

NPL FLUOTAR objectives
For phase contrast (green engraving)

Tube length 160 mm
Image distance 150 mm
Adjustment length 45 mm



Designation	Free working distance in mm	Cover-glass correction	Colour code for magnification/immersion	Code No.
NPL FLUOTAR 10/0.30 PHACO 1	0.75	DO	yellow	519 497
NPL FLUOTAR 16/0.45 PHACO 1	0.58	D	light green	519 505
NPL FLUOTAR 25/0.55 PHACO 2	0.36	D	dark green	519 506
NPL FLUOTAR 40/0.70 PHACO 2	0.24	D	light blue	519 507
NPL FLUOTAR 63/0.90 PHACO 4 KORR	0.11	D	dark blue	519 559
NPL FLUOTAR 100/1.32 Oil PHACO 3	0.15	D	white/black	519 508

NPL FLUOTAR objectives
Strainfree (red engraving)

Tube length 160 mm
Image distance 150 mm
Adjustment length 45 mm

Designation	Free working distance in mm	Cover-glass correction	Colour code for magnification/immersion	Code No.
NPL FLUOTAR 6.3/0.20 P	2.30	DO	orange	559 131
NPL FLUOTAR 16/0.45 P	0.75	D	light green	559 134
NPL FLUOTAR 25/0.55 P	0.36	D	dark green	559 135
NPL FLUOTAR 40/0.70 P	0.24	D	light blue	559 136
NPL FLUOTAR 100/1.32 Oil P	0.15	D	white/black	559 138

For the objective with correction mount (Korr) coverglass thicknesses from 0.11 to 0.23 mm can be used.

In the NPL FLUOTAR objectives and in the PL 1.6/0.05 and PL 2.5/0.08 objectives available as supplements, the knurled screw on fitting has been moved downwards towards the front lens to increase operational reliability when objectives are changed on the nosepiece and when this is rotated. The rotatory outer sleeve constitutes an additional mechanical improvement of these objectives. It facilitates the reading of the objective data engraved on it in any position of the nosepiece. To differentiate the various objective series, the engraving is in different colours: brightfield/darkground black, phase contrast green, polarized light red. In addition, the primary magnifications of these objectives are indicated by means of coloured rings. The details of the colour markings are listed in the objective tables on pp. 8/9 of this brochure.

Eyeieces of 6.3x to 12.5x magnification are provided for the observation tubes of the LEITZ DIALUX 20. Paired 10x eyepieces are available for spectacle wearers. Here the GF 10x 60° eyepiece must be specially mentioned: its field-of-view index is 20, which represents an improvement of the field performance of the objective/eyepiece combination of 23.5% compared with a conventional optical outfit. This eyepiece can be used with and without spectacles. For the objective with correction mount (Korr) coverglass thickness from 0.11 to 0.23mm can be used.

The object stages Large Mechanical Stage No. 78

The Large Mechanical Stage No. 78, measuring 200 x 140 mm, is part of the standard equipment of the LEITZ DIALUX 20. Its coaxial controls for object movement are conveniently arranged above the right-hand handrest of the microscope foot. Guide tracks running on ball bearings facilitate the exact lining up of the most minute object details at maximum magnification and the smooth adjustment of the stage during the examination of living organisms.

The scanning area is 76 x 50 mm. Graduations and verniers in both directions permit the reading of the object position to an accuracy of 0.1 mm. Smear preparations on the usual microscope slides can be scanned throughout their full extent.

Circular rotating and centring mechanical stage

As an alternative to the stage No. 78 the LEITZ DIALUX 20 can be equipped with the circular rotating and centring mechanical stage. Its diameter is 150 mm, the scanning area 76 x 26 mm, graduations and verniers permit the reading of the object position to 0.1 mm. Rotation and y movement can be clamped in any position. The object guide can be removed for the investigation of large specimen plates. The rotating and centring object stage is particularly well suited for lining up the objects in photomicrography, cinemicrography, and when for line-investigation, for instance, of linear structures in interference contrast or in polarized light. Both stages are permanently fixed to the microscope stand in the factory, this should be borne in mind when the stage is ordered.

