

UNITRON

STUDENT PHASE

• **EASY TO OPERATE**

From the student's standpoint, the Phase Microscope is "different" only in the sense that, with it, he can observe specimen structures that are invisible under an ordinary microscope. There is no new operating technique to be learned or to be taught.

• **WIDE RANGE OF COATED OPTICS**

The UNITRON Student Models are furnished with three achromatic, parfocal, coated objectives: a brightfield 4X (N.A. 0.15) scanning lens and two *phase* objectives — P10X (N.A. 0.25), P20X (N.A. 0.45) for Model MPA and P10X (N.A. 0.25), P40X (N.A. 0.65) for Model MPB.

• **FOR BOTH PHASE AND BRIGHTFIELD**

Merely by unscrewing the substage annulus, a UNITRON Student Phase Model is changed from a phase, to a brightfield, microscope. These instruments are therefore of double value in teaching: use them with your present stained slides (that will continue to be important in many laboratory exercises) and, in addition, let the phase feature serve as the basis for introducing exciting new studies of living material into the teaching program. If control of aperture for brightfield applications is desired, you can obtain an accessory iris diaphragm to screw into the substage condenser. This versatility explains why forward looking schools are gradually replacing their conventional brightfield instruments with UNITRON Phase Models.

• **LOW-POWERED DARKFIELD**

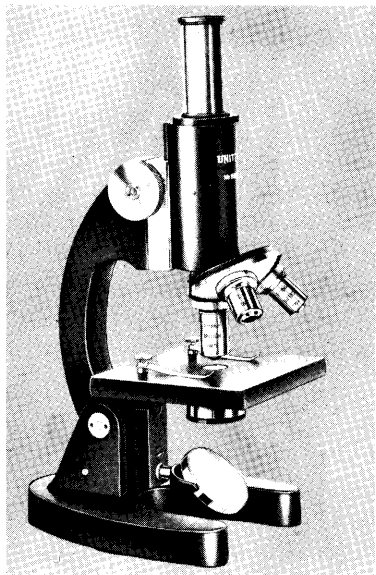
When the phase annulus is used with the 4X non-phase objective, it serves as a darkfield "stop." Teachers have found this feature especially valuable as a means of introducing students to darkfield microscopy without the need to purchase any extra equipment. Low-power reveals in a dramatic way the abundance of life present in a drop of water.

• **SUBSTAGE CONDENSER FOR MAXIMUM RESOLUTION**

A fixed condenser of N.A. 0.65 forms part of the optical equipment of UNITRON Student Models. This professional feature, often lacking in teaching instruments, insures maximum resolution at all magnifications.

• **OPTICS AND MECHANICS OF PROFESSIONAL QUALITY**

As with UNITRON Student Microscopes of other types, the phase models are furnished with the same high-resolution objectives supplied on more expensive medical microscopes — not merely a "student-type," so often used in other brands. The stand, focusing slideways, nose-piece, and other mechanical parts are likewise constructed to the same standards of precision as professional instruments, and furnished with our regular printed guarantee, your assurance of UNITRON quality. Dependable performance can be expected, year after year.



UNITRON STUDENT SERIES MPA

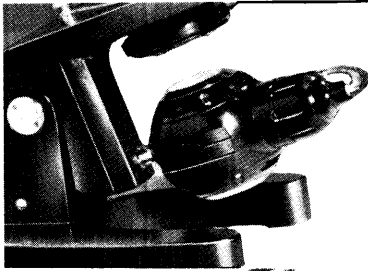
SPECIFICATIONS — Three coated, achromatic objectives: 4X (non-phase, N.A. 0.15), phase P10X (N.A. 0.25) and P20X (N.A. 0.45); medium stand inclinable through 90°; triple revolving nose-piece; focusing by diagonal-cut rack and pinion; stage 95x95mm. with stage clips; fixed, single-lens condenser (N.A. 0.65) with phase annulus removable for brightfield observation; plano-concave mirror; wooden cabinet and dustcover. Choice of bright or dark contrast.

| EYEPIECE INCLUDED | STANDARD MODELS | AUTO-ILLUMINATION MODELS |
|-------------------|-----------------------|--------------------------|
| Huygens 10X | MPA-HG . . . \$99 | MPA-LV-HG . . . \$125 |
| Widefield 10X | MPA-WF . . . \$104.50 | MPA-LV-WF . . . \$130.50 |
| Zoom (10X-20X) | MPA-ZM . . . \$119.00 | MPA-LV-ZM . . . \$145.00 |

