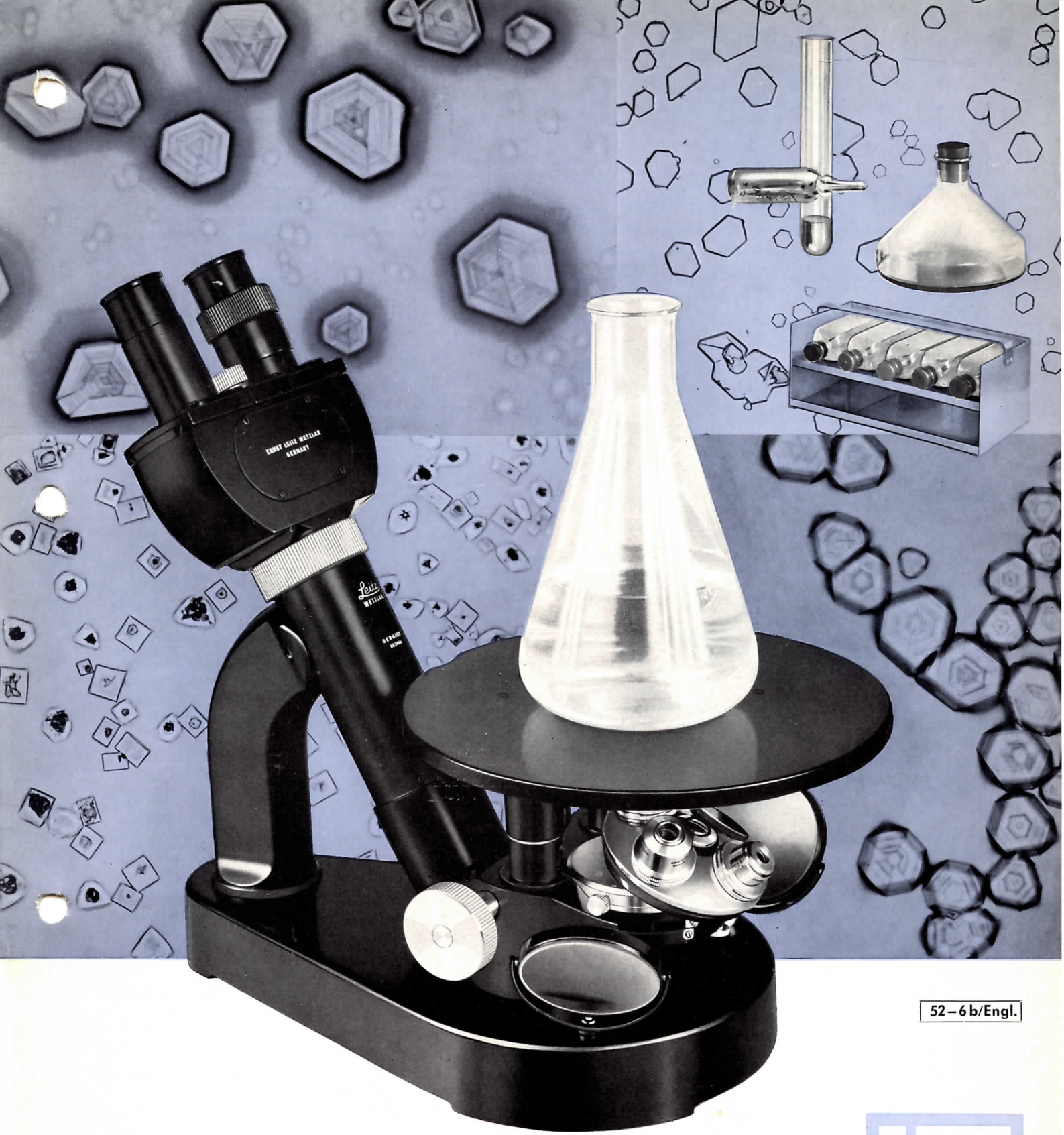


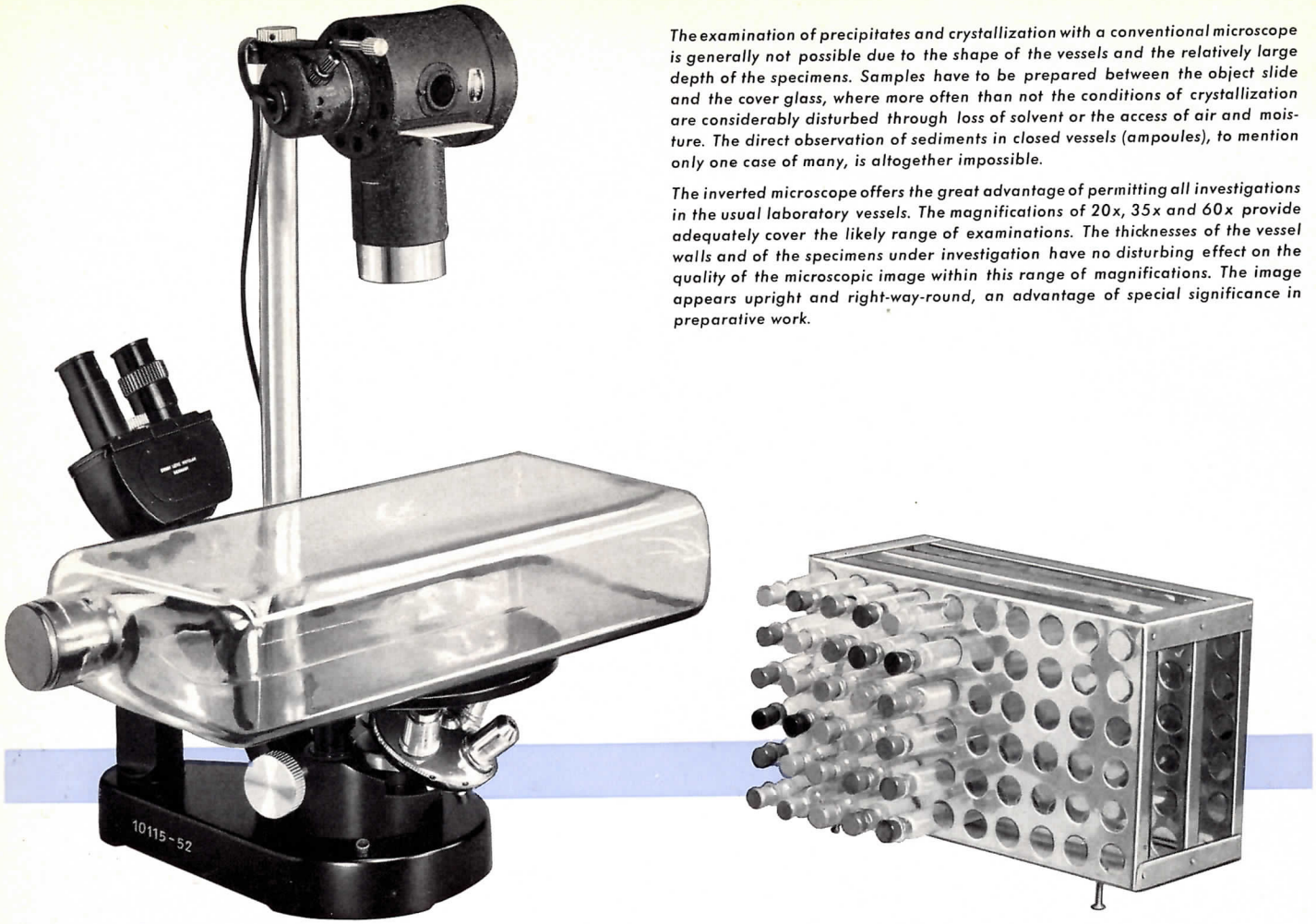
52 – 6 b/Engl.

A versatile laboratory stand for
microscopic investigations in
medicine, chemistry and biology

The Inverted Microscope

The examination of precipitates and crystallization with a conventional microscope is generally not possible due to the shape of the vessels and the relatively large depth of the specimens. Samples have to be prepared between the object slide and the cover glass, where more often than not the conditions of crystallization are considerably disturbed through loss of solvent or the access of air and moisture. The direct observation of sediments in closed vessels (ampoules), to mention only one case of many, is altogether impossible.

The inverted microscope offers the great advantage of permitting all investigations in the usual laboratory vessels. The magnifications of 20x, 35x and 60x provide adequately cover the likely range of examinations. The thicknesses of the vessel walls and of the specimens under investigation have no disturbing effect on the quality of the microscopic image within this range of magnifications. The image appears upright and right-way-round, an advantage of special significance in preparative work.



Inverted microscope equipped with illumination for transmitted light.
The special vessels for tissue cultures are readily accommodated on the large object stage.

General and Analytical Chemistry

Investigations in this field are particularly simple with the inverted microscope: – The vessel (maximum volume of 1,000 cc) containing a thin film of the precipitate is placed on the object stage, and the specimen examined under the appropriate magnification. Flat-bottomed vessels can be moved about on the plane surface of the object stage. Test tubes, ampoules and round-bottomed flasks are placed in the circular aperture in the stage which is centred to the optical axis; they can be inclined and turned as required.