The condensers

So that the performance of the NPL FLUOTAR objectives can be utilized to the full, the standard condenser SK and the universal condenser UK have been designed; both optically and mechanically they offer considerable advantages over the conventional versions. Both types of condenser have the following properties in common:

- 1.** "Köhler's illumination", once set, is perfectly maintained during magnification change for all objectives (including the PL 1.6:1) without vertical adjustment of the condenser. For objectives of reproduction ratios smaller than 10:1 it is merely necessary to swing out the front lens of the condenser. This movement actuates the simultaneous turning-in of a field lens, which automatically restores exact illumination of the object field and "Köhler's illumination".
- 2.** For investigations in darkground, only the brightfield condenser top is exchanged this obviates the need for a special darkground condenser.
- 3.** The centring device for alignment with the optical axis of the microscope is built into the dovetail fork of the condenser fitting. This makes the centring mechanism hitherto necessary on each interchangeable condenser redundant for the LEITZ DIALUX 20.
- 4.** The field diaphragm is built into the foot of the stand and can be moved in all directions to ensure rapid

and highly precise fine correction of its position relative to the condenser. Its diameter can be adjusted with the same manipulation by rotation of the sliding mount.

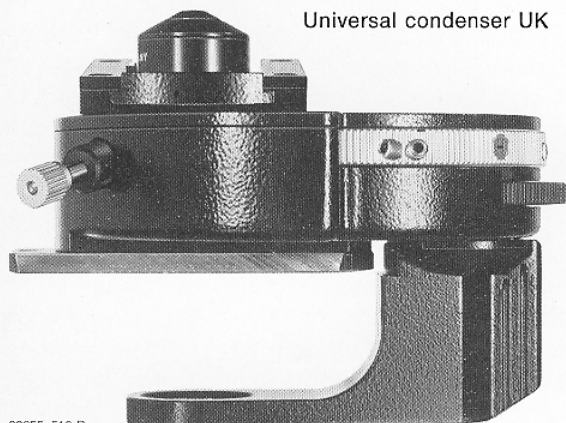
The achromatic condenser top for brightfield illumination has a numerical aperture of 0.90. It allows the unrestricted utilization of the resolving power of the NPL FLUOTAR dry objectives and is also completely adequate for all routine investigations with the 100/1.32 Oil immersion objective. For investigations of very fine structures and for photomicrography in which the highest demands of the resolving power of the optical systems are made the immersion condenser top, N.A. 1.32 is available.

Darkground condenser tops of numerical apertures 0.80 to 0.95 or 1.19 to 1.44 are used for darkground investigations and fluorescence observations with transmitted-light excitation. The various condenser tops are rapidly and easily interchanged on the changing thread of the swing-out front part of the condenser. For observation of objects immersed in liquids which must be illuminated through the bottom of laboratory vessels (Petri dishes) or counting chambers, condenser top of long intercept distances are available.

In addition, these condensers can be used in conjunction with the polarizing device for the location of birefringent components of specimens.

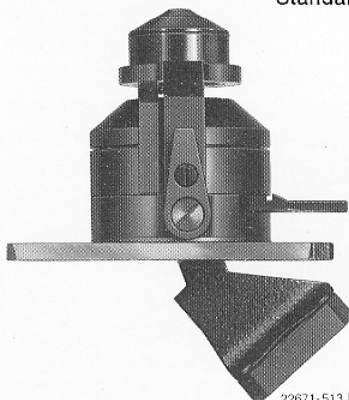
The universal condenser UK for the LEITZ DIALUX 20 is designed mainly for work in which a change of the optical

