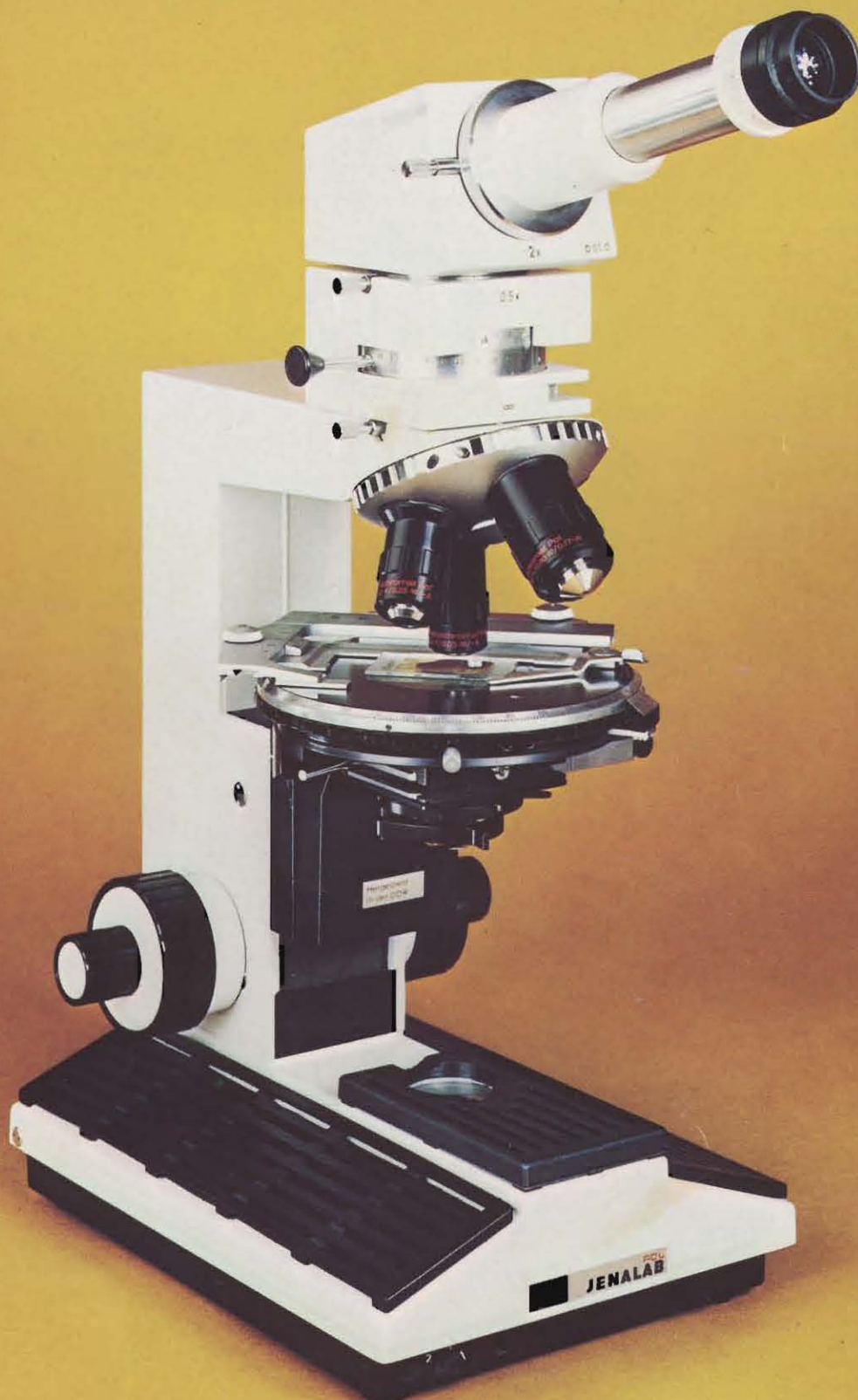


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Polarizing
Microscopes

JENALAB_{pol}

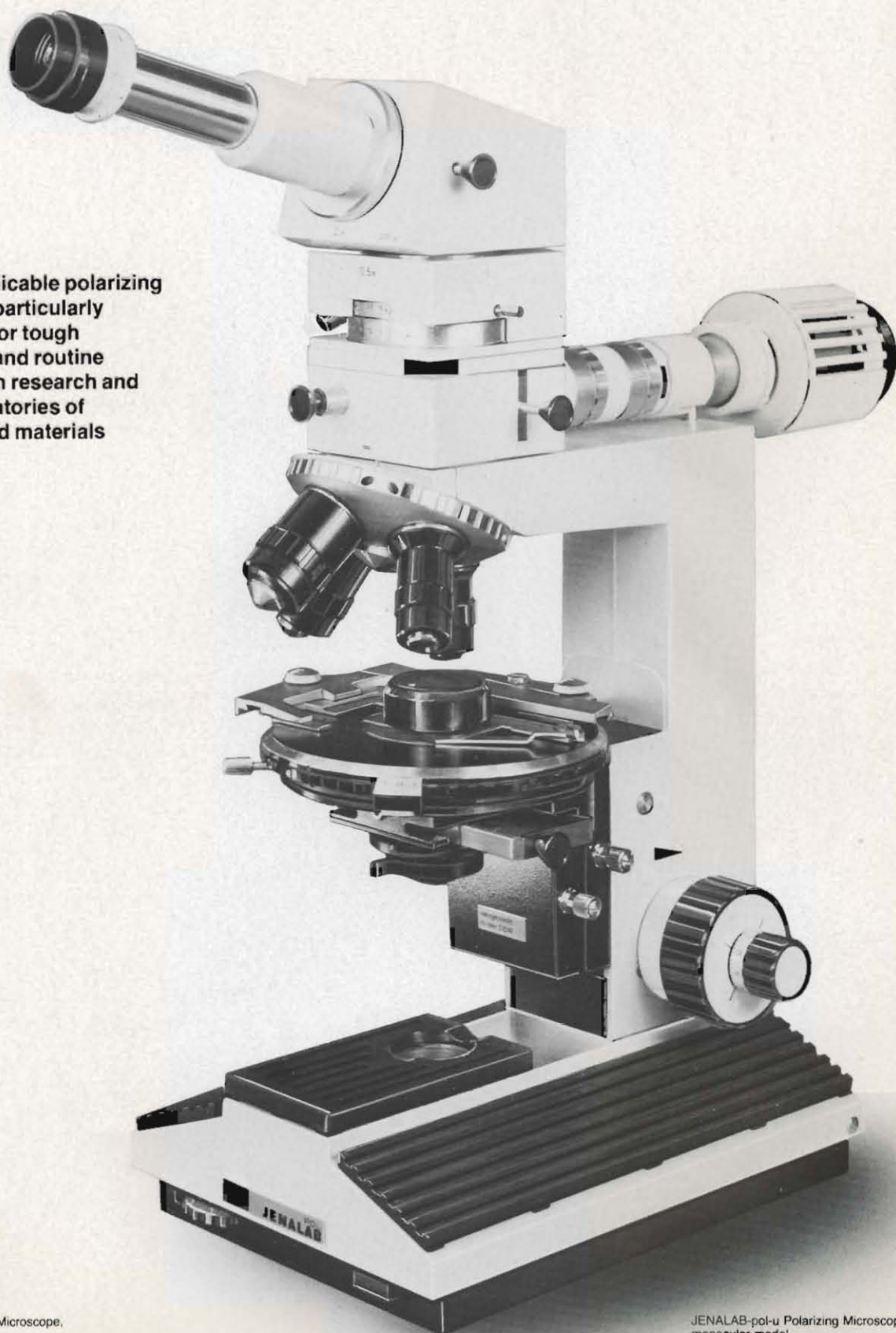


Polarizing microscopes
of the new generation
of JENA MICROSCOPES
for education and
routine

JENALAB pol u

monocular model
for transmitted and
incident light

Universally applicable polarizing
microscopes – particularly
recommended for tough
classroom use and routine
investigations in research and
industrial laboratories of
geosciences and materials
sciences



