



## Technical Bulletin: ACCESSORY INFORMATION

# NU-959-200/400 Portable Ultraviolet Light Operation and Installation Instructions

### Specifications

**\*Power:** 115 or 230 VAC, 1.0 AMP, 50/60Hz

**Operating Temp:** 10°C to 40°C

#### **Size:**

##### NU-959-200:

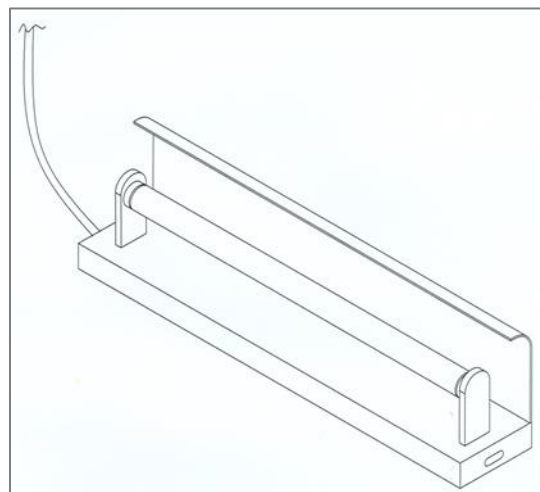
- 4-5/8"(W) x 5-1/2"(H) x 19"(L)
- 118mm(W) x 140mm(H) x 483mm(L)

##### NU-959-400

- 4-5/8"(W) x 5-1/2"(H) x 37"(L)
- 118mm(W) x 140mm(H) x 940mm(L)

**Power Cord Length:** 90" (2286mm)

**Lamp Housing Material:** Stainless Steel



\*Add Suffix "E" for 230 VAC Operation (i.e. NU-959-200E)

### General Description

The germicidal ultraviolet is primarily intended for the destruction of bacteria and other microorganisms in the air or on directly exposed surfaces. Approximately 95% of the ultraviolet radiations from germicidal tubes are in the 253.7 nanometer region. This is a region in the ultraviolet spectrum which is near the peak of germicidal effectiveness. The exposure necessary to kill bacteria is the product of time and intensity. High intensities for a short period of time, or low intensities for a longer period are fundamentally equal in lethal dosage on bacteria (disregarding the life cycle of bacteria). The intensity of light falling on a given area is governed by the inverse law; that is the killing intensity decreases as the distance increases from the tube.

**The germicidal tube is placed in the cabinet to provide an average intensity of 100 microwatts per centimeter (for a new tube) falling on a horizontal plane defined by the bottom of the work surface. The minimum requirement per paragraph 5.12 of NSF Standard 49 is 40 microwatts per square centimeter (ref. NSF Std. 49 June, 1976).**

Since ultraviolet rays will not penetrate ordinary glass, it is recommended that the sliding window be closed while the ultraviolet light is on within the cabinet; or that personnel leave the cabinet face area.

### **Additional instructions for 115v models only:**

The 115v model has an electronic countdown timer switch to activate the UV light. There are four timer buttons and an OFF button. Each timer button has an adjacent green LED to indicate the current countdown time. The green button LED is ON when the load is OFF and is OFF when the load is ON.

### **OPERATION**

1. To turn the load ON, press one of the timer buttons. The green LED adjacent to that button will illuminate and the timer will begin to countdown for the selected timer period.
2. To select a different countdown time, press the button corresponding to the desired time. The LED adjacent to that button will illuminate and the timer will begin countdown from the new selection.
3. To turn the load OFF, press the OFF button or wait until the selected amount of time has passed. The LED adjacent to each button will extinguish as time passes to the next preset level.

### **Timer Override**

To override the Timer countdown, press and hold the top button for several seconds. The locator LED will turn amber to indicate the EXTENDED ON state. In this state, the timer will automatically turn OFF after 24 hours. To exit the EXTENDED ON state, press any of the timer buttons or the OFF switch.

### **Precaution**

The rays from germicidal tubes may cause a painful but temporary irritation of the eyes and reddening of the skin, if of sufficiently high intensity, or if exposure covers a prolonged period of time. For this reason, one should avoid direct eye and skin exposure to ultraviolet light. If exposure cannot be avoided, it is necessary for personnel to wear eye goggles or face shields, and long sleeve gowns with rubber gloves.

Since ultraviolet rays will not penetrate ordinary glass, it is recommended that the sliding window be closed while the ultraviolet light is on within the cabinet; or that personnel leave the cabinet face area.

### **Maintenance**

The output of an ultraviolet lamp deteriorates with burning age. The useful life of the lamp is approximately 3750 hours under specific test conditions. If the tube is turned on every day for 12 hours, the tube will last approximately one year.

It is recommended that either a time schedule be established or the tube's output be measured periodically and the tube replaced when its output falls below 40 microwatts per square centimeter or exceeds 3750 hours of operation. Lamps should be allowed to operate approximately 5 to 10 minutes (longer when the lamp is in low temperatures) to warm up sufficiently and wiped clean of dust or dirt before reading the output with a meter. Even minute amounts of dust will absorb ultraviolet energy. The lamp may be cleaned with a lint-free cloth dampened with alcohol or ammonia and water.