Universal condenser UK



22655-513 R

Standard condenser SK

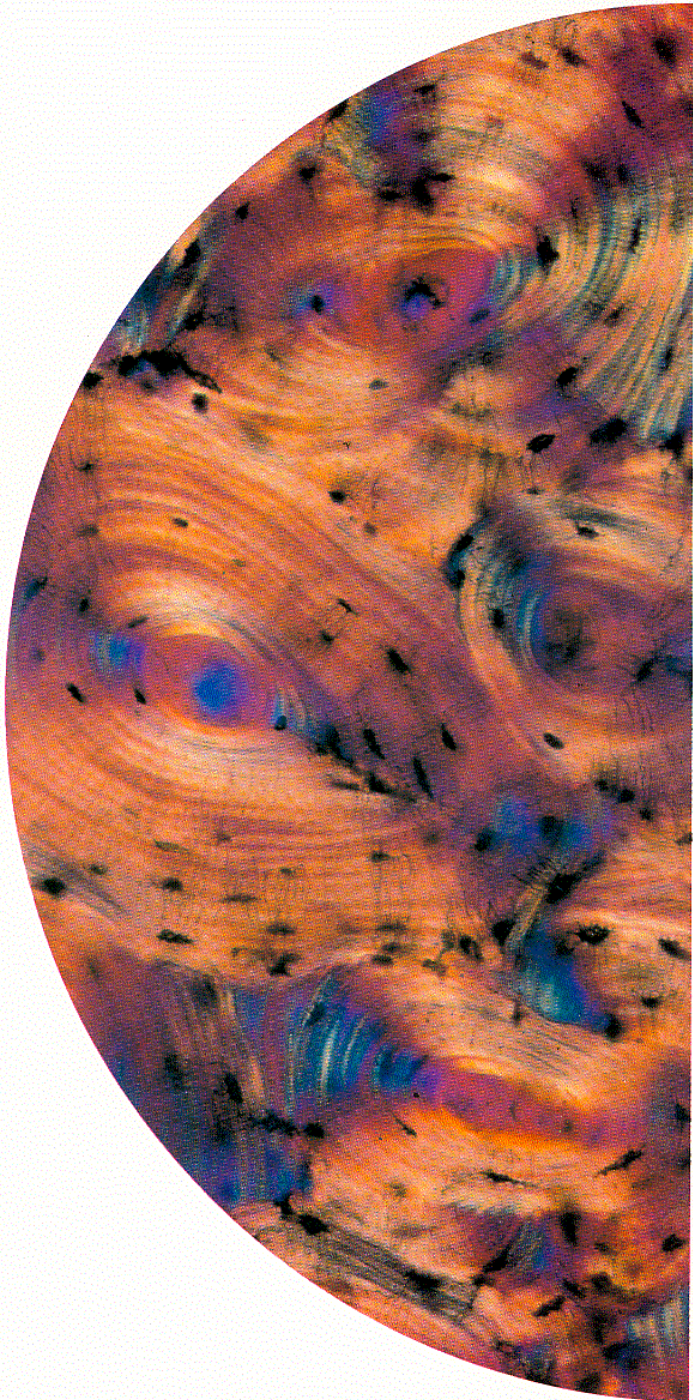


22671-513 R

illuminating and contrasting methods is required to utilize as fully as possible the information contained in the specimen.

The condenser UK has all the properties of the SK standard version. But it has additional facilities for a light-ring turret for phase contrast illumination or a prism turret for interference contrast. These revolving turrets can be interchanged by the user at any time. The light rings for phase contrast illumination can likewise be used individually. This permits, for instance, the combination of conventional brightfield objectives with phase contrast optical systems in the same optical version and the instant changeover between various methods of observation.

The Wollaston prisms necessary for interference contrast observation are inserted in the revolving turret in the factory and permanently aligned to ensure precision adjustment with the prisms on the objective side and therefore perfect interference contrast images.



Thin section of Havers' Lamellar system within the compacta of a tubular bone; cattle, 15 μm .
Polarized light. Formol fixation, thionine-picric acid.
NPL FLUOTAR 16/0.45,
microscope magnification 160x.
Preparation: Prof. Dr. Th. Peters,
Zentr. f. Anatomie u. Cytobiologie, Gießen.

