

LABORLUX

Laboratory microscope for transmitted and incident light



LABORLUX®
for transmitted light
adaptable for incident light

Functional, smooth design, corrosion-resistant light-alloy casting.

Instant readiness for use through a built-in illuminator with field diaphragm.

Interchangeable tubes, revolving nosepieces, condensers, lamps.

Relaxed, strain-free posture due to convenient, constant level of the observation tubes.

Rapid and reliable focusing by low-set single-knob controls on both sides of the stand.

Adaptable for phase contrast and fluorescence photography or micro-projection in transmitted light as well as for incident-light investigations with the ULTROPAK®.

Versatile application of microscope accessories such as heating stages, television attachment, etc.



LABORLUX UB
for incident light
adaptable
for transmitted light

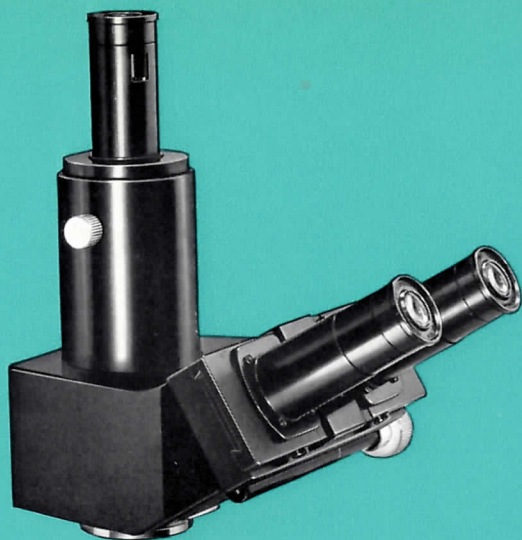
Stand as described on p. 2, but with interchangeable object stages.

60mm vertical adjustment range of the object stage permitting incident-light investigations even of large objects.

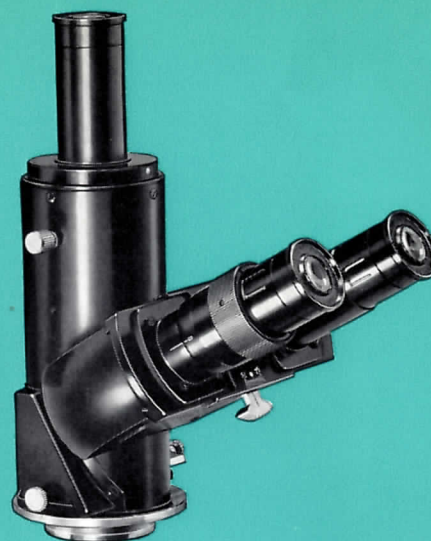
Clear and brilliant images through the ULTROPAK darkfield incident-light illuminator and objectives of up to 100 x primary magnification, and Opak vertical illuminator (see p. 12).

Unlimited possibilities of extension for all modern and classical methods of microscopy in transmitted light.





FSA Binocular tube



FS Binocular tube

Stand

The smooth, extremely rigid stand is made of corrosion-resistant light alloy. The single knob coarse- and fine focusing mechanism, running on precision ball races, is built into the stand, with controls on both sides, and allows rapid and reliable focusing of the specimen at all magnifications. The focusing mechanism actuates the object stage; focusing is therefore unaffected by the weight of any accessories on the microscope tube. Also, inclination and level of the tubes remain unchanged.

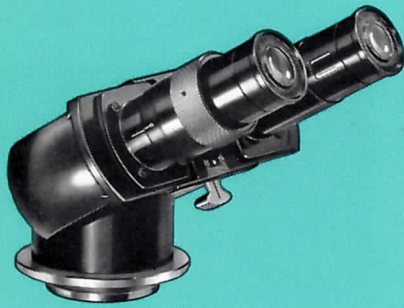
The design of the LABORLUX UB stand is identical, except for a changing guide for the object stages.

Five tubes are available for the LABORLUX and LABORLUX UB microscopes. It is advisable to use binocular tubes which allow observation with relaxed eyes, corresponding to normal vision. Image depth and quality are enhanced, and minute structures are more readily identified. The possibility of photomicrography should be considered when a stand of LABORLUX type is bought; the purchase of an FS or an FSA binocular tube, the latter with automatic sharpness compensation, is therefore recommended. Their outstanding characteristics are strainfree observation and instant use for photomicrography. The FSA tube is recommended especially for cinemicrography, since it guarantees fully parfocal images, in eyepieces and film plane for any interpupillary distance. Alternatively, the more moderately-priced binocular tube S can be used for observations, and the monocular tube O for photomicrography. As a simple outfit the microscope can be supplied with the monocular tube P.

All binocular tubes can be adjusted for the interpupillary distance of the user, and focused for different eyesight.

Objective revolving nosepieces

The quadruple objective revolving nosepiece is interchangeable with other nosepieces. A slot above the revolving nosepiece accepts a filter slide, e.g. for fluorescent microscopy. The revolving nosepiece is of course suitable also for the LABORLUX UB.



