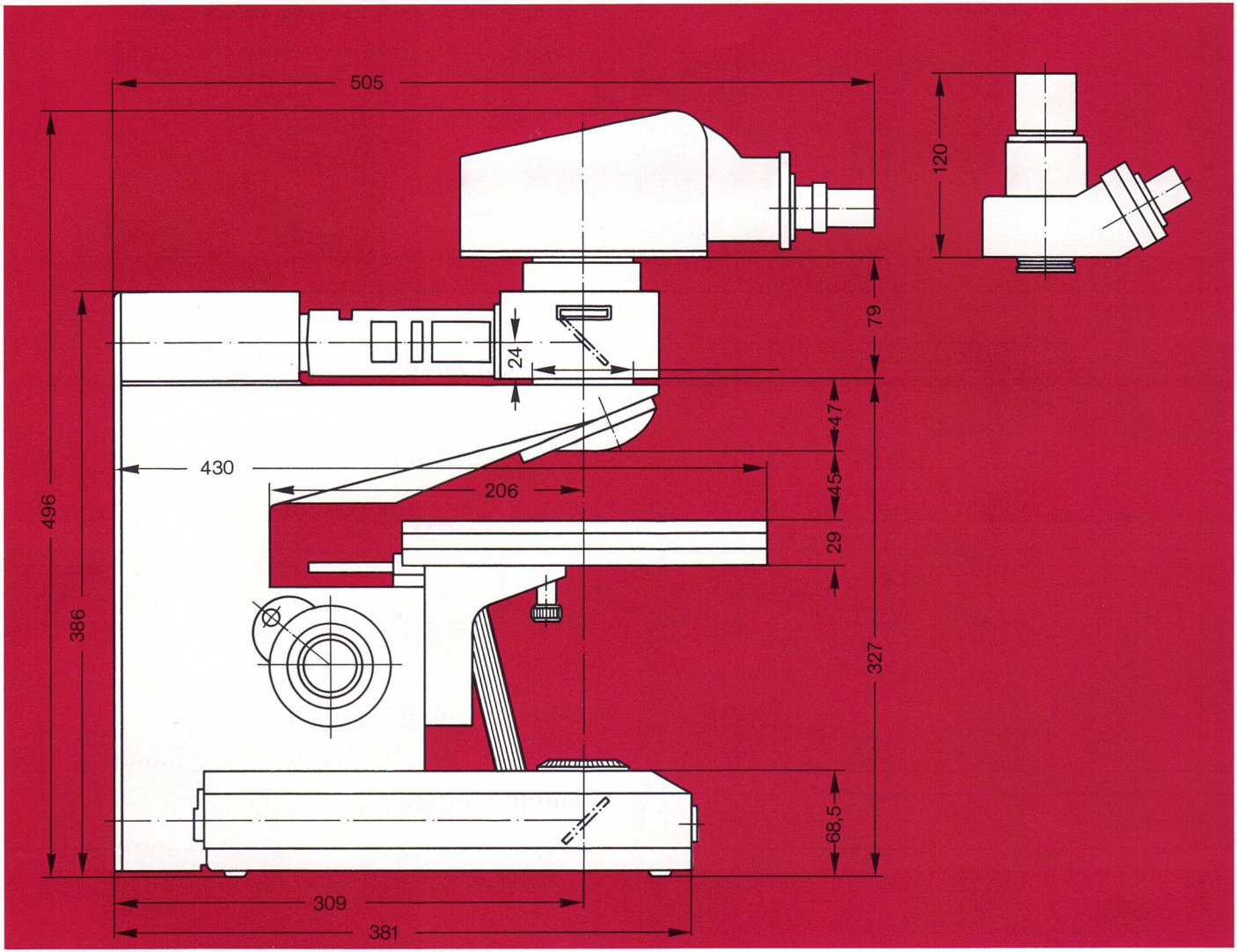
Avoid fingermarks

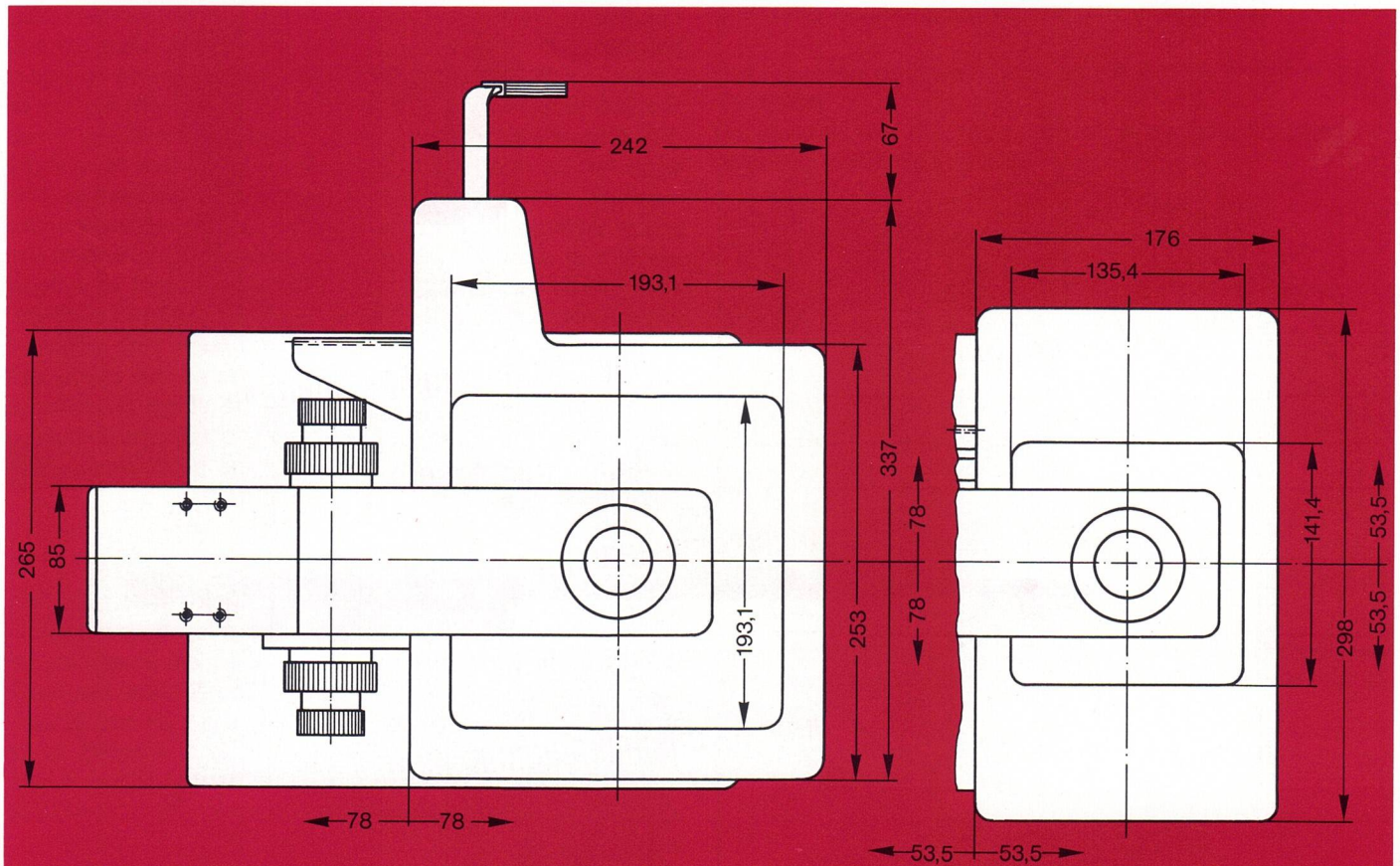
Pull the burnt-out lamp out of the plug-in socket, insert the new lamp between the two clamps in the plug-in socket. Insertion of the lamp mount centres the lamp.

⚠ To avoid fingermarks, handle the new lamp in its wrapper.

