

POLARIZING
MICROSCOPES

LEITZ

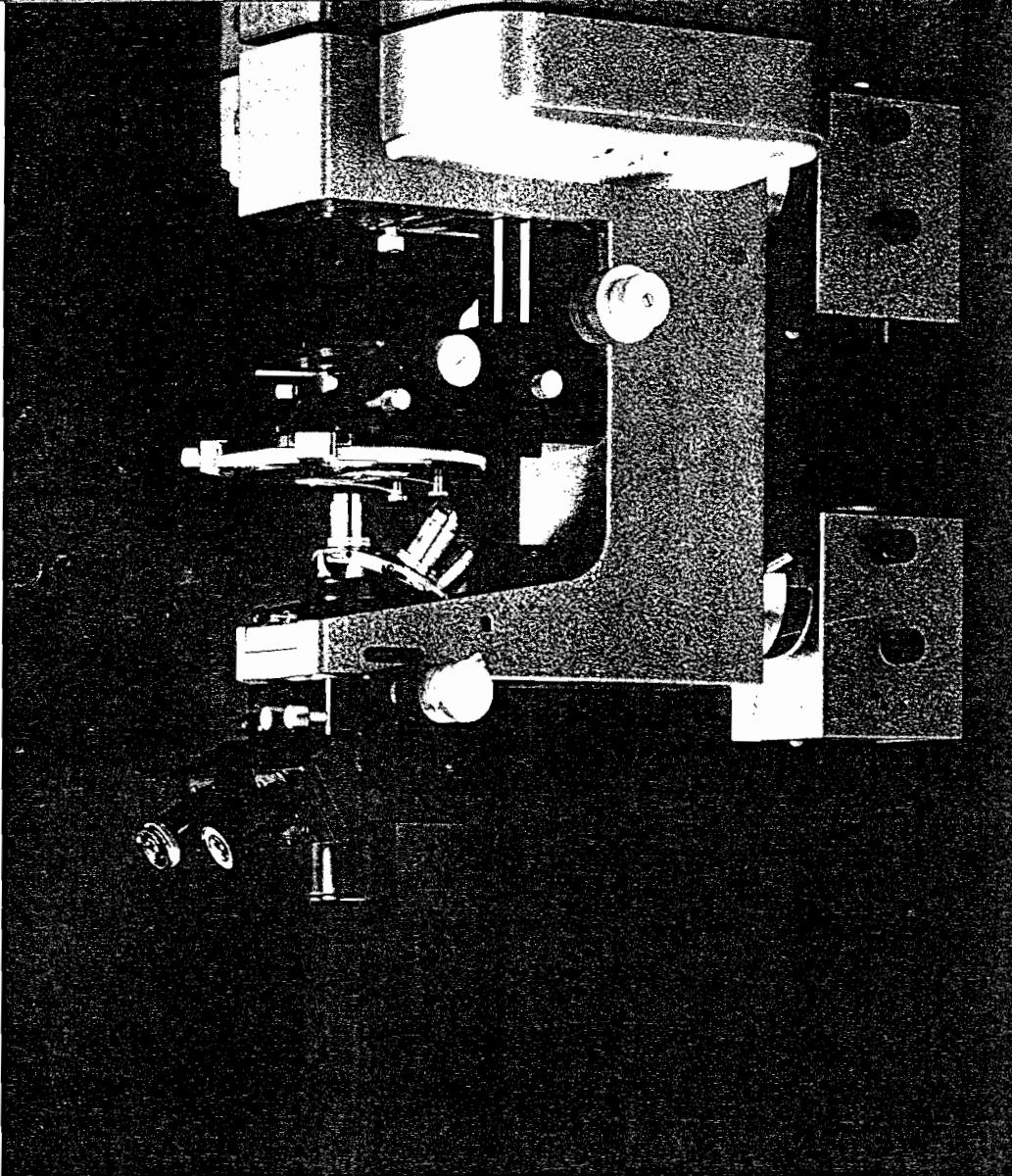


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Optical methods of examination with the aid of polarized light have been perfected to such a remarkable extent in the course of the past hundred years that they have been introduced with great success into almost all fields of the natural sciences and technology.

The importance of polarized light for optical research work was recognized very early, and it was Brewster (1781 - 1868) who pointed out, only a few years after the discovery of polarization, the practical possibility of examining organic and inorganic materials in polarized light, with emphasis, however, on the identification of minerals. The development of special polarizing instruments, however, proceeded very slowly at this early stage. H. F. Talbot equipped a compound microscope with polarizer and analyzer (Nicol prisms) for the first time in 1834 and thus introduced an efficient polarizing microscope.

But still in 1860, the Utrecht scientist Pieter Harting wrote in his book *The Microscope*: "The applications for which a specially constructed polarizing microscope may be desirable are very rare, and therefore an ordinary microscope supplemented by attachable polarizing elements should generally be preferred." In accordance with such opinions, LEITZ microscopes supplied at the time were offered with separate polarizers and analyzers for mineralogical work, and special polarizing microscopes such as the Rosenbusch polarizing stand of Carl Kellner (founder of the LEITZ works) remained exceptions. It was not until the development of the preparation of polished mineralogical thin sections that more exacting methods of examination were called for, leading to a growing demand for polarizing microscopes.

The first LEITZ polarizing microscope was supplied in 1885, and only five years later a special petrographic instrument was introduced. Ample proof of the efforts made in this new field is the fact that in 1893 a special catalog on polarizing microscopes and accessories was published by LEITZ WETZLAR.

The type of microscope stand developed at the beginning of the twentieth century featured a horseshoe foot with inclinable curve limb; a novel micrometer screw on horizontal

axis immediately below the coarse focusing heads proved to be extremely successful for half a century. It was only in recent years that advanced designs with built-in illuminating system were introduced.

In 1912, Max Berek, former student of Theodor Liebisch, joined the LEITZ staff. His work found expression in the advancement of the polarizing microscope and optical methods of examination which consolidated the leading position of LEITZ microscopes in the mineralogical field. It is his merit to have laid down an exact theory on microscopy in transmitted and incident light, including polarized light, and to have introduced remarkable design improvements. His achievements are most outstanding in incident light microscopy. His compensating prism (trapezoidal prism), widely used today, deflects the illuminating rays without changing their state of polarization. This optical means became the basis of quantitative examination in incident light. The application of polarized light in microscopy, initially confined to the work of mineralogists, gradually found its way into other fields of the natural sciences. W. J. Schmidt greatly contributed to the introduction of polarized light microscopy into biological and medical research in his fundamental work by which new methods were established and former prejudices removed.

The classical form of the polarizing microscope stand as it was introduced at the beginning of this century was manufactured with more or less external modifications until radically new designs appeared a few years ago which followed the example set by the large biological research microscope ORTHOLUX about 25 years earlier. The outstanding features of this famous instrument were adopted for creating a range of polarizing microscopes which met all requirements of modern teaching and routine laboratory work, as well as research. Their versatility, performance and operation convenience were outstanding since LEITZ designers worked closely with noted scientists and users of polarizing outfits. Like the well-known ORTHOLUX, the new polarizing stands offered the advantages of a built-in illuminating system, low-placed focusing controls for utmost conven-

ence and displacement of the freely accessible object stage, while the observation height of the interchangeable monocular and binocular tubes remained unchanged. Binocular vision could now be applied to orthoscopic as well as conoscopic observations. A remarkable degree of interchangeability ensured ready adaptation of the new polarizing stands to all types of work.

The current line of LEITZ polarizing microscopes is as follows:

1. SM-POL. Simple polarizing microscope for general examinations in transmitted light.

2. LABOLUX-POL. Polarizing microscope with built-in illuminating system for investigations in transmitted light and with provision for work in reflected light.

3. DIALUX-POL. Large polarizing microscope with built-in illuminating system for all types of research work in transmitted light and with provision for work in reflected light.

4. EPIUX-POL. Polarizing microscope for work in reflected light with provision for fitting transmitted light equipment.

5. ORTHOLUX-POL. Universal research microscope with built-in illuminating system for work in transmitted and reflected light including incident phase contrast illumination.

6. ORTHOPLAN-POL. The new member of this versatile product line is the ORTHOPLAN-POL, introduced in 1970. When the basic ORTHOPLAN Wide-Field Research Microscope was developed by LEITZ several years ago, it was selected by an international jury for excellence in industrial design. Here for the first time was an exceptionally contemporary microscope designed for functional accessory integration.

Now a special ORTHOPLAN, the ORTHOPLAN-POL, is available for polarized light investigations — for orthoscopic and conoscopic observations

and for photomicrography in both transmitted and reflected light.

The polarizing elements of LEITZ microscopes are in most cases high-grade polarizing filters with a neutral-gray polarizing film to suit microscopic requirements. These filters have been considerably improved in recent years and their efficiency is equal to calcite prisms formerly exclusively used in LEITZ microscopes. As constructional elements for microscopes, these filters are more advantageous since they require less space. Moreover, the microscopic images of instruments equipped with polarizing filters are free from astigmatism without the interposition of additional optical means. The DIALUX-POL research stand is alternatively made with calcite polarizing prisms which are still preferred for specialized work such as spectro-photometric measurements or prolonged examinations and photomicrography with the aid of high-power light sources, i.e., xenon discharge lamps.

