



**Rapid Heat Sterilizers with
6, 8, and 12 Minute Sterilization Cycle Times**

USER MANUAL

**MODELS: COX – 115V
 COX – 220V**



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RECOMMENDATIONS

Read the entire instruction manual *before* installation or operation of the COX Rapid Heat Transfer Sterilizer. It will help you to understand the operation of the system, how various sub assemblies work together and the operating sequence of the controls.

**WARNING: NEVER ATTEMPT TO PERFORM ANY ELECTRICAL TROUBLESHOOTING
ADJUSTMENT(S) OR SERVICE(S) UNLESS YOU ARE A QUALIFIED ELECTRICIAN,
ELECTRONICS TECHNICIAN OR FACTORY TRAINED SERVICE TECHNICIAN**

IMPORTANT SAFEGUARDS

When using your COX Rapid Heat Transfer Sterilizer, these basic safety precautions should be followed:

1. Read and understand all instructions.
2. Care must be taken to avoid burns from touching hot parts.
3. Do not operate this appliance with a damaged cord or if appliance has been dropped or damaged until it has been examined by a qualified service technician.
4. Do not let power cord hang over edge of table or counter or touch hot surfaces.
5. An extension cord should not be used with this unit. The unit should be plugged directly into a power outlet. Only use a properly grounded fuse/breaker protected outlet (110V, 60 cycles, or a 220/240V, 50 cycles). A separate circuit is recommended.
6. To protect against electrical shock hazard, do not immerse this appliance in water or other liquids.
7. To avoid electrical shock hazard, do not disassemble this appliance. Call a qualified service technician when service or repair work is required. Incorrect reassembly can cause electric shock hazard.
8. Do not lift unit by handle or door opening in front of unit. Hold securely by the bottom when lifting or moving unit.

SAVE THESE INSTRUCTIONS

COX STERILIZERS

The Cox Rapid Heat Transfer Sterilizer was invented by Keith Cox. The technology used in the Cox sterilizer represents significant advancement in dry heat sterilization. We are confident you will find it a valuable and cost saving addition to your practice. The Cox sterilizer* is intended for indoor use in hospitals and dental, orthodontic and health care facilities.

ACCESSORIES

The Cox sterilizer comes equipped with a removable instrument basket, an instrument rack for packaged instruments, a tool for changing baskets, and a cooling rack upon which to place the hot basket. Depending on the size of your practice, you may wish to purchase additional baskets.

OPTIONAL ACCESSORIES

Part No. CX0031: MESH BASKET (BURR HOLDER)

An optional mesh basket is available for sterilizing small/lightweight items.

Call CPAC at **(585) 382-3223** to place an order.

MATERIALS INTEGRITY

Tests have been conducted on various surgical and dental instruments as to compatibility with the 375 °F (190 °C) temperatures. Generally, medical and dental stainless and carbon steel hand instruments are safe in the Cox sterilizer. Caution should be used with plastic and rubber goods. When in doubt, consult the instrument manufacturer.

CAUTIONS

- During operation, the exterior surface of the sterilizer remains comfortable to the touch; however the interior of the drawer and the sterilized instruments will be hot. Use only the handle to carry the drawer. Caution should be taken when handling hot instruments.
- The sterilizer is designed for use with metal instruments. While many new plastics, Teflon and rubber products can be used in a high temperature environment, extreme care should be used in sterilizing these materials until compatibility has been confirmed.
- When sterilizing packaged instruments, use only dry heat packaging material suitable for 375 °F (190 °C) temperatures.
- Instruments that have been wiped with alcohol, or any combustible solution, **must** be allowed to dry before being placed in the sterilizer.
- **Use only dry heat wraps and pouches suitable for 375 °F (190 °C) temperatures.**

*The Cox Sterilizer is non-patient care equipment.

SAFETY NOTES CONCERNING TEMPERATURE

The temperature in the Cox sterilizer is controlled by computer logic, which precisely maintains temperature throughout the sterilizer chamber. The temperature control is extremely sensitive and maintains 375 °F (190 °C).