S Binocular tube



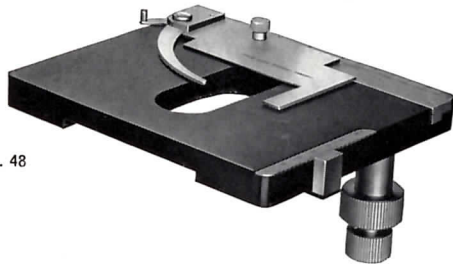
P Monocular tube



O Monocular tube

Object stages *

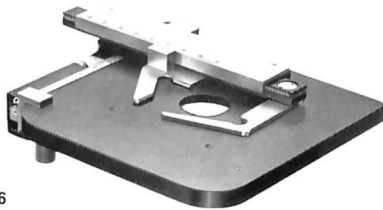
All object stages of the LABORLUX are permanent fixtures, so that the type of stage required should be selected before the microscope is ordered. The following types are available: –



No. 48

Large mechanical stage No. 48.

This stage is graduated being equipped with scales and verniers. The low-set, coaxial stage controls facilitate operation, with rapid systematic scanning of the object. An object area of 76x50mm can be traversed. Stage area 160x138mm. The object guide can be removed for large specimens.



No. 26

Object stage No. 17.

A moderately-priced version of our large mechanical stage No. 48, consisting of object stage No. 19 and attachable mechanical stage No. 21.



No. 19

Square object stage No. 19.

This stage is particularly suitable for classroom outfits. Stage area 130x125mm. The usefulness of this stage can be increased by fitting the attachable mechanical stage No. 21.



No. 23

Centring rotating stage No. 23.

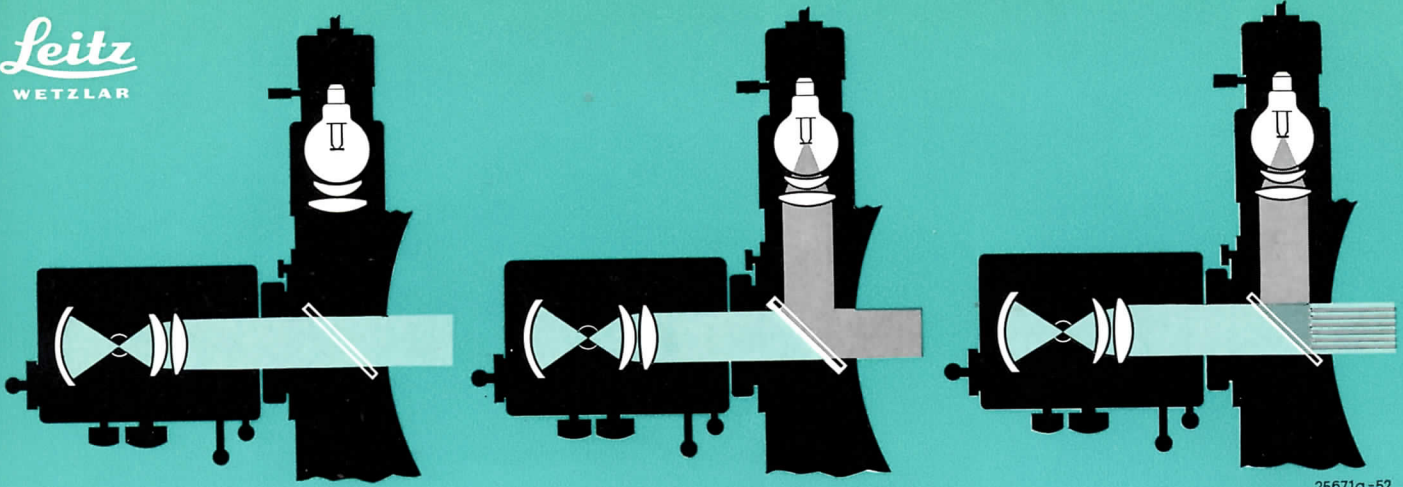
This centring object stage is eminently suitable for general polarized-light investigations and for accessories such as heating stages, etc. Diameter: 130mm. Here, too, the attachable mechanical stage No. 43 can be fitted.

Attachable mechanical stages Nos. 21 and 43 (not illustrated)

No. 21 with scales and vernier and low-set coaxial drives, fitting square object stage No. 19.

No. 43 without scales, with upper individual knobs for the mechanical movement, fitting rotating stage No. 23.