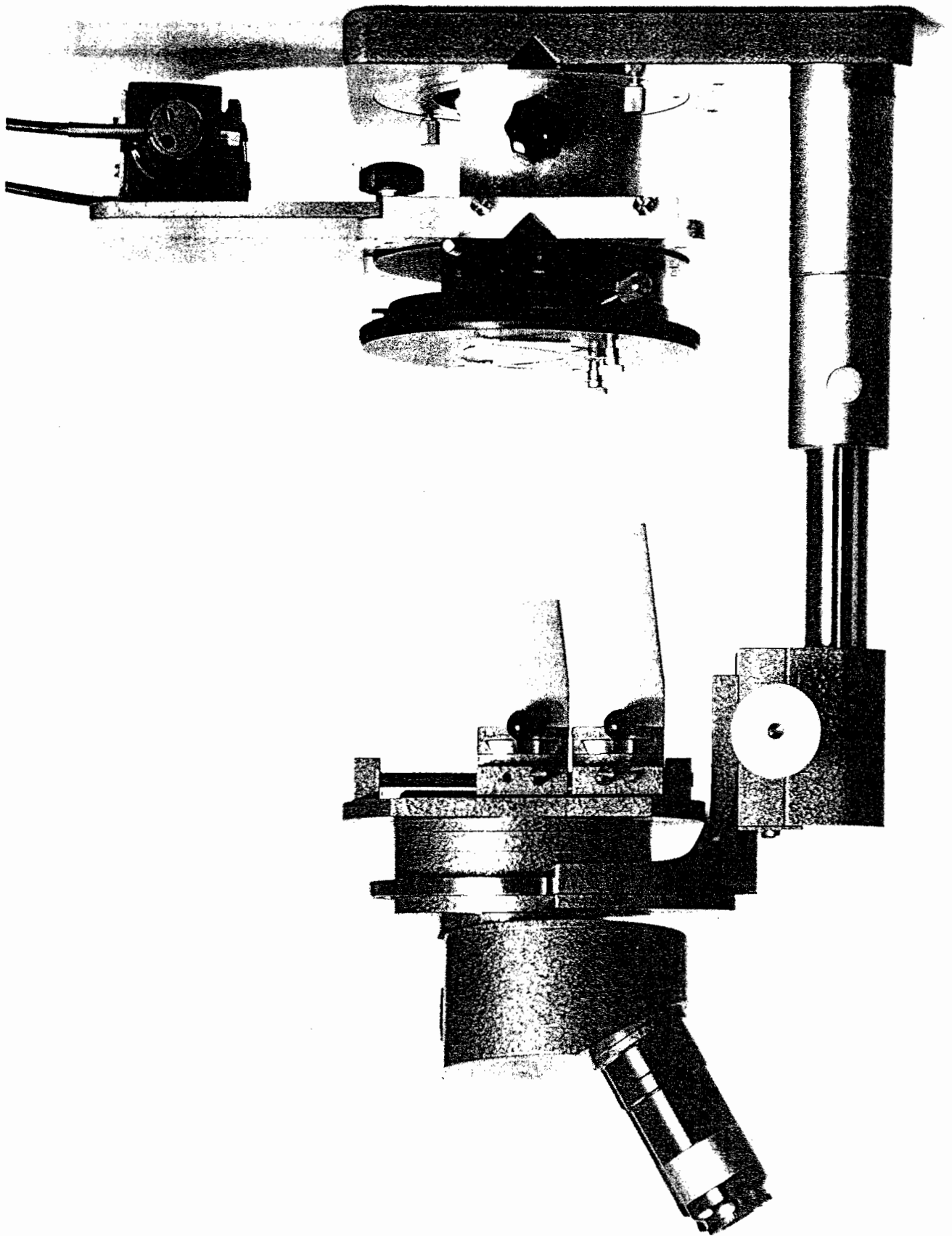
In addition to the standard microscope outfits described in this catalog, we would like to call your attention to the special accessories and attachments such as the MACRO-DIA Apparatus for photomicrography, Compensators (mica, Berék, Brace Kohler and tilting types; quartz wedges and Wright eyepiece), the Universal Rotating Stages and the Micro Hardness Tester.

Unique to the LEITZ polarizing microscope system is the family of interference contrast accessories: the Smith, Nomarski, Francon and Jamin Lebedeff attachments.

Equipment for projecting interference figures with the PRADO UNIVERSAL makes this instrument particularly valuable for lecture work.

And for three-dimensional observations, you will want to review the Stereo-Pol equipment described at the front of this catalog.

Of course, we will be happy to assist you in selecting the LEITZ polarizing microscope, attachments and accessories most suitable for your requirements. Please feel free to contact us at any time for technical advice.



**LEITZ STEREOSCOPIC - POL MICROSCOPES
WITH FIELD OF VIEW UP TO 28MM ϕ
FOR ORIENTATING INVESTIGATIONS IN TRANSMITTED
POLARIZED LIGHT**

**STEREOSCOPIC - POL MICROSCOPE, MODEL RS - POL,
WITH RAPID OBJECTIVE CHANGER**

511 271	Large field stereo body, RS-POL, with field of view up to 28mm ϕ , inclined eyepiece tubes rotatable through 360° with click stops at 90° and swing-out filter analyser; rapid objective changer for three pairs of parfocal objectives. The pair of 1x/0.05 objectives being permanently mounted	\$ 735.00
511 233	Incident light stand with extensible column (76mm), rack and pinion focusing motion and base plate with stage plate, metal insert, black glass plate, opal glass plate, clear glass plate and two object clamps	111.00
511 236	Transmitted light stage with built-in adjustable illuminating mirror; the front side concave and reverse side white	91.00
511 272	Rotating and centering object stage with filter polarizer rotatable 90° and slot to accept compensator	283.00
512 036	Flexible plastic protective dust cover	3.00
511 276	LEITZ STEREOSCOPIC - POL MICROSCOPE RS - POL as described above, however, without optical equipment	\$1,223.00
Optical Equipment ST 12		
511 204	Paired achromatic stereo objectives, 1.6x/0.07 on slider, free working distance 120mm	\$ 82.00
511 205	Paired achromatic stereo objectives, 4x/0.08 on slider, free working distance 60mm	89.00
511 206	Paired achromatic stereo objectives, 10x/0.10 on slider, free working distance 30mm	93.00
511 211	Paired large field eyepieces, W 6.3x, one with adjustable eyelens, field of view up to 28mm ϕ	100.00
511 218	Paired large field eyepieces, W 16xM, one with adjustable eyelens and mount for reticles, field of view up to 16mm ϕ	123.00
511 221	Paired large field eyepieces, W 25x, with fixed eyelens, field of view up to 10mm ϕ	114.00
	LEITZ LARGE FIELD STEREOSCOPIC - POL MICROSCOPE RS - POL WITH OPTICAL EQUIPMENT ST 12 FOR MAGNIFICATIONS 6.3X TO 250X (TRANSMITTED LIGHT)	\$1,824.00
511 273	First order red compensator	\$ 149.00
511 274	Quarter wave compensator	89.00
511 235	Twin transmitted light illuminators 6 volt 5 watt with mounting bracket	\$ 140.00
500 124	Regulating transformer with voltmeter for 6 volt 15 watt, 8 volt 5 watt or 6 volt 5 watt lamps; for connection to 110/120 volts, 60 cycles A.C.	78.00
514 001	Monia lamp 6 volts, 30 watts with centerable lamp socket, focusable condenser lens, blue and ground glass filters; adjustable on pillar stand	\$ 107.00
500 101	Combination regulating transformer with ammeter 6 volts, 5 amps and dual fixed transformer 8 volts, 5 watts; for connection to 110/120 volts, 60 cycles A.C.	130.00
511 253	Fitted cabinet with handle, lock and key	\$ 67.00

511 270	\$ 620.00	Large field stereo body, ES-POL, with field of view up to 28mm ϕ , inclined eyepiece tubes rotatable through 360° with click stops at 90° and swing-out filter analyzer, dovetail fittings accepting paired objective slider. The pair of 1X/0.05 objectives being permanently mounted
511 233	\$ 111.00	Incident light stand with extensible column (76mm), rack and pinion focusing motion and base plate with stage plate, metal insert, black glass plate, opal glass plate, clear glass plate and two object clamps
511 236	91.00	Transmitted light stage with built-in adjustable illuminating mirror, the front side concave and reverse side white
511 272	283.00	Rotating and centering object stage with filter polarizer rotatable 90° and slot to accept compensators
512 036	3.00	Flexible plastic protective dust cover
511 275	\$1,108.00	LEITZ STEREO SCOPIC - POL MICROSCOPE ES - POL as described above, however, without optical equipment
Optical Equipment ST 12		
511 204	\$ 82.00	Paired achromatic stereo objectives, 1.6x/0.07 on slider, free working distance 120mm
511 205	89.00	Paired achromatic stereo objectives, 4x/0.08 on slider, free working distance 60mm
511 206	93.00	Paired achromatic stereo objectives, 10x/0.10 on slider, free working distance 30mm
511 211	100.00	Paired large field eyepieces, W 6.3x, one with adjustable eyelens, field of view up to 28mm ϕ
511 218	123.00	Paired large field eyepieces, W 16xM, one with adjustable eyelens and mount for recticles, field of view up to 16mm ϕ
511 221	114.00	Paired large field eyepieces, W 25x, with fixed eyelens, field of view up to 10mm ϕ - LEITZ LARGE FIELD STEREO SCOPIC - POL MICROSCOPE ES - POL WITH OPTICAL EQUIPMENT ST 12 FOR MAGNIFICATIONS 6.3X TO 250X (TRANSMITTED LIGHT)
511 273	\$ 149.00	First order red compensator
511 274	89.00	Quarter wave compensator
511 235	\$ 140.00	Twin transmitted light illuminators 6 volt 5 watt with mounting bracket
500 124	78.00	Regulating transformer with voltmeter for 6 volt 15 watt, 8 volt 5 watt or 6 volt 5 watt lamps; for connection to 110/120 volts, 60 cycles A.C.
514 001	\$ 107.00	Monta lamp 6 volts, 30 watts with centerable lamp socket, focusable condenser lens, blue and ground glass filters; adjustable on pillar stand
500 101	130.00	Combination regulating transformer with ammeter 6 volts, 5 amps and dual fixed transformer 8 volts, 5 watts; for connection to 110/120 volts, 60 cycles A.C.
511 253	\$ 67.00	Fitted cabinet with handle, lock and key

STEREO SCOPIC - POL MICROSCOPE, MODEL ES - POL, WITH DOVETAIL FITTING FOR PAIRED OBJECTIVE SLIDER

OPTICAL EQUIPMENT FOR STEREO MICROSCOPES ES & RS

Optical data for the RS and ES wide-field stereo microscopes						
Working distance mm	Eyepieces					Objectives/ Aperture
	W 32 x	W 25 x	W 16xM	W 10 x	W 6.3 x	
140	32 x	25 x	16 x	10 x	6.3 x	Magnif. Field mm 1/0.05
120	50 x	40 x	25 x	16 x	10 x	Magnif. Field mm 1.6/0.065
90	80 x	63 x	40 x	25 x	16 x	Magnif. Field mm 2.5/0.08
60	125 x	100 x	63 x	40 x	25 x	Magnif. Field mm 4/0.08
30	320 x	250 x	160 x	100 x	63 x	Magnif. Field mm 10/0.10