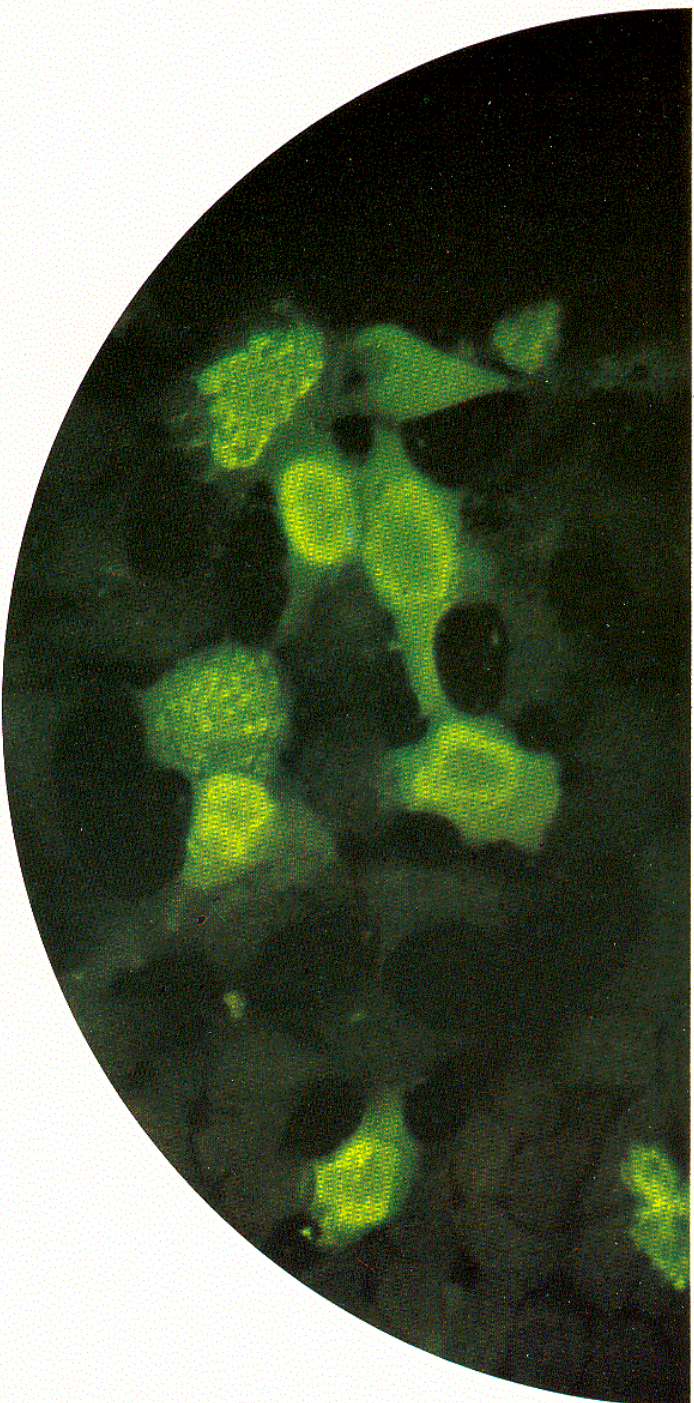
The light sources

In the DIALUX 20 EB microscope the illuminating optical system, 6 V 20 W tungsten halogen lamp, regulating transformer and voltmeter are built into the foot of the stand. The knurled knob for setting the illuminating intensity is on the right-hand handrest. The lighting intensity set can be conveniently checked by the user on the reading instrument built into the foot of the stand. It lights up as soon as the switch for the mains supply of the microscope illuminator is actuated. This makes its operational state immediately apparent also in the darkened room.

The lamp housing 102 Z for the LEITZ DIALUX 20 is locked in the bayonet mount on the back of the foot of the stand. In addition to the illuminating optical systems it contains a 12 V 100 W tungsten halogen lamp as standard light source. This can be replaced by gas discharge or spectrum lamps of up to 100 W at any time.

A sufficient number of powerful light sources are thus available for fluorescence investigations, photomicrography and cinemicrography, microscope photometry, and the projection attachment.

