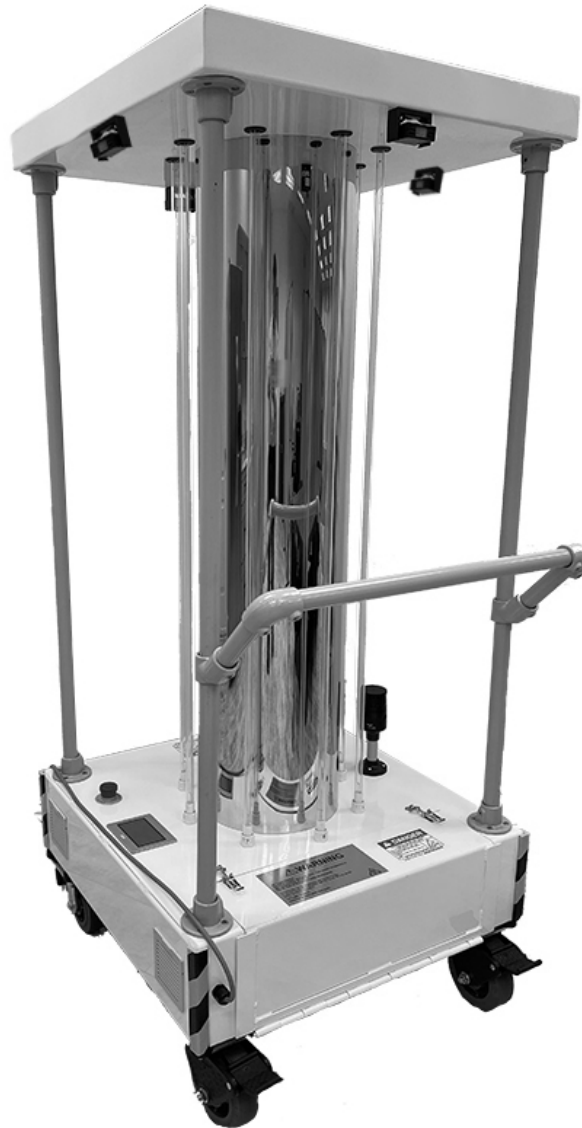


# UVC-PKCART-ULTRA SURFACE DISINFECTION UNIT

## QUICK START GUIDE



**Models:**  
UVC-PKCART-ULTRA

# ERICSON MANUFACTURING COMPANY

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Seller agrees to repair or exchange the goods sold hereunder necessitated by reason of defective workmanship and material discovered and reported to Seller within one year after shipment of such goods to Buyer.

Except where the nature of the defect is such that it is appropriate, in Seller's judgment, to effect repairs on site, Seller's obligation hereunder to remedy defects shall be limited to repairing or replacing (at Seller's option) FOB point of original shipment by Seller, any part returned to Seller at the risk and cost of Buyer. Defective parts replaced by Seller shall become the property of Seller.

Seller shall only be obligated to make such repair or replacement if the goods have been used by Buyer only in service recommended by Seller and altered only as authorized by Seller. Seller is not responsible for defects which arise from improper installation, neglect, or improper use or from normal wear and tear.

Additionally, Seller's obligation shall be limited by the manufacturer's warranty (and is not further warranted by Seller) for all parts procured from others according to published data, specifications or performance information not designed by or for Seller.

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There is no guarantee or warranty as to anything made or sold by Seller, or any services performed, except as to title and freedom from encumbrances and, except as herein expressly stated and particularly, and without limiting the foregoing, there is no guarantee or warranty, express or implied, of merchantability or of fitness for any particular purpose or against claim of infringement or the like.

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Seller's liability on any claim, whether in contract, tort (including negligence), or otherwise, for any loss or damage arising out of, connected with, or resulting from the manufacture, sale, delivery, resale, repair, replacement or use of any products or services shall in no case exceed the price paid for the product or services or any part thereof which give rise to the claim. In no event shall Seller be liable for consequential, special, incidental or other damages, nor shall Seller be liable in respect of personal injury or damage to property not the subject matter hereof unless attributable to gross misconduct of Seller, which shall mean an act or omission by Seller demonstrating reckless disregard of the foreseeable consequences thereof.

Seller is not responsible for incorrect choice of models or where products are used in excess of their rated and recommended capacities and design functions or under abnormal conditions. Seller assumes no liability for loss of time, damage or injuries to property or persons resulting from the use of Seller's products. Buyer shall hold Seller harmless from all liability, claims, suits and expenses in connection with loss or damage resulting from operation of products or utilization of services, respectively, of Seller and shall defend any suit or action which might arise there from in Buyer's name - provided that Seller shall have the right to elect to defend any such suit or action for the account of Buyer. The foregoing shall be the exclusive remedies of the Buyer and all persons and entities claiming through the Buyer.

# INDEX

Advisories (Purpose/Contents)	Page 4
Safe Operation Procedure	Page 5
Safety Guidelines	Page 5
System Description	Page 6
System Delivery	Page 7
Operation Overview	Page 7
Operation Settings (Default)	Page 8
Operation Settings (Customizable)	Page 8
Cycle Stop Status Screens	Page 9
System Care	Page 10
FAQ	Pages 11-12
Appendix A - Dosage Guidelines	Page 14

# ADVISORIES

## Purpose

The Ericson UV-C Perma-Kleen Cart (PK-CART) system has been designed to offer direct disinfection exposure to surface areas. The system design allows for microbial disinfection control.

The Ericson UV-C Perma-Kleen Cart (PK-CART) system was developed as a cleaning device utilizing Ultraviolet Light (UV) for direct exposure disinfection. The system can disinfect 360 degrees from the system center.

## Contents

This manual will serve as your reference guide for installation, operation, and service of your UV-C Perma-Kleen Cart (PK-CART). Reference to all parts, warranty, and support are included.

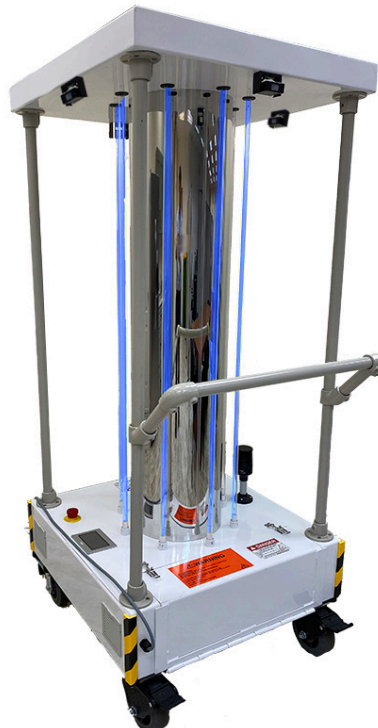
This manual covers the system/equipment/products listed below:

- Ericson Part #: UVC-PK-CART-ULTRA

### **Safety Observation:**

It is required for the person(s) responsible for the installation of this equipment, operators of this equipment, and operation personnel managers to review and understand this manual.

**USE OF LISTED SYSTEM / EQUIPMENT MUST COMPLY WITH INSTRUCTIONS AND SAFETY REQUIREMENTS.**



# PK-CART SAFE OPERATION

## Safety

1. You should never look directly at a UV lamp in operation without wearing approved safety glasses. Safety glasses should be made of any material other than Quartz or Teflon.
2. The space should be vacant and closed prior to PKCART operation
3. **Never command the system on when the treatment space is occupied**

## Disposal of Mercury Added Lamps

Germicidal ultraviolet lamps, like standard fluorescent lamps contain small amounts of mercury. Mercury added lamps should not be placed in the trash. Dispose of properly. For further information regarding the disposal and recycling of lamps containing mercury, along with Federal and State requirements visit [LampRecycle.org](http://LampRecycle.org).

## Safety Guidelines

Long term exposure to ultraviolet light is dangerous. UV-C can produce eye injuries and skin irritation similar to a sun burn over prolonged exposure. These effects are considered transient. UV-C may also be carcinogenic but since it has very limited penetrating ability it is unlikely to cause damage to anything besides the outer layer of skin or other exposed surfaces.

The Ericson PK-CART is designed for zero user exposure to UV-C; however, we will review safety factors regarding UV-C for better knowledge and understanding.

## Protective Clothing and Eyewear

It is not recommended that any personnel be subject to direct UV-C exposure. In the event such exposure is probable, personnel should wear PPE providing full coverage of exposed skin and appropriate eye protection.

UV-C safety glasses designed to filter UV-C and those of the wrap-around type are recommended. Safety glasses should be made of any material other than Quartz or Teflon.

## OSHA Guidelines for Ultraviolet Exposure

OSHA provides technical guidance regarding protecting employees from ultraviolet light with respect to laser hazards only.

OSHA has two standards that cover employee exposure to radiation: Nonionizing Radiation (29 CFR 1910.97) and Ionizing Radiation (29 CFR 1910.1096). You may access a copy of the OSHA radiation standards from their website at <http://www.osha.gov>.

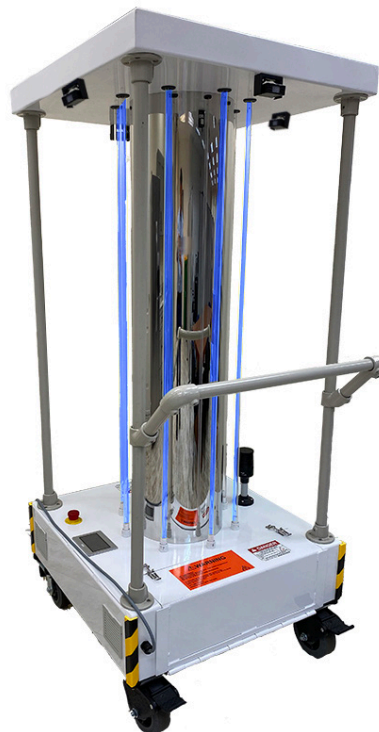
The non-ionizing radiation standard only covers the radio frequency region, including microwaves. The ionizing radiation standard covers alpha, beta, gamma, and X-rays; neutrons; high-speed electrons and protons; and other atomic particles; but does not include sound or radio waves, or visible, infrared, or ultraviolet light. Therefore, there are no OSHA-mandated employee exposure limits to ultraviolet radiation.

## SYSTEM DESCRIPTION

The Ericson PK-CART is designed for maximum disinfection through the shortest exposure time. More UV-C wattage allows shorter exposure times to surfaces. Exposure times vary based on furthest distance from the UV-C source. The system design provides the optimum in:

- UV dosage output to footprint served
- Rugged design build
- Ease of use controls
- User safety protection

- INDUSTRIAL STRENGTH FRAME AND STRUCTURE
- CORROSION PROOF CONSTRUCTION
- 6" INDUSTRIAL CASTERS
- HIGH OUTPUT PRE-HEAT LAMPS FOR LONG RUN TIME LENGTH
- PIR SENSOR DETECTION SAFETY SHUTOFF
- INDIVIDUAL LAMP FAILURE INDICATOR LED'S
- EMERGENCY STOP BUTTON
- BUILT TO IP56 WATER AND DUST STANDARDS
- SELECTABLE TARGET PATHOGEN



# SYSTEM DELIVERY / OPERATION OVERVIEW

When you receive your PK-CART you will need to unpack and inspect the system.  
Please perform the following procedure:

1. Unpack your new system and stand upright
2. Inspect fully for damage  
(If damage present, contact Ericson prior to use at 1-(800)ERICSON)
3. Verify secure lamp installation
4. Plug in system power cord
5. **Do not activate unit without reading and adhering to instructions below.**

The PK-CART is designed to operate in the following manner:

## Start Sequence

1. Position unit in unoccupied space, centralized for operation
2. Ensure you are wearing recommended safety equipment.
3. Plug system into power supply
4. Press “Bacteria” or “Spores” Operation Mode
5. Initiate system cycle
6. Evacuate space

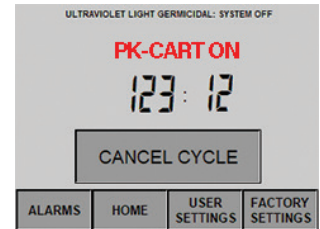
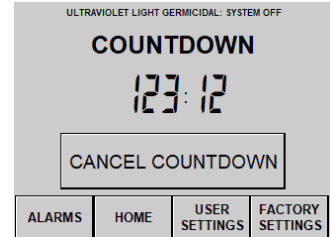
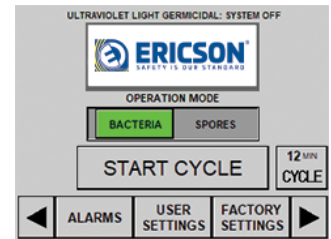
## Audio and Visual Indicators

1. There is no audible alarm for countdown or run cycle on the PK-CART ULTRA as not to interfere with medical facility monitoring equipment alert systems
2. Visual Indicator
  - a. Countdown Timer display present during countdown cycle
  - b. Flashing “System On” during run cycle
  - c. Home Screen displayed upon completion of cycle
3. Display of System
  - a. Operations
  - b. Controls
  - c. Indication of System Functions

# OPERATION SETTINGS

Normal operation for factory default settings are covered on this page.

1. **Review system for condition.**
  - a. There should be no physical damage to the system
  - b. Lamps should be clean
  - c. System frame should be in good condition
  - d. Display of system should be clean
2. **Plug in system power cord**
3. **Ensure all personnel are out of treatment area**
4. **Operate system**
  - a. Select “Start Cycle” to initiate treatment cycle
  - b. The system will enter Countdown mode for the selected dose time for the space.
  - c. Once process is complete, panel will revert to Home screen



# CUSTOMIZABLE OPERATION SETTINGS

Customizing settings for normal operation are covered on this page.

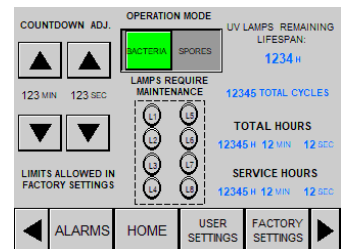
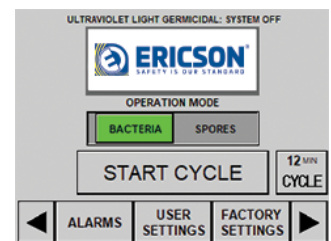
## Target Pathogen Selection Options

1. From Start Cycle home screen, user may select either “Bacteria” or “Spores” Operation Mode (System default is Bacteria Mode)
2. Selection may also be made by selecting “User Settings” and choosing Operation Mode

## Countdown Timer Customizing

1. From Start Cycle home screen, press “User Settings”
2. The User Settings screen is displayed with Countdown Timer Adjustment arrows available to increase or decrease countdown cycle time
 

\*Countdown Timer– control for time delay from when Start Cycle button is pressed to when system lamps come on
3. After adjusting to preferred settings, press HOME button to return to Start Cycle screen
4. Press START CYCLE button to begin customized treatment cycle
5. Leave the area.





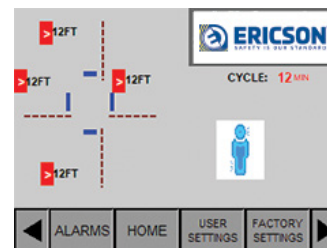
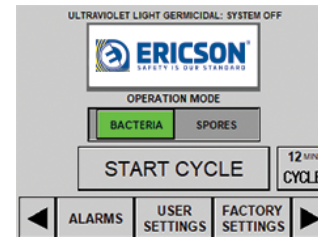
# OPERATION SETTINGS

## Room Sensing Feature

The PK-CART ULTRA is equipped with Room Sensing Technology in which the device will calculate the distance between walls and calculate the required machine run-time depending on Operation Mode (Bacteria or Spores) selected.

1. From Home Screen, press Right Arrow at bottom right of screen.
2. Room Sensing Screen will appear with distance shown between each measuring laser and wall. This screen is for observation only.
  - a. Each laser will measure up to a 16' radius for a total of 32' forward and backward and 32' side to side
  - b. The machine will always calculate run-time based on the longest measured point ensuring a sufficient treatment dose
  - c. If any distance measure is greater than 16', the machine will automatically run 30-minute cycle on Bacteria setting and 60-minute cycle on Spores setting.

3. Cycle time is displayed on Room Sensing screen and can be observed automatically adjusting with movement of the machine and selection of target Operation mode
4. Press "Home" button to return to Start Cycle screen for initiating treatment



# CYCLE STOP NOTIFICATIONS

Cycle stop displays for normal system operation are covered on this page.

## Emergency Stop

Should cycle deactivation occur by engagement of the Emergency Stop button, the following method will be required to reset the system:

1. Observe Emergency Stop Active status on control screen
2. Release Emergency Stop by pulling up on the red knob
3. Select HOME button to return to main screen
4. Press START CYCLE to restart normal operation of system
5. Leave the area.

## PIR Sensor Cycle Interruption

Should cycle interruption occur by means of a PIR sensor activation, the following will be required:

1. Observe the interruption status type on the control panel
2. Ensure no one is in treatment area
3. Select HOME button to return to main screen
4. Press START CYCLE to restart normal safe operation of system
5. Leave the area.

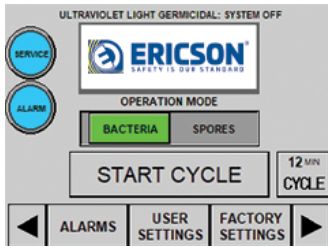


# ALERTS

## Alerts

A Service or Alarm indicator may be illuminated on the Home screen. Should this occur, the following steps should be taken to address the alert:

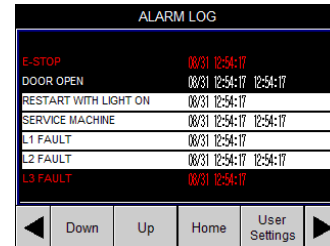
1. Observe the alert type on the control panel
2. Ensure all system alerts have been properly addressed
3. Select HOME button to return to main screen
4. Press START CYCLE to restart normal system operation
5. Leave the area.



## Alarm Indicators

In the “Alarm” indicator is illuminated on the Home screen:

1. Press “Alarm” indicator to observe the Alarm Log
2. Ensure all system alerts have been properly addressed
3. Select HOME button to resume normal system operation
4. Should Alarm persist, contact Ericson customer service 1.800.ERICSON.



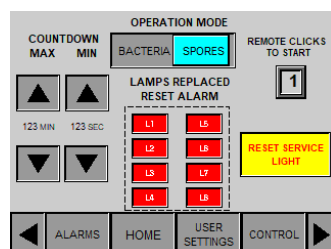
## Service Indicators

The “Service” alert will illuminate every 8 run hours as a “clean lamps” notification or when lamps need replacement. The User Setting screen will differentiate need to perform:

1. Lamp Cleaning
  - a. Press “Service” button on home screen
  - b. Lamp Clean indicators will be illuminated in Yellow
  - c. Wipe lamps with isopropyl alcohol and clean cloth
  - d. Press “Factory Settings” on bottom right of screen
  - e. Enter Passcode (1470) and press Enter
  - f. Press “Reset Service Light” button to clear alert
  - g. Press “Home” to return to Start Cycle screen

Lamps are designed for 12,000 run hours after which point, they will only provide 80% of original UVC dosage output and will continue to degrade. The device will alert for lamp replacement at 8,000 run hours. It is recommended that lamps be replaced at this time for optimal dosage output.

2. Replace Lamp(s)
  - a. Press “Service” button on Home screen
  - b. Lamp Replacement indicators will be illuminated in Red
  - c. Replace lamps as indicated
  - d. Press “Factory Settings” button
  - e. Enter Passcode (1470) and press enter
  - f. Press “Reset Service Light” to clear alert
  - g. Press “Home” to return to Start Cycle screen



# SYSTEM CARE

The Ericson PK-CART system is designed for repeat performance with consistent results. Based on system designs, minimal maintenance is required. Adherence to the following regular service of your system should provide years of disinfection.

## Each Duty Cycle

1. Inspect the system interior, exterior, and lamps for clean conditions
2. Clean as needed

## Monthly

1. Inspect the system interior, exterior, and lamps for clean conditions
2. Clean as needed
3. It is recommended to test system performance with Dosimeter Cards or ATP Meter.

## Bi-Annual

1. Inspect the system interior and exterior lamp for clean conditions
2. Clean as needed
3. It is recommended to test system performance with Dosimeter Cards or ATP Meter.

## “Service Machine” Message

1. Every 8 running hours it is recommended that lamps be wiped down with isopropyl or rubbing alcohol. This will remove any debris that may have accumulated on the lamp. Once cleaned, you can reset this message by pressing USER SETTINGS button followed by RESET SERVICE LIGHT

**Note:** The above steps are listed as the basic level of care, should the system be utilized in a heavy work environment, further care may be required.

## FREQUENTLY ASKED QUESTIONS

**Q: What should I do if the unit will not turn on?**

A: Verify there is power to the system

A: Verify the display is reads correctly

A: Verify the Emergency Stop is not engaged

**Q: Why does the unit turn off when I enter the room?**

A: Safety features turn off lamps based on detection by the PIR sensor.

**Q: My system will turn on, but the lamps will not come on.**

A: Verify the start cycle button is pressed

A: Inspect the lamp for age or physical failure

A: Contact Ericson Support for further information

**Q: My system is running fine, how do I verify the lamp output is correct?**

A: The system has a status screen at the end of the cycle

A: Use dosimeter cards in the space to verify UVC dosage.

**Q: The touchscreen has presented a flashing “Service Machine” icon. What does this mean?**

A: Every 8 running hours it is recommended that lamps be wiped down with isopropyl or rubbing alcohol. This will remove any debris that may have accumulated on the lamp. Once cleaned, you can reset this message by pressing USER SETTINGS button followed by RESET SERVICE LIGHT

**Q: What is a PIR (Passive Infrared) Sensor?**

A: PIR stands for Passive Infrared. These sensors are used extensively in occupancy sensors for lighting control and security products. The PIR sensor detects human heat and movement. In the case of the PK-Cart, when it detects both human heat and movement it will turn off the UVC Unit.

## TROUBLESHOOTING & FAQ

The below statements are listed as troubleshooting guidelines. Further information is available through Ericson support.

**Q: Is UV-C disinfection strictly line of sight?**

**A:** Yes, it needs to shine on the surface to disinfect. It will not go around objects or disinfect shadowed areas.

**Q: Does UV-C light reflect off surfaces?**

**A:** Yes, it reflects off many surfaces, but loses intensity dramatically if the surface is not highly polished like the Stainless-Steel center installed on our unit.

**Q: Is the UV-C light I can see under the door dangerous?**

**A:** Zero exposure to people is imperative so block it or protect your eyes and skin (please note: 254nm UV-C wavelength is invisible, what is seen is visible light)

**Q: Does UV-C light go through glass or windows?**

**A:** Standard window glass or poly carbonate provides sufficient protection from UVC rays.

**Q: Can I use an ATP Meter with the PK-CART?**

**A:** Yes. When used by properly trained personnel, it can be used to measure how clean a surface is.

**Q: Can I use a response card with the PK-CART?**

**A:** Yes, it can be used to indicate the correct dose has been applied to a surface

**Q: What is the difference between bacteria and sporicidal modes?**

**A:** Your PK-CART Ultra is equipped with two modes of operation, Bacterial and Sporicidal. It is important for the user to understand the difference between the two. For sporicidal mode, the time function is doubled. Spores are the more difficult microorganism to target due to the composition of the cell membrane. In order to be categorized as a spore a rigid protective layer on the cell membrane must exist. Most common bacteria and viruses do not have this protective layer or have a layer of less rigid protection like lipids and are much easier to deactivate using UV-C light. A common example of a sporicidal target is Clostridium difficile, or C. Diff.

<b>EASE OF KILL</b>	<b>DIFFICULT</b> ↑ <b>EASY</b>	Small non-enveloped	MS2,Cdiff, TB
		Large non-enveloped	Norovirus, MRSA, Candida
		Enveloped	HIV, Coronavirus Flu

# APPENDIX A: DOSE GUIDELINES

Ericson Model:			ULTRA & MAX		MAX LP		ECO	
UV-C Wattage:			320		240		175	
Time:			Time in Minutes		Time in Minutes		Time in Minutes	
Feet From Target	Room Dims	Room Square Footage (unit center of room)	*Time in Minutes to Kill Bacteria/ Viruses	Time in Minutes to Kill Spores	*Time in Minutes to Kill Bacteria/ Viruses	Time in Minutes to Kill Spores	*Time in Minutes to Kill Bacteria/ Viruses	Time in Minutes to Kill Spores
1			1	2	1	3	2	4
2			1	2	1	3	2	4
3			2	3	3	5	4	7
4	8 x 8	64	2	3	3	5	4	7
5	10 x 10	100	2	4	3	5	4	7
6	12 x 12	144	3	6	4	8	5	11
7	14 x 14	196	3	6	4	8	5	11
8	16 x 16	256	4	8	5	11	7	15
9	18 x 18	324	4	8	5	11	7	15
10	20 x 20	400	5	10	7	13	9	18
11	22 x 22	484	6	12	8	12	11	22
12	24 x 24	576	6	12	8	16	11	22

The above listed treatment times are based on widely acceptable inactivation dose levels of 50,000  $\mu\text{Ws}/\text{cm}^2$  (bactericidal) or 100,000  $\mu\text{Ws}/\text{cm}^2$  (sporicidal). It is offered as a reference point, in an empty space, using fresh lamps and does not account for objects physically blocking UV-C ray transmission.



Electrical Manufacturing

4323 Hamann Parkway  
 Willoughby, OH 44094  
 info@ericson.com  
 ericson.com  
 1.800.374.2766  
 C8021246A

