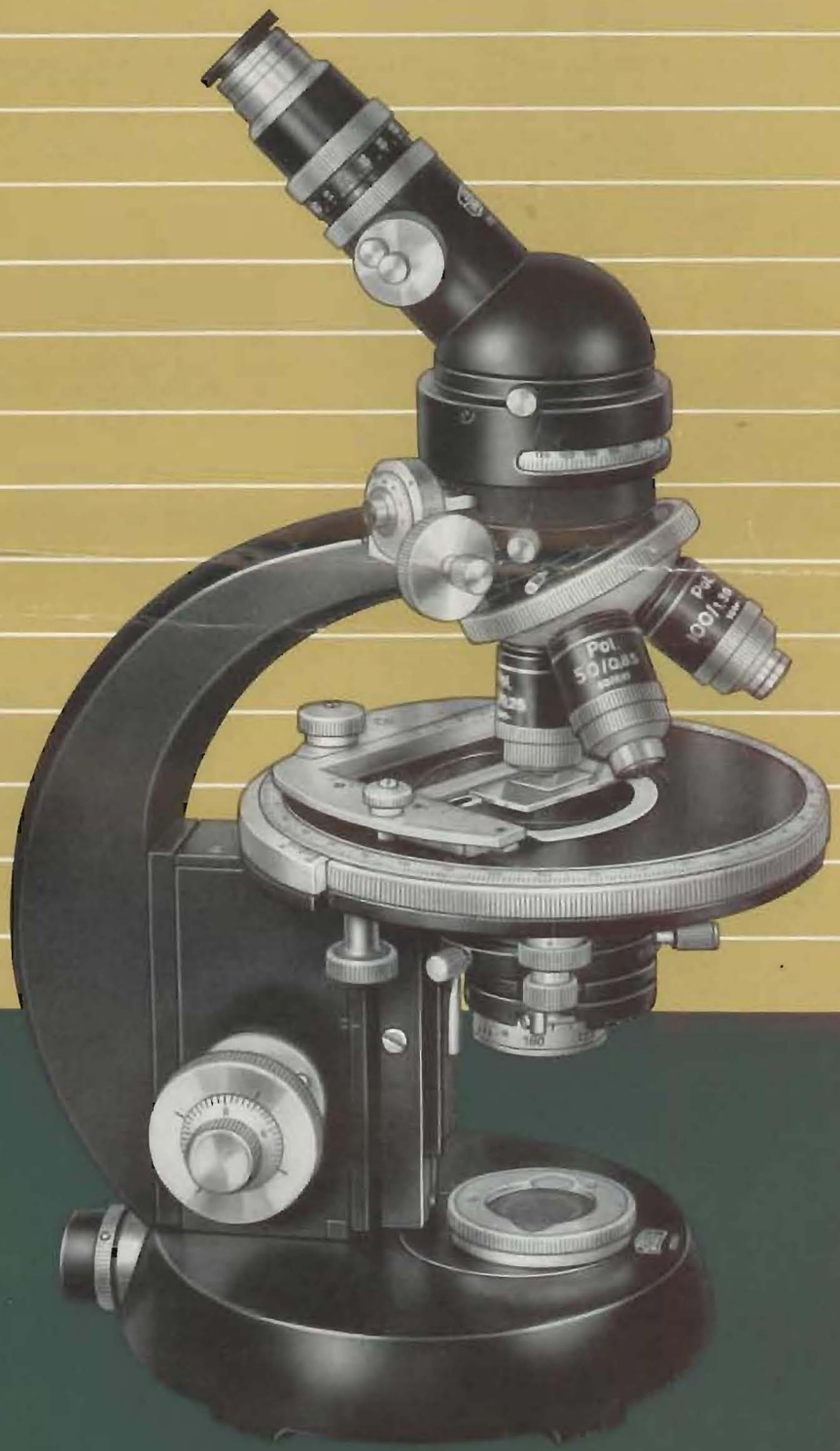
STANDARD POLARIZING MICROSCOPE

ZEISS WINKEL



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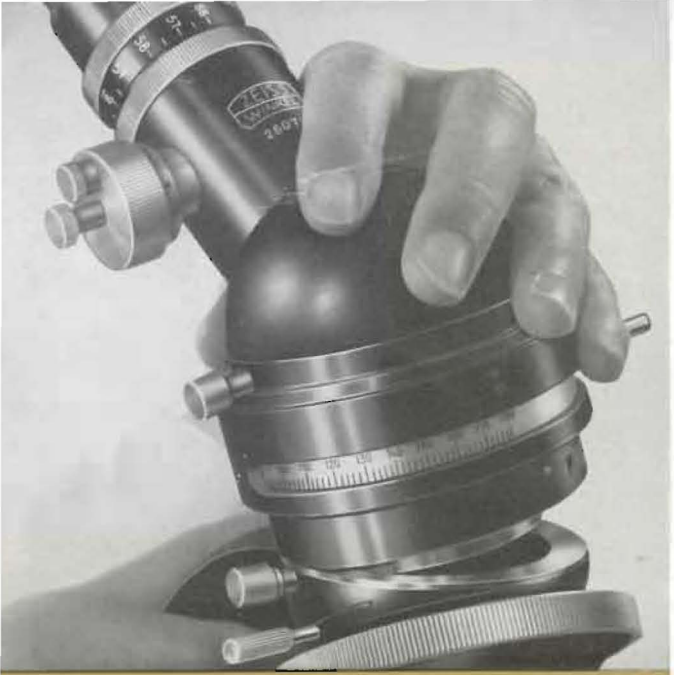
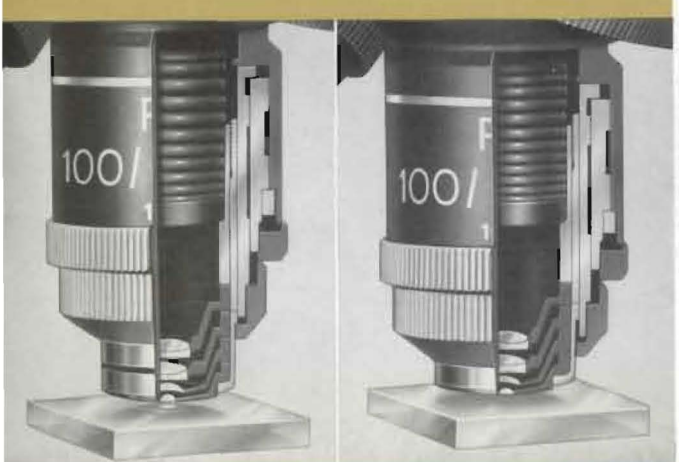


Quick-changing device
permitting the interchange of different tubes

Attaching of the revolving nosepiece on slide fitting



Resilient mounts on objectives

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THE STANDARD POLA

has been specially designed for mineralogical and petrographical investigations. Long years devoted to the building of Polarizing Microscopes and the assistance of an experienced staff of scientific collaborators enabled us to produce an instrument which is outstanding both in opto-mechanical performance and high reading accuracy.

Convenient in handling and embodying some entirely new properties this instrument is being favourably commented upon by users.

In this combination also the merits of our Standard Microscope are turned to full account, as the Standard Polarizing Microscope rapidly and perfectly adapts itself, same as the Standard Microscope, to the various microscopic observation procedures and to specific types of work.

A quick-changing device permits of the convenient interchange of the different tubes. Tubes attach securely and reliably to the tube head by one single manipulation and ore held in place by means of a clamping screw. Tubes for the various microscopic problems include the large

Polarizing Tube which embodies noticeable innovations over the former models, viz.,

Inclined view for observation comfort and dust-proof installed An ici-Bertrand lens with screw centering arrangement.

Helically adjustable tube extension for critically focusing the axial images.

Tube-iris diaphragm for the vignetting of small crystals for conoscopic observation.