After room temperature instruments are placed in the sterilizer, the temperature may drop a few degrees depending on the size of the load. If the temperature drops below 372 °F (189 °C), the cycle will not begin until 375 °F (190 °C) has been reestablished.

The sterilizer is designed to maintain 375 °F (190 °C) at all times. The door must be closed during operation, otherwise the heating element will continually operate to compensate for the lower temperature caused by room temperature air entering the sterilizer.

Do not open the door during a sterilization cycle. In the event that the door is opened, the cycle timer will reset and the sterilization cycle will restart after reaching operating temperature.

OPERATING INSTRUCTIONS

TO START THE DAY

Before turning the sterilizer on, open the door and visually inspect the heating chamber. Close the door, make sure the handle is in the fully closed (horizontal) position, push and release the ON STANDBY/OFF button for 1-2 seconds, and allow the sterilizer to heat to 375 °F (190 °C). This will take about 12 minutes. The ON STANDBY/OFF LED will change color from amber to green when the warm-up to 375 °F (190 °C) is complete.

The temperature read out will begin at 70 °F (21 °C).

The sterilizer is very energy efficient and should be left on all day, as its electrical consumption is minimal.

Before beginning a sterilization cycle, be sure instruments are clean and free of debris (for information about which instruments can be safely sterilized see Materials Integrity – page 4).

TO STERILIZE

Instruments which are to be sterilized in Cycles I and II need not to be dried prior to placing them in the sterilizer. However, instruments which are packaged for Cycle III must be dried before packaging.

All instruments, including those that have been placed in a holding, ultrasonic, or cold chemical disinfectant solution, must be thoroughly rinsed before sterilization.

Failure to thoroughly remove extraneous agents prior to sterilization could lead to surface staining of instruments.

CYCLE I – 6 MINUTES

Unwrapped Instruments Sterilization Instructions

To sterilize unwrapped instruments, place them in a basket, place the basket in the basket tray and slide the basket into the heating chamber using the basket removal tool. Close the door, make sure the handle is in the fully closed (horizontal) position, push and release the Cycle I button.

NOTE: It's recommended that only a single layer of instruments be placed in the basket to ensure thorough and complete sterilization.

Be sure to place burs, diamonds and other small items in the accessory mesh basket. At the end of 6 minutes, a beep will sound and a "6 C" will appear in the time window on the face of the sterilizer indicating the cycle has been completed.

Immediately after opening the door, use the basket removal tool to slide the basket out of the chamber, remove the basket from the tray and place it on the cooling rack. The basket containing the sterilized instruments may continue to cool on the cooling rack.

CYCLE II – 8 MINUTES

Hand Piece Sterilization Instructions

To sterilize air rotor hand pieces or medical drills with internal tubing, the following protocol should be used:

- Clean the hand piece (flush water lines by running the hand piece for 30 seconds); thoroughly scrub with detergent and water to remove adherent material. Remove old lubricant and debris from turbine head by spraying a hand piece cleaner/solvent into the air drive.

DO NOT USE A CLEANER/LUBRICANT.

- Place thoroughly clean hand pieces in a basket.

To sterilize hand pieces, select Cycle II. When the beep sounds and an "8 C" appears in the time window at the end of the 8 minutes, promptly remove and cool the instruments and insert another loaded basket into the sterilizer. Remember to lubricate the hand piece prior to use.

CYCLE III – 12 MINUTES

Wrapped Instruments Sterilization Instructions

To sterilize packaged instruments, dry instruments before packing and place up to 8 packages in the accessory instrument rack.

NOTE: It's recommended that the instrument rack be used when sterilizing packaged instruments to ensure thorough and complete sterilization.

Place the rack in a basket, insert the basket in the sterilizer, push and release the Cycle III button. At the end of 12 minutes, a beep will sound and a "12 C" will appear in the window indicating the cycle is complete. Remove and cool the instruments. As a reminder, be sure to use dry heat compatible bagging material suitable for 375 °F (190 °C) temperatures. For your convenience, nylon pouches are available from CPAC.

