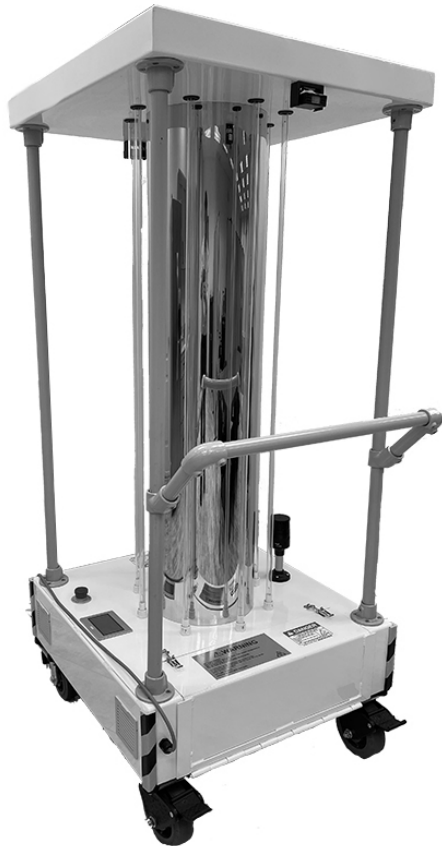


# UV-C MOBILE SURFACE DISINFECTION UNIT

## USER MANUAL



**Models:**

UVC-PKCART-ECO

UVC-PKCART-MAX-LP

UVC-PKCART-MAX

# ERICSON MANUFACTURING COMPANY

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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.

Seller further agrees to replace or at Seller's option to provide a refund of the sales price of any goods that do not conform to applicable specifications or which differ from that agreed to be supplied which non-conformity is discovered and forthwith reported to Seller within thirty (30) days after shipment to the Buyer. Seller's obligation to replace or refund the purchase price for non-conforming goods shall arise once Buyer returns such goods FOB point of original shipment by Seller at the risk and cost of Buyer. Goods replaced by Seller shall become the property of Seller.

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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.

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# ADVISORIES

## Purpose

The Ericson UV-C Perma-Kleen Cart (PKCART) 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 (PKCART) 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 (PKCART). Reference to all parts, warranty, and support are included.

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

- Ericson Part #: UVC-PKCART-ECO
- Ericson Part #: UVC-PKCART-MAX-LP
- Ericson Part #: UVC-PKCART-MAX

### 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.



# PKCART 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**

## PKCART Safe Operation

1. Always wear personal protective equipment (PPE) when operating PKCART to limit exposure to light
2. Place PKCART in area to be treated
3. Ensure the PIR Sensors (Passive Infrared) are positioned to the re-entry point. PIR sensors operations are explained in the FAQ section at the end of this manual.
4. Connect PKCART to 120vac plug receptacle
5. Press start on PKCART control and exit treatment area
6. Adhere to recommended safety precautions to avoid potential injury

## 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 PKCART 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 PKCART 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



# SYSTEM DELIVERY / OPERATION OVERVIEW

When you receive your PKCART 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 PKCART is designed to operate in the following manner:

## Start Sequence

1. **Position unit in unoccupied space, centralized for operation with Occupancy sensor pointed at point of entry**
2. **Plug system into power supply**
3. **Press on-screen logo to display “Start Cycle” state**
4. **Initiate system cycle**
5. **Evacuate space**

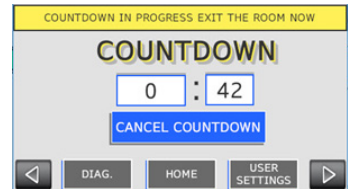
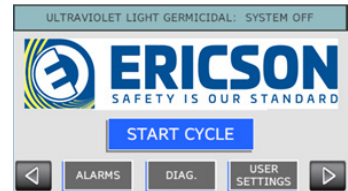
## Audio and Visual Indicators

1. **Audio Alarm**
  - a. **Once Started:** LONG warning beeps increasing in frequency
  - b. **During Process:** SHORT stroke beeps
  - c. **Process Complete:** Three short beeps (no beep thereafter)
2. **Visual Indicator**
  - a. **Red Light –** Warning, get out process running
  - b. **Green Light –** Safe/Process complete
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. Press Ericson logo for Home screen
  - b. Select Start Cycle to initiate treatment cycle
  - c. The system will enter Countdown mode
  - d. Once process is complete, panel will revert to Home screen



# CUSTOMIZABLE OPERATION SETTINGS

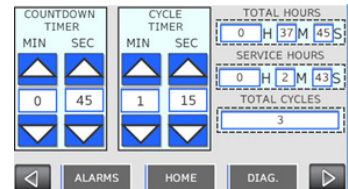
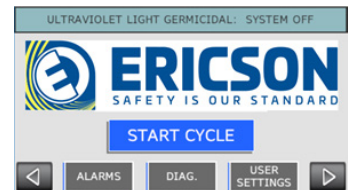
Customizing settings for normal operation are covered on this page.

1. From the START CYCLE home screen, press USER SETTINGS button
2. The COUNTDOWN TIMER / CYCLE TIMER screen is displayed and may be used to modify system variables as follows:
 

**Countdown Timer:** control for time delay from when Start Cycle button is pressed to when system lamps come on

**Cycle Timer:** control for duration of cycle operation.

**Note:** See page 10v or Appendix A: Dosage Guidelines to assist in Cycle Timer selection.
3. After adjusting to preferred settings, press HOME button to return to Start Cycle
4. Press START CYCLE button to begin customized treatment cycle





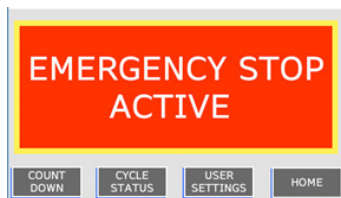
# CYCLE STOP NOTIFICATIONS

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:

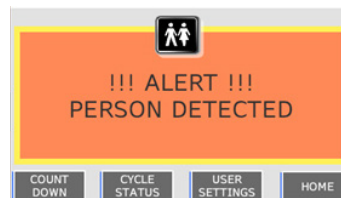
1. Observe Emergency Stop Active status on control screen
2. Release Emergency Stop by pulling up on the red knob
3. Select HOME button to return to main screen
4. Press START CYCLE to resume normal operation of system



## System Faults

Should cycle deactivation occur by means of a system fault, the following method will be required to reset the system:

1. Observe the fault status type on the control panel
2. Ensure all system faults have been properly addressed
3. Select HOME button to return to main screen
4. Press START CYCLE to resume normal operation of system



# DOSAGE GUIDELINES

Ericson Model:			<i>ULTRA &amp; MAX</i>		<i>MAX LP</i>		<i>ECO</i>		<i>Competitor</i>		
Watts:			320		240		175		25		
Time:			Time in Minutes		Time in Minutes		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		Time in Minutes to Kill Bacteria/Virus	Time in Minutes to Kill Spores
1			1	2	1	3	2	4		13	26
2			1	2	1	3	2	4		13	26
3			2	3	3	5	4	7		26	51
4	8 x 8	64	2	3	3	5	4	7		26	51
5	10 x 10	100	2	4	3	5	4	7		26	51
6	12 x 12	144	3	6	4	8	5	11		38	77
7	14 x 14	196	3	6	4	8	5	11		<b>38</b>	<b>77</b>
8	16 x 16	256	4	8	5	11	7	15		51	102
9	18 x 18	324	4	8	5	11	7	15		51	102
10	20 x 20	400	5	10	7	13	9	18		64	128
11	22 x 22	484	6	12	8	12	11	22		77	154
12	24 x 24	576	6	12	8	16	11	22		77	154

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.

# SYSTEM CARE

The Ericson PKCART 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 using an 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 using an 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.

## TROUBLESHOOTING & FAQ

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

A: Verify there is power to the system

A: Verify the display 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

A: Verify the Emergency Stop is not engaged

### **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: Faults will indicate if the system is not performing correctly

### **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: Passive InfraRed sensors (PIRs) are electronic devices which are used in some security alarm systems to detect motion of an infrared emitting source, usually a human body.

Radiation (energy) is invisible to the human eye but can be detected by electronic devices designed for such a purpose.

The term 'passive' in this instance means the PIR does not emit any energy of any type but merely sits 'passive' accepting infrared energy through the 'window' in its housing.

An intruder entering the protected area is detected when the infrared energy emitted from the intruder's body is focused by a Fresnel lens or a mirror segment and overlaps a section on the chip which had previously been looking at some much cooler part of the protected area.

That portion of the chip is now much warmer than when the intruder wasn't there.

As the intruder moves, so does the hot spot on the surface of the chip.

This moving hot spot causes the electronics connected to the chip to de-energize the relay, operating its contacts, thereby activating the detection input on the alarm control panel.

## 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 blocks almost 100% of UV-C light according to the IUVA. (Normal glass, as used in a window, is transparent to UV radiation to a wavelength of about 330 nm (UV-A). The transparency is quite high so almost all UV-A light will pass through glass. Below 330 nm (UV-B and UV-C), almost 100% is blocked by normal glass.

**Q: Can I use a response card with the PKCART?**

**A:** Yes, it can be used to indicate the correct dosage (intensity x time x distance) has been applied to a surface

# APPENDIX A: DOSAGE GUIDELINES

Ericson Model:			<i>ULTRA &amp; MAX</i>		<i>MAX LP</i>		<i>ECO</i>	
Watts:			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			3	6	4	8	5	11
2			3	6	4	8	5	11
3	6 x 6	36	4	8	5	11	7	15
4	8 x 8	64	6	11	8	16	11	22
5	10 x 10	100	11	22	15	29	20	40
6	12 x 12	144	16	33	21	43	29	59
7	14 x 14	196	18	35	24	48	33	66
8	16 x 16	256	20	40	27	53	37	73
9	18 x 18	324	20	40	27	53	37	73
10	20 x 20	400	20	40	27	53	37	73
11	22 x 22	484	30	60	40	80	55	110
12	24 x 24	576	30	60	40	80	55	110

\* The efficacy of your cleaning program and hygienic status of all surfaces throughout the facility can be quickly verified with an ATP Meter. A handheld meter gives results in 10 seconds.

