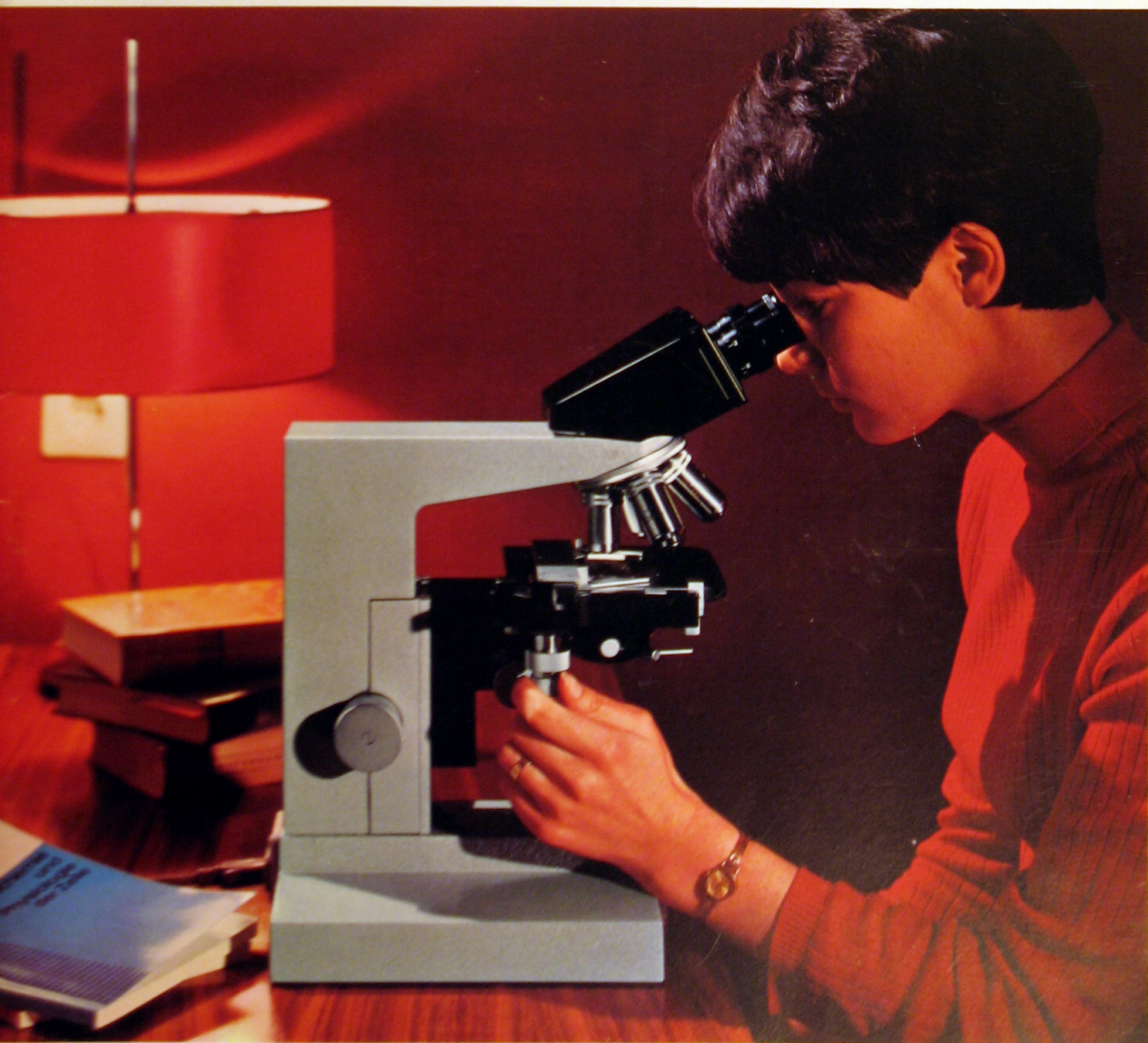


# SM-LUX

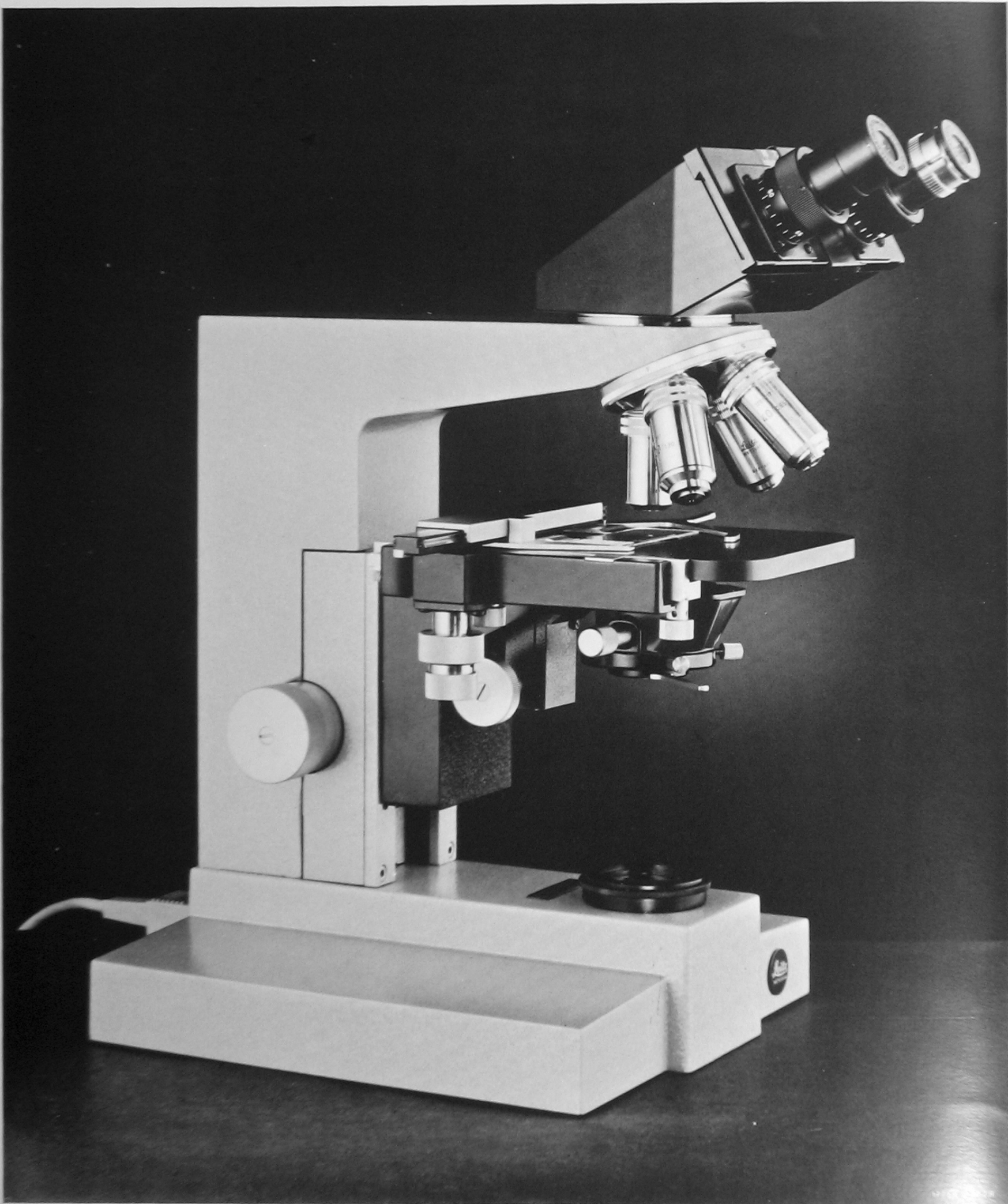
## Classroom- and Routine Microscope





# LEITZ SM-LUX classroom and routine microscope

SM-LUX with the most elaborate equipment: binocular tube and mechanical stage No. 16 with interchangeable condenser 601.





**The SM-LUX is a classroom- and laboratory microscope of the new series headed by the ORTHOPLAN<sup>®</sup> large-field microscope. Its excellent optical and mechanical performance, the thought devoted to its ease of operation, its versatile possibilities of expansion make it eminently suitable for practical work in universities and schools, medical and technical training establishments, for study and the surgery of the general practitioner.**

#### **Technical details in brief**

Interchangeable monocular or binocular tubes, inclined at 45° and 30° respectively ensure relaxed operation. The stage remains horizontal. The tubes can be rotated through 360°.

