

**UVICURE®**  
USER'S MANUAL



## General Description

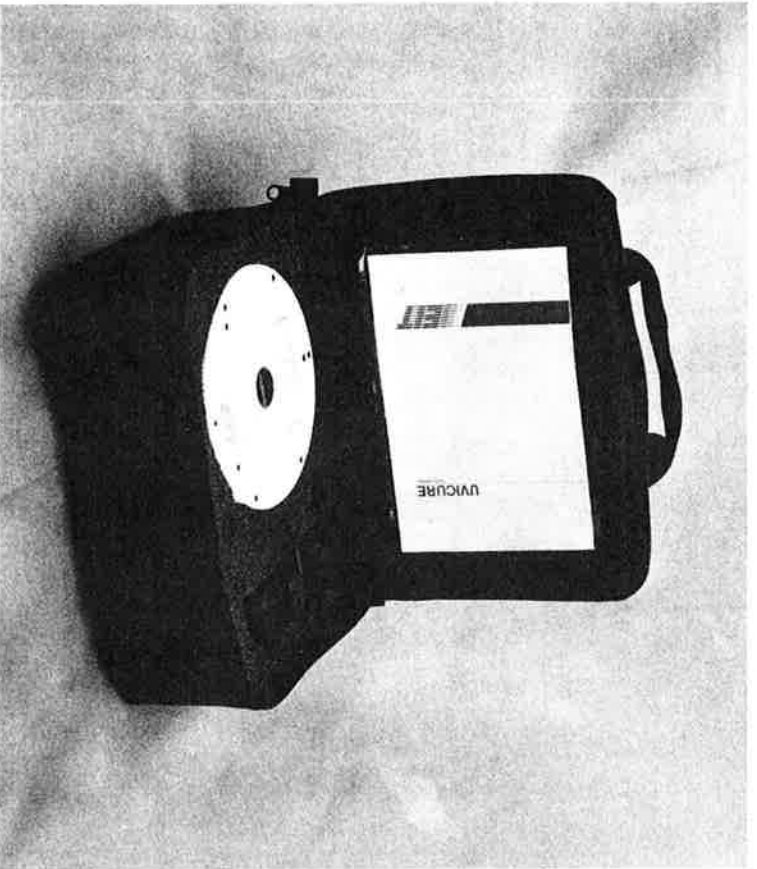
UVICURE® is a self-contained electro-optic radiometer designed to measure and display total UV energy applied to a workpiece in a UV curing system. Its unique mechanical design allows it to be placed directly in a UV curing environment and operate satisfactorily in extremes of UV and thermal radiation. A carefully designed optical sensing system measures only the UV wavelengths while rejecting those wavelengths, such as visible light, which do not substantially affect the curing process. The output of the sensing system is converted to digital form and displayed on a self-contained four digit liquid crystal display. The displayed number is the integrated value of UV radiation impinged on the sensor system since the UVICURE® was reset. UVICURE® is designed to accommodate energy intensities of up to 2.5W/cm<sup>2</sup>. The measuring circuitry is designed with a threshold which inhibits counting at energy levels below 2.5mW/cm<sup>2</sup> to eliminate "nuisance" counting when UVICURE® is outside the curing system.

Total energy range is 0 to 9,999 joules of UV energy measured at the chosen wavelengths. Accumulated energy is displayed on a 4 digit LCD display. No electronic damage is done if the upper energy limit is exceeded.

The unit is battery powered and charging is accomplished through a short-circuit protected jack in the side of the case. A specially designed charger is provided which is also short circuit proof and provides proper charging current.

An attractive, convenient foam-lined carrying case houses UVICURE® and its charger when not in use. Chargers for 110/100 VAC and 220/240 VAC use are available.