Complete freedom from dust ensured by self-contained construction

Analyser "Intermediate Tube" with dust-proof installed analyser rotatable about 180°

Telecentric path of rays within the analyser region. Dust protected slot opening (for auxiliary optical specimens) admitting the introduction and removal of rotatable compensators in any rotatory position.

The tube head is provided with a novel short type of **dovetail slide** admitting the attachment of the various changing devices including objective-revolving nosepiece, single lens slide changer or incidentlight illuminators.

A precision turret may be operated by a knurled collar and reliably registers in effectively working click-stops.

The objectives may be individually centred while in the nosepiece by simply adjusting two knurled collars in opposite direction to each other.

RIZING MICROSCOPE

High-power systems, moreover, are set in resilient mounts affording full protection to specimens and lenses alike. All objectives in the turret are parfocalized.

Precision Rotatable Stage runs on ball bearings thus ensuring a remarkably easy and uniform movement. The rim of the stage carries a degree scale with two verniers for immediate reading to 0.1°. An optionally operatable fine adjustment admits of the most minute rotations to be made. In addition to a clamp locking the rotatory movement the stage is provided with a click-stop arrangement upon operation of which the stage clicks in after any 45 degree rotation.

In addition to a stage on ball bearings the Standard Polarizing Microscope may be also equipped with the slide bearing type of rotatable stage.

Both stages are available with a new type of object traverser with graduation and verniers.

The stage supporting plate may be provided with a slideway permitting synchronised rotation of analyser and polarizer.

The substage is rack and pinion vertically adjustable and fitted with a centering type of condenser holder for the simple and rapid interchange of various condensers, such as the bright-field, dark-ground, phase-contrast and the rotatable conoscope condensers. The bright-field condensers are provided with a swing-out type of front lens.

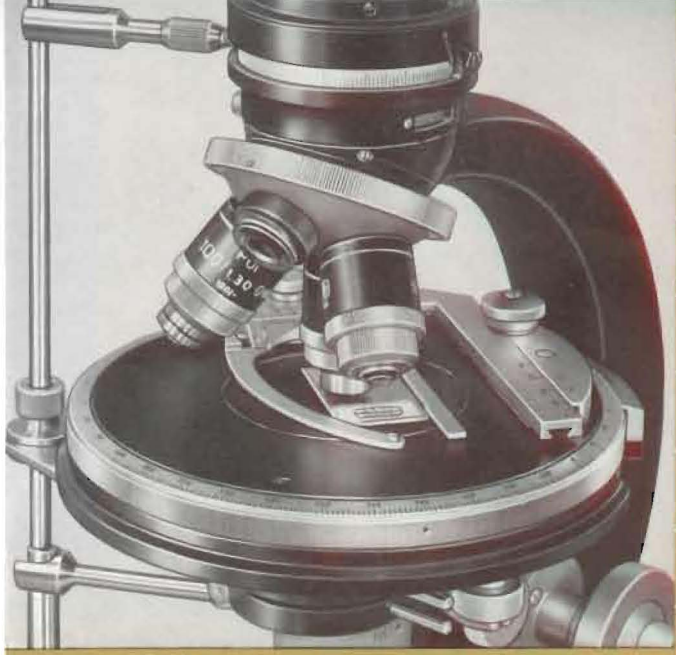
The Wide-field Polarizer is fitted into a graduated mount and rotates about 180°. It clicks in position at rotatory intervals from 90 to 90 degrees. By means of a lever the polarizer can be cut out of the optical path.

The circular base affords a remarkable stability of the microscope in any direction. It also holds the illuminating mirror and the inserting type of **illuminant** thus representing an organic combination with the instrument permitting illumination in full compliance with optical laws governing the limitation of rays.