Fig. 52

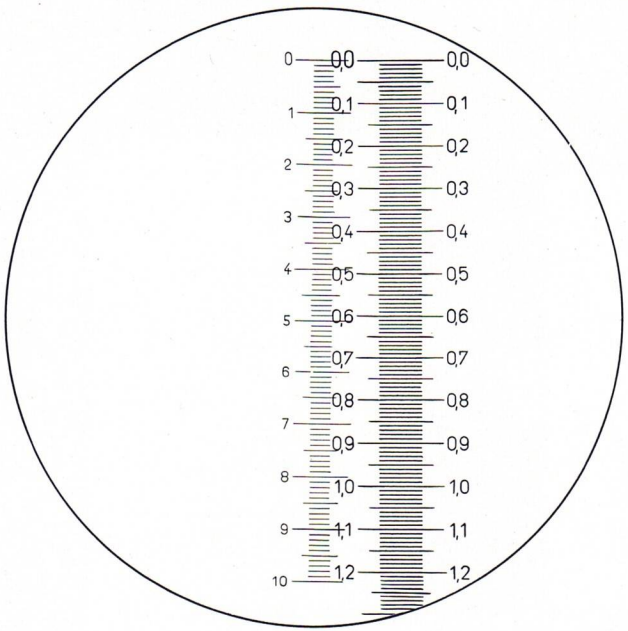
6. Dimensions in mm





Weight of microscope approx. 28 kg

7. Microscopic measurement



Lengths in the microscopic specimen are measured in conjunction with a micrometer eyepiece (graduation usually 10mm = 100 intervals). Before the measurement is begun the micrometer value of the objective used must be found. The micrometer value is the distance in the object plane of which an image is formed by the objective on exactly 1 interval of the reticule graduation in the micrometer eyepiece. Because the optical constants of the objectives are subject to slight variations, it is advisable to determine the micrometer values once and for all with the aid of a stage micrometer graduated 2mm = 200 intervals and a micrometer eyepiece with a graticule 10mm = 100 intervals. To determine the micrometer value, make the zero lines of the micrometer eyepiece and of the stage micrometer coincide in the microscope. Read the micrometer value at unchanged setting at the end of the graduation of the micrometer eyepiece.

Example

If 1.22 mm of the stage micrometer coincide with 100 intervals of the micrometer eyepiece, the micrometer value = 1.22 : 100 = 0.0122mm = 12.2 µm. With low-power objectives, which do not form an image of the scale of the stage micrometer across the entire scale of the micrometer eyepiece, only 10 intervals of the latter are compared. If, for instance, 0.36 mm coincide with 10 intervals of the micrometer eyepiece, the micrometer value = 0.36 : 10 = 0.036 mm = 36 µm.

The screw micrometer eyepiece is used for highly precise measurements under the microscope. Detailed information will be found in our list 513-17.

Fig. 53

Measuring with the LEITZ LATIMET

For the measurement of structures and distances in masks and wafers the LATIMET television micrometer can be attached to the ERGOLUX.
Detailed information will be found in our lists 810–066/.91.

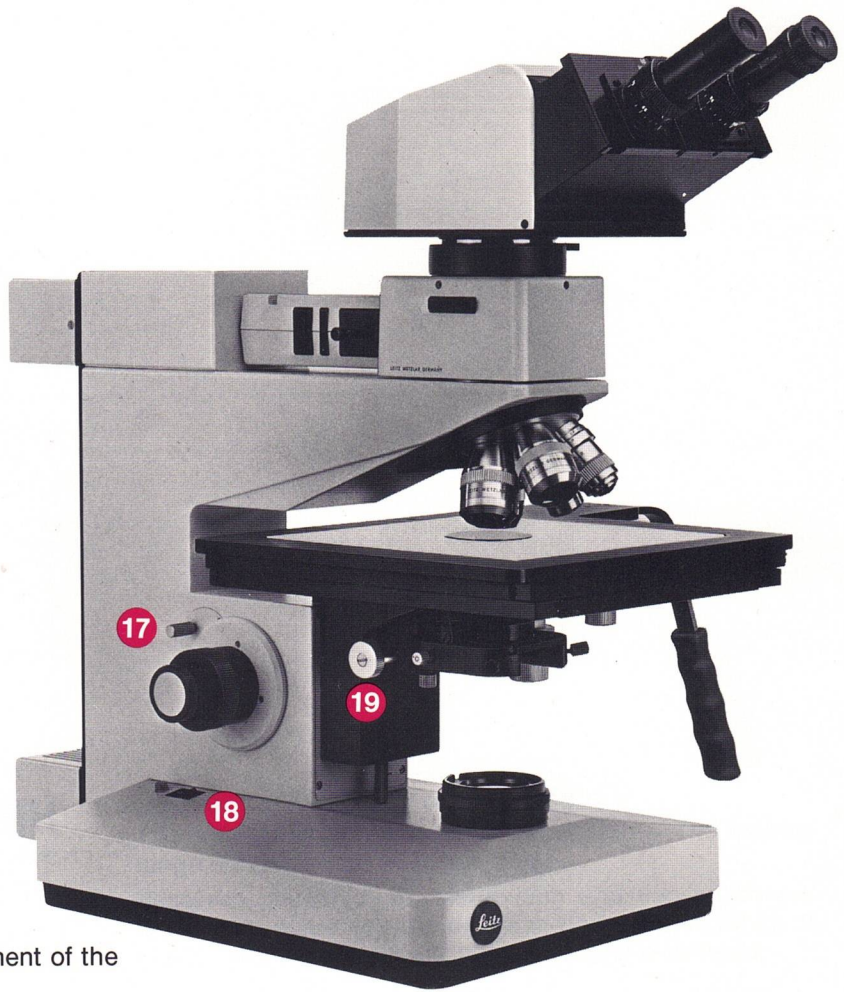


Fig. 54

17 Adjustable focusing stop
18 Mains switch with warning light
19 Knurled knob for the vertical adjustment of the condenser

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