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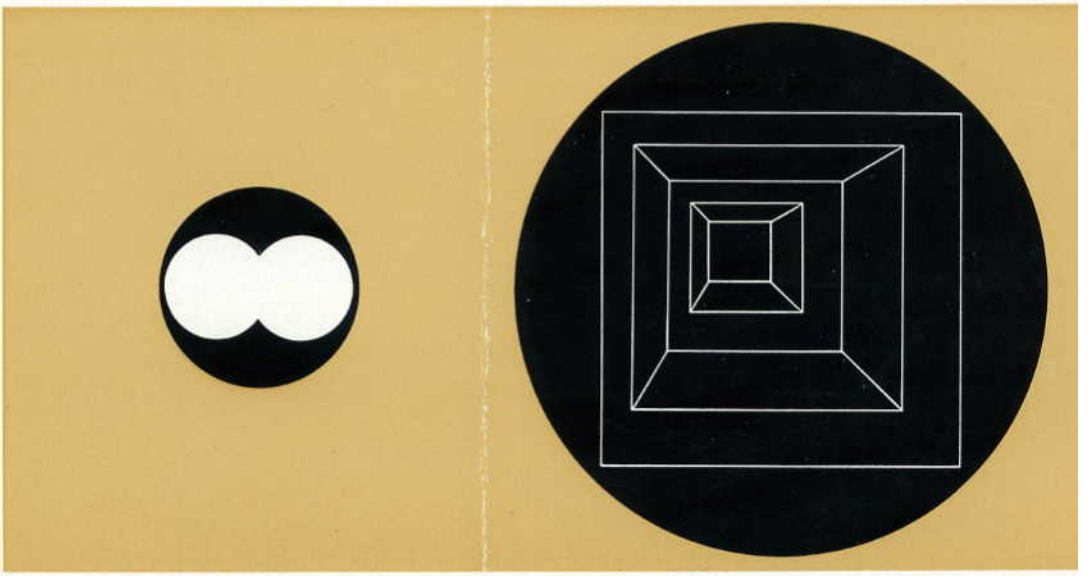
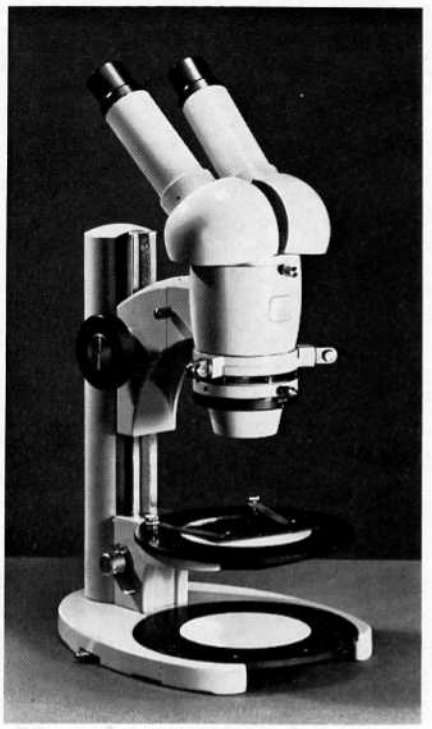
CARL ZEISS

Stereomicroscope I
Stereomicroscope III
Stereomicroscope IV

Operating Instructions





1 Stereomicroscope I

Stereomicroscope I

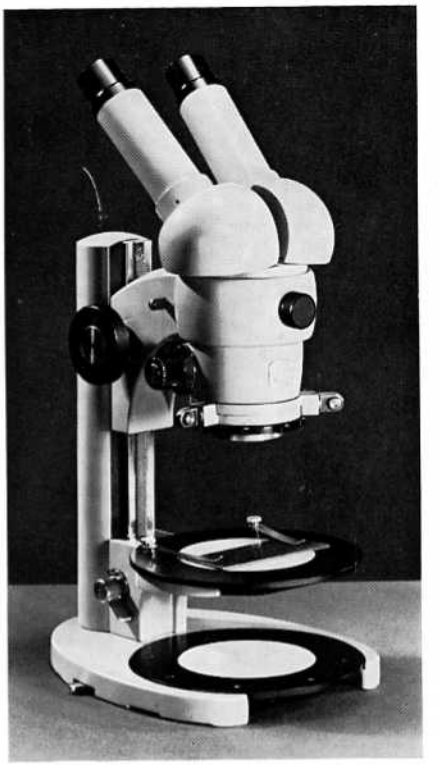
Objective	seven interchangeable pairs of objectives
Auxiliary lens attachments	none
Eyepieces	4× 10× 25×
Image	erect and unreversed
Body tube	removable, can be attached facing in the opposite direction
Specimen stages	see Fig. 11
Stand	see Fig. 11
Also fits on	our table stands for examining large objects (page 14)
Illumination	by two illuminators which can be attached either for reflected or transmitted light. Choice of low voltage or diffuse-light illuminator (page 10). In addition, trans-illuminator (page 11).
Accessories	for drawing under the microscope (page 18).
Special model	with a straight binocular body (page 19).

