

# Table of Contents

**P387352-635**

**04/23/15**

<u>Part Number</u>	<u>Description</u>	<u>Section</u>
P062941-091...	General Installation notes	I
P129367-411...	Installation Instructions	II
P387354-799...	Operating Procedure	III

**\*\* Items in Poly Zip Bag**

P055985-001...	Warranty Envelope
P089496-091...	Tag-Return Material Procedure
P150829-895...	Warranty Book
P056401-175...	Envelope



## INTRODUCTION

These general notes and recommendations are intended to complement the equipment drawing(s) and thereby further assist in achieving satisfactory installation of the equipment. The information on this and the enclosed drawing(s) is based upon the design and construction of the equipment as of the date of the design and construction of the equipment as of the date of the drawing.

## SPACE CONSIDERATIONS

### **Floor Levelness**

Floor space in load/unloading areas of equipment to be level within 1/16". For instances of multiple installations this tolerance should be held for the entire span of installed equipment.

### **Clearances**

The clearance dimensions shown on each drawing are the minimum considered necessary to allow space for servicing and operating the equipment.

Clearance in front of sterilizer, for comfortable loading and unloading operations, should equal about twice the inside length of the sterilizer chamber unless otherwise specified on Equipment Drawing.

### **Dimensions**

Attention must be given to all printed dimensions shown on each drawing, since no attempt has been made to hold these drawings to any specific scale.

## **STERILIZER SPECIFIC NOTES**

## MOUNTING DETAILS

### **Wall Thickness – Recessed Sterilizer**

STERIS must be advised of the total finished thickness of the wall or walls through which the sterilizer will extend.

## **Recessing Area**

- **Ventilation** – It is recommended that a louvered, grilled opening be provided in the curtain wall above the sterilizer(s) to dispel excess vapor by negative pressure behind the wall. The recessing area should be adequately ventilated to maintain maximum temperature in the range of 80°F to 90°F (27°C to 32°C) when the equipment is in operation. 10% to 90% Relative Humidity – non-condensing.
- **Access** – Access to recessed service area from control end of the sterilizer is recommended.
- **Illumination** – Illumination designed to afford 50 to 100 footcandles of total illumination, evenly distributed in principal areas of the recessing area, should be provided.
- **Service Power Requirement** – One convenience outlet (110-120 Volts) is required for power tools.
- **Drainage** – A floor drain or floor sink is recommended for each sterilizer / washer and should be provided within the confines of equipment framework.

### **Cabinet-enclosed Sterilizer**

Cabinet-enclosed units should be located in a well-ventilated room from which heat and steam vapors may be dispelled rapidly. A separate floor drain is recommended for each cabinet-enclosed sterilizer, to be located within the confines of the sterilizer framework.

## UTILITY SERVICE REQUIREMENTS

### **Roughing-in**

All lines should be short-stubbed thought the floor, wall or, ceiling, far enough to permit coupling with stop valves. Provisions must be made for short-swing connections to equipment terminals. Piping outlets (stubbing) for multiple units (composite installations) should be combined in one common set, usually at rear of the equipment.

It is recommended that pipes and conduit not be stubbed through the floor under the chamber of a recessed sterilizer. This recommendation would not preclude the stubbing of pipes and conduit through the floor within the confines of the panels on a cabinet-enclosed sterilizer.

**STERIS**<sup>®</sup>



**Document Number:**  
062941091

**Initials:**  
JGF

**Revision: 11**  
28 July 2015

**GENERAL NOTES –  
APPLICABLE TO STERILIZER AND WASHER EQUIPMENT**

This document contains confidential and proprietary information of STERIS Corporation. Neither this document nor the information therein are to be reproduced, either in part or in whole, except as specifically authorized by STERIS Corporation.

**Sheet:**  
**1 OF 5**

### Terminal Fittings

Unless installation is purchased from STERIS, piping and other components between terminal fittings on the equipment and wall or floor outlets (stubbing) are not furnished by STERIS.

### Pipe Sizes

Pipe sizes listed on equipment drawing indicate the equipment termination sizes only. Size of supply piping is dependent on length of pipe run from pressure regulating station / source and is determined by Mechanical Engineer to ensure adequate supply service pressure and demand flow at equipment terminals. Effect of coincident draw of multiple unit installations must also be considered.

### Pressure Relief Valves

Any piping installed to a pressure vessel relief valve must not reduce the discharge capacity of the relief valve. Plumbing must be such that removal of sterilizer parts, including relief valve, does not require unsoldering or cutting of new piping.

Recommended piping practices for relief valve piping can be found in ASMI Boiler and Pressure Vessel Code (section VIII, Para. UG-135).

### Backflow Preventer

If local codes require a reduced pressure principle device on water supply line, it shall be provided by others.

### Blow Down Valve

Recommended provisions of blow down valve at each facility steam and water strainer to enable strainer clean out.

Blow down building steam and water supply lines before final connection to equipment.

### Shutoff Valves

Provide piping shutoff valve, pipe plugged tee and union in steam and water supply connections between each piece of equipment and stub outs, so that the unit can be serviced without interruptions of supply to other equipment. Plugged tee can be used later for test pressure gauge connection. Arrange connection piping to allow access to machine components and electrical control panel.

### Steam and Water Pressures

Steam and water pressures indicated on each drawing are to be dynamic at the sterilizer.

Steam should be condensate free and between 97 and 100% saturated vapor to ensure proper goods drying.

Sterilizer is adequately equipped to operate on the pressures listed in the equipment drawing. If supply line pressure exceeds those shown, provide reducing valves. These are not furnished by STERIS unless specifically called for in the contract of purchase order.

### Water Quality

- **Water Supply to Sterilizer** – Water is used for ejectors, heat exchangers and trap cooling. Refer to Table 1 for recommended water quality. Use of feed water within the nominal conditions will optimize equipment performance and reduce maintenance.
- **Carbon Steel Steam Generator Feed Water** – Refer to Table 2 for required water quality. Use of feed water within the nominal conditions will optimize equipment performance and reduce maintenance.
- **Stainless Steel Steam Generator Feed Water** – Requires deionized, distilled or reverse osmosis water minimum resistivity of 1MΩ-cm.

### Notes:

1. Do not connect tap water to stainless steel generator. Use of water not meeting the required feed water quality will invalidate the warranty, and is a violation of ASME boiler codes.
2. Failure to correct utility pressure and steam quality will result in reduced equipment performance which may affect overall equipment performance.

**STERIS**®



**Document Number:**  
062941091

**Initials:**  
JGF

**Revision: 11**  
28 July 2015

**GENERAL NOTES –  
APPLICABLE TO STERILIZER AND WASHER EQUIPMENT**

This document contains confidential and proprietary information of STERIS Corporation. Neither this document nor the information therein are to be reproduced, either in part or in whole, except as specifically authorized by STERIS Corporation.

**Sheet:**  
**2 OF 5**



**Table 1. Recommended Feed Water Quality for Sterilizers using Facility/Plant Steam**

Condition	Nominal Conditions	Maximum Conditions
Temperature	40° - 60°F (4°-16°C)	70°F (21°C)
Total Hardness as CaCO3 <sup>a</sup>	50 - 120 ppm	171 ppm
Total Dissolved Solids	100 - 200 ppm	500 ppm
Total Alkalinity as CaCO3	70 - 120 ppm	180 ppm
pH	6.8 - 7.5	6.5 - 8.5
Total Silica	0.1 - 1.0 ppm	2.5 ppm
Chlorides	1.0 - 8.0 ppm	10.0 ppm
Cu	0.0 - 0.08 ppm	0.1 ppm
Fe	0.0 - 0.08 ppm	0.1 ppm
Zn	0.0 - 0.08 ppm	0.1 ppm
Al	0.0 - 0.08 ppm	0.1 ppm
Mg	0.0 - 0.08 ppm	0.1 ppm

a. 17.1 ppm = 1.0 grain hardness

**Table 2. Required Feed Water Quality for Carbon-Steel Steam Generators**

Condition	Nominal Conditions	Maximum Conditions
Temperature	40 - 140°F (4-60°C)	150°F (66°C)
Total hardness as CaCO3 <sup>a</sup>	0 - 17 ppm	130 ppm
Total Dissolved Solids	50 - 150 ppm	250 ppm
Total Alkalinity as CaCO3	50 - 100 ppm	180 ppm
pH	6.8 - 7.5	6.5 - 8.5
Total Silica	0.1 - 1.0 ppm	2.5 ppm
Resistivity - Ω-cm <sup>b</sup>	2000 - 6000	26000
Chlorides	1.0 - 8.0 ppm	10.0 ppm
Cu	0.0 - 0.08 ppm	0.1 ppm
Fe	0.0 - 0.08 ppm	0.1 ppm
Zn	0.0 - 0.08 ppm	0.1 ppm
Al	0.0 - 0.08 ppm	0.1 ppm
Mg	0.0 - 0.08 ppm	0.1 ppm

a. 17.1 ppm = 1.0 grain hardness

b. **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 Ω-cm (38.5 micro-ohms 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 Ω-cm, contact STERIS Service Engineering for information concerning modifications required to the generator control system.

**Venting Sterilizer to Atmosphere**

If sterilizer has an atmospheric vent fitting (in lieu of a condenser), it should be connected to a vertical, unrestricted atmospheric vent stack. When more than one sterilizer is connected to a single vent stack, a self-draining header may be used. At no time should any riser from the sterilizer exhaust terminal to the header or vent stack be less than 45° to the horizontal. If more than one sterilizer is connected by header to riser, header is to drain toward sterilizer at 45° angle. Header and riser are to increase in size accordingly.

**Wiring Terminals**

Wiring on the equipment terminates at a junction box or boxes as shown on each drawing. Wiring and other appurtenances between junction box (or boxes) and building service lines are not furnished by STERIS.

**Disconnect Switches**

Each piece of equipment must have a dedicated disconnect switch to allow servicing. Disconnected switches with off position lockout only must be furnished and installed by the Customer in electric supply lines within line of site of equipment. National and Local code must be followed.

**Steam Return Lines**

Steam return lines from the sterilizer jacket should be connected to a gravity system piped to a vented receiver. Avoid any piping arrangement that could cause back pressure in the return line. (This would not apply if steam return lines were specified to be piped into the sterilizer condenser system or waste line.) Pressurized steam condensate return lines can cause reduced equipment performance.

**Motors**

In providing electric service for motors, conductors should be sized to conform to the National Electric Code specifications for rated motor current and motor branch circuit capacity, adjusted for ambient temperature conditions (for ¾ HP and over) and voltage drop.

**Drains**

Equipment drains must be properly sized to handle peak water usage. Sterilizer funnels supplied by STERIS have an integrated, internal air gap.

**STERIS**®



**Document Number:**  
062941091

**Initials:**  
JGF

**Revision: 11**  
28 July 2015

**GENERAL NOTES –  
APPLICABLE TO STERILIZER AND WASHER EQUIPMENT**

This document contains confidential and proprietary information of STERIS Corporation. Neither this document nor the information therein are to be reproduced, either in part or in whole, except as specifically authorized by STERIS Corporation.

**Sheet:**  
**3 OF 5**

# WASHER SPECIFIC NOTES

**Table 3. Recommended Cold Feed Water Quality for Washers (Ref., AAMI TIR 34)**

Condition	Nominal conditions	Maximum Conditions
Temperature	40 - 60°F (4 - 16°C)	70°F (16°C)
Total Dissolved Hardness as CaCo3	50 - 80 ppm	120 ppm
Total Dissolved Solids	100 - 200 ppm	500 ppm
Total Alkalinity as CaCo3	70 - 120 ppm	180 ppm
pH	6.8 - 7.0	7.5
Total Silica	0.1 - 0.5 ppm	1.0 ppm
Chlorides	1.0 - 8.0 ppm	10.0 ppm
Cu	0.0 - 0.08 ppm	0.1 ppm
Fe	0.0 - 0.08 ppm	0.1 ppm
Zn	0.0 - 0.08 ppm	0.1 ppm
Al	0.0 - 0.08 ppm	0.1 ppm
Mg	0.0 - 0.08 ppm	0.1 ppm

**Table 4. Recommended Hot Feed Water Quality for Washer (Ref., AAMI TIR 34)**


Condition	Nominal Conditions	Maximum Conditions
Temperature	110°F (43°C)	150°F (66°C)
Total Dissolved Hardness as CaCo3	50 - 80 ppm	120 ppm
Total Dissolved Solids	100 - 200 ppm	500 ppm
Total Alkalinity as CaCo3	70 - 120 ppm	180 ppm
pH	6.8 - 7.0	7.5
Total Silica	0.1 - 0.5 ppm	1.0 ppm
Chlorides	1.0 - 8.0 ppm	10.0 ppm
Cu	0.0 - 0.08 ppm	0.1 ppm
Fe	0.0 - 0.08 ppm	0.1 ppm
Zn	0.0 - 0.08 ppm	0.1 ppm
Al	0.0 - 0.08 ppm	0.1 ppm
Mg	0.0 - 0.08 ppm	0.1 ppm

**Table 5. Recommended Pure Water Quality for Washers (Ref., AAMI TIR 34)**

Condition	Nominal Conditions	Maximum Conditions
Temperature	60°F (16°C)	140°F (60°C)
pH	7.0	6.8 - 7.5
Resistivity - MΩ-cm	0.5 MΩ-cm	0.1MΩ-cm

**Table 6. Recommended Clean Dry Compressed Air Quality for Washers (Ref., ISO 8573-1 Class 5)**

Condition	Nominal Conditions	Maximum Conditions
Maximum Particle Size	20 Microns	40 microns
Particulate Density	5.0 ppm	8.3 ppm
Dew Point	37°F (3°C)	45°F (7°C)
Oil Concentration	10 mg/cubic-m	25 mg/cubic-m
Air Pressure	80 -100 PSIG Dynamic	125 PSIG Dynamic

	<b>Document Number:</b> 062941091	<b>Initials:</b> JGF	<b>Revision: 11</b> 28 July 2015
	<b>GENERAL NOTES - APPLICABLE TO STERILIZER AND WASHER EQUIPMENT</b>		
This document contains confidential and proprietary information of STERIS Corporation. Neither this document nor the information therein are to be reproduced, either in part or in whole, except as specifically authorized by STERIS Corporation.			<b>Sheet: 4 OF 5</b>

## Water Quality Supplied to Washer

- **Cold Water Supply to Washer** – Cold water is used for pre-wash, chamber steam vapor condensing, and for cooling hot water or steam condensate going to the drain. Use of feed water quality within the nominal conditions will improve pre-wash of instruments or utensils, optimize equipment performance, and reduce maintenance.
- **Hot Water Supply to Washer** – Hot water is used for wash phase and rinse phase. Use of feed water quality within the nominal conditions will improve detergent performance, reduce chamber scale build-up, optimize equipment performance, and reduce maintenance.
- **Pure Water Supply to Washer** – Pure water is used during the final rinse phase. Use of feed water quality within the nominal conditions will reduce spotting on instruments, reduce chamber scale build-up, optimize equipment performance, and reduce maintenance. If pure water is not supplied or available, hot water will be used for the final rinse.