- Objectives**
- 511 204 Paired achromatic stereo objectives, 1.6x/0.07 on slider, free working distance 120mm \$ 82.00
 - 511 207 Paired achromatic stereo objectives, 2.5x/0.08 on slider, free working distance 90mm 82.00
 - 511 205 Paired achromatic stereo objectives, 4x/0.08 on slider, free working distance 60mm 89.00
 - 511 206 Paired achromatic stereo objectives, 10x/0.10 on slider, free working distance 30mm 93.00

- Large Field Eyepieces**
- 511 211 Paired large field eyepieces, W 6.3x, one with adjustable eyelens, field of view up to 28mm ϕ \$ 100.00
 - 511 215 Paired large field eyepieces, W 10x, one with adjustable eyelens, field of view up to 24mm ϕ 119.00
 - 511 218 Paired large field eyepieces, W 16xM, one with adjustable eyelens and mount for reticles, field of view up to 16mm ϕ 123.00
 - 511 219 Paired large field eyepieces, W 16xM, both with adjustable eyelens and mount for reticles, field of view up to 16mm ϕ 138.00
 - 511 217 Single large field eyepiece, W 16xM, with adjustable eyelens and mount for reticles, field of view up to 16mm ϕ 69.00
 - 511 221 Paired large field eyepieces, W 25x, with fixed eyelens, field of view up to 10mm ϕ 114.00
 - 511 223 Paired large field eyepieces, W 32x, with fixed eyelens, field of view up to 8mm ϕ 136.00
 - 511 251 Paired eyecups, soft rubber \$ 8.00

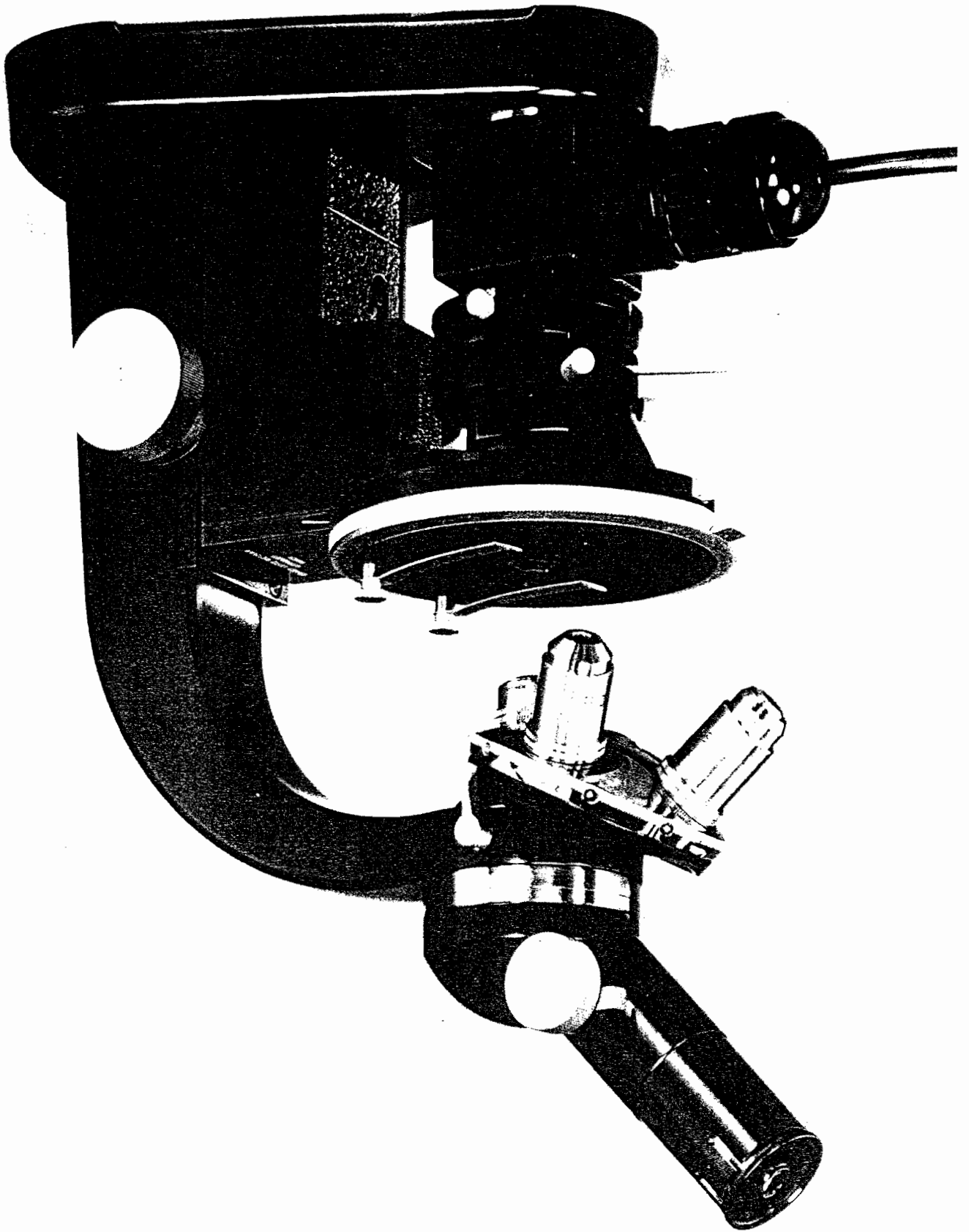
**EYEPiece RETICLES
FOR "M" EYEPieces ONLY**

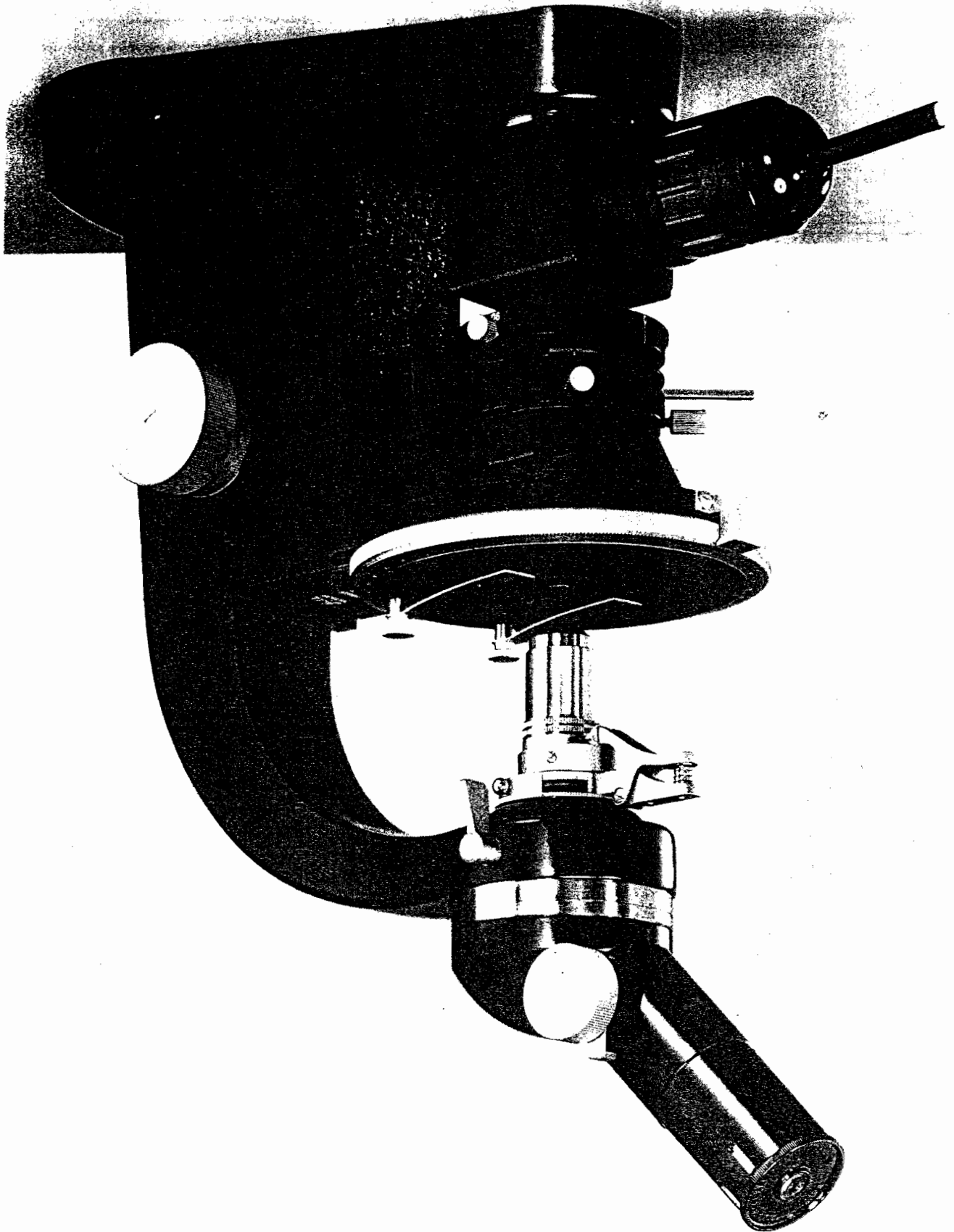
For Stereoscopic Microscopes, Models ES, RS and FS	
511 310	Eyepiece micrometer, 6.3mm = 100 divisions \$ 31.00
511 311	Eyepiece micrometer, 5mm = 100 divisions 31.00
519 920	Eyepiece micrometer, 10mm = 100 divisions 31.00
511 313	Eyepiece micrometer, 10mm = 200 divisions 31.00
511 139	Crossline plate \$ 31.00
519 937	Eyepiece micrometer, 10mm = 100 divisions and crosslines \$ 31.00
511 309	Eyepiece net micrometer, 10 x 10mm divided into squares 0.075mm \$ 31.00
511 308	Eyepiece net micrometer, 10 x 10mm divided into squares 0.10mm 31.00
511 307	Eyepiece net micrometer, 10 x 10mm divided into squares 0.20mm 31.00
511 306	Eyepiece net micrometer, 10 x 10mm divided into squares 0.50mm 31.00
511 305	Eyepiece net micrometer, 10 x 10mm divided into squares 0.65mm 31.00
511 304	Eyepiece net micrometer, 10 x 10mm divided into squares 1.0mm 31.00

Stage Micrometer

513 106 Stage micrometer on glass 2mm = 200 divisions with photographic scale \$ 34.00

See page 10 for SM-POL M Microscope.