Numerous microchemical reactions even between minimum quantities of substances (single crystals measuring fractions of a μ or tiny droplets) can be performed on the microscope stage under constant observation. Simple examples of such reactions include precipitations, recrystallizations, solubility tests with various reagents (organic solvents, water, acids, alkalis), and the detection of carbonates, especially the differentiation between alkaline earth carbonates and other salts of these elements.

Preparative Chemistry

Chemists engaged in preparative work will use this microscope primarily to determine whether a product is uniformly crystalline or amorphous. In addition it is used in preparative chemistry for the systematic separation of mixtures according to the shape or colour of the crystals, the selection of individual components from solid substances, and the separation of racemates which spontaneously decompose into enantiomorphous forms.

Grain sizes etc. can be determined with the aid of the eyepiece micrometer.

Biology and Medicine

In the inverted microscope the biologist has a tool which he can use with great success in many fields. It is equally suitable for the examination of cultures on solid media in Petri dishes as for plankton research in hydrobiology, to mention only a few examples. It enables sewage biologists to carry out rapid examinations on the spot.

In virology the importance of the inverted microscope is constantly increasing. Many methods in virological research depend on the determination of the cytopathogenic effect. The use of the phase contrast method which alone reproduces well-differentiated structures in culture preparations is not feasible in conjunction with culture vessels for technical reasons. The inverted microscope, on the other hand, permits the observation not only of cells adhering to the vessel wall, but also of those which through virus effect, contamination, etc. have become detached.

Examinations in Polarized Transmitted Light

A polarizing device is available for general survey of birefringence. The rotating polarizer is fitted below the lamp housing, and the slide-out analyser below the revolving nosepiece. The rotating stage required for polarized-light examinations can be readily attached to the object stage.

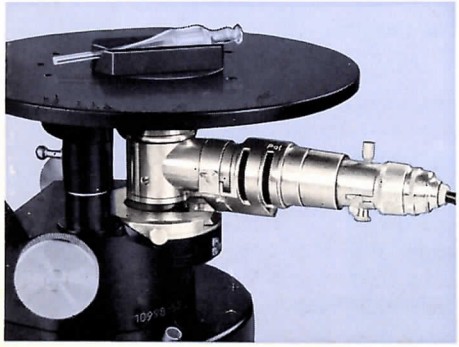
The inverted microscope is distinguished from ordinary microscope stands through its inverted design, i. e. the arrangement of the objectives below the object stage. The surface of the stage is thus left completely free, so that apart from the usual microscope preparations vessels of any shape can be placed or propped on the stage. The large object stage of approx. 180 mm. diameter can be vertically adjusted for focusing the preparation by means of milled heads on both sides. It is fitted with two interchangeable ring plates to meet all requirements: – Round-bottomed flasks of 250 cc capacity and over can be examined without ring plate; a ring plate with a 14 mm. aperture is suitable for small round- and flat-bottomed flasks, Erlenmeyer flasks, and normal test tubes (16 and 18 mm. diameter), and round-bottomed ampoules of 10 cc capacity and above. The ring plate of 7.5 mm. aperture is used for the examination of substances in narrow test tubes and flat-bottomed ampoules.

A stage inset with a V-shaped groove is used for examining ampoules and test tubes in a horizontal position. For test tubes to be held in an inclined position so that their contents cannot run out special brackets are available; they are inserted into holes of the object stage.

Beakers, round-bottomed and Erlenmeyer flasks, test tubes and Petri dishes can be placed on the object stage without difficulty.

The objectives are mounted on a quadruple revolving nosepiece; this can be interchanged with the ULTROPAK® incident light illuminator by means of a dovetail slide.

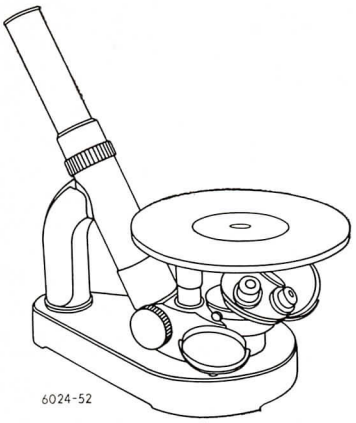
Two interchangeable observation tubes are available for the inverted microscope. The wide inclined monocular tube is designed for large-diameter eyepieces whose microscopic field of view is considerably larger than that of ordinary microscope eyepieces. If desired, it can be replaced by a binocular tube for standard eyepieces. For the incident illumination of opaque preparations (from the direction of the objective) two attachable mirrors, adjustable in all directions, are provided; they focus any light (daylight or artificial light) on the object. One side of these illuminating mirrors is plane, the other concave.