MICROSCOPES—SERIES MPA and MPB

• TWO STANDS TO CHOOSE FROM

Two series of models are offered: the Student MPA and the Advanced Student MPB. The optical equipment and phase features of both are identical. The economy MPA Series uses a medium stand with coarse focusing adjustment only. In the MPB Series, the large stand is the same size as conventional laboratory models and is, in addition, equipped with a micrometer-screw, fine focusing mechanism.



• AVAILABLE IN A CHOICE OF STANDARD OR AUTO-ILLUMINATION MODELS

STANDARD Models are furnished with a plano-concave mirror. Any external light source of sufficient intensity may be used provided that the beam is broad enough to illuminate the substage annulus, completely and evenly. **AUTO-ILLUMINATION** Models use the **UNITRON** Low Voltage Substage Illuminator, LLV, in place of the mirror. Since the illuminator maintains perfect alignment, irrespective of the inclination of the stand, highest resolution and perfect results are insured at all times without need for time-consuming adjustments. The external transformer has a 5-position rotary switch to provide correct intensity at all powers, with or without filters, for either visual observation or photography. Where illumination requirements are less critical, the **UNITRON** 110 Volt Substage Illuminator, Model LHC, offers adequate intensity for general use. It is available for the **STANDARD** Models in place of the plano-concave mirror at an additional cost of \$7.00.

• CHOICE OF HUYGENS, WIDEFIELD, OR ZOOM EYEPIECES

Student Models are available with a single 10X Huygens eyepiece. More striking views are obtained with the **UNITRON** 10X Widefield Eyepiece which gives a field diameter about one third greater than the Huygens ocular. For the greatest flexibility in magnification, choose the **UNITRON** ZOOM Eyepiece which provides *continuous* power from 10X through 20X by the turn of a collar. (A catalog sheet on the Zoom Eyepiece is available on request.)

ADDITIONAL ACCESSORIES FOR STUDENT MODELS

- Mechanical stage, Model STA \$14.75
- Iris Diaphragm: with filter and holder ... 10.00
- 5X Huygens Eyepiece 4.50
- Bulbs, Type VLL per dozen 6.00

• AVAILABLE FOR FREE 10 DAY TRIAL

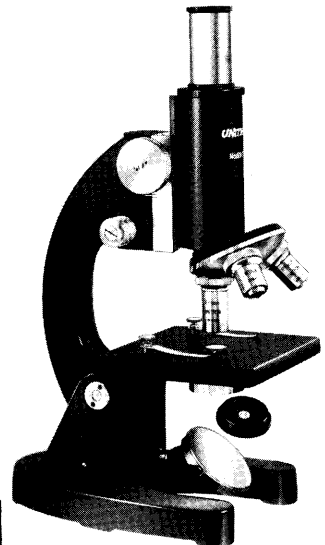
Investigate the advantages of phase microscopy in your own teaching program. Request a free 10 day trial at no cost or obligation to you or your school.

All prices f.o.b. Newton Highlands, Mass.

UNITRON ADVANCED—STUDENT SERIES MPB

SPECIFICATIONS—Three coated, achromatic objectives: 4X (non-phase, N.A. 0.15), phase P10X (N.A. 0.25) and P40X (N.A. 0.65); large stand inclinable through 90°; triple revolving nose-piece; coarse focusing by diagonal-cut rack and pinion; fine focusing by micrometer screw; built-in safety focusing stop; stage 107x107mm. with stage clips; fixed, single-lens condenser (N.A. 0.65) with phase annulus removable for brightfield observation; plano-concave mirror; wooden cabinet and dustcover. Choice of bright or dark contrast.

| EYEPIECE INCLUDED | STANDARD MODELS | AUTO-ILLUMINATION MODELS |
|-------------------|---------------------|--------------------------|
| Huygens 10X | MPB-HG.... \$167 | MPB-LV-HG..... \$193 |
| Widefield 10X | MPB-WF.... \$172.50 | MPB-LV-WF..... \$198.50 |
| Zoom (10X-20X) | MPB-ZM.... \$187.00 | MPB-LV-ZM..... \$213.00 |



66 NEEDHAM ST., NEWTON HIGHLANDS 61, MASS.

• **EASY TO USE**

The operating technique is essentially the same as for the familiar brightfield microscope. There are no substage annuli to change or align. To obtain a phase image with any objective, merely set the condenser at the height indicated by a scale on the condenser bracket.