MONOCULAR POLARIZING MICROSCOPE, SM - POL M, WITH OBJECTIVE CENTERING CLUTCH

Modern stand, SM-POL M, made of non-corroding alloy with single knob combined coarse and fine adjustment and built-in swing-out filter analyser
 Permanently attached objective clutch changer with three centering collars and slot to accept compensators 0.73.-
 Dovetail carrier --.5-, for the interchange of condensers with rack and pinion for the adjustment in the height of condensers
 First order red compensator (Gypsum plate)
 Flexible plastic protective dust cover
 Leatherette carrying case, upright
 Interchangeable inclined monocular observation tube P 11 (30mm ϕ), with swing-out Bertrand lens and pinhole diaphragm
 Rotating and permanently centered ball bearing object stage No 39, 120mm diameter, with 360° graduations
 Swing-out condenser No. 70ZF, free from polarization, with aperture diaphragm, rotating filter polarizer indexed at 90° intervals, slot to accept quarter wave length plate, centering mount and interchangeable top element Achr. 0.90; on interchange carrier
 LEITZ POLARIZING MICROSCOPE SM-POL M 0.73.5. P 11 39/70ZF as described above

552 131 \$ 808.00

Optical Equipment B1A Mono

559 037 Achromatic dry objective, free from polarization, P 3.5x/0.10, focal length 32mm, free working distance 22mm
 559 045 Achromatic dry objective, free from polarization, P 10x/0.25, focal length 16mm, free working distance 5.3mm
 559 038 Achromatic dry objective, free from polarization, P 50x/0.85, focal length 3.6mm, free working distance 0.36mm, with spring loaded mount
 559 006 Huygens eyepiece P 8x (30mm ϕ) with adjustable eyelens and fixed crosslines, field of view 19mm
 550 045 LEITZ MONOCULAR STUDENT AND LABORATORY POLARIZING MICROSCOPE SM-POL M 0.73.5. P 11 39/70ZF COMPLETE WITH OPTICAL EQUIPMENT B1A MONO as described above
 512 078 Plane and concave mirror with bayonet mounting device ---12

514 096 \$ 29.00
 051 475 \$ 66.00

Alternate Substage Illuminators

Micro-dia lamp 15 watts, 110 volts A.C., with bayonet mounting device ---13
 Low voltage lamp 6.3 volts, 5 watts with adjustable aspherical condenser, blue and ground glass filters and bayonet mounting device; regulating transformer 6.5 volts, 0.8 amps for connection to 110/120 volts, 60 cycles A.C. ---22

\$ 1,261.00
 \$ 1,244.00
 17.00



SM-POL MICROSCOPE

INTERCHANGEABLE AND SUPPLEMENTARY EQUIPMENT

Tubes

552 035	Interchangeable straight monocular photographic tube O 14 (30mm ϕ), with swing-out Bertrand lens and pinhole diaphragm	\$ 136.00
552 029	Interchangeable inclined monocular observation tube P 11 (30mm ϕ), with swing-out Bertrand lens and pinhole diaphragm (included with basic equipment)	182.00
552 028	Interchangeable inclined binocular observation tube S 20; for standard diameter (23.2mm) eyepieces	451.00

Discussion Tube

553 193	Discussion tube for the simultaneous observation by two people of the microscope image with built-in mechanical arrow pointer, quartz plate and bayonet mounts to accept the standard observation tubes (not included)	\$ 721.00
054 385	Shock absorbing base	82.00

Note:

We recommend the monocular observation tube P 11 (catalog No. 552 029) in conjunction with the P 8x eyepiece (catalog No. 559 006). To insure adequate illumination the low voltage lamp 6 volts, 15 watts (catalog No. 514 095) is required.

Attachable Mechanical Stages

553 082	Attachable mechanical stage No. 42, with graduated vernier reading to 0.1mm; traversing area 34 x 20mm	\$ 212.00
553 083	Attachable mechanical stage No. 40 for point counting with seven pairs of interchangeable pinion heads to advance the slide at intervals of 0.1mm, 0.2mm, 0.3mm, 0.4mm, 0.5mm, 1.0mm and 2.0mm; traversing area 34 x 20mm	378.00

Equipment for Reflected Light

553 107	Vertical illuminator with swing-out polarizer and analyser, aperture and field diaphragm, bayonet mounting device; built-in low voltage lamp 6 volts, 15 watts with daylight conversion filter CB 16.5, ground glass and green filters (objectives for 215mm tube length)	\$ 558.00
500 124	Regulating transformer with voltmeter for 6 volt 15 watt, 8 volt 5 watt or 6 volt 5 watt lamps; for connection to 110 volts, 60 cycles A.C.	78.00
559 051	Achromatic dry objective, free from polarization, F 6.3x/0.20, focal length 30mm, free working distance 21mm	79.00
559 015	Achromatic dry objective, free from polarization, F 8x/0.18, focal length 23mm, free working distance 16mm	79.00
559 008	Achromatic dry objective, free from polarization, F 16x/0.40, focal length 13mm, free working distance 3.3mm	93.00
559 033	Achromatic dry objective, free from polarization, F 44x/0.65, focal length 4.5mm, free working distance 0.53mm	128.00

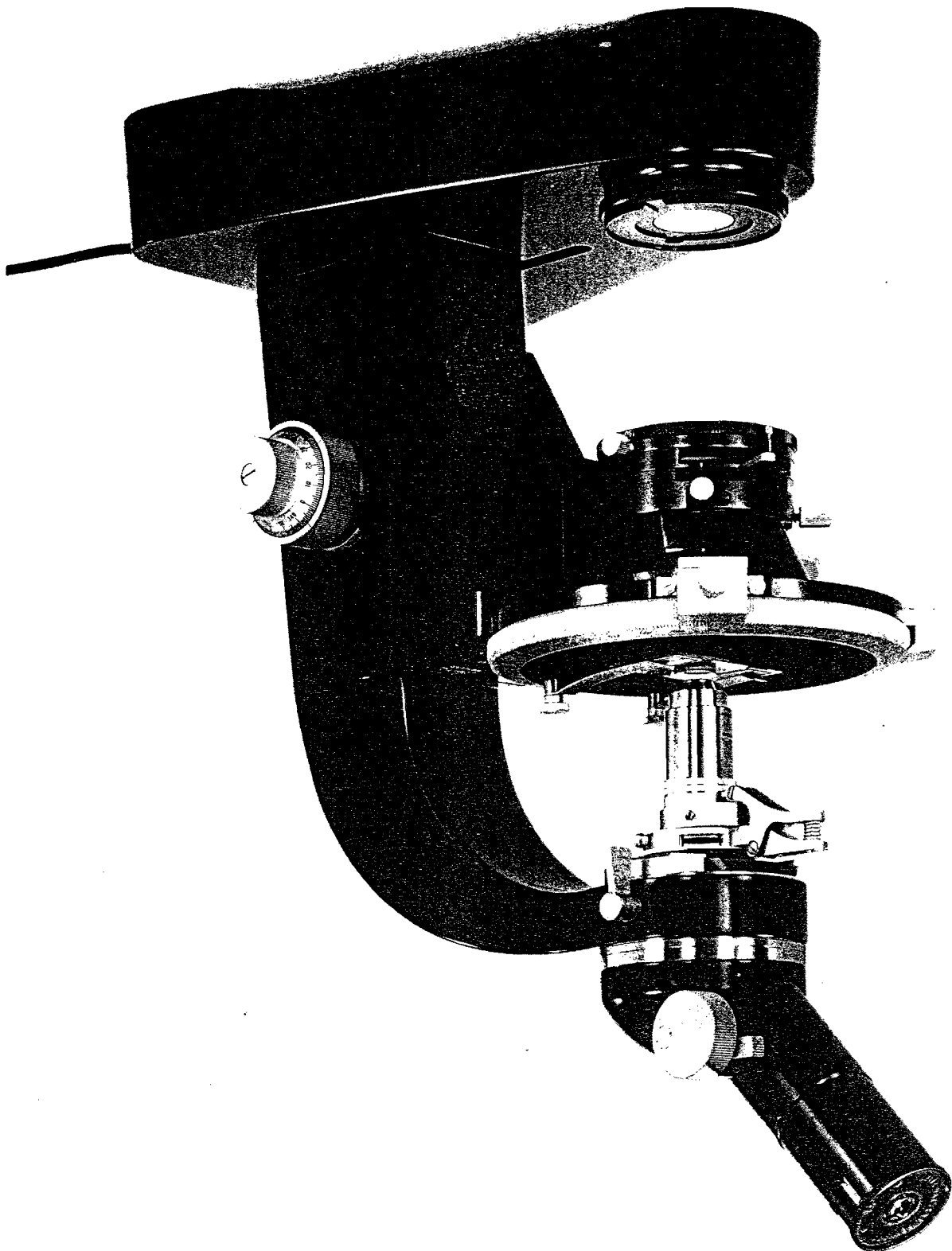
Note:

Due to the limited travel of the object stage, samples exceeding 10mm thickness, including the slide, cannot be used.