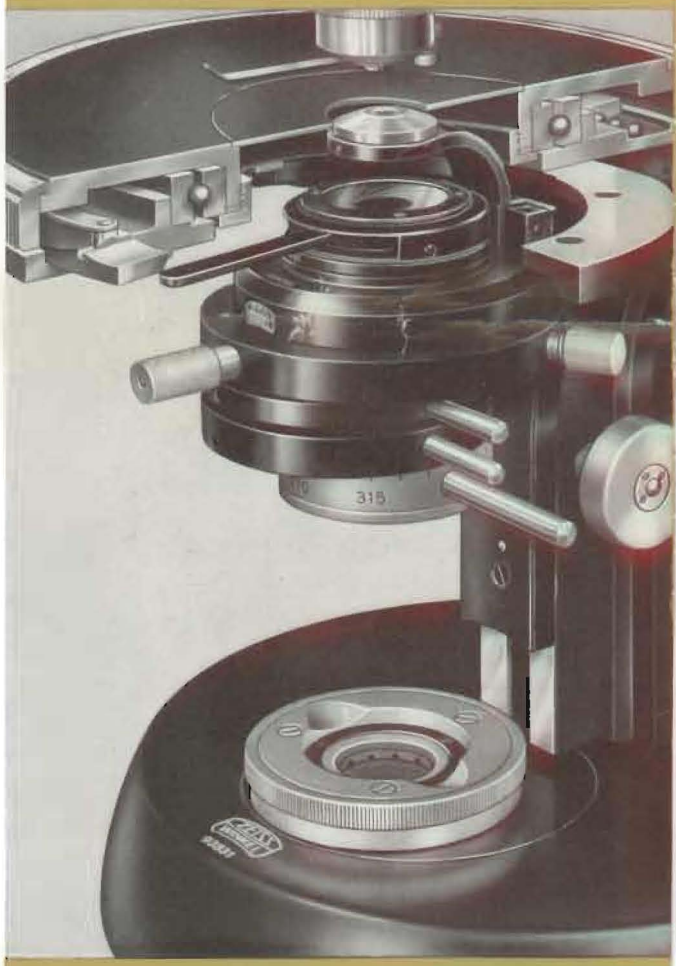
Standard Polarizing Microscopes are in general equipped with coarse and fine adjustments. Their controls are low-positioned and disposed on a common spindle at either side of the motion box, so that the operator's hand rests securely on the working table when actuating the control heads.

Finest phase differences will be accurately and in a simple manner ascertained with the **Ehringhaus Rotating Compensators.** They may be conveniently introduced into the Analyser Intermediate Tube:

Measuring range with quartz plates: 0 to 7th order.
Measuring range with calcite plates: 0 to abt. 133rd order.



Ball bearing stage with object traverser, attached device permitting synchronised rotation



Illuminating device: Collector tray, polarizer, condenser

Ehringhaus rotating compensator

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SUPPLEMENTARIES TO THE STANDARD POLARIZING MICROSCOPE

Universal Rotatable Stage: For the examination of rock sections or grain specimens on the conventional size of object slides. The central glass stage is vertically adjustable to permit the focusing of specimens if mounted on object glasses of varying thickness. Each Universal Rotatable Stage is supplied with two sphere-segments having refractive indices of $n_D = 1.516$ and $n_D = 1.649$. Segments with other refractive indices will be supplied upon request.

For orthoscopic examinations with the Universal Rotatable Stage special types of objectives can be furnished.

The **Rotatable Conoscope Equipment** is available for the conoscopic examination of specimens on the Universal Rotatable Stage. For this purpose a special type of objective and a special condenser of relatively high aperture for long object distance is supplied. A worklimit bracket is provided to prevent the objective from contacting the sphere-segments.

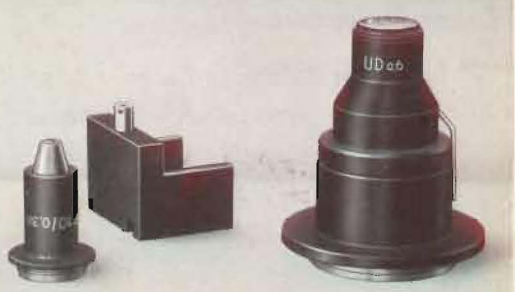
Special slide changers with centering device will be supplied for work with single objectives not provided with centering mount.