• **CONTINUOUS TRANSITION FROM PHASE→BRIGHTFIELD→DARKFIELD**

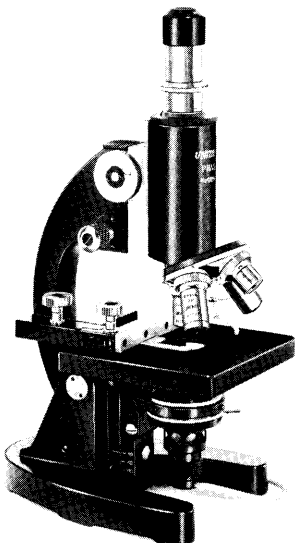
The UNITRON Laboratory Models offer more than just the advantages of phase images. By focusing the condenser, you obtain a continuous transition from phase, to brightfield, and (except with the 100X objective) to darkfield microscopy. Even polarized light is available using accessory filters. With a *single* instrument, you can use the most important techniques of microscopy, all in rapid succession.

• **FULL RANGE OF COATED OPTICS**

The UNITRON Laboratory Models come complete with four achromatic, par-focal, coated objectives: three phase objectives — P10X, P40X, P100X oil immersion — and a brightfield 4X scanning lens. Using standard and accessory eye-pieces, a magnification range of 20X-2000X is available.

• **BUILT-IN ILLUMINATOR ELIMINATES GUESSWORK**

The auto-illuminator provides maximum resolution and full-field illumination at all powers, for all types of microscopy. Perfect alignment is maintained even when the stand is inclined. A 5-position transformer provides a wide range of intensities for both visual observation and photomicrography, with or without filters.



UNITRON MONOCULAR LAB MODEL MPH

SPECIFICATIONS — Four coated achromatic objectives: 4X (non-phase, N.A. 0.15), phase P10X (N.A. 0.25), P40X (N.A. 0.65), and P100X (N.A. 1.25) oil immersion; monocular body with graduated, adjustable drawtube; large stand inclinable through 90°; quadruple revolving nosepiece; coarse focusing by diagonal-cut rack and pinion; fine focusing by micrometer screw; detachable mechanical stage; phase condenser (N.A. 1.2) for "Continuous-Transition" Microscopy, focusable by rack and pinion, with removable phase annulus, and iris diaphragm for brightfield applications; filter holder and green filter; built-in illuminating system with 5-intensity transformer (115 volts AC); 6 spare bulbs; stage clips; wooden cabinet and dustcover. Choice of bright or dark contrast.

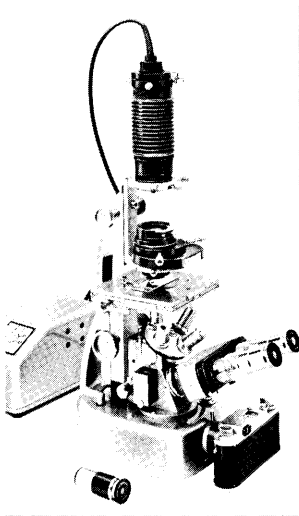
- MODEL MPH: with Widefield W10X Eyepiece..... \$315**
- MODEL MPH-ZM: with ZOOM (10X thru 20X) Eyepiece..... \$328.00**
- **Polarizing Accessories: Polarizer and analyzer, type PMP... 8.75**
- **Replacement Bulbs: Type EL-2B..... Per dozen 6.00**
- **For graduations on mechanical stage, extra cost..... 6.00**