## Compressed Air Supplied to Washer

Compressed air is used for operating pneumatically controlled water or steam valves, operating opening and closing of doors, and operating conveyor mechanisms. Use of compressed air quality within the nominal conditions will provide optimal pneumatic device performance, prevent internal pneumatic device corrosion, and reduce maintenance.

## Steam Condensate Return from Washer

Steam condensate is the byproduct from heating water and from drying circulated air within the washer. The steam heating process is done through means of heat exchanger coils whereby the steam supply does not make direct contact with the media processed within the washer. The steam condensate from the process will be of equivalent water quality in the facility steam boiler whereby it may be recycled. If the steam condensate is not to be recycled, it may be directed to the floor drain through use of optional steam condensate cool down equipment modification packages.

For best washer heating and drying performance, it is required to direct the steam condensate return to a non-pressurized vented enclosure\* to prevent back pressure against the incoming steam supply to the washer. Steam condensate return piping vertical rises in excess of 17 feet can also create excess back pressure which can hinder the heating process.

**\*NOTE: Typical vented condensate return enclosures or sumps have internal float mechanisms that activate a water pump to return the condensate to the facility boiler.**

## IMPORTANT

STERIS assumes no responsibility for changes made necessary through failure to explicitly observe these instructions and recommendations. In all instances, local, county, state, and national regulations should be observed.

**STERIS**<sup>®</sup>



**Document Number:**  
062941091

**Initials:**  
JGF

**Revision: 11**  
28 July 2015

**GENERAL NOTES –  
APPLICABLE TO STERILIZER AND WASHER EQUIPMENT**

This document contains confidential and proprietary information of STERIS Corporation. Neither this document nor the information therein are to be reproduced, either in part or in whole, except as specifically authorized by STERIS Corporation.

**Sheet:**  
**5 OF 5**



## **INSTALLATION INSTRUCTIONS**

### **Small Steam Sterilizers**

#### **Healthcare and Life Sciences Sterilizers**

**16x16x26"**

**(406x406x660 mm)**

**(05/22/15)**

**Rev. AB**

**20x20x38"**

**(508x508x965 mm)**

**P129367-411**

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

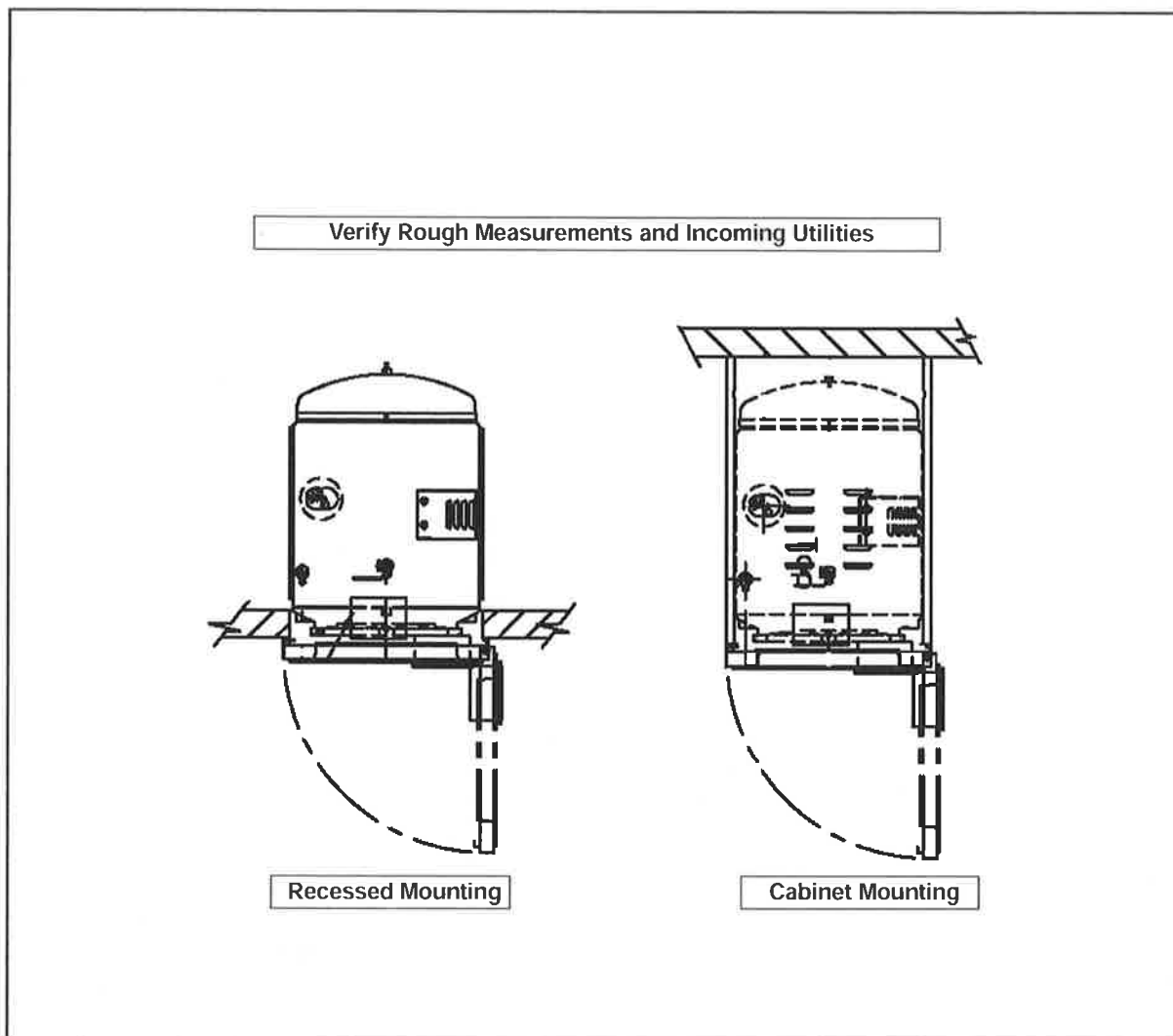


**Manufactured by:**

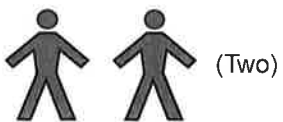
STERIS Mexico, S. de R.L. de C.V.  
Avenida Avante 790  
Parque Industrial Guadalupe  
Guadalupe, Nuevo Leon, Mexico C.P. 67190

**Sales and Service:**

STERIS Corporation  
5960 Heisley Road  
Mentor, OH 44060-1834 • USA  
440-354-2600 • 800-444-9009  
[www.steris.com](http://www.steris.com)



**Personnel Required:**



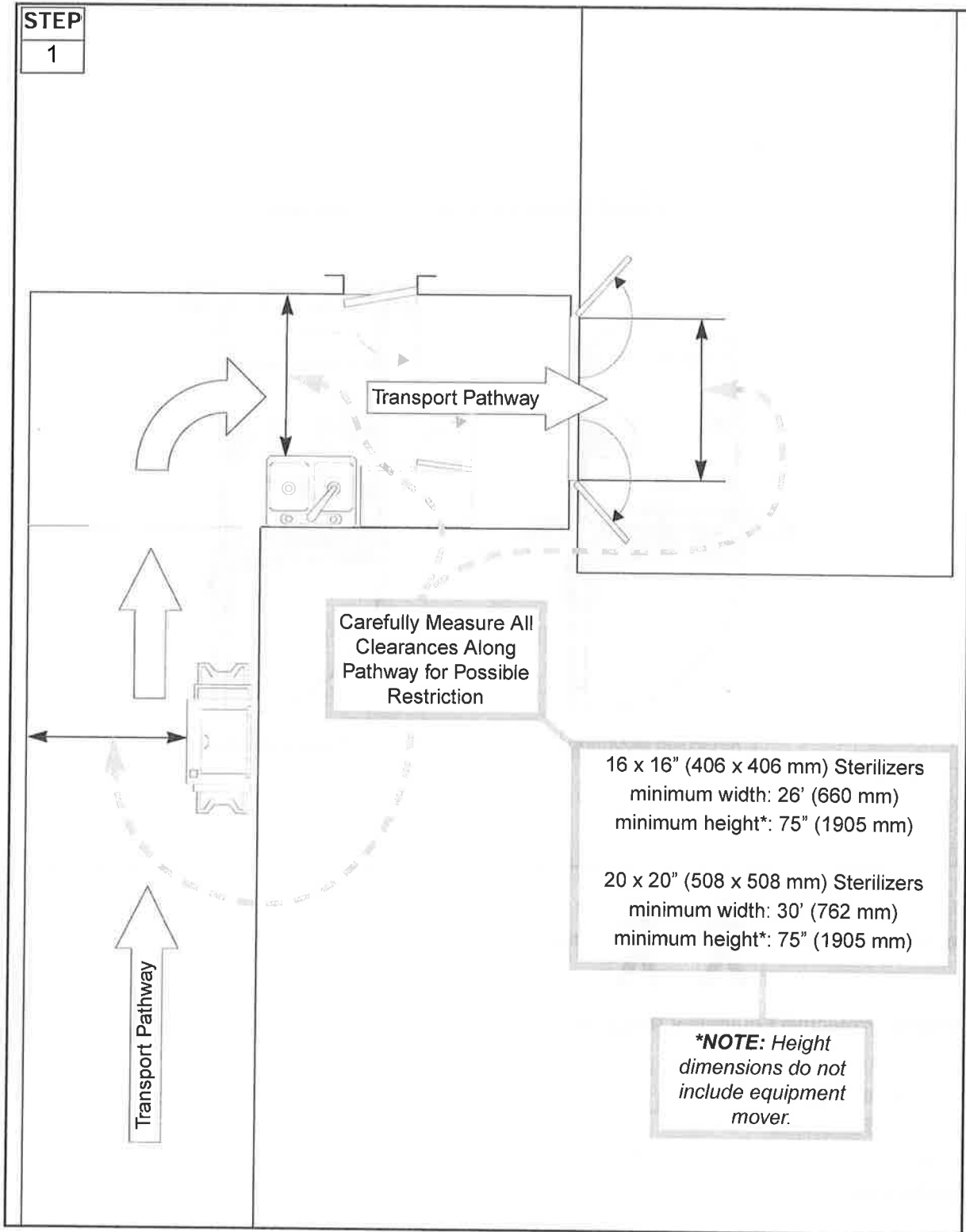
**Personal Protective Equipment Required:**

- Safety Goggles or Glasses
- Gloves
- Steel-Toe Shoes
- Hard Hat

**Special Tools:**

- Tape Rule

# Pre-Installation Procedures

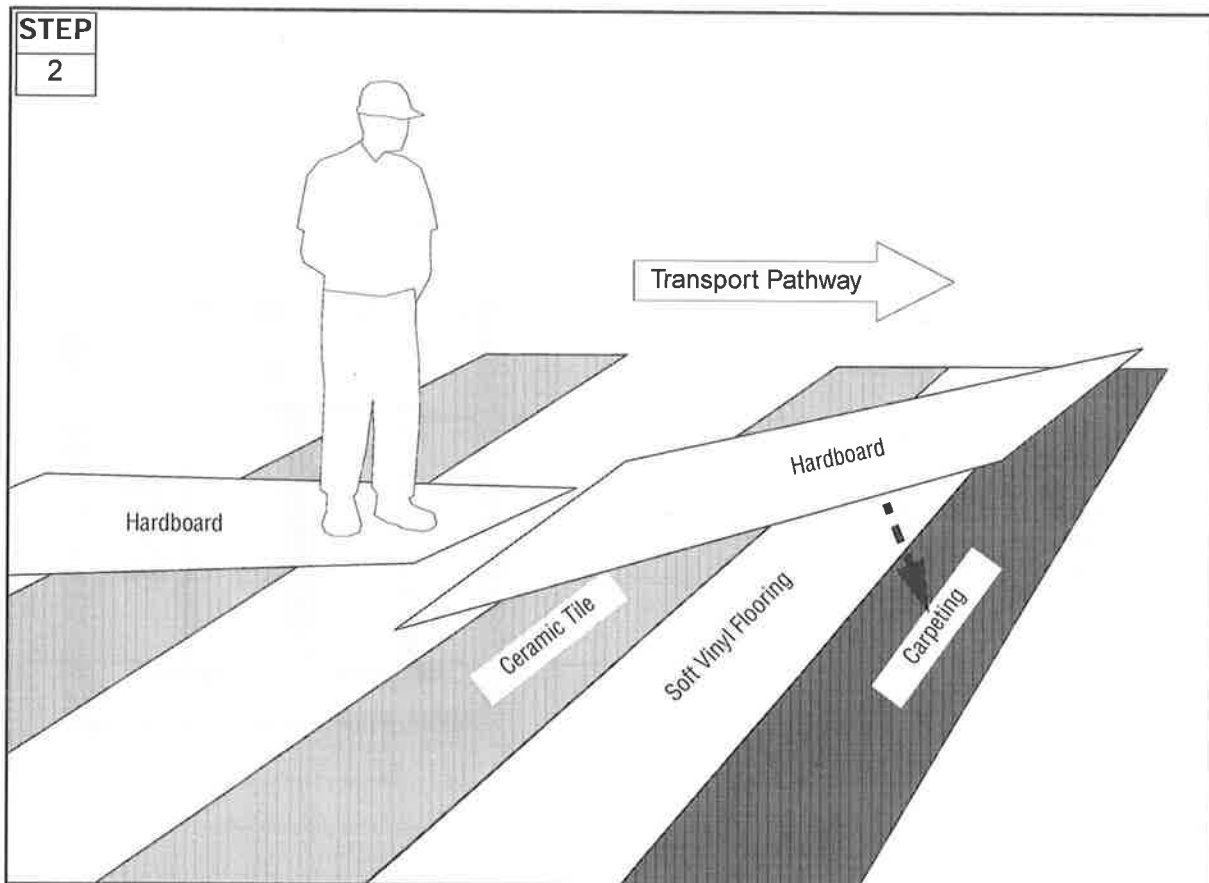


**Step 1:** Measure clearances for sterilizer on moving device.

- Ensure adequate clearances for moving equipment from delivery point (e.g., receiving dock) to installation site.