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Gas-discharge lamp

Tungsten filament lamp

Gas-discharge lamp and tungsten filament lamp

Beam path in the lamp housing 250

Illumination for transmitted light

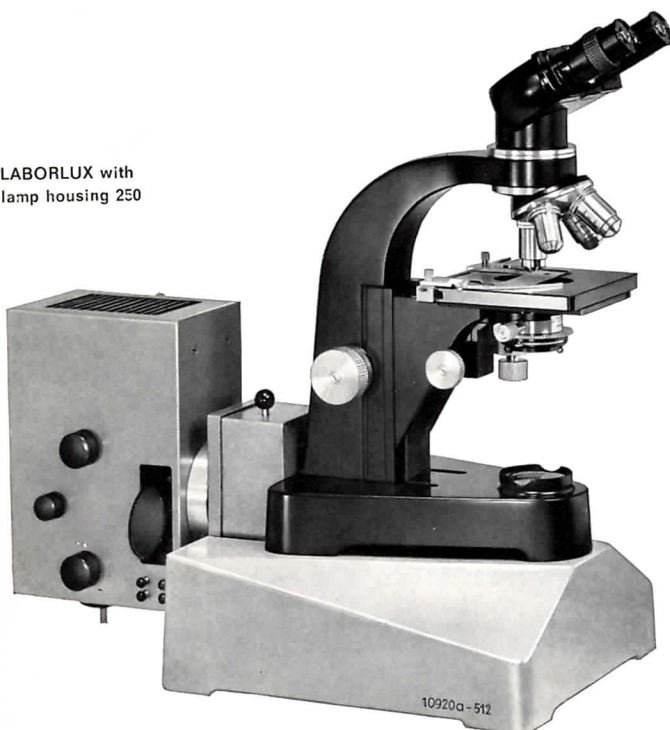
Modern methods of microscopy require a high standard of lighting efficiency. The only suitable light sources besides high-pressure lamps are low-voltage lamps, whose almost point-shaped coils and high luminous densities make them almost ideal.

The basic outfit of the LABORLUX microscope includes a built-in, centring 6 v 15 W low-voltage lamp which is generally adequate for the purposes of visual observation and photomicrography. All details can be identified with sufficient accuracy even at the highest magnifications with oil immersion or phase contrast objectives.

The built-in light source is readily replaced by the lamp housing 250 in cases requiring special light sources, such as high-pressure mercury burners for fluorescence microscopy, or xenon burners for micro-projection. This lamp housing accepts all air-cooled high-pressure lamps of up to 250 W. In addition, the most varied special lamps, e. g. deuterium lamps etc., can be used. The microscope is placed on the base of the lamp housing. The mirror housing 15 S is supplied for the attachment of the 6 v 15 W low-voltage lamp, to enable the microscopist to use high-pressure lamp and low-voltage lamp alternately or work with mixed light from both sources.

However, it must be pointed out that the lamp housing 250 can be used only for transmitted light on the LABORLUX. For incident-light examinations with the LABORLUX or LABORLUX UB only the built-in 6 v 15 W low-voltage lamp of the ULTROPAK incident-light-illuminator is available. Our ORTHOLUX® research microscope is recommended for fluorescence examinations or for special methods of microscopy in incident light for which the low-voltage lamp of the ULTROPAK is unsuitable.

LABORLUX with
lamp housing 250



Condensers for brightfield transmitted light

The versatility of our LABORLUX as a routine or research microscope for scientific departments, industrial laboratories or for the medical practitioner calls for the greatest possible adaptability of its optical equipment. As a rule the choice will lie between the swing-out condensers No. 601 or 602 for the basic outfit of the LABORLUX. Köhler's Illumination can be set up with all swing-out condensers of the Class 600.

Aspherical swing-out condenser No. 601, A 0.90

This condenser consists of the bottom part No. 600 with aperture diaphragm and condenser lens, and the swing-out condenser top No. 001 with aspherical lens. The spherical correction of the condenser is matched with that of our achromatic objectives. It is therefore recommended when the stand is used mainly for general investigations with achromatic objectives. The condenser is suitable also for fluorescence investigations provided the fluorescence of the specimen is sufficiently bright. For weakly fluorescing specimens the special fluorescence condenser No. 72 r A 1.40 is recommended. As the intensity of object illumination increases with the square of the condenser aperture, a considerably higher fluorescence excitation is achieved with the condenser No. 72 r.

Achromatic swing-out condenser No. 602, A 0.90

If higher standards of illumination are required the condenser No. 602 consisting of the bottom part No. 600 and the achromatic condenser top No. 002 is recommended. The advantages of more highly corrected optical systems such as fluorites and apochromats can be fully utilized only with this condenser.

Both condensers have a numerical aperture of 0.90, with which practically all dry objectives can be fully illuminated. Immersion objectives, too, can be used with this condenser except where the resolution of the most minute structures is essential; here, our condenser No. 603 of aperture A 1.25 is required.

Achromatic-aplanatic swing-out condenser No. 603, A 1.25

It consists of the same bottom part as the two above-mentioned condensers, and the condenser top No. 003. It is therefore easy to convert an existing condenser No. 601 or 602 into the condenser No. 603 simply by interchanging the top. This condenser has been designed mainly for use with oil immersion apochromats and in colour photomicrography at large condenser apertures. Its outstanding characteristics are excellent aspherical and chromatic correction, high light utilization and optimum fusion of rays in the field of view. In order to make full use of the large aperture, immersion oil must be introduced also between the front lens of the condenser and the underside of the object slide during the use of immersion objectives. This condenser is unsuitable for fluorescence microscopy.



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Condenser bottom part No. 600 with five different condenser tops 002, 003, 005, 006, 007, for the swing-out condensers No. 602, 603, 605, 606, 607.