JENALAB-pol-d Polarizing Microscope,
monocular model

JENALAB-pol-u Polarizing Microscope,
monocular model

Novel concept

Infinity corrected objectives – the basis of efficient standard outfits and versatile extensibility through accessories

Angular polarizing tubes

for ergonomic connection of monocular or binocular heads, firmly adjusted Bertrand lens

New optics

Achromats (A) and planachromats (PA) "pol" of the new generation of objectives with essentially improved performance; user friendly universal condenser

Incident light outfit

Coming as standard with outfits "u" (= universal, i.e. transmitted and incident light), microscope magnifications of up to 500×

Accessories

Measuring compensator, crystal rotating device, UT-124 universal rotary stage, outfits for phase contrast, measuring and counting and photomicrography

Intermediate polarizing tubes for transmitted and incident light with measuring analyzer and fixed or rotary compensators arranged in the telecentric path of rays as well as improved incident light illumination after KOEHLER

15° viewing angle for convenient posture of head and body; Bertrand lens with fixed stop for selecting small crystals in conoscopy and rotary conoscopy; photomicrography with special photo/viewing head

Standard outfits comprising PA 2.5×, A 10×, A 50× objectives and GF-P 10× (18) eyepiece(s)
Immersible N.A. 1.25 condenser "pol" with lowpower lens
Optional objectives:
PA 20× and oil immersion type A HI 100× for covered specimens in transmitted light

KOEHLER illumination with 25W halogen lamp and incident light illuminator

Outfits "u" containing in addition A 50× objective for uncovered specimens
Optionally available GF-PA VI 12.5×/0.33 objective for various immersion agents and oil immersion objectives PA HI 25×/0.65 and GF-PA HI 50×/1.0

Optionally available compensators:
0...4 λ wedge compensator,
0...6 λ and 0...130 λ tilt compensators,
λ/8 rotary compensator
Crystal rotating device with spindle stage, threeaxial universal stage, phase contrast equipment with 10× and 40× achromats

JENALAB-pol-d transmitted light outfits

Applications

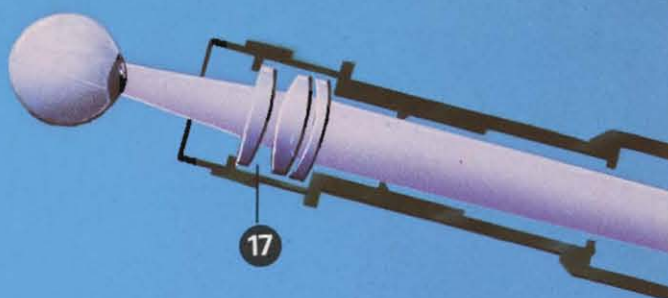
- in the classical field of geosciences for the determination of minerals and rocks
- in technical petrography for the determination of minerals and textures
- in chemical industry, e. g. for monitoring of fertilizer production and in pharmaceutical chemistry
- in the growth of synthetic crystals for the determination of their optical properties
- in the field of environmental research for phase and quantity analysis of dust
- in plastography for the examination of thin sections, injection moulded plastics and high-polymeric fibres and films
- in specialized fields of medicine, e. g. in urology for the investigation of urinary calculi

JENALAB-pol-u transmitted/incident light outfits

Additional applications

- in the exploration of mineral deposits for the analysis of smeltable ore minerals
- in building materials industry, e. g. for the examination of cement clinker thin sections
- in coal petrography for the determination of organic and inorganic constituents
- in metallography for special investigations, e. g. of nonmetallic inclusions, or for contrasting