## Pre-Installation Procedures



**Step 2:** Inspect flooring material(s) between delivery point (e.g., receiving dock) and installation site.

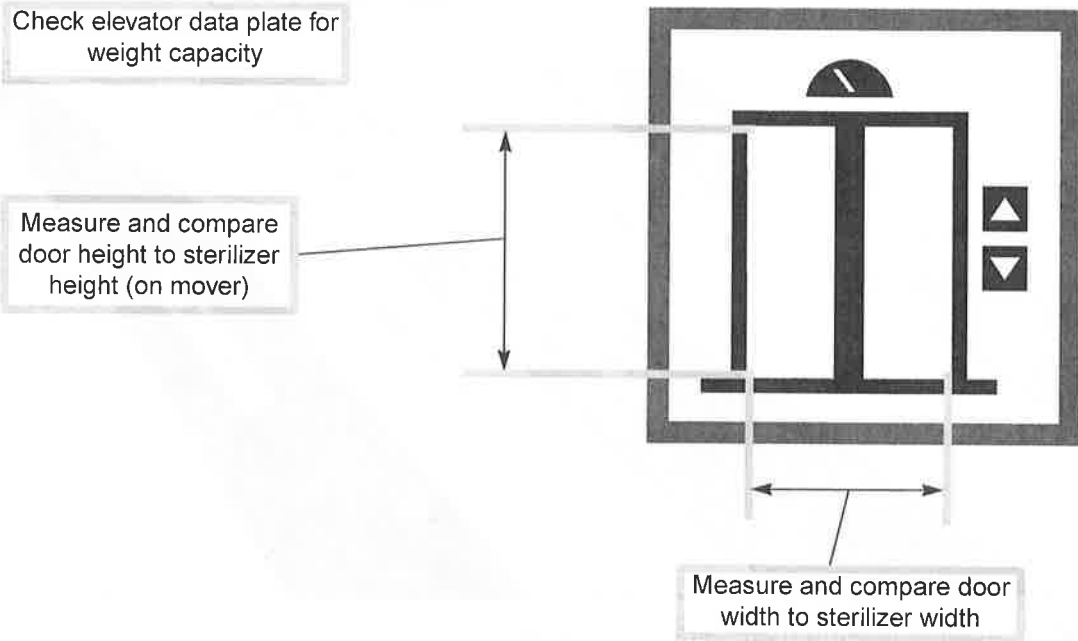
- Some flooring surfaces must be protected. For example:
  - Ceramic tile
  - Soft vinyl
  - Carpeting
- Lay down sheets of hardboard to protect flooring.

## Pre-Installation Procedures

**STEP**

**3**

- Check Elevator Weight Capacity
- Check Elevator Door Height
- Check Elevator Door Width

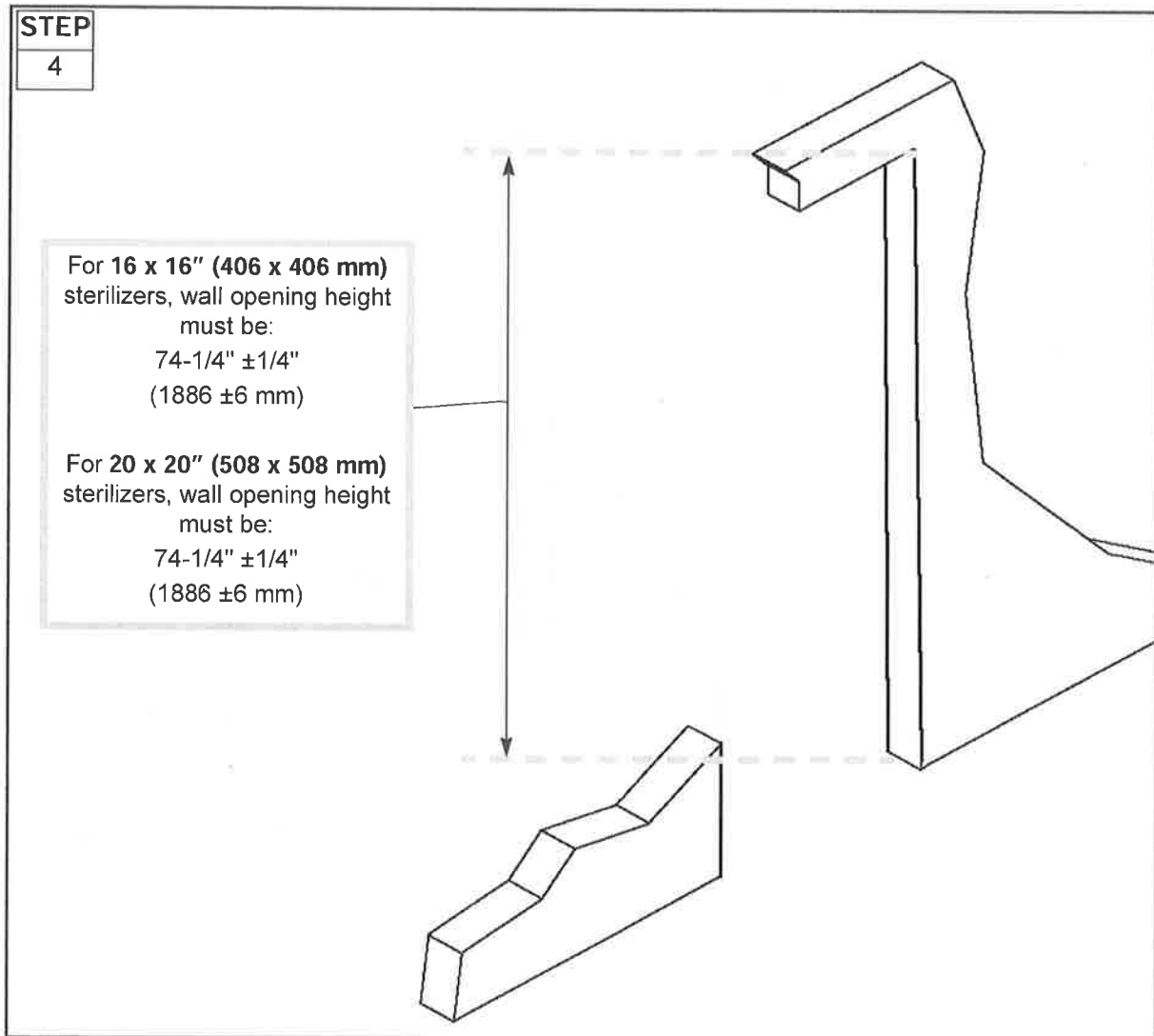


Sterilizer Chamber Size Inches (mm)	Sterilizer Type	Approximate Weight lb (kg)
16 x 16 x 26 (406 x 406 x 660)	Single Door	750 (341)
	Single Door w/Generator	890 (405)
	Double door	989 (450)
20 x 20 x 38 (508 x 508 x 965)	Single Door	1231 (560)
	Single Door w/Generator	1371 (623)
	Double door	1606 (730)
	Double Door w/Generator	1726 (785)

**Step 3:** If an elevator must be used when moving sterilizer, check the following:

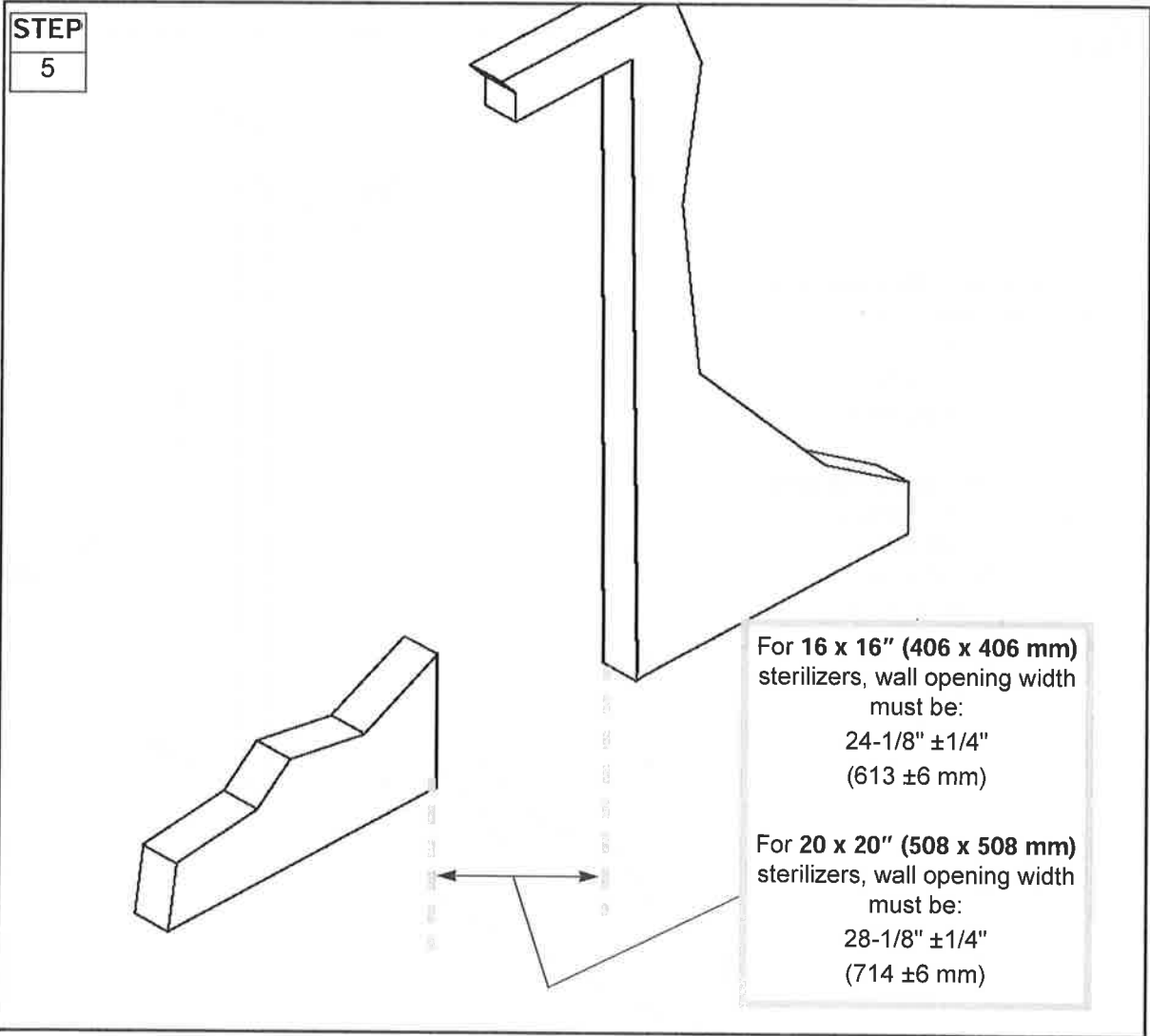
- Height and width of elevator doorway and elevator.
- Elevator weight capacity.