Hard-chromium-plated tube seating ensures precision adjustment and perfect fit of the tubes even after many years of use. The bilateral, maintenance-free single-knob control makes focusing easy and rapid in all magnification ranges.

The novel steel needle bearing of the object stage offers the advantage of reduced friction and uniform hardness of the guide track of the stage, ensuring a smooth and even fine movement.

Objectives and eyepieces are matched. After each change the image remains in the focusing range.

The aspherical condensers can be centred and are either interchangeable or fixed depending on the type of object stage.

The quadruple nosepiece revolves on ball bearings and has internal precision clickstops; the image remains in the field of view even after objective change.

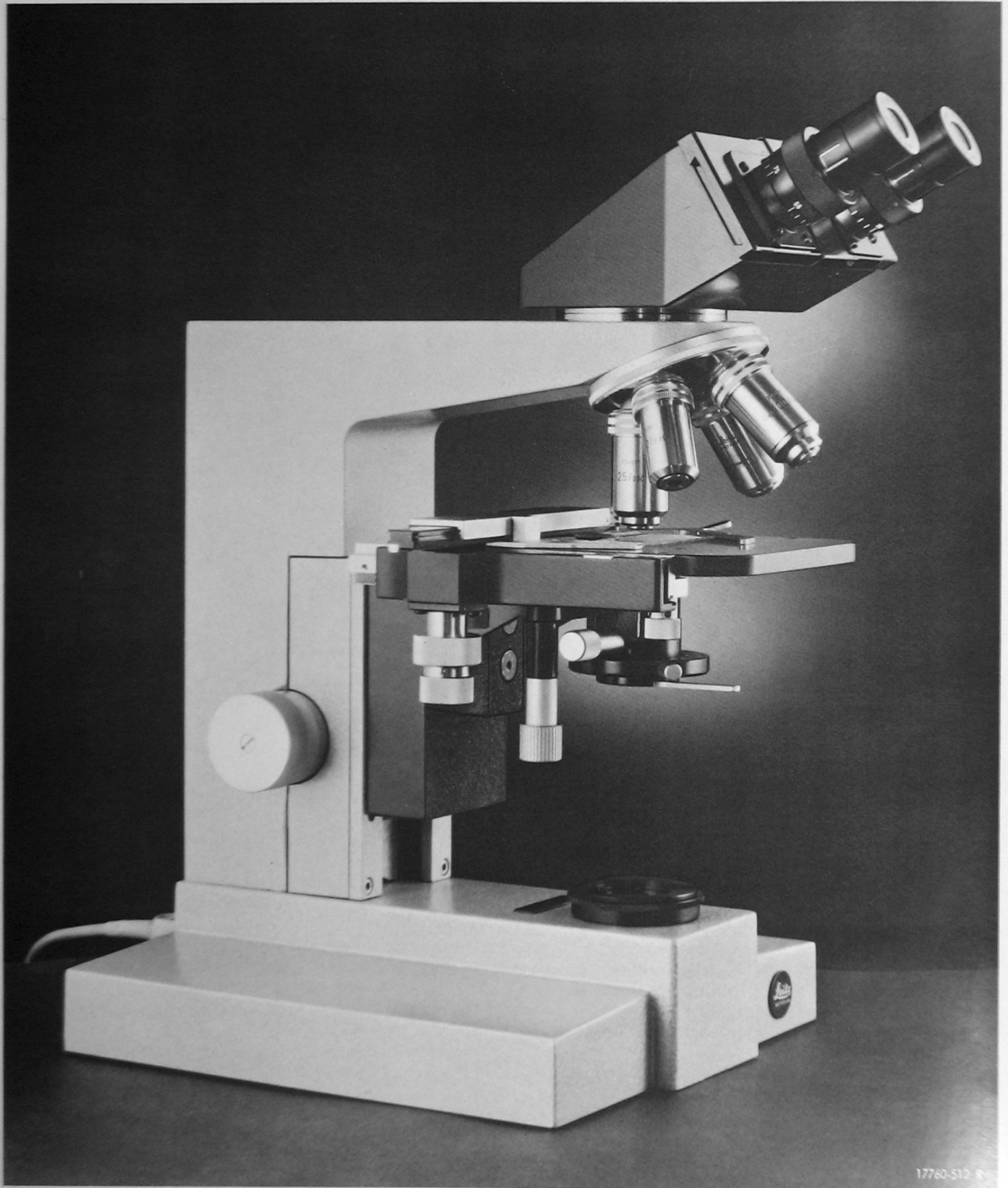
The 6v 5W low-voltage illuminator and 3-tap transformer are built into the foot of the microscope. The lamp is permanently centred, the microscope is therefore always ready for operation. The beam path is based on Köhler's Principle. The attachable object guide with low-set coaxial controls effectively converts the standard object stage into a mechanical stage.

Wide range of accessories for heating-stage microscopy, photomicrography, phase-contrast microscopy, etc.



# SM-LUX binocular

SM-LUX with binocular tube S and square object stage No. 24a with fixed condenser



17760-512 R



# Recommended outfits

## Elaborate outfit

SM-LUX with binocular tube S, NPI planachromats, GF eyepieces, mechanical stage No. 16 interchangeable condenser No. 601

## Standard outfit

SM-LUX with binocular tube S, achromatic objectives, GF or NF eyepieces, mechanical stage No. 16, interchangeable condenser No. 601

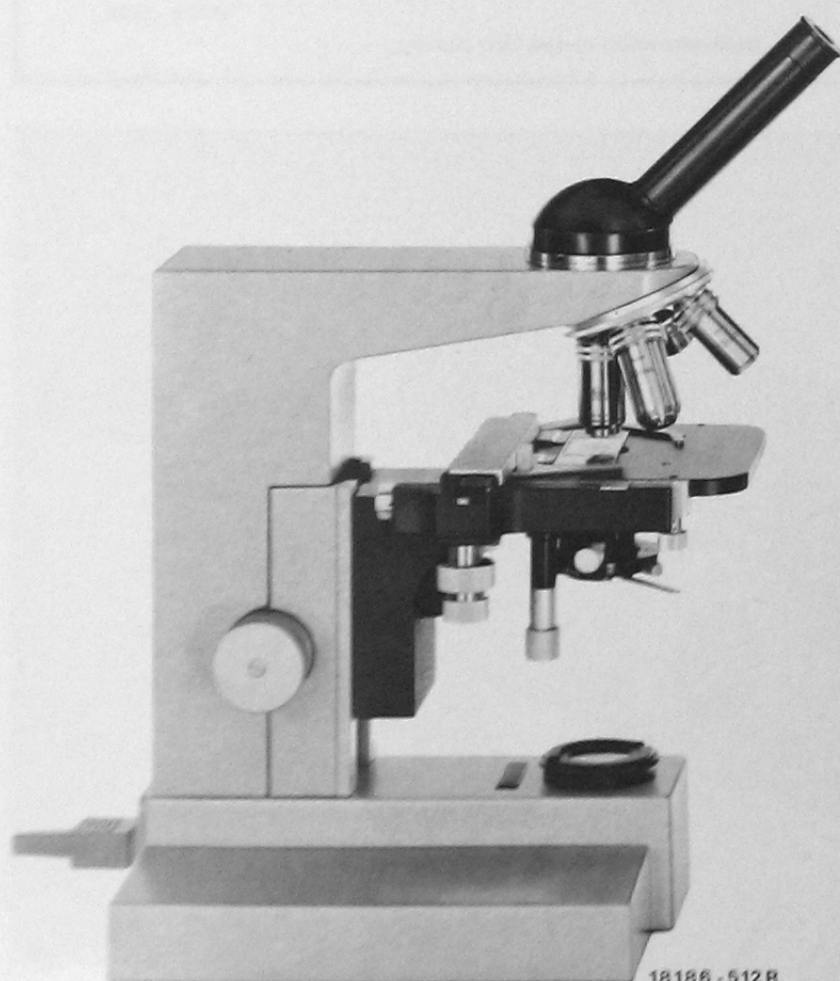
SM-LUX with monocular tube P, achromatic objectives, NF or GF eyepiece, object stage No. 24, interchangeable condenser No. 601

