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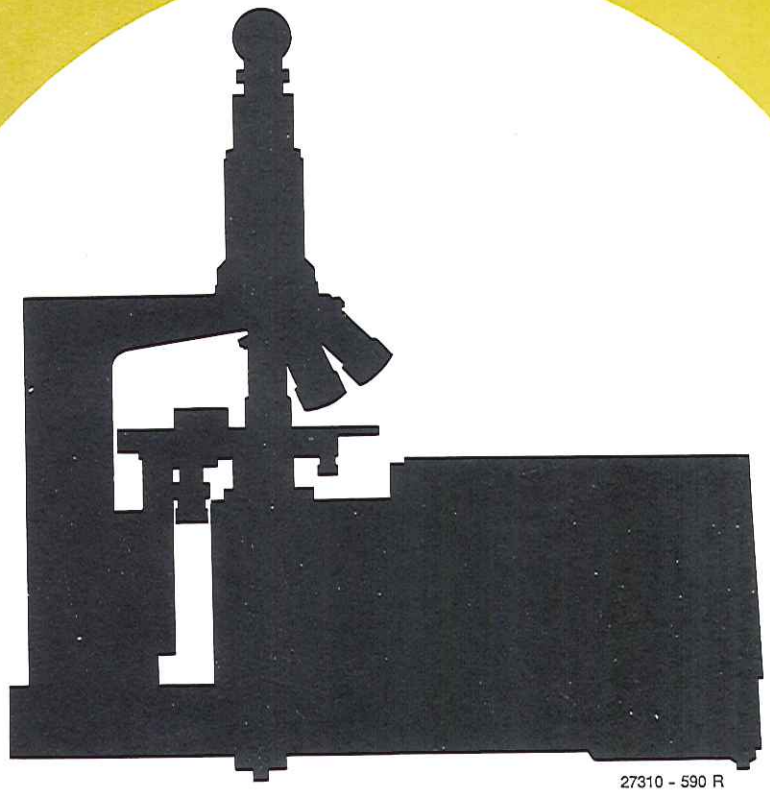
Projection Microscope
LEITZ Neo-PROMAR®

Instructions



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Projection Microscope
LEITZ Neo-PROMAR®

Instructions

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1 Introduction

The Neo-PROMAR projection microscope serves for the wall projection of microscopic specimens in brightfield. When the O tube is replaced by the P tube and a grey filter inserted the Neo-PROMAR is converted into a microscope. This combination of projector and microscope offers the possibility of rapid and convenient specimen selection and preparation for subsequent wall projection.

Fig. 1 Neo-PROMAR projection microscope with O tube

1 Fixing screw of the lamp housing
2 Lever for the condenser and diffusion disc
3 Pinhole stop
4 Single-knob control for coarse and fine focusing of the image (total travel 3mm) on both sides of the stand