Further condenser tops of long intercepts are available for investigations in culture chambers, for very thick specimens, for intravital microscopy, and for micromanipulators. They form an image of the field diaphragm at a distance corresponding to the working distance above the stage. Further details are given in the table.

for long intercepts

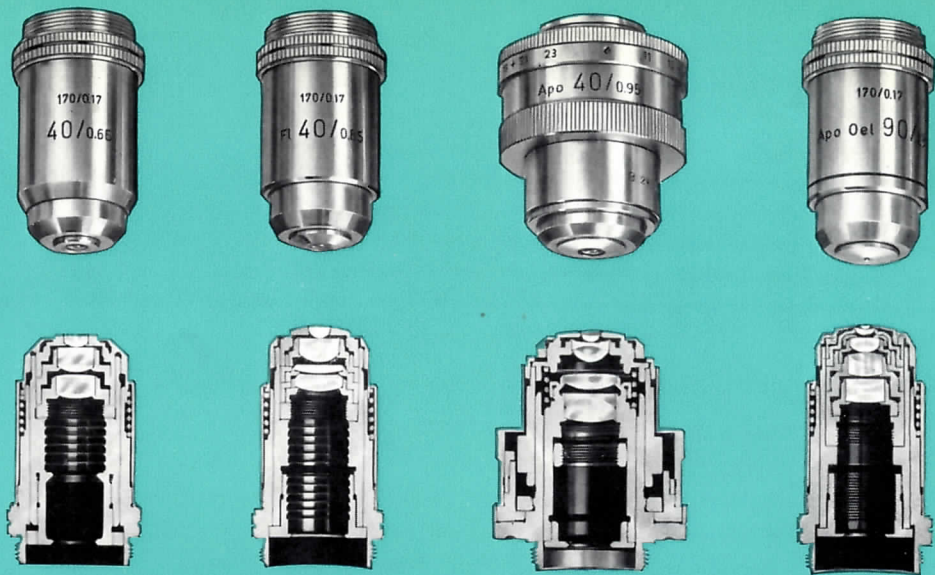
Code No.	Description	Working distance	Corrected for
605	achromatic condenser No. 605, A 0.70, consisting of bottom part No. 600 and condenser top 005, engraved achr. 0.70 L 4	4mm	4mm glass, water, agar-agar, etc.
606	non-achromatic condenser No. 606, A 0.60, consisting of bottom part No. 600 and condenser top 006, engraved 0.60/L 11	11mm	6mm glass etc.
607	non-achromatic condenser No. 607, A 0.45, consisting of bottom part No. 600 and condenser top 007, engraved 0.45 L 20	20mm	6mm glass etc.

Condenser No. 72r, A 1.40

The three-lens condenser No. 72 r with aperture diaphragm and filter holder has been designed mainly for fluorescence microscopy. Because of its large aperture this is the best condenser when the range of specimens includes weakly fluorescing preparations.



LEITZ objectives
of various corrections,
normal view and cross section



Objectives for transmitted light

Microscope objectives are generally classified according to their color correction as achromats, fluorite systems, and apochromats. Achromatically and apochromatically corrected plano objectives represent another category. These terms are based on physical definitions explained in our List "Objectives and Eyepieces".

Achromats

Achromats are spherically and chromatically corrected objectives, for which chromatic aberration* has been eliminated for two colours, defined by the C and F lines of the spectrum representing a specific red and blue colour respectively. The intermediate spectral colours, too, are included in this correction as far as possible and, above all, across the entire aperture of the objective. This ensures high image quality, particularly in the middle part of the spectrum so that achromatic objectives are well suited for visual observation. For photomicrography on black-and-white film a green filter is indicated which cuts out especially the photographically effective, but not completely corrected violet region.

Apochromats

Apochromats are objectives in which three spectral colours are completely combined. Their general image definition is therefore of outstanding quality, sharpness, contrast and resolution are unsurpassable. These objectives should therefore be chosen for research problems in which the identification of most minute structural details is decisive. This high image quality is achieved by the liberal use of fluor-spar or similar materials. Due to the increased correction, apertures, particularly of apochromatic dry systems, are larger than those of achromats of the same power so that a considerably brighter image is obtained.

Fluorite systems

Fluorite systems, also described as semi-apochromats, have a smaller number of fluor-spar lenses, and their price is correspondingly lower than that of apochromats. Nevertheless, their apochromatic correction leaves little to be desired so that in the majority of cases they will be fully adequate for colour photomicrography.



12566-513

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LEITZ plano objectives

Plano objectives

Flatfield objectives

All microscope objectives of conventional design form a curved image of a plane through the object. As a result, a given plane through the object, on an extremely thin section cannot be seen or photographed at uniform sharpness across the entire field of view. This "curvature of field" has been eliminated in our plano-objectives, which produce images perfectly plane throughout the whole field of view, and sharp from corner to corner; they are therefore particularly suitable for the observation of smear preparations and very thin sections. Their large field of view makes rapid scanning of preparations possible, an advantage which is greatly appreciated during diagnostic work.