Schematic sectional view

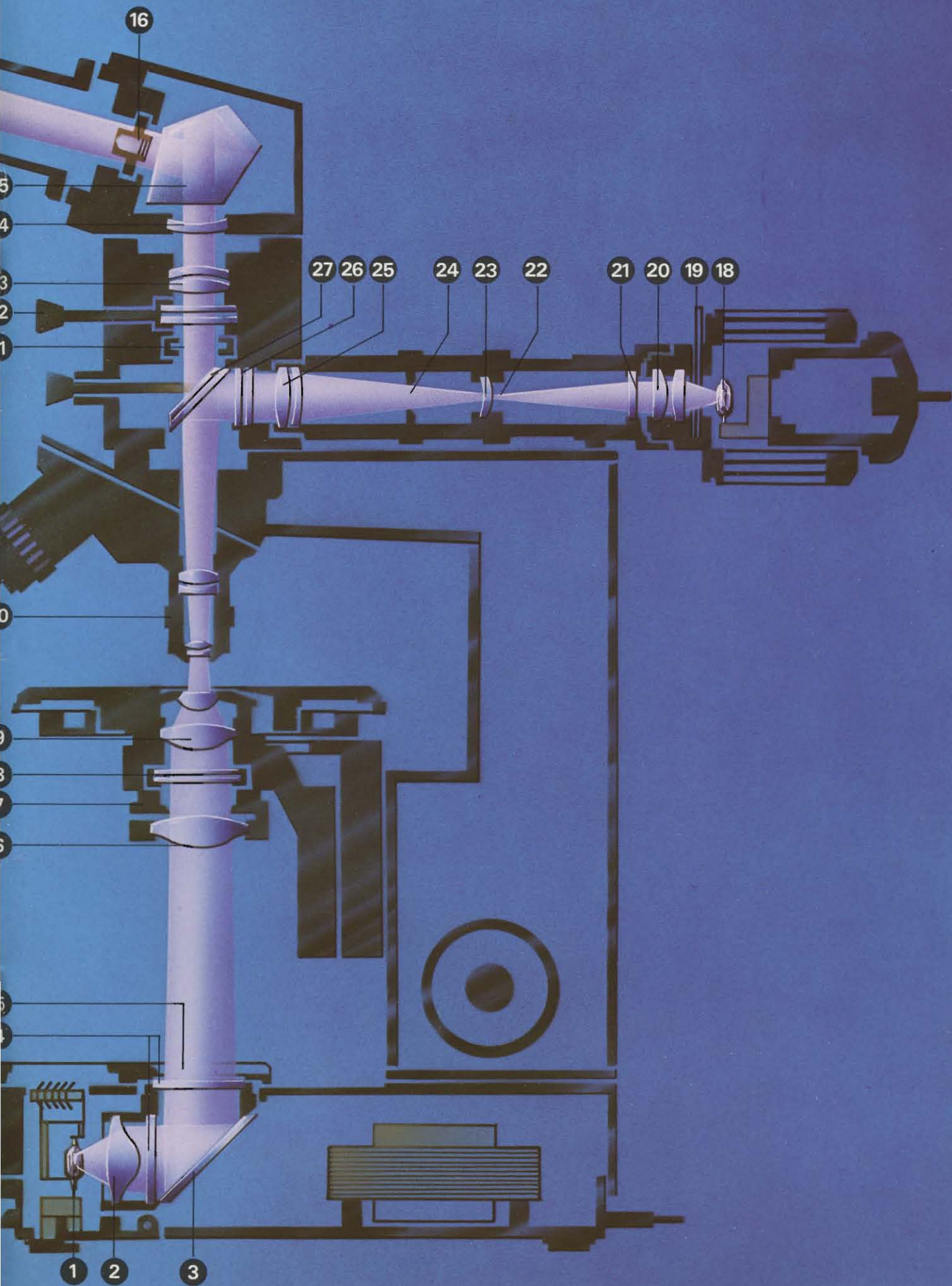


Transmitted light path 1...17

Incident light path 18...27 and 10...17

- 1 6V 20W halogen lamp
- 2 aspherical collector
- 3 reflecting mirror
- 4 diffusing screens (ground glasses)
- 5 filter mount, 32 mm dia.
- 6 swing-out low-power lens
- 7 aperture diaphragm
- 8 rotary polarizer slide or annular stop slide
- 9 N.A. 1.25 universal condenser "pol"
- 10 achromatic objective "pol" or "ph" for phase contrast
- 11 compensator slot
- 12 rotary analyzer slide
- 13 0.5× achromatic tube lens
- 14 2× tube length correction lens
- 15 15° pentaprism
- 16 Bertrand lens slide
- 17 standard eyepiece GF P 10× (18) pol
- 18 6V 25W halogen lamp
- 19 slot for ground glass
- 20 two-lens collector
- 21 filter mount for heat-absorbing and colour filter
- 22 aperture diaphragm
- 23 illumination lens
- 24 field diaphragm
- 25 achromat
- 26 fixed polarizer slide
- 27 incident light illuminator