In place of the conventional inclined tube an efficient **Binocular Body Tube** may be fitted to the Analyser Intermediate Tube. While leaving the total magnification of microscope unaffected the Binocular Body Tube affords steady and reliable observation.

The Wide-Range Research Microscope Illuminant may be equipped with a variety of lamps, including very powerful ones, such as Mercury Burners for instance. For mineralogical work the equipment with Sodium Spectral Lamp (ZW 540/E) is recommended.

The Camera Attachment is placed upon the microscope in conjunction with either a straight tube or with specific types of photographic tubes, permitting observation of the microscopic image during exposure. The Attachment may be used alternatively with a focusing eyepiece or with an observation focusing screen. Equipments are available for 6.5 × 9 cm. plates, for sub-standard film or for the employment of the Contax, Robot or Leica Cameras (cf. ZW 541/E).

Universal rotatable stage in centring ring



Rotatable conoscope equipment for the universal rotatable stage

Camera attachment for plates and for sub-standard film

Slide changer with centring device for single objectives

Fitted binocular tube

Wide-range research microscope lamp

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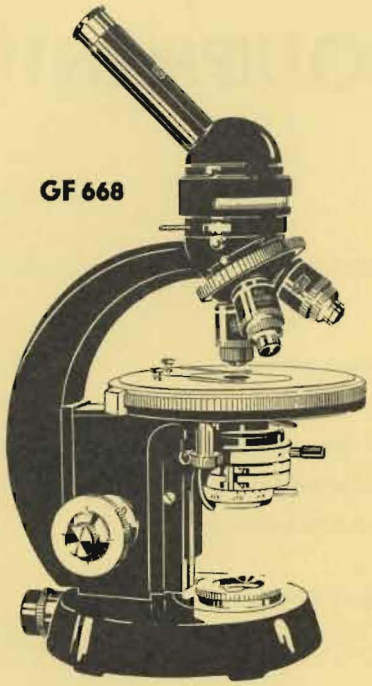
STANDARD POLARIZING MICROSCOPE

with coarse and fine motion,

circular base, illuminating mirror,

quadruple revolving nosepiece on slide changer,

Rack and pinion vertically adjustable and centering type of substage, with swing-out and rotatable polariser with click stops from 90° to 90°



GF 668

GF 458

GF 679

shown on front page but without rotatable compensator and object traverser

Illuminant installed in base, circular precision rotatable stage on ball bearings, analyser intermediate tube, large polariser tube with Amici-Bertrand lens . . . . . OSIRU

Cabinet . . . . . UKDON

Electrical equipment for a. c. *) . . . . . VILAS

Optical Equipment C (cf. lower left hand corner) . . . . . OWENU

Total Equipment: OWEPA

GF 668

Illuminant installed in base, circular slide-bearing rotatable stage, analyser intermediate tube with simplified monocular inclined tube . . . . . VILET

Cabinet . . . . . UKDON

Electrical equipment for a. c. *) . . . . . VILAS

Optical equipment C (cf. lower left hand corner) . . . . . OWENU

Total Equipment: OWADA

GF 468

Same as GF 668 but without integral illuminant

Total Equipment: OWABI

GF 458

Without integral illuminant, with circular slide-bearing rotatable stage, simplified polariser tube with permanently installed analyser and tube-slot for inserting optical auxiliary specimens VILIV

Cabinet . . . . . VILOW

Optical Equipment C, but **without** oil immersion 100/1,30 Pol . . VILUZ

Total Equipment: VIMAB

*) Electrical equipment for a. c., consisting of:

1 6 V./15 W. bulb with centering collar . . . UKENA

1 Neutral filter . . . . . UKMAU

1 Diffusing screen . . . . . UKOLA

1 Transformer 110/125/150 and 220 V., secondary 5/6/8 V. . . . . UKERC

Addition for equipment with resistance for d. c. in place of the transformer . . . . . VIMEC

(Please do not fail to state the available voltage)

	Code-word
OSIRU	
UKDON	
VILAS	
OWENU	
OWEPA	
VILET	
UKDON	
VILAS	
OWENU	
OWADA	
OWABI	
VILIV	
VILOW	
VILUZ	
VIMAB	
UKENA	
UKMAU	
UKOLA	
UKERC	
VIMEC	

Optical Equipment C

Condenser n. A. 1,3 (free from strains) with swing-out front lens, iris diaphragm and blue diffusing screen . . . . .