Magnifications, object-field diameters, working distances

Pair of objectives	Cat. No.	**10× eyepiece**		4× eyepiece		25× eyepiece		Working distance
		Magn.	Dia.	Magn.	Dia.	Magn.	Dia.	
0.63	47 50 10	**6.3 x**	32 mm	2.5 x	48 mm	16 x	16 mm	app. 85 mm
1	47 50 11	**10 x**	20 mm	4 x	30 mm	25 x	10 mm	
1.6	47 50 12	**16 x**	12.5 mm	6.3 x	18.5 mm	40 x	6 mm	
2.5	47 50 13	**25 x**	8 mm	10 x	12 mm	63 x	4 mm	
4	47 50 14	**40 x**	5 mm	16 x	7.5 mm	100 x	2.5 mm	app. 65 mm
6.3	47 50 15	**63 x**	3 mm	25 x	5 mm	160 x	1.6 mm	app. 43 mm
10	47 50 16	**100 x**	2 mm	40 x	3 mm	250 x	1 mm	app. 28 mm

Stereomicroscope III

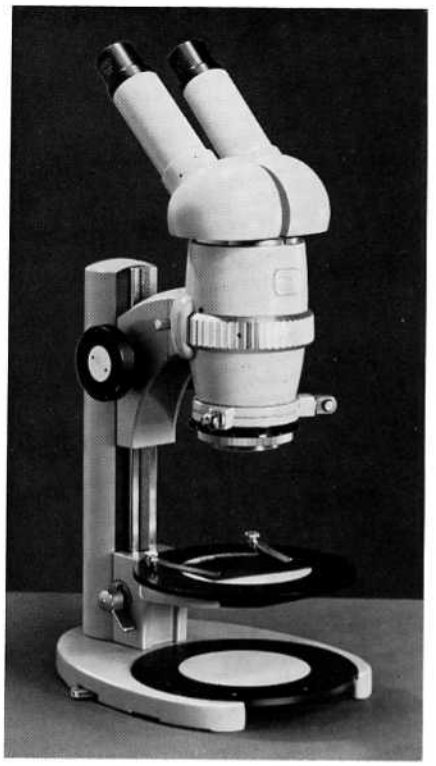
Objective	1 – 4× pancratic objective (zoom optical system)
Auxiliary lens attachments	see Fig. 4
Eyepieces	4× 10× 25×
Image	erect and unreversed
Body tube	permanently mounted. After slackening a black knob, the microscope body can be rotated and clamped in any desired position.
Specimen stages	see Fig. 11
Stand	see Fig. 11
Also fits onto	our table stands for examining large objects (page 14).
Illumination	by two illuminators which can be attached either for reflected or transmitted light. Choice of low-voltage or diffuse-light illuminator (page 10). In addition, trans-illuminator (page 11).
Accessories	for polarized-light work (page 12), for drawing under the microscope (page 18).
Special model	Stereoscopic Depth-measuring Microscope III T (page 19). Straight binocular body (page 19).



2 Stereomicroscope III

Magnifications, object-field diameters, working distances

Zoom magnification changer set to	**10× eyepiece**		4× eyepiece		25× eyepiece		Working distance
	Magn.	Dia.	Magn.	Dia.	Magn.	Dia.	
1	**10 x**	20 mm	4 x	30 mm	25 x	10 mm	app. 75 mm
1.2	**12 x**	16.5 mm	5 x	25 mm	30 x	8 mm	with 2× auxiliary lens attachment app. 25 mm
1.6	**16 x**	12.5 mm	6.3 x	18.5 mm	40 x	6 mm	
2	**20 x**	10 mm	8 x	15 mm	50 x	5 mm	
2.5	**25 x**	8 mm	10 x	12 mm	63 x	4 mm	with 0.5× auxiliary lens attachment app. 122 mm
3.2	**32 x**	6 mm	12.5 x	9 mm	80 x	3 mm	
4	**40 x**	5 mm	16 x	7.5 mm	100 x	2.5 mm	