JENALAB pol u



JENALAB-pol – versatilely extensible

Compensators

Compensators for the internationally used slot size of 20 mm × 6 mm

The simple full wave and quarter wave compensators for qualitative evaluation are standard; full wave and quarter wave compensators in sub-parallel position are optionally available

Wedge compensator

The 0...4 λ wedge compensator serves for the estimation for path differences and for the determination of optical properties in conoscopy.

Measuring compensators

As measuring compensators the 0.6 λ and 0.130 λ EHRINGHAUS tilting compensators and the λ/8 rotary compensator for small path differences are recommended for use in conjunction with the "1J" filter set (interference filters).

By using our RETARMET-2 Digital Compensator the work with the measuring compensators can be decisively rationalized, considerably improved ergonomically and extended to dynamic measurements (e. g. of temperature dependencies). When retrofitting this system the graduated drums are exchanged for the optoelectronic angle measuring device. Direct display or print-out of path difference averages – no tedious reading from scales and interpolation of tabulated values!



JENALAB-pol-d Polarizing Microscope
with RETARMET-2



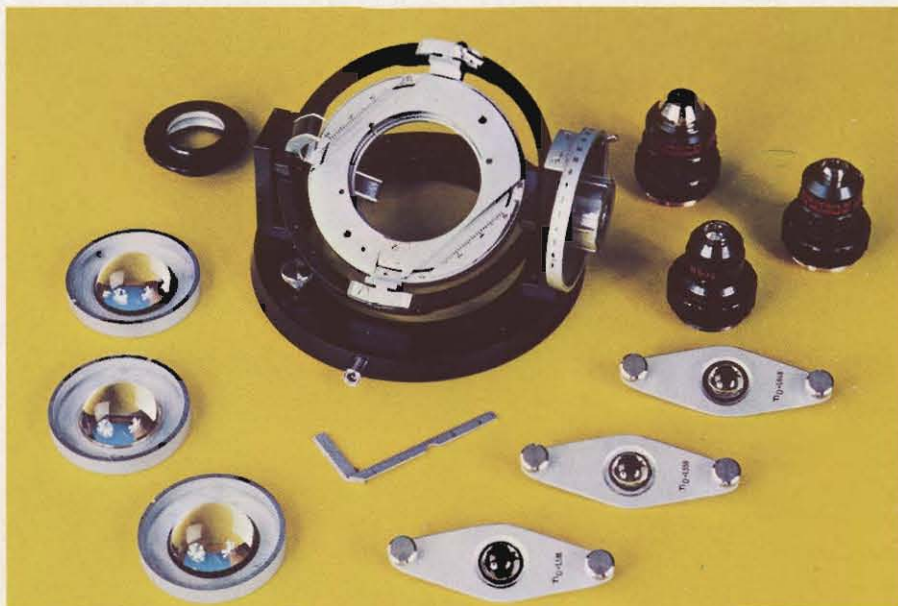
Full wave compensator, subparallel
quarter wave compensator, subparallel
wedge compensator, 0...4 λ
λ/8 rotary compensator
tilting compensator 0...6 λ, after Ehringhaus

UT-124 Universal rotary stage

The use of the UT-124 three-axial universal rotary stage (in preparation) in special courses helps intensifying the training of mineralogists and geologists on polarizing microscopes. The UT-124 stage is suited also for routine use in structure analysis of rock thin sections and for the classical field of plagioclase determinations after Federow.