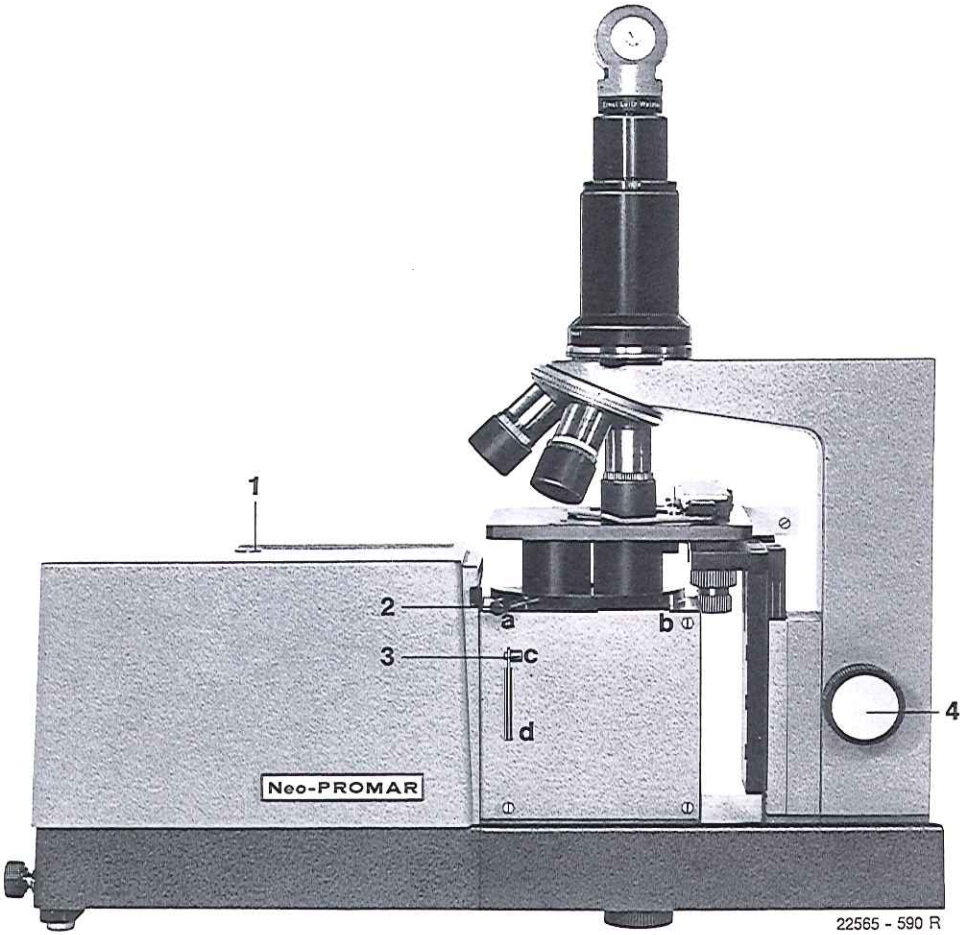

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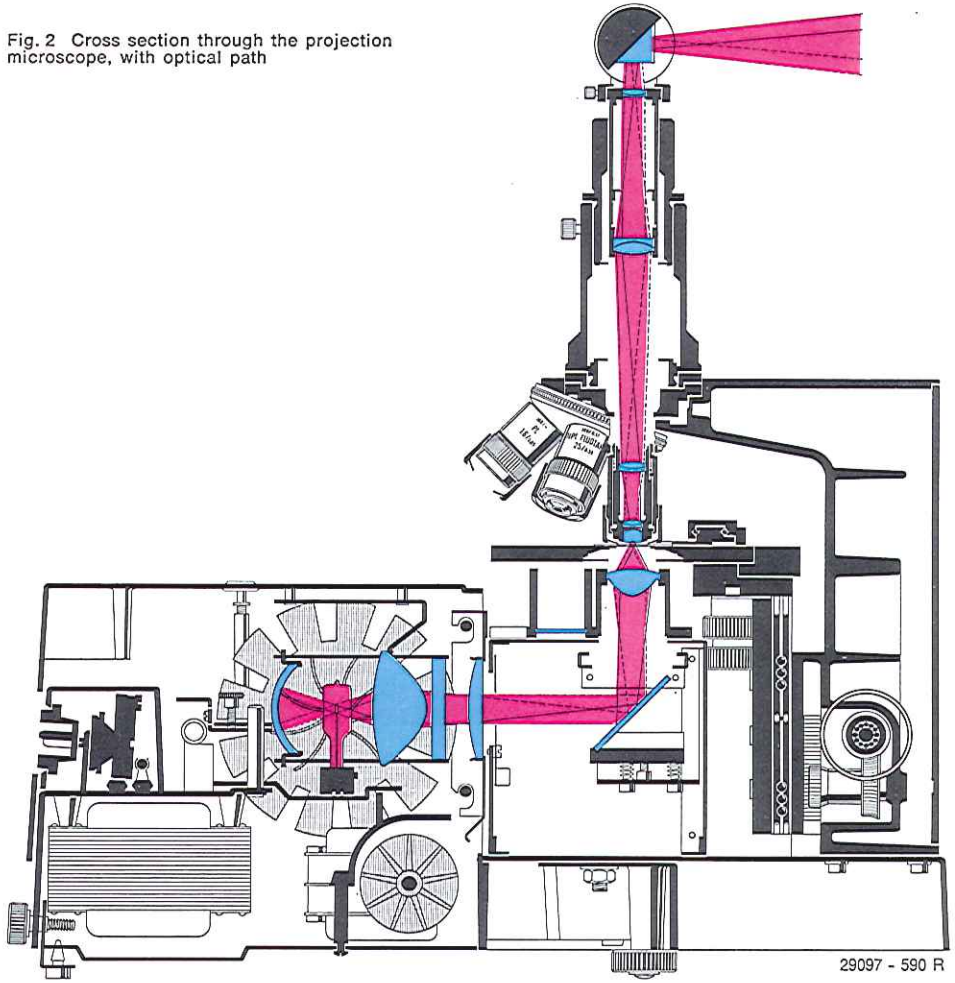
Fig. 2 Cross section through the projection microscope, with optical path