But their greatest importance is in photomicrography. They produce photographs of thin sections with uniform, corner-to-corner sharpness. Here, too, every photograph taken with a plano-objective provides considerably more information than its equivalent taken with an objective of conventional design. Plano-objectives must be used with PERIPLAN-widefield eyepieces. For further details please consult our list [513-55](#)



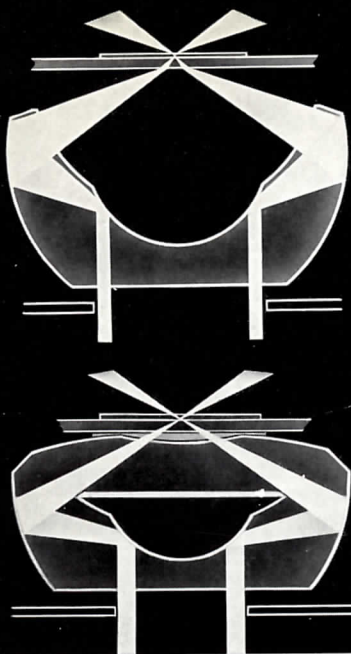
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Eyepieces

Our newly designed objectives have been computed for optimum performance when used with our PERIPLAN® widefield eyepieces, which have much larger fields of view than conventional PERIPLAN eyepieces.

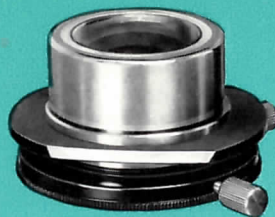
Compared with the fields of view of standard periplanatic eyepieces, with field diameters from 110-150mm to the observer, the periplanatic widefield eyepieces have field diameters from 180-250mm.

In addition we supply Huygens eyepieces, highpoint eyepieces for spectacle wearers', and pointer eyepieces.



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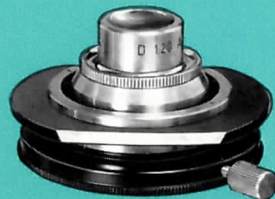
Darkfield condensers



D 0.80

Dry darkfield condenser No. 84
D 0.80
(inner limiting aperture 0.80).

For serial examinations and general scanning with medium- and high-power dry systems.



D 1.20

Immersion darkfield condenser No. 82
D 1.20
(inner limiting aperture 1.20).

For high magnifications, particularly with oil immersion objectives. Standard outfit for clinical and bacteriological investigations.

Special outfits for biology, medicine and technology

Transmitted-light darkfield

Unstained objects or small particles can often be investigated successfully in darkfield. Particularly well suited for this type of illumination are extremely small objects which are clearly visible against the dark background of the surrounding field, such as protozoa, bacteria, etc. In extensive objects, often only the marginal portions will reveal their structural detail, while internal structures are not reproduced critically. The darkfield method is also useful during the observation of particles whose dimensions are below the resolving power of a microscope.

Darkfield investigations are possible in transmitted as well as in incident light. In biological and medical research observations will generally be carried out in transmitted light for which only a darkfield condenser for dry or for oil immersion objectives is required. Special objectives are not necessary provided that the inner limiting aperture of the darkfield condenser is larger than the objective aperture. Otherwise objectives with drop-in funnel stops or with built-in iris diaphragms must be used.

Transmitted-light phase contrast

The phase contrast equipment after Zernike consists of the phase contrast condenser and the phase contrast objectives. The condenser includes a turret with annular stops matched with the phase rings of the corresponding objectives. Each objective has its own related setting of the annular-stop turret, so that conditions are easy to control and reproducible at any time. In addition, the system of annular stops permits the full utilization of the condenser aperture, which means higher resolving power in brightfield, and high exciting energy when the condenser is used in phase contrast fluorescence.

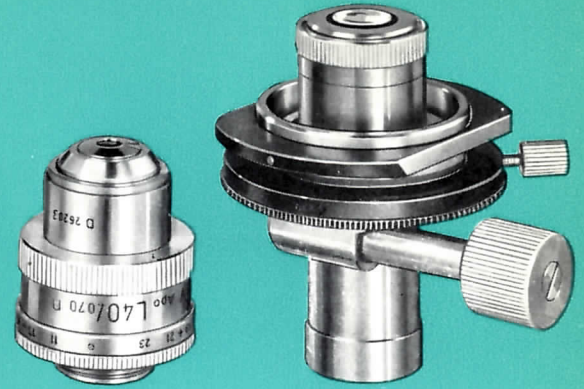
The phase contrast equipment with Heine condenser is recommended for examinations in brightfield, phase contrast, and darkfield with continuous transition between, or rapid change of, these types of illumination during uninterrupted observation. The simultaneous use of brightfield and phase contrast can be of advantage especially with objects containing both amplitude and phase structures, such as histological sections with stained detail, fine-grain dressing products, dust samples including absorbing or opaque particles, etc.

Our list "Phase Contrast Equipment by LEITZ" contains further information.

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LEITZ Zernike-type phase contrast equipment
phase contrast condenser and PHACO objective



25239-513

LEITZ Heine-type phase contrast equipment
Heine condenser and Pv apochromatic objective

Fluorescence microscopy

Uses: Basic research in histology, pathology, and physiology, with increasing scope for clinical diagnostic routine examinations (antibody techniques).