Part No. 400636, NYLON SELF SEAL POUCHES 2" X 10"

Part No. 400651, NYLON SELF SEAL POUCHES 3" X 10"

Part No. 400637, NYLON SELF SEAL POUCHES 4" X 10"

Part No. 400638, NYLON SELF SEAL POUCHES 7" X 10.5"

Part No. 400639, NYLON SELF SEAL POUCHES 9.5" X 13"

Call CPAC at **(585) 382-3223** to place an order.

TO END THE DAY

Push and release the ON STANDBY/OFF button. The sterilizer will go into standby mode while the cooling fan operates for 10 minutes.

At the end of ten minutes, the sterilizer will automatically shut off. If the sterilizer is connected to a wall outlet controlled on/off switch, do not turn the switch off, or in any way disrupt the power supply while sterilizer is in cool down mode.

DEFAULT SETTINGS

The following system settings can be changed from their default or viewed only when the power is OFF (Standby). Press and hold for 5 seconds the CYCLE I key to enter SET mode. The 4-digit LED display will show the first setting to be changed. Continue to press the CYCLE I key to toggle through all the settings which are listed below. Use the CYCLE II key to increase values and the CYCLE III key to decrease the values of the settings. Press the CYCLE I key after the last setting is displayed to exit SET mode and save changes to memory.

STAND-BY MODE: Default - 2 hours

Unit will maintain cycle temperature for 2 hours after last cycle. Unit will automatically enter power OFF (Standby) if there is no cycle activity for 2 hours. This time can be adjusted from 2 – 4 hours. Display format example = "Sb-2".

AUDIBLE ALARM: Default – 1(ON)

The unit has an audible alarm that alerts the user when the sterilization temperature has been reached during warm-up and when a cycle has been completed. The alarm can be defeated by changing the value to 0(OFF). Display format example = "AA-1".

FAHRENHEIT/CELSIUS: Default – F (Fahrenheit)

The temperature measurement can be displayed in units of Fahrenheit (F) or Celsius (C). Display format example = " F".

PRINTER OUTPUT COPIES: Default – 1

The number of copies for the printer output can be increased to 2 or 3. Display format example = "PC-1".

MONTH: Default – 1.

The month can be updated to current month as follows: 1-January, 2-February, 3-March, 4-April, 5- May, 6-June, 7-July, 8-August, 9-September, 10-October, 11-November or 12-December. Display format example = " 10".

DAY of MONTH: Default – 1.

The day of month can be updated to current day. Display format example = "d-20".

YEAR: Default – 2011.

The year can be updated to current year. Display format example = "2011".

MODEL: Sterilizer model can only be viewed not changed. Display format example = "6000".

SERIAL NUMBER – Serial number can only be viewed not changed. Display format example = "1 2345".

MAINTENANCE – SERVICE

The Cox sterilizer is designed for minimum and easy service. It is constructed of high quality stainless steel, which may be cleaned with mild soap and a damp cloth or any non-abrasive stainless steel cleaner. Unit can be externally disinfected with the disinfectant of your choice.

A cooling fan filter is located on the back of the unit to ensure the sterilizer performs reliably and efficiently for many years. Visually inspect the filter for build up of dust or contaminants at least once a month. Replace the filter if an excessive amount of dust is evident. Replacement foam filters can be purchased from CPAC.

NOTE: A 'CFF' (Change Fan Filter) indicator will be displayed when the unit is shut off if a clogged filter has not been replaced and the performance of the cooling fan is being affected. If the filter is not replaced, an E-14 error code may occur and the sterilizer will require servicing.

All internal components used in the sterilizer's construction are long life, heavy-duty parts that require no maintenance. Below is a list of potential error codes or performance symptoms that would indicate the possible need for service. If anything needs to be replaced, an authorized service representative should be called or call CPAC at **(585) 382-3223**.

ERROR CODES

Any failure in performance will be signaled by an error code.

If one of the following error codes appears, press the power ON/OFF key for 1 second. This will reestablish the error detect logic and will eliminate false error codes that may occur.

If the error code persists, call your authorized service representative or CPAC at **(585) 382-3223**.