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2 Preparing the instrument for operation

21 Unpacking

Before despatch, the components of the Neo-PROMAR are cleaned and packed separately. Ensure during unpacking that the optical components are protected against fingermarks (see also Care and Maintenance).

Setting up

Set up the Neo-PROMAR so that it can project freely above the viewers' heads. The projection room must be completely blacked out.
The projection microscope has a 3-point support with rigid 4-point base.
Release the fixing screw (3.1); the rear feet will then adjust themselves to the support. Align the instrument horizontally with the knurled nuts (Fig. 4). Tighten the fixing screw (3.1).
The final position is now fixed and the projection microscope firmly supported.

Fig. 3 Fixing screw of the 3-point support

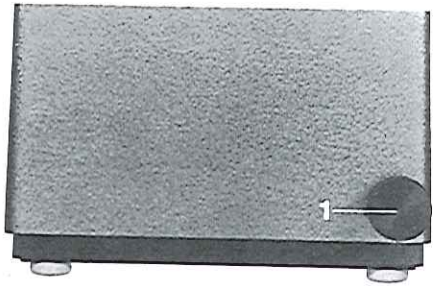

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Fig. 4 Vertical adjustment of the projection microscope

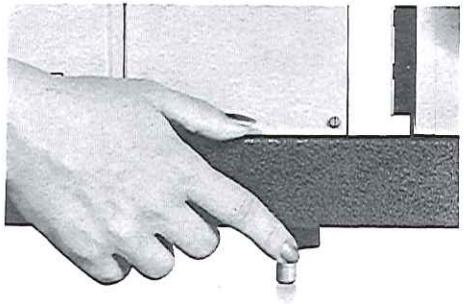

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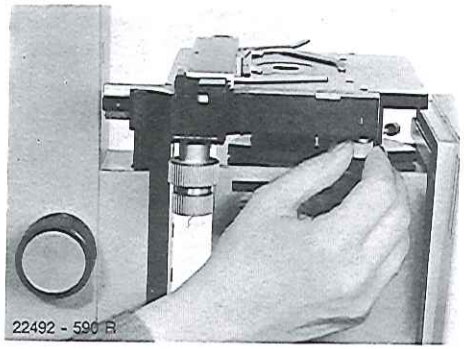
Fig. 5



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22 Assembly of the components

Screw the objectives into the revolving nosepiece and push the anti-glare shields on to the knurled rims of the objectives. (The anti-glare shield for the Pl 1.6/0.05 objective has no pinhole stop.)
Rotate the collar with the engraved data until these can be read by the user.

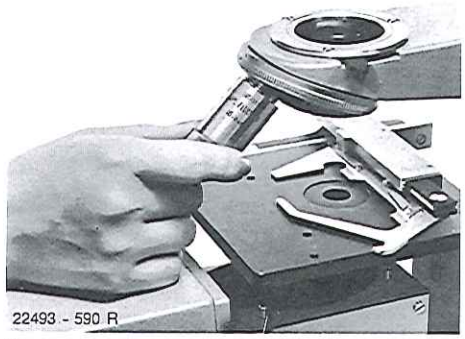

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Fig. 6



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Fig. 7 Inserting the O tube

Push the lever for the tube change backwards and drop the tube in position from above. Arrest it by lightly pushing the lever to the front.