Achromat 2,5 Pol . . . . . .

Achromat 10/0,25 Pol in centering mount .

Achromat 50/0,85 Pol with specimen protector in centering mount . . . . . .

Achromat 100/1,30 Pol oil, with specimen protector in centering mount . . . . . .

Focusing Huyghenian eyepiece 6,3× Pol with centered cross-hairs . . . . . .

Focusing cross-hair measuring eyepiece 10 × Pol . . . . . .

Quartz Red I. order, in metal mount . .

Quartz wedge I.-III. order, in metal mount

Dioptric stop for observing the axial image

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SUPPLEMENTARY EQUIPMENT FOR

		Code-word
For minute displacements of the object:	Object traverser with graduations and verniers, (range of displacement 30 x 40 mm.)	VIKOP
Supplementary optics:	Achromat 25/0,45 Pol, with specimen protector in centering mount	VIKUR
	Achromat 10/0,25 Pol, without centering mount	VIMOE
	Achromat 25/0,45 Pol, with specimen protector without centering mount	VIMUF
	Achromat 50/0,85 Pol, with specimen protector without centering mount	VINAG
	Achromat 100/1,30 Oil, with specimen protector without centering mount	VINEH
	Auxiliary microscope for the observation of axial images in tubes without Bertrand lens	OPHEC
	1/4 λ Mica plate in metal mount	VINIK
	Condenser n. A. 0,9 (free from strain) with swing-out front lens, iris diaphragm and blue diffusing screen	VINOL
For measuring small phase differences:	Rotatable compensator (Ehringhaus) with quartz combination plate	VINUM
For determining large phase differences:	Rotatable compensator (Ehringhaus) with calcite combination plate	VIPAP
For phase contrast examinations:	Phase contrast equipment Pol consisting of:	
	Phase condenser II Z (free from strain) with green filter, in case	VIHAE
	Achromat Ph 10/0,25 (free from strain)	VIHEF
	Achromat Ph 25/0,45 (free from strain) with specimen protector	VIHIG
	Achromat Ph 40/0,65 (free from strain) with specimen protector	VIHOH
	Achromat Ph 100/1,30 Oil, (free from strain) with specimen protector	VIHUK
	Total Equipment:	VIGUD
	For tubes without Bertrand lens:	
	Phase contrast auxiliary microscope	OPHEC
For objectives without centering mount:	Centering type of slide-changer for single objectives	VIKAL
For objectives with centering mount:	Ordinary slide-changer for single objectives	VIPEQ
For the common rotation both of the polariser and the analyser:	Synchronous rotating device, consisting of:	
	Arc slideway with slide and holding screws,	
	2 fork fittings and 1 connecting bar	VIPIR