The UVICURE® is very easy to use and virtually foolproof. In use, the instrument is removed from its carrying case and the ON/RESET button is depressed. This takes the UVICURE® out of its extremely low power consumption mode, resets the display and prepares it for a measurement. The unit is placed on a conveyor or surface which is normally occupied by an item which is to be cured. UVICURE® circuitry automatically starts counting when UV energy is encountered and the integrated UV energy result is displayed in the LCD display. Accumulation continues until the conveyor carries UVICURE® outside the oven or, in other applications, the UV source is removed. The integrated value of energy, in Joules, is displayed for approximately four minutes after the last count is entered or until RESET is pushed. UVICURE® automatically reverts to extremely low power operation after the four minute time out. This feature enhances already excellent battery life of 8 hours continuous usage between charges. UVICURE® also provides an over-temperature alarm which provides an audible alarm and flashing display whenever the unit approaches 75° C internal temperature. An audible alarm is also provided if an attempt is made to operate the unit in an inverted position which would expose the soft (display) underside to damaging radiation. A flashing display only is provided if the batteries are discharged to within 30 minutes of complete discharge.



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## Operating Instructions

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Important: The UVICURE® should be charged 8-12 hours before using for the first time.

### I. OPERATING INSTRUCTIONS

- Press "ON/RESET" button. Display will come on displaying all zeros.
- Place UVICURE® on conveyor with round detector window facing up.
- Wear gloves to pick up the UVICURE® when it exits the oven. **Caution: the unit may be very hot.**
- Read energy level on display.
- To clear display, press "ON/RESET" button.
- UVICURE® is now ready to make another reading.

### II. INDICATORS

- Low Battery:** Display will flash ON and OFF when the level of charge is too low for reliable operation. As charge level decreases, display may blank leaving only the decimal point showing.
- Over Temperature:** Display will flash ON and OFF and an intermittent audible alarm will sound when the internal temperature is too high for reliable operation. As the temperature rises, the display may turn dark and the audible alarm may sound steadily. Allow unit to cool before attempting further readings.
- Inversion Alarm:** An audible alarm will sound if the unit is actuated and the unprotected underside is placed up. The alarm will silence when the protected (detector) side is placed on top. The alarm is intended to prevent damage due to excess radiation on the "soft" underside.

### III. "ON/RESET"

The unit can be turned on or reset by pressing the "ON/RESET" button. It will remain on for four minutes after its last exposure to ultraviolet levels of at least 2.5mW/cm<sup>2</sup>. Unit will then turn itself OFF after 4 minutes to conserve batteries.

### IV. Cleaning

Clean unit only with denatured alcohol and a clean cloth or cotton swab. To ensure accuracy, clean detector window periodically with denatured alcohol and a cotton swab. Avoid touching detector window with hands or fingers.

### V. Recharging

Plug the battery charger into the UVICURE®. Plug in the charger.

**Caution: do not attempt to use any other charger than the one supplied with UVICURE. Damage to the unit could result.**

- Charge the batteries only when the unit is cool. Never charge the unit when the temperature inside the unit is above 30° C. The user should allow 15 minutes under constant airflow. Charging of the battery packs while the unit is still warm will severely limit the life span of the batteries and possibly burst them.
- Allow the instrument to report "low battery" before recharging. Continue to use the unit until it indicates that the batteries are low. The UVICURE's® display will flash when the batteries need charging.
- Don't charge the batteries any longer than 8-12 hours. If your UVICURE® does need charging, place it on the battery charger for 8 to 12 hours. Overnight recharging (slightly longer than 12 hours) does not hurt the batteries, but leaving the instrument on charge for weeks at a time will shorten the life of the batteries.

Note: These batteries are not serviceable by the end-user. Units should not be opened as there are not any user serviceable parts within. Opening the shell of a UVICURE® violates the calibration of the instrument.

### Warranty

Warranty period for UVICURE® is 6 months from the date of purchase, abuse and neglect excepted. There are no user serviceable parts inside UVICURE®. If your unit does not operate properly call EIT at (703) 478-0700. We will arrange for its return to the factory for repair and recalibration.

## Specifications

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### **RADIOMETER:**

**Range:** 2.5mW/cm<sup>2</sup> to 2.5 W/cm<sup>2</sup> except Model M254; 2.5mW/cm<sup>2</sup> to 1 W/cm<sup>2</sup> for Model 254.

**Display:** 0-9.999 Joules/cm<sup>2</sup>, 4 digit LCD

**Accuracy:** 5% typical, ±10% guaranteed

**Spectral Response:** Standard ranges are 250 to 260nm, 280 to 320nm, 320 to 390nm or 390 to 440nm; switch-selectable radiometer ranges are 250 to 260nm, 280 to 320nm, 320 to 390nm, and 390 to 440nm (choose any three bandwidths).