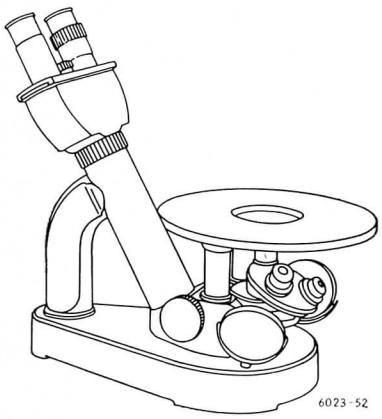
ULTROPAK with 8 volts 5 watts illuminating attachment for observations in incident light. With the ULTROPAK, higher magnifications than those possible with transmitted light can be achieved with suitable preparations.

Generally, the light from a table lamp set up above the object stage, or ordinary room lighting will be adequate for observations in transmitted light. Higher demands will be met either by the 40 watts lamp for direct mains connection or the adjustable 6 volts 30 watts low-voltage lamp. The lamps are vertically adjustable on the column, so that they can be used for the investigation of specimens even in large vessels. An iris diaphragm on the lamp housing acts as an aperture stop. A filter holder permits the use of 5 x 5 cm. (2″ x 2″) contrast filters.

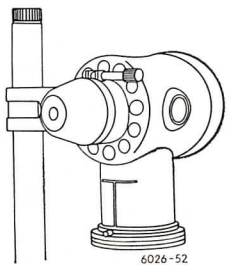
Outfits for investigations in transmitted light



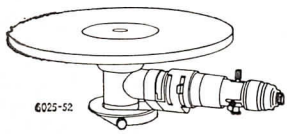
Inverted microscope KEMAV with incident light attachment KEMOY



Inverted microscope KENEX with incident light attachment KEMOY



Illuminating attachment for transmitted light KEMUZ



ULTROPAK incident light illuminator KELDY

Inverted microscope stand with circular object stage of 180 mm. diameter, vertically adjustable by means of dual rack-and-pinion controls. Interchangeable, monocular eyepiece tube for large-diameter eyepieces and adapter for standard-diameter eyepieces; alternatively, binocular tube for standard-diameter eyepieces. Two stage inserts of 7.5 mm. and 14 mm. aperture respectively, one stage insert with V-shaped groove, test tube supporting brackets. Folding dust cover. Storage cabinet with lock and key.

Monocular outfit	KEMIX
Binocular outfit	KENAW

Optical equipment:

Interchangeable quadruple revolving nosepiece	NADUR
Achromat 3.5/0.10	OANEE
Achromat 6/0.18	ACEDU
Achromat 10/0.25	ACORA
Eyepiece H 6 x with enlarged field of view, with micrometer for monocular tube	IBLTI-IBXTI
Pair of Huygens eyepieces 6 x for binocular tube	GIZRA

Alternatively: –

Optical outfit with plano objectives and widefield eyepieces

Interchangeable quadruple revolving nosepiece	NADUR
Plano objective Pl 4/0.10	PLAVS
Plano objective Pl 10/0.25	PLABY
Periplanatic widefield eyepiece GF 10 x, pair for binocular tube	PESIS
Periplanatic widefield eyepiece GF 16 x, pair for binocular tube	PESOT

Complete outfit, monocular	**with achromatic objectives**	**KEMAV**
Complete outfit, binocular		**KENEX**
Complete outfit, binocular, with plano objectives		**KEKOW**

Illuminating attachments for transmitted light

a) for direct mains connection with 220 v 40 w bulb,

column with lamp housing, illuminating lens, iris diaphragm, groundglass disc and daylight filter, including replacement bulb, 220 v 40 w	KEMUZ
220 v 40 w bulb	KELOY

b) 6 v 30 w low-voltage lamp, for observations in polarized light (particularly conoscopical observations), and photomicrography

Outfit as KEMUZ, but with 6 v 30 w low-voltage lamp and transformer 6 v 30 w bulb	KENOZ-REDYX
6 v 30 w bulb	LINID

Illuminating attachments for incident light

a) two tilting mirrors for incident light illumination	KEMOY
b) ULTROPAK incident light illuminator, interchangeable, with 8 v 5 w illuminatino attachment and transformer for 110–240 v	KELOX-BEEVY
Objective UO 6.5 x	AIREE
Objective UO 11 x	AKEER

Accessories for observations in polarized transmitted light

(monocular or binocular equipment)

Slide-in analyser	KEPOB
Holder with polarizer, to be clamped on the vertical column	KEPAX
Revolving object stage plate, to be attached to the stage	KEPIZ

(Estimates for measurements in polarized light with strain-free optics on request).

The illustrations shown in this catalogue are not binding for all details.

We reserve the right to alter construction and design.

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