UNITRON

INVERTED PHASE RESEARCH

There is an ever-growing appreciation of the inverted design as the most versatile and logical arrangement for a biological research microscope. With these UNITRON Phase Models, regular mounted slides, wet mounts, and containers of fluid, are placed directly on the microscope stage. Material such as tissue cultures, living protozoa, plankton, etc. can be examined in the normal position in the very glassware in which they have been growing. (If studied with the upright microscope, the culture bottles would have to be turned upside down, leaving the cells adhering to the glass without benefit of the culture media.) The flat smooth surface of the stage — with

built-in, graduated, rectangular motions — readily accommodates special instruments and equipment. Micromanipulators, warming enclosures, needles, tweezers, and glass chambers are accessible and in full view of the operator. Using the special optical glassware provided, liquid may be added to a preparation even while it is being examined under oil immersion . . . without disturbing the specimen. Reactions, precipitation, crystallization, and solubility, may all be studied with the utmost of convenience. The stage is focusable in height to allow specimens in the interior of containers and "hanging drops" to be brought within the working distance of the objectives.

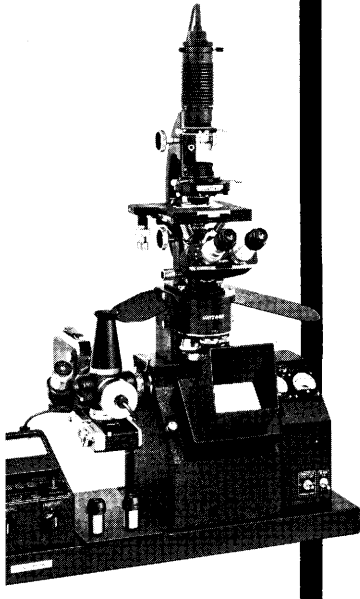


INVERTED RESEARCH PHASE MICROSCOPES

- **STAND:** Inverted design. Built-in graduated mechanical stage with verniers, focusable by rack and pinion. Focusable support for illuminator and condenser, with individual centering screws. Quadruple nosepiece. Micrometer screw fine focusing.
- **OPTICS:** Eight, coated, phase objectives, with four in bright and four in dark contrast, with magnifications 10X, 20X, 40X, 100X oil. Divisible phase turret condenser (N.A. 1.25) for normal and long working distances, with iris diaphragm and filter holder. Centering telescope. Coated eyepieces: widefield, high-eyepoint WFH10XR and Ke15X.
- **OTHER EQUIPMENT:** High-intensity Koehler illuminating system with variable transformer. Special optical slides and petri dishes, three filters, fitted wooden cabinet with elevating compartment, dustcover, etc.

MONOCULAR MODEL PH-MIC:..... \$ 842
BINOCULAR MODEL PH-BMIC: includes built-in camera mechanism with accessories for 35mm photography and provision for Polaroid Attachment..... \$1072

RESEARCH PHASE-CAMERA-MICROSCOPES



- **STAND:** Inverted design. Built-in graduated mechanical stage with verniers, focusable by rack and pinion, with coaxial controls. Focusable support for lamp and condenser with centering screws. Quadruple nosepiece. Micrometer-screw fine focusing. Arm rests.
- **OPTICS:** Five coated objectives; four phase 10X, 20X, 40X, 100X oil in choice of bright or dark contrast and 5X brightfield scanning lens. Widefield, high-eyepoint oculars: WFH10XR Micrometer and WFH15X. Divisible phase turret condenser (N.A. 1.25) for both normal and long working distances, with iris diaphragm and filter holder. Centering telescope.
- **CAMERA MECHANISM:** Built-in 3 1/4" x 4 1/4" camera with Fresnel-lens viewing screen. Four parfocal photo-projection lenses on revolving turret: 10X, 12.5X, 15X Micrometer, 20X. Instantaneous changeover from visual observation to photography.
- **OTHER EQUIPMENT:** High-intensity Koehler illuminating system with integral variac. Special optical slides and petri dishes, three filters, polarizing accessories, cabinets, etc.
- **ADDITIONAL ACCESSORIES AVAILABLE:** Camera attachments for 35mm, movie, and Polaroid photography (both 3 1/4" x 4 1/4" and 4" x 5"). Photoelectric Exposure Meter, Low Power Optics (5X-40X), accessories for reflected light, heating stages, etc.

MONOCULAR SERIES N MODEL N-13:..... \$1470
BINOCULAR SERIES N MODEL BN-13:..... \$1660

Write for literature on UNITRON Inverted Models for both phase and brightfield microscopy.

UNITRON INSTRUMENT CO. 66 NEEDHAM ST., NEWTON HIGHLANDS 61, MASS.