## Classroom outfits

SM-LUX with binocular tube S, achromatic objectives, NF or GF eyepieces, mechanical stage No. 16a with fixed condenser

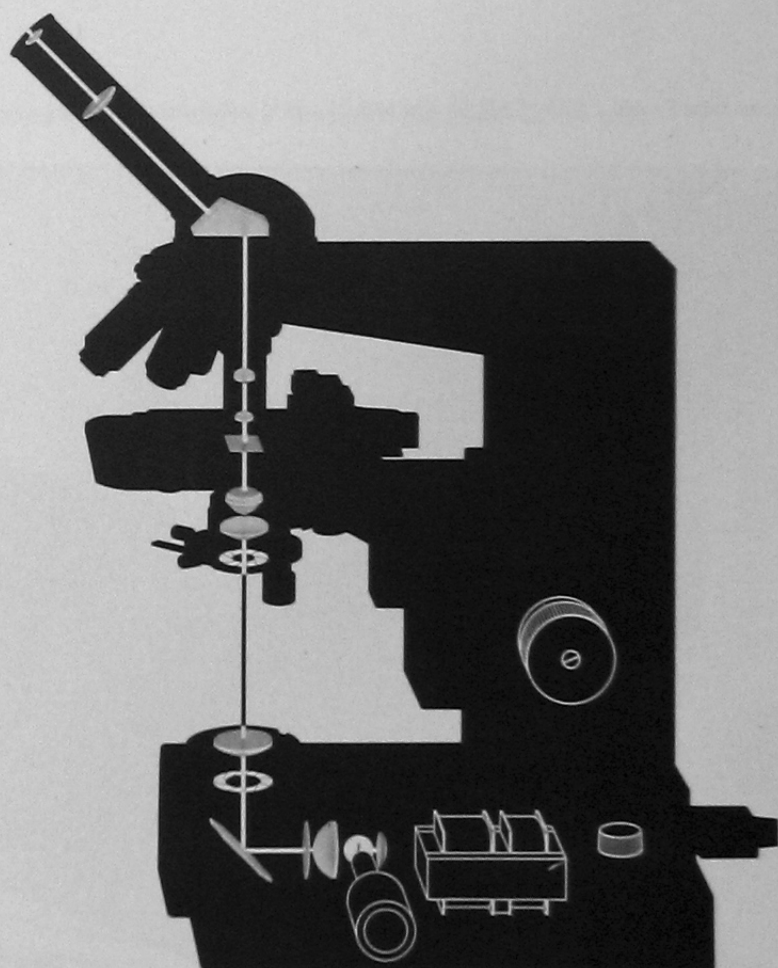
SM-LUX with monocular tube P, achromatic objectives, NF or GF eyepiece, object stage No. 24a with fixed condenser

SM-LUX with monocular tube P and square object stage No. 24a with fixed condenser.



18186 - 512R

Transformer, 6v 5W low-voltage illuminator, and field diaphragm are built into the microscope stand. The illumination is based on Köhlers Principle. Tube and if necessary condensers can be interchanged.





# Tubes

All tubes are interchangeable, can be rotated through 360°, and have a hard-chromium-plated seating. The binocular tube has an interference film to guarantee physical beam splitting without any loss of light. Brightness and image contrast are therefore unequalled even with binocular observation. The tube factor is 1x for all tubes.

## Binocular tube S

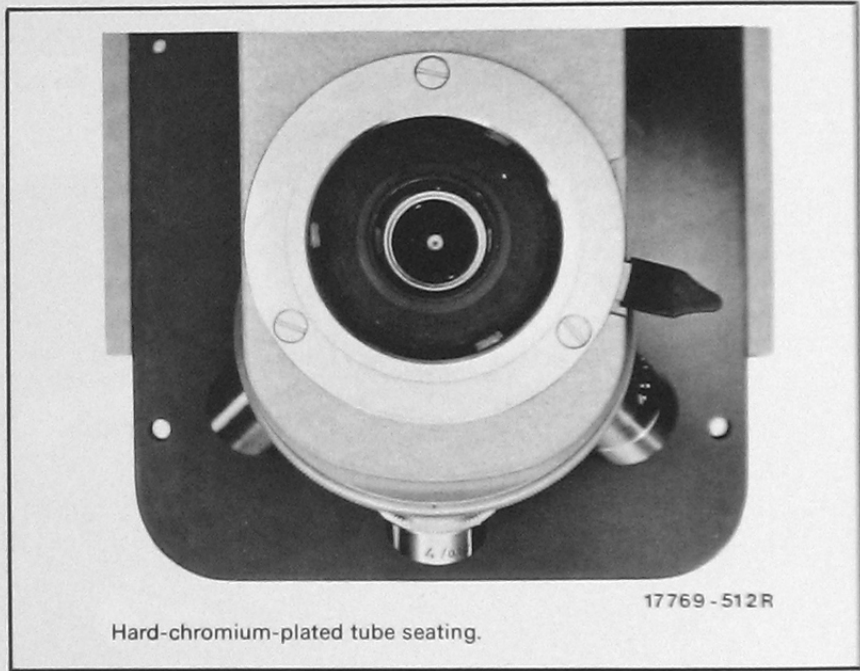
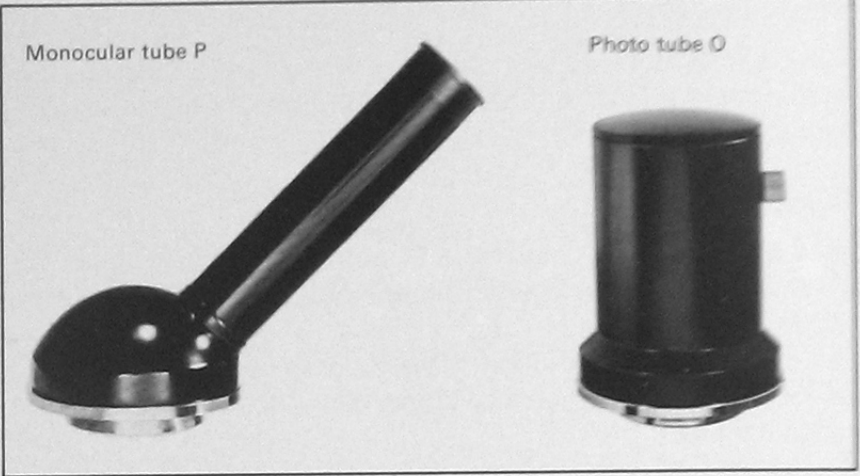
Inclined binocular observation tube for fatigue-free microscopy. Interpupillary distance range from 55 to 75mm. The change in tubelength caused by this adjustment can be individually compensated for each eyepiece tube.

## Monocular tube P

Inclined tube for monocular observation for simpler outfits.

## Photo tube O

Straight tube for the attachment of a camera.



Binocular tube S with 2 PERIPLAN GF 10x and GF 10xM widefield eyepieces





# Stages

## Object stages

The object stages for the SM-LUX are permanently mounted. Four versions are available. The following points must be considered:

The stage versions „a“ have fixed condensers. Other condensers, e. g. for darkground or phase contrast, cannot be used in combination with these stages; however, a stop for darkground or phase contrast can be supplied.

## Stages with fixed condenser

### Square object stage No. 24a

This stage is suitable for simple classroom equipment. It has the same dimensions as stage No. 24, but is fitted with a fixed brightfield condenser, n.a. 0.90. The condenser can be centred, and vertically adjusted by means of a knurled screw. The swing-out condenser top 0.90 As can easily be exchanged with the top No. 010 of n.a. 1.25. This top is, however, required only if the full aperture of an immersion system is to be used. Generally the aperture 0.90 is completely adequate.

A diaphragm for insertion in the condenser (see p. 10) is available for darkground and phase contrast examinations at up to medium magnifications.

### Square mechanical stage No. 16a

This is the square object stage No. 24a with the fixed condenser and mechanical stage No. 22.

## Stages for interchangeable condensers

### Square object stage No. 24

This stage is recommended if the stand is to be used without restriction also in darkground and phase contrast with interchangeable condensers. Stage area 130 x 125mm. The stage can be extended at any time with the mechanical stage No. 22, adjustment area 76 x 50mm.

