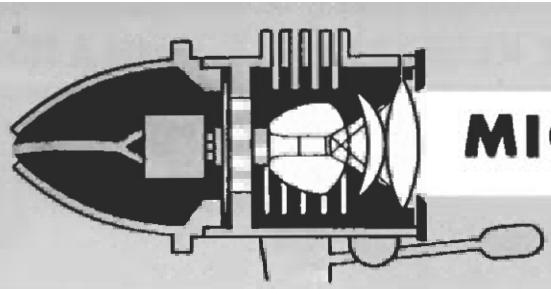


# UNITRON

# MICROSCOPE ILLUMINATORS

for STUDENT • LABORATORY • RESEARCH PHASE • STEREOSCOPIC • POLARIZING Models

## ATTACHABLE SUBSTAGE ILLUMINATORS

### *for School, Laboratory, and Student-Phase Models*

UNITRON offers two types of substage illuminators — a 110 volt model for routine student and laboratory wark and a low-voltage model with transfarmer to provide the higher intensity needed far visual observation with high-powered eyepieces, photomicrography, and student phase microscopes. Both types offer the advantages of integral illumination and eliminate the need for troublesome mirror adjustments. The illuminator is designed to snap into the mirror support in place of the substage mirror and can be installed in a fraction of a minute. Perfect optical alignment and uniform illumination is maintained even if the microscope is moved or its inclination changed. The well-ventilated housing may be rotated through 180° to give the choice of two lamp apertures: either a special condenser lens or a diffuse plane surface. In this way, optimum illumination at all powers may be selected for microscopes which either have or lack a substage condenser. Both apertures are fitted with daylight-type blue filters to eliminate eyestrain during prolonged observations.

**Model LHC, 110 Volt Illuminator**

Priced within the range of even limited school budgets. This compact efficient illuminotor gives ample light intensity for essentiolly all brightfield observotions with student and laboratory micrascopes. Also adequate for routine work with binocular models. Especially recommended for UNITRON Models MUS, MLEB, MLK, BMLK, Series MSH, MSF-H, and similar microscapes.

SPECIFICATIONS: UNITRON Model LHC Substage Illuminator with 15 watt bulb. Sturdy, well-ventilated housing with apertures far both cancentrated and diffuse light, doylight-blue filters. Card and plug for 110-115 volts, on-off line switch, spore bulb.

**Price, Model LHC** ..... **$10.00**

Replacement bulbs, type EL-CHL, per dozen 3.00

**Model LLV High-Intensity Illuminator**

Designed for applications which require a high intensity of illuminotion. Provides ample light for binocular models even when special colored filters or high-powered eyepieces are used. Ideal for use with UNITRON Student Phase Models MPA and MPB. The voriable transformer provides the correct intensity needed for both visual observation and phatomicrography.

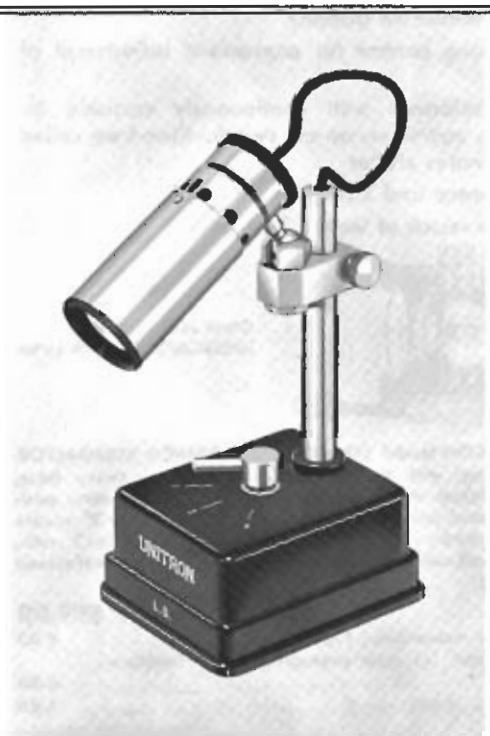
SPECIFICATIONS: UNITRON Model LLV Substage Illuminator with low-voltage bulb. Sturdy housing, with apertures for both concentrated and diffuse light, daylight-blue filters. Five-intensity transfarmer (0-14 volts) with pilot light, line cord, on-off switch, spare bulb.