3 Stereomicroscope IV

Stereomicroscope IV

Objective	0.8 – 4× pancratic objective (zoom optical system)
Auxiliary lens attachments	see Fig. 4
Eyepieces	10× 25×
Image	erect and unreversed
Body tube	removable, can be attached facing in the opposite direction
Specimen stages	see Fig. 11
Stand	see Fig. 11
Also fits onto	our table stands for examining large objects (page 14).
Illumination	by two illuminators which can be attached either for reflected or transmitted light. Choice of low-voltage or diffuse-light illuminator (page 10). In addition, trans-illuminator (page 11).
Accessories	for polarized-light work (page 12), for stereophotomicrography (page 17), for low-power photography (also with LUMINAR) (page 16), for drawing under the microscope (page 18).

Magnifications, object-field diameters, working distances

Zoom magnification changer set to	10× eyepiece		25× eyepiece		Working distance
	Magn.	Dia.	Magn.	Dia.	
0.8	8 x	25 mm	20 x	12.5 mm	app. 84 mm
1.2	12 x	16.5 mm	30 x	8 mm	
1.6	16 x	12.5 mm	40 x	6 mm	
2	20 x	10 mm	50 x	5 mm	with 2× auxiliary lens attachment app. 25 mm
2.4	24 x	8.5 mm	60 x	4 mm	
2.8	28 x	7 mm	70 x	3.5 mm	
3.2	32 x	6 mm	80 x	3 mm	
3.6	36 x	5.5 mm	90 x	2.8 mm	with 0.5× auxiliary lens attachment app. 118 mm
4	40 x	5 mm	100 x	2.5 mm	

Auxiliary lens attachments

for Stereomicroscopes III and IV

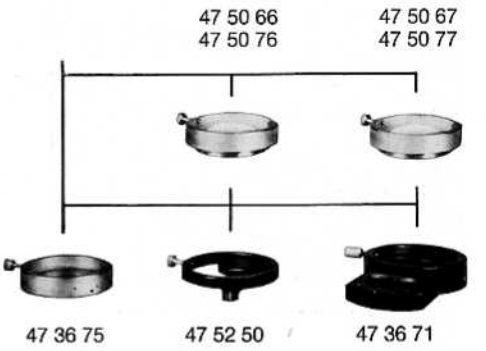
The **2× auxiliary lens attachment** doubles the magnification and numerical aperture of the microscope and halves the object-field diameter.
Model for Stereomicroscope III: 47 50 66
Model for Stereomicroscope IV: 47 50 76

The **0.5× auxiliary lens attachment** halves the magnification and numerical aperture and doubles the object-field diameter. Owing to the long working distance, this attachment should be used only in conjunction with table stands.
Model for Stereomicroscope III: 47 50 67
Model for Stereomicroscope IV: 47 50 77

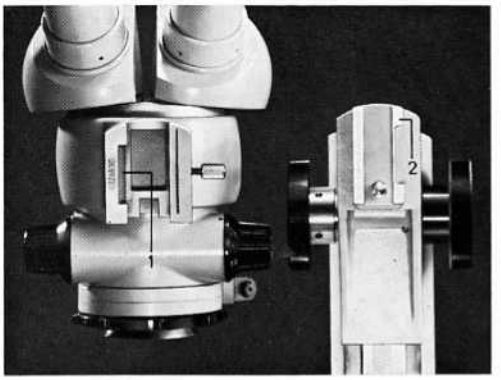
The **analyzer attachment,** 47 36 71, should be clamped to the objective or 2× auxiliary lens attachment so that the slide points towards the stand. 4× eyepieces cannot be used due to vignetting. For further details, see page 12.

The **simple analyzer,** 47 36 75, used in conjunction with a polarizer, serves to eliminate reflections on the specimen under vertical illumination. Clamp the analyzer to the objective and auxiliary lens attachment and insert the polarizing filter, 47 36 00, (heat-absorbing filter!) into the filter holder of the low-voltage illuminator. Rotate the two filters in opposite directions until the reflections disappear.