Fig. 8 Insert eyepiece tube (1) in the tube and clamp it with the knurled screw (2).

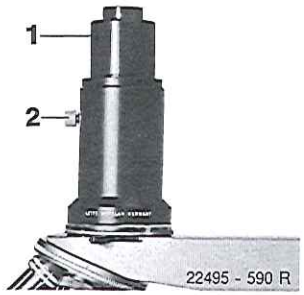

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Fig. 9 Insert the projection eyepiece (3) with adapter ring TL 160.

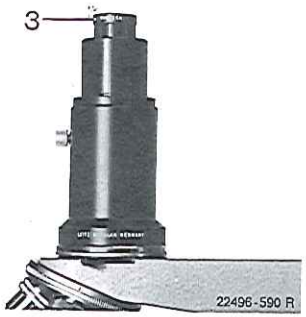

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Fig. 10 Place the projection prism (4) on the eyepiece (3) and clamp it with the knurled screw (5).



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23 Inserting (changing) the lamp

Pull the mains cable out of the housing. Release screw (1.1) with a coin and remove the lamp housing. Take out the condenser system (pull out the lamp for replacement).

ATTENTION

Do not remove the protective cover of the tungsten filament lamp before you have inserted the lamp. Follow the instructions of the lamp manufacturer.

Push the 24 v 250 W tungsten halogen lamp with its pin base into the lamp socket. Replace the condenser system.

Replacement lamp

It is recommended always to have a replacement lamp ready. It is best to keep it in the foam rubber piece in the housing cover.

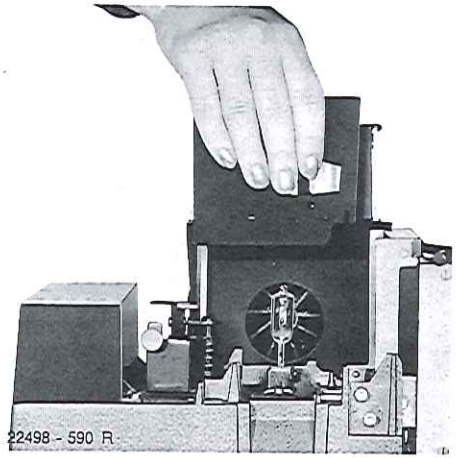


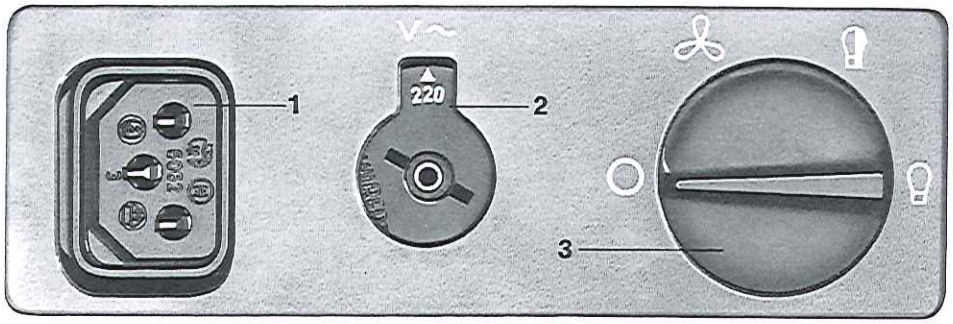
Fig. 11 Inserting the lamp. Illuminating system pulled out.

24 Centring the lamp

Before switching the instrument on check whether the voltage set agrees with the local mains voltage; if necessary, adjust the voltage selector (12.2) with a coin (Fig. 12).

Insert the mains cable in the back of the lamp housing.
Turn the Pl 1.6 objective on the nosepiece into the optical path.
Turn the condenser (1.2) into pos. a. (It is turned in only for centration of the lamp with the 1.6/0.05 objective.)
Turn out the pinhole stop (1.3), position c. Switch on blower and illumination on the 4-step program switch (12.3).

