STERIS®

AMSCO® Century® Series Sterilizers

Routine Maintenance

Operator Manual

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A Word from STERIS

Introduction

This manual contains important information on proper use of this sterilizer. All operators and department supervisors are urged to carefully review and become familiar with the warnings, cautions and instructions contained herein.

This sterilizer is specifically designed to process goods using only the cycles as specified in this manual. If there is any doubt about a specific material or product, contact the manufacturer of the product for the recommended sterilization technique.

STERIS carries a complete line of accessories for this unit to simplify, organize and assure sterility of the sterilization process. Instrument trays, pouches and biological/chemical monitoring systems are all available to fulfill your facility's processing needs. A STERIS representative will gladly review these with you.

Advisory

A summary of the Safety Precautions to be observed when operating or servicing this sterilizer can be found in Section 1 of this manual. Do not operate or service the sterilizer until you have become familiar with this information.

This sterilizer is not designed to process flammable compounds. Any alteration of the sterilizer which affects its operation will void the warranty, could adversely affect sterilization efficacy, could violate federal, state and local regulations, and jeopardize your insurance coverage.

Service Information

A thorough preventive maintenance program is essential to safe and proper sterilizer operation. You are encouraged to contact STERIS concerning our Preventive Maintenance Agreement. Under terms of this agreement, preventive maintenance, adjustments, and replacement of worn parts are done on a scheduled basis to assure equipment performance at peak capability and to help avoid untimely or costly interruptions. STERIS maintains a nationwide staff of well-equipped, factory-trained technicians to provide this service, as well as expert repair services. Contact STERIS for details.

Addresses

The base language of this document is ENGLISH. Any translations must be made from the base language document.

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1.1 WARNING – PERSONAL INJURY AND/OR EQUIPMENT DAMAGE HAZARD

WARNING

PERSONAL INJURY AND/OR EQUIPMENT DAMAGE HAZARD

⚠ Repairs and adjustments to this equipment must be made only by fully qualified service personnel. Maintenance performed by inexperienced, unqualified persons or installation of unauthorized parts could cause personal injury or result in costly equipment damage.

⚠ Regularly scheduled preventive maintenance is required for safe and reliable operation of this equipment. Contact your STERIS service representative to schedule preventive maintenance.

⚠ When closing the chamber door, keep hands and arms out of the door opening and ensure opening is clear of obstructions.

1.2 WARNING – PERSONAL INJURY HAZARD

WARNING

WARNING – PERSONAL INJURY HAZARD

⚠ Avoid personal injury from bursting bottles. Liquid sterilization cycle must only be used for liquids in borosilicate (Pyrex) flasks with vented closures.

⚠ Door must be locked and the key retained prior to entering chamber for servicing. Always follow appropriate Lockout-Tagout and electrical safety-related work practice standards. Emergency stop switch can be depressed and key retained on sliding door units.

1.3 WARNING – EXPLOSION HAZARD

WARNING

WARNING – EXPLOSION HAZARD

⚠ This sterilizer is not designed to process flammable compounds.

1.4 WARNING – BURN HAZARD

WARNING

WARNING – BURN HAZARD

When sterilizing liquids, to prevent personal injury or property damage resulting from bursting bottles and hot fluid, you must observe the following procedures:

- Use Liquid cycle only; no other cycle is safe for processing liquids.
- Use only vented closures; do not use screw caps or rubber stoppers with crimped seals.
- Use only Type I borosilicate glass bottles; do not use ordinary glass bottles or any container not designed for sterilization.
- Do not allow hot bottles to be jolted; this can cause hot-bottle explosions. Do not move bottles if any boiling or bubbling is present.

⚠ It is inappropriate for a healthcare facility to sterilize liquids for direct patient contact.

⚠ Sterilizer, rack/shelves, and loading car will be hot after cycle is run. Always wear protective gloves and apron when removing a processed load. Protective gloves and apron must be worn when reloading sterilizer following the previous operation.

⚠ Before daily flushing of the generator, generator must be at zero psig and cooled to room temperature.

⚠ Do not attempt to open the sterilizer door if a WATER IN CHAMBER ALARM condition exists. Call a qualified service technician before attempting to use sterilizer further.

⚠ Sterilizer operator may be severely burned by scalding water if the water level control malfunctions. The steam generator level control may malfunction if the supply water exceeds 26,000 ohms/cm (38.5 conductivity min.). Do not connect to treated water (e. g., distilled, reverse osmosis, deionized) unless water resistivity is determined to be acceptable. If water exceeds 26,000 ohms/cm, contact STERIS Engineering Service for information concerning modifications required to the generator control system.

⚠ After manual exhaust, steam may remain inside the chamber. Always wear protective gloves, apron and a face shield when following emergency procedure to unload sterilizer. Stay as far back from the chamber opening as possible when opening the door.

⚠ Allow sterilizer to cool to room temperature before performing any cleaning or maintenance procedures.

⚠ Failure to shut off the steam supply when cleaning or replacing strainers can result in serious injury. Jacket pressure must be 0 psig before beginning work on the steam trap.

⚠ Proper testing of the safety valve requires the valve to be operated under pressure. Exhaust from the safety valve is hot and can cause burns. Proper safety attire (gloves, eye protection, insulated overall) as designated by OSHA, is required. Testing is to be performed by qualified service personnel only.

⚠ Steam may be released from the chamber when door is opened. Step back from the sterilizer each time the door is opened to minimize contact with steam vapor.

1.5 WARNING – ELECTRIC SHOCK AND BURN HAZARD

WARNING

WARNING – ELECTRIC SHOCK AND BURN HAZARD

⚠ Disconnect all utilities to sterilizer before servicing. Do not service the sterilizer unless all utilities have been properly locked out. Always follow OSHA Lockout-Tagout and electrical safety-related work practice standards. (See CFR 1910.147 and .331 through .335.)

1.6 WARNING – SLIPPING HAZARD

WARNING

WARNING – SLIPPING HAZARD

⚠ To prevent falls keep floors dry by immediately wiping up any spilled liquids or condensation in sterilizer loading or unloading area.

1.7 WARNING – STERILITY ASSURANCE HAZARD

WARNING

WARNING – STERILITY ASSURANCE HAZARD

⚠ Load sterility may be compromised if the biological indicator or air leak test indicates a potential problem. If these indicators show a potential problem, refer the situation to a qualified service technician before using the sterilizer further.

⚠ According to AAMI standards, a measured leak rate greater than 1.0 mm Hg/minute indicates a problem with the sterilizer. Refer the situation to a qualified service technician before using the sterilizer further.

⚠ The Express cycle is only intended for use with a single instrument in a single wrapped instrument tray.

⚠ The Express cycle is not intended for processing porous items (except the tray wrapper).

⚠ The Flash cycle is not intended for processing porous items.

1.8 CAUTION – POSSIBLE EQUIPMENT DAMAGE

CAUTION

CAUTION – POSSIBLE EQUIPMENT DAMAGE

⚠ Gasket must be fully retracted prior to operating sterilizer door.

⚠ Failure to flush generator daily could result in malfunction of the generator. Warranty on the generator will be voided unless flushed daily.

⚠ Before flushing generator, ensure generator drain valve is fully open to prevent generator heaters from turning on during flush phase.

⚠ If zero dry time is selected, sterilizer automatically initiates a vapor removal phase in place of drying. This phase can still draw a vacuum to 5.0 inHg. Consult device manufacturer's recommendations to ensure devices being processed can withstand this depth of vacuum.

⚠ Lifting the chamber float switch when cleaning the chamber may cause the sterilizer control to initiate a “Chamber Flooded” alarm. If this alarm condition occurs, the operator must turn the control power OFF then ON to clear the alarm. The control power switch is located in the mechanical area at the side of the sterilizer. Placing the sterilizer in standby does not clear this alarm.

⚠ Never use a wire brush, abrasives, or steel wool on door and chamber assembly. Do not use cleaners containing chloride on stainless-steel surfaces. Chloride-based cleaners will deteriorate stainless steel, eventually leading to failure of the vessel.

⚠ Do not use cleaners containing chlorides on loading cars. Chloride-based cleaners will deteriorate the loading car metal.

⚠ Sterilization of chloride-containing solutions (e.g., saline) can cause chamber corrosion and is not recommended by the manufacturer. If, however, chloride-containing solutions must be processed, clean the chamber after each use.

⚠ Allow thermostatic traps to cool down to room temperature before removing cover. Since there is nothing to limit expansion, the bellows may rupture or fatigue if trap is opened while hot.

⚠ Actuation at less than 75% of rated pressure can allow debris to contaminate the seat and cause the safety valve to leak. A leaking safety valve must be replaced.

⚠ Insufficient service clearance will make repairs more difficult and time-consuming.

⚠ Piping sized too small may cause water hammer, resulting in damage to the sterilizer.

⚠ After installation, it is mandatory to brace piping at the drain funnel so that it will not move vertically.

⚠ Make sure door opening is clear of any obstruction before closing the door(s).

⚠ Do not attempt to open sterilizer door during manual operation unless chamber is at 0 psig.

⚠ During manual operation, gasket must be fully retracted prior to operating sterilizer door.

⚠ Immediately wipe up saline solution spills on loading car, to prevent damage to stainless steel.

Installation Verification

2.1 General

An Equipment Drawing showing all utility and space requirements was supplied with the sterilizer. Clearance space shown on the drawing is necessary for ease of installation and to assure proper operation and maintenance of equipment. Installation and Uncrating Instructions were also furnished with the sterilizer. If any of these documents are missing or misplaced, contact STERIS giving the Serial, Equipment and Model numbers. Replacement copies will be sent to you promptly.

2.2 Installation Checklist

This section includes the following:

After installing this unit (see *Figure 2-1*) according to the instructions provided, complete the following checklist to assure that your installation is complete and correct. Or, if you desire, contact STERIS for a technician to be scheduled to test your installation and demonstrate proper equipment operation.

Service Clearance

CAUTION

POSSIBLE EQUIPMENT DAMAGE

⚠ Insufficient service clearance will make repairs more difficult and time consuming.

☐ Clearance as specified on the Equipment Drawing must be available.

Plumbing Service

CAUTION

POSSIBLE EQUIPMENT DAMAGE

⚠ Piping sized too small may cause water hammer, resulting in damage to the sterilizer.

⚠ After installation, it is mandatory to brace piping at the drain funnel so that it will not move vertically.

☐ **Feed Water:**

- ☐ All supply line shutoffs must be provided with lockout capability.

- ☐ Backflow prevention is by others.

☐ **Water Pressure** measured (specification is 30 to 50 psig, static and dynamic). Water pressure supplied must be within specifications as shown on the **Equipment Drawing**. If pressure is too high, a regulator must be installed. If water pressure is too low, equipment performance will be affected; use of a booster pump (by others) is recommended.

☐ **Water Quality** supplied must be within specifications. Improper water quality adversely affects equipment operation, especially units equipped with an electric steam generator. Damage to the equipment from improper water quality is not covered under warranty.

☐ **Steam Supply:**

- ☐ Shutoffs (with provisions for lockout and tag out) located nearby.
- ☐ Supply piping adequately sized.
- ☐ Supply pressure measured (specification is 50 to 80 psig, static and dynamic).

☐ **Steam Piping** to the sterilizer is to be trapped at a point before connection to the sterilizer. Trap is required to remove condensate from the steam line.

☐ **Drain Piping** must be sloped properly, and sized to handle the maximum waste flow from the sterilizer.

Electrical Service

☐ All **disconnects** must be provided with lockout capability.

☐ 120 VAC, one phase service to the unit must be as specified on the Equipment Drawing.

☐ 120 VAC, one phase service requires a clearly marked **disconnect** located near the sterilizer

☐ 120 VAC, one phase service should be on a separate circuit, and not tied into circuits containing large reactive loads (e.g., motors).

☐ Three phase power for optional electric steam generators must meet specifications on the Equipment Drawing.

☐ Three phase service requires a clearly marked **disconnect** located near the sterilizer.

Sterilizer Final Check

☐ Door runs up and down smoothly.

☐ Door open/close time is 7.0-9.0 seconds (power door units).

☐ Door up switches adjusted correctly.

☐ Chamber strainer in place.

☐ Rack and shelves/loading car operates correctly.

☐ Paper loaded in printer.

