FirstResponder® Sterilizer

Catalog #	Description/Content	Contents
E4110FRS	FirstResponder® Sterilizer, 110V	1 Sterilizer Device; 2 Scrub Filters; 1 Power Cord; 1 Spare Fuse; 1 Remote Control; Spare Battery for remote control
E4220FRS	FirstResponder® Sterilizer, 220V	

Related Products	Catalog #
FirstResponder® Mobile Gear Sterilizer	E600PCM
SteriZAP™ UV-C Room Sterilizer, 110V	E500UVCT
SteriZAP™ UV-C Desktop Sterilizer, 110V	E500UVCD
FirstResponder® Handheld UV-C Sterilizer, 110V	E500UVCH
FirstResponder® Duffle Bag Sterilizer, medium	E600DBM
FirstResponder® Duffle Bag Sterilizer, large with wheels	E600DBLW

Storage:	Keep unit stored in shipping container while not in use to protect filters and electronics from contamination and dust.

INTRODUCTION

The FirstResponder Sterilizer* is a unique and innovative sterilization system. This portable sterilizer generates high-levels of Triatomic Oxygen (TO) to clean and sterilize first responder vehicles. The unit will eliminate surface and airborne bacteria, mold, fungi, spores andviruses, and eliminate odors as well. The FirstResponder Sterilizer is designed to allow maximum placement flexibility and usage.

The TO produced by the FirstResponder Sterilizer readily gives up its single oxygen atom, which combines with other molecules and neutralizes them via a powerful and natural oxidative process. Best of all, the FirstResponder Sterilizer contains a scrubbing feature, which converts TO back to oxygen at the end of a sterilization cycle, hence removing TO gas from the environment rapidly and efficiently.

PRECAUTIONS AND WARNINGS

(a) **DEVICE IS NOT INTENDED FOR USE IN ANY OCCUPIED SPACES.** TO may cause respiratory irritation; make sure the FirstResponder device finishes its sterilization and scrub cycles in full.

(b) **Read all instructions before using the device, which must be used ONLY as intended and described in this manual**.

(c) **Do NOT operate the FirstResponder® Sterilizer without the scrub filters**.

(d) **DO NOT Immerse the FirstResponder® Sterilizer in water or operate at high humidity levels above 70%**.

(e) **Do not operate this appliance if it has a damaged cord or plug**, if it is not working properly, or if it has been damaged or dropped.

(f) Do not attempt to repair the unit unless you are a qualified repair technician.

SPECIFICATIONS	Cat#: E4110FRS	Cat#: E4220FRS
Electrical	120 VA, 60 Hz. AC	230 VA, 50 Hz. AC
Fuse	Type 239, 250V, 2 Amp	Type 239, 250V, 2 Amp
Dimensions (Width x Depth x Height)	20.62" x 16.87" x 8.12" (52.4 x 42.8 x 20.6 cm)	20.62" x 16.87" x 8.12" (52.4 x 42.8 x 20.6 cm)
Weight	35.0 lbs. (15.8 kg.)	35.0 lbs. (15.8 kg.)
Ozone Fan	220 CFM	220 CFM
Ozone Output	16,000 mg/hour (mgph)	16,000 mg/hour (mgph)
De-ozonation (scrub) Fans	4 @ 110 cfm (440 CFM total)	4 @ 110 cfm (440 CFM total)
Warranty	1 year parts and labor	1 year parts and labor

* ***Disclaimer***: *The FirstResponder Sterilizer is not a replacement or substitute for autoclaves, and should not be used to sterilize equipment for use directlyin medical or surgical applications of any kind. The FirstResponder sterilizing cycles can eliminate most surface contaminants, especially bacteria and fungus thatexist under normal use, however heavier concentrations of contaminants MUST be removed or wiped clean first before using the FirstResponder Sterilizer.* ***CAREFULLY READ AND FOLLOW ALL INSTRUCTIONS FOR OPERATION OF THE FIRSTRESPONDER STERILIZER. Avoid walking into any first responder vehicle or space while the FirstResponder Sterilizer is still running AND before it completes its full sterilization and scrub cycles.***
†AMSBIO makes no claims and offers no guarantees of any kind that the FirstResponder Sterilizer will eliminate 100% of all contaminants under all circumstances. Whenever and wherever possible, users should test an FirstResponder sterilized area for presence of trace contaminants if absolute cleanliness is desired or required.