In the conventional methods of microscopical investigation the light transmitted or reflected by the specimen is observed; in fluorescence microscopy, the object of observation is either luminous, emitting characteristic rays of its own, or it is treated with fluorochromes producing secondary radiation. The fluorescence-exciting radiation, usually U. V. light, does not contribute to the image formation, it is removed by means of suppression filters. Hence, the fluorescent portions of the object appear coloured, usually on a dark background. Since only a small proportion of the fluorescence-exciting UV- or blue light is converted into fluorescent radiation, strong light sources are necessary such as the commercially available high-pressure mercury burners in conjunction with our lamp housing 250. The following items are necessary for a complete fluorescence outfit: -

Lamp housing 250 with HBO 200 W high-pressure mercury burner.

Exciting and suppression filters.

LABORLUX microscope for transmitted light with filter slide in the stand.

A modified Zernike-type phase-contrast equipment allows for simultaneous observation of fluorescent object details on a phase-contrast background.

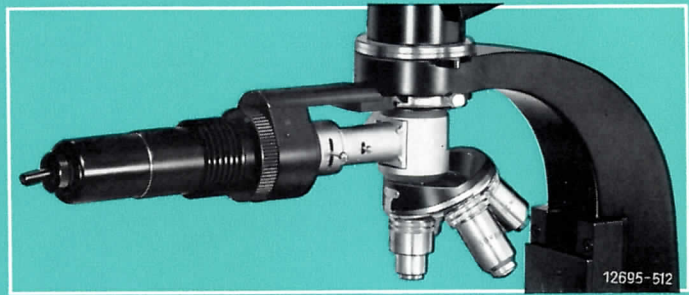
Our list [52-20](#) provides detailed information about our fluorescence outfits.

Polarized light

Basically the LABORLUX can be used for orientating observations in polarized light. However, for more frequent investigations of this nature, or for exact measurements of bi-refringent substances we recommend the use of a special polarized-light microscope such as our [®]DIALUX-POL which permits binocular orthoscopical and conoscopical observations and measurements. Our list [55-16c](#) contains detailed information.



LABORLUX UB microscope with ULTROPAK vertical illuminator



Opak illuminator

LABORLUX UB

For investigations in incident light, especially of large objects, we have developed a variant of our LABORLUX, the LABORLUX UB. Unlike the LABORLUX, this stand has a changing device for the object stage. The very long slide track of the changing guide permits a 60mm vertical adjustment of the object stage independent of the coarse- and fine adjustment. This makes the examination also of large industrial products possible in incident light. The object stage is of course interchangeable.

The ULTROPAK® darkfield incident-light illuminator with objective changing device is used for incident-light illumination; it consists of the housing with the illuminating attachment and the interchangeable UO-objectives of 4–100 x primary magnification. The light is passed to the object through a vertically adjustable condenser concentrically surrounding the objective. Polarizers can be used for eliminating reflections from non-metallic media (wet or shiny material); the polarizer, which can be rotated through 90°, is inserted in a slot of the ULTROPAK, the analyser fits into the filter slide. For further details about the ULTROPAK see List 513–36. For the investigation of metallic surfaces in brightfield the ULTROPAK illuminator can be exchanged with the Opak illuminator with attached quadruple revolving nosepiece. The powerful 6v 15W lamp attachment produces bright and well differentiated images even at high magnifications. Lamp attachment and Opak illuminator are rigidly connected with each other. The optical outfit consists of 4 achromatic or apochromatic 5x/0.09, 10x/0.18, 20x/0.35, FI 50x/0.85 objectives and 10 x M PERIPLAN eyepieces, with which the standard metallographic magnifications 50x, 100x, 200x, and 500x can be obtained.

The LABORLUX UB can of course also be expanded to a full-standard transmitted-light instrument by fitting the component: described on pp. 6–11.

Device for bearing jewels

Manufacturers and users of bearing jewels often depend on an optical control of the general quality or the dimensions of their products.

A special device for examining bearing jewels has been designed for this purpose; in combination with the LABORLUX UB microscope its range of applications is very wide. Its light source is the ULTROPAK incident-light illuminator, which provides both incident and combined illumination. A 6v 5W lamp is built into the holder for the transillumination of transparent jewels. It remains independent of the position of the circular stage and reveals internal faults of the jewels. The jewel is inserted in an interchangeable jewel holder, and can be exactly centred in the field of view by means of two centring screws. The holders can be vertically adjusted during the examination and can be tilted towards the optical axis of the microscope on the graduated circular stage. These movement facilities allow the observation and correct assessment of the object from any direction. The image of the jewel remains always in the field of view of the microscope at constant sharpness.



ARISTOPHOT for photomicrography and macrophotography

The most versatile photographic equipment is the ARISTOPHOT. The microscope retains its character as a portable table stand as it can be easily detached from the ARISTOPHOT at any time for use in general microscopy. On the whole the 4x5" bellows camera with rotatable darkslide frame and international back is preferred on the ARISTOPHOT. The rotatable darkslide frame permits the orientation of the negative in any desired position relative to the object, thus fully utilizing the film area. In addition it allows the use of the POLAROID Land method which produces final paper prints of high quality within a matter of seconds. A 9x12cm bellows camera with mirror reflex attachment is also available.