This combination presents the user with an excellent mechanical stage with low-set coaxial controls.

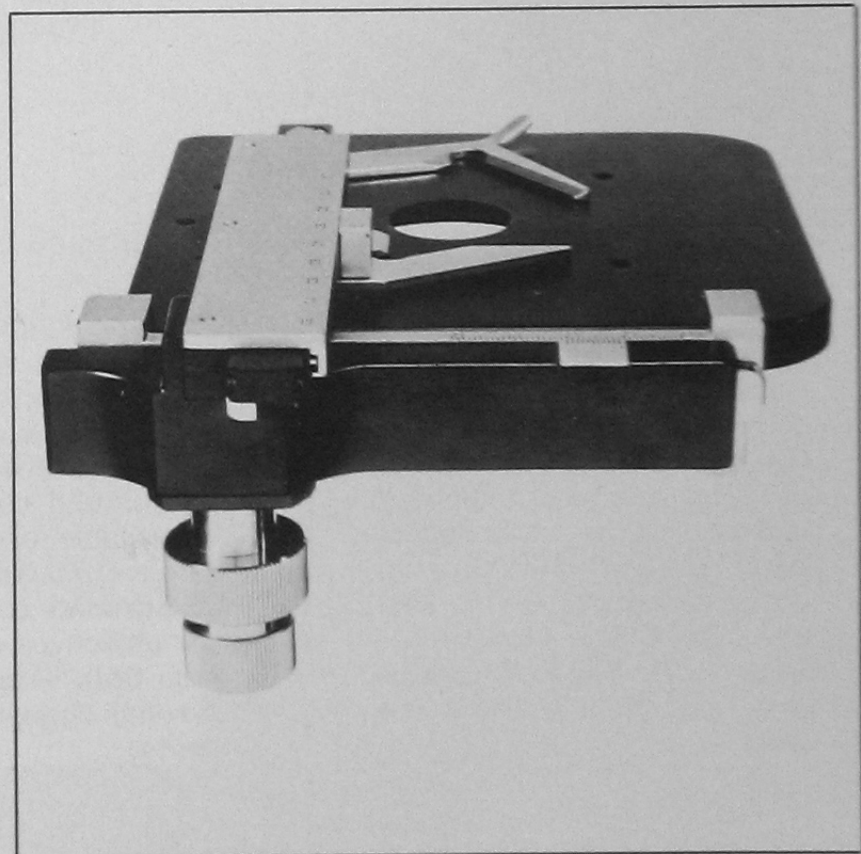
### Square mechanical stage No. 16

This is the square object stage No. 24 and the mechanical stage No. 22. Suitable condensers p. 8.

Square object stage No. 24a with fixed condenser and push-in diaphragm

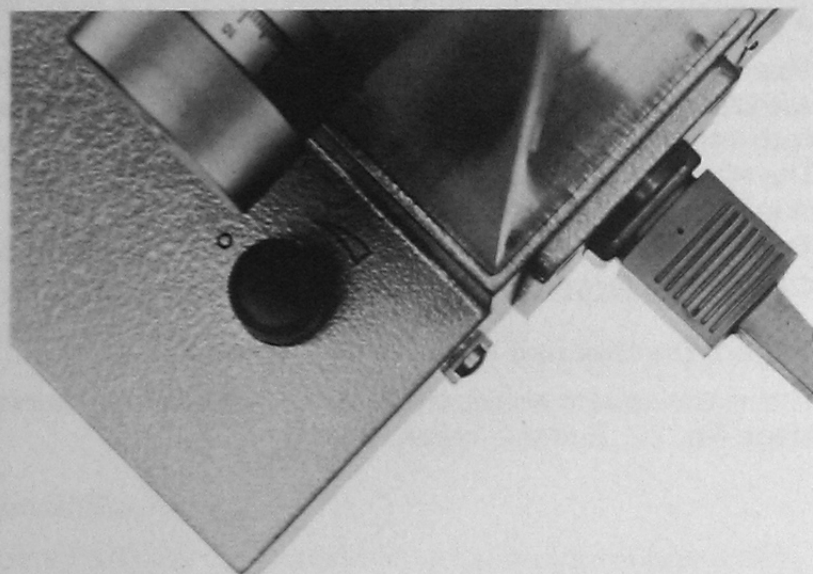


Square mechanical stage No. 16 for interchangeable condensers





# Illuminators and interchangeable condensers



The illumination is based on Köhler's Principle and ensures the best possible utilization of the light source, which is a 6v 5W low-voltage lamp powerful enough for use with darkground and phase contrast. Together with its 3-tap transformer it is built into the foot of the microscope which for operation has merely to be plugged into the mains. The microscope therefore sits on the bench without any separate components. The field diaphragm and 3-step switch can be conveniently operated.

## Condensers

The condensers described here are fitted with dovetail changers, and can

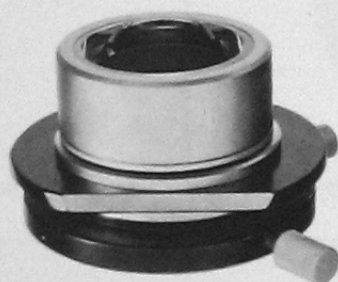
therefore be used only in connection with object stages Nos 24 and 16. Brightfield and phase contrast conden-

sers are designed for Köhler's illumination.



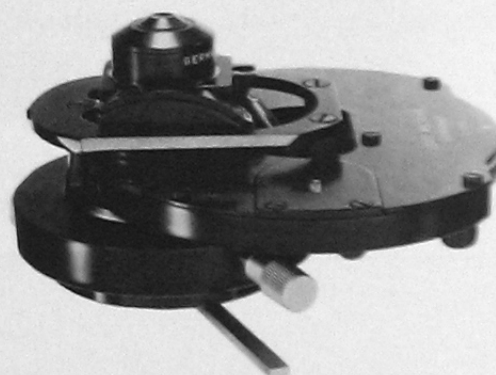
### Brightfield condenser No. 601 L

This aspherical condenser, aperture 0.90, consists of the centring bottom part 600 with condenser lens for the illumination of the low-power objectives and aperture diaphragm, and the swing-out condenser top 0.90 As, which can be interchanged with the top 010, aperture 1.25; this is, however, necessary only if the full aperture of an immersion system is to be used.



### Darkground condenser

For transmitted-light darkground observations in the biological field the only items required are darkground condensers for dry or immersion objectives. The dry darkground condenser D 0.80 is available for dry objectives up to n.a. 0.70, and the immersion darkground condenser D 1.20 for objectives of larger apertures. Both condensers have a dovetail changer and a centring device.