**** Patents Pending. Registered under EPA Establishment Number 91845-CA-001***

OPERATION

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I. Positioning the Unit

The FirstResponder® Sterilizer is portable and ready to plug in and use directly out of the box. Its effectiveness depends on how the generated is dispersed through ambient air. We recommend that users place the unit as centrally as possible in the vehicle or room, or closest to known or suspected heavy contamination areas.

TRAINING VIDEO

The online training video for the Ozilla®EMS Sterilizer is identical in operation and usage as the FirstResponder Sterilizer. The video is available at https://youtu.be/DJ8VE8sndoc.

NOTE: Consult Table 1 on Page 5 for suggestions on FirstResponder sterilization times.

II. Preparing the Area to Be Sterilized

1. Clean area or cabinet that needs sterilization from heavy or excess contaminants using wipes or cleaning solutions like soap, ethanol, bleach, etc.
2. Seal room or vehicle and verify that there are no gaps or openings. An airtight space will prevent TO gas from escaping and will allow the buildup of TO molecules. If any spaces cannot be closed off, it is necessary to seal openings with plastic sheeting and/or tape.
3.
4. Use a copy of the "CAUTION" page in this manual (Page 7), or make your own note and prepare to affix on the outside of the first responder vehicle or room door indicating that a sterilization cycle is in progress. This is necessary to avoid disrupting a sterilization cycle and to eliminate accidental human exposure to high levels of TO.

III. Operating the Unit

Figure 1: Front panel of FirstResponder Sterilizer

General Notes

a. Different materials will react differently to TO. Consult Appendix A on page 4 for guidance.
b. For safety reasons, the unit will not operate if the lid is open.
c. The unit can be set to operate between 00:01 and 99:99 minutes for either of the TO or scrub cycles.
d. We recommend users keep a log of hours used; this will help with knowing when to replace the Scrub Filter (recommended after each 3,000 hours).

To set the run time for the **ozone cycle**:
For recommended sterilization times based on size of area, see Table 1 below.

a. Press the [OZONE TIME] button; the digital display will light up and read either "0000" or a previously set time.
b. Press [TIME SELECT] button; the left-most digit will blink;
c. Press [SET TIME] up or down arrow button repeatedly until desired time is selected.
d. Press [TIME SELECT] button to move to next digit, repeat Step c, then press [SET TIME] to move to the next digit.
e. Repeat Step d. one last time to set the last digit; the display now should read the ozone time with no blinking digits.

To set the run time for the **scrub cycle**:
For recommended scrubbing times based on size of area, see Table 1 below.

f. Press the [SCRUB TIME] button; the digital display will read either "0000" or a previously set time.
g. Press [TIME SELECT] button; the left-most digit will blink;
h. Press [SET TIME] up or down arrow button repeatedly until desired time is selected.
i. Press [TIME SELECT] button to move to next digit, repeat Step c, then press [SET TIME] to move to the next digit.
j. Repeat Step d. one last time to set the last digit; the display now should read the ozone time with no blinking digits.
k. If needed or desired, set a lab timer with the total sterilization and scrubbing cycle times as a reminder before you run the unit. Once the ozone and scrub cycles have been set, press the [RUN] button; the green light will turn on and you will hear the machine operate. Immediately seal the area that is being sterilized.
l. Upon sterilization and scrub cycles completion, the FirstResponder Sterilizer will automatically turn off and the digital display will be blank; users can enter the vehicle or room that is being sterilized. If needed, the FirstResponder Sterilizer can be run again with current or readjusted settings for further cleaning cycles.

Table 1: Recommended Sterilization and Scrubbing Times

Enclosure Type Examples	Subtype	Recommended Minimum Sterilization Time (hours)	Recommended Minimum Scrubbing Time**
Ambulance (initial sterilization)	EMS Types I, II, and III	4 hours	30 minutes
Ambulance (subsequent sterilizations)	EMS Types I, II, and III	1 hour	30 minutes
Police vehicle (initial sterilization)	Sedan (e.g. Ford Taurus)	30 minutes	10 minutes
Police vehicle (initial sterilization)	SUV (e.g. Ford Explorer)	45 minutes	10 minutes

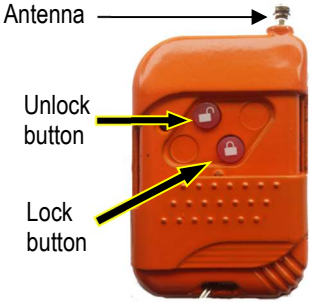
***NOTE**: Minimum Scrub Times recommended can be extended by running additional scrub cycles if needed or desired.*

Remote Control Operation

The FirstResponder® Remote Control allows users to switch the Sterilizer [RUN] cycle from "Ozone" to "Scrub". This allows users to prematurely terminate the sterilization cycle when needed and the unit will start to remove generated TO gas for the amount of time that has been programmed by the user.