Fig. 12
1 Connection for mains cable
2 Voltage selector
3 4-step program switch
○ = full light power
⚘ = lamp economy switch
⚷ = blower running on its own
⏻ = instrument switched off



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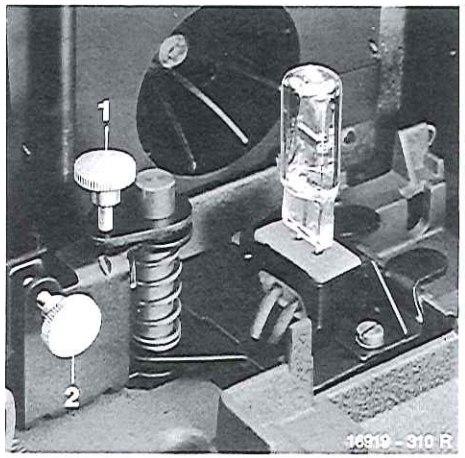


Fig. 13

ATTENTION

Do not introduce solid objects into the running blower, to avoid possible damage to the vanes.
Inadvertently touching the running blower by hand during lamp adjustment causes no injury; the fan belt is slack enough to slip on the drive pulley.

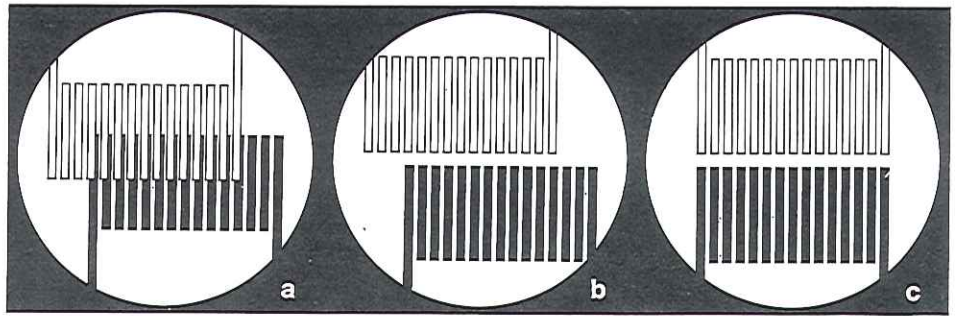
Hold a piece of white paper in front of the projection prism at about 30cm distance. Here the lamp filament and its mirror image formed by the reflector will be seen. If the aspect is similar to the one shown in Fig. 14 a the lamp must be centred as shown in Fig. 14 c:
Switch off lamp, pull out mains cable, close the lamp housing, reinsert mains cable and switch on lamp. Rotate and tilt the projection prism to align it to the projection wall.

Fig. 14
Turning screw (13.1) = vertical alignment of the lamp filament.
Turning screw (13.2) = horizontal alignment of the lamp filament.

Objectives and the appropriate settings of the pinhole stop (1.3) and the condenser (1.2)

Objective	Position of pinhole stop	Position of condenser
1.6	c	b
2.5	c	b
6.3	c	a
16	c	a
25	d	a
40	d	a

Place a suitable specimen on the object stage and form a sharp image of it on the projection wall by vertical adjustment (3mm adjustment range) of the object stage with the knurled knob (1.4). Ensure that the anti-glare shields are in the correct position on the objectives, to prevent stray light from entering the projection room.



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25 Adjusting the instrument for conventional microscopy

1. Remove the straight monocular tube (O tube) and replace it by the inclined monocular tube (Fig. 15).
2. Insert GF 10x eyepiece.
3. Push the 0.2% neutral density filter in the filter slot (21.1).
4. Switch on the lamp, place the specimen on the object stage and obtain a sharp microscopic image of it (1.4) with the vertical adjustment of the stage.
5. Check the position of the condenser (1.2) and of the pinhole stop (1.3), see table on previous page.



Fig. 15 Inserting the monocular tube (P tube)



Fig. 16 Projection attachment on the LEITZ Neo-PROMAR

Fig. 17 Micro attachment for the LEICA® with vibration damper for 35mm photography



26 High-temperature cut-out

The Neo-PROMAR is protected against overheating by means of a high-temperature cut-out, which switches the instrument off automatically if for any reason a certain temperature is exceeded in the lamp housing and the instrument might become damaged.
After the cause of overheating (for instance a broken fan belt) is eliminated and the instrument allowed to cool a little, the cover is removed and the cut-out pushed in the direction of the arrow (18).

