

Low Energy UV Integrating Radiometer UVIRAD®



Features

- Monitors UV energy at work surface
- No external connections required
- Instrument won't damage artwork, platen
- Easy to use
- Digital readout
- Battery powered low battery indicator
- Carrying case and charger

Applications

- Q.C. tool in manufacturing printed circuit boards, screen, color proofing, and most UV imaging situations
- Exposure machine intensity profiling
- UV lamp evaluation
- Platen and artwork opacity measurements

General Description

UVIRAD is an integrating radiometer designed to measure relatively low levels of ultraviolet energy. It features an extremely rugged design, permitting it to be placed in the UV system as a normal workpiece. This results in very accurate measurement of the UV energy that is impinged on a workpiece during exposure.

Introduction

Exposure of ultraviolet sensitive materials requires controlled amounts of ultraviolet energy. Many variables such as time, temperature, geometry, etc. combine to make the amount of UV energy delivered by an exposure machine vary. Visual observation is not a reliable way of determining UV intensity since UV cannot be seen by the unaided eye. Further total energy delivered is a function of time of exposure as well as of UV irradiance. As a result, obtaining and maintaining proper energy in a UV exposure machine is difficult.

Conventional UV measurement practices make use of a UV sensor to measure UV irradiance at the point of interest. In some cases, irradiance is assumed to be constant with time while in other cases an electronic integrator, which provides total energy density delivered during the exposure period, is connected to the sensor from an external location. In either case, the UV sensor, because of its size and geometry, is inconvenient to use, may damage film or exposure machine components and requires external connections to provide readout.

Measures Under Actual Working Conditions

EIT's UVIRAD, low energy UV integrating radiometer provides a rapid, convenient means of measuring total UV energy density striking a workpiece. A UV sensor, associated electronics and digital readout are combined and housed in a 3/8" thick, 5 1/4" diameter aluminum housing that can be placed under artwork platen and/or cover sheet under full



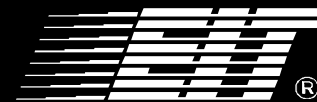
vacuum. Or it may be used on top of the exposure surface. UVIRAD provides the ability to determine the performance of an exposure machine as it occurs under actual operating conditions. A UV sensor is located on the top side of the instrument. All necessary electronic circuitry, including batteries, is located inside the housing.

In most applications, UVIRAD is placed so that the UV light striking it is the same as that falling on the UV sensitive material being exposed. The items between the material and the lamp would include the Mylar platen, artwork and vacuum frame glass, and foreign material such as dust. They are included because they typically have substantial impact on the amount of UV striking the material. Thus, the UVIRAD is able to measure the actual UV reaching the work surface as opposed to what external UV sensors measure.

Easy to Use

In operation, the unit is turned on or reset by pushing a flush mounted button on the top surface. UVIRAD is then placed in the position where UV energy is to be measured. It measures UV during the exposure cycle and retains the value. Upon completion of an exposure cycle, UVIRAD is removed from the exposure machine and the value for total energy density, in millijoules/cm² of UV which fell on it, is read on the digital display. Subsequent cycles are measured by resetting UVIRAD and replacing it in the measurement position. UVIRAD will accommodate irradiance values from 100uW/cm² to 100mW/cm², which covers most UV exposure intensities. The 4 digit, UV resistant display covers the energy range from 0-9999 millijoules. A threshold circuit inhibits counts whenever irradiance is below 100uW/cm² to prevent nuisance counting in room light. Calibration is recommended at 6 month intervals under normal circumstances.

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Specifications

Range	100uW/cm ² to 100mW/cm ²
Display	0-9999 millijoules, 4 digit, LCD
Spectral Response	320-390nm, others available
Accuracy	+/-5% typical, +/-10% maximum
Spatial Response	Approximately cosine (response 0.5 at 60° angle of incidence)
Controls	ON/RESET button applies power to unit and resets display to zero when depressed and released. Unit operation is initiated by depressing and releasing ON/RESET button. When unit is exposed to UV radiation in excess of 100uW/cm ² , counts are accumulated in display at rate proportional to radiation irradiance. Counting stops when radiation falls below 100uW/cm ² threshold. If the threshold is not exceeded within 45 seconds, the display is cleared and unit operation ceases until reinitiated.
Time-Out Period	45 seconds, +/- 10 seconds
Operating Time Between Charges	8 hours
Recharge Time	14 hours (maximum)
“LO BAT” Indication	Display flashes at approximately 1 Hz when unit batteries have a remaining charge of approximately 20 minutes or less
Unit Dimensions	5 ¼” diameter, 3/8” thick (13.3 x 0.95cm)
Weight	5.8 oz (160 grams)
Operating Temperature Range	0° to 75°C. Upper limit may be exceeded momentarily
Operating Pressure	0.1 PSI to 20 PSI absolute, intermittent

Battery Charger

Charger Output	20VDC limited to 10mA (maximum). Indicator LED is dark at no charge, medium bright at normal charge, and bright at short circuit
Recharge Rate	2mA; 14 hours to recharge completely discharged batteries
Power Plus Configuration	US/Japanese – Conventional two prong; supported in wall outlet European – Standard EUROPLUG; supported in wall output
Power Requirements	US/Japanese – 90-132 VAC, 50/60 Hz; European – 200-240 VAC, 50/60 Hz
Charger Cord	Cord 30” (0.76m) long, jack mates with plug in UVIRAD
Dimensions	2.1”W x 2”H x 2.4”D (5.3 x 5.0 x 6.1cm)
Weight	12 oz (345 grams)

Carrying Case

Construction	Cut polyurethane foam interior to accommodate charger and radiometer. Soft nylon exterior cover
Weight Dimensions	1 l. (448 grams)
Dimensions	12”W x 4.75”H x 8.25”D (30.0 x 11.8 x 20.6cm)

Specifications subject to change