STANDARD-POLARIZING MICROSCOPES

		Code-word
For work with the Universal rotatable stage:	Universal rotatable stage „D 4" with 4 rotation axes, including:	
	1 centre glass plate	
	1 pair of hemisphere segments n_D = 1,516	
	1 pair of hemisphere segments n_D = 1,649	
	1 guide ruler	
	1 pin wrench	
	2 spring clips	
	1 centering device	VIPOS
Accessories for orthoscopic observation with the rotatable stage:	Achromat UD 6,3/0,12	VIPUT
	Achromat UD 16/0,16 with inset stops for reducing the objective aperture	VIRAU
	Centering type of slide-changer	VIKAL
For conoscopic observation with the rotatable stage:	Rotatable Conoscope Equipment, consisting of:	
	Condenser UD n. A. 0,6	VIREV
	Arresting bracket	VIRIW
	Achromat F 10/0,38	VIROX
	Total Equipment:	VIRUZ
	Centering type of slide-changer	VIKAL
For traversing microsections between the sphere segments of the rotatable stage:	Traverser	VISAF
For binocular observation:	Binocular inclined tube Pol	VISEG
	Huyghenian eyepiece 6,3 ×	OPUTI
	Huyghenian eyepiece 10 ×	OPUSE
	These two eyepieces are to be jointly used with the cross-hair eyepieces referred to in the optical equipment	
For measurements and quantitative mineral analyses:	Focusing Huyghenian eyepiece × 8, without eyepiece micrometer	OKOBU
	Focusing Huyghenian eyepiece × 12,5, without eyepiece micrometer	VEABU
	Micrometers in screw-mount:	
	Eyepiece micrometer 5 mm. in 100 parts	VEACO
	Eyepiece micrometer 10 mm. in 100 parts	VEADI
	Eyepiece squared micrometer 10 x 10 mm. in 0,25 $mm.^2$	VEAFE
	Cross line disc in mount	VEPOZ
	box for eyepiece micrometer	VEMOK
	Stage micrometer 2 mm. in 200 parts	OZAUS
For the spectroscopic determination of colour phenomena in the specimen or interference figure:	Pupillary Spectroscope for attachment to the microscope eyepiece, consisting of: Hand Spectroscope with symmetrically adjustable slit and dust guard window, swing-in type of comparison prism, wavelength scale, direct-vision prism and Ramsden eyepiece with iris diaphragm and holder with two adjustable mirrors. (cf. leaflet ZW 507/E)	VIDOR

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SUPPLEMENTARY EQUIPMENT FOR STANDARD-POLARIZING MICROSCOPES

		Code-word
For single photomicrographs:	Attachment Camera with focusing eyepiece and 6,5 x 9 cm. plate adapter with built-in shutter, including 2 plate holders	UKFAM
	Cases for above	UKVIL
	6,5 x 9 cm. plate holder (equipment for low-power photographs on request)	UKFES
Accessories:	Monocular straight tube (for STANDARD-Microscopes)	UKIEW
	or: monocular photographic tube with inclined eyepiece	OPKIX
	Three-colour filter ⌀ 32 mm., yellow, and blue = green	UKMEF
	Photo-eyepiece × 4	VEDUN
	Photo-eyepiece × 6	FOTRE
	Photo-eyepiece × 9	FOTRI
	Photo-eyepiece × 12	FOTRO
For the photography of axial images:	Auxiliary Microscope	OPHEC
For photomicrographic serial exposures:	Attachment Camera with focusing eyepiece and 24 x 36 mm. miniature camera attachment with built-in shutter	ULEMO
	Case for above	UKVIL
	Attachment camera with focusing eyepiece for using the CONTAX-camera	UKINS
	Same, for using the ROBOT-camera	UKIMY
	Same, for using the LEICA-camera	UKIRB
	Case for above Accessories as above (cf. pamphlet "ZW 541/E" on Attachment Cameras)	UKVIL
For work in monochromatic light:	Wide-range Research Illuminant II with Sodium Spectral Lamp and electrical connecting element for 220 V. a.c. (cf. pamphlet "ZW 540/E" on Microscope Illuminants)	VISIK
In the place of polarizing filters:	Equipment of the Standard-Polarizing Microscope with Calcite prisms . . . . . Additional price: (Polariser prism ⌀ 20 mm.) (Analyser prism ⌀ 10 mm.)	OSENE

Our manufacturing schedule furthermore includes:

Microscopes
for bright field, dark ground and phase contrast work
Metallurgical Microscopes
Photomicrographic Universal Camera 9 x 12 cm.
Micro-projection apparatus
Micro-cine equipments
Grinding and Polishing Machines for mineralogy and metallography
Polarisation apparatus with circle division
Polarisation apparatus with quartz-wedge compensation
Hand Spectroscopes
Vertex Refractionometers
Ophtalmological Equipment
Magnifiers

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