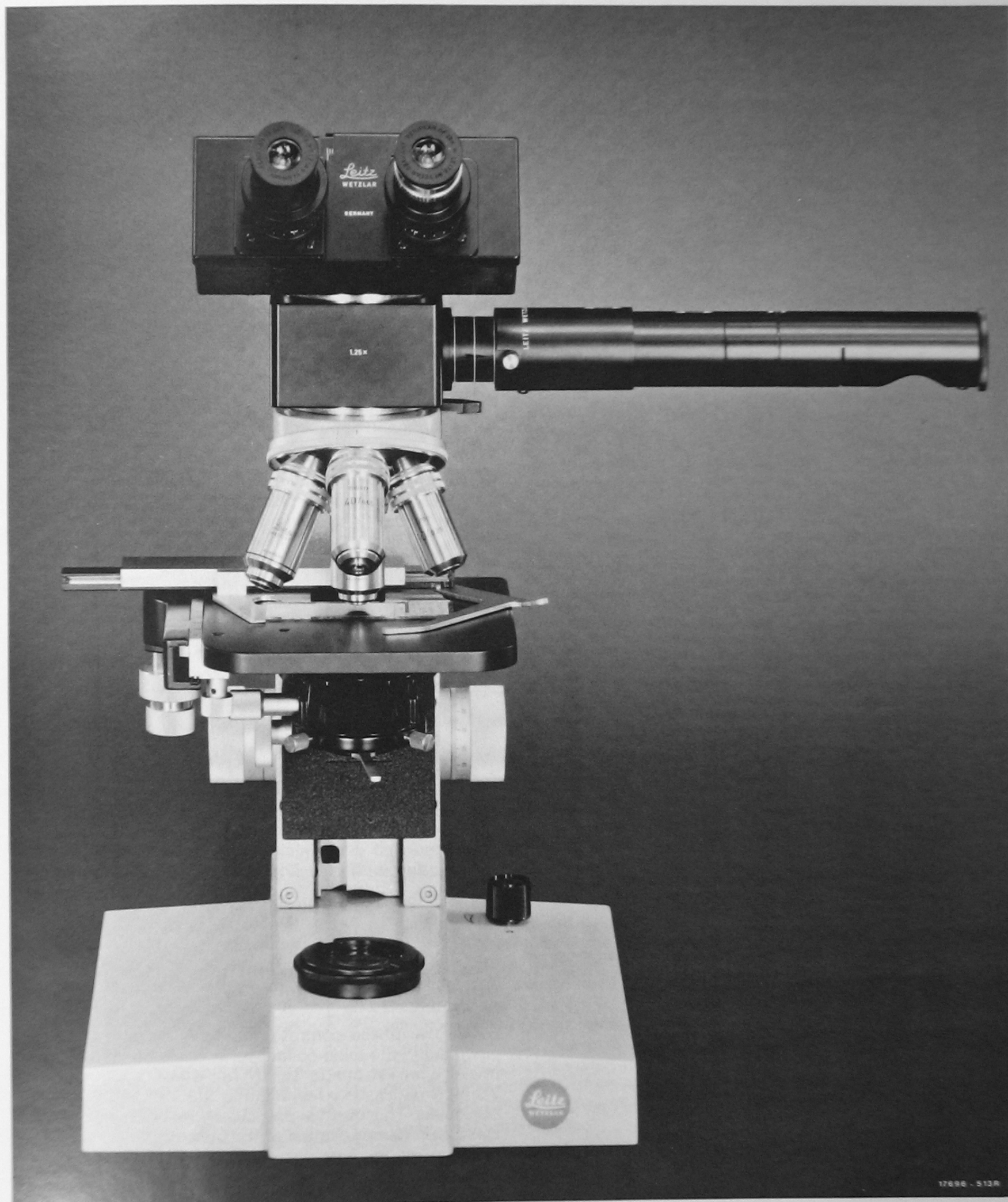
### Phase contrast condenser after Zernike

For investigations in phase contrast we supply our phase contrast equipment, consisting of the phase contrast condenser and special objectives. The condenser has a dovetail changer and a centring device. Details about the phase contrast equipment see p. 10.



# SM-LUX with tracing device

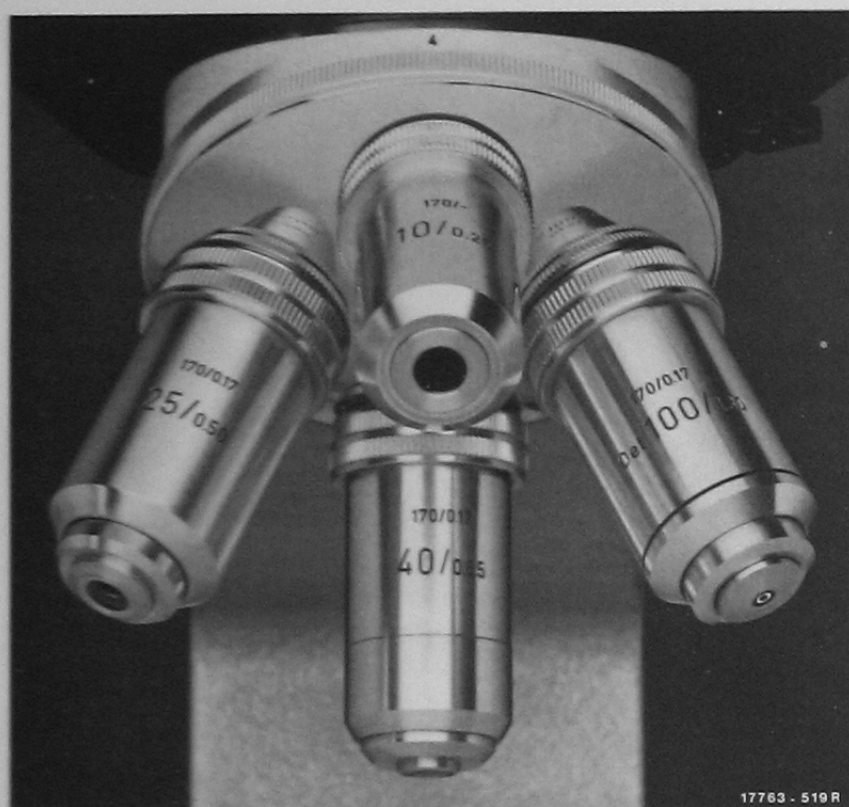
SM-LUX with binocular tube S, mechanical stage No. 16, condenser 601L, with tracing device



17898 - 513R



# Optical equipment



Revolving nosepiece with 4 achromats, 45mm adjustment length

## 170/0.17/45mm objectives

Type of objective	Engraved ratio/aperture	Reproduction ratio	Free working distance mm	Coverglass correction
Achromatic dry systems	4	0.12	24	DO
	10	0.25	7,6	DO
	25	0.50	0,44	D
	40	0.65	0,28	D
Oil immersion objective	Oil 100	1.30	0,08	D
Planachromats NPI	NPI 6,3	0.20	2,0	DO
	NPI 10	0.25	0,53	DO
	NPI 16	0.40	0,50	D
	NPI 25	0.50	0,38	D
	NPI 40	0.65	0,15	D
Oil immersion objective	NPI Oil 100	1.30	0,26	D

D = to be used with coverglass, DO = with or without coverglass

## Eyepieces

Magnification		Field-of-view index
6.3x	PERIPLAN-eyepieces	18
8x		16
NF 10x		18
GF 10x	PERIPLAN widefield eyepieces	18
GF 10xM		18
GF 12.5x		18
GF 12.5xM		18
GF 16x		15
GF 25x		10
GF 25xM		10

M = eyepiece with focusing eyelens

For the optical equipment 5 LEITZ achromats of 4x–100x primary magnification are available. They have been selected to enable the user to obtain the magnifications that can reasonably be expected of a microscope. The upper limit of 1000x reveals the fine structure of microscopic objects, whereas the lowest magnification permits the examination of even relatively large and thick specimens. The medium magnifications, 100x, 250x and 400x, are suitable for the most varied objects in botany, zoology and medicine.

For more stringent demands, especially in photomicrography, we recommend our NPI planachromats, which produce a flat image throughout the entire field of view.

The standard eyepiece for achromats of conventional design, i.e. not for NPI planachromats, is the NF 10x PERIPLAN eyepiece. For the NPI planachromats our GF 10x PERIPLAN® widefield eyepieces must be used. Further combinations of magnifications can be obtained with the 6.3x PERIPLAN eyepiece or with the GF eyepieces listed in the table and supplied on request. These eyepieces are suitable for all objectives.

All objectives are parfocal on the revolving nosepiece so that after magnification change at worst a slight readjustment with the fine focusing control is required. The medium- and high-power systems have a spring-loaded mount for the protection of the front lens and the object.