Lamp and illuminating mirror can be precision centred in the microscopic beam. The focusing lamp condenser system makes fully homogeneous illumination of the object field possible at all stages of magnification. With a special centring disc to be placed on the dust glass in the foot of the microscope the adjustments can be carried out conveniently and reliably with the control knobs on the outside of the lamp housing and allow optimum utilization of the light source in use.



Adeno virus, type 7
FITC fluorescence
FL 40/0.85
microscope magnification 100x

The LEITZ DIALUX 20 fluorescence microscope



Outfit for fluorescence investigations in transmitted-light excitation*

For the investigation of fluorochromed specimens the DIALUX 20 with Lamp Housing 102 Z can be equipped for **transmitted-light excitation** of fluorescence with little technical and financial outlay. For routine investigations which do not call for very high luminous density of the exciting radiation and for the excitation in blue (e. g. FITC fluorescence) and in the green (e. g. TRITC fluorescence) region of the spectrum the 100 W tungsten halogen lamp of the standard outfit is often already adequate. For only weakly fluorescing specimens and especially for fluorescence excitation in the UV region the Lamp Housing 102 Z should, however, always be fitted with a 50 W ultra-high-pressure mercury lamp.

It is best to replace the brightfield condenser top with a condenser top for darkground to obtain a dark background and thereby optimum contrast of the fluorescent image. Such a fluorescence outfit also includes, depending on the fluorochroming of the specimens, at least one filter set consisting of exciting and suppression filters for UV, blue, or green excitation.



Outfits for fluorescence investigations with incident-light excitation*

To extend the special advantages of this method also to the LEITZ DIALUX 20, the PLOEMOPAK 2.4 fluorescence vertical illuminator has been designed. It can be used equally well on the DIALUX 20 EB (with built-in illuminator) and on the stand with attachable Lamp Housing 102 Z and is inserted in the rapid changing mount between the top part of the stand and the observation tube.

The 50 W ultra-high-pressure mercury lamp in the Lamp Housing 102 Z serves as the exciting light source; the lamp housing is attached to the light-conducting tube of the fluorescence illuminator.

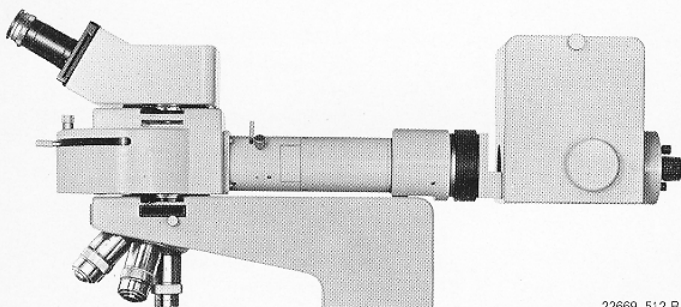
A changing device for 3 filter blocks is built into the PLOEMOPAK 2.4. It permits the instand change of the spectral region of excitation. In addition, each filter block can be conveniently interchanged in the changing device and can therefore be freely chosen. It consists of the exciting filter, the dichroic beam splitter and the suppression filter on a common filter support. Interchange takes less than a minute, and the new filter block will be automatically adjusted in the optical path of the microscope.

A special clamping device of the filter changer allows the changeover between two neighbouring filter blocks at will. This possibility is useful particularly when the specimen under investigation had been treated with two fluorochromes which have to be excited with different light wave lengths.

Filter polarizing device

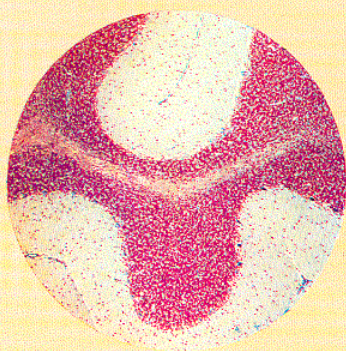
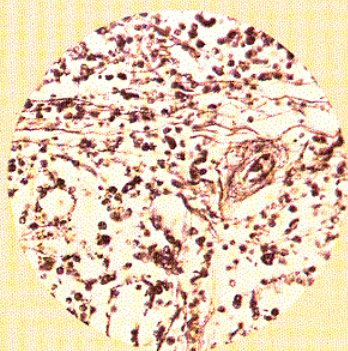
This serves for the location of birefringent components of the specimen and consists of polarizer for mounting on the dust glass in the foot of the stand, analyser in slide, for insertion in the filter slot of the stand of the microscope.