Crystal rotating device

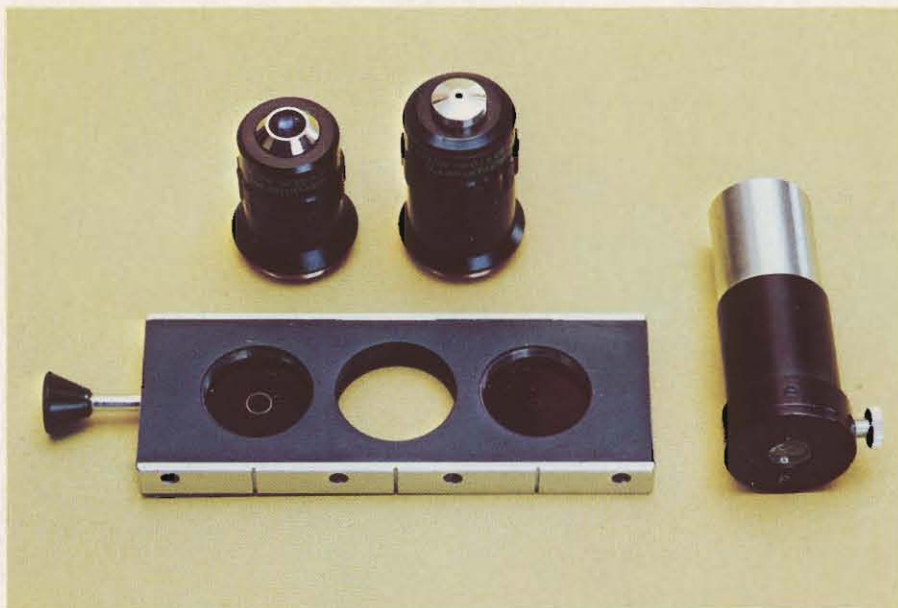
The crystal rotating device with the UT-4 spindle stage is designed for the investigation of small crystals and crystal fractions. It can be used for refractive index determinations in cells by the immersion method and for orientation determinations by the extinction method.



UT-124 three-axial universal rotary stage, with accessories

Phase contrast equipment

The phase contrast equipment (in preparation) comprises two phase contrast objectives and a slide with centrable annular stops which is used in place of the polarizer slide in conjunction with the N. A. 1.25 standard condenser. In phase contrast, minor refractive index differences can be distinguished more easily than by the conventional method with the Becke line. Thus, the sophistication of the immersion method for refractive index determinations is a significant application in the field of geosciences.



Model ph 10/40 phase contrast equipment

Measuring and counting

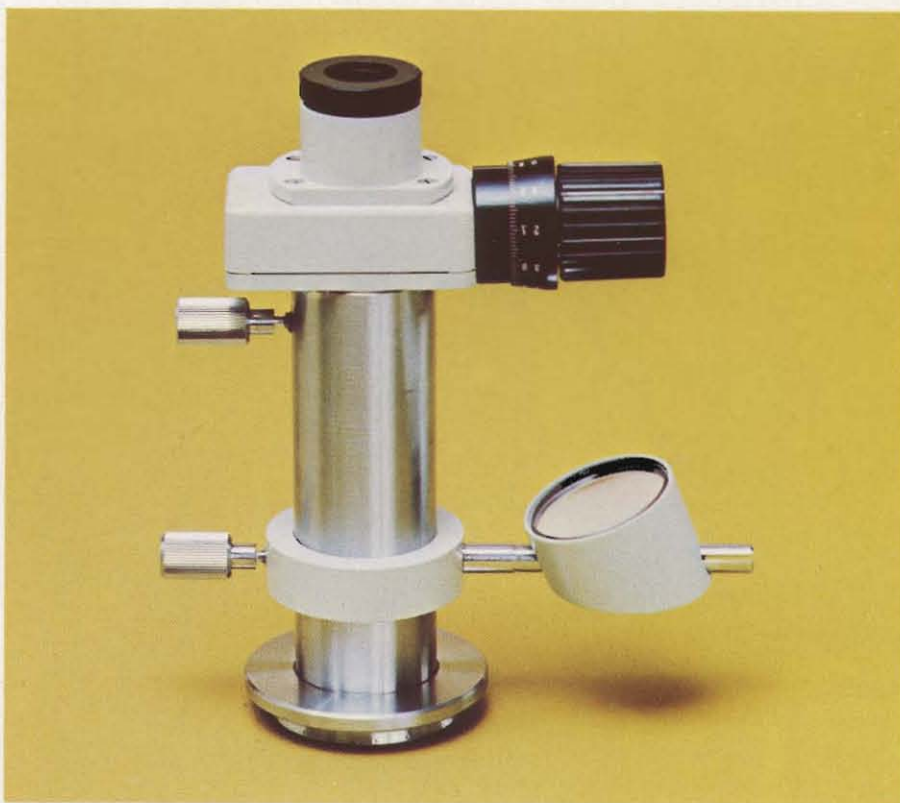
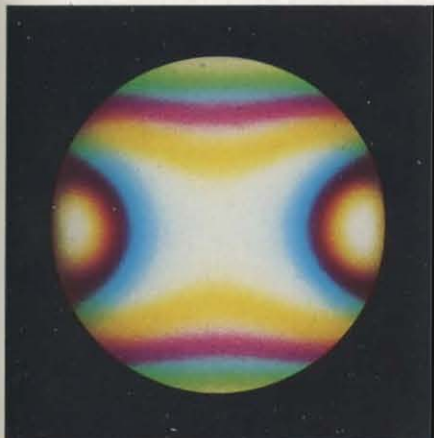
For conventional microscopic measuring and counting tasks we refer you to our assortment of stage micrometer slides and eyepiece micrometer discs which necessitate the use of the focusing eyepiece GF-P 10 \times (18). For higher accuracy measurements the monocular 16 \times measuring head with micrometer eyepiece is available which is attached in place of the monocular head "pol" or the binocular draw tube "pol".