## Pre-Installation Procedures



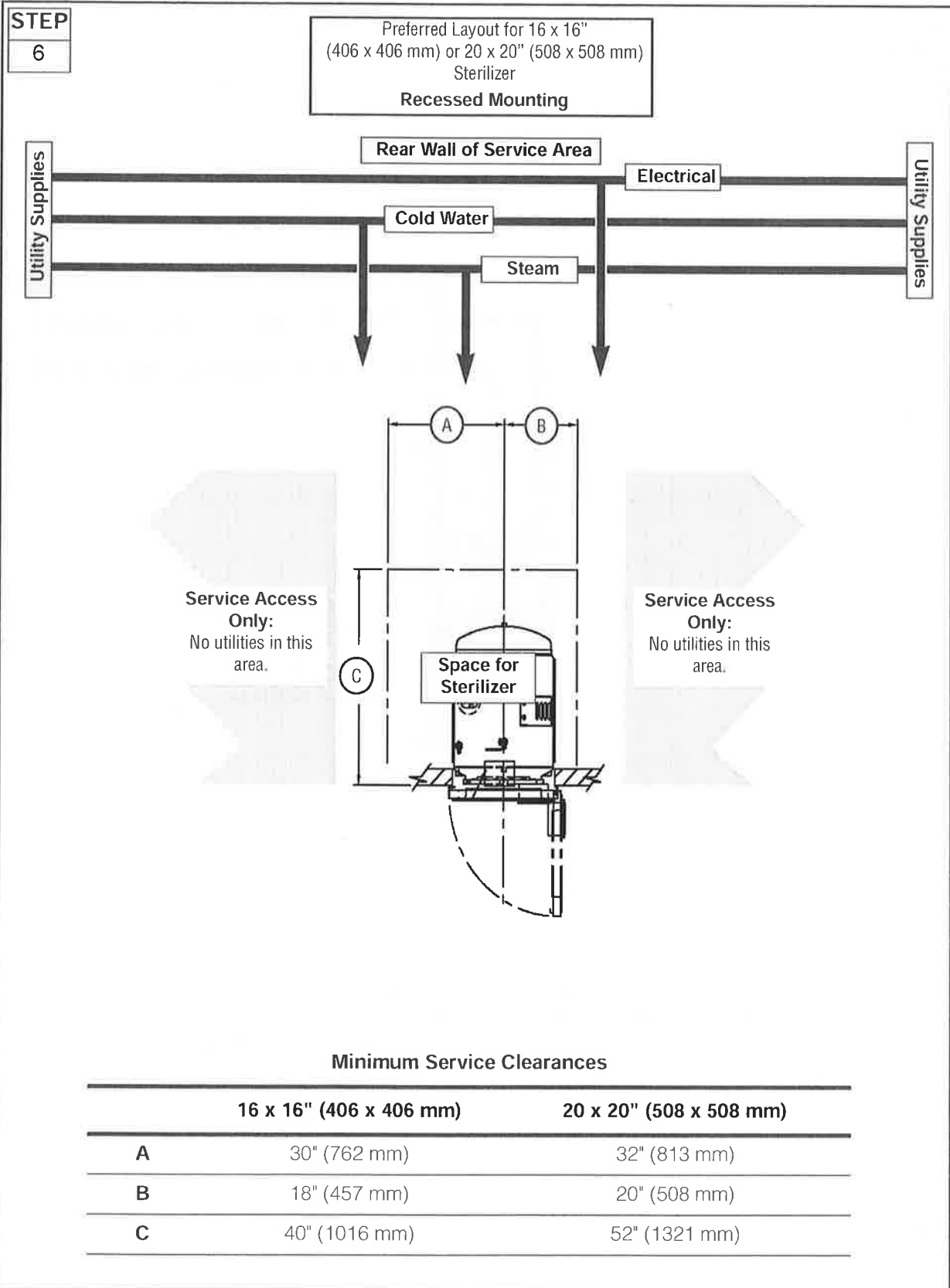
**Step 4:** Measure rough wall opening for correct **height**. See specifications above.

# Pre-Installation Procedures



**Step 5:** Measure rough wall opening for correct **width**. See specifications above.

## Pre-Installation Procedures

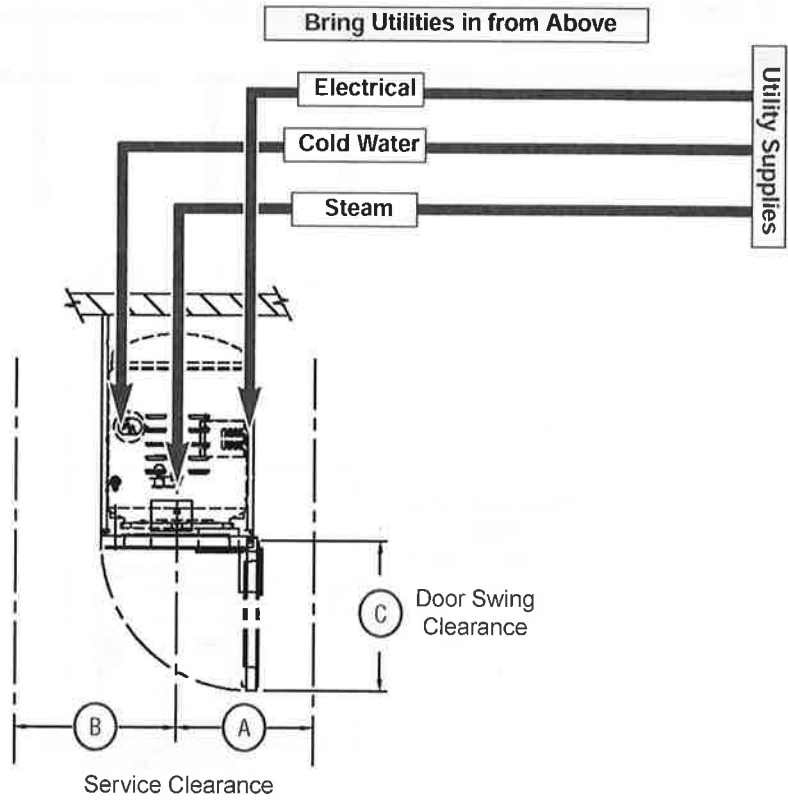


**Step 6:** Ensure that access room is arranged for minimum working clearances.

# Pre-Installation Procedures

**STEP**  
**7**

Preferred Layout for 16 x 16"  
(406 x 406 mm) or 20 x 20" (508 x 508 mm)  
Sterilizer  
**Cabinet Mounting**

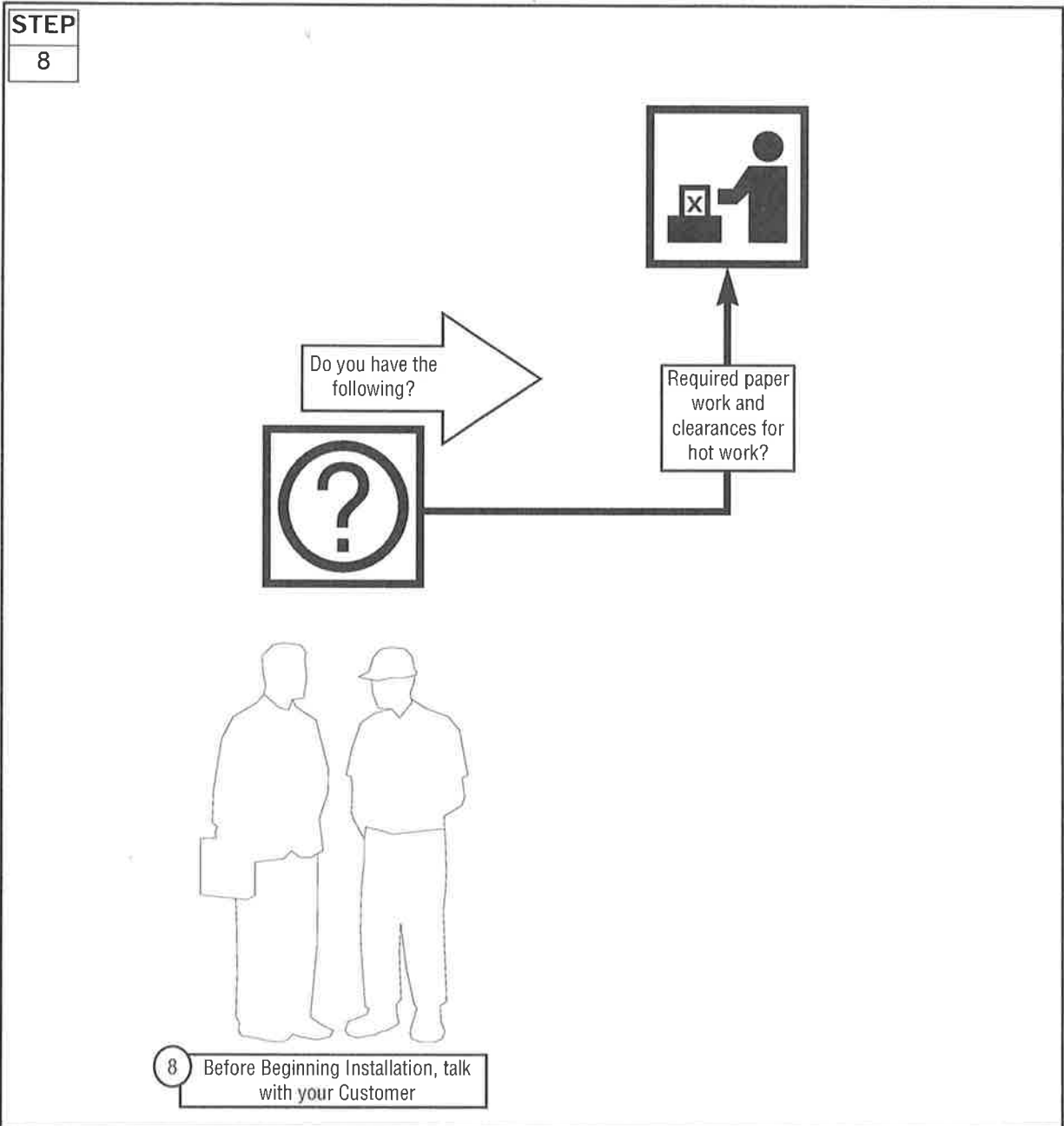


### Minimum Service Clearances

	16 x 16" (406 x 406 mm)	20 x 20" (508 x 508 mm)
<b>A</b>	25" (635 mm)	27" (686 mm)
<b>B</b>	30" (762 mm)	32" (813 mm)
<b>C</b>	25-1/2" (646 mm)	29-3/8" (747 mm)

**Step 7:** Determine if sterilizer piping orientations (OE/NOE) are standard, or will require or path restriction.

## Pre-Installation Procedures

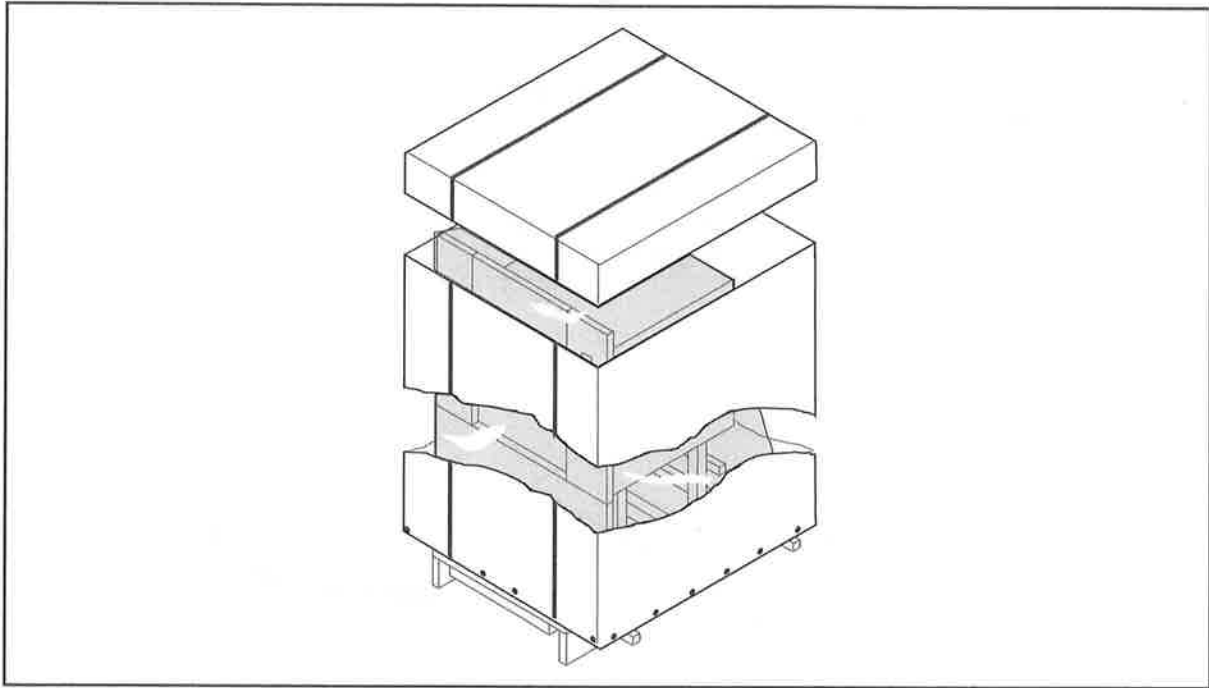


**Step 8:** Talk to Customer and verify requirements to obtain clearances to perform utility connections (e.g., “Hot Work” permits, etc.).