Incident light fluorescence illuminator
PLOEMOPAK 2.4

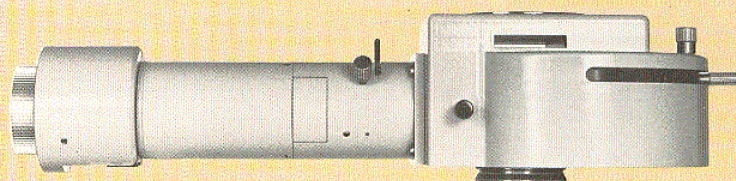


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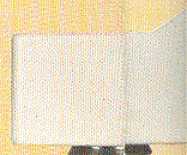
* Detailed explanations of fluorescence microscopy with LEITZ microscopes is contained in the List No. 512-125 a. The possibilities and outfits described there basically also apply to the LEITZ DIALUX 20.



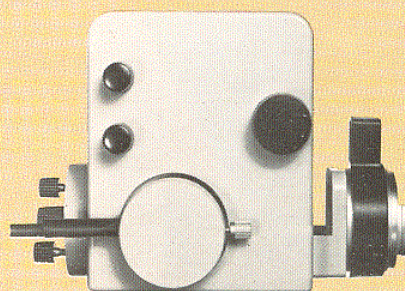
Projecting head



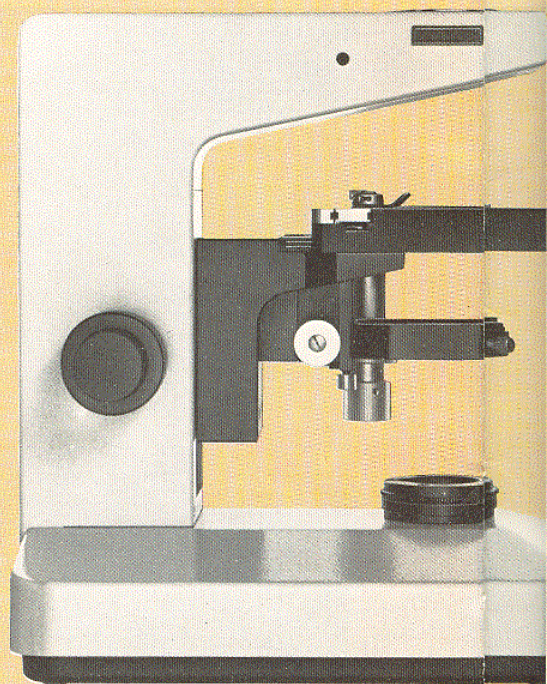
PLOEMOPAK 2.4



binocular tube S



Lamp housing



Stand DIALUX 20



LEICA



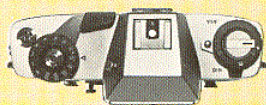
adapte
(for LE



LEICA MDa



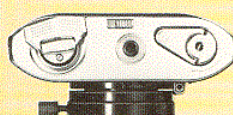
adapter 0.32
for LEICA-M)



LEICAFLEX SL 2



adapter 0.32
(for LEICAFLEX)



film transport housing

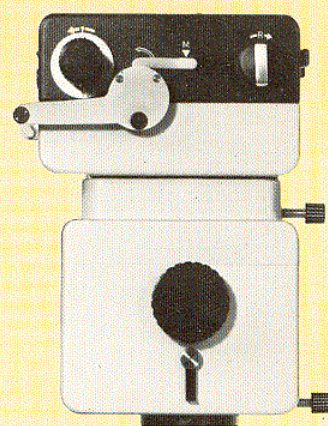
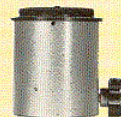


adapter 0.32
(for film transport
housing)

electrical
shutter unit



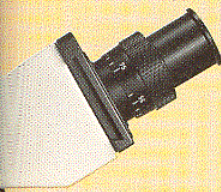
clamping collar



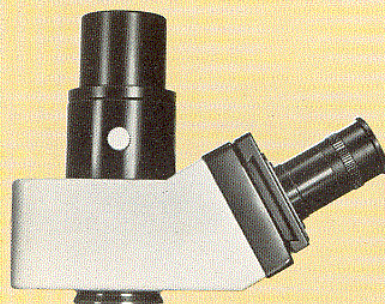
WILD automatic
photomicrographic system
MPS 50