Process Failures:

- E-12 Key Switch failure
- E-14 Board over heat
- E-16 Cycle Interruption
- E-18 PCB failure

Temperature Probe:

- E-20 Open probe
- E-21 Thermocouple

Heater Drive:

- E-30 Over heat
- E-31 Under heat

<u>(#) - Error Code / Symptom</u>	<u>Possible Causes</u>	<u>Repair / Solution</u>
(1) - Failing spore tests	<p>Instruments stacked on top of each other.</p> <p>Not running 12 minute cycle when instruments are in a cassette or pouch.</p>	<p>Place instruments on one level or in divider rack.</p> <p>Run 12 minute cycle.</p>
(2) - Burning pouches	<p>Temperature rising above 380°F.</p> <p>Temperature rising above 380°F after cleaning fan filter/grill.</p> <p>Not using pouches designed for Cox sterilizer.</p> <p>Pouches left in sterilizer for more than 30 minutes after cycle.</p>	<p>Clean cooling fan filter/grill.</p> <p>Replace thermocouple, (CX0088).</p> <p>Use SteriSure nylon pouches.</p> <p>Remove pouched instruments promptly after sterilization cycle has completed.</p>
(3) - E-31 error code / Sterilizer not heating up to 375°F.	<p>Blower is not blowing air into chamber through slots.</p> <p>Heater is not warming chamber.</p>	<p>Replace blower (CX0001).</p> <p>Replace heating element (CX0082 - 115VAC unit) (CX0027 - 230VAC unit).</p>
(4) - E-14 error code / Ambient air temperature near PCB too high.	<p>Cooling fan filter/grill is clogged with dust.</p> <p>Cooling fan is not running.</p>	<p>Clean fan filter/grill.</p> <p>Replace cooling fan (CX0037 - 115VAC unit) (CX0093 – 230VAC unit)</p>
(5) - E-12 error code / Key(s) on membrane keypad not working.	Keypad failure.	Replace membrane keypad (CX0022).

<u>(#) - Error Code / Symptom</u>	<u>Possible Causes</u>	<u>Repair / Solution</u>
(6) - E-20 or E-21 error code / Control of temperature erratic.	Bad thermocouple reading sequence. Faulty thermocouple.	Unplug unit for 20 seconds and then plug back in, turn power ON. If error code appears again, thermocouple is faulty. Replace thermocouple (CX0088).
(7) - E-30 error code / Chamber temperature exceeding maximum value.	Cooling fan filter/grill is clogged with dust. Cooling fan is not running. Faulty PCB.	Clean fan filter/grill. Replace cooling fan (CX0037 - 115VAC unit) (CX0093 – 230VAC unit). Unplug unit for 20 seconds and then plug back in, turn power ON. If error code appears again, replace PCB (CX0079).
(8) - Timer not counting down during cycle.	Temperature has not reached 375°F. Faulty door switch.	Allow temperature to reach sterilization setting. Install door switch jumper wire on PCB until door switch can be replaced.

USB PORT

The COX Rapid Heat Transfer Sterilizer is capable of storing sterilization cycle data on a USB flash drive. The flash drive should be inserted in the provided USB port located on the right side of the sterilizer. The sterilizer will record cycle parameters, including start date and time, cycle phase time and temperatures, and the cycle status. The cycle status at the end of the record will indicate whether the sterilization cycle successfully completed or if there was an error. A new text file is automatically created each day and named using the following format: month-day-year.txt (ex: 05-20-11.txt).

The flash drive can be any type formatted for FAT (FAT16) or FAT32.

NOTE: The flash drive must be installed before the cycle ends or the cycle data will not be stored. The drive can be removed anytime after a cycle ends and the data can be downloaded to your computer for archiving or printing.

If direct printing is desired, the following printer can be connected to the USB port:

Printer - Epson TM-U220 with USB interface

Cable – USB printer cable

NOTE: The printer must be connected to the COX USB port via the above cable and must be turned on for the printer output to work. The number of copies can be changed in order to printout multiple copies (see DEFAULT SETTINGS). Cycle data will not be stored electronically when the printer is used.

The date and time should be set before the Cox sterilizer is first used and will need to be updated if the power is lost to the sterilizer. Follow the instructions on page 7, DEFAULT SETTINGS, to adjust these settings.