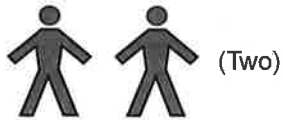
**Pre-Installation Procedures**

Healthcare  
Capital Equipment





**Personnel Required:**



**Personal Protective Equipment Required:**

- Safety Goggles or Glasses
- Gloves
- Steel-Toe Shoes
- Hard Hat

**Parts Required:**

- Four leveling feet (5")<sup>1</sup>
- Four floor pads<sup>1</sup>

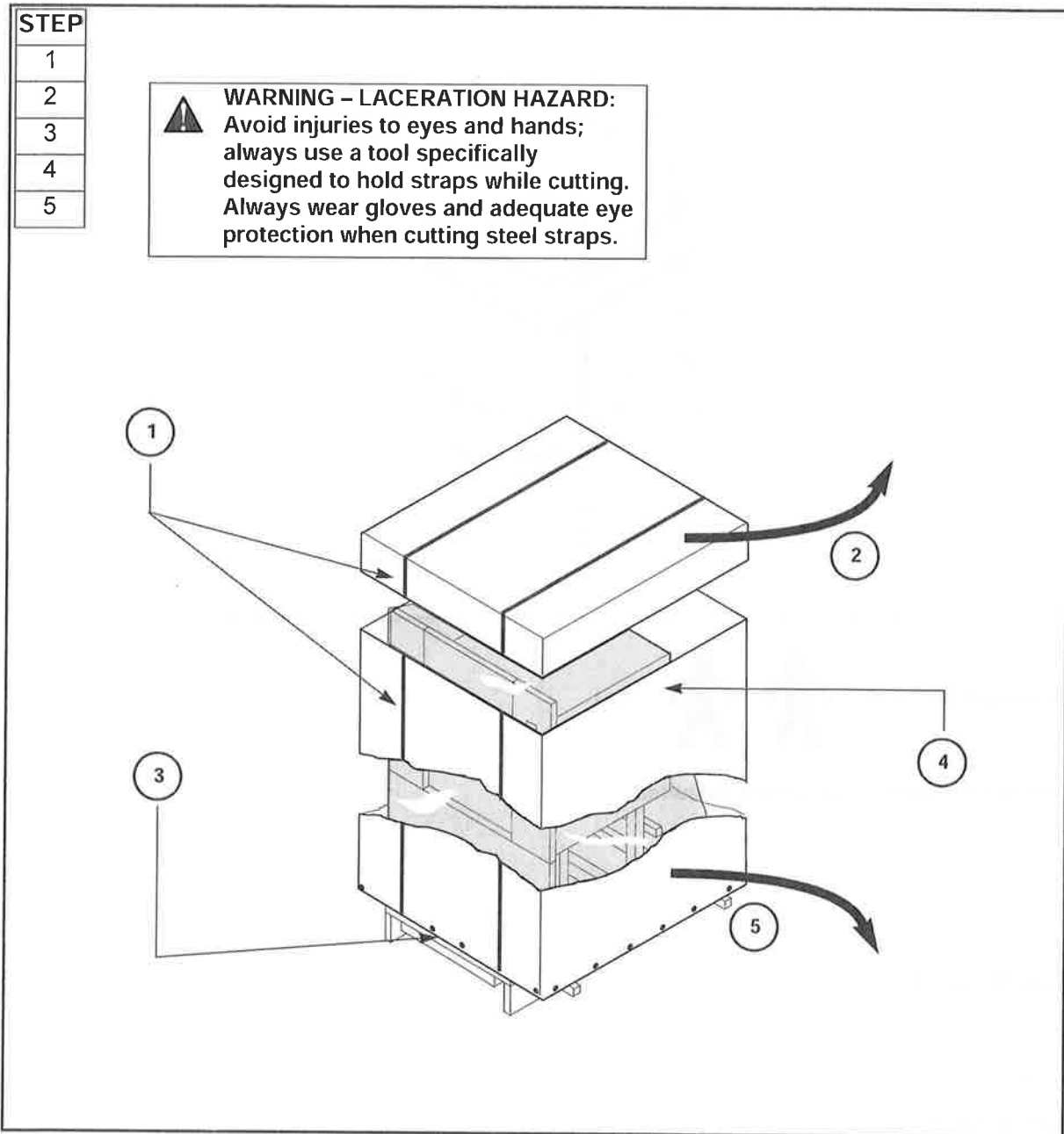
**Special Tools:**

- Strap Cutter
- Utility Knife
- STERIS equipment mover (P726650-300)
- 2x4x16"-long door brace (two, if double door)
- 2x4x20"-long door brace (two, if double door)
- One 1" ratchet strap
- Several sheets of 1/8" hardboard (to protect Customer's floor coverings when necessary)
- Power saw (for cutting hardboard sheets)

---

1. These items ship with sterilizer.

## Uncrating Procedures



**Step 1:** Carefully cut straps.

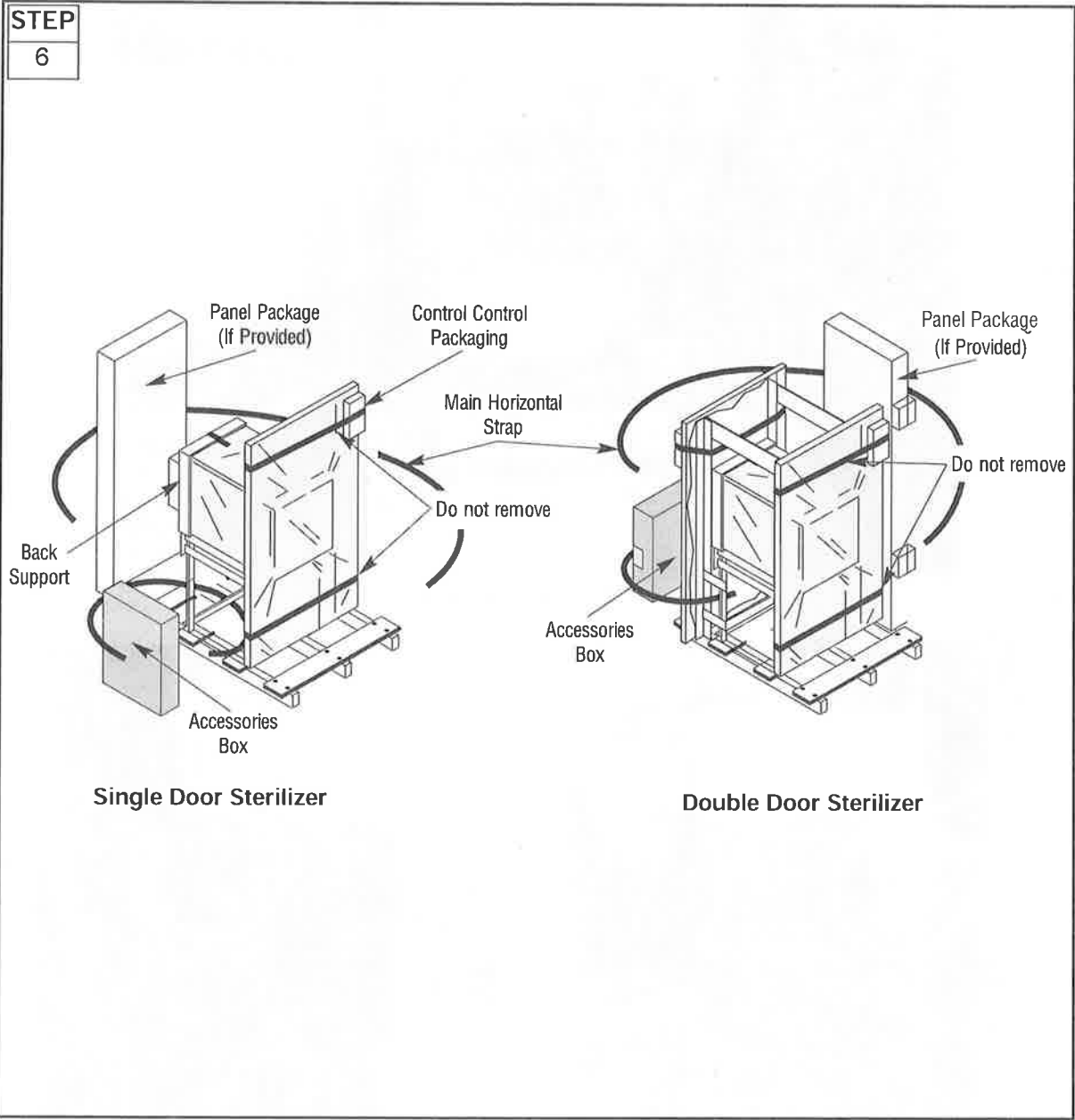
**Step 2:** Remove and discard cap.

**Step 3:** Pry off and discard wooden strips.

**Step 4:** Cut cardboard sleeve (carton, tube) using utility knife.

**Step 5:** Discard cardboard sleeve (carton, tube).

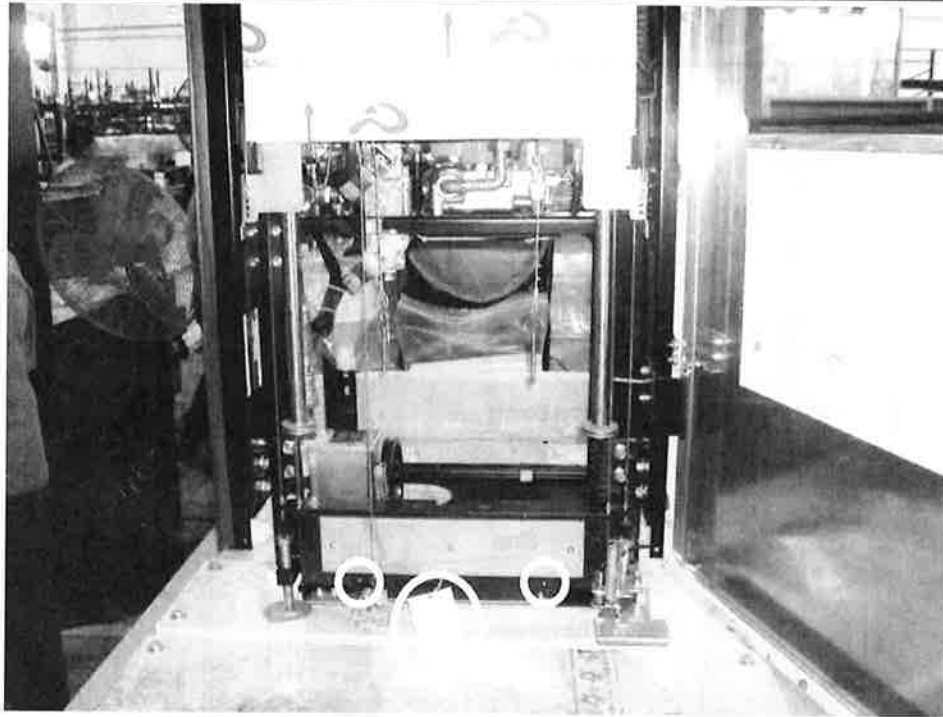
# Uncrating Procedures



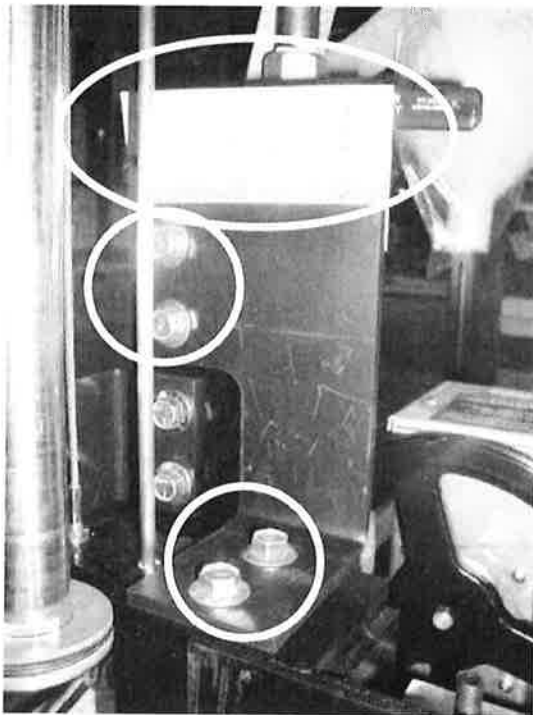
- Step 6:** Remove inner packaging.
- Cut and remove straps holding components to sterilizer.
  - Verify contents of shipment match bill of materials.
  - Set aside Accesories Box.

## Uncrating Procedures

STEP
7



**16" (408 mm) Sterilizer**



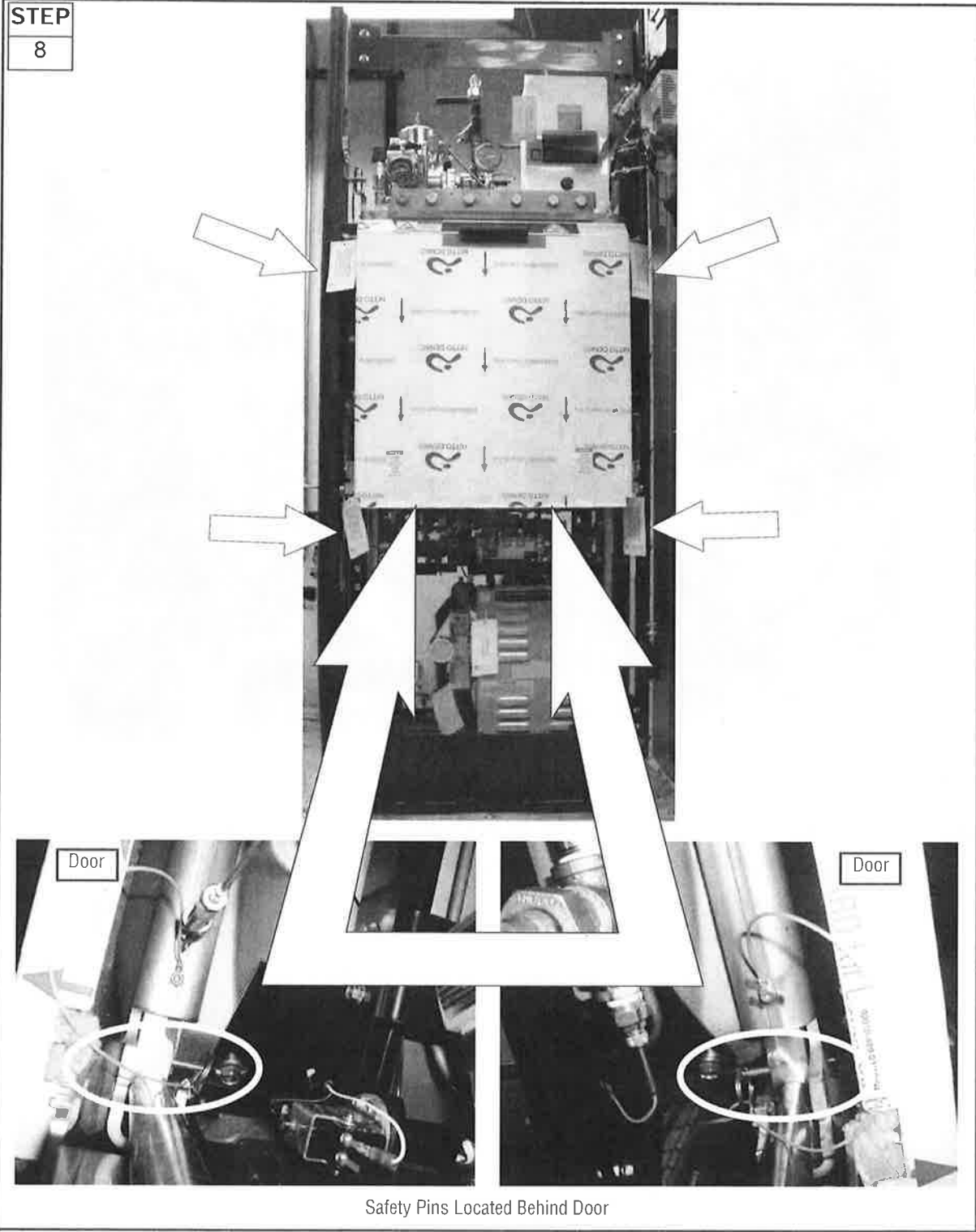
**20" (508 mm) Sterilizer**

**Step 7:** Remove counterweight shipping bracket:

- Locate tags identifying counterweight bracket.
- Remove counterweight shipping bracket bolts.
- Remove and discard brackets.