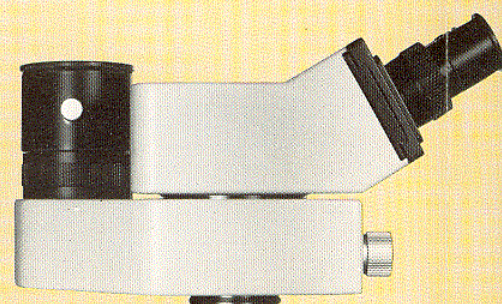
6.5 x 9cm cam
attachment



tube S



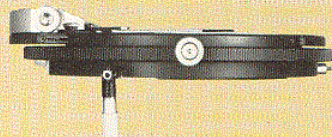
binocular phototube FSA



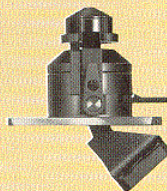
inclined binocular tube SA
with phototube HU



quintuple revolving nosepiece



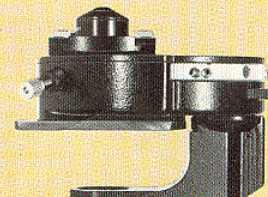
centring, rotating
mechanical stage



Condenser SK



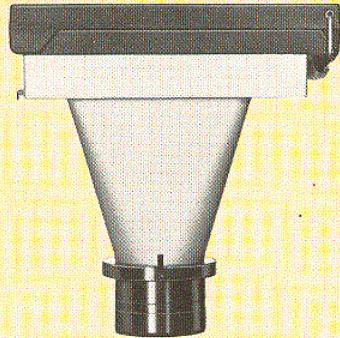
dark field
condenser
head



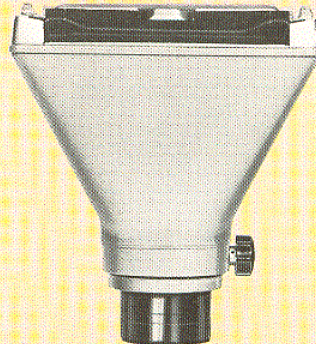
Condenser UK



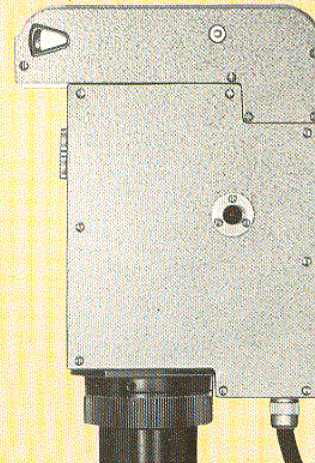
6.5 x 9cm camera attachment



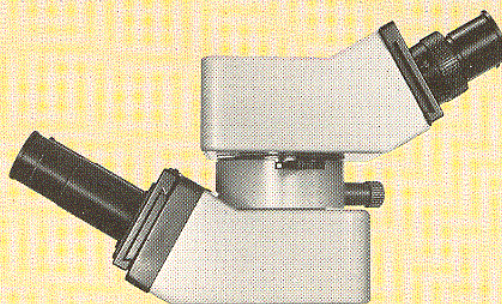
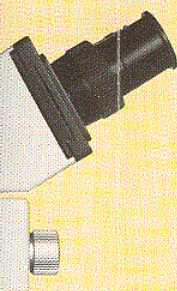
POLAROID CB 101 camera attachment



9 x 12 (4 x 5'') camera attachment



ORTHOMAT W



discussion and demonstration body

LEITZ DIALUX 20

All attachment cameras by Wild Heerbrugg and LEITZ Wetzlar for photomicrography can be used on the LEITZ DIALUX 20 laboratory and research microscope. Technical details of the various photomicrographic outfits can be obtained from the relevant special brochures.