\$1,015.00

553 192	Drawing attachment with 80/20 prism, built-in quartz plate, adjustable lateral drawing tube, focusing device with built-in achromatic objective, eyepiece tube for the projection eyepiece (eyepiece not included), 45° mirror and bayonet mount for the observation tube	\$ 451.00
519 051	PERIPLAN widefield eyepiece, single GF 12.5x, field of view 18mm (drawing area 14 - 23cm)	59.00
Note:		
The microscope light source must be equipped with a regulating transformer. A 60 watt desk lamp is also required to illuminate the drawing area.		
512 078	Plane and concave mirror with bayonet mounting device ---12	\$ 17.00
514 096	Micro-dia lamp 15 watts, 110 volts A.C., with bayonet mounting device ---13	29.00
051 475	Low voltage lamp 6.3 volts, 5 watts with adjustable aspherical condenser, blue and ground glass filters and bayonet mounting device; regulating transformer 6.5 volts, 0.8 amps for connection to 110/120 volts, 60 cycles A.C. ---22	66.00
514 095	Low voltage lamp 6 volts, 15 watts with bayonet mounting device ---17	\$ 108.00
500 124	Regulating transformer with voltmeter for 6 volt 15 watt, 8 volt 5 watt or 6 volt 5 watt lamps; for connection to 110 volts, 60 cycles A.C.	78.00
Spectral Lamp		
514 090	Lamp housing, monia type, with adjustable collector, socket for sodium bulb and ground glass; adjustable on pillar stand	\$ 98.00
500 032	Sodium bulb Na 4 watt	25.00
514 092	Sodium vapor lamp for SM-POL M Microscope, however, without power unit	\$1,123.00
500 116	Power unit for sodium spectral lamp 4 watt, 220 volts, 60 cycles A.C.	138.00
500 039	Step-up transformer for connection to 110 volts, 60 cycles A.C.	69.00
Miscellaneous Accessories and Replacement Parts		
553 030	First order red compensator - Gypsum plate (included with basic equipment)	\$ 36.00
553 035	Quarter wave compensator - Mica plate	32.00
553 044	Quartz wedge I - IV orders, short type	143.00
512 037	Flexible plastic protective dust cover (included with basic equipment)	\$ 2.00
552 008	Leatherette carrying case, upright (included with basic equipment)	48.00
500 013	Bulb 15 watt, 110 volts A.C. (as replacement for catalog No 514 096)	\$ 1.00
050 520	Bulb 6.3 volts, 5 watts (as replacement for catalog No. 051 475)	0.40
500 012	Bulb 6 volts, 15 watts (as replacement for catalog No. 514 095 and 553 107)	3.30
Drawing Attachment		

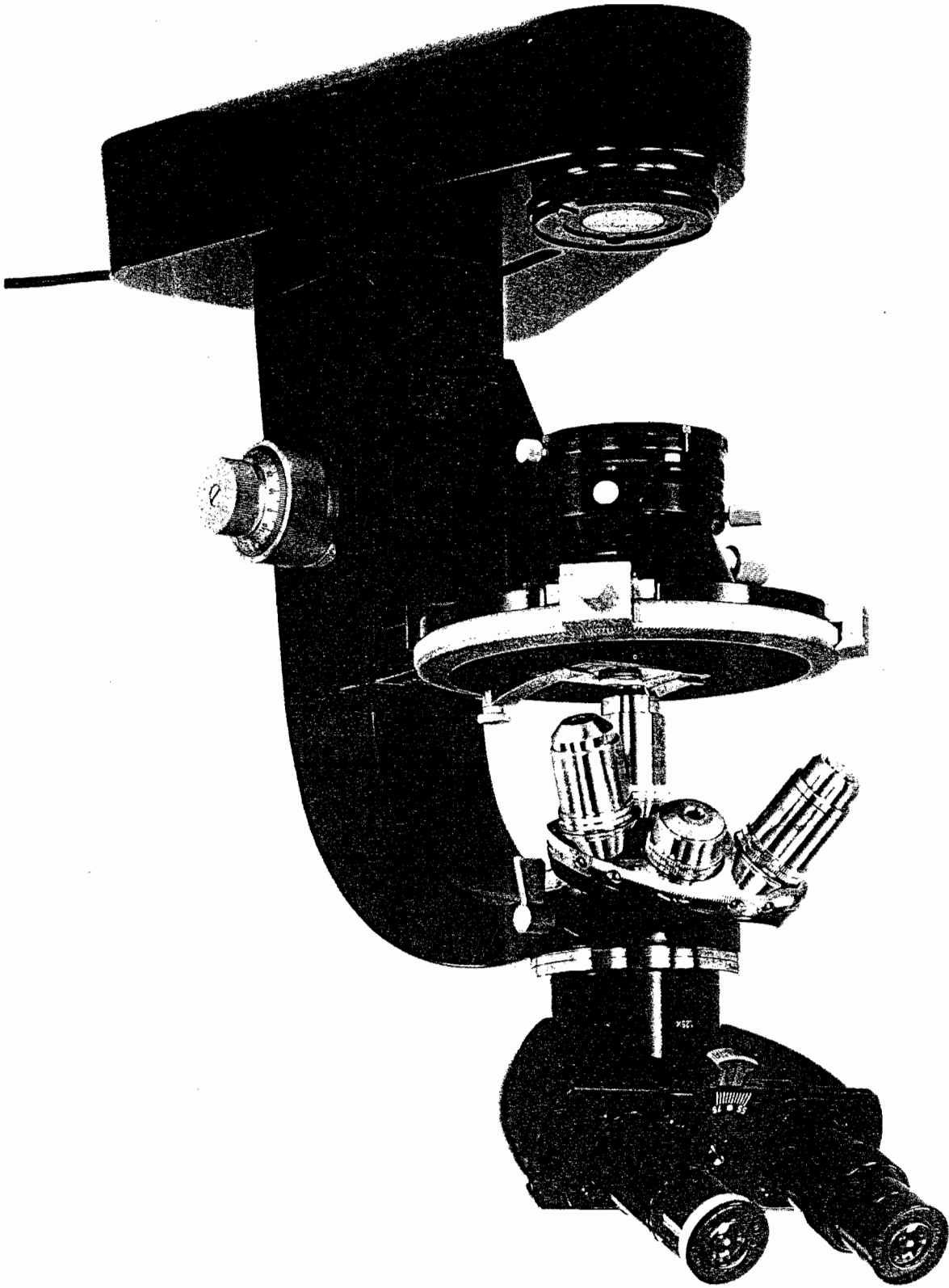
See page 18 for LABOLUX-POLD Microscope.



**MONOCULAR LABORATORY AND RESEARCH POLARIZING MICROSCOPE
LABOLUX-POL D: EQUIPPED FOR TRANSMITTED LIGHT**

055 219	Modern stand, LABOLUX-POL D, made of non-corroding alloy, with dual knob, coaxial coarse and fine adjustment (1 interval = 0.002mm); identical controls on either side of the stand for the vertical displacement of the stage along precision ball races. Built-in swing-out filter analyser, bayonet mount for interchangeable body tubes and Mipolam pad. Dovetail carrier for the interchange of condensers with rack and pinion for the adjustment in the height of condenser --5. Built-in low voltage lamp 6 volts, 15 watts with daylight conversion filter CB 16.5, ground glass and green filter, including one spare bulb --.31 and built-in field diaphragm for Koehler illumination	\$ 790.00
512 036	Flexible plastic protective dust cover	3.00
553 030	First order red compensator (Gypsum plate)	36.00
553 035	Quarter wave compensator (Mica plate)	32.00
552 048	Objective centering clutch on carrier with four centering collars and slot to accept compensators 7.74	118.00
552 029	Inclined monocular observation tube P11 30mm ϕ , with swing-out Bertrand lens and independently operated pinhole diaphragm	182.00
552 032	Rotating object stage No. 38, 130mm ϕ , with scales and verniers, reading to 0.1 μ	274.00
552 077	Swing-out condenser No. 702FI, free from polarization, with lower element, aperture diaphragm, rotating filter polarizer indexed at 90 $^{\circ}$ intervals, slot to accept quarter wave length plate, centering mount and interchangeable top element Achr. 0.90; on interchange carrier	257.00
	LEITZ POLARIZING MICROSCOPE LABOLUX-POL D 7.74.5.31 P11 38/702FL as described above	\$1,692.00
Optical Equipment		
559 037	Achromatic dry objective, free from polarization, P 3.5x/0.10, focal length 32mm, free working distance 22mm	\$ 61.00
559 045	Achromatic dry objective, free from polarization, P 10x/0.25, focal length 16mm, free working distance 5.3mm	87.00
559 038	Achromatic dry objective, free from polarization, P 50x/0.85, focal length 3.6mm, free working distance 0.36mm, with spring loaded mount	218.00
559 042	Achromatic oil immersion objective, free from polarization P Oil 100x/1.30, focal length 1.9mm, free working distance 0.10mm, with spring loaded mount	188.00
559 001	Huygens eyepiece 30mm ϕ , single P 6.3x with adjustable eyelens and mount for reticles, field of view 21mm	45.00
519 910	Eyepiece reticle 10mm = 100 divisions and crossline	30.00
559 006	Huygens eyepiece 30mm ϕ , single P 8x with adjustable eyelens and fixed crossline, field of view 19mm	70.00
552 081*	Interchangeable condenser top element No. 003P, free from polarization, Apl Oil 1.25	120.00
513 106	Stage micrometer on glass 2mm = 200 divisions with photographic scale	34.00
	LEITZ MONOCULAR LABORATORY AND RESEARCH POLARIZING MICROSCOPE LABOLUX-POL D 7.74.5.31 P11 38/702FL COMPLETE WITH OPTICAL EQUIPMENT as described above	\$2,545.00
500 124	Regulating transformer with voltmeter for 6 volt, 15 watt lamps, 6 volt, 5 watt or 8 volt 5 watt lamps; for connection to 110 volts, 60 cycles A.C.	78.00
	\$2,623.00
552 038	Mahogany cabinet	\$ 142.00

*Discontinued, limited supply still available.

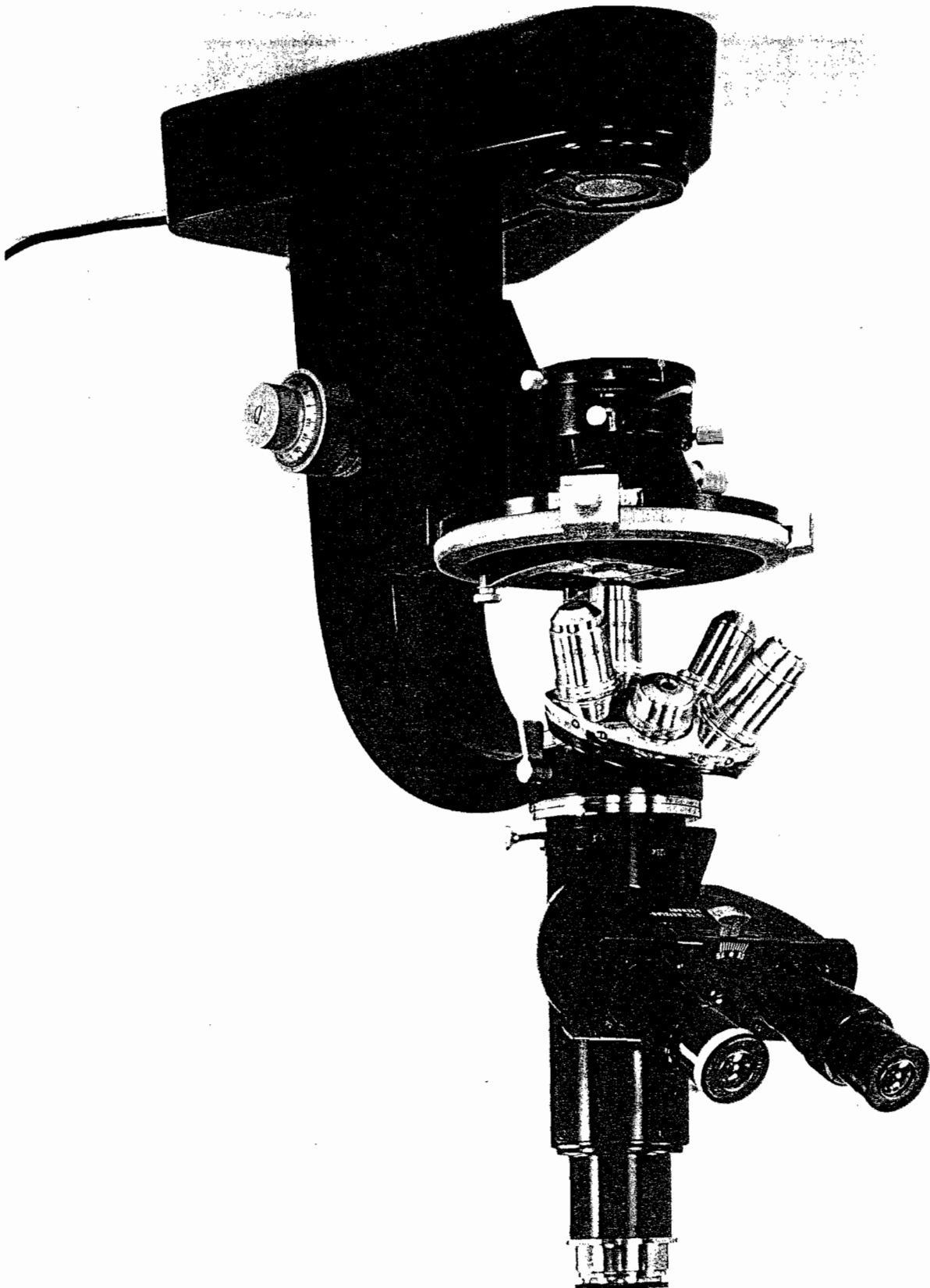


**BINOCLULAR LABORATORY AND RESEARCH POLARIZING MICROSCOPE
LABOLUX-POL D: EQUIPPED FOR TRANSMITTED LIGHT**

055 219	Modern stand, LABOLUX-POL D, made of non-corroding alloy, with dual knob, coaxial coarse and fine adjustment (1 interval = 0.002mm); identical controls on either side of the stand for the vertical displacement of the stage along precision ball races. Built-in swing-out filter analyser, bayonet mount for interchangeable body tubes and Mipolam pad. Dovetail carrier for the interchange of condensers with rack and pinion for the adjustment in the height of condenser -.5. Built-in low voltage lamp 6 volts, 15 watts with daylight conversion filter CB 16.5, ground glass and green filter; including one spare bulb -.-.-.31 and built-in field diaphragm for Koehler illumination	\$ 790.00
512 036	Flexible plastic protective dust cover	3.00
553 030	First order red compensator (Gypsum plate)	36.00
553 035	Quarter wave compensator (Mica plate)	32.00
552 045	Quintuple revolving objective nosepiece on carrier with individual centering device and slot to accept compensators 7.35-	193.00
552 028	Inclined binocular observation tube S 20, 23.2mm ϕ	451.00
552 032	Rotating object stage No. 38, 130mm ϕ , with scales and verniers, reading to 0.1 μ	274.00
552 077	Swing-out condenser No. 702FL, free from polarization, with lower element, aperture diaphragm, rotating filter polarizer indexed at 90 $^{\circ}$ intervals, slot to accept quarter wave length plate, centering mount and interchangeable top element Achr. 0.90, on interchange carrier	257.00
	LEITZ POLARIZING MICROSCOPE LABOLUX-POL D 7.35.5.31 S 20 38/702FL as described above	\$2,036.00
559 037	Achromatic dry objective, free from polarization, P 3.5x/0.10, focal length 32mm, free working distance 22mm	\$ 61.00
559 045	Achromatic dry objective, free from polarization, P 10x/0.25, focal length 16mm, free working distance 5.3mm	87.00
559 038	Achromatic dry objective, free from polarization, P 50x/0.85, focal length 3.6mm, free working distance 0.36mm, with spring loaded mount	218.00
559 042	Achromatic oil immersion objective, free from polarization, P Oil 100x/1.30, focal length 1.9mm, free working distance 0.10mm, with spring loaded mount	188.00
559 035	PERIPLAN widefield eyepieces, paired GF 10x, one with adjustable eyelens and fixed crosslines, field of view 18mm	144.00
552 081*	Interchangeable condenser top element No. 003P, free from polarization, Apl Oil 1.25	120.00
513 106	Stage micrometer on glass, 2mm = 200 divisions with photographic scale	34.00
	LEITZ BINOCLULAR LABORATORY AND RESEARCH POLARIZING MICROSCOPE LABOLUX-POL D 7.35.5.31 S20 38/702FL COMPLETE WITH OPTICAL EQUIPMENT as described above	\$2,888.00
500 124	Regulating transformer with voltmeter for 6 volt, 15 watt lamps, 6 volt, 5 watt or 8 volt 5 watt lamps; for connection to 110 volts, 60 cycles A.C.	78.00
		\$2,966.00
552 038	Mahogany cabinet	\$ 142.00

Optional

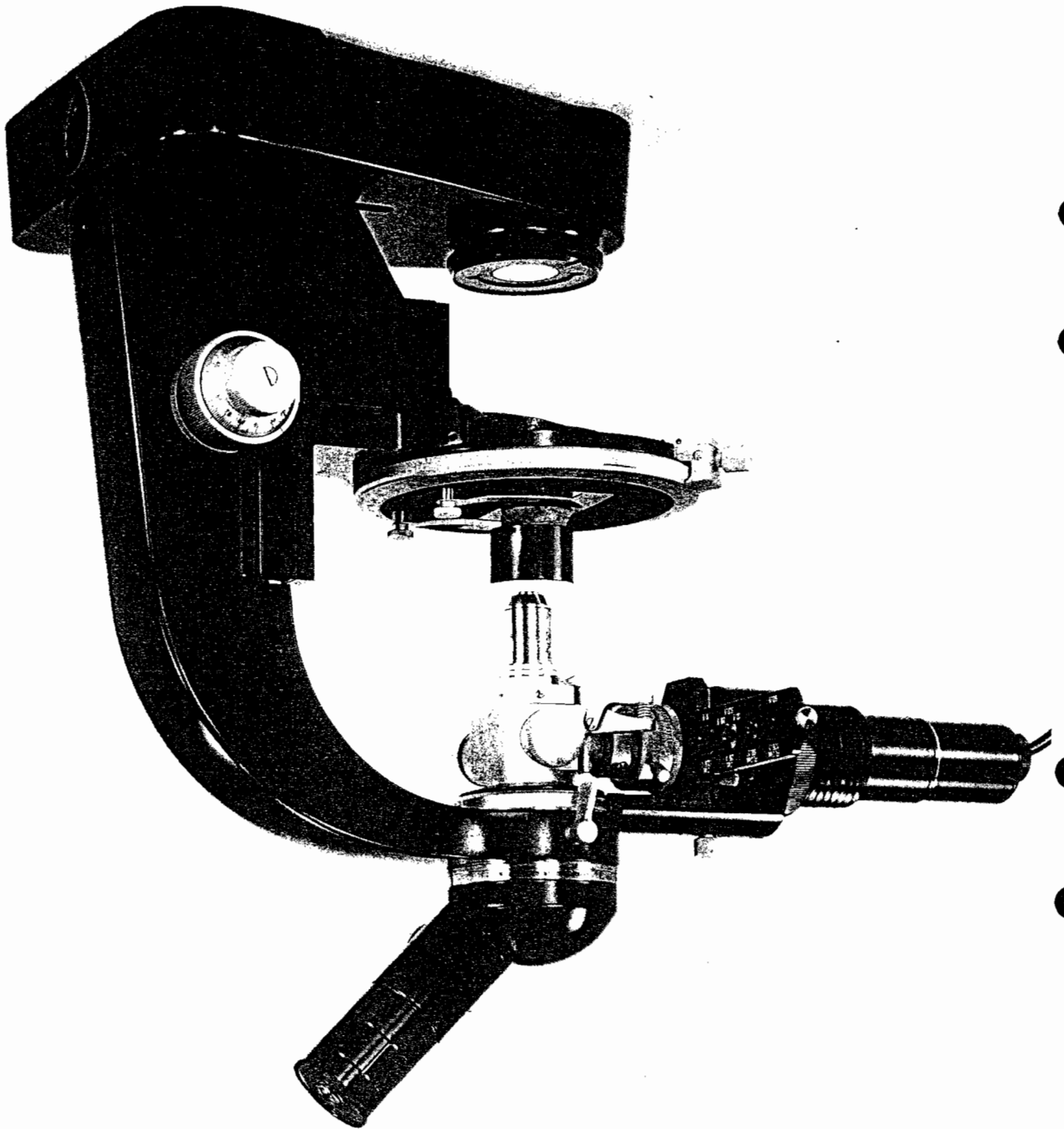
*Discontinued, limited supply still available.



**TRINOCULAR LABORATORY AND RESEARCH POLARIZING MICROSCOPE
LABOLUX-POL D: EQUIPPED FOR TRANSMITTED LIGHT**

055 219	Modern stand, LABOLUX-POL D, made of non-corroding alloy, with dual knob, coaxial coarse and fine adjustment (1 interval = 0.002mm); identical controls on either side of the stand for the vertical displacement of the stage along precision ball races. Built-in swing-out filter analyser, bayonet mount for interchangeable body tubes and Mipolam pad. Dove-tail carrier for the interchange of condensers with rack and pinion for the adjustment in the height of condenser --.5. Built-in low voltage lamp 6 volts, 15 watts with daylight conversion filter CB 16.5; ground glass and green filter; including one spare bulb --.31 and built-in field diaphragm for Koehler illumination	\$ 790.00
512 036	Flexible plastic protective dust cover	3.00
553 030	First order red compensator (Gypsum plate)	36.00
553 035	Quarter wave compensator (Mica plate)	32.00
552 045	Quintuple revolving objective nosepiece on carrier with individual centering device and slot to accept compensators 7.35-	193.00
552 037	Combination, inclined binocular observation and straight monocular photographic tube FS 22	558.00
552 032	Rotating object stage No. 38, 130mm ϕ , with scales and verniers reading to 0.1 μ	274.00
552 077	Swing-out condenser No. 702FL, free from polarization, with lower element, aperture diaphragm, rotating filter polarizer indexed at 90 $^{\circ}$ intervals, slot to accept quarter wave length plate, centering mount and interchangeable top element Achr. 0.90; on interchange carrier	257.00
	LEITZ POLARIZING MICROSCOPE LABOLUX POL D 7.35.5.31 FS22 38/702FL as described above	\$2,143.00
Optical Equipment		
559 037	Achromatic dry objective, free from polarization, P 3.5x/0.10, focal length 32mm, free working distance 22mm	\$ 61.00
559 045	Achromatic dry objective, free from polarization, P 10x/0.25, focal length 16mm, free working distance 5.3mm	87.00
559 038	Achromatic dry objective, free from polarization, P 50x/0.85, focal length 3.6mm, free working distance 0.36mm, with spring loaded mount	218.00
559 042	Achromatic oil immersion objective, free from polarization, P Oil 100x/1.30, focal length 1.9mm, free working distance 0.10mm, with spring loaded mount	188.00
559 001	Huygens eyepiece 30mm ϕ , single P 6.3x with adjustable eyelens and mount for reticles, field of view 21mm	45.00
519 910	Eyepiece reticle 10mm = 100 divisions and crossline	30.00
559 006	Huygens eyepiece 30mm ϕ , single P 8x with adjustable eyelens and fixed crossline, field of view 19mm	70.00
559 035	PERIPLAN widefield eyepieces, paired GF 10x, one with adjustable eyelens and fixed crosslines, field of view 18mm	144.00
552 081 *	Interchangeable condenser top element No. 003P, free from polarization, Api Oil 1.25	120.00
513 106	Stage micrometer on glass, 2mm = 200 divisions with photographic scale	34.00
	LEITZ TRINOCULAR LABORATORY AND RESEARCH POLARIZING MICROSCOPE LABOLUX-POL D 7.35.5.31 FS22 38/702FL COMPLETE WITH OPTICAL EQUIPMENT as described above	\$3,140.00
500 124	Regulating transformer with voltmeter for 6 volt, 15 watt lamps, 6 volt, 5 watt or 8 volt 5 watt lamps; for connection to 110 volts, 60 cycles A.C.	78.00
	\$3,218.00
552 038	Mahogany cabinet	\$ 142.00

*Discontinued, limited supply still available

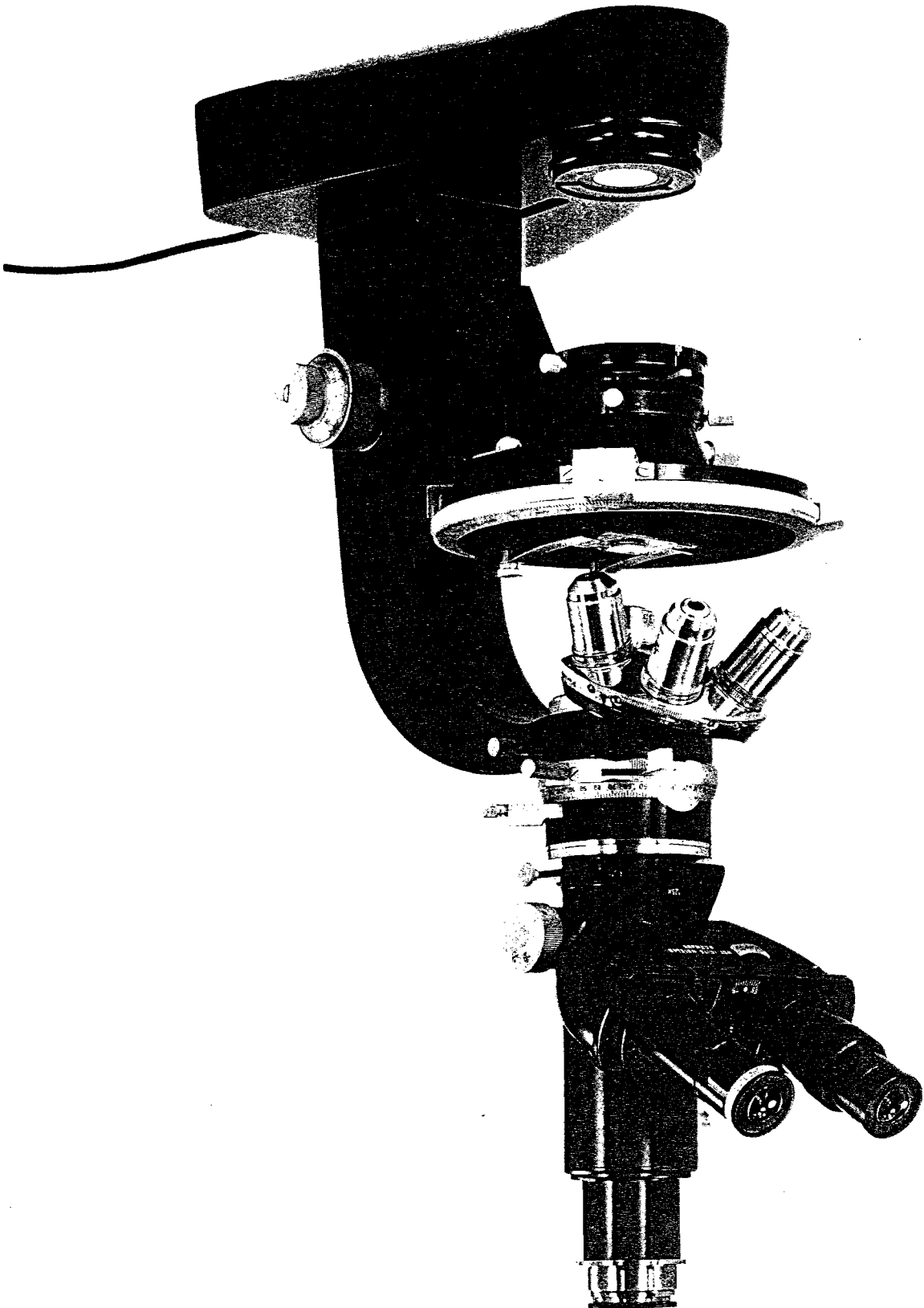


**MONOCULAR LABORATORY AND RESEARCH POLARIZING MICROSCOPE
EPILUX-POL D EQUIPPED FOR REFLECTED LIGHT**

055 223	Modern stand, EPILUX-POL D, made of non-corroding alloy, with dual knob, coaxial coarse and fine adjustment (1 interval = 0.002mm); identical controls on either side of the stand for the vertical displacement of the stage along precision ball races. Built-in swing-out filter analyser, bayonet mount for interchangeable body tubes and Mipolam pad. Dove-tail carrier for the interchange of condensers with rack and pinion for the adjustment in the height of condenser. .-.5	\$	650.00
512 036	Flexible plastic protective dust cover		3.00
553 030	First order red compensator (Gypsum plate)		36.00
553 035	Quarter wave compensator (Mica plate)		32.00
553 070	Vertical illuminator on carrier with objective centering clutch and five centering collars, detachable prism polarizer, slot to accept compensators and built-in low voltage lamp 6 volts, 15 watts with daylight conversion filter CB 16.5, ground glass and green filter. Supplementary front collector on clamping holder with iris diaphragm, half stop for oblique illumination and centerable diaphragm on slide 7.55-.35		895.00
552 029	Inclined monocular observation tube P 11 30mm ϕ , with swing-out Bertrand lens and independently operated pinhole diaphragm		182.00
552 032	Rotating object stage No. 38, 130mm ϕ , with scales and verniers, reading to 0.1 μ . LEITZ POLARIZING MICROSCOPE EPILUX-POL D 7.55.5.35 P 11 38/- as described above	\$	2,072.00
Optical Equipment E2d Mono			
559 051	Achromatic dry objective, free from polarization, F 6.3x/0.20, focal length 30mm, free working distance 21mm	\$	79.00
559 010	Achromatic oil and water immersion objective, free from polarization, P Oil + We 12.5x/0.25, focal length 16mm, free working distance 0.26mm		114.00
559 009	Fluorite dry objective, free from polarization, (P) F1 45x/0.85, focal length 1.4mm, free working distance 0.33mm, with spring loaded mount		207.00
559 012	Fluorite oil immersion objective, free from polarization, (P) F1 Oil 60x/0.95, focal length 3.4mm, free working distance 0.33mm, with spring loaded mount		224.00
559 014	Fluorite oil immersion objective, free from polarization, (P) F1 Oil 105x/1.32, focal length 2.0mm, free working distance 0.27mm, with spring loaded mount		306.00
559 006	Huygens eyepiece 30mm ϕ , single P 8x with adjustable eyelens and fixed crossline, field of view 19mm		70.00
563 011	Stage micrometer on metal 1mm = 100 divisions		46.00
Supplementary Equipment for Transmitted Light			
512 071	Collector lens	\$	48.00
512 139	Field diaphragm		28.00
512 133	Low voltage lamp 6 volts, 2.5 amps with daylight conversion filter CB 16.5, ground glass and green filter; including one spare bulb -.-.31		74.00
Optional			
552 038	Mahogany cabinet	\$	142.00
563 035	Hand press with adjustable stop, for levelling specimens		74.00
500 124	Regulating transformer with voltmeter for 6 volt, 15 watt lamps, 6 volt, 5 watt or 8 volt 5 watt lamps; for connection to 110 volts, 60 cycles A.C.		78.00
LEITZ MONOCULAR LABORATORY AND RESEARCH POLARIZING MICROSCOPE EPILUX-POL D 7.55.5.35 P 11 38/- COMPLETE WITH OPTICAL EQUIPMENT E2d MONO as described above			
		\$	3,118.00
Supplementary Equipment for Transmitted Light			
512 071	Collector lens	\$	48.00
512 139	Field diaphragm		28.00
512 133	Low voltage lamp 6 volts, 2.5 amps with daylight conversion filter CB 16.5, ground glass and green filter; including one spare bulb -.-.31		74.00
Note:			
The EPILUX-POL D accepts the same tubes, condensers and objective carriers as listed for the LABOLUX-POL D Microscope. Objectives for transmitted light corrected for 170mm tube length.			

553 097	Interference line filter 12.5m μ , veril S 200 (400-700m μ) with graduated mount and diaphragm housing	\$ 430.00
553 099	Interference band filter 25m μ , veril B 200 (400-700m μ) with graduated mount and diaphragm housing	\$ 430.00
Interference Filter Attachment		
500 124	Regulating transformer with voltmeter for 6 volt 15 watt, 8 volt 5 watt or 6 volt 5 watt lamps; for connection to 110 volts, 60 cycles A.C.	\$ 78.00
500 099	Fixed transformer for 6 volt 15 watt, 8 volt 5 watt or 6 volt 5 watt lamps; for connection to 110 volts, 60 cycles A.C.	42.00
Transformers		
552 038	Mahogany cabinet	\$ 142.00
512 036	Flexible plastic protective dust cover	3.00
512 119	Mipolam pad	3.00
552 041	Plane and concave mirror in mount	\$ 16.00
512 061	Lamp socket	\$ 33.00
500 012	Bulb 6 volts, 15 watts	3.30
512 075	Daylight conversion filter CB 16.5	13.00
512 076	Ground glass filter	8.00
512 077	Green filter	11.00
513 176	Illumination centering disc	1.00

Miscellaneous Accessories and Replacement Parts



TRINOCULAR RESEARCH POLARIZING MICROSCOPE DIALUX-POL DF: EQUIPPED FOR TRANSMITTED LIGHT

055 231	Modern stand, DIALUX-POL DF, made of non-corroding alloy, with dual knob coaxial coarse and fine adjustment (1 interval = 0.002mm); identical controls on either side of the stand for the vertical displacement of the stage along precision ball races. Built-in filter analyser, rotatable 180°, centerable swing-out Bertrand lens for conoscopic observation, bayonet mount for interchangeable body tubes and Mipolam pad. Dovetail carrier for the interchange of condensers with rack and pinion for the adjustment in the height of condenser --5-, built-in low voltage lamp 6 volts, 15 watts with illumination centering disc, daylight conversion filter CB 16.5, ground glass and green filter; including one spare bulb --.31 and built-in field diaphragm for Koehler illumination	\$1,485.00
512 036	Flexible plastic protective dust cover	3.00
553 030	First order red compensator (Gypsum plate)	36.00
553 035	Quarter wave compensator (Mica plate)	32.00
552 045	Quintuple revolving objective nosepiece on carrier with individual centering device and slot to accept compensators 7.35-	193.00
552 036	Combination, inclined binocular observation and straight monocular photographic tube FS 21	602.00
552 031	Rotating object stage No. 37, 150mm diameter with scales and verniers, click stop at 45° intervals and locking device	393.00
552 077	Swing-out condenser No. 702FL, free from polarization, with lower element, aperture diaphragm, rotating filter polarizer indexed at 90° intervals, slot to accept quarter wave length plate, centering mount and interchangeable top element Achr. 0.90; on interchange carrier	257.00
	LEITZ POLARIZING MICROSCOPE DIALUX-POL DF 7.35.5.31 FS 21 37/702FL as described above	\$3,001.00
Optical Equipment		
559 037	Achromatic dry objective, free from polarization, P 3.5x/0.10, focal length 32mm, free working distance 22mm	\$ 61.00
559 045	Achromatic dry objective, free from polarization, P 10x/0.25, focal length 16mm, free working distance 5.3mm	87.00
559 038	Achromatic dry objective, free from polarization, P 50x/0.85, focal length 3.6mm, free working distance 0.36mm, with spring loaded mount	218.00
559 042	Achromatic oil immersion objective, free from polarization, P Oil 100x/1.30, focal length 1.9mm, free working distance 0.10mm, with spring loaded mount	188.00
559 001	Huygens eyepiece 30mm φ, single P 6.3x with adjustable eyelens and mount for reticles, field of view 21mm	45.00
519 910	Eyepiece reticle 10mm = 100 divisions and crossline	30.00
559 006	Huygens eyepiece 30mm φ, single P 8x with adjustable eyelens and fixed crossline, field of view 19mm	70.00
559 035	PERIPLAN widefield eyepieces, paired GF 10x, one with adjustable eyelens and fixed crosslines, field of view 18mm	144.00
552 081*	Interchangeable condenser top element No. 003P, free from polarization, Api Oil 1.25	120.00
513 106	Stage micrometer on glass, 2mm = 200 divisions with photographic scale	34.00
	LEITZ TRINOCULAR RESEARCH POLARIZING MICROSCOPE DIALUX-POL DF 7.35.5.31 FS 21 37/702FL COMPLETE WITH OPTICAL EQUIPMENT as described above	\$3,998.00
500 124	Regulating transformer with voltmeter for 6 volt, 15 watt, 8 volt, 5 watt or 6 volt, 5 watt lamps; for connection to 110 volts, 60 cycles A.C.	78.00
		<u>\$4,076.00</u>

*Discontinued, limited supply still available.

Continued on the next page.

Note:

The DIALUX-POL Microscope can also be supplied with a prism polarizer and analyser. In this case the stand (No. 055 231) and condenser (No. 552 077) are replaced by the following:

552 234	Modern stand, DIALUX-POL DP, as described under No. 055 231, however, with prism analyser	\$2,005.00
552 017	Five lens condenser No. 500P, with swing-out upper element A. 0.85, aperture and field diaphragm and rotating calcite prism polarizer graduated at 5° intervals; on interchange carrier	1,048.00
552 038	Mahogany cabinet	\$ 142.00

Optional

LEITZ RESEARCH POLARIZING MICROSCOPE DIALUX-POL DF EQUIPPED FOR STRAIN MEASUREMENTS IN GLASS

055 231	Modern stand, DIALUX-POL DF, made of non-corroding alloy, with dual knob coaxial coarse and fine adjustment (1 interval = 0.002mm); identical controls on either side of the stand for the vertical displacement of the stage along precision ball races. Built-in filter analyser, rotatable 180°, centerable swing-out Bertrand lens for microscopic observation, bayonet mount for interchangeable body tubes and Mipolam pad. Dovetail carrier for the interchange of condensers with rack and pinion for the adjustment in the height of condenser --5--, built-in low voltage lamp 6 volts, 15 watts with illumination centering disc, daylight conversion filter CB 16.5, ground glass and green filter; including one spare bulb --.31 and built-in field diaphragm for Koehler illumination	\$1,485.00
512 036	Flexible plastic protective dust cover	3.00
552 048	Objective centering clutch on carrier with four centering collars and slot to accept compensators 7.74.	118.00
552 036	Combination, inclined binocular observation and straight monocular photographic tube FS 21	602.00
552 031	Rotating object stage No. 37, 150mm diameter with scales and verniers, click stop at 45° intervals and locking device	393.00
552 077	Swing-out condenser No. 702FL, free from polarization, with lower element, aperture diaphragm, rotating filter polarizer indexed at 90° intervals, slot to accept quarter wave length plate, centering mount and interchangeable top element Achr. 0.90; on interchange carrier	257.00
	LEITZ POLARIZING MICROSCOPE DIALUX-POL DF 7.74.5.31 FS 21	\$2,858.00
	37/702FL as described above	
Optical Equipment		
559 037	Achromatic dry objective, free from polarization, P 3.5x/0.10, focal length 32mm, free working distance 22mm	\$ 61.00
559 044	Achromatic objective, free from polarization, P 6x/0.18, focal length 23mm, free working distance 17mm	76.00
559 045	Achromatic dry objective, free from polarization, P 10x/0.25, focal length 16mm free working distance 5.3mm	87.00
559 036	Achromatic objective, free from polarization, P 25x/0.50, focal length 7.1mm, free working distance 0.72mm, with spring loaded mount	128.00
559 035	PERIPLAN widefield eyepieces, paired GF 10x, one with adjustable eyelens and fixed crosslines, field of view 18mm	144.00
553 015	Wright universal eyepiece with field of view iris diaphragm, focusing eyelens; compensator slot, and flange index for the top analyser	218.00
553 001	Top analyser with 360° graduation reading to 1°	248.00
553 039	Half - shadow plate after Nakamura	115.00
553 040	Quarter wave plate	53.00
563 156	Green interference filter IL 546m μ	48.00
	LEITZ RESEARCH POLARIZING MICROSCOPE DIALUX-POL DF 7.74.5.31 FS 21 37/702FL COMPLETE WITH OPTICAL EQUIPMENT AND ACCESSORIES	\$4,036.00
500 124	Regulating transformer with voltmeter for 6 volt, 15 watt lamps, 6 volt 5 watt or 8 volt 5 watt lamps; for connection to 110 volts, 60 cycles A.C.	78.00
		\$4,114.00