# Uncrating Procedures

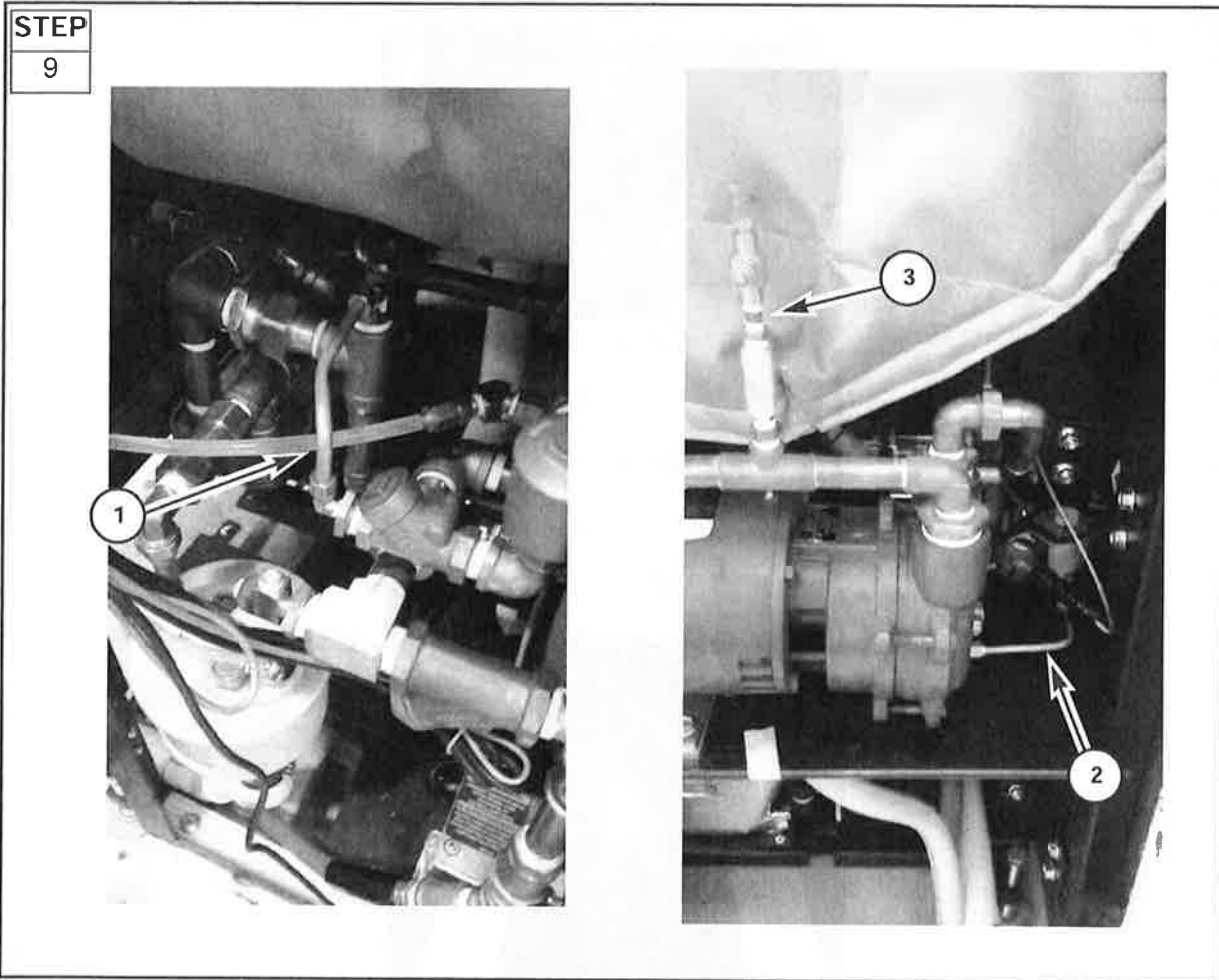
STEP  
8



Safety Pins Located Behind Door

- Step 8:** Remove door shipping bolts.
- Locate tags identifying door retaining bolts and remove bolts. Retain bolts for later use when transporting sterilizer.
  - Pull out safety pins from underneath the door.
  - Open sterilizer door and verify chamber is empty.

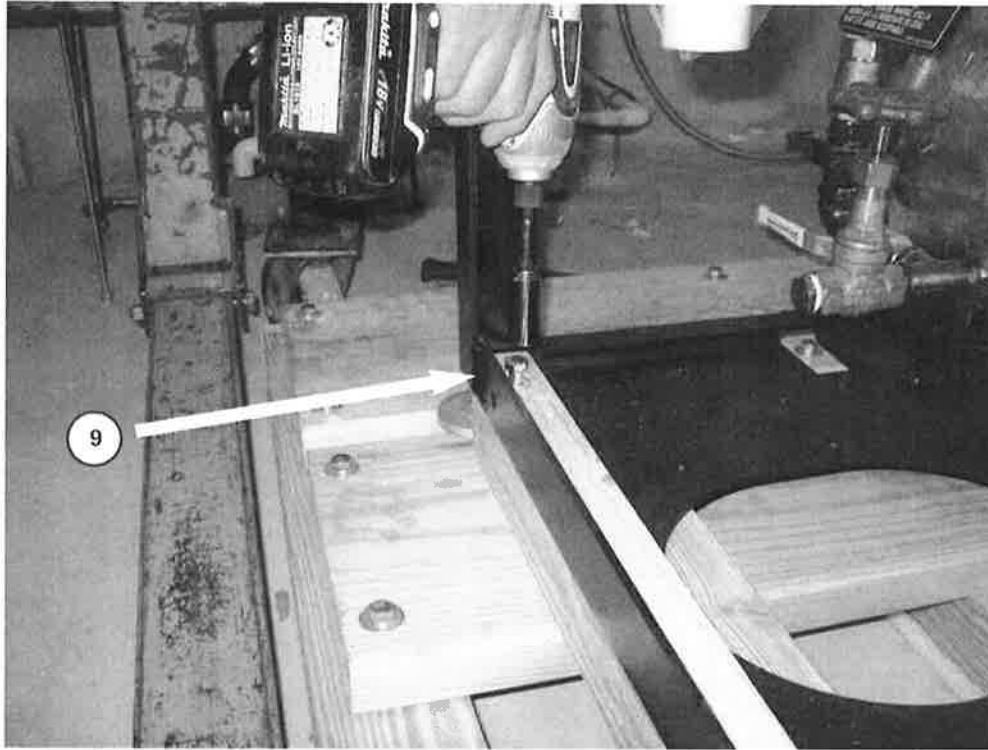
## Uncrating Procedures



- Step 9:** For AMSCO 400 sterilizers with vacuum pump option, obtain drain tubes and vacuum pump accessory from accessory box and install.
- Insert the Jacket Trap Drain Line ① (P/N 093918-464) into the compression tube fittings between the Jacket Trap and Heat Exchanger plumbing.
  - Units with Vacuum Pumps: Install the Vacuum Pump Drain Line ② (16" P/N 10065031, 20" P/N 10065311) and the Anti-Cavitation Valve assembly ③.

## Uncrating Procedures

**STEP**  
10

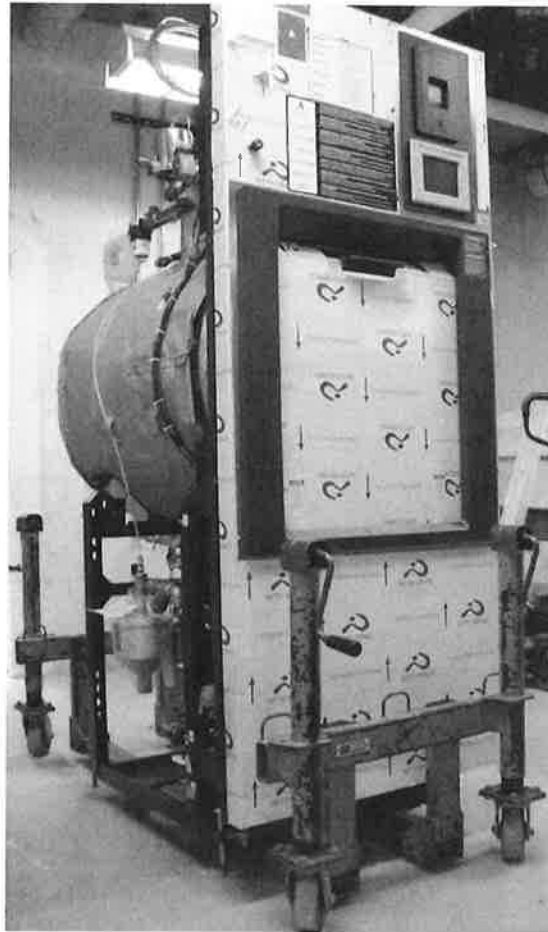


**Step 10:** Remove four bolts fastening sterilizer frame to pallet.

**Uncrating Procedures**







Amsco® Small Steam Sterilizer on STERIS Equipment Mover

**Personnel Required:**  (Two)

**Personal Protective Equipment Required:**

- Safety Goggles or Glasses
- Steel-Toe Shoes
- Gloves
- Hard Hat

**Parts Required:**

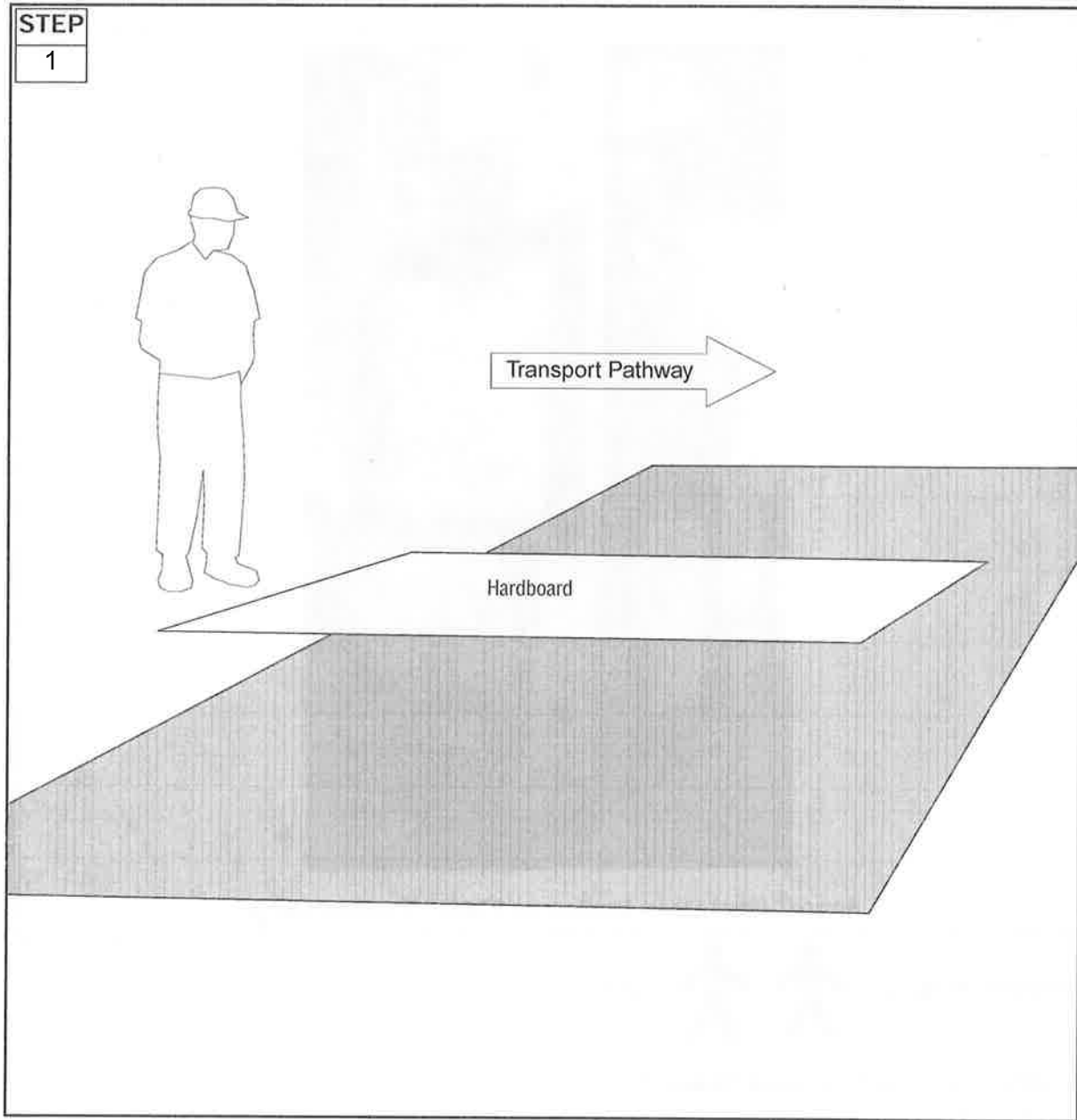
- Four leveling screws (5")<sup>1</sup>
- Four floor pads<sup>1</sup>

