

# Ultra254™ Auto UVC Disinfector

## Model 950



## Operating Manual

Serial #

Date



### Table of Contents

---

Safety .....	2
Parts .....	5
Use and Operation .....	7
Battery and Charging .....	9
Maintenance .....	9
Specifications .....	11
Troubleshooting .....	12
Replacement Parts .....	13
Warranty and Service .....	13
Event Log .....	14

This document describes the product functions, use, maintenance, and service contact for model 950. Contact CoScientific LLC at [service@coscientific.com](mailto:service@coscientific.com) for questions that are not answered or unclear in these instructions. Information and recommendations are not a guarantee of performance, safety, results, or suitability to the user’s application by CoScientific LLC. Not for use on medical devices. For full terms and conditions related to this sale visit [coscientific.com/terms-and-conditions](http://coscientific.com/terms-and-conditions). Specifications are subject to change without notice.

# Safety

---

All users should be knowledgeable about the proper use and hazards of the tool by understanding the content of this document and their company's safety requirements before the use of the tool. Only adults should operate the tool. Follow all instructions in the manual, labels, and tags.

## Types of Hazards

### Warning



- Indicates a hazardous situation which, if not avoided, could result in death or serious injury

### Ultraviolet Radiation



- Avoid exposure to the lights when they are on unless protected by a solid object or car window glass (a few types of scientific specialty glass are transparent to UVC light)
- Lamps emit high power UV radiation that can cause cancer and/or severe injury to skin and eyes in less than a minute
- Use only in an enclosed vehicle that is locked from entry during the treatment time
- Lamps are in Risk Group 3 per ANSI/IESNARP-27.3-96
- If you can see the light without a protective barrier, you are being exposed; the closer the more dangerous

### Dangerous voltage



- The lamps operate between 50-120V AC
- Disconnect battery and turn the tool OFF before servicing
- Do not disassemble the control box for service
- Do not operate the tool when wet

### Lamp breakage notice



- Lamp contains mercury. Manage in Accord with Disposal Laws. See [www.lamprecycle.org](http://www.lamprecycle.org) or 1-800-555-0050
- A lamp breaking is unlikely to have any impact on your health
- If a lamp does break indoors, ventilate the room for 30 minutes
- Do not use a vacuum cleaner
- Remove the broken parts with latex or nitrile gloves
- Put them in a sealed plastic bag and take it to your local waste facilities for recycling

## UV Overexposure

Symptoms can be delayed several hours to a day and include sunburn and photokeratitis (also known as snow blindness or welder's flash).

- Skin irritation can vary in severity depending on the level of exposure, a person's genetics, and some medications. Chronic exposure to UV radiation has been linked to premature skin aging and skin cancer.
- UV radiation can damage the cornea, which is the outer protective coating of the eye. Photokeratitis is a painful inflammation with symptoms such as an itching feeling like sand is in your eye that can last for several days. Chronic exposures to short term UV radiation can lead to the formation of cataracts.

## Safety Labels and Tags

UV Radiation Warning - Control Box Warning Label (Part #1059; Description: Label, Control Safety)

- Located on the side of the control box
- Positioned to warn operators of the tool to be knowledgeable of the operation and hazards before use
- Notice to remove the battery before servicing lamps



Dangerous Voltage Warning – Dangerous Voltage Disconnect Label (Part #1074; Description: Label, Dangerous Voltage Disconnect)

- Located inside the control box
- Positioned to be visible if someone were to open the control box lid
- No user-serviceable parts are located inside the control box



UV Radiation Warning - External Vehicle Tag (Part #1058; Description: Tag, External Safety, 4x6)