To activate the Scrub cycle, pull remote control antenna out (see figure to the right), point the remote in the direction of the FirstResponder, preferably while having direct line of sight, then continuously press the unlock button for 3-5 seconds until the green [RUN] button on the unit starts to flash and the Scrub Cycle time appears on the display.

NOTE: The remote lock button does not have any function at this time and pressing it will result in no action.



FirstResponder Sterilizer Remote Control

IV. Post Sterilization Steps

During the sterilization process, TO gas will penetrate into hidden areas and crevices. Even after scrub cycles, some TO gas may remain trapped in certain areas, like in AC vents for example. To avoid exposure to residual TO gas, follow these steps:

a. Open all doors and windows to air out of the first responder vehicle before entering.
b. Set the first responder vehicle ventilation/AC fan(s) to maximum and run for 3-5 minutes to purge the trapped TO gas.
c. If in a room, open windows and let ambient air vent out gradually or use fans to circulate air more effectively.

TROUBLESHOOTING

Problem	Solution
Unit does not start when [OZONE TIME] or [SCRUB TIME] buttons are pressed.	• Check that power cord is attached on the back of the unit; • Check that the FirstResponder Sterilizer case is closed and latched tight. • Sometimes during shipping, the ozone ceramic plates may get dislodged. Check the plates and seat them properly by removing them and reinserting them back tightly in their respective slots.
Ozone smell is not as noticeable as usual, or there is no detectable ozone smell.	Clean the ceramic ozone plates as described in the MAINTENTANCE section. If plates are older than two years replace with new ones (Cat# E40016P).
Power does not come on.	Check fuse on the back side of the unit; and if blown, replace with type 239, 250V, 3 Amp fuse.

MAINTENANCE

WARNING: The FirstResponder® Sterilizer generates high voltage current inside the machine. **MAKE SURE TO UNPLUG UNIT** from power source before performing any parts cleaning or replacements.

(a) Scrub Filter Replacement: Replace the scrub filter according to the following guidelines:

	Time Used	Hours Used
Light Use	12 months	≤ 500 hours
Moderate use	9 months	≤ 1,000 hours
Heavy use	6 months	≤ 3,000 hours

To change the filters, unlatch and open the unit's lid. Locate and cut the zip tie that is holding the two filters down (towards front of lid opening). Insert new filters and replace with new zip tie (supplied). Close and latch lid tightly.

(b) Ozone Plates Cleaning: Clean the ozone plates at the beginning of each new season, or when you suspect that ozone production has decreased. To clean the ozone plates, open the unit lid and pull out the sixteen ozone generator plates. i) wash the plates in warm soapy water, then air dry or use a hair dryer; ii) clean the contact area of the flat stainless steel holders with a Q-tip moistened with alcohol and dry with tissue; iii) to avoid arcing or damaging the FirstResponder Sterilizer, make sure plates are completely dry before re-inserting into the unit.

(c) Ozone Plates Replacement: Replace every two years or so depending on usage, and especially when you notice a decrease in sterilization efficiency.

(d) General cleaning: wipe the unit exterior with a clean soft cloth tissue that's lightly moistened with water or mild cleaning solution. **DO NOT SPRAY the unit directly with any liquid cleaner or immerse in water or solution of any kind.**

FIRST AID: if users experience eye or breathing irritations, immediately take the following steps:

(i) Turn the sterilization cycle off by pressing [RUN] button;

(ii) Remove affected person from the area and administer first aid as necessary and described in the Material Safety Data Sheet;

(iii) Run a scrub cycle as indicated in this Owner's Manual, Section III "Operating the Unit" on Page 3; alternatively, turn the FirstResponder device off and air the affected area until the odor of ozone is no longer detectable or noticeable.

