Zenith™

ULTRAVIOLET METER

Owner's Manual

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These instructions generally describe the operation of the **Zenith™** Ultraviolet Meter. Questions that are not specifically answered by these instructions should be directed to the Factory.

Atlantic Ultraviolet Corporation takes all possible precautions when packaging equipment to prevent damage. Carefully inspect and report all damage. Do not operate damaged equipment.

Follow all instructions on any labels or tags. Carefully inspect all packing materials before discarding to prevent the loss of accessories, spare parts or instructions.

The information and recommendations contained in this publication are based upon data collected by the Atlantic Ultraviolet Corporation® and are believed to be correct. However, no guarantee or warranty of any kind, expressed or implied, is made with respect to the information contained herein. Specifications and information are subject to change without notice.

WARNINGS

USE PERSONAL PROTECTION EQUIPMENT, SUCH AS LONG SLEEVES WITH NO GAPS BETWEEN CUFFS AND GLOVES, AND ULTRAVIOLET RESISTANT FACE SHIELD, WHEN TAKING ULTRAVIOLET INTENSITY MEASUREMENTS.

This instrument can be affected by high humidity, which may prevent the meter from correctly displaying Zero when there is no ultraviolet radiation. The Zenith™ meter has been shipped inside a sealed plastic bag to avoid humidity problems and it should be resealed in the bag when not in use.

APPLICATION

The **Zenith™** Ultraviolet Meter is a sensitive, hand-held, ultraviolet meter that can be used to:

1. Survey ultraviolet room air sanitizer installations to ensure that the ultraviolet radiant exposure, of occupants within the treated area, is within acceptable limits. The **Zenith™** Ultraviolet Meter provides accurate and easy-to-read levels of intensity that may be interpreted by anyone - not just engineers.
2. Check the intensity of aging ultraviolet lamps

CONSTRUCTION

- The **Zenith™** is 5.5” long by 3.6” wide by 1.13” deep and weighs approximately 8½ ounces, including the battery. The enclosure is constructed of ABS 94HB plastic and is capable of withstanding normal physical abuse that may be encountered by a portable meter.
- A narrow ultraviolet band pass filter in combination with the photodiode detector makes the **Zenith™** insensitive to ambient lighting within the area being surveyed.
- The **Zenith™** is zeroed and calibrated at the factory.

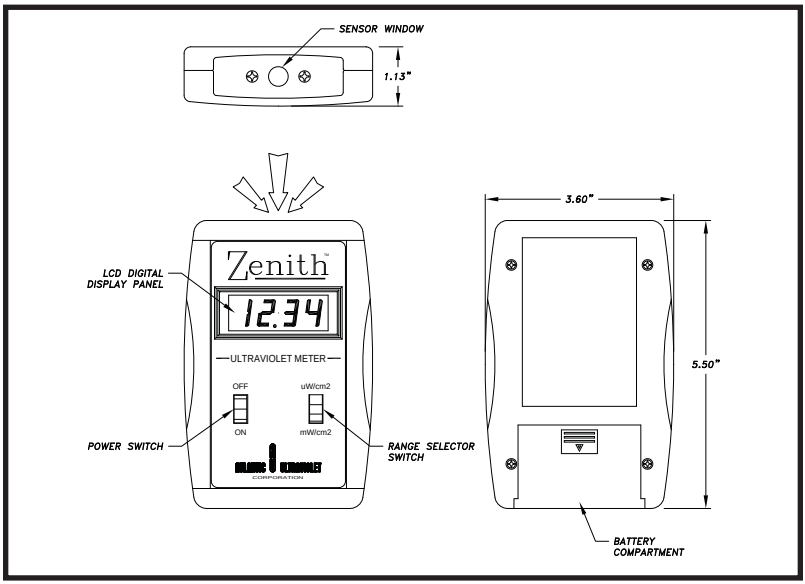
METER POWER

A single 9-volt DC alkaline battery supplies the **Zenith’s™** operating power. An internal battery-saver will automatically shut off the meter after 30 minutes of inactivity. At any time during operation, the automatic shut off time may be extended a further 30 minutes if the power switch is pressed ON again.