Where a combination of precision and economy is essential, e.g. with series of pictures, the 35mm LEICA camera, negative format 24x36mm, is recommended. The outfit includes the micro-mirror reflex attachment, a focusing adapter with central shutter, focusing telescope and light screening collar and a $\frac{1}{3} \times$ adapter. The microscopic image is focused on the groundglass screen of the micro-mirror reflex attachment at low powers, and in the focusing telescope or on the clear glass disc at high powers. The interchangeable adapter projects the microscopic image onto the film or the groundglass screen of the mirror reflex attachment at $\frac{1}{3} \times$ the visual final magnification of the microscope. At a 3x enlargement on paper the picture therefore corresponds with that on a 9x12cm plate at 25cm bellows extension by the same objective/eyepiece combination. However, the exposure time is considerably shortened compared with that required for a 9x12cm negative.

Our lamp housing 250 can of course also be used on the ARISTOPHOT, which gives the microcopist the choice of working with powerful gas discharge lamps, the 6v 15W low-voltage lamp or with mixed light.

For detailed information about the ARISTOPHOT see list 54-8

We supply a 4x5" bellows camera with fully automatic exposure control for large-format automatic photomicrography. For details please see List 540-28

ARISTOPHOT
with bellows
camera,
international back
4 x 5",
and LABORLUX
microscope



9 x 12 cm camera attachments

The 9x12cm camera attachment is placed on the microscope like a normal eyepiece. It is instantly centred, immediately ready for use, and extremely simple to handle. The microscopic image can be observed in the focusing telescope in full detail. Critical focusing is therefore possible of dark objects and at high magnifications. A graticule with an oblong outline indicates the area of the microscope image covered by the camera. The focusing adapter includes a beam-splitting swing-out prism to allow, if necessary, observation of the object in the focusing telescope even during the exposure. Photomicrography of living or changing objects is therefore easy. The self-winding central shutter has speeds $\frac{1}{125}$ - 1 sec., T, and B, and is fully synchronized. The camera accepts 9x12cm plates and sheet films; adapters for the 6.5x9cm format are also available.

This camera is also available with CB 100 Polaroid Back.

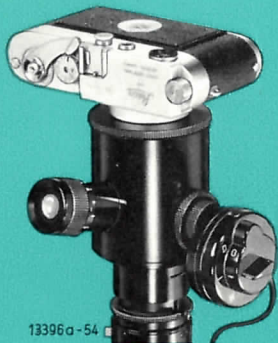




MIKAS
Micro-attachment

2976 k-54

Micro-attachment
for LEICA



13396 a-54



MICROSIX-L
exposure meter for
photomicrography

Micro-attachment with central shutter

The micro attachment with central shutter has the same focusing adapter with focusing telescope, flash-synchronized time- and instantaneous shutter, and swing-out prism as the 9x12cm camera attachment. Either the 9x12cm camera body (see p. 13) or a 1/3 x adapter with thread or bayonet fitting for the LEICA or other 35mm cameras can be mounted on it. For further details see List 54-3.

Micro-attachment with vibration damper

The built-in vibration damper of this micro-attachment prevents the unavoidable shutter vibration from being transmitted to the microscope stand. This makes it the first camera attachment with which perfectly sharp photomicrographs are possible even with oil immersion objectives and at short exposure times. The exposure time is measured on small object details with the MICROSIX®-L exposure meter; an advantage which in the past was, with the exception of our ORTHOMAT fully automatic microscope camera, an almost exclusive advantage of the large format. In this method of measurement the effect of the surrounding field is largely eliminated. This micro-attachment can be used with the LEICA only.

For further details see List 54-22.

MICROSIX-L exposure meter

The MICROSIX-L is a highly sensitive light meter for photomicrography and can be used with any photomicrographic apparatus. Its large measuring range - the new exposure meter is 250 times as sensitive as the previous MICROSIX - reliably accommodates all exposure times likely to occur in photomicrography. Even for the most extreme exposure times the photomicrographer will hardly ever find it necessary to go to the upper or lower measuring limit of the instrument. For further details see List 54-22.

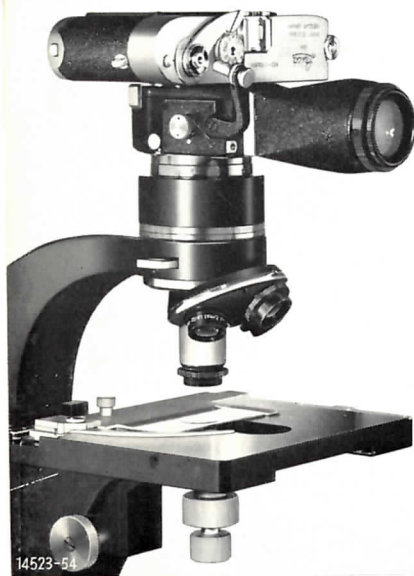
Device for low-power photomicrography

A special device is available for the macro-range from 2:1 to 10:1 which cannot be covered photographically with the normal optical outfit of the microscope; it consists of a tube for low-power photography, the low-power condenser II, the mirror reflex attachment III with 5x magnifier and a number of objectives.