The automatic photographic attachments must be specially mentioned here. They appreciably facilitate work whenever a microscopic finding is to be recorded reliably, rapidly and effortlessly by means of black-and-white or colour photography.

LEITZ COMPIPHOT®-AUTOMATIC is a universal system camera with automatic exposure control for shutter speeds from 1/125 sec to 5 min at 50 ASA.

Camera bodies for the 35 mm, 6.5 x 9 cm, 9 x 12 cm (4 x 5") formats and 3¼ x 4¼" Polaroid can be quickly and conveniently interchanged on the shutter part with automatic, vibration-damped central shutter.

The fully transistorized control unit allows setting for film speeds from 6-37 DIN (3-4000 ASA) at 1 DIN (1.25 x ASA) increments. Warning lights indicate the correct function of the exposure control within the set range (film format, film speed) and when this is exceeded. Faulty exposures, for instance owing to excessive brightness of object illumination, is thereby prevented.

Picture area and focusing are controlled in the binocular phototubes FSA (LEITZ) or SA/HU (WILD).

The WILD MPS 50 automatic photography system

In this attachment camera for formats from 35 mm to 9 x 12 cm (4 x 5") shutter speed and film transport are electronically controlled. A pointer instrument indicates the shutter speed and — especially for long-time exposures — the exposure process in % time.

A special automatic mechanism to correct the so-called reciprocity law failure is built in and adjusted to the most frequently used colour films. It can be disengaged for films for which it is not required. A blank exposure key permits multiple exposures, manually operated exposures or exposures at constant shutter speed.

Automatic light metering from 1/100 sec to more than 2 hours is integrating and centre weighted. Film speed can be ad-

justed between 5 and 43 DIN (2½ and 16,000 ASA) at 1 DIN (1.25 x ASA) increments. Referred to the basic calibration of the instrument such a correction can be carried out within the range between 4x shorter and 4x longer exposure times. Picture area and focusing are controlled on the binocular phototubes SA/HU (WILD), FSA (LEITZ) or through a focusing telescope.

The WILD MPS 50 automatic photography system with the camera attachments for the various film formats of the LEITZ COMBIPHOT AUTOMATIC: for the 35 mm format, a special motor-driven film transport housing is also available.

LEITZ ORTHOMAT-W

This fully automatic microscope camera, well tried for years, for the 35 mm format can naturally also be used on the binocular tubes FSA and SA/HU for the LEITZ DIALUX 20.

In the ORTHOMAT-W the automatic exposure measurement can be carried out via a photomultiplier either integrating the entire image area or as spot measurement of a picture portion (darkground, fluorescence) essential to the record. Exposures from 1/200 sec to the longest exposure time occurring in photomicrography are possible. The ORTHOMAT-W can be adjusted to film speeds from 3 to 38 DIN (1½ to 5000 ASA) at 1 DIN (1.25 x ASA) increments.

The eyepiece magnification in the photographic beam can be set continuously between the factors 2-2.5-3.2. This ensures optimum utilization of the film format. Picture area and focusing are controlled with the binocular tube.

Detailed brochure: List No. 540-39.

Projection attachment

This accessory for the rapid and convenient scanning of microscopic specimens or their demonstration to a small number of observers permits the projection of the image on a groundglass screen of 155 mm diameter. The projection attachment is eminently suitable for use on the LEITZ DIALUX 20 with Lamp Housing 102 Z and 100 W tungsten halogen lamp.



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worldwide.**

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List **512/149/Engl.**

Printed in W-Germany

VI/76/FY/SD

Thin section through the occiput of alpine newt.

Bouin fixation; 7 μ m.

Carmalaun-Pikronigrosine.

PL 1,6/0.05

microscope magnification 16x

Preparation: Prof. Dr. Th. Peters

Zentr. f. Anatomie u. Cytobiologie, Gießen.