CONTROLS

- The LCD Digital Display Panel is a 3½ digit (1999) LCD panel meter with ½”digit height.
- The Power Switch is a momentary rocker switch, used to turn the Zenith™ ON/OFF or to reset the automatic shut off timer.
- The Range Selector Switch is a two-position rocker switch. The range may be set to either 0-19.99 microwatts per square centimeter ($\mu W/cm^2$), or 0-1.999 milliwatts per square centimeter (mW/cm^2).

Figure 1 - Zenith™ Ultraviolet Meter



OPERATION

- **Read and follow all notices, of these instructions, and warnings on the Zenith™ Ultraviolet Meter.**
- All personnel should be alerted to the potential hazards indicated by the product safety labeling on this meter.
- Failure to observe precautions could result in personal injury.

Survey Room for Ultraviolet Radiant Exposure:

- Press and release Power Switch.
- Select desired Range, either microwatts per square centimeter ($\mu W/cm^2$) or milliwatts per square centimeter (mW/cm^2).
- Point sensor window at ultraviolet source.
- Note reading on the display panel, and record as required.
- When using the 30-0083 - see notes in ***ULTRAVIOLET RADIATION.***

Ultraviolet Lamp Intensity and Aging:

- Press and release Power Switch.
- Set Range to milliwatts per square centimeter (mW/cm^2).
- Point sensor window at ultraviolet lamp, NOTE: keep measuring distance and location, of the meter, the same each time the ultraviolet lamp is tested.
- Note reading on the display panel, and record results.
- Replace ultraviolet lamp(s) when output drops below 70% of original readings.

Meter Over Range:

- If the ultraviolet is too high to read, the meter will indicate "1." Measurements may be taken at a greater distance.

ULTRAVIOLET RADIATION

Currently, the ultraviolet radiant exposure incident 'Threshold Limit Value' (TLV), as set by the American Conference of Government Industrial Hygienists for unprotected skin or eyes, should not exceed 0.2 microwatts per square centimeter ($\mu W/cm^2$) at 254 nanometers (nM) for an eight (8) hour period.

Table 1 - Permissible Ultraviolet Exposure at 254nm.

Duration of Exposure Per Day	Effective Irradiance	
	Microwatts/cm2	Milliwatts/cm2
8 hours	0.2	0.0002
4 hours	0.4	0.0004
2 hours	0.8	0.0008
1 hour	1.7	0.0017
30 min.	3.4	0.0034
15 min.	6.6	0.0066
10 min.	10	0.01
5 min.	20	0.02
1 min.	100	0.1
30 sec	200	0.2
10 sec.	600	0.6
1 sec	6,000	6.0
0.5 sec.	12,000	12
0.1 sec.	60,000	60

WARNING: To guard against injury, basic safety precautions should be observed, including the following:

WARNING: Avoid exposure to direct or strongly reflected germicidal ultraviolet rays. Germicidal ultraviolet rays are harmful to the eyes and skin.

UV exposure is not immediately felt . . . the user may not realize a hazard until after the damage is done.

The 30-0081 **Zenith™** Ultraviolet Meter is preferable when the main requirement is for safety measurements of low-level radiation (below 1 microwatt).

If the 30-0083 meter has to be used for low-level measurement, the operator should ensure that the meter is not reading some of the longer wavelength ultraviolet light radiated by fluorescent lamps in the measurement area. Switch off any fluorescent lamps that may interfere with the required measurements.