**Spatial Response:** Approximately cosine

**Polar Response:** ±5%, max.

**Operating Temperature Range:** 0° C - 75° C Internal temperature range. UVICURE<sup>®</sup> will tolerate much higher external temperature for short periods. Audible alarm sounds and display flashes at impending over temperature.

**Operation:** Unit operation initiated by pressing ON/RESET button. When unit is exposed to total UV radiation in excess of 2.5mW/cm<sup>2</sup>, counts are accumulated at a rate proportional to radiation intensity. Counting stops whenever total radiation falls below 2.5 mW/cm<sup>2</sup> threshold. If no counts occur during a 3 to 4 minute period, UVICURE<sup>®</sup> turns itself off, preserving battery life.

**Time Out Period:** 4 minutes, ±0.5 minutes.

**Controls:** ON/RESET initiates UVICURE<sup>®</sup> operation and/or clears display when pressed.

**User Adjustments:** None. Factory recalibration at minimal cost.

**Operating Time Between Charges:** 8 hours; display flashes as batteries near discharged condition.

**Recharge Time:** 14 hours (maximum)

**Dimensions:** 6.5" diameter x 0.5" high

**Weight:** 325 grams

**Package Materials:** Silicone, fiberglass/epoxy, and ceramic. Patent #4,644,165

### **CHARGER:**

**Output:** 20VDC limited to 25mA (maximum). Short circuit proof.

**Charger Cord:** 60" long; jack mates with connector in side of UVICURE<sup>®</sup>

**Recharge Rate:** 10mA; 12 hours for completely discharged batteries.

**Power Requirements:** US/Japanese -90-130 Vac, 50/60 Hz; European - 200-240 Vac, 50/60 Hz

**Power Plug Configuration:** US/Japanese - Conventional two prong, supported in wall outlet;

European - Standard EUROPLUG supported in wall outlet.

**Dimensions:** 1.75"W X 2.75"L X 1.5"D (4.4 X 6.9 X 3.8 cm)

**Weight:** US/Japanese and European - 8oz. (224 grams).

### **CASE:**

**Construction:** Cut polyurethane foam interior to accommodate charger and radiometer. Soft nylon exterior cover

**Weight:** 1 lb. (448 grams)

**Dimensions:** 12"W X 4.75"H X 8.25"D (30.0 X 11.8 X 20.6 cm)

**Ordering Information:**

UVICURE<sup>®</sup> with 250 to 260nm spectral response order Model M254

UVICURE<sup>®</sup> with 280 to 320nm spectral response order Model M313

UVICURE<sup>®</sup> with 320 to 390nm spectral response order Model M365

UVICURE<sup>®</sup> with 390 to 440nm spectral response order Model M415

UVICURE<sup>®</sup> switch-selectable with 250 to 260nm, 280 to 320nm, 320 to 390nm and 390 to 450nm spectral response order Model MABC. Choose any three bandwidths for a switch-selectable unit.

Battery charger is included. Specify operating voltage of 110/100VAC or 220 VAC when ordering.

*Specifications may be subject to change.*

## Other EIT Products

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- **UVIRAD Low Energy UV Integrating Radiometer:** Measures UV in 100 μW/cm<sup>2</sup> to 100 mW/cm<sup>2</sup> range. Display in Millijoules. For use in plate-making, primary imaging, and soldermask imaging.
- **UVSENSOR:** Provides output current linearly proportional to UV intensity. Used to monitor UV lamp intensity.
- **UVIMAP** Ultraviolet Intensity Profiler: Monitors and stores UV output and substrate temperature and plots the intensities on X-Y plotter.
- **UVIBRITE:** Monitors UV intensity for a single UV source.
- **MULTIBRITE:** Monitors UV intensity for up to four lamps simultaneously.
- **CHEM-CHECK** Solution Saturation Instrument: Measures in FT<sup>2</sup>-Mil/Gal the amount of solid dissolved in a bath, e.g. photoresist in a developer bath. Used to determine when to change the bath.
- **PANEL MOUNT UV INTENSITY MONITOR:** Monitors UV intensity on-line for a single UV source.
- **DIN RAIL MOUNT UV INTENSITY MONITOR:** Monitors UV intensity on-line for a single UV source in DIN rail mountable module.