## Phase contrast after Zernike

(for stages 16 and 24)

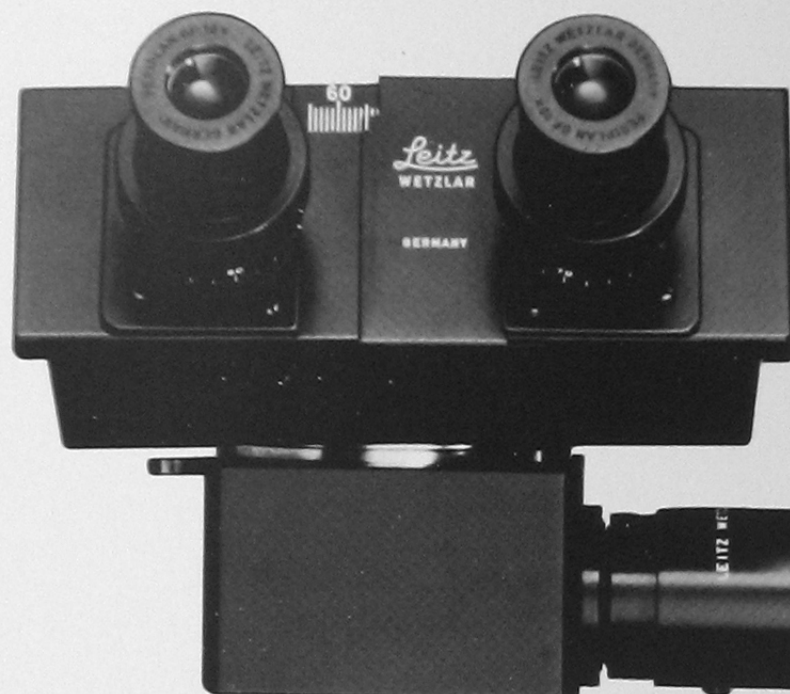
With this equipment consisting of the phase contrast condenser No. 402 La, Phaco objectives, and auxiliary magnifier objects can be investigated in phase contrast, brightfield and darkground. Since with each objective a certain position of the annular stop turret in the condenser is associated, the changeover to the associated annular stop instantly produces a precisely adjusted illumination. The widths of the annular stops and the phase rings have been chosen so that even thick objects are rendered at good contrast and with only a narrow halo. For objectives see outfit key.

## Phase contrast and darkground with push-in diaphragm

(for stages 16 and 24 a)

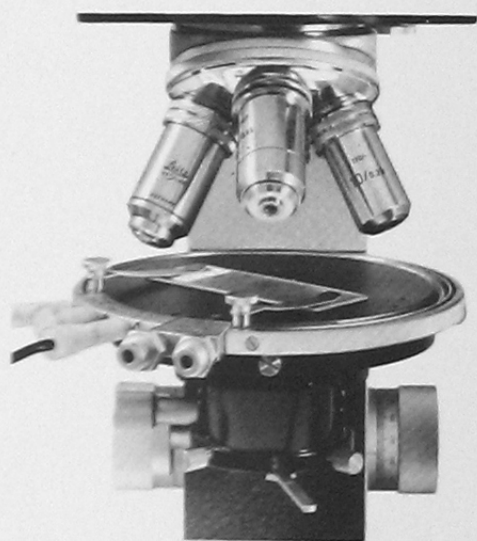
For simple phase contrast rendering a diaphragm to be pushed into the fixed condenser is available instead of the phase contrast condenser. Mere, phase contrast observation is necessarily restricted to the 25:1 and 40:1 Phaco objectives. This outfit is particularly recommended for the classroom demonstration of the phase contrast method or when phase contrast observation is only occasional. This diaphragm is suitable also for darkground with the 10:1, 25:1, and 40:1 objectives.





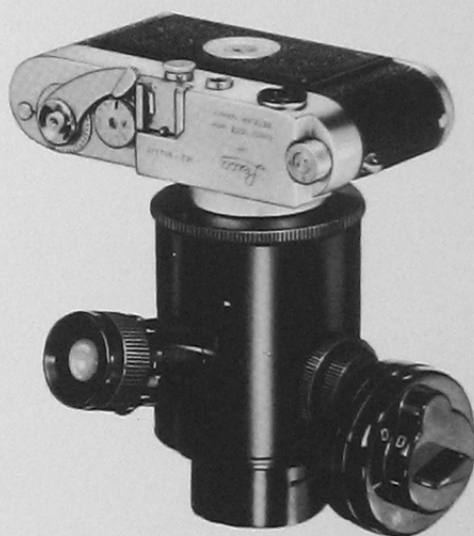
## Tracing device

The tracing device operates on the split-image principle. An image of the tracing area lit by a desk lamp is formed in the eyepiece plane of the microscope via a mirror and beam-splitting prism. The tracing area with the pencil and the object are seen simultaneously in the microscope. All the user has to do is to trace the contours. The room need not be darkened. The magnification of the image of the tracing area can be varied up to the factor 2.



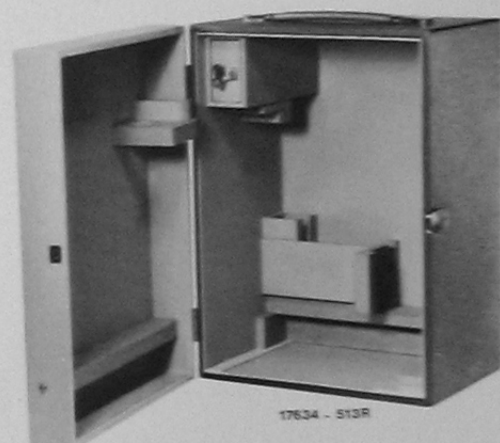
## Heating stage 80

The Heating and Cooling Stage 80 with automatic thermostat control permits investigations at constant or variable temperatures between  $-20^{\circ}$  and  $+80^{\circ}$  C. It is particularly suitable for the growing and in vivo observations of the micro organisms. For the use of the heating stage the stand must be fitted with the condenser 601L and substage No. 33.



## Micro-attachment for the LEICA®

This micro-attachment is mounted on the phototube O. It has a built-in vibration damper which prevents the transmission of shutter bounce to the stand. The exposure is measured with the „detail“ method by means of the MICROSIX exposure meter; the object is focused and observed through the focusing magnifier of the micro-attachment.

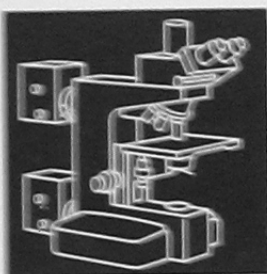


## Carrying case for the SM-LUX

A plastic carrying case is available for the SM-LUX for protection from dust and mechanical damage during transport and storage.



# LEITZ Production Range

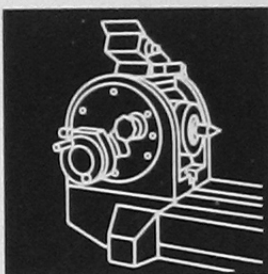
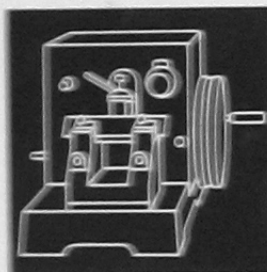


## Microscopes

Microscopes of modern design for all investigations in transmitted, incident, and polarized light. Supplementary equipment for microscopy, such as phase contrast outfits, heating and cooling stages, universal rotating stages, special microscope accessories, such as micromanipulator, transmitted-light interference microscopes, stereomicroscopes, comparison microscopes. Photomicrographic apparatus. ORTHOMAT® fully automatic microscope camera, 4x5" large-format camera with automatic exposure control.

## Microtomes

Microtomes for the research and routine laboratory. Ultra-microtomes for electron microscopy.

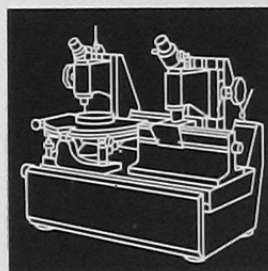


## Photo-electric instruments

Photo-electric incremental linear and angle transducers. Photo-electric measuring tubes. Linear and angle-measuring instruments with digital display.

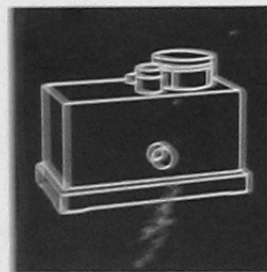
## Materials testing instruments

Miniload hardness tester. Dilatometers. Heating microscopes.



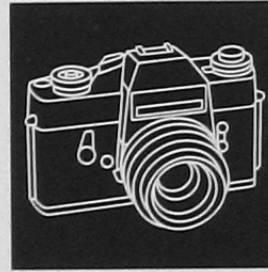
## Binoculars

TRINOVID® for sport, travel and hunting.



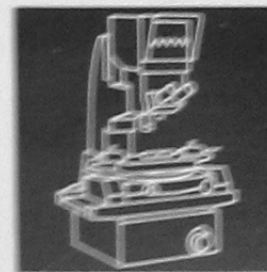
## Physics research instruments based on optical methods

MPV microscope photometer. Monochromators. Micro-refractometers. Dust measuring instruments.