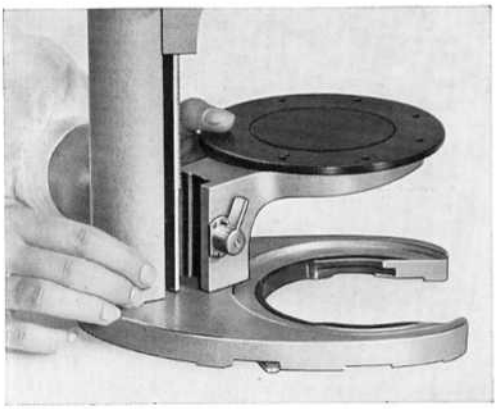
The **prism for vertical illumination,** 47 52 50, reflects the light from the illuminator into deeper regions of the specimen. Without an auxiliary lens attachment, an object field of 26×26 mm is illuminated. At low magnifications, vignetting will occur (with 10× eyepiece up to a magnification factor of 2). The prism should be clamped to the objective or lens attachment with the holder pointing to the stand to prevent partial occultation of the objective aperture. To ensure passage of the largest possible amount of light through the small prism, the filament of the low-voltage lamp should be imaged in the aperture of the prism by shifting the lamp socket.



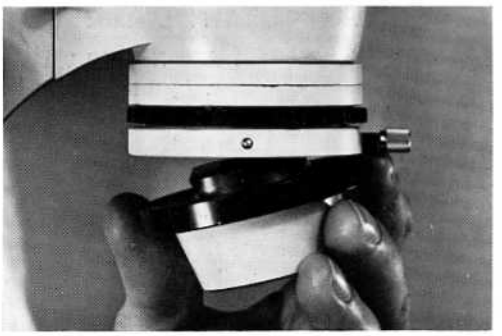
4 Auxiliary lens attachments. The illustration shows that, for example, the analyzer attachment, 47 36 71, can be clamped either directly to the main objective or to the auxiliary lens attachments.



5 Attaching the microscope body to the stand



6 Attaching the stage carrier



7 Stereomicroscope I: Changing objectives

Assembling the microscope

If the stereomicroscope was supplied in a **cabinet,** the stand is secured by a screw projecting from the bottom of the cabinet. This screw can be removed with the aid of the wrench contained in the cabinet.

To fit the **microscope body** to the stand, loosen the clamp screw and attach the body so that the guide edge 2 engages the cutout 1 (Fig. 5). Then slide it down as far as it will go and tighten the clamp screw.

Insert the **stage carrier** with the edge opposite the clamp lever into the dovetail guide of the stand (Fig. 6). Then swing it towards the stand until the spring bolt engages the guide. Move the clamp lever down, thus arresting the stage carrier.

Insert the **specimen stage** into the base of the stand or the stage carrier so that the red dots are opposite each other. Then turn the stage through about 90° and lock it by means of the lever on one side (or the clamp screw in the stage carrier, which acts from below).

Applicable only to Stereomicroscope I:

Loosen the clamp screw and attach the desired **pair of objectives** at an angle from below. With the side of the dovetail collar push the spring bolt back until the paired objectives snap into position (Fig. 7). It is advisable to practise this manipulation several times until it takes only a few seconds.

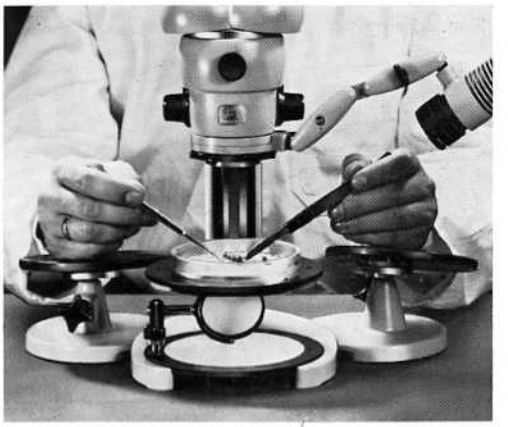
To attach the **illuminator holder,** turn the thumb screw back until the holder can be slipped over the pair of tapers on the microscope body. Adjust the stiffnes of the joints by means of the thumb screws.

Insert the **6-volt, 15-watt filament lamp,** 38 01 77, into the socket (red dot opposite red pin) and lock it by clockwise rotation. Remove all finger prints to prevent their burning in and slip the black shield onto the lamp bulb for glare protection. To insert (or remove) the lamp socket, turn the black clamp ring of the illuminator so that the two red dots are opposite each other.