**Special Tools:**

- STERIS equipment mover (P726650-300)
- Several sheets of 1/8" hardboard (to protect Customer's floor coverings when necessary)
- Power saw (for cutting boards and hardboard sheets)

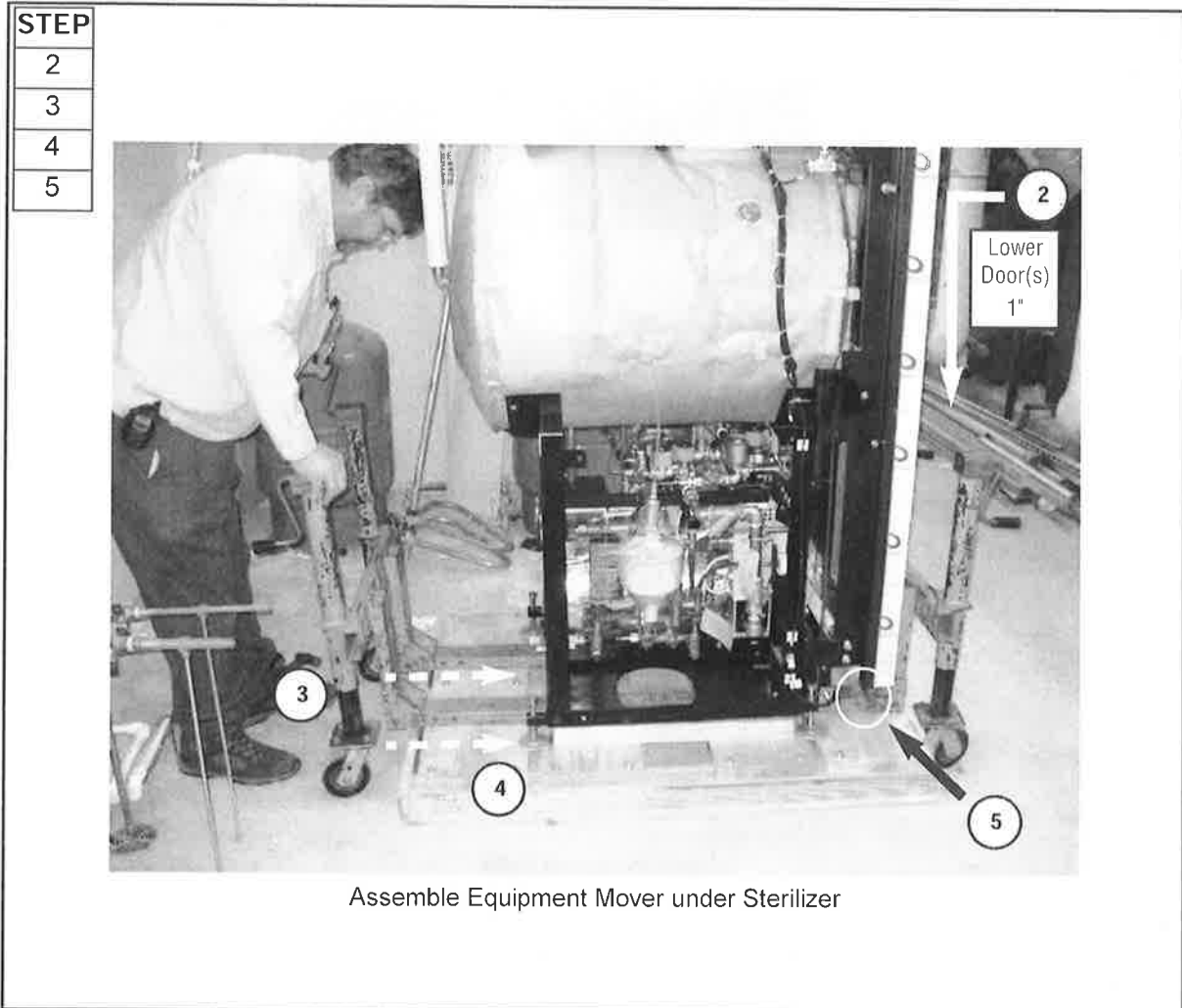
<sup>1</sup>. These items ship with sterilizer.

## Transport (STERIS Equipment Mover)



**Step 1:** Place 1/8" hardboard sheets over floor surfaces prone to damage by rollers.

## Transport (STERIS Equipment Mover)

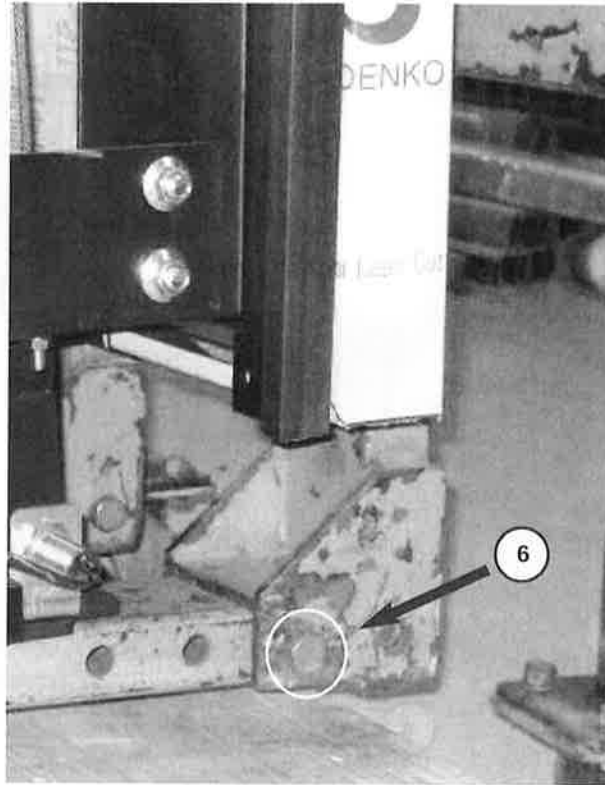


- Step 2:** Lower the door(s) one inch to allow the transporter forks to clear the door(s) counterweight.
- Step 3:** Align equipment mover.
- Step 4:** Insert forks under sterilizer.
- Step 5:** Align forks with lift assembly.

## Transport (STERIS Equipment Mover)

STEP

6



Insert Nuts and Bolts

**Step 6:** After aligning and inserting forks into lift assembly, insert nuts and bolts to secure forks to lift assembly.

## Transport (STERIS Equipment Mover)

STEP

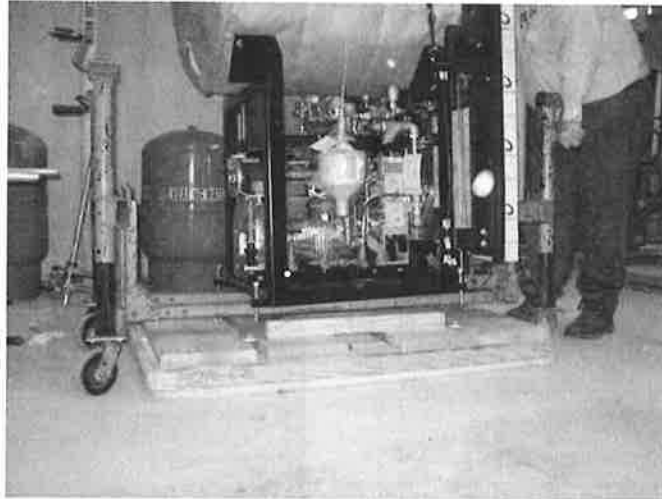
7



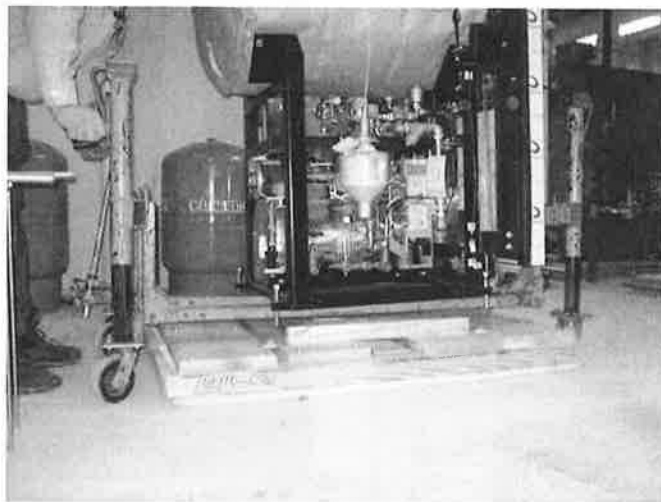
### WARNING – TIPPING HAZARD:

To prevent possible personal injury and or sterilizer damage, you must observe the following when moving the sterilizer:

- Do not open the chamber door(s) until the sterilizer is installed (stabilized). Sterilizer is top-front-heavy and may tip.
- Do not use upper frame as a handhold, it is not designed for such.
- Do not jar sterilizer as delicate instruments might be damaged.



7



Raise Sterilizer Evenly

**Step 7:** Raise sterilizer from pallet.

- Turn hand cranks evenly at each corner to lift sterilizer.

## Transport (STERIS Equipment Mover)

STEP

8

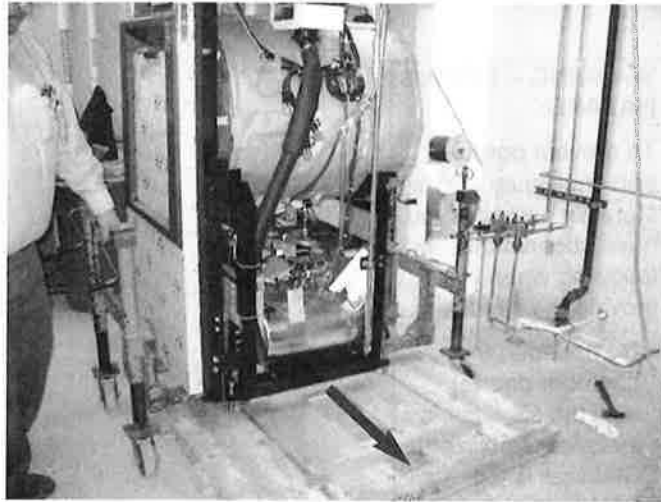
9



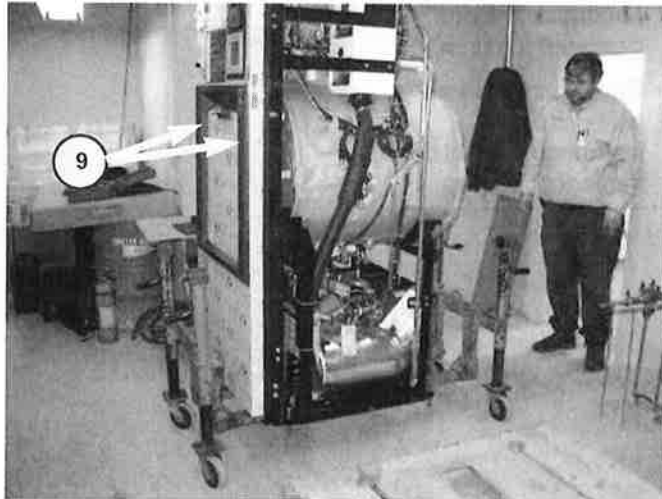
### WARNING – TIPPING HAZARD:

To prevent possible personal injury and or sterilizer damage, you must observe the following when moving the sterilizer:

- Do not open the chamber door(s) until the sterilizer is installed (stabilized). Sterilizer is top-front-heavy and may tip.
- Do not use upper frame as a handhold, it is not designed for such.
- Do not jar sterilizer as delicate instruments might be damaged.



8



9

**Step 8:** Remove pallet from under sterilizer.

**Step 9:** Re-insert the top two door shipping bolts if transporting sterilizer over rough surfaces.

## Transport (STERIS Equipment Mover)

STEP

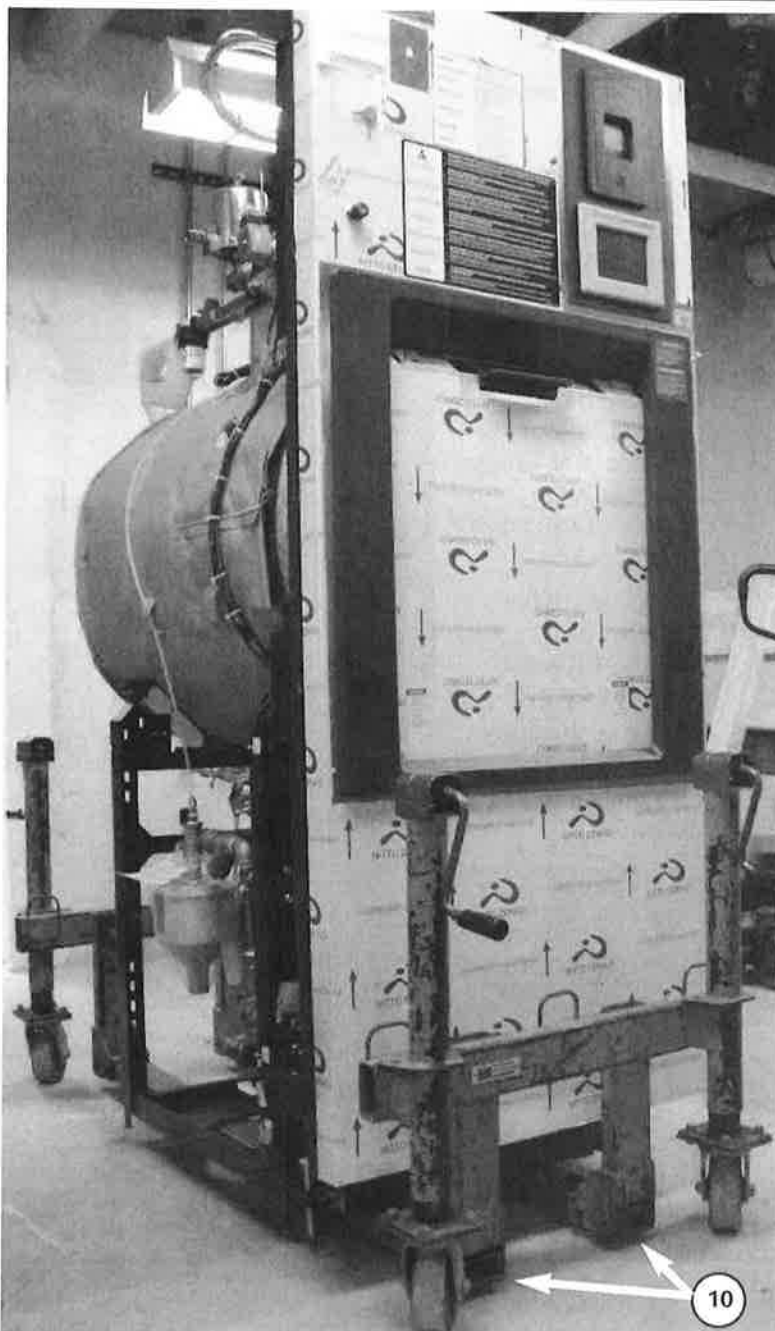
10



### WARNING – TIPPING HAZARD:

To prevent possible personal injury and or sterilizer damage, you must observe the following when moving the sterilizer:

- Do not open the chamber door(s) until the sterilizer is installed (stabilized). Sterilizer is top-front-heavy and may tip.
- Do not use upper frame as a handhold, it is not designed for such.
- Do not jar sterilizer as delicate instruments might be damaged.