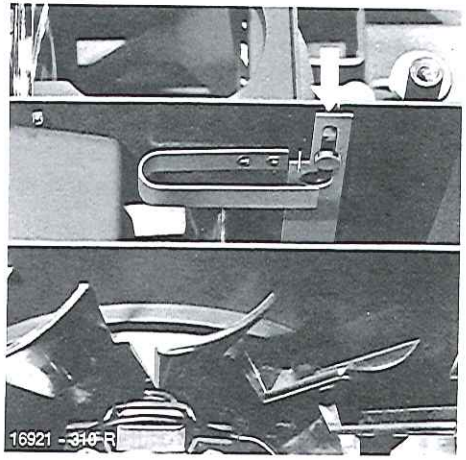


Fig. 18 High-temperature cut-out

27 Reading light

A non-dazzling reading light allows the reading of notes or manuscripts even during projection. For use, simply lift the Neo-PROMAR name plate.



Fig. 19

28 Magnification

The magnifications and screen image diameters obtainable with the Neo-PROMAR are listed in the table on p. 11.

3 Care and maintenance

The Neo-PROMAR is a very sturdily constructed projection microscope which does not require special maintenance.

31 Changing the fan belt

When inserting the replacement belt, Order No. 031–047 042, which can be kept in the foam rubber piece of the housing cover, place it first on the motor pulley and then on the fan pulley.

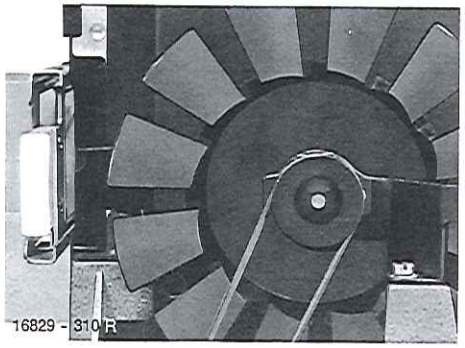


Fig. 20

32 Cleaning the optical parts

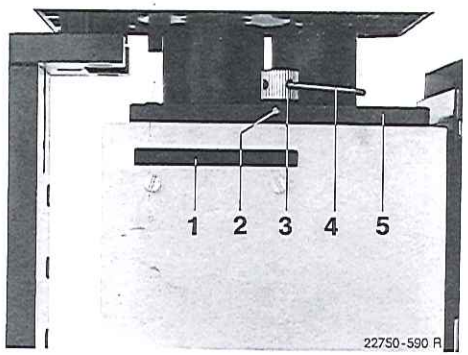
All exposed lens and prism surfaces are coated with a reflection-reducing layer that considerably increases brilliance and brightness of the projected image. The glass surfaces are sensitive to fingermarks and other contamination which should be immediately removed with a soft, clean, non-fluffy piece of cloth. Lens cleaning tissue or a piece of soft chamois leather is also suitable. Resistant dirt should be removed with methylated spirit or petrol.

Cleaning the condenser and the diffusion disc

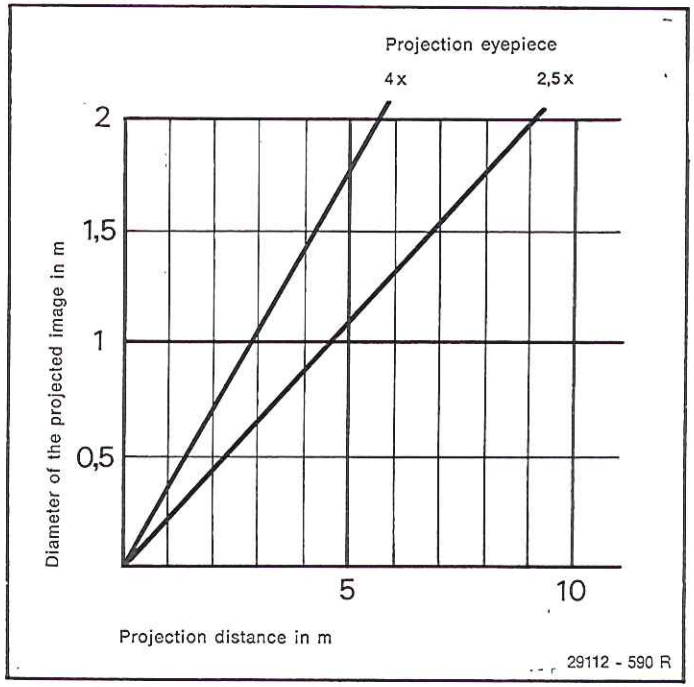
Unscrew the object guide (cf. Fig. 5) and move the object stage into its topmost position with the single-knob control (1.4).

Unlock screw (21.2). Release the knurled screw (21.3) with the pin (21.4), take out the holder (21.5) with condenser and diffusing disc, clean the assembly and replace it.

Fig. 21



4 Projection distance, diameter of the projected image



Screen image sizes
Up to about 2m diameter* projection distances up to about 9m

* This information applies only to normal matt white projection screens. Bead screens of high reflecting power allow the projection of larger images over longer distances at the same brightness.

Reproduction scale on the image screen
Up to about 3000 : 1 at full utilization of the resolving power of the microscope objectives.

Calculation of the final magnification

$M_{total} = M_{objective} \times M_{eyepiece} \times 4 \times$ screen distance in m

Example:	Objective	40/0.70	40 x 4 x 4 x 3 = 1920
	Eyepiece	4x	
	Factor	4	
	Screen image distance	3m	M_{total} = 1920 : 1

Calculation of the diameter of the projected image in mm

Image diameter = eyepiece field-of-view diameter x $M_{eyepiece}$ x 4 x screen distance in m

Example:	Eyepiece field-of-view dia.	22mm	22 x 4 x 4 x 3 = 1056mm
	$M_{eyepiece}$	4x	
	Factor	4	
	Screen distance	3m	Image diameter = 0.05m

Calculation of the projection distance

$$\text{Image diameter} \div (\text{Field-of-view diameter} \times M_{eyepiece} \times 4)$$

Example:	Image diameter	1056mm	$\frac{1056}{22 \times 4 \times 4} = 3\text{m}$
	Field-of-view diameter	22mm	
	$M_{eyepiece}$	4x	
	Factor	4	

Calculation of the object field

Object field diameter = eyepiece field-of-view diameter: $M_{objective}$

Example:	Eyepiece field-of-view dia.	22mm	
	$M_{objective}$	40	22 : 40 = 0.55mm object field diameter

5 Fault tracing

1. Lamp does not light up	a Mains cable is not properly plugged in b Defective c High-temperature cut-out (Fig. 18) has jumped out
2. The projected image is unsatisfactory	a Projection room insufficiently blacked out b Bad-quality projection screen c A filter is jammed in the changer d Lamp badly centred e Wrong position: condenser, diffusion disc, pinhole stop f Objective, projection eyepiece or projection prism dirty (fingermarks) g Condenser or diffusion disc dirty h The object is unsuitable i Illuminating optical system dirty (condensation)
3. Projected image cannot be focused	a Front lens of objective very dirty b Coverglass too thick (DIN 0.17mm) c Microscope slide wrongly placed with coverglass pointing downwards d For specimens without coverglass special objectives engraved 160/0 = tube length 160, coverglass thickness 0.0mm must be used for medium and high magnifications e TL 160 adapter ring is missing (Fig. 9)
4. Object field too small	a The distance to the projection screen is too short b Eyepiece magnification too low
5. Projection microscope switches off during projection	a High-temperature cut-out switches off because of overheating, possible cause: broken fan-belt b Lamp defective

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Projection Microscope

LEITZ Neo-PROMAR®

Brief Instructions

1 Set-up the projection microscope with the 3-point support

2 Switch on the 24 v 250 W tungsten halogen lamp

3 Place the specimen on the object stage

4 Turn the desired objective into the optical path

Objective	Lever position
1.6/ 2.5	c/b
6.3/16	c/a
25 /40	d/a

5 Align the projection prism to the projection wall

6 Form sharp image of the specimen