Cycle Operation

WARNING

EXPLOSION HAZARD

⚠ This sterilizer is not designed to process flammable compounds.

CAUTION

POSSIBLE EQUIPMENT DAMAGE

⚠ Sterilization of chloridecontaining solutions (e.g., saline) can cause chamber corrosion and is not recommended by the manufacturer. If, however, chloride-containing solutions must be processed, clean the chamber after each use.

- ☐ Unit powers up correctly
- ☐ If prevacuum sterilizer, run leak test cycle leak rate is to be less than 1.0 mmHg/minute.
- ☐ Verify operation of a typical cycle (e.g., Gravity).

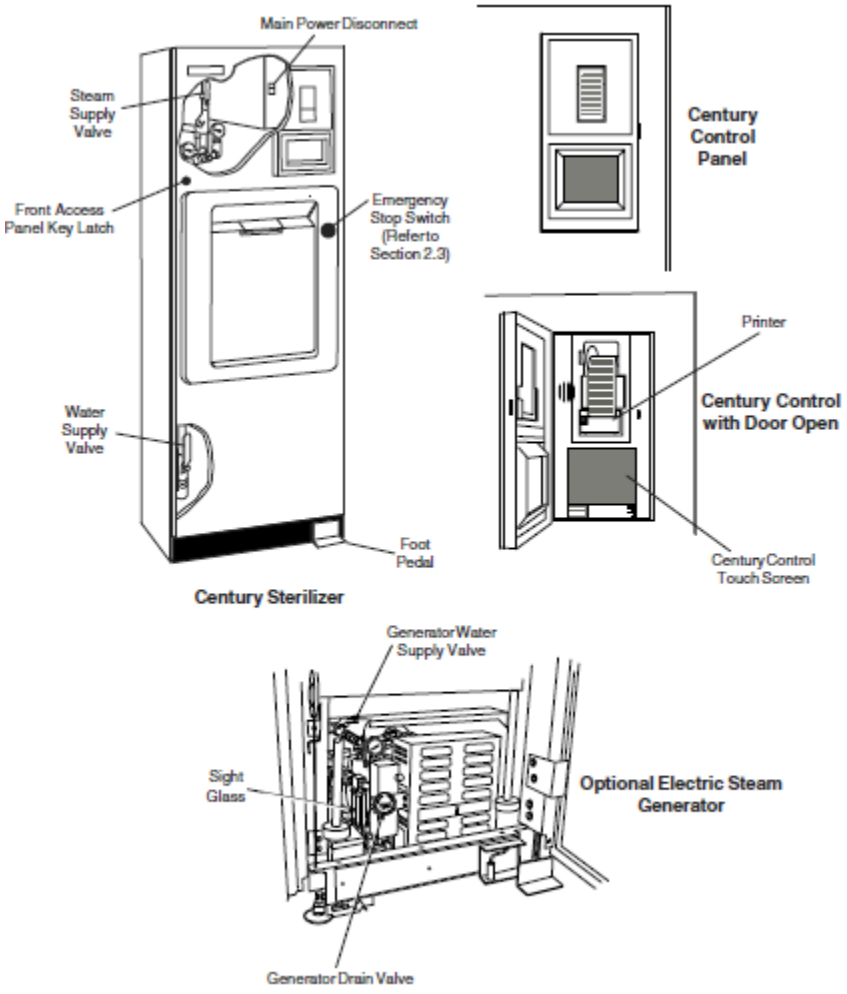


Figure 2-1. Typical AMSCO Century Series Sterilizer

2.3 Emergency Stop Switch

Introduction

An emergency stop switch (*Figure 2-2*) is a safety feature designed to shut the sterilizer down completely in an emergency situation.

Pressing the emergency stop switch disconnects power to the door and valves, causing the door to stop and all valves to close.

WARNING

BURN HAZARD

⚠ Steam may be released from the chamber when door is opened. Step back from the sterilizer each time the door is opened to minimize contact with steam vapor.

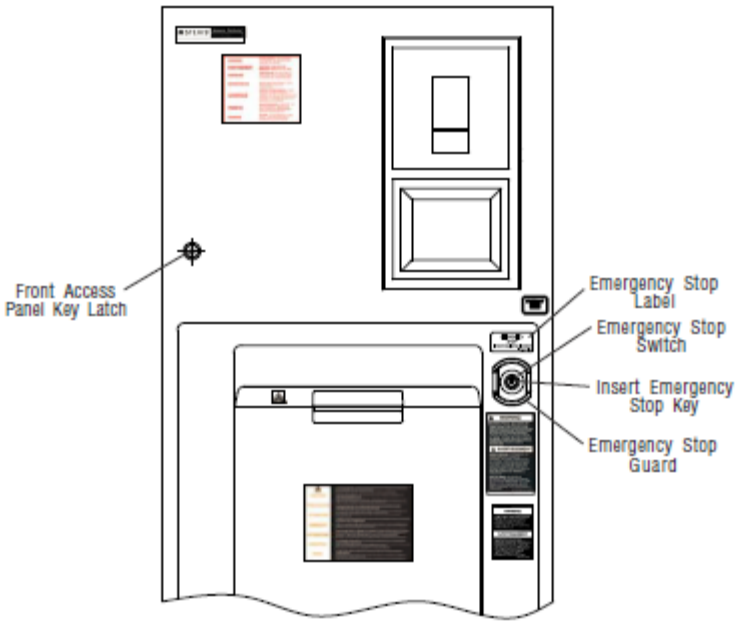


Figure 2-2. Emergency Stop Switch

IMPORTANT: *The emergency stop switch is for* ***emergency use only!*** *DO NOT USE AS A* ***START/STOP*** *BUTTON. To properly abort a cycle, press abort button on sterilizer display.*

The emergency stop switch should be pressed only in an emergency situation such as

- Safety mechanism fails to stop door when an obstruction is present
- Steam enters the chamber when the door is open

NOTE: An alarm is generated when the emergency stop switch is pressed. An emergency stop key is required to reset the switch. Refer to alarm procedure to clear alarm.

Emergency Stop Key

An emergency stop key is required to reset the emergency stop switch.

NOTE: The emergency stop key should be retained by the department supervi

Resetting the Switch:

1. Insert emergency stop key.
2. Turn emergency stop key counterclockwise.
    a. Alarm clears
    b. Cycle aborts
    c. Sterilizer resumes normal operation

Emergency Stop Guard

The emergency stop guard (*Figure 2-2*) helps prevent the operator from accidentally pressing the emergency stop switch.

Emergency Stop Label

The emergency stop label is located above the emergency stop switch (see *Figure 2-2* and *Figure 2-3*).

Figure 2-3. Emergency Stop Label

2.4 Front Access Panel Key Latch

The front access panel key latch (see *Figure 2-2*) locks the front access panel. The key latch helps protect operators from:

- contacting moving door parts during operation
- accessing electrical connections, hot steam pipes and other components that should only be accessed by a qualified service technician or qualified personnel

IMPORTANT: *If the front access panel must be unlocked, this service must be performed by trained and qualified personnel.*

Unlocking front access panel:

1. Insert front access panel key.
2. Turn key counterclockwise.
3. Turn knob right or left to disengage the latch, and hold.

4. Pull knob firmly to release the panel from the magnets securing the panel.

Locking front access panel:

1. Close panel.
2. Turn key clockwise.

Preventive Maintenance

3.1 Introduction

The following preventive maintenance advisories must be observed:

1. Regular service and maintenance MUST be performed only by STERIS or a STERIS-trained technician. Any work performed by inexperienced or unqualified persons or the installation of unauthorized parts could cause personal injury, invalidate the warranty or result in costly damage.
2. Under no circumstances should this equipment be serviced without the Maintenance Manual. The Maintenance Manual can be purchased by contacting STERIS Customer Service.
3. A detailed Preventive Maintenance schedule and replacement parts list can be found in the Maintenance Manual. The Maintenance Manual can be purchased by contacting STERIS Customer Service.
4. Preventive Maintenance is essential in keeping this equipment in optimal working condition. STERIS recommends establishing an annual maintenance agreement with STERIS service.

NOTE: Preventive Maintenance is not covered under warranty.

3.2 Flush Optional Electric Steam Generator

CAUTION

POSSIBLE EQUIPMENT DAMAGE

⚠ Failure to flush generator on a daily basis could result in generator malfunctions. Warranty on the generator will be voided unless flushed daily.

Pressing STOP TIMER stops flush phase and resets timer to three minutes.

Pressing CANCEL bypasses flush phase and advances display to screen #1. Do not press CANCEL unless generator has already been flushed that day.

WARNING

BURN HAZARD

⚠ Before daily flushing of the generator, generator must be at 0.0 psig and cooled to room temperature.

CAUTION

POSSIBLE EQUIPMENT DAMAGE

⚠ Before flushing generator, ensure generator drain valve is fully open to prevent generator heaters from turning on during flush phase.

WARNING

BURN HAZARD

⚠ Sterilizer operator may be severely burned by scalding water if the water level control malfunctions. The steam generator level control may malfunction if the supply water exceeds 26,000 ohms/ cm(38.5 Micromhos conductivity min.). Do not connect to treated water (e.g., distilled, reverse osmosis, deionized) unless water resistivity is determined to be acceptable. If water exceeds 26,000 ohms/ cm, contact STERIS for information concerning modifications required to the generator control system.

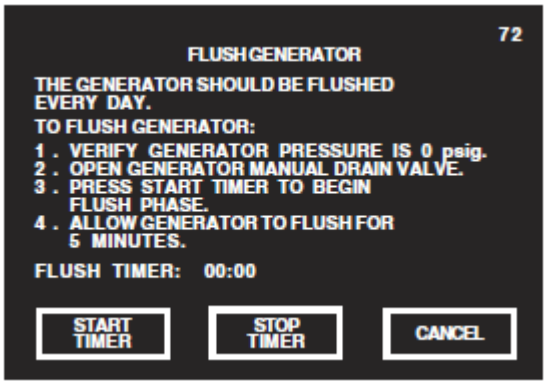
If a building steam source is not available, the sterilizer may be equipped with an electric steam generator. The generator automatically converts water to steam using electric heat. The steam created is then used to power the sterilizer.

Steam generators are highly susceptible to mineral scaling if the supplied water has any level of hardness. Refer to *Table 3-1* for water quality requirements.

IMPORTANT: *Regardless of the hardness level of supplied water, the generator must be flushed every day before use to prevent mineral scaling or carryover of debris into the chamber.*

IMPORTANT: *Warranty on this steam generator is voided unless daily flushing procedures are performed.*

1. Press the **ON** button on the sterilizer touch screen (screen #0). Display advances to screen #72. Instructions on how to flush the generator are listed on screen #72.



2. Check generator pressure gauge (see *Figure 3-1*). Generator must be at 0.0 psig and room temperature before flushing.

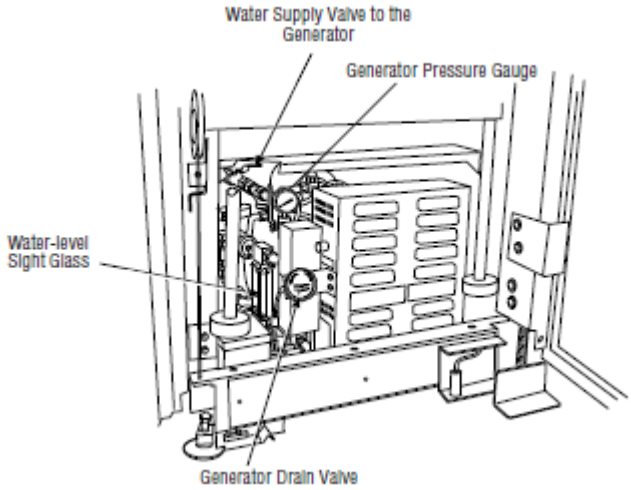
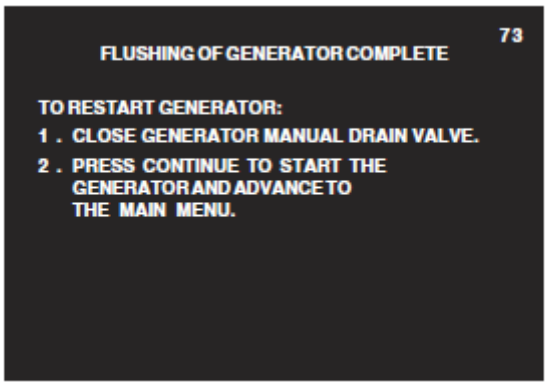


Figure 3-1. Optional Steam Generator

NOTE: If generator is not at 0.0 psig, the Flush can be bypassed by pressing CANCEL, however the flush should not be bypassed on a continuous basis or else damage to the generator occurs.

To ensure generator is at 0.0 psig the sterilizer can be shut off at end of the day and by next morning the unit is able to be flushed. Approximately seven hours is required for generator to cool down to less than 140°F (60°C)

3. Open drain valve on the side of the generator electric box (see *Figure 3-1*).
4. Verify water supply valve to the sterilizer are open.
5. Ensure water supply valve to the generator is open (see *Figure 3-1*).
6. Press **START TIMER** on screen #72. Water automatically flushes through the generator and out the drain for five minutes. Flush timer on screen #72 counts down time remaining in the flush phase.
7. After five minutes, alarm buzzer sounds and display advances to screen #73. Instructions on how to restart the generator are listed on screen #73.



8. Close the generator drain valve.
9. Press **CONTINUE** on screen #73. Generator automatically fills to the proper level and starts to heat. Display screen advances to the Main Menu screen (#1). Allow 10 minutes warm-up time once generator starts to fill.
10. Close front cabinet panel.

NOTE: The generator must be flushed every day before use

Table 3-1. Required Feed Water Quality for Carbon Steel Steam Generators

Condition	Nominal Conditions	Maximum Conditions
Temperature	as supplied	140° F (60° C)
Total Hardness as $CaCO_3$ *	0-17 mg/L	130 mg/L
Total Dissolved Solids	50-150 mg/L	250 mg/L
Total Alkalinity as $CaCO_3$	50-100 mg/L	180 mg/L
180 mg/L	6.8-7.5	6.5-8.5
Total Silica	0.1-1.0 mg/L	2.5 mg/L
Resistivity - ohms/cm	2000-6000	26000
*17.1 mg/L = 1 grain hardness		

3.3 Materials Required

WARNING

PERSONAL INJURY

⚠ Personal protective equipment, including heat resistant gloves, heavy rubber gloves, protective gown and face shield or safety goggles are required to perform routine chamber cleaning.

Prolystica™ HP Neutral Manual Cleaner

STERIS part #1C2708, 1 gal. (4 gallons per case); substitutions are not recommended except as noted in the drain cleaning procedure.

It can be purchased here: *https://shop.steris.com/en/us/parts/prolystica-hp-neutral-manual-cleaner-4-x-1-gal-case-1c2708*

ChamberCare™ Pro Kit (Item #11047270)

The ChamberCare™ Pro Kit contains the tools you need to perform routine sterilizer chamber cleaning following this IFU. To purchase this kit, contact your local STERIS District Service Manager, Specialty Service Technician, or Equipment Service Technician.

Figure 3-2. ChamberCare Kit

Kit Content Includes:

- Chamber Cleaning Pad and Holder Kit
- Chamber Cleaning Brown Heavy Duty Scrub Pad
- Chamber Cleaning White Light Duty Scrub Pad
- Chamber Extension Pole Telescopic
- Chamber Cleaning Pump-Up Sprayer
- Lint Free Microfiber Cloth Pack
- Plastic Chamber Scraping Tool
- Chemistry Dosing Syringe

Alternative Cleaning Supplies

- Prolystica HP Neutral Manual Cleaner #1C2708, 1 gal. (4 per case); substitutions are not recommended except as noted in the drain cleaning procedure
- Hand Pump 1/2 oz #T619Q0, for 1 gal. (sold individually); can be used with Prolysitca HP Neutral Manual Cleaning #1C2708 1 gal. to aid in dosing chemistry
- Pump-up sprayer to mix chemistry with water and for rinsing the chamber
- 10 mL chemistry dosing syringe used for mixing
- Scrub pad and holder kit with additional scrub pads
- Soft lint-free cloths and/or a soft brush suitable for attaching to a mop extension handle
- Plastic scraping tool
- Mop extension handle with a clamping mechanism on the end (available through hospital suppliers or hardware stores)
- Personal protective equipment, including heat resistant gloves, heavy rubber gloves, protective gown and face shield or safety goggles

3.4 Safety Considerations

The following considerations should be observed before proceeding with the cleaning procedure:

- Be sure to follow facility policy and STERIS Operator Manual procedures to turn off sterilizer power and to not turn on the unit while the equipment is being cleaned.
- Open the sterilizer door and allow the sterilizer to cool completely before cleaning. This takes approximately 4-5 hours.
- Use appropriate personal protective equipment, including heavy rubber gloves, protective gown and safety goggles or face shield to prevent contact with the chemical solutions.
- When spraying the diluted Prolystica™ HP Neutral Manual Cleaner into the sterilizer, use a coarse sprayer that does not produce a fine mist.
- Prior to using Prolystica HP Neutral Manual Cleaner, review all warnings and cautions on the product label.
- In addition to the safety considerations outlined in this document, follow all safety protocols outlined within the facility's safety procedures.

3.5 Drain Strainer Routine Cleaning Procedure

WARNING

PERSONAL INJURY

⚠ Personal protective equipment, including heat resistant gloves, heavy rubber gloves, protective gown and face shield or safety goggles are required to perform routine chamber cleaning.

Drain Strainer Cleaning Frequency

The chamber drain strainer should be cleaned at least once a day, preferably in the morning before running the first cycle and whenever the strainer is clogged with debris.

Figure 3-3. AMSCO 400 Med Sterilizer Drain and Strainer

Figure 3-4. AMSCO 600 Med Sterilizer Drain and Strainer

NOTE: Review operator manual for more information about how to properly remove and clean the drain strainer.

Daily Drain Strainer Cleaning Procedure

1. Wear heat-protective gloves prior to cleaning the chamber drain strainer, unless the sterilizer is cool.
2. Remove the strainer following instructions provided in the operator manual.
3. Remove obvious debris from strainer and use a brush, wire, or similar tool to remove any remaining accumulation
4. Once strainer has been cleared, position the strainer upside down and under running water.
5. Replace the strainer in the chamber drain.

3.6 Drain Routine Cleaning Procedure

WARNING

PERSONAL INJURY

⚠ Personal protective equipment, including heat resistant gloves, heavy rubber gloves, protective gown and face shield or safety goggles are required to perform routine chamber cleaning.

Drain Cleaning Frequency

- If liquids such as microbiology media are processed in the sterilizer on a regular basis, the chamber drain should be cleaned once a week.

- Drain should also be cleaned following chamber cleaning to remove any debris resulting from the cleaning process.
- Drain should be cleaned whenever it becomes clogged.

Drain Cleaning Procedure

1. Make sure to follow facility policy and STERIS Operator Manual procedures to turn off sterilizer power and to not turn on the unit while the equipment is being cleaned.
2. Open the sterilizer door and allow the sterilizer to cool (approximately 4-5 hours).
3. Remove the chamber drain strainer and clean using the procedure above if necessary.
4. To clean the chamber drain, measure 1-2 ounces (60 mL) of full-strength Prolystica™ HP Neutral Manual Cleaner into a metal medicine cup and pour the solution slowly down the sterilizer drain.

   NOTE: If Prolystica HP Neutral Manual Cleaner is unavailable, a hot solution of 1 tablespoon (10.8g) of trisodium phosphate to 1 pint (500 ml) of hot water may be used.
5. After five minutes, pour approximately 1 pint (500 mL) of hot tap water down drain to rinse out Prolystica HP Neutral Manual Cleaner.

   NOTE: Tap water may puddle on the bottom of the chamber. This is normal and should drain completely after 10 minutes. If the water does not drain completely, it may be necessary to turn the unit on, initiate a cycle, wait 10 seconds, and immediately abort it. The cycle/abort action opens the sterilizer drain, draining the water from the chamber.

   CAUTION

   TAP WATER NOT DRAINING

   ⚠ If water does not drain after first attempt, take the following actions:

   - Turn off unit and its power supply.
   - Contact STERIS Service to allow a STERIS Technician to assess the issue.
   - Do not reattempt to initiate a cycle and abort a second time.
6. Thoroughly rinse bottom of chamber with water to prevent detergent residue from baking on chamber surface.
7. Reinstall Chamber Drain Strainer.

3.7 Chamber Routine Cleaning Procedure

WARNING

PERSONAL INJURY

⚠ Personal protective equipment, including heat resistant gloves, heavy rubber gloves, protective gown and face shield or safety goggles are required to perform routine chamber cleaning.

Chamber Cleaning Frequency

Due to differences in water quality, steam quality, frequency of use and boiler additives, no specific frequency interval is recommended for chamber cleaning. Operators must determine the appropriate cleaning interval based on the local water conditions and chamber appearance.

In general, chamber cleaning should be performed under the following circumstances:

- When spills or other soiling have occurred

- Routinely to maintain sterilizer cleanliness and appearance
- When processing materials that may be detrimental to the chamber

NOTE: Routine Chamber Cleaning conducted by equipment operators does not replace the STERIS-recommended annual professional cleaning.

Chamber Cleaning Procedure

1. Make sure to follow facility policy and STERIS Operator Manual procedures to turn off sterilizer power and to not turn on the unit while the equipment is being cleaned.

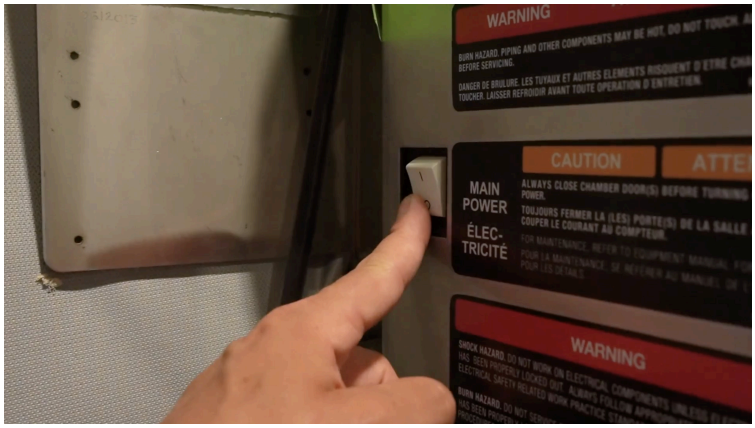


Figure 3-5. Power Down Unit

2. Open the sterilizer door and allow the sterilizer to cool (approximately 4-5 hours).
3. Remove the chamber rack and shelves according to instructions found in the operator manual if applicable.
4. Put on heavy rubber gloves, a protective gown and a face shield or safety goggles. Additionally, follow your facility's safety procedures at all times.

Figure 3-6. Required PPE for Cleaning

5. Prepare a solution of Prolystica™ HP Neutral Manual Cleaner and hot water (~approximately 50°C) in the Chamber Cleaning Pump-Up Sprayer container found in the ChamberCare™ Pro Kit by diluting ½ oz/gal which is 5.85 mL to the 1500 mL capacity of the pump-up sprayer. Use the dosing syringe to add the Prolystica to the hot water in the sprayer.

6. Using a coarse spray pattern to avoid creating a fine mist, evenly apply the solution to the inside surfaces of the sterilizer chamber, including the inside surface of the door.
7. Place the coarse brown pad onto the telescopic extension pole and use it to scrub the entire chamber surface.
8. Spray the chamber walls with the diluted cleaning solution again.

Figure 3-7. Spray Chamber with Diluted Cleaning Solution

9. Replace the brown coarse pad with the white pad and scrub the entire chamber surface once more.
10. Empty the pump-up sprayer and rinse it with tap water once you are done scrubbing down the surface.
11. Fill the pump-up spray bottle with tepid tap water.
12. Flush sterilizer chamber surfaces and inside of the sterilizer door thoroughly at least two times with tap water. Make sure to eliminate all detergent residue. If not removed, detergent residue may become visible upon heating of the chamber and may cause damage to the chamber surface.
13. Take a lint-free microfiber cloth, place it on the end of the telescopic extension pole, and wipe down the sterilizer chamber walls. You may need to use a few microfiber cloths to achieve the desired dry and clean look.
14. Refill the pump-up sprayer container with more tap water if necessary to ensure proper rinsing. Spray thoroughly to remove all residual chemistry from the chamber. If it is not removed, there is a potential for detergent residue to be visible on the chamber wall when you run your next full cycle.

    NOTE: Tap water may puddle on the bottom of the chamber. This is normal and should drain completely after 10 minutes. If the water does not drain completely, it may be necessary to turn the unit on, initiate a cycle, wait 10 seconds, and immediately abort it. The cycle/abort action opens the sterilizer drain, draining the water from the chamber.

CAUTION

TAP WATER NOT DRAINING

⚠

If water does not drain after first attempt, take the following action:

- Turn off the unit and its power supply.
- Contact STERIS Service to allow a STERIS Technician to assess the issue.
- Do not reattempt to initiate a cycle and abort a second time.

15. Drain strainer should also be cleaned following chamber cleaning to remove any debris resulting from the cleaning process. Refer to *Section 3.5, Drain Strainer Routine Cleaning Procedure*.
16. Replace the sterilizer rack and shelves, if applicable, using the reverse of the removal procedure.

17. Return the unit to operation.
18. Run a Warm-up Cycle, followed by a DART® Air Removal Test Cycle for flushing and testing purposes.
19. Clean up the area you are working in and put all supplies back into the ChamberCare™ Pro Kit box.
20. Rinse the pump-up sprayer thoroughly.
21. Empty the water from the pump-up sprayer used for rinsing and store containers in a manner that promotes drying until needed for further use.

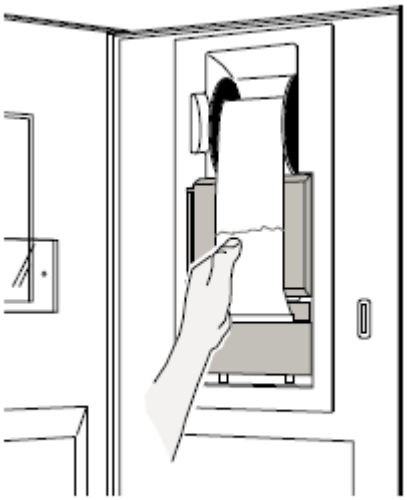
3.8 Loading Equipment Cleaning Procedure

1. Spray the loading car and transfer carriage with diluted Prolystica™ HP Neutral Manual Cleaner cleaning solution and remove any soil with a damp cloth.
2. Rinse thoroughly with water and dry with a lint free cloth.
3. For rack and shelves, remove rack and shelves according to instructions in the sterilizer operator manual and place in a large sink.
4. Using the sprayer, apply diluted Prolystica HP Neutral Manual Cleaner to the surface and with a dampened cloth remove any soil.
5. Rinse thoroughly using tap water and dry with a soft, lint-free cloth.
6. Replace the sterilizer rack and shelves using the reverse of the removal procedure.

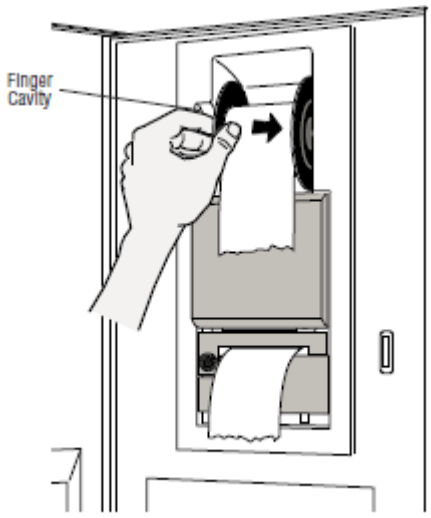
3.9 Change Printer Paper Roll

The printer paper roll should be changed whenever a colored stripe is visible on one or both edges of the printout paper.

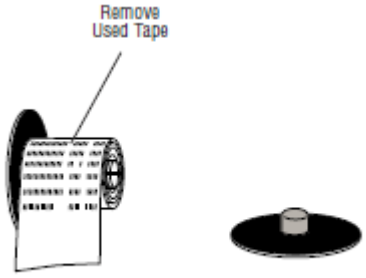
1. Tear paper between take-up spool and printer.



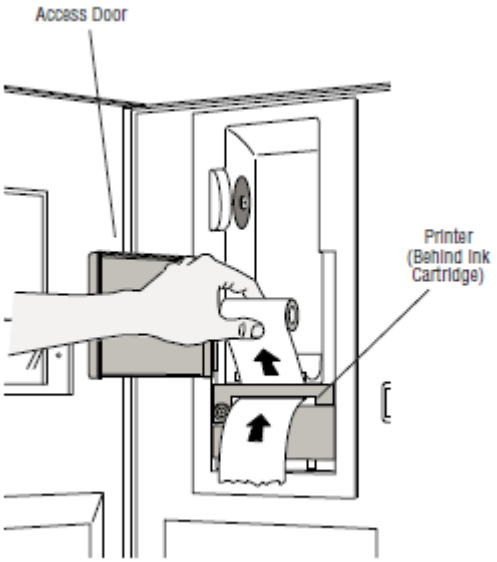
2. Remove take-up spool from drive by inserting fingers in cavity as shown and pushing spool to the right.



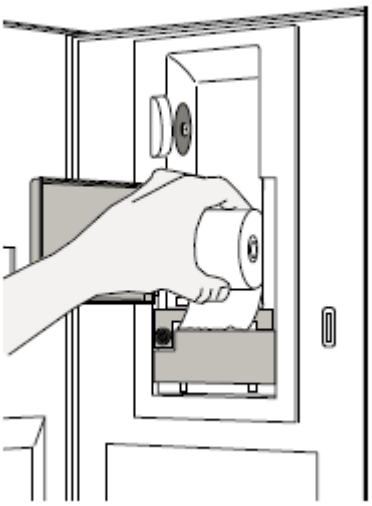
3. Pull off right end of spool and remove used paper roll from spindle.



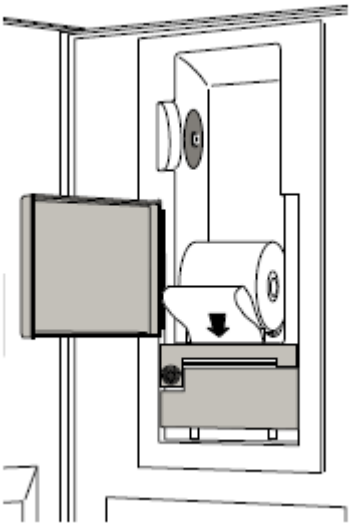
4. Open access door and remove old paper roll, **gently** pulling any remaining tape up and out of printer.



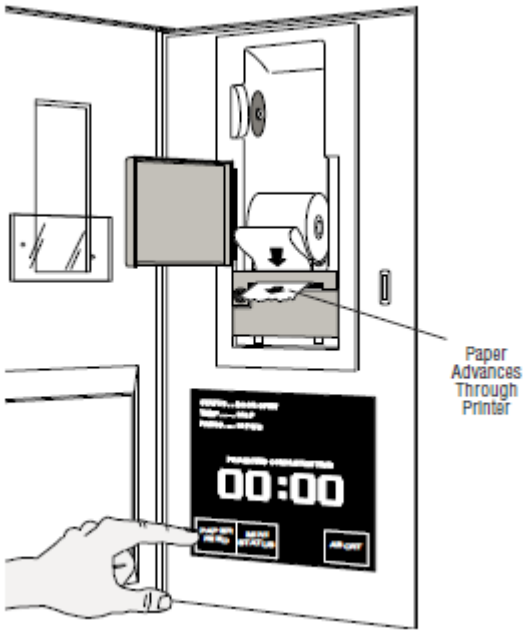
5. Insert new paper roll.



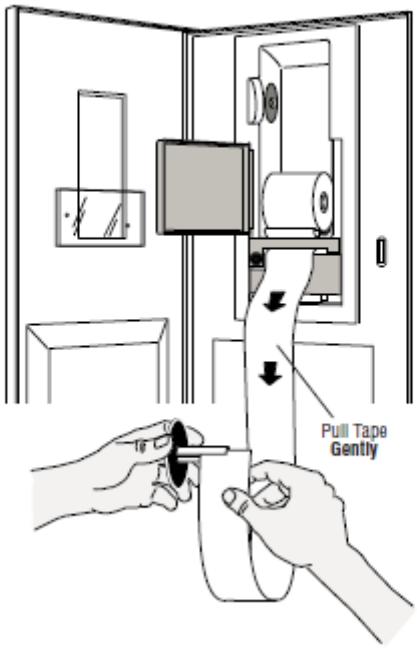
6. Insert end of paper into printer slot just behind ink cartridge.



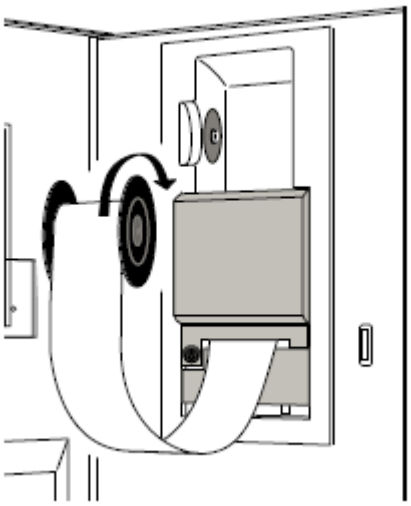
7. Press **PAPER FEED** touch screen pad on display until paper advances through printer and ink cartridge, exiting the front.



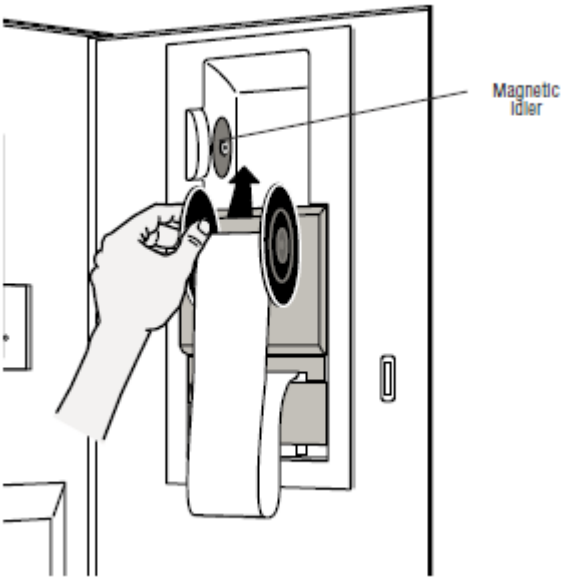
8. Continue pressing **PAPER FEED** (or pull tape gently) until about 18" (457 mm) of paper hangs out of printer. Insert end of paper into slot of take-up spool, then replace right end of spool.



9. Rotate spool in direction shown until paper is secure.



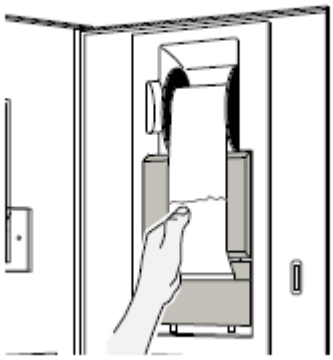
10. Reinstall take-up spool on magnetic idler. Manually roll up slack paper.



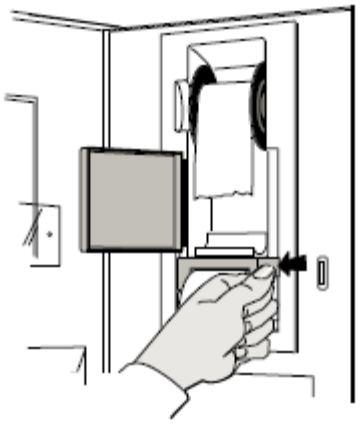
3.10 Change Printer Ink Cartridge

The printer ink cartridge should be changed as soon as the type on printouts is light or faded, and before printouts become difficult to read.

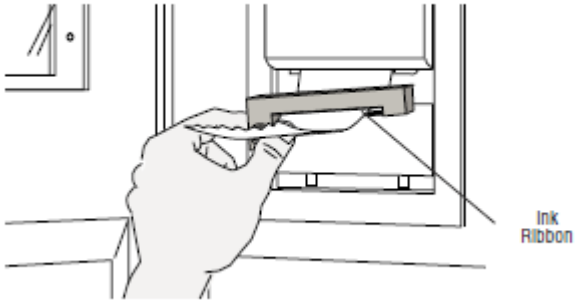
1. Tear paper between take-up spool and printer.



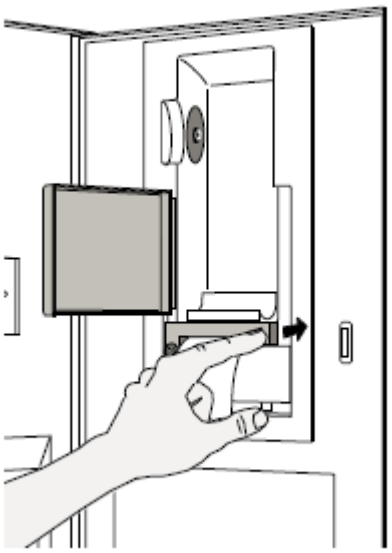
2. Open access door, then press on right end of ink cartridge, until left end of cartridge pops out of the printer.



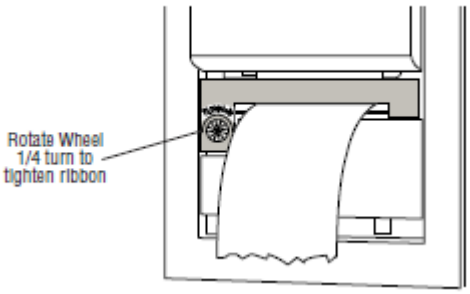
3. Slip cartridge off end of paper tape, slip new cartridge over tape in the same way as before, making sure paper tape slides between ink cartridge housing and ink ribbon.



4. Install left end of cartridge first, then push right end in as shown, snapping it into place.



5. Retighten ribbon by rotating wheel on left side of cartridge 1/4 turn. Then refer to *Section 3.9, Change Printer Paper Roll* to reinstall take-up spool.



3.11 Replace Door Seal

If the door seal requires replacement, perform the following:

1. Use a tongue depressor or similar non-metal tool to pry and twist one section of the seal from the groove. Refer to *Figure 3-8*.
2. Grasp the raised section of the seal and pull the remainder from the end-ring groove.
3. Examine the end ring groove for debris or residue. Clean if necessary.
4. Install new seal as follows:

   NOTE: When replacing the door seal, note the following

   a. Ensure date information molded into rear of seal (refer to *Figure 3-9*) is at the bottom of the groove.

   b. Reference indicators are located inside the rear groove of door seal, at the middle of each side (refer to *Figure 3-9*).

   - **Do not** use a sharp instrument to install the seal.
   - **Do not** stretch the seal.

i. Align right and left reference indicators with the screws attaching the end frame to the support stand, align top and bottom indicators with the ports in the top and bottom of the end ring frame.

ii. Press seal in at each reference point with fingertips.

iii. Press remainder of the seal into end-ring groove, starting at the corners.

5. Test installation.

   a. Attempt to close the door. If the door jams or sticks at any point in its travel check to ensure the seal has been fully pressed into the groove.

   b. Run a shortened test cycle to determine if the door seals adequately. If steam leaks from around the door or the seal, abort the cycle and examine the seal to ensure it has been properly seated in the end-ring groove. Once re-seated, run another test cycle. If the door fails to seal following the second test, another problem may exist. Contact your supervisor before using the sterilizer further.

   c. At the end of cycle, ensure seal has retracted fully into the groove.

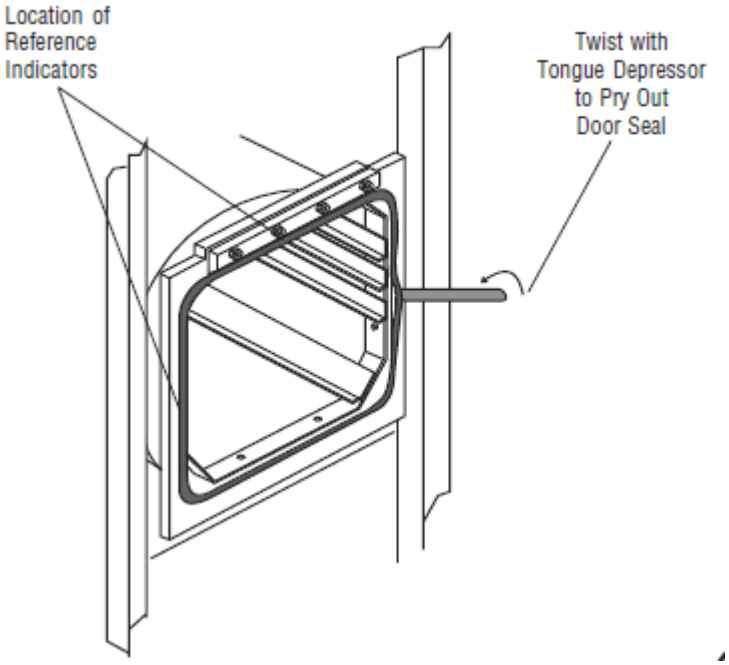


Figure 3-8. Remove Door Seal

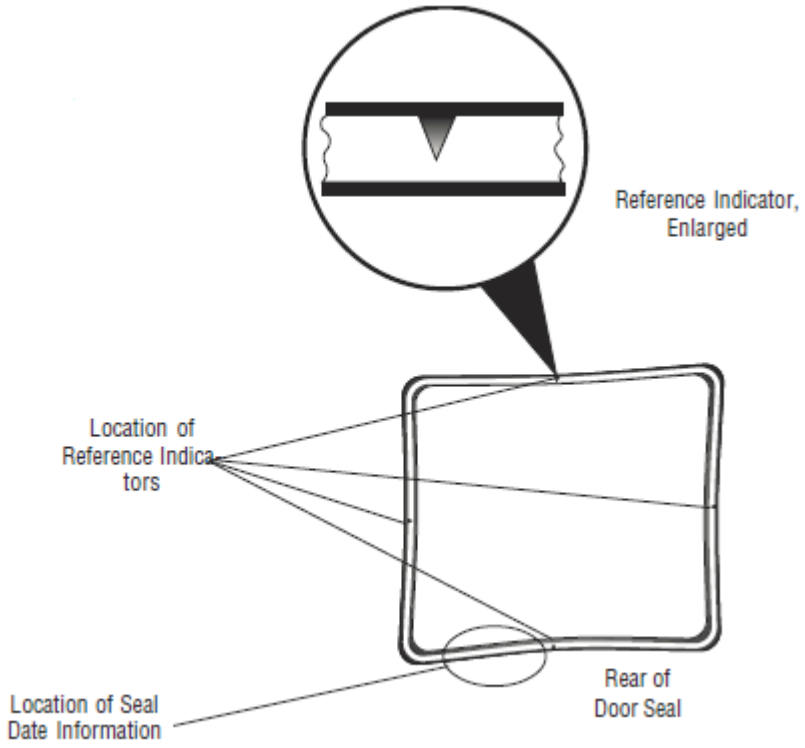


Figure 3-9. Location of Seal Date Information and Reference Indicators

Service Procedures

4.1 Introduction – Service Procedures

WARNING

BURN HAZARD

⚠ Before performing any cleaning or maintenance procedures, allow sterilizer, generator (if applicable) and accessories to cool to room temperature.

CAUTION

POSSIBLE EQUIPMENT DAMAGE

⚠ Sterilization of chloride containing solutions (e.g., saline) can cause chamber corrosion and is not recommended by the manufacturer. If, however, chloride- containing solutions must be processed, clean the chamber after each use.

The material in this section of the manual is provided to allow for servicing components of the sterilizer most likely to need attention. These procedures are more advance than cleaning and replacing expendables (such as printer paper and door seals). These procedures should always be performed by an experienced, trained service technician.

4.2 Air Filter Replacement

Refer to *Figure 4-1* for location.

The purpose of the bacterial air filter is to filter incoming air. The system is exposed to contamination whenever the filter or the air lines below the filter are opened. Keep these components as clean as possible when servicing. The bacterial air filter contains a replaceable filter cartridge.

1. Remove bowl from filter body by loosening retaining nut.
2. Remove the old filter element and discard.
3. Insert new filter element into the bowl.
4. Replace bowl and tighten retaining nut.

4.3 Clean Strainers

WARNING

BURN HAZARD

⚠ Failure to shut off the steam supply when cleaning or replacing strainers can result in serious injury.

Refer to *Figure 4-1* for location of strainers.

The strainers should be opened for cleaning after initial start-up and at least twice a year thereafter. Accumulation of sediment and rust reduces pressure and flow. In extreme conditions, blockage may occur.

- **Disassembly**

  Shut off supply and vent pressure in line by running a short sterilizer cycle. Abort the cycle when no pressure is present in the steam or water lines.

  1. Shut off water and steam supplies.
  2. Remove hex plug and gasket.
  3. Pull strainer and screen from body.
  4. Scrape and polish all rust and residue from strainer screen and body. Use a wire brush or steel wool. Ensure all perforations are clear by poking open with a wire. Replace screen if damaged, rusted or corroded.

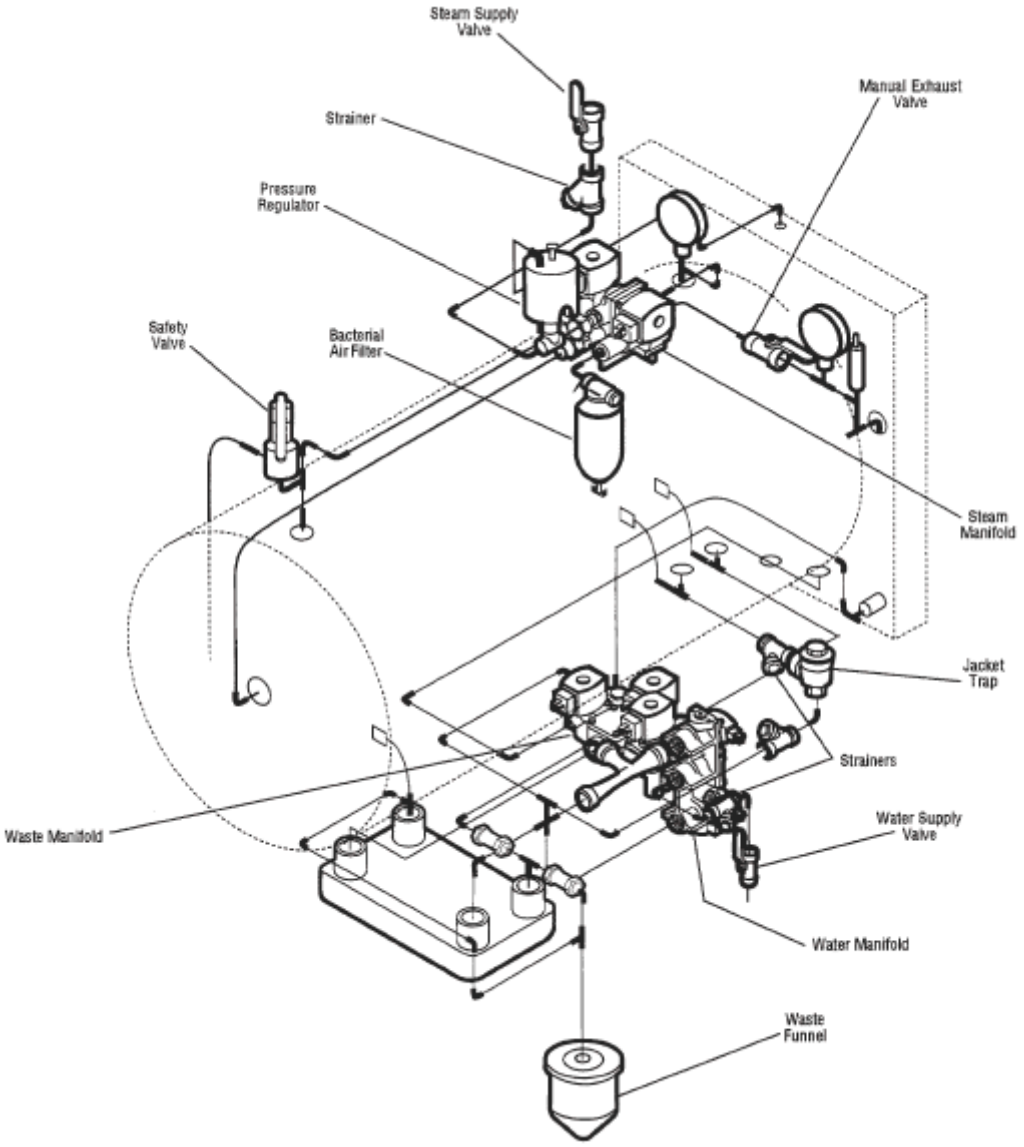


Figure 4-1. Serviceable Components

- **Reassembly**

1. Insert screen into strainer body. Take care that no dirt or other particles remain in strainer body.
2. Replace and tighten hex plug. Use a new gasket if necessary.
3. Ensure all pipe connections are tight after assembly.

4.4 Steam Trap Replacement

WARNING

BURN HAZARD

⚠ Before performing any cleaning allow sterilizer and generator (if applicable) to cool to room temperature.

⚠ Jacket pressure must be at 0.0 psig before beginning work on the steam trap.

CAUTION

POSSIBLE EQUIPMENT DAMAGE

⚠ Allow thermostatic traps to cool to room temperature before removing cover. Since there is nothing to limit expansion, the bellows may rupture or fatigue if trap is opened while hot.

Refer to *Figure 4-1* for location.

- **Disassembly**
  1. Using a suitable wrench, unscrew and remove cap and attached diaphragm assembly.
  2. Remove seat from body using a hex socket wrench.
  3. Wipe out bowl taking care that loose material does not enter the piping.
- **Reassembly**
  1. Screw new seat in firmly. (Use a socket head wrench to tighten.)

     NOTE: Seat and diaphragm are a lapped pair.
  2. Install new diaphragm.
  3. Replace cap and attached diaphragm assembly, using a new gasket.
  4. Check for leaks.

4.5 Valves

This section includes the following:

Clean or Replace Piping Check Valves

Repair of check valves is limited to cleaning of valve seats and/or replacing seal rings when foreign matter causes improper operation. When a valve becomes defective, the entire valve must be replaced or repaired with the appropriate Seal Kit. Refer to **Illustrated Parts Breakdown** in Maintenance Manual (P764326797) for correct check valve part number.

Clean or Replace Manifold Check Valves

Repair of check valves is limited to cleaning valve seats when foreign matter causes improper operation. If the seat itself is damaged, the valve can be repaired according to the instructions in the Manifold Repair Kit. Refer to **ILLUSTRATED PARTS BREAKDOWN** in Maintenance Manual (P764326797) for correct Manifold Repair Kit part number.

Rebuild Manifold Solenoid Valves

Solenoid valves can be rebuilt following the instructions included in the manifold repair kit. Refer to **ILLUSTRATED PARTS BREAKDOWN** in Maintenance Manual (P764326797) for correct Manifold Repair Kit part number.

Safety Valve Test

WARNING

BURN HAZARD

⚠ Proper testing of the safety valve requires the valve to be under pressure. Exhaust from the safety valve is hot and can cause burns. Proper safety attire (gloves, eye protection, insulated overalls) as designated by OSHA, is required. Testing is to be performed by qualified service personnel only.

CAUTION

POSSIBLE EQUIPMENT DAMAGE

⚠ Actuation at less than 75% of rated pressure can allow debris to contaminate the seat and cause the safety valve to leak. A leaking safety valve must be replaced.

The safety valve is to be tested periodically. This procedure can also be used test the optional integral steam generator's safety valve (if applicable).

- Prevent damage during testing by ensuring at least 75% of rated pressure is in the chamber. Check current pressure level by observing chamber pressure gauge (located behind front access door).
- Open try lever and hold valve open for one to two seconds
- Allow try lever to snap shut.

Pressure Regulating Valve Adjustment

Any adjustments to this valve should be performed by a qualified service technician. Improper adjustments to this valve may result in inadequate sterilizer operation.

Troubleshooting

5.1 General

WARNING

PERSONAL INJURY AND/OR EQUIPMENT DAMAGE HAZARD

⚠ Repairs and adjustments to this equipment must be made only by fully qualified service personnel. Maintenance performed by inexperienced, unqualified persons or installation of unauthorized parts could cause personal injury or result in costly equipment damage.

WARNING

ELECTRIC SHOCK HAZARD

⚠ Disconnect all utilities to sterilizer before servicing..

WARNING

BEFORE PERFORMING ANY CLEANING OR MAINTENANCE PROCEDURES, ALLOW STERILIZER AND GENERATOR (IF APPLICABLE) TO COOL TO ROOM TEMPERATURE.

⚠

This section describes all the possible alarm conditions which may occur when operating the sterilizer.

If a problem occurs not described in this section, contact STERIS. A trained service technician will promptly place your sterilizer in proper working condition.

NOTE: Never permit unqualified persons to service the sterilizer.

Typical Alarm Screen

When an alarm condition occurs, the alarm buzzer sounds and the touch screen automatically displays the corresponding alarm screen. Typically, each alarm screen indicates the alarm name, current chamber status, current sterilizer activity and operator instructions (see *Figure 5-1* and *Figure 5-2*).

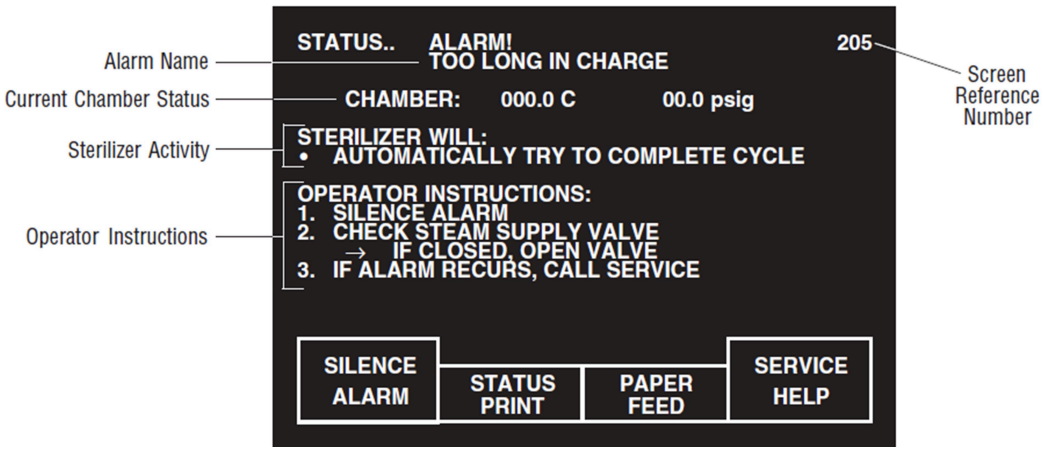


Figure 5-1. Typical Alarm Screen – Life Sciences Only

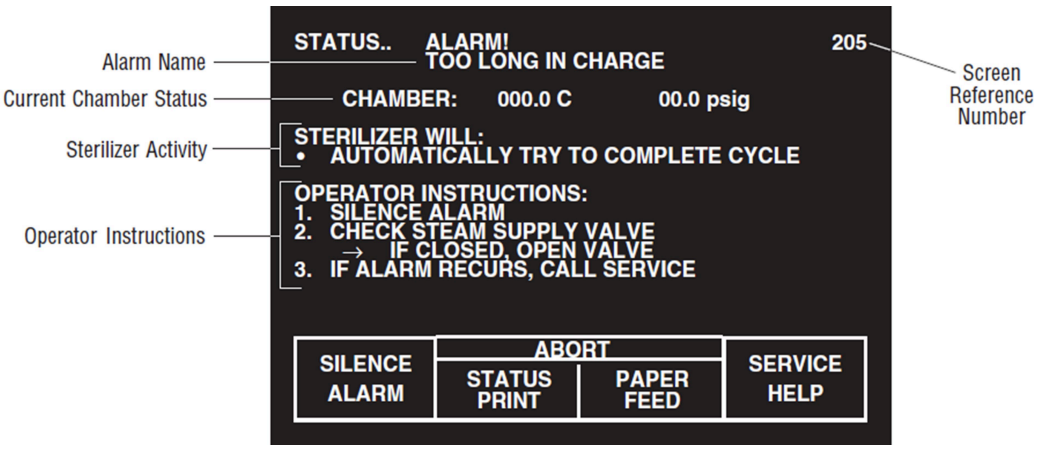


Figure 5-2. Typical Alarm Screen – Healthcare Only

Touch screen buttons, located along bottom of alarm screen, are used to perform the following functions.

- Pressing **SILENCE ALARM** turns off alarm buzzer.
- Pressing **STATUS PRINT** generates a printout of current temperature and pressure in sterilizer chamber at the time the button was pressed.
- Pressing **PAPER FEED** advances printer paper up by one line.
- Pressing **SERVICE HELP** advances display to the corresponding service information screen. This screen provides the qualified service technician with possible causes and advanced corrective actions for that alarm condition.

IMPORTANT: *In the event of an alarm condition, the operator should always follow the instructions indicated on the alarm screen.*

Typical Alarm Printout

When an alarm occurs the printer automatically generates a printout, typically listing alarm name, time alarm occurred, current chamber status and any associated sensor temperature. See *Figure 5-3*.

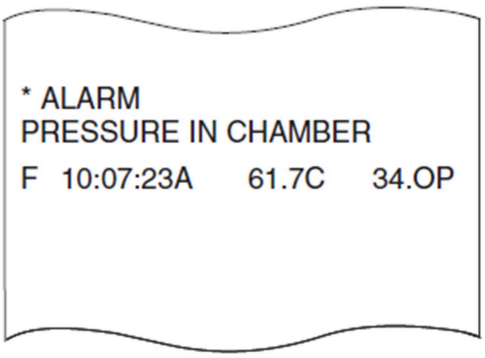


Figure 5-3. Typical Alarm Printout

5.2 Aborts But No Alarm

Condition

Program aborts with low or no pressure rise during purge without creating an alarm.

General Troubleshooting	Additional Information
Faulty S2 or S9 valve or dislodged S2/S9 O-ring.	1. Contact STERIS.

5.3 ADC Failure

Condition

Occurs if the Analog to Digital Convertor on the main control circuit board fails. The measured temperature of the fixed 110 ohm resistor is above 104.0°F or below 53.6°F for 5 seconds.

General Troubleshooting	Additional Information
ADC needs reset	1. Silence alarm and remove load. Cycle power and run a test cycle. 2. If test cycle fails, contact STERIS.

5.4 Atmospheric Pressure

Condition

Occurs if atmospheric pressure is more than 1 psi or 2 inHg from calibrated atmospheric pressure when door is opened or closed, exiting standby mode, or during power up.

Review cycle tapes and service alarm log for alarm frequency and cycle relevance.

General Troubleshooting	Additional Information
Silence alarm.	1. Fully open and close the door once. Attempt to start a cycle. 2. If alarm recurs, contact STERIS.

5.5 Board Over Temperature Failure

Condition

Occurs if main control circuit board exceeds acceptable environmental conditions.

Review cycle tapes and service alarm log for alarm frequency and cycle relevance.

General Troubleshooting	Additional Information
Ambient temperature exceeds 90 F (32 C).	1. Utility room temperature must be 90F or below. Contact Facilities for verification and to repair HVAC if necessary. 2. Contact STERIS

5.6 Chamber Pressure Transducer Failure

Condition

Occurs if chamber pressure reading is above 49 psig or vacuum above 32.9 inHg for five seconds.

Review cycle tapes and service alarm log for alarm frequency and cycle relevance.

General Troubleshooting	Additional Information
Reset ADC	1. Remove load. Cycle power and run a test cycle. 2. If test cycle fails, contact STERIS.

5.7 Chamber Pressure/Temperature Failure

Condition

Two conditions can cause this alarm to print:

1. Chamber temperature is greater than 250°F (121°C) and pressure is less than 11 psig or 270°F (132°C) and pressure is less than 20 psig.
2. Chamber and jacket temperature are more than 10°F apart.

Review cycle tapes and service alarm log for alarm frequency and cycle relevance.

General Troubleshooting	Additional Information
Software Issue.	1. Cycle power (switch on control box). 2. Remove load and clean chamber drain strainer per *Section ,* . Run test cycle. 3. If alarm recurs, contact STERIS.

5.8 Chamber Temperature Probe Failure

Condition

Occurs if temperature reading is outside the normal range of 32 - 310 F (0 - 154 C) for five seconds.

Review cycle tapes and service alarm log for alarm frequency and cycle relevance.

General Troubleshooting	Additional Information
Temperature reading is outside the normal range.	1. Silence alarm. Cycle power and run a test cycle. 2. If test cycle fails, contact STERIS.

5.9 Bowie-Dick Test Failed

Condition

Bowie-Dick Test failed.

NOTE:

A leak in the sterilizer or facility steam piping may have a venturi effect causing air to be drawn into the steam supply when the chamber is calling for steam. There may not be a continuous steam leak from the piping. For example, a fault at the steam to chamber valve may show up as a quick steam burst at the beginning of charge. After the burst, there would be no apparent leak because air is being drawn in through the leak.

General Troubleshooting	Additional Information
Expired test indicator.	1. Rerun test with different date code.
Indicator faulty.	1. Check DART indicator date codes for expired indicators. 2. Verify indicator by running one from same lot in alternate sterilizer. 3. Run Bowie-Dick Test with alternate date code indicator. Refer to Biological and Bowie-Dick Testing Needed After Sterilizer Repair after repair. 4. Contact STERIS.
Chamber drain strainer obstructed.	1. Allow chamber to cool, remove load. Clean chamber drain strainer. Run test cycle. 2. If alarm recurs, contact STERIS.

5.10 Display Issues

Condition

No Audio Tones, Touch Screen Slow to Respond or Does Not Respond, Display Blank, Display Frozen

General Troubleshooting	Additional Information
Control locked (frozen screen).	1. Reset control and retest.

5.11 Door A Seal Switch Failure PS1

Condition

Occurs if seal switch (PS1) closes out of cycle or switched neutral relay (NS2) associated with door seal A closed switch fails.

Review cycle tapes and service alarm log for alarm frequency and cycle relevance.

General Troubleshooting	Additional Information
Silence alarm.	1. Remove the load. Cycle power and run a test cycle. 2. If fault recurs, contact STERIS

5.12 Door Switch Failure

Condition

Occurs in cycle when the door switch opens but the seal pressure switch indicates that the door is sealed. The sterilizer will automatically abort and exhaust the chamber.

General Troubleshooting	Additional Information
Silence alarm	1. Remove load. Cycle power and run a test cycle. 2. If test cycle fails, contact STERIS.

5.13 Door Unsealed (OE door) or Door Unsealed B (NOE door)

Condition

Occurs in all cycles. Occurs if steam pressure in door seal drops below 10 psig for five seconds while a cycle is running, and door seals have been activated. Cycle aborts.

Review cycle tapes and service alarm log for alarm frequency and cycle relevance.

General Troubleshooting	Additional Information
Steam supply	1. For house steam, contact maintenance to ensure steam supply is 50-80 PSIG. 2. For electric steam generator, ensure generator supply valve is open. 3. Ensure generator drain valve is closed. 4. Cycle power and verify the generator pump comes on. If it does not, contact STERIS. 5. If it does, press reset on safety pressure control on generator and verify pressure increases. If it does not, contact STERIS. 6. If it does, run a test cycle. If alarm recurs, contact STERIS.

5.14 Emergency Stop Pressed

Condition

Occurs if emergency stop switch has been pressed or no 120 Vac power detected on I/O board.

Review cycle tapes and service alarm log for alarm frequency and cycle relevance.

General Troubleshooting	Additional Information
Silence alarm.	1. Re-set E-stop switch if tripped. 2. If re-occurs, contact STERIS
E-stop accidentally pressed	1. Verify E-stop is pressed. Obtain E-stop key and reset E-stop. Wait for cycle to abort. Restart the cycle.

5.15 Exhaust Rate Too Fast

Condition

Occurs only in liquid cycle if chamber pressure is 1.0 psig above the fixed rate during slow exhaust phase.

Review cycle tapes and service alarm log for alarm frequency and cycle relevance.

General Troubleshooting	Additional Information
Silence alarm.	1. Re-run cycle, if fault re-occurs, contact STERIS.

5.16 Exhaust Rate Too Slow

Condition

Occurs only in Liquid cycle, if chamber pressure is 1.0 psig below the fixed rate during slow exhaust phase.

General Troubleshooting	Additional Information
Chamber strainer clogged.	1. After allowing chamber to completely cool, remove load, clean chamber drain strainer. Run test cycle. 2. If alarm recurs, contact STERIS.

5.17 Generator — All elements have short life.

Condition

General Troubleshooting	Additional Information
Contact STERIS	1. Contact STERIS

5.18 Generator — Control Power Is OFF

Condition

No control power at generator.

General Troubleshooting	Additional Information
Generator control power is off.	1. Contact STERIS

5.19 Generator – Failure to Build Pressure

Condition

Steam generator is slow or fails to reach operating pressure of 80 PSIG.

General Troubleshooting	Additional Information
Generator supply valve closed	1. Open supply valve.
Drain valve left open.	1. Close drain valve.
Generator pump	1. Cycle power and verify the generator pump comes on. If it does not, contact STERIS. 2. If it does, press reset on safety pressure control on generator and verify pressure increases. If pressure does not increase, contact STERIS.

5.20 Generator — Heater element has open circuit.

Condition

Element looks OK but Ohmmeter check shows infinite resistance

NOTE:

Causes a localized hot spot which melts the wire inside the element. Fault in water level control system. Elements damaged in this way may be distorted.

NOTE:

If generator is undersized for its application, heaters will be overworked and reach end of life sooner.

General Troubleshooting	Additional Information
Contact STERIS	1. Contact STERIS

5.21 Generator — Heater element has developed a ground fault.

Condition

When this occurs, a hole may be formed in the sheath material, allowing water to enter the element.

General Troubleshooting	Additional Information
Heater element failure. Generator does not build steam pressure.	1. Contact STERIS

5.22 Generator — Heater gasket leaks after a short period of operation.

Condition

General Troubleshooting	Additional Information
Contact STERIS	1. Contact STERIS

5.23 Generator — Steam generation does not work.

Condition

Control power is ON. No steam pressure building in the steam generator.

General Troubleshooting	Additional Information
High limit pressure switch tripped.	1. Reset switch. 2. If generator still does not build steam pressure, contact STERIS.

5.24 Generator — Pump noisy.

Condition

General Troubleshooting	Additional Information
Water supply line pressure too low.	1. Verify with facilities water pressure is within specification 20-50 PSIG.

5.25 Generator — Pump starts (power) but does not run or fill.

Condition

No water is being pumped into the generator.

General Troubleshooting	Additional Information
Generator supply valve closed.	1. Open supply valve.
Generator drain valve open.	1. Close drain valve.
Generator pump	1. Cycle power and verify the generator pump comes on. If it does not, contact STERIS. 2. If it does, press reset on safety pressure control on generator and verify pressure increases. If pressure does not increase, contact STERIS.
Water supply line pressure too low.	1. Verify with facilities water pressure is within specification 20-50 PSIG.

5.26 Generator — Steam generator is flooded

Condition

General Troubleshooting	Additional Information
Contact STERIS	1. Contact STERIS

5.27 Generator — Steam pressure fluctuates dramatically under load.

Condition

General Troubleshooting	Additional Information
Contact STERIS	1. Contact STERIS

5.28 Generator — Threaded connection leak over time

Condition

General Troubleshooting	Additional Information
High alkalinity in steam generator water attacks pipe sealant and metal.	1. Maintain steam generator water quality with proper blowdown and drain and flush cycles (soft water). 2. Increase frequency of steam generator maintenance. 3. Improve water quality. Contact STERIS for assistance with improvements if necessary.

5.29 Generator — View ports empty. Generator functioning normally.

Condition

General Troubleshooting	Additional Information
Contact STERIS	1. Contact STERIS

5.30 Generator — No water in view ports. Pump does not start.

Condition

General Troubleshooting	Additional Information
Contact STERIS	1. Contact STERIS

5.31 Generator – Water leakage at heater flange

Condition

Water leaking from between heater flange and boiler flange.

General Troubleshooting	Additional Information
Water leaking issue.	1. Contact STERIS

5.32 Generator — Water leakage at heater element to flange junction

Condition

General Troubleshooting	Additional Information
Contact STERIS	1. Contact STERIS

5.33 Generator - Water Level Control Issue

Condition

Generator water level is too high or too low.

General Troubleshooting	Additional Information
Contact STERIS.	1. Contact STERIS.

5.34 I/O Board #1 Failure

Condition

Occurs if switched neutral relay circuit failed operational contact test. A safety interlock switch input does not match the corresponding switched neutral relay input for 5 seconds.

General Troubleshooting	Additional Information
Contact STERIS	1. Contact STERIS

5.35 I/O Board Communication Failure

Condition

The I/O board fails to achieve communication with board #1, #2, or #3 in the control box.

General Troubleshooting	Additional Information
Silence alarm	1. Remove load. Cycle power and run a test cycle. 2. If test cycle fails, contact STERIS.

5.36 Jacket Temperature Probe Failure

Condition

Occurs if temperature reading is outside the normal range of 32 - 310 F (0 - 154 C) for five seconds.

Review cycle tapes and service alarm log for alarm frequency and cycle relevance.

General Troubleshooting	Additional Information
ADC needs reset	1. Remove load. Cycle power and run a test cycle. 2. If test cycle fails, contact STERIS.

5.37 Leak Rate Test

Condition

Verified leak rate (millimeters of mercury [mm Hg] per minute) is calculated by control over a timed 10-minute period and is included in cycle printout. A leak rate of 1 mm Hg/minute or less is considered acceptable.

Review cycle tapes and service alarm log for alarm frequency and cycle relevance.

Sterilizer should be warm before running this test cycle. If no other cycle has been completed on this sterilizer before leak test, run a Dart Warm Up cycle.

General Troubleshooting	Additional Information
Sterilizer cold	1. Run a Dart Warm Up cycle.
Chamber drain strainer clogged.	1. Clean chamber drain strainer. Rerun cycle, if fails again contact STERIS.

5.38 Load Temperature Probe Failure

Condition

Occurs if load temperature reading is outside the normal range. (Life Sciences program option only.)

General Troubleshooting	Additional Information
Silence alarm	1. Remove load. Cycle power and run a test cycle. 2. If test cycle fails, contact STERIS.

5.39 Over Sterilize Temperature * Over Temp

Condition

Occurs in all sterilize cycles. Occurs if chamber temperature exceeds maximum sterilize temperature (sterilize temperature + over temperature value).

- Over temperature value is 2 F or 3 F if sterilize temperature is over 260 F (127 C) or
- 1.3 F if sterilize temperature is 260 F (127 C) or less.

Review cycle tapes and service alarm log for alarm frequency and cycle relevance.

General Troubleshooting	Additional Information
Steam pressure	1. House steam, contact facilities to verify steam pressure is 30-50PSIG 2. Electric generator, ensure pressure gauge is less than 60 PSIG. 3. Open the door, cycle power then rerun cycle. If fault recurs, contact STERIS.

5.40 Pressure in Chamber

Condition

Occurs any time while out of cycle and more than 2 psig but less than 50 psig pressure is sensed in the chamber for minimum of two seconds. Automatically tries to exhaust chamber to atmospheric. S7 activated for one minute minimum. Alarm clears when pressure in chamber is between 0.75 psig and 1 inHg. Occurs whether door(s) are open or closed.

Review cycle tapes and service alarm log for alarm frequency and cycle relevance.

General Troubleshooting	Additional Information
Silence alarm.	1. Open the door to attempt to reset the atmospheric pressure, then close the door and lock it. Rerun a cycle. 2. If alarm recurs, contact STERIS.

5.41 Printer Issues

Condition

Printer issue.

General Troubleshooting	Additional Information
Print is not legible.	1. Verify correct paper is used. 2. Verify printer ribbon is installed properly. 3. Replace ribbon.
Printout is blank.	1. Verify paper is installed in correct direction. 2. Verify paper is not catching on sides. 3. Verify ribbon is installed correctly. 4. Replace ribbon.
Print is light.	1. Verify installation and operation of printer ribbon. 2. Replace ribbon.

5.42 Power Failure

Condition

DC power to control box was interrupted.