LIMITED LICENSE: ***The FirstResponder® Sterilizer is Patent Pending.*** The purchase price paid for the FirstResponder® Sterilizer grants end users a non-transferable, non-exclusive license to use the unit in a research laboratory setting, and for sterilizing purposes only as described in this manual. This use license excludes and without limitation, resale, repackaging, or modification of the unit in any way and without prior notification and approval.
Under no circumstances shall the FirstResponder Sterilizer be used on food or drink products intended for human or animal consumption. At all times, care and attention should be exercised in handling and using the FirstResponder Sterilizer by following the instructions in the manual, using common sense practices, wearing protective clothing and eyewear when appropriate. NEVER OPERATE THE FIRSTRESPONDER STERILIZER IN A ROOM OR AREA WHERE PEOPLE OR ANIMALS ARE PRESENT.
Purchasers may refuse this license by returning the FirstResponder Sterilizing unit unused and its original packaging. By keeping or using the FirstResponder device, users agree to be bound by the terms of this license. The laws of the State of California shall govern the interpretation and enforcement of the terms of this license

APPENDIX A

WARNING: Different materials respond differently to TO molecules, and some common first responder gear and triage materials may be damaged by exposure. To minimize material damage, carefully read and adhere to the following guidelines:

SE = Strong effect: Materials are most susceptible to triatomic oxygen (TO) degradation; these materials should be removed from areas to be sterilized.
MEH = Moderate Effect High: Materials are noticeably affected by TO and exposure should be limited to short periods of time only. Frequent exposure of these materials to TO will require they be discarded or replaced.
MEL = Moderate Effect Low: Materials are not affected by infrequent, brief exposure, but TO can deteriorate materials found under MEL. Prolonged exposure to high levels of TO will require they be discarded or replaced.
ZE = Zero Effect: materials are not affected by TO; sterilize as often as needed.
Unlisted Materials: if a laboratory material is not listed in the table below, err on the side of caution and remove these unlisted materials from areas to be sterilized with the FirstResponder Mobile Gear Sterilizer.

AMSBIO is not responsible for damage arising from failure to follow these guidelines.

Material	SE	MEH	MEL	ZE
Buna-N (nitrile) / Fiber reinforced plastic (FRP) / Magnesium…	X			
Natural Rubber / Nylon / Steel / Zinc.	X			
Acetal resin (Delrin™) / Cast Iron / Galvanized Steel…		X		
Chlorosulfonated polyethylene (CSPE) (Hypalon™)…		X		
Thermoplastic elastomer (Hytrel™) / Monel™ / Neoprene (Polychlorprene™)…		X		
Polyamide / Polypropylene / Glass filled polypropylene (GFPP).		X		
ABS Plastic / Acrylic / Aluminum / Brass / Bronze / Copper…			X	
Ethylene propylene diene monomer (EPDM) / Flexelene™ tubing…			X	
Low-density polyethylene (LDPE) / Poly(vinyl chloride) (PVC)…			X	
Polyacrylate / Polyethylene / Polysulfide / Tygon™.			X	
Butyl / Chlorinated polyvinyl chloride (CPVC) / Cross linked polyethelene (PEX)…				X
ehtylene propylene / Ethylene acrylic elastomer (Vamac™) /				X
Ethylene propylene rubber (EPR) / Fluorosilicone / Glass…				X
High-density polyethylene (HDPE) / Polycarbonate / PVDF…				X
Perfluoroelastomer (Kalrez™, Chemraz™, Viton™) / Silicone…				X
Polychlorotrifluoroethene(PCTFE) / Polyether ether ketone (PEEK)…				X
Polytetrafluoroethylene (PTFE) / Polyurethane / Stainless Steel…				X
Superalloys (Hastelloy™, Inconel) / Thermoplastic elastomer (TPE) / Titanium.				X

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CAUTION

Sterilization Cycle in progress

Do NOT open door until this sign is removed

For users with remote control, press the remote button to immediately cancel the Ozone cycle and shift the device into the Scrub cycle. Allow the FirstResponder device to fully run the Scrub cycle (the digital display will go blank) before entering space, or opening cabinet that is being sterilized.

Name:_____

Date:_____

Time Sterilization Cycle Started:_____

Expected Cycle Completion:_____

Photocopy this page of the manual and post on the door of an area or cabinet during every ozone sterilization cycle.