TECHNICAL SPECIFICATIONS

Table 2 - Technical Specifications (MODELS 30-0081 & 30-0083)

WAVELENGTH:	30-0081 (Germicidal) 254 nM with + 10 nM bandwidth . 30-0083 240 nM (185-320 nM)
BANDWIDTH:	Approx. 20 nanometers (30-0081), 135nM (30-0083)
DISPLAY:	3½ Digit LCD
DIGIT SIZE:	0.5 inch, (12.7 mm.) figure height.
OVER RANGE:	Display 1.
CONVERSION RATE:	2.5 per second.
ACCURACY:	+ or - 0.5% (and + or - 1 last digit)
SENSOR:	Built-in Vacuum Photodiode.
SENSITIVITY:	(Two ranges) 0 - 19.99 microwatts per square centimeter. 0 - 1.999 milliwatts per square centimeter.
SWITCHES:	On/Off momentary rocker. Range, 2-position rocker - $\mu W/cm^2$ and mW/cm^2.
POWER SOURCE:	9-Volt DC by Replaceable Alkaline battery.
BATTERY TYPE:	Alkaline 9v, EN-22 or similar.
BATTERY LIFE:	More than 200 hours of operation.
BATTERY-SAVER:	Meter automatically switched off after 30 minutes if not renewed by pushing the 'ON' button.
LOW BATTERY INDICATION:	A steady or flashing display (-1.) display shows when the battery need to be replaced.
OPERATING TEMPERATURE:	5º to 40º C, 41ºF to 104º F.
STORAGE TEMPERATURE:	-30º to + 57º C, -20º to 135º F.
OPERATING HUMIDITY:	5% to 90%
SIZE:	5-3/8" long x 3-½" wide x 1-¼" high.
HOUSING:	High impact plastic, with stainless steel faceplate.
WEIGHT:	8.5 ounces, including battery.
CARRYING CASE:	Blow Molded, foam lined, Black 8-½" x 7" x 2 ½"
Weight:	12oz.

MAINTENANCE

The **Zenith™** Ultraviolet Meter is designed to operate with a minimal amount of maintenance.

- Keep LCD display and Sensor Window clean, using alcohol or other non-abrasive window cleaner and soft tissues.
- Remove the battery if the meter is not going to be used over an extended period of time.
- Do not subject the Zenith™ to extremes of temperature, humidity and shock/ vibration.
- The Zenith™ Ultraviolet Meter contains no user serviceable parts, and we do not recommend that the user attempt to make any repairs.

Battery Replacement

LOW BATTERY INDICATION: A steady or flashing (-1.) in the display indicates when the battery needs to be replaced.

- The battery compartment is located on the back of the Zenith™ Ultraviolet Meter. To replace the battery:
- Remove battery compartment cover by pressing firmly on the marked window of the compartment door and slide down, toward bottom of meter.
- Lift out old 9v battery.
- Install new 9v battery; use only high quality alkaline battery. Note polarity markings on inside of compartment and install battery accordingly. Attempting to install battery reversed may damage the meter enclosure and/or printed circuit board.
- Slide cover back onto enclosure and snap into place.

WARRANTY

We warrant that this product will be free from defects in material and workmanship for a period of one year from the date of shipment thereof or the product's total rated life, whichever first occurs. Within the warranty period we shall repair or replace such products, which are returned to us with shipping charges prepaid, and which are determined by us to be defective. This warranty will not apply to any product, which has been subjected to misuse, negligence, or accident; or misapplied; or modified; or repaired by unauthorized persons; or improperly installed.

The Buyer shall inspect the product promptly after receipt and shall notify us at our main office in writing of claims, including claims of breach of warranty, within thirty (30) days after the Buyer discovers or should have discovered the facts upon which the claim is based. Failure of the Buyer to give written notice of a claim within the time period shall be deemed to be a waiver of such claim.

The provisions of the above warranty are our sole obligation and exclude all other remedies or warranties, expressed or implied, including warranties of merchantability and fitness for a particular purpose, whether or not purposes or specifications are described herein. We further disclaim any responsibility whatsoever to the customer, or to any person, for injury to person, damage to, or loss of property or value caused by any product which has been subjected to misuse, negligence, accident; or modified or repaired by unauthorized persons; or improperly installed Under no circumstances shall the Company be liable for any incidental, consequential or special damages, losses or expenses arising from the contract for this product, or in connection with the use of, or inability to use, our product for any other purpose whatsoever.