**Price, Model LLV** ..... **$29.50**

Replacement bulbs, type EL-VLL, per dazen 6.00


Above: Illuminator snaps into support in place of substage mirror

Below: Transformer of Model LLV offers choice of 5 intensities




## SPOTLIGHT ILLUMINATOR, Model LS

### *for Stereoscopic and Low Power Microscopes*

- A budget-priced, spotlight illuminator especially recommended far industrial and school use
- Designed for incident illumination of opaque objects
- Focusable condenser varies lighting from concentrated spot to large-area illumination for wide-field observation at law powers
- Lamp house adjusts in height and direction to provide an incident beam of the desired angle for specimens of varying height
- Base transformer offers choice of three intensities
- Uses inexpensive tungsten bulb. Ventilated lamp house insures lang bulb life

SPECIFICATIONS: UNITRON MODEL LS SPOTLIGHT ILLUMINATOR. Complete with ventilated lamp house adjustable in height and direction, focusable condenser, integral base transformer with three-intensity switch, line cord far 110-115 volt aperation. Wooden cabinet and spare bulb.

**Price, complete** ..... **$14.75**

Spare bulbs, type EL-SL, per dozen ..... 3.00

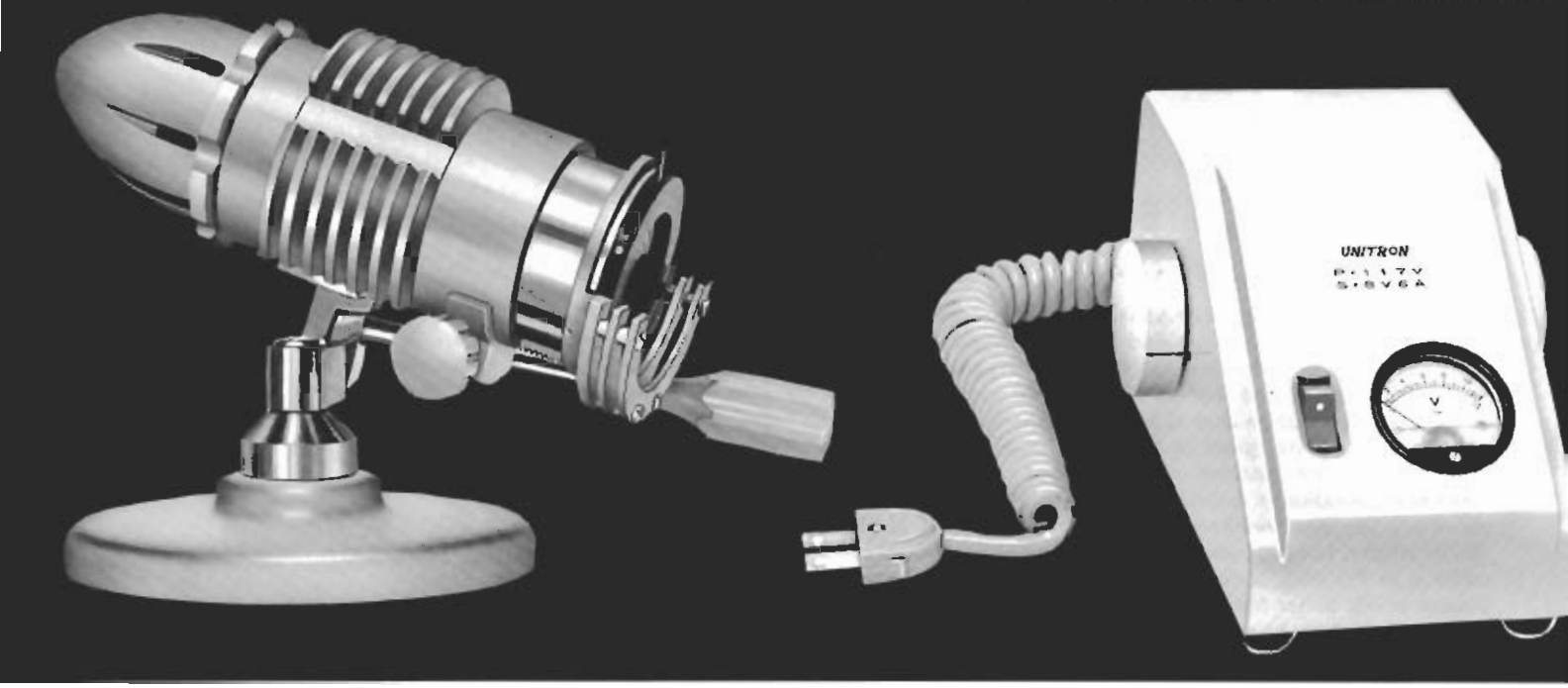
Note: The Model LS Spotlight Illuminator is not recammended for transmitted-light microscopy with high-magnification, high-numerical aperture laboratary or student models.