With this device the low-power phototube replaces the usual microscope tube on the stand. A bayonet changer on the top of this photo tube accepts the mirror reflex attachment with its groundglass screen and clear-glass plate for observation and focusing. A 5x focusing magnifier included in the mirror reflex attachment ensures critical focusing. For the perfect illumination of the large field of view the normal microscope condenser must be replaced by the low-power condenser. Photographic lenses of the SUMMAR and MILAR type, of various focal lengths, or microscope objectives of 3x - 10x primary magnification are part of the optical outfit, and are screwed into the revolving nosepiece as usual. The table below helps the user to find the combinations best suited for his purposes.

Device for low-power photomicrography

Lens or objective	Working distance	Reproduction ratio	Object field on groundglass screen
SUMMAR 24 with ring	21mm	5.8 : 1	3.8 x 5.9mm
SUMMAR 35	39.5mm	3.2 : 1	7.1 x 10mm
SUMMAR 42	51mm	2.6 : 1	8.9 x 13.5mm
MILAR 50	63.5mm	2.2 : 1	10.9 x 16.6mm
3.2 / 0.12	34mm	3 : 1	7.5 x 11.4mm
10 / 0.25	5mm	10 : 1	2.4 x 3.5mm



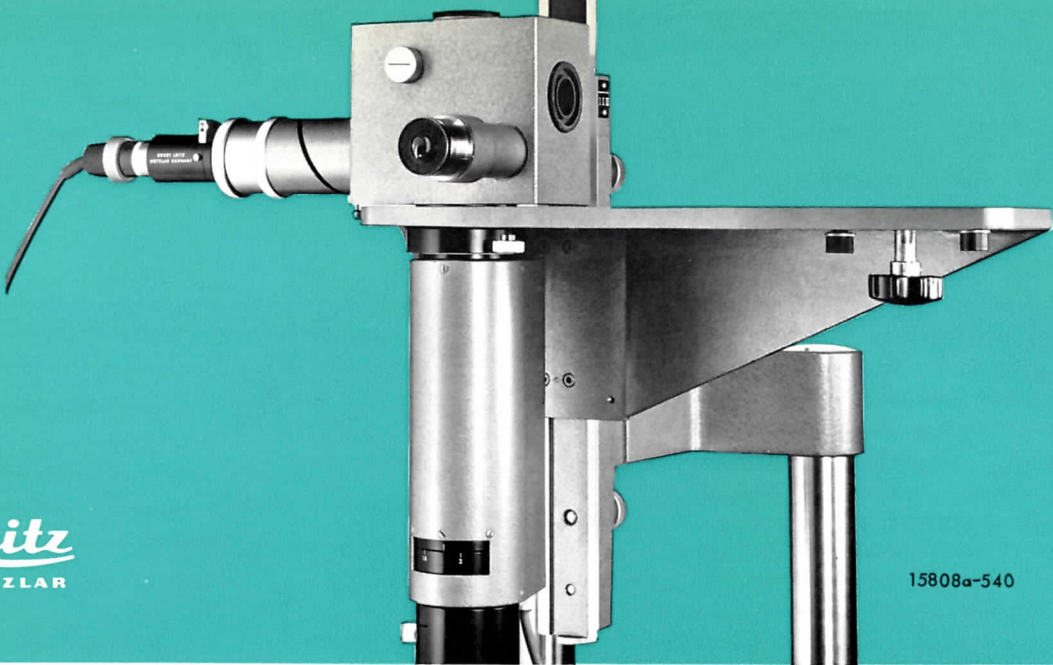
14523-54



14524-54



Leitz
WETZLAR



15808a-540

Vario attachment for cinematography and television

Panratic (zoom) 1.6 x – 6.3 x

This outfit is designed for the use of cine- and television cameras on the microscope. It consists of the panratic 1.6x – 6.3x, the camera attachment with observation tube, and the light regulator. The panratic is inserted in the phototube of the FSA tube in place of the eyepiece, permitting a continuously variable range of magnifications from 1.6x to 6.3x. The minimum magnification covers approximately the field of view of an eyepiece of field of view index 18; the maximum magnification covers correspondingly less. In order to ensure uniform variation of the magnification the panratic is motor-driven and remote-controlled.

Camera attachment and observation tube

The attachment for the cine- or the television camera is fixed to the guide rail of the ARISTOPHOT above the panratic, but without mechanical connection with the microscope. The television picture is viewed through the lateral observatoin tube. In cinematography or colour television microscopy this tube accommodates the measuring eye of the light regulator, and the object must be viewed in the viewfinder of the cinecamera or on the screen of the colour television monitor respectively.

Light regulator

When the magnification is varied, the light flux reaching the camera obviously also varies. This can be ignored in black-and-white television receivers with precision automatic light flux control, but an automatic light regulator is essential for colour television cameras, non-automatic black-and-white television cameras or automatic and non-automatic cine-cameras, where the diaphragm control does not respond to the small exit pupil of the microscope. The regulator controls the illumination so that the light flux remains constant regardless of changes in the magnification. This is an indispensable requirement for pictures of uniform brightness on the television screen, correctly exposed films, and faithful colour rendering of the colour television picture. A light regulator is of course also useful for visual investigations with the vario attachment.



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