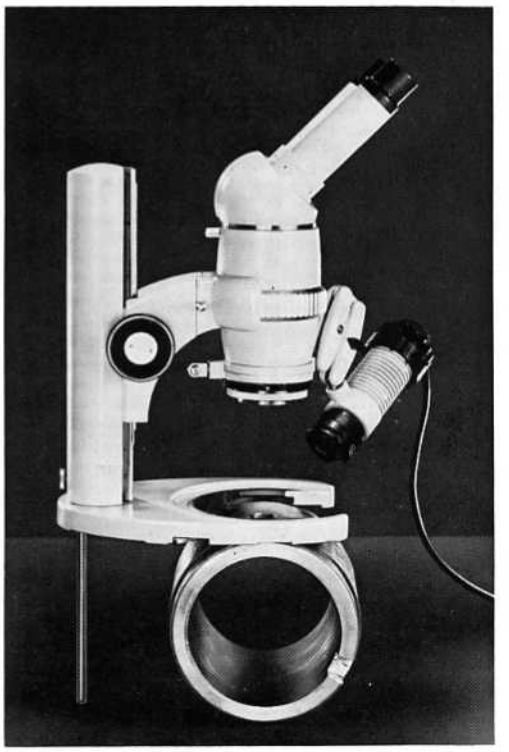
To insert the fluorescent tubes into the diffuse-light illuminator, unscrew the transparent cover plate, introduce the tubes and turn them about 90° about their axis. Insert the plastic safety clip with its notches facing down as shown in Fig. 8. Then replace the cover plate.

The **transformer** must be set for the correct line voltage. Check the voltage setting in the window provided in the base plate.

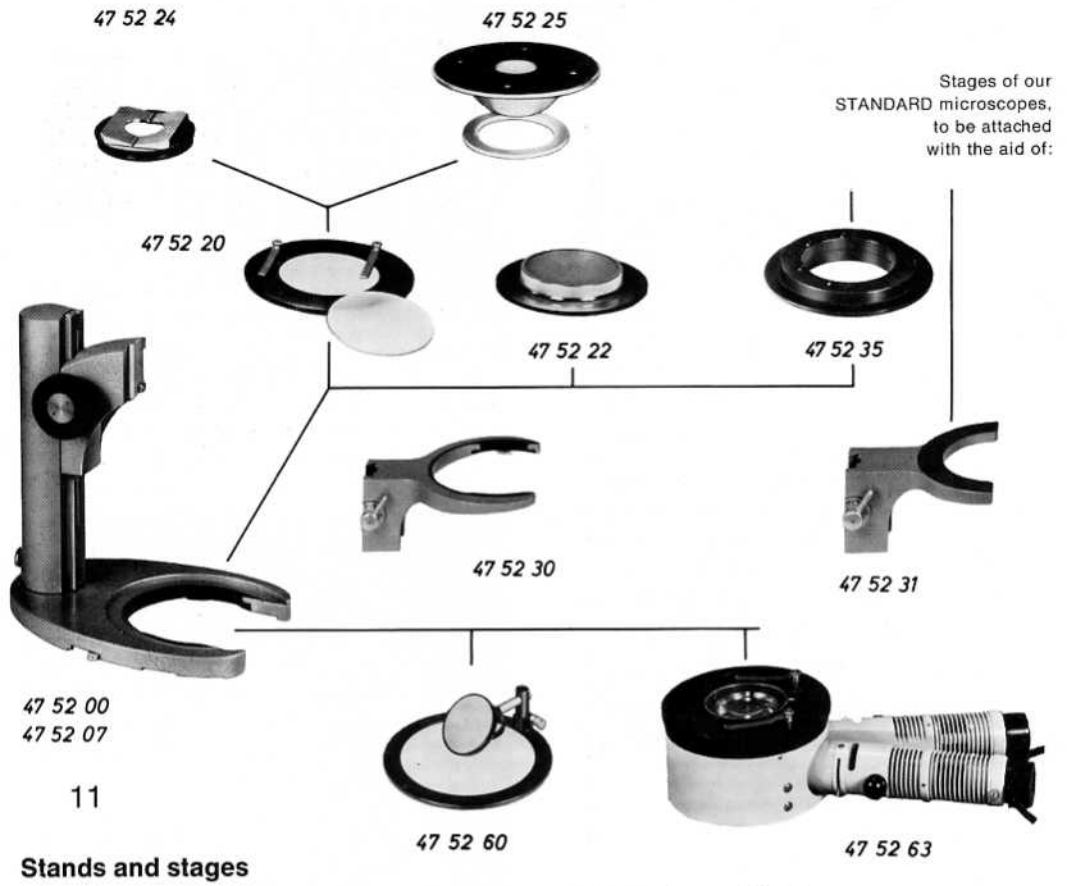
8 Diffuse-light illuminator: After inserting the fluorescent tubes, replace the plastic clip.