### **Replacement Lamps**

<u>Description</u>	<u>NuAire Part #</u>	<u>Phillips Part #</u>
NU-959-200(E)	X-999443-01	TUV 15W/G15T8
NU-959-400(E)	X-999442-01	TUV 30W/G30T8

## Energies Required to Destroy Some Microorganisms By Ultraviolet Radiations(e)

<b>Mold Spores</b>	<b>Microwatt seconds per cm/2</b>	<b>Protozoa</b>	<b>Microwatt seconds per cm/2</b>
Penicillium roqueforti	26,400	Paramecium	200,000(a)
Penicillium expansum	22,000		
Penicillium digitatum	88,000	<b><u>Nematode Eggs</u></b>	40,000(b)
Aspergillus glaucus	88,000		
Aspergillus flavus	99,000	<b><u>Algae</u></b>	22,000(c)
Aspergillus niger	330,000		
Rhizopus nigricans	220,000	<b><u>Virus</u></b>	
Mucor racemosus A	35,200	Bacteriophage (E. Coli)	6,600
Mucor racemosus B	35,200	Tobacco Mosaic	440,000
Oospora lactis	11,000	Influenza	3,400(d)
 <b><u>Yeasts</u></b>			
Saccharomyces	13,200		
ellipsoideus	17,600		
Saccharomyces cerevisiae	13,200		
Brewers' yeast	6,600		
Baker's yeast	8,800		
Common yeast cake	13,200		
 <b><u>Bacteria</u></b>			
Streptococcus lactis	8,800		
Strep. hemolyticus (alpha type)	5,500		
Staphylococcus aureus	6,600		
Staphylococcus albus	5,720		
Micrococcus sphaeroides	15,400		
Sarcina lutea	26,400		
Pseudomonas fluorescens	7,040		
Escherichia coli	7,040		
Proteus vulgaris	7,480		
Serratia marcescens	6,160		
Bacillus subtilis	11,000		
Bacillus subtilis spores	22,000		
Spirillum rubrum	6,160		

### **References:**

- (a) Luckiesh, Matthew (1946) Application of Germicidal, Ethyemal and Infrared Energy, D. Van Nostrand o., New York, New York, pp 253
- (b) Hollaender (1942) Aerobiology, A.A.A.S. (for 90% inactivation), pp 162
- (c) Ellis, C. and Wells, O.O. (1941) The Chemical Action of Ultraviolet Rays, Reinhold Publishing Corp., pp. 713-714
- (d) Hollaender, A., Oliphant, J.W. (1944) The inactivation effect of monochromatic ultraviolet. Radiation on Influenza Virus (for 90% inactivation) Jour. of Bact. 48, pp. 447-454
- (e) This table, "Energies Required to Destroy Some Microorganisms by Ultraviolet Radiations" comes from Westinghouse brochure entitled - "Westinghouse Sterilamp Germicidal Ultraviolet Tubes"

## **Warranty**

NuAire, Inc. warrants that it will repair F.O.B its factory or furnish without charge F.O.B. its factory, a similar part to replace any material in its equipment within 12 months after the date of sale if proved to the satisfaction of the company to have been defective at the time it was sold provided that all parts claimed defective shall be returned, properly identified to the company at its factory, charged prepaid. Factory installed equipment or accessories are warranted only to the extent guaranteed by the original manufacturer and this warranty shall not apply to any portion of the equipment modified by the user. Claims under this warranty should be directed to NuAire, Inc. setting forth in detail the nature of the defect, the date of the initial installation and the serial and model number of the equipment.

This warranty shall not apply to any NuAire product or part thereof which has been subject to misuse, abuse, accident, shipping damage, improper installation or service or damage by fire, flood, or acts of God. If the serial number of the product is altered, removed or defaced as to be illegible, the warranty shall be null and void in its entirety.

The warranty is for the sole benefit of the original purchaser and is not assignable or transferable.

## **Shipments**

NuAire takes every reasonable precaution to insure that your incubator arrives without damage. Motor carriers are carefully selected and shipping cartons have been specially designed to insure your purchase. However, damage can occur in any shipment and the following outlines the steps you should take on receipt of a NuAire incubator to be sure that if damage has occurred, the proper claims and actions are taken immediately.

## **Damaged Shipments**

Terms are factory, unless stated otherwise. Therefore it is important to check each shipment before acceptance.

If there is visible damage, the material can be accepted after the driver makes a notation on the consignee's copy of the freight bill. Then an inspection must be made to verify the claim against the carrier. This inspection is the basis of your filing the claim against the carrier.

If concealed damage is found, it is absolutely necessary to NOTIFY THE FREIGHT AGENT AT ONCE, and request an inspection. Without this inspection, the transportation company may not accept a claim for loss or damage. If the carrier will not perform the inspection, an affidavit must be prepared stating that he was contacted on a certain date and that he failed to comply with the request. This, along with other papers in the customer's possession, will support the claim.