BIOLOGICAL TESTING

The American Dental Association, United States Air Force, Joint Commission of Accreditation of Hospitals, and the Centers for Disease Control recommend biological indicator tests to verify the sterilizer's performance.

For monitoring dry heat, biological indicators containing *Bacillus atrophaeus* should be used. Spore strips, as well as test services are widely available through universities and commercial services.

The following spore strip is recommended:

1. Weight the spore strip envelope with a jumbo paper clip.

NOTE: Be careful not to puncture the envelope.

2. Place the weighted strip in the basket.
3. With the sterilizer operating at 375 °F (190 °C), place basket containing the spore strip in the sterilizer.
4. Start the test cycle by starting Cycle I, II or III.
5. When the beep sounds, remove the spore strip for culturing.

UNIT ELECTRICAL RATINGS

MODELS COX-115V

120 VAC, 60Hz, 12 Amps

MODELS COX-220V

220 VAC, 50Hz, 8 Amps

ENVIRONMENTAL CONDITIONS

The COX Rapid Heat Transfer Sterilizer is designed for indoor use with the following conditions:

- Temperature Range of 5°C to 40° C (41°F to 104°F)
- Maximum Relative Humidity of 80% up to 31°C (88°F). Decreasing linearly to 50% at 40°C (104°F).
- Pollution Degree 2 applies in accordance with IEC 664.
- Transient Over-voltage Category II applies.
- Supply Voltage not to fluctuate more than 10% (+/- 12V at 120V, +/- 22V at 220V)
- Maximum altitude of 2000 m (6562 ft).

COX STERILIZER SPARE PARTS LIST

March 20, 2013

Product Number	Description
CX0001	Blower Assembly w/o heater
CX0015	Wire Harness
CX0018	Wire Harness (black and white)
CX0022	Keypad
CX0024	Fuse Holder
CX0025	Fuse 15 Amp 250V (slow blow)
CX0031	Burr Holder
CX0036	Drawer Handle
CX0037	Muffin Fan 115V 106 CFM FAN
CX0046	Instrument Basket
CX0048	Silicone Mat (6 7/8" x 7 1/2")
CX0051	Rubber Foot
CX0052	Cooling Rack External
CX0079	Circuit Board Assembly
CX0081	Instrument Rack (Internal)
CX0082	Heater Assembly Complete
CX0085	Blower Assembly w/Heater
CX0088	Thermocouple
CX0097	Ophthalmology Kit (basket and 2 silicone mats)
CX0190	COX Shipping Box
CX0268	Door Gasket (for new COX design)
CX0273	Basket Removal Tool (new style)
CX0294	Instrument Basket Cooling Rack
CX0315	Cooling Rack, 2 Instrument Baskets, Stacked
CX0322	Foam Filter, 4 1/2" Square (5/pack)

STATEMENT OF WARRANTY

All equipment is manufactured to exacting standards and has been tested and inspected for proper workmanship and performance before shipping.

Any parts which are defective will be repaired or replaced within a one-year period after date of shipment, provided the equipment has been used according to the instruction manual and have not been abused or tampered with.

The company will not be responsible for any damage resulting from improper installation, operator carelessness or improper operation of the equipment. The company assumes no responsibility for damage in transit and the customer should present any claim for such damages to the carrier.

This warranty gives you specific legal rights. You may also have additional rights that vary from state to state.

Any unit to be repaired under warranty must be shipped, freight prepaid, or delivered to a facility authorized to render services provided hereunder. Returned unit must be either in its original package or a similar package affording an equal degree of protection. All units must have a Return Material Authorization code (RMA) visible on the returned item. RMA's can be obtained by calling CPAC at **(585) 382-3223**.

EVERY EFFORT HAS BEEN MADE TO ENSURE THE COMPLETE ACCURACY OF THE CONTENTS OF THIS MANUAL. NO LIABILITY ARISING FROM ITS USE, HOWEVER, CAN BE ACCEPTED BY THE COMPANY, WHO RESERVES THE RIGHT, WITHOUT PRIOR NOTICE, TO ALTER THE SPECIFICATIONS, CONSTRUCTION, OR CONTENT OF ITS EQUIPMENT AT THE COMPANY'S OWN DISCRETION.