UNITRON INSTRUMENT CO. MICROSCOPE SALES DIVISION 66 NEEDHAM STREET, NEWTON HIGHLANDS 61, MASS.

Prices F.O.B. Newton

# UNITRON Model LKR KOEHLER RESEARCH ILLUMINATOR

**HIGHEST IMAGE CONTRAST • EVEN ILLUMINATION • MAXIMUM RESOLUTION**




## THEORY OF KOEHLER ILLUMINATION

The benefits of Koehler Illumination can be achieved only by using a microscope lamp which has been designed especially for the purpose. To set up the illuminating system, an enlarged image of the bulb filament is reflected from the substage mirror and brought to a sharp focus in the plane of the iris diaphragm of the microscope condenser. Focusing this condenser will cause a sharp image of the lamp iris diaphragm to appear in the field of view. By regulating this lamp "field" diaphrogm, only the portion of the specimen actually in the observed field will be illuminated. A corresponding adjustment of the "aperture" diaphragm of the microscope condenser limits the cone of entering light rays to a size which can actually be transmitted and utilized by the objective lens. Correct adjustment of these two iris diaphragms assures highest image contrast and eliminates the stray light which causes glare. In the Koehler system, these adjustments are completely independent of each other, giving the microscopist the advantage of the greatest degree of control. For example, the aperture diaphragm may be closed down to increase depth of field and contrast without changing the size or evenness of illumination in the observed field of view. Similarly, adjustments of the field diaphragm increase contrast by eliminating glare and not by decreasing the effective aperture of the objective.

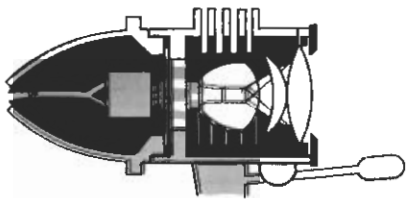
## ADVANTAGES OF UNITRON KOEHLER ILLUMINATOR

All adjustments such as alignment of the lamp house, focusing of the condenser, regulation of the iris field diaphragm, changing light intensity, and insertion of filters are made with the greatest of convenience while the user remains seated in the customary position for observing. A unique feature of the UNITRON lamp is the single control lever and locking device for varying orientation in the up-down and left-right directions. The focusable aspheric condenser is carefully corrected for spherical aberration to insure highest image contrast. Correct intensity for all application is obtained from the variable transformer. A voltmeter is provided so that intensity settings can be recorded for future reference, a particular advantage in photomicrography.

Printed in U.S.A.

## NOTE THESE MANY OUTSTANDING FEATURES

- High-intensity for brightfield, darkfield, phase contrast and polarized light microscopy
- Provides true Koehler illumination for all objectives, from low power to oil-immersion
- All controls within easy reach of the operator
- Uses inexpensive tungsten-filament bulb in prefocused base to insure perfect alignment
- Rack and pinion control for precise focusing of condenser
- Aspheric two-lens condenser system. Completely free of surface blemishes to produce uniform illumination
- Calibrated iris field diaphragm and filter holder
- Ventilated lamp house with radiation fins assures long bulb life and prevents stray light
- Heavy base for maximum stability
- Single-lever locking control for convenient adjustment of lamp position
- Heavy-duty transformer with continuously variable intensity control; voltmeter; on-off switch. Kink-free, coiled line cord eliminates clutter
- Modern appearance and sturdy construction
- Priced within the reach of limited budgets



Cross section view of UNITRON'S Research Lamp

**SPECIFICATIONS: UNITRON Model LKR KOEHLER RESEARCH ILLUMINATOR, High-Intensity Illuminator: with finned, ventilated housing, heavy base, two-lens aspheric condenser with rack and pinion focus, single-lever positioning and locking control, calibrated field diaphragm, holder for 2" square or round filters. Transformer: with variable-intensity control (0-12 volts, 5 amps), voltmeter, on-off switch, kink-free coiled line cord. Two prefocused tungsten bulbs included.**

| | |
|---|---|
| Price, complete | **$99.00** |
| Green contrast filter, X1 transmission, Type F-KG | **6.00** |
| Blue color balancing filter, for color photography with "outdoor film", Type F-KB | **4.00** |
| Replacement bulbs, Type EL-RKL, per 3 | **3.00** |

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