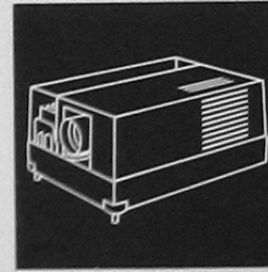
## Photographic equipment

LEICA® 35mm camera. LEICA lenses and accessories. LEICAFLEX® 35mm single-lens-reflex camera. LEICAFLEX lenses and accessories. Accessories for scientific and technical photography. Enlargers.



## Optical-mechanical precision measuring instruments

Measuring microscopes. Linear measuring instruments. Angle measuring instruments. Contour projectors. Alignment- and direction testers. Optical installations and attachments. Incident light interference microscopes.



## Projectors

PRADOVIT® Color automatic miniature projector. PRADOLUX semi-automatic magazine projector. PRADO®-UNIVERSAL versatile school projector. Episcopes. Epidiascopes. Large-lecture hall projectors. Microprojectors. Writing- and drawing projectors.

\* - Registered Trademark

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TELEGRAMS: MICROTOME, LONDON, TELEX.

CABLES: MICROTOME, LONDON

TELEX: LON 21531

PRICE LISTPAGE 1JULY 1970

	<u>CODE</u>	<u>DUTY PAID</u>	<u>DUTY FREE</u>
<u>SM-LUX Brightfield Microscope</u> <u>for transmitted light:</u>			
Stand with fine and coarse adjustment operated by one drum			
Revolving objective nosepiece for 5 objectives.			
Bayonet mount for microscope tube interchange.			
Mechanical stage No. 16a with low set co-axial controls.			
Centring brightfield condenser No. 001, N.A. 90, with swing-out frontlens, vertically adjustable, with built-in pre centred low voltage lamp system with 6V 5W bulb and three step transformer, with field of view diaphragm in microscope foot.			
Mains cable.			
SM 0.4.14 32 - 16a / 001-	512 373 - 500 998	114.17.0.	103. 7.0.
Straight monocular photo tube "O"	512 358	10.11.0.	9.11.0.
Inclined monocular tube "P"	512 347	17.16.0.	16. 0.0.
Inclined binocular tube "S"	512 348	85.16.0.	77. 4.0.
Green filter	512 077	2.16.0.	2.10.0.
Blue filter	514 316	2. 9.0.	2. 4.0.
Carrying case with lock and key	512 349	13.11.0.	12. 4.0.
Flexible dust cover	512 357	0.13.0.	0.12.0.
Condenser top lens No. 010, oil N.A. 1.25	512 399	28.17.0.	26. 0.0.
Diaphragm insert for demonstration darkground with medium power objectives for condenser 001	513 324	2.16.0.	2.10.0.

PRICES INCLUDE DELIVERY IN U.K., THEY ARE BASED ON TODAY'S COST  
AND ARE SUBJECT TO CHANGE WITHOUT NOTICE.

6/1

MICROSCOPES AND OPTICAL MEASURING INSTRUMENTS FOR USE IN SCIENCE AND INDUSTRY



EXAMPLES OF COMPLETE OUTFITS:SM-LUX Brightfield Microscope  
for transmitted light:

Stand with fine and coarse adjustment  
operated by one drum.

Revolving objective nosepiece for  
5 objectives.

Bayonet mount for microscope tube  
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Mechanical stage No. 16a with low  
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N.A. 90, with swing-out frontlens,  
vertically adjustable, with built-in  
pre centred low voltage lamp system  
with 6V 5W bulb and three step  
transformer, with field of view  
diaphragm in microscope foot.

Mains cable.

SM 0.4.14. 32 - 16a / 001-

512 373 - 500 998

114.17.0.

103. 7.0.

Inclined binocular tube "S"

512 348

85.16.0.

77. 4.0.

Flexible dust cover

512 357

0.13.0.

0.12.0.

Achr. Obj.

4/0.12

519 292

9. 5.0.

8. 6.0.

" "

10/0.25

519 293

12.17.0.

11.11.0.

" "

40/0.65

519 294

19. 6.0.

17. 8.0.

" "

oil

100/1.30

519 295

34. 0.0.

30.12.0.

Paired eyepieces. GF 10x

519 142

32.16.0.

25. 4.0.

309.10.0.

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274. 4.0.

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TELEGRAMS: MICROTOME, LONDON, TELEX.

CABLES: MICROTOME, LONDON

TELEX: LDN 21531

PRICE LISTPAGE 3JULY 1970CODEDUTY PAIDDUTY FREESM-LUX Brightfield Microscope  
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voltage lamp system with 6V 5W  
bulb and three step transformer, with  
field of view diaphragm in microscope  
foot.

Mains cable.

SM 0.4.14 32 - 16a / 001-	512 373 - 500 998	114.17.0.	103. 7.0.
Inclined binocular tube "S"	512 348	85.16.0.	77. 4.0.
Flexible dust cover	512 357	0.13.0.	0.12.0.
NPL Flatfield Obj. 6.3/0.20	519 245	43.17.0.	33.15.0.
" " " 16/0.40	519 246	45. 1.0.	34.14.0.
" " " 40/0.65	519 248	58.18.0.	45. 7.0.
" " " oil 100/1.30	519 249	101. 8.0.	78. 1.0.
Paired eyepieces GF 10x	519 142	32. 6.0.	25. 4.0.
		<u>483. 6.0.</u>	<u>398. 4.0.</u>
		=====	=====