9 Hand rests, 47 52 68, facilitate dissecting work. They can be vertically adjusted as well as tilted and turned by means of ball-and-socket joints.



10 Stereomicroscope IV resting on a large object.



Stands and stages

47 52 00 **Stand F** with 250 mm column, for transmitted and reflected-light work.

47 52 07 **Stand E** with 225 mm column, for reflected light.

The base of the stand has cutouts on its underside so that the stereomicroscope can be placed directly on large objects. For the same purpose, the Vee-block insert can be attached upside down. With the aid of the 6 mm-thick prop incorporated in the stand, the microscope can be set up on objects as high as 120 mm (Fig. 10).

Stiffness of control knob

The control knob can be adjusted for greater or lesser stiffness. To increase the stiffness of motion, insert the pin supplied into one of the holes in the bright disks in the center of the knobs and turn them counterclockwise. The motion of the knob should be just stiff enough to prevent the stereomicroscope from sliding down under its own weight.

47 52 20 **Plain circular stage,** to be inserted into the base of the stand (for incident light only) or into the stage carrier, 47 52 30, (for combined incident and substage

illumination). The stage comes with a metal contrast plate and a glass plate frosted on one side, which can be exchanged for special inserts.

47 52 22 **Glide stage** for displacing the specimen by hand – to be attached to the stand in the same manner as the plain circular stage. The rotatable ground-glass stage top can be shifted 9 mm from the center in any direction.

Inserts for plain circular stage

47 52 24 **Vee-block insert** for cylindrical objects. Can also be inserted from below if the microscope is to be placed directly on top of such objects (Fig. 10).

47 52 25 **Ball-and-socket hemispherical stage.** Can be rotated and tilted in its supporting ring together with the object, for observation by transmitted or reflected light.

47 52 30 **Stage carrier.** Accepts the stages for transmitted and reflected light in the same manner as the base of the stand. The stages are clamped by means of a projecting screw on the underside.

47 52 31 **Carrier** for stages of the STANDARD series of microscopes. Is attached to the stand with the stage screwed to it. Uniform rotation of centering specimen stages is fully guaranteed.

47 52 35 **Holder** for stages of the STANDARD series of microscopes. Screwed to this holder, the stage is attached to the stand like the plain circular stage.

47 52 60 **Trans-illumination insert** with a polished concave mirror and a diffusely reflecting plane mirror. For low magnifications, direct the low-voltage illuminator at the bright surface which reflects the light to the specimen, swinging the mirror out of the way. For substage illumination at higher magnifications, use the concave mirror.

47 52 63 **Trans-illuminator,** page 11.

Eyepieces 12

10× wide-angle eyepieces, 46 40 01, are supplied as standard equipment. In addition, 4×, 46 36 01, and 25× eyepieces, 46 44 01, are available for special purposes. However, the latter lead to excessive magnification and are therefore primarily intended for measuring and counting. In this case, the image is, of course, less bright.

The 10×, 46 40 04, and 25× eyepieces, 46 44 04, can be supplied with a focusing eyelens to compensate for visual defects. These eyepieces will also accept micrometer disks, cross-hair disks and eyepiece net micrometers of 22.5 mm diameter. For this purpose unscrew the black insert on the lower side of the eyepiece, withdraw the ring from the field stop, insert the micrometer disk (with its graduation facing up) and replace the ring. Then lock the eyepiece in position by means of the clamp ring 46 49 12.

For accurate length measurements eyepiece micrometers must be calibrated once and for all with the aid of a stage micrometer. On the stage micrometer No. 47 40 25, there are 25 whole millimeters and 5 millimeters subdivided into 50 intervals. For calibration, the ratio between a certain number of divisions of the eyepiece and stage micrometers is determined. This micrometer value must be ascertained for every magnification.

Once this has been done, it will then only be necessary to multiply the number of divisions by the micrometer value in order to measure a distance in the specimen.

The eyepieces should always remain in place in the body tube in order to prevent the entry of dust.