When the binocular measuring equipment with micrometer eyepiece is used, evaluation, is optional via graduated drums or via an opto-electronic transducer in conjunction with the length measuring programs of the RETARMET-2.

Photomicrography

With the 2 \times /15 $^\circ$ pol photo/viewing tube (in preparation) and our MF-AKS photomicrographic system outfits for 35 mm photography are offered in various price ranges. They can be supplemented by camera attachments for medium-size and instant photography.

Interference figure of muscovite, optically biaxial, diagonal position, 90 $^\circ$ polars, observation towards the acute bisectrix



16 \times monocular measuring tube

JENALAB-pol-d Polarizing Microscope, binocular model



Optical specification

"pol" objectives, low-strain, infinity corrected M 25 × 0.75 screw thread							"pol" eyepieces, focusing with cross lines			
objective type A: achromat PA: planachromat	objective magnification	numerical aperture	cover glass thickness correction	used in d: transmitted light a: incident light	free working distance (mm)	supplied as ○ standard △ option	P 6.3× (18) pol △ option		GF-P 10× (19) pol ○ standard	
							microscope magnification	object field diameter (mm)	microscope magnification	object field diameter (mm)
PA	2.5×	0.05	—	d+a	4.6	○	16×	7.6	25×	7.2
A	10×	0.25	—	d+a	9.2	○	63×	1.9	100×	1.8
A	50×	0.80	0.17	d	0.32	○	320×	0.38	500×	0.36
A	50×	0.80	0	a	0.32	○	320×	0.38	500×	0.36
PA	20×	0.40	0.17	d	2.1	△	125×	0.95	200×	0.90
A HI	100×	1.25	0.17	d	0.12	△	630×	0.19	1000×	0.18
PA	20×	0.40	0	a	2.6	△	125×	0.95	200×	0.90
GF-PA	12.5×	0.33	0	a	0.28	△	80×	1.52	125×	1.44
VI										
PA HI	25×	0.65	0	a	0.55	△	160×	0.76	250×	0.72
PA HI	50×	1.0	0	a	0.40	△	320×	0.38	500×	0.36
A	5×	0.10	S	d	6.0	⊗	32×	3.8	50×	3.6
A	16×	0.20	S	d	2.8	⊗	100×	1.2	160×	1.1
A	50×	0.60	S	d	2.0	△	320×	0.38	500×	0.36

GF: wide field;

S: segment for UT-124;

VI: variable immersion,

i. e. for water, oil or glycerine;

HI: homogeneous oil immersion

⊗: included in standard equipment
of universal rotary stage

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