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6/3

MICROSCOPES AND OPTICAL MEASURING INSTRUMENTS FOR USE IN SCIENCE AND INDUSTRY

LEICA

LEICAFLEX

FOCOMAT

PRADOVIT

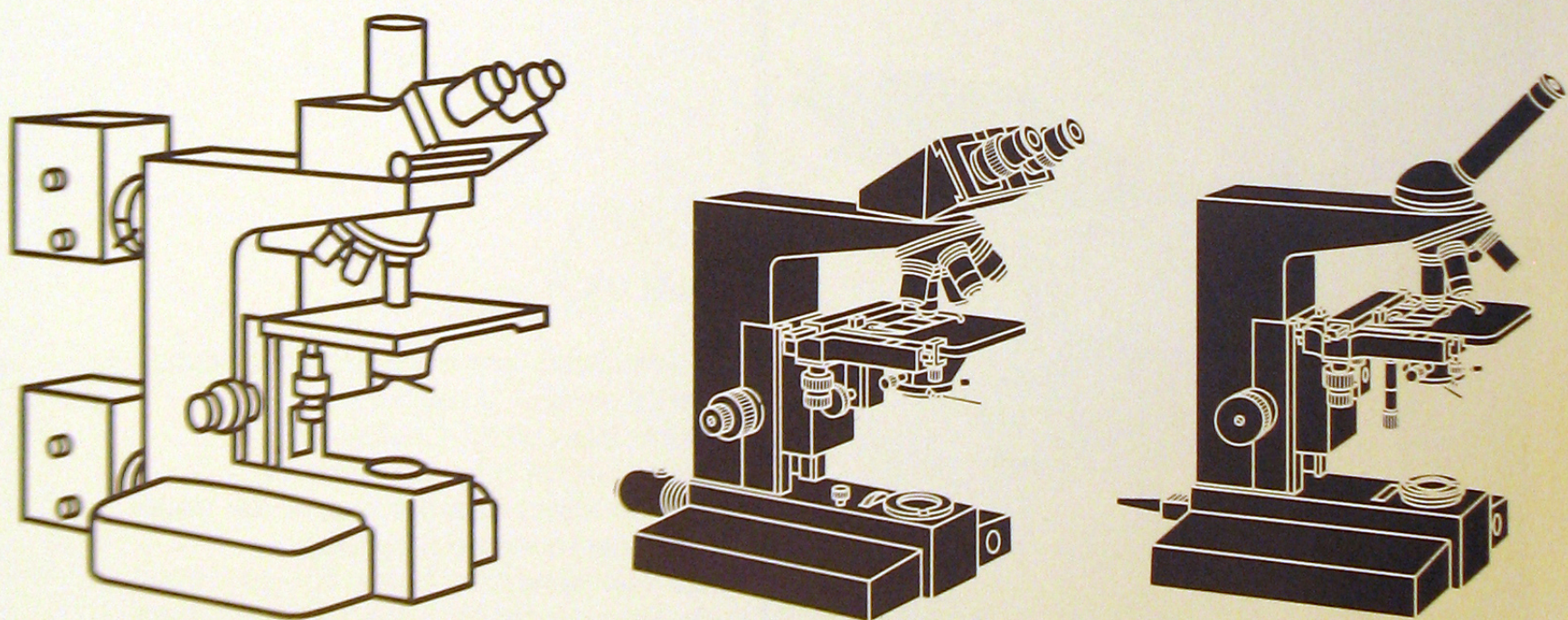
TRINOVID



MICROSCOPES  
MICROTOMES  
MEASURING INSTRUMENTS  
MACHINE TOOLS  
PROJECTION EQUIPMENT  
PHOTOGRAPHIC EQUIPMENT

# Leitz Information

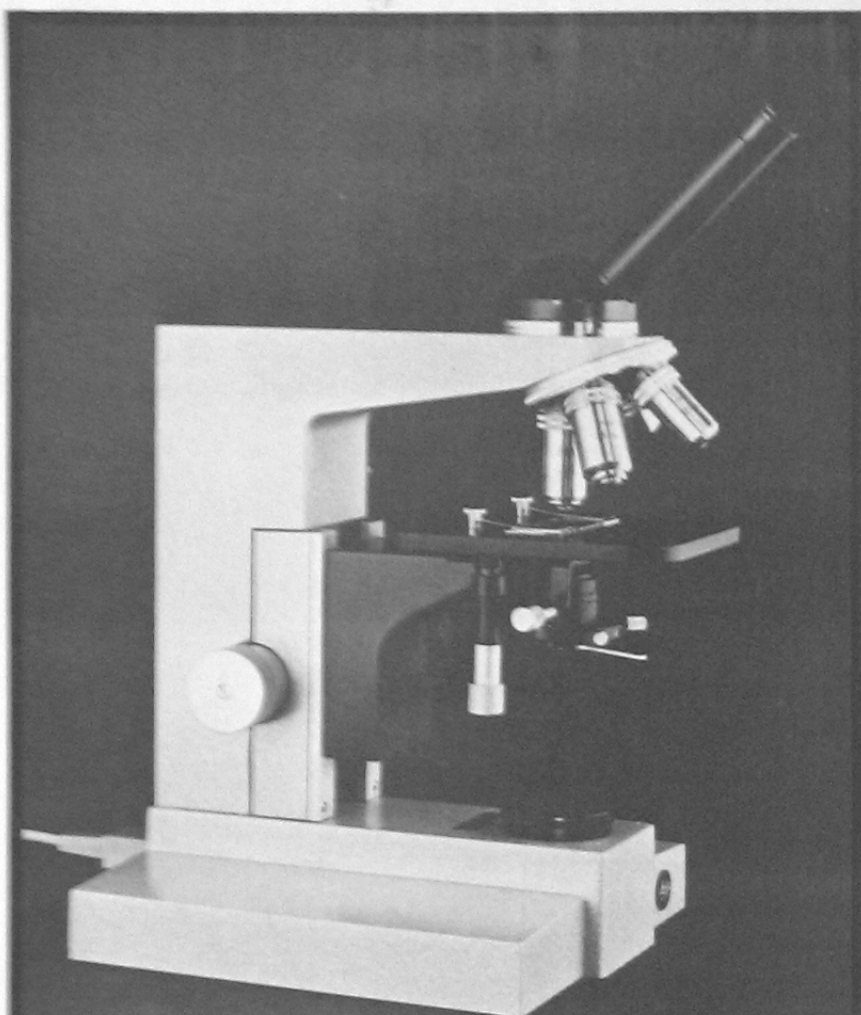
**The new generation of LEITZ Microscopes:**



**After the ORTHOPLAN  
we now present the DIALUX and SM-LUX**



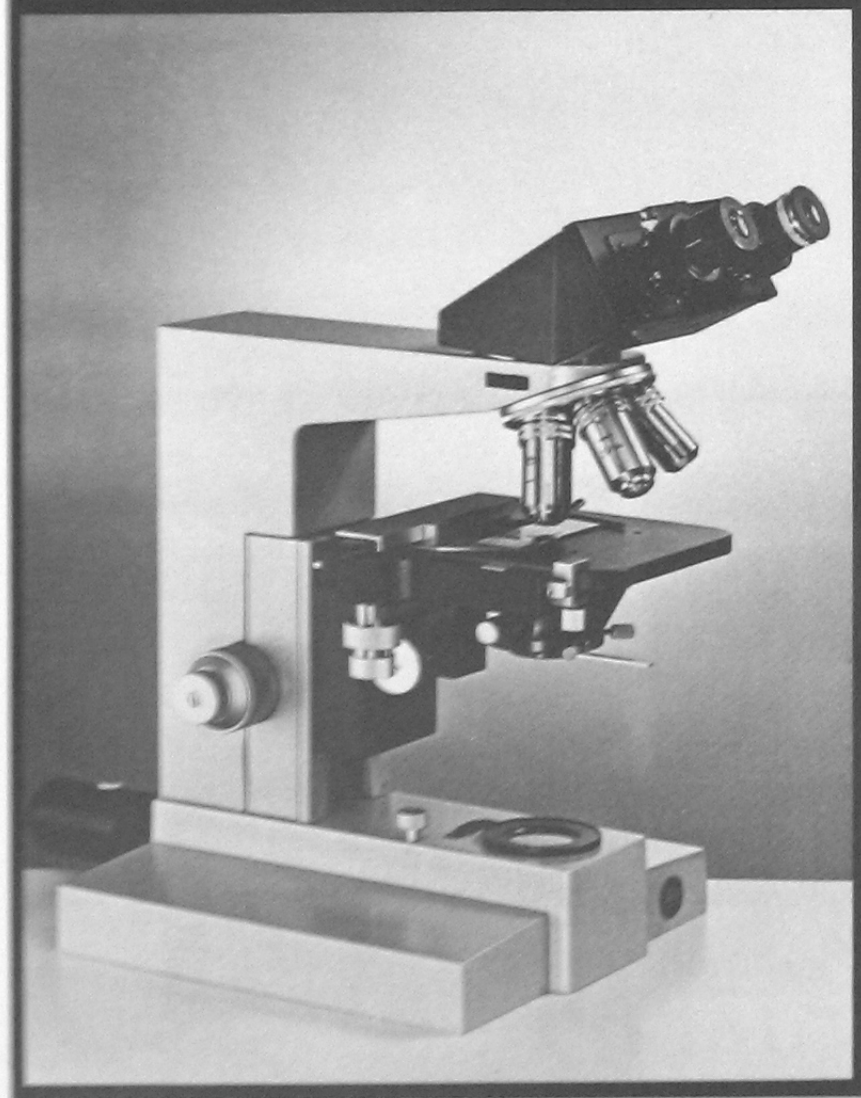
Two new Microscopes to supplement our range of SM, LABORLUX, ORTHOLUX and ORTHOPLAN Microscopes:



### SM LUX

Brightfield Microscope for transmitted light.  
Quadruple objective nosepiece.  
Monocular or binocular tubes.  
Simple object stages or mechanical stages with low set co-axial controls.  
Brightfield condenser with aperture diaphragm and swing-out top, N.A. 0.90 N.A. 1.25.  
Field diaphragm in foot of microscope.  
Built-in low voltage lamp 6V 5W with built-in 3 step transformer.

PRICE: With 4 Achro. objectives, paired eyepieces, mechanical stage, binocular tube and brightfield condenser. **£285. 9.0.**



### DIALUX

Transmitted light microscope for brightfield, darkground or phase contrast.  
Quintuple objective nosepiece.  
Monocular or binocular tubes.  
Simple object stages or mechanical stages with low set co-axial controls.  
Dovetail condenser holder for brightfield, darkground or phase contrast condensers.  
Field diaphragm in foot of microscope.  
Built-in low voltage lamp 6V 15W with separate transformer.

PRICE: With 5 Achro. objectives, paired eyepieces, mechanical stage, binocular tube and brightfield condenser. **£417. 9.0.**

Please ask for detailed quotation or for a demonstration.



**E. Leitz (Instruments) Ltd.** 30 Mortimer Street, London, W.1. Tel: MUSEum 3774