**Step 10:** Lower the transporter jacks to within one inch of floor for safe transport to install location.

## Transport (STERIS Equipment Mover)

STEP

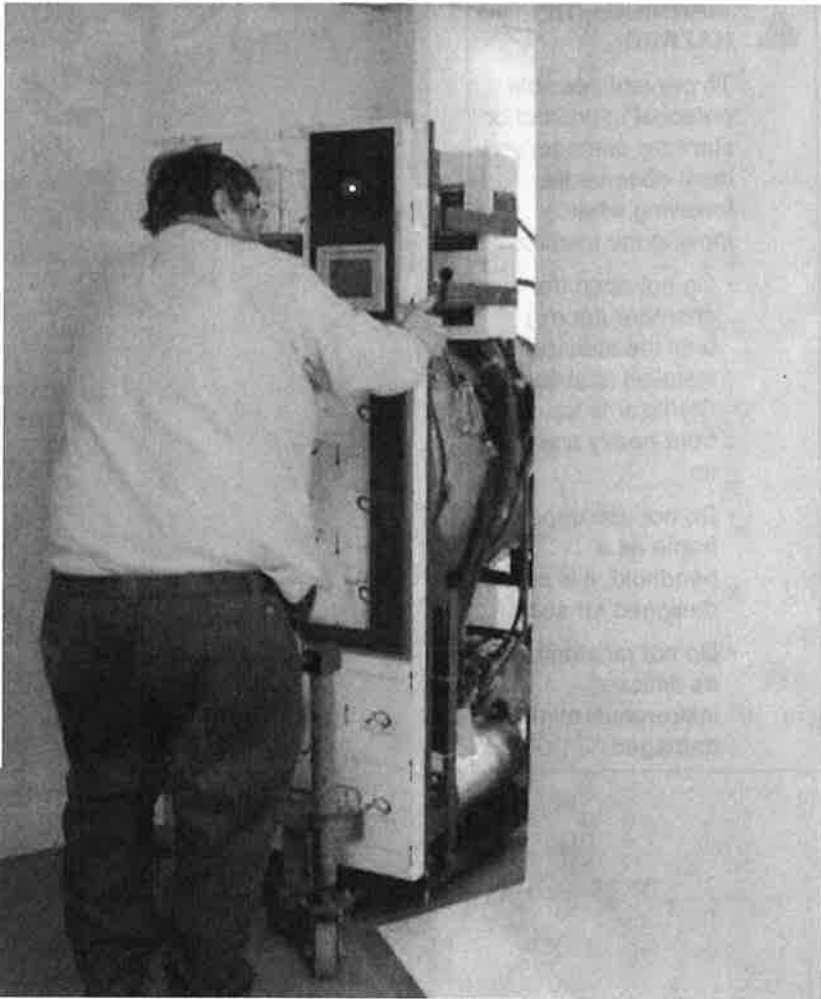
11



### WARNING – TIPPING HAZARD:

To prevent possible personal injury and or sterilizer damage, you must observe the following when moving the sterilizer:

- Do not open the chamber door(s) until the sterilizer is installed (stabilized). Sterilizer is top-front-heavy and may tip.
- Do not use upper frame as a handhold, it is not designed for such.
- Do not jar sterilizer as delicate instruments might be damaged.



**Step 11:** Transport sterilizer to installation location.

- Support the upper portion of the sterilizer during transport.

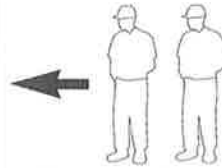
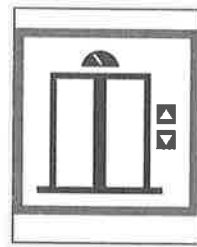


## Transport (STERIS Equipment Mover)

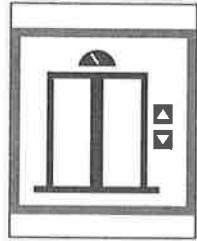
**STEP**

**12**

If ELEVATOR is part of transport pathway.



Installers check elevator weight capacity before loading sterilizer onto elevator. Installers ride with sterilizer to destination floor



Installers remove sterilizer from elevator on destination floor and transport to installation site.

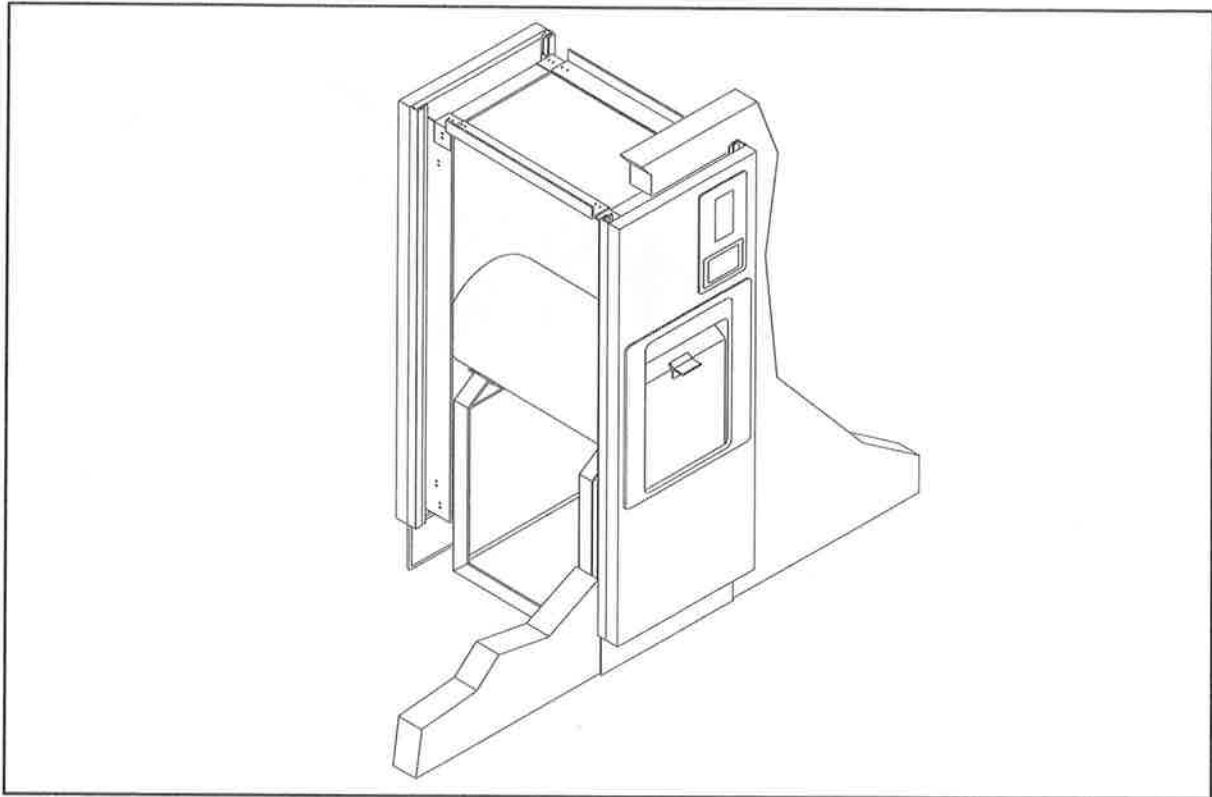
**NOTE:** Arrange for use of elevator with facility before transporting sterilizer from shipping dock to installation site.

**Step 12:** When an elevator is in the transportation path, place sterilizer into elevator car.

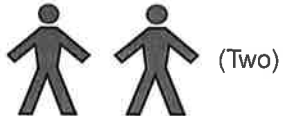
- Double check elevator weight capacity against unit weight plus two installer's weights before placing sterilizer into elevator.
- Installers ride in elevator with sterilizer.

**Transport (STERIS Equipment Mover)**

Healthcare  
Capital Equipment



**Personnel Required:**



**Personal Protective Equipment Required:**

- Gloves
- Steel-Toe Shoes

**Parts Required:**

- Four floor pads<sup>1</sup>

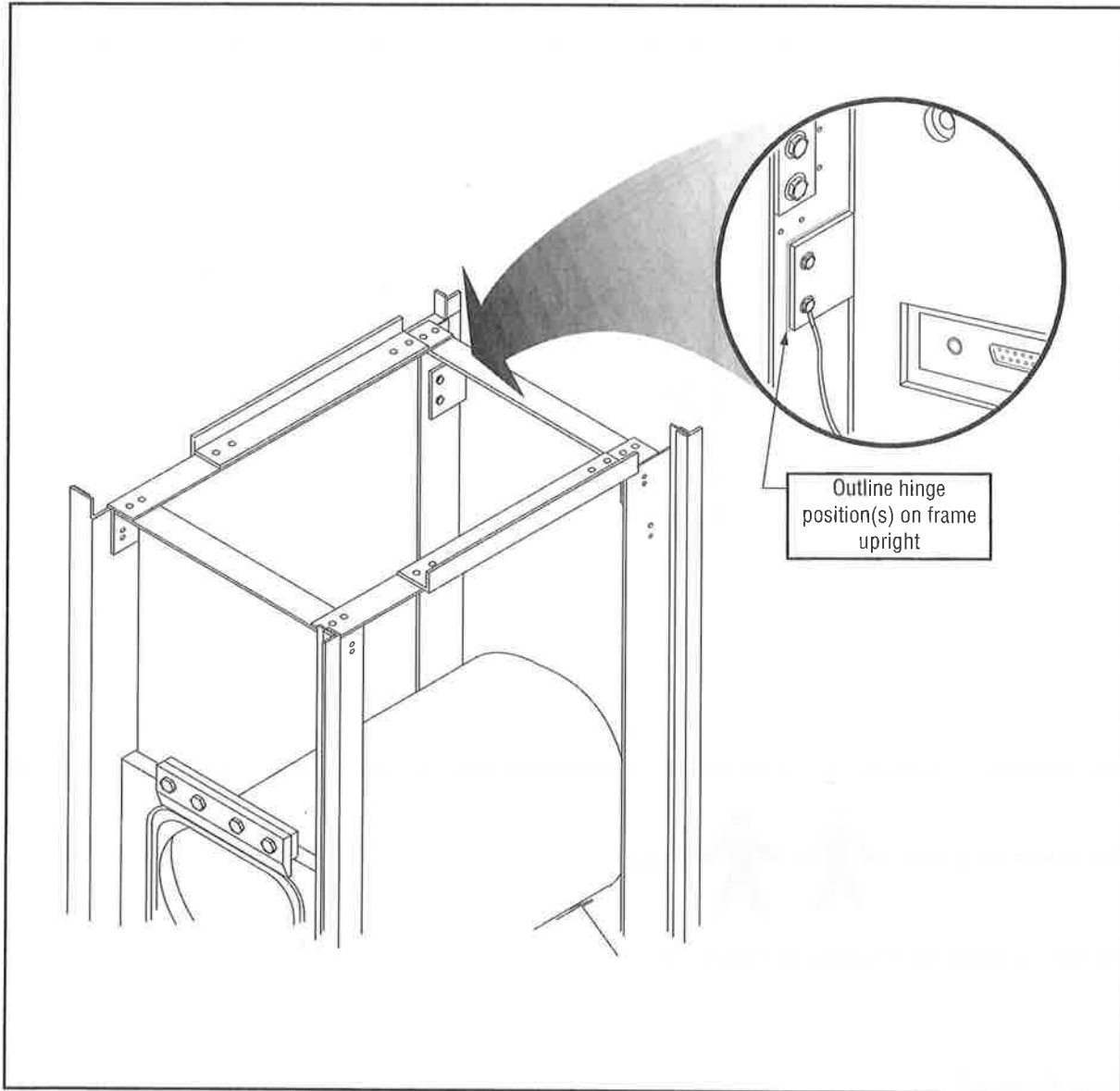
**Special Tools:**

- Equipment mover

---

*1. These items ship with sterilizer.*

## Set Sterilizer In Place



If installing **Cabinet** configuration, distance from front of unit to wall should be:

