POLARIZING MICROSCOPE
POH-2
Many minerals, rocks, metals, fibers and chemicals, as well as animal and plant tissues, have intrinsic birefringent properties which only show up under polarized light. The polarizing microscope, making use of these properties, magnifies minute details of these materials for distinguishing the nature of their component parts. Long used in petrological and mineralogical studies of the optical properties of specimens, the polarizing microscope is now extensively used in the chemical, plastics, metal, synthetic fiber and food industries, as well as in medicine, biology and pharmacology. The Nikon Polarizing Microscope Model POH-2 fills all the requirements for polarization studies in these fields. It provides the following features:
Extra-Long Range of Stage Elevation and Focusing
The stage, together with substage, can be lowered by 71 mm for a distance of 104.6 mm from the objective shoulder to the stage surface to accommodate a universal stage with hemispheres. The stage can, of course, be clamped at any intermediate position from which coarse or fine focusing can be conducted within a range of 38 mm. Fine focusing is calibrated in two-micron increments and is operated by an incorporated differential gear train which serves the whole range of focusing without interruption.

Interchangeable Single and Multiple Revolving Nosepieces
Single Objective Nosepiece
A strain-free objective is screwed into a centerable clutch and inserted into the dovetail of the single mount adapter. It is furnished with a locking bar which assures easy interchange of objectives. The single mount adapter is fastened securely to the dovetail on the microscope arm by a clamping lever.

Revolving Objective Nosepiece
A four-place nosepiece to interchange strain-free objectives easily and in succession from one magnification to another. Each objective, after being screwed into the lens receptacle, can be centered to the microscope optical axis by manipulating two screws inserted into two holes on each side of the objective receptacles on the nosepiece assembly.

Built-In Illuminator Base
A tungsten illuminator is built into the microscope base. A precentered 6v 18w flat filament bulb is used as light source. Supplied with a step-down transformer with a main switch, pilot lamp and variable voltage control. The knurled ring on the top surface of the microscope base, when rotated, faces the internal reflecting mirror in the opposite direction so that an external light source, such as a sodium vapor lamp, may be directed through the front opening when precise measurement of minute retardations is to be carried out.

Easy Interchange of Eyepiece Tubes With Intermediate Tube
The intermediate tube mounted on top of the microscope arm contains (1) a rotating turret on which a focusable and centerable Bertrand lens for conoscopic observations, a magnifier for the Babinet compensator and an empty opening for orthoscopic observations are provided, (2) a push-pull filter analyzer, rotatable 180° reading to 6 minutes with vernier, and (3) a slide on which are mounted a 1/4-wavelength plate (λ=589.3 μm), a sensitive tint plate (λ=530 μm) and an empty opening, or as an alternate on the same slide, a Sénarmont compensator. As these elements are contained in the intermediate tube, the eyepiece tubes, either a 30° inclined monocular, a vertical phototube or a 30° inclined trinocular tube, can be interchanged without deterioration of optical performance.

Graduated, Circular Rotatable Stage (ball bearing)
150 mm in diameter, 360° rotatable. The goniometer is divided into 1-degree increments and reads to 6 minutes with either of two verniers placed 90° apart, with click stops at each 45° division. The position from which the 45° division is counted can be set at any optional point with a lever on the side of the stage. A clamping knob and two stage clips are provided. On the stage surface there are two screw-threaded and six straight holes for attaching a universal stage, an attachable mechanical stage or stage clips.

Epi (Surface)-Illuminator
The epi-illuminator can be attached between the dovetail on the microscope arm and the single-nosepiece assembly. It has a 1.2X magnification factor and is used for examination of opaque specimens. The filter polarizer is 90° rotatable with an index mark at the 45° position. A 6v 18w precentered bulb is used. A built-in push-pull auxiliary lens and field and aperture diaphragms assure optimum illumination at all magnifications. When the mirror holder is pulled out of the optical path, the microscope can be used for normal, transmitted light observations.
Objectives

- **Single-objective revolving nosepiece**: Directly slid into microscope arm dovetail. Each objective is individually centerable. (Note: When this nosepiece is used, the Babinet compensator cannot be used simultaneously.)

Specifications

<table>
<thead>
<tr>
<th>Type</th>
<th>Individual Magnification</th>
<th>Focal Length</th>
<th>Field No.</th>
<th>Reticle</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Achromatic Dry</strong></td>
<td>P* 1X</td>
<td>28.3mm</td>
<td>50.0mm</td>
<td>Crossline</td>
</tr>
<tr>
<td></td>
<td>P* 10X</td>
<td>14.8mm</td>
<td>7.10mm</td>
<td>Crossline</td>
</tr>
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<td></td>
<td>P* 20X</td>
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<td>5.70mm</td>
<td>Crossline</td>
</tr>
<tr>
<td></td>
<td>P* 40X</td>
<td>4.3mm</td>
<td>0.54mm</td>
<td>Crossline</td>
</tr>
<tr>
<td></td>
<td>P* 100X</td>
<td>1.25mm</td>
<td>0.16mm</td>
<td>Crossline</td>
</tr>
<tr>
<td><strong>Oil-immersion</strong></td>
<td>P* 1X</td>
<td>25.0mm</td>
<td>15.00mm</td>
<td>Crossline</td>
</tr>
<tr>
<td></td>
<td>P* 10X</td>
<td>14.8mm</td>
<td>7.10mm</td>
<td>Crossline</td>
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<tr>
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<td></td>
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<td>4.3mm</td>
<td>0.54mm</td>
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<td></td>
<td>P* 100X</td>
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<td>0.16mm</td>
<td>Crossline</td>
</tr>
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<td><strong>Plan Achromatic Dry</strong></td>
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<td>18.20mm</td>
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<td>P Plan 40X</td>
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<td>0.24mm</td>
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<td>P Plan 100X</td>
<td>1.30mm</td>
<td>0.12mm</td>
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For opaque objects, epi-illuminator use

<table>
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<th>Type</th>
<th>Individual Magnification</th>
<th>Focal Length</th>
<th>Field No.</th>
<th>Reticle</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Achromatic Dry</strong></td>
<td>P M 5X</td>
<td>25.0mm</td>
<td>15.00mm</td>
<td>Crossline</td>
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<tr>
<td></td>
<td>P M 10X</td>
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<td>P M 20X</td>
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<td>Crossline</td>
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<td>P M 100X</td>
<td>1.25mm</td>
<td>0.16mm</td>
<td>Crossline</td>
</tr>
<tr>
<td><strong>Oil-immersion</strong></td>
<td>P M 5X</td>
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<td>15.00mm</td>
<td>Crossline</td>
</tr>
<tr>
<td></td>
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<td>P M 20X</td>
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<tr>
<td></td>
<td>P M 40X</td>
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<td>0.54mm</td>
<td>Crossline</td>
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<tr>
<td></td>
<td>P M 100X</td>
<td>1.25mm</td>
<td>0.16mm</td>
<td>Crossline</td>
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</tbody>
</table>

For use with universal stage and hemispheres

<table>
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<th>Type</th>
<th>Individual Magnification</th>
<th>Focal Length</th>
<th>Field No.</th>
<th>Reticle</th>
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</thead>
<tbody>
<tr>
<td><strong>Achromatic (Oil-immersion)</strong></td>
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<td></td>
<td>U** 20X</td>
<td>11.8mm</td>
<td>1.10mm</td>
<td>Crossline</td>
</tr>
</tbody>
</table>

* Strain-free objective lens  ** Universal stage objective lens  † Spring-loaded
Nile 150mm diameter, 360° rotatable. Goniometer is divided into one-degree increments and reads to 6 minutes with either of two verniers, 90° apart. Click stops are provided at every 45° position and can be set to work from any point with the release lever. Has rotation locking clamp and two stage clips. Stage surface has two screw-threaded and six straight holes for mounting a universal stage, an attachable mechanical stage or slide clips. The stage with substage construction can be lowered 71 mm from the standard position and clamped at any intermediate position, from which coarse and fine focusing can be conducted.

A special 1/4-wavelength retardation plate (λ=546.1μm). Mounted on a slider which replaces the regular 1/4-wavelength retardation plate and tint plate slider.

Houses a tungsten illuminator as light source, using a precentered 6V 18w bulb. Supplied with a step-down transformer provided with a main switch, pilot lamp and variable voltage control. When the knurled ring on the top surface of the microscope base is rotated to the red index mark in the opposite direction, it revolves an internal reflecting mirror to the front aperture so that an external light source, e.g., a monochromatic source, such as sodium vapor lamp, may be employed for measurement of minute retardations. The ring accepts inlaid 45mm-diameter filters.

Consists of three lens elements, N.A. 0.65 corresponding to a conoscopic angle of 62°. When the condenser is oil-immersed, the numerical aperture becomes 1.0. The top element of the condenser can be swung out of the optical path for orthoscopic observation and used with a universal stage, in which case the remaining two lower lens elements are used and the numerical aperture is lowered to 0.25. An iris diaphragm is provided. The condenser is mounted on a precentered clutch and is slid into the dovetail of the substage. A clutch is also available as an accessory to be used for mounting another condenser, e.g., phase contrast for measurement of refractive index of a specimen.
Special Accessories

**Universal Stage:** Four-axis type. The stage is mounted on top of the graduated, circular rotatable stage by two thumb screws and permits tilting of a thin specimen at any angle to the optical axis of the microscope for measuring the optical structure of a birefringent crystal specimen. Provided with two centering screws. Supplied with three pairs of 13.5mm-diameter hemispheres with ND=1.516, ND=1.556 and ND=1.649. Objectives to be used with the hemispheres: U 5X (N.A. 0.1, W.D. 5.3mm), U 10X (N.A. 0.22, W.D. 2.9mm) and U 20X (N.A. 0.33, W.D. 1.1mm).

**Beblin's Compensator:** Consists of two quartz wedge vibration planes set crossed to each other; one wedge is fixed while the other is slid to determine the retardation of a thin specimen. The scale graduation is read through the magnifier mounted on the turret on which the Bertrand lens is also attached. Range of measurement, -1 to +3. To be inserted into the slot of the single mount adapter at 45° from the rear.

**Eckel's Micrometer:** Attached between the dovetail of the scope arm and the single-objective nosepiece. Has 1.2X magnification factor and is used for examination of opaque specimens. Polarizer is 90° rotatable. Incorporates a precentered 6° bulb, collector lens, aperture diaphragm, field diaphragm, and half-reflecting mirror. When the half-reflecting mirror is out of the optical path, the microscope can be used for mitred light observations. The openings of the two diaphragms are adjusted by turning external rings. Use of P.M. 5X, P.M. 40X and P.M. 100X objectives is recommended.
UNIVERSAL 4 AXIS STAGE
77240 Universal stage, 4 axis with 3 pairs of 13.5 mm diameter hemispheres with ND 1.516, 1.556 and 1.649, stage plate, 2 centering screws and fitted case ........................................ 1100.00

OBJECTIVES For Use With Universal Stage and Hemispheres Long Working Distance
77250 Achromat U 5x, n.a. 0.10 .................................. 60.00
77252 Achromat U 10x, n.a. 0.22 .............................. 67.00
77254 Achromat U 20x, n.a. 0.33 .............................. 87.00
Photomicrographic equipment and other microscope accessories that can be used with the POH-2, see centerfold and listings.

SUGGESTED ASSEMBLIES
We are listing two suggested configurations of the POH-2 microscope. One set is with the Monocular Tube (M), the other set is with the new Trinocular Tube (F). You may and should vary the sets to suit your individual needs.

Monocular Polarizing Microscope, POH-2 (M)
consisting of:
77200 Basic stand .............................................. $1020.00
76165 Transformer (variable) only with on/off switch 6V/3A 24.50
77202 Monocular Eyepiece Tube IP .......................... 45.00
77204 Huygenian Eyepiece POH 5x with cross line reticle 37.50
77206 Huygenian Eyepiece POH 7x with 10/100mm reticle 37.50
77208 Huygenian Eyepiece POH 10x with cross line reticle 37.50
77214 Single objective holder adapter ......................... 41.50
77217 Set of 4 single objective holders ..................... 38.00
77204 Achromat objective P 4x .............................. 14.50
76804 Achromat objective P 10x ............................. 23.50
76810 Achromat objective P 40x ............................. 48.00
76815 Achromat objective P 100x (oil) ....................... 73.00
77224 Babinet Compensator .................................. 304.00
77230 Daylight filter, 27.3mm ............................... 2.00
76930 Green filter, 33mm ...................................... 2.50
77238 Fitted Hardwood Cabinet ............................. 35.00
Total .................................................................. $1784.00

Trinocular Polarizing Microscope, POH-2 (F)
consisting of:
77200 Basic stand .............................................. $1020.00
76165 Transformer (variable) only with on/off switch 6V/3A 24.50
77254 Trinocular Eyepiece Tube (F) ......................... 405.00
77855 Eyepiece HK 5x ........................................... 18.50
77210 Eyepiece DHK 5x with cross line reticle .......... 41.50
77857 Eyepiece HKW 10x ....................................... 22.00
77212 Eyepiece DHKW 10x with cross line reticle .... 45.00
76802 Achromat objective P 4x ............................. 14.50
76804 Achromat objective P 10x ............................. 23.50
76810 Achromat objective P 40x ............................. 48.00
76815 Achromat objective P 100x (oil) ..................... 73.00
77213 Micrometer holder sleeve with 10/100 reticle 14.00
77214 Single objective holder adapter ..................... 41.50
77217 Set of 4 single objective holders ................. 38.00
77224 Babinet compensator .................................. 304.00
77230 Daylight filter, 27.3mm ............................... 2.00
76930 Green filter, 33mm ...................................... 2.50
77238 Fitted Hardwood Cabinet ............................. 35.00
Total .................................................................. $2172.50