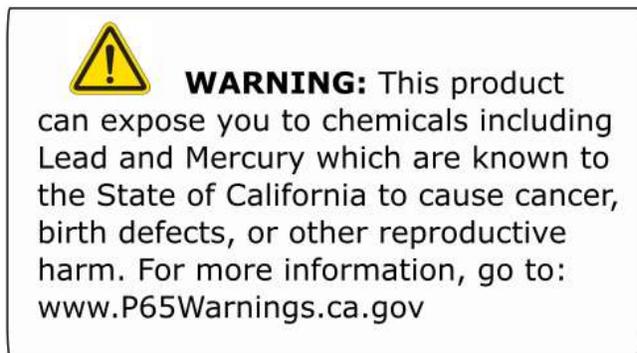
- Located on both ends of the orange straps
- Printed on both sides
- Positioned to warn people from entering the vehicle while the UV light is on
- Make sure this tag is visible during operation



Mercury Lamp Notice - Control box instructions label (Part#1060; Description: Label, Control Box Guide)



CA Prop 65 Warnings – Shipping box label



Contact CoScientific LLC to replace missing or damaged labels.

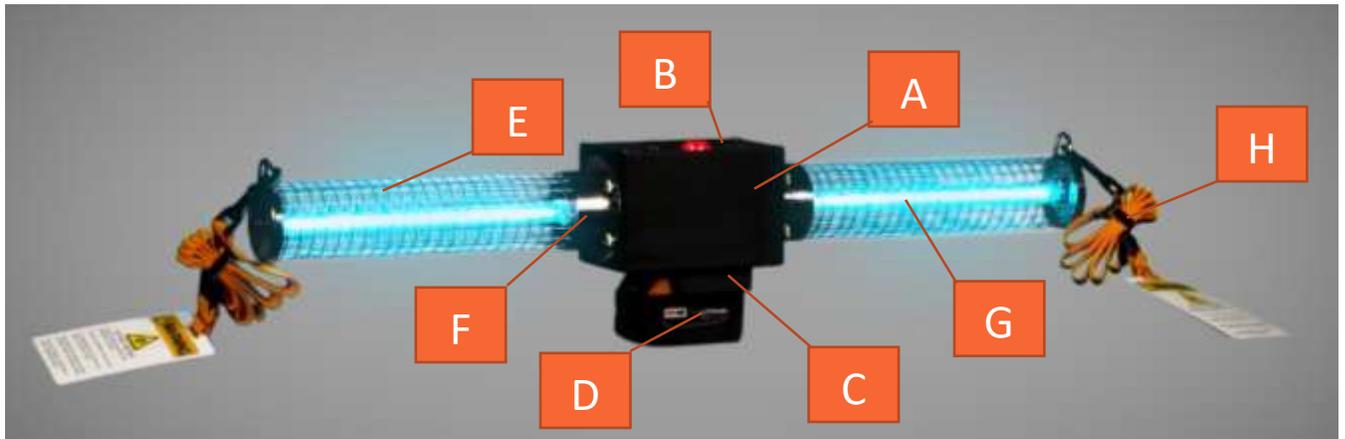
## Parts

---

Model 950 is a portable, battery-operated UVC light disinfecting tool that is designed for regular commercial use in unoccupied vehicles.

Parts of the tool are:

- A. Control box – Impact resistant, carbon fiber filler polymer that supports the two lamps and their covers
- B. Control panel – Top of the control box contains all the control functions
- C. Battery holder – Click to lock mating platform for Milwaukee® M18 or compatible battery
- D. Battery - Milwaukee® M18 or compatible battery, 3 A-hr or larger recommended
- E. Lamp covers – (2) Lamp covering made of stainless steel grid attached to impact-resistant, carbon fiber-filled polymer flange, and endcap
- F. Lamp sockets – (2) Locking 2G11 base sockets with red release button
- G. Lamps – (2) 24W germicidal UVC lamps
- H. Door straps – (2) Orange poly straps with clips and warning tag



Internal parts (not shown)

- Warning buzzer – Audible beep to warn the tool is on or within 10 seconds from turning on
- Drop sensor – Sensor to detect if there was a significant movement of the tool during the process when the lamps are on
- Fan – Cooling fan runs when the lamps are on or when the control box is above room temperature

1. On/Off toggle switch – Turn on for immediate use, turn off the tool when not in use
2. Start button – One press starts the treatment process
3. Stop button – Illuminated red stop button will stop the process at any point and will reset the system including any error codes
4. Status light – Multicolor LED to indicate the status of the tool. Red, Green, Blue



## Status Light Indications

	Ready
	1-minute delay period
	Final 10 seconds of delay
	Lamps on
	Process completed successfully
	Lamp current out of range
	Drop detected
	Temperature out of range
	Battery level low
	Process stopped due to low battery

# Use and Operation

---

The Model 950 is designed for air and surface disinfection of an unoccupied vehicle with closed windows and locked doors. Inactivation of a wide variety of microorganisms is accomplished with two germicidal lamps that emit a wavelength of light at 254 nm. The treatment time required to inactivate varies by type of organism, humidity, and temperature. The general relationship is more energy equals more of the microorganism population is inactivated. Energy is the light intensity multiplied by the illumination time. The model 950 is set to a time of 12 minutes to provide the energy dose recommended by the International Ultraviolet Association ([iuva.org](http://iuva.org)) of 40 mJ/cm<sup>2</sup>.

Limitations of germicidal light are shaded areas that are unlikely to be treated well enough and should be cleaned with another method such as wiping with an EPA List N which covers disinfectants for use against SARS-CoV-2 (COVID-19).

A good complementary approach to protect both the people cleaning the vehicle and the users would start with UVC disinfection first to reduce the bioactivity within the vehicle followed by hand cleaning of shaded and high touch areas such as the steering wheel and door handles.

## Use Example

A use example in a typical 4 door sedan (details depend on the vehicle's specifics)

1. Use the model 950 as directed across the front seat area
2. Use the model 950 as directed across the back-seat area (or at the same time if 2 tools are available)
3. Remove the tool(s)
4. Hand clean the high touch areas and areas that are shaded from the light such as
  - Steering wheel and controls (turn signals, lights)
  - Door handles
  - Gear selector
  - Handles outside of the car

## Operational Steps

1. Check the tool for damaged, dirty, or broken lamps – do not use a broken tool.
2. Attach battery
3. Remove trash and debris from the vehicle's interior
4. Close all of the vehicle's windows
5. Vehicle side 1
  - a. Place the tool on the seat closest to you
  - b. Pull out the strap and hang it over the center of the door frame as you close the door while holding the strap
  - c. Pull the strap with enough tension to lift the end of the tool slightly up towards your hands
  - d. Slide the cam lock (located near the warning label) up to the door frame and close the cam lock
6. Vehicle side 2
  - a. Turn the tool on

- b. Press the start button – There is a 1-minute delay before the tool turns the lamps on
  - c. Pull out the strap and hang it over the center of the door frame and close the door while holding the strap
  - d. Pull the strap with enough tension to lift the end of the tool so it is roughly centered between the seat and the roof
  - e. Slide the cam lock (located near the warning label) up to the door frame and close the cam lock
7. Return to side 1 and adjust to center the tool if necessary.
  8. Lock the doors.
  9. Wait for the lamps to shut off and either the green 'process complete' light or the red flashing error light to illuminate before entry
  10. Turn off the tool
  11. Fold up the orange straps and place them in the elastic band near the clip
  12. Remove the tool from the vehicle

## Helpful Information

- The tool does not have to be level – the purpose is to equally treat the vehicle's interior by roughly centering it in the cabin.
- Fanfolding the strap is usually the easiest method to put it back into the elastic band. Start by holding the strap with the elastic band in your hand.
- Placing and removing the tool with the straps unclipped may be better for your work efficiency and provide less chance of contaminating the tool.
- Keep the lamps clean by storing the tool in the provided box or covered in a clean area.
- The green light and fan will turn off after 30 minutes to conserve battery power.
- The fan will stay on until the control box temperature is below 81°F. It's ok to turn the power switch off before the fan turns off by itself, the tool will cool naturally.
- To run the process the vehicle must be above 36°F and below 113°F.
- Lamps emit a lower intensity of UVC at colder temperatures, so a sensor automatically detects the temperature and adjusts the treatment time as needed. The maximum time is 24 minutes at 36°F.

See the article *Basics of UV Disinfection to Reduce the Spread of COVID-19* at [coscientific.com](https://coscientific.com) for more information and references to scientific articles and helpful links.

## Battery and Charging

---

A Milwaukee® M18™ series rechargeable battery with a capacity of 5 A-hr is provided with the tool. It should be recharged with the provided charger or another compatible charger as needed. The battery has a built-in level indicator and should be at least at 1 bar out of 4 before starting a treatment process. The tool will automatically detect an error if the battery level is too low to start a process run. Charging a fully discharged battery will take about 1.5 hours.

Using M18™ compatible replacement batteries is acceptable. Lower or higher capacity batteries are also acceptable but will change the number of treatments before a recharge is needed. Extra-large capacity batteries will fit and operate the tool, but the extra weight may make it difficult to lift with the straps.

The battery needs to be slid into place until it clicks into the locked position. Press both red tabs to release before sliding the battery off the mount.



## Maintenance

---

**Caution: Remove the battery before all maintenance and service.**

### Lamp cleaning - small particulates

Use a canned air duster or compressed air nozzle with the lamp covers in place.

### Lamp cleaning – heavy particulates or visible debris

1. Remove a lamp cover by removing the 4 thumbscrews and by carefully sliding the cover off the end of the lamp
2. Wear latex or nitrile gloves to keep the lamps clean
3. Moisten a clean, lint-free cloth with isopropyl, ethyl, or denatured alcohol and wipe down the surface of the lamp(s)
4. Replace the lamp cover by sliding in over the lamp making sure the end of the lamp is captured by its holder in the end cap
5. Replace the 4 thumbscrews, finger tight

### Lamp lifetime

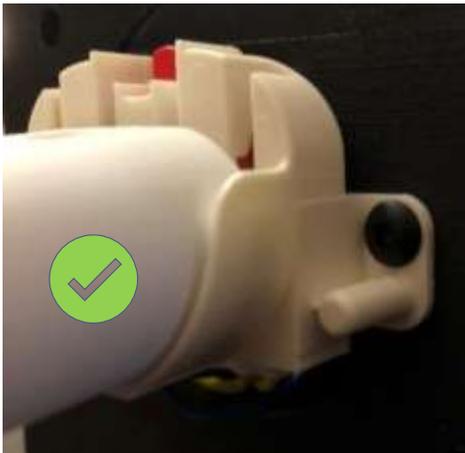
Lamps are rated for 8,000 hours of continuous use, but the manufacture's lifetime needs to be derated due to the high number of on/off cycles relative to run time. We recommend that the lamps be replaced after 6,000 hours of run time. As an example, one 8-hour shift of operation for a year is about 2,000 hours.

## Lamp breakage

See the instructions in the safety section above

## Lamp replacement

1. Remove a lamp cover by removing the 4 thumbscrews and by carefully sliding the cover off the end of the lamp
2. Wear latex or nitrile gloves
3. Fully depress the red button on the top of the lamp socket and lift the lamp away from the socket by holding its base connector
4. Hold the new lamp by the base connector with your thumb on the top of the connector and slide the four pins down the 4 slots until it is seated. When the lamp is seated correctly it will not pull out of the socket
5. Replace the lamp cover by sliding in over the lamp making sure the end of the lamp is captured by its holder in the end cap
6. Replace the 4 thumbscrews, finger tight
7. Put lamp(s) in a sealed plastic bag and take them to your local waste facilities for recycling
8. Lamp contains mercury. Manage in Accord with Disposal Laws. See [www.lamprecycle.org](http://www.lamprecycle.org) or call (800) 555-0050



## Specifications

---

Power source: Milwaukee® Tool M18™ removable battery

Charging: Charging cradle provided, 120 VAC

Battery capacity: 6 treatments

Weight: 6.4 lbs. [2.9 kg] with battery

Size: 4.3" W x 8.0" H x 34" L [11 cm x 20 cm x 86 cm]

Lamps: Two, 24-Watt, low-pressure Hg, ozone-free

Light intensity and wavelengths: 88% at 254 nm (UVC), 12% at 360-550 nm (Visible)

Treatment time: 12 minutes (time increases below 68°F to maintain dose)

Run time (min)	Temperature Band (°F)	Temperature Band (C)
12	68 - 113	20 - 45
16	46 - 67	8 - 19
20	42 - 45	6 - 7
24	36 - 41	2 - 5

Operating temperature range: 36 to 113°F (2 to 45C)

Storage temperature range: -40 to 120°F (-40 to 49C)

UVC irradiance: 0.06 mW/cm<sup>2</sup> at 30" [76 cm] (maximum effective range) for 12 min is a dose of 40 mJ/cm<sup>2</sup>

## Effect of UV on Vehicle Materials

Due to the absorption of energy, plastic and fabric materials will breakdown with prolonged exposure which shows up as yellowing, surface cracks, and ultimately mechanical failure. Most plastics that are designed for outdoor use, have UV coatings or inhibitors added to the material to prolong the life of materials. This was a much bigger problem in the past for car manufacturers, so UV inhibitors are now widely added to materials that are expected to receive sun exposure.

## Troubleshooting

Error Codes – Red flashing light with a repeating pattern of blinks and a delay

Number of red blinks	Reason	Action
1	Lamp current out of range	Check for a loose or broken lamp
2	Drop detected	Press stop to reset and start without motion after the delay
3	Temperature out of range	Low Temp – warm vehicle above 36°F High Temp – Allow tool and vehicle to cool below 113°F
4	Battery level low	Recharge battery
5	Process stopped due to low battery	Recharge battery

Problem	Possible Cause	Solution
Does not power on	Battery loose or needs charging	Remove the battery and check the level by pressing the button on the battery. The tool needs 1 or more bars to run the process. Make sure battery fully 'clicks' into place when attaching to mount
Fan won't shut off	Temperature is higher than 81°F	It's ok to turn the power switch off before the fan turns off. The tool will cool naturally.
Lamps are not operating	Loose or broken lamp	See the instructions in the maintenance section
Tool does not shut off after 25 minutes	Controller error	Wait for the battery to discharge or release the cam lock on the strap to let the tool drop to seat and shut-off. Contact service
No green light after process run	Green light goes off after 30 minutes to save power	No action

## Replacement Parts

---

Contact [sales@coscientific.com](mailto:sales@coscientific.com) for replacement parts

CoScientific Part #	CoScientific Description	Alt Manufacturer	Alt Part #
1020	Lamp, UVC, 24W, 2G11 Base	Osram Sylvania	Puritec HNS L 24 W 2G11
		Philips	TUV PL-L 24W/4P 1CT/25
		LSE	PL-L24W/TUV/2G11
1022	Battery, Milwaukee, M18, 5Ah	Milwaukee	M18 Redlithium XC5.0, 48-11-1850
		Others	M18 compatible
1023	Battery Charger, 120VAC	Milwaukee	M18 Charger 48-59-1812
		Others	M18 compatible
CAG-24	Lamp cage, SS, 24W, Black	None	
STA-5	Strap Assy, 5ft	None	
1053	Thumbscrews, Brass, 12-24	Other	Brass thumbscrew #12-24
1058	Tag, External Safety, 4x6	None	
1059	Label, Control Safety	None	
1060	Label, Control Box Guide	None	
1074	Label, Dangerous Voltage Disconnect	SafetySign.com	J5316-AF

## Warranty and Service

---

Warranty information is available at [coscientific.com/terms-and-conditions](http://coscientific.com/terms-and-conditions).

Contact [service@coscientific.com](mailto:service@coscientific.com) for warranty service or additional information.

A Return Merchandise Authorization (RMA) number will be needed before returns will be accepted.

CoScientific LLC

2440 N. Coyote Dr. #130

Tucson, AZ 85745

(252) 419-1520

[service@coscientific.com](mailto:service@coscientific.com)

GTIN/UPC 195893899708

EPA Est. No. 96844-AZ-1

**Save these instructions for reference and future users**