General Troubleshooting	Additional Information
Contact STERIS	1. Contact STERIS

5.43 Random Access Memory (RAM) Failure

Condition

Occurs if Random Access Memory (RAM) on main control circuit board fails.

General Troubleshooting	Additional Information
Silence alarm.	1. Remove load. Cycle power and run a test cycle. 2. If test cycle fails, contact STERIS.

5.44 Read Only Memory (ROM) Failure

Condition

Occurs if the Read Only Memory (ROM) on the main control circuit board fails.

General Troubleshooting	Additional Information
Silence alarm.	1. Remove load. Cycle power and run a test cycle. 2. If test cycle fails, contact STERIS.

5.45 Real Time Clock (RTC) Failure

Condition

Occurs if Real Time Clock (RTC) on main control circuit board fails. RTC must continually test against board CPU clock every five minutes for ±3 seconds.

Review cycle tapes and service alarm log for alarm frequency and cycle relevance.

General Troubleshooting	Additional Information
Silence alarm.	1. Remove load. Cycle power and run a test cycle. 2. If test cycle fails, contact STERIS.

5.46 Recorder Deviation

Condition

Occurs if the two temperature sensing elements in chamber drain probe read more than 1°F (0.5° C) apart at end of sterilize phase.

Review cycle tapes and service alarm log for alarm frequency and cycle relevance.

General Troubleshooting	Additional Information
Print out shows temp over 300°F.	1. Cycle power to reset ADC and rerun cycle. If fault recurs, contact STERIS.
Print out shows temp under 300°F.	1. Silence alarm, cyle power then rerun cycle. If fault recurs, contact STERIS.

5.47 Reference Drain Deviation

Condition

Occurs if chamber temperature varies ±2°F (1°C) from the reference temperature. (Life Sciences program option only.)

General Troubleshooting	Additional Information
Silence alarm	1. Remove load. Cycle power and run a test cycle. 2. If test cycle fails, contact STERIS.

5.48 Relay #1 Failure

Condition

Occurs if switched neutral relay associated with door seal A, door seal B, and the chamber float switch fails

General Troubleshooting	Additional Information
Silence alarm	1. Remove load. Cycle power and run a test cycle. 2. If test cycle fails, contact STERIS.

5.49 Relay #2 Failure

Condition

Occurs if switched neutral relay associated with door seal or door switch fails

General Troubleshooting	Additional Information
Control needs reset.	1. Silence alarm.
E-stop is pressed.	1. Verify E-stop is not pressed. Reset if needed.
Control needs to be reset.	1. Remove load. Cycle power and run a test cycle. 2. If test cycle fails, contact STERIS.

5.50 Relay #3 Failure

Condition

Occurs if switched neutral relay associated with door seal or door switch fails on double door.

General Troubleshooting	Additional Information
Silence alarm.	1. Remove load. Cycle power and run a test cycle. 2. If test cycle fails, contact STERIS.

5.51 Steam Leak/Dislocated Seal with Door Open

Condition

There is a steam leak/dislocated seal with door open.

General Troubleshooting	Additional Information
Dislocated seal.	1. Contact facility biomedical department to reinsert door seal. 2. If leak continues, contact STERIS.

5.52 Testing Memory Appears on Screen and Does Not Clear

Condition

TESTING MEMORY appears on screen and does not clear.

General Troubleshooting	Additional Information
The control program has become corrupted.	1. Contact STERIS.

5.53 Too Long in Air Break

Condition

Prevac, Gravity or SFPP (dry time>0), air break. Occurs if chamber does not air break to less than 2 inHg within allotted time.

Liquid, vapor removal. Occurs if chamber does not air break to less than 2 inHg within allotted time.

Review cycle tapes and service alarm log for alarm frequency and cycle relevance.

NOTE:

SFPP is available only on Millennium.

General Troubleshooting	Additional Information
Silence alarm.	1. If alarm continues for more than two minutes, abort cycle. 2. Cycle power, then re-run cycle. If fault recurs, contact STERIS.

5.54 Too Long in Charge

Condition

All cycles, Charge: Alarm occurs if chamber does not reach set temperature within allotted time. Alarm clears when chamber reaches sterilize temperature. Prevac, Vacuum Pulse: Alarm occurs if cycle sterilization temperature is:

- ≤ 260 F (127 C) - and chamber pressure is not ≥14 psig.
- 260 F (127 C) and < 275 F (135 C) - and chamber pressure not ≥26 psig.
- ≥275 F (135 C) - chamber pressure not ≥30 psig.

SFPP, Pressure Pulse Steam Flush, occurs if chamber pressure is not at least 7 psig within allotted time. SFPP, Pressure Pulse Vacuum Pulse, occurs if chamber temperature is not =>270 F (132 C) within allotted time.

Review cycle tapes and service alarm log for alarm frequency and cycle relevance.

General Troubleshooting	Additional Information
Steam Supply	1. For house steam, contact maintenance to ensure steam supply is 50-80 PSIG. 2. For electric steam generator, ensure generator supply valve is open. 3. Ensure generator drain valve is closed. 4. Cycle power and verify the generator pump comes on. If it does not, contact STERIS. 5. If it does, press reset on safety pressure control on generator and verify pressure increases. If it does not, contact STERIS. 6. If it does, run a test cycle. If alarm recurs, contact STERIS.
Emergency exhaust valve open	1. Close emergency exhaust valve.
Chamber drain strainer clogged	1. Clean chamber drain strainer. Re-run cycle. If alarm recurs, contact STERIS

5.55 Too Long in Evacuation

Condition

Occurs if the chamber vacuum does not reach 10 inHg minimum within the alloted time. For Gravity and SFPP cycle, occurs if the chamber vacuum does not reach 2 inHg minimum within the alloted time.

General Troubleshooting	Additional Information
Water pressure is less than 30 PSIG.	1. Contact facilities to verify water pressure is between 30 and 50 PSIG.
Water supply valve closed.	1. Open water supply valve.
Emergency exhaust valve open.	1. Close emergency exhaust valve.
Chamber drain strainer	1. After allowing chamber to completely cool, remove load, clean chamber drain strainer. Run test cycle. 2. If alarm recurs, contact STERIS.

5.56 Too Long in Exhaust

Condition

Prevac: Occurs if chamber does not exhaust from 29-30psig to less than 4 psig and the chamber temperature is not below 245°F within the allotted time.

Liquid, Vapor Removal: Occurs if chamber vacuum is not greater than 1 inHg within the allotted time.

Gravity or SFPP, Vent (dry time=0): Occurs if chamber pressure is not less than 1 psig within the allotted time.

SFPP, Pressure Pulse Steam Flush: Occurs if chamber pressure is not greater than 0.5 psig within the allotted time

General Troubleshooting	Additional Information
Emergency exhaust valve open.	1. Close emergency exhaust valve.
Water supply valve closed.	1. Open water supply valve.
Water pressure is less than 30 PSIG.	1. Contact facilities to verify water pressure is between 30 and 50 PSIG.
Chamber drain strainer clogged.	1. After allowing chamber to completely cool, remove load, clean chamber drain strainer. Run test cycle. 2. If alarm recurs, contact STERIS.

5.57 Too Long in Jacket Charge

Condition

Occurs if jacket does not reach set temperature within allotted time. Alarm automatically clears three minutes after reaching 265°F (129°C).

Review cycle tapes and service alarm log for alarm frequency and cycle relevance.

General Troubleshooting	Additional Information
Steam supply valve closed.	1. Turn on steam supply valve.
Steam Supply	1. For house steam, contact maintenance to ensure steam supply is 50-80 PSIG. Cycle power, allow jacket to charge, then run a test cycle. If alarm recurs, contact STERIS. 2. For electric steam generator, ensure generator supply valve is open. 3. Ensure generator drain valve is closed. 4. Cycle power and verify the generator pump comes on. If it does not, contact STERIS. 5. If it does, press reset on safety pressure control on generator and verify pressure increases. If it does not, contact STERIS. 6. If it does, cycle power, allow jacket to charge, then run a test cycle. If alarm recurs, contact STERIS.

5.58 Too Long In Sterilize

Condition

Occurs if cycle remains in the sterilize phase longer than the allotted time. (Life Sciences program option only.)

General Troubleshooting	Additional Information
Silence alarm	1. Remove load. Cycle power and run a test cycle. 2. If test cycle fails, contact STERIS.

5.59 Too Long to Close Door

Condition

Occurs if door switch does not make contact within allotted time.

Review cycle tapes and service alarm log for alarm frequency and cycle relevance.

General Troubleshooting	Additional Information
Door obstruction	1. Wear appropriate PPE and remove any obstructions from the door.
Door seal not fully retracted.	1. Push the seal into the channel.
Shelves not properly installed.	1. Slide shelves inside chamber and verify position does not interfere with the door.

5.60 Too Long to Open Door

Condition

Occurs if door switch does not open within allotted time.

Review cycle tapes and service alarm log for alarm frequency and cycle relevance.

General Troubleshooting	Additional Information
Door obstruction	1. Wear appropriate PPE. Check door area for obstruction and remove if necessary. 2. Perform emergency door open procedure. If door does not open, contact STERIS. 3. If door does open, ensure shelves are installed properly. 4. Ensure door seal is fully retracted. If not, reinstall the seal. 5. Run a test cycle, if alarm recurs contact STERIS.

5.61 Too Long to Seal Door

Condition

Occurs in all cycles. Alarm occurs after cycle selected if door seal does not reach 10 psig within allotted time.

Review cycle tapes and service alarm log for alarm frequency and cycle relevance.

General Troubleshooting	Additional Information
Steam supply	1. For house steam, contact maintenance to ensure steam supply is 50-80 PSIG. 2. For electric steam generator, ensure generator supply valve is open. 3. Ensure generator drain valve is closed. 4. Cycle power and verify the generator pump comes on. If it does not, contact STERIS. 5. If it does, press reset on safety pressure control on generator and verify pressure increases. If it does not, contact STERIS. 6. If it does, run a test cycle. If alarm recurs, contact STERIS.

5.62 Too Long to Unseal Door

Condition

Occurs if door seal pressure does not drop below 10 psig within allotted time.

Review cycle tapes and service alarm log for alarm frequency and cycle relevance.

General Troubleshooting	Additional Information
Silence alarm.	1. Re-run cycle, if fault recurs, contact STERIS.

5.63 Under Sterilize Temperature

Condition

Occurs in all sterilize cycles. Occurs if chamber temperature drops below sterilize temperature. Alarm clears when:

- Chamber reaches sterilize temperature and
- Sterilize phase completes properly

Sterilize phase timer resets once the sterilize temperature is reached.

Review cycle tapes and service alarm log for alarm frequency and cycle relevance.

General Troubleshooting	Additional Information
Emergency exhaust valve open.	1. Close emergency exhaust valve.
Steam supply valve closed.	1. Open steam supply valve.
Steam supply	1. For house steam, contact maintenance to ensure steam supply is 50-80 PSIG. 2. For electric steam generator, ensure generator supply valve is open. 3. Ensure generator drain valve is closed. 4. Cycle power and verify the generator pump comes on. If it does not, contact STERIS. 5. If it does, press reset on safety pressure control on generator and verify pressure increases. If it does not, contact STERIS. 6. If it does, run a test cycle. If alarm recurs, contact STERIS.
Chamber drain strainer clogged	1. Clean chamber drain strainer.

5.64 Waste Temperature Probe Failure

Condition

Occurs if waste line temperature reading is outside the normal range of 32-293F (0-145C).

General Troubleshooting	Additional Information
Reset ADC	1. Remove load. Cycle power and run a test cycle. 2. If test cycle fails, contact STERIS.

5.65 Water in Chamber

Condition

Occurs if excess water is sensed in chamber. Power must be cycled to clear this alarm.

Review cycle tapes and service alarm log for alarm frequency and cycle relevance.

General Troubleshooting	Additional Information
Chamber strainer clogged.	1. After allowing chamber to completely cool, remove load, clean chamber drain strainer. Run test cycle. 2. If alarm recurs, contact STERIS.

5.66 Wetpacks

Condition

Water in chamber.

General Troubleshooting	Additional Information
Incorrect water pressure	1. Contact facilities to ensure water supply is between 30-50 PSIG.
Wetpacks present.	1. Verify proper IFU (instruction for use). 2. Verify proper instrument processing protocols are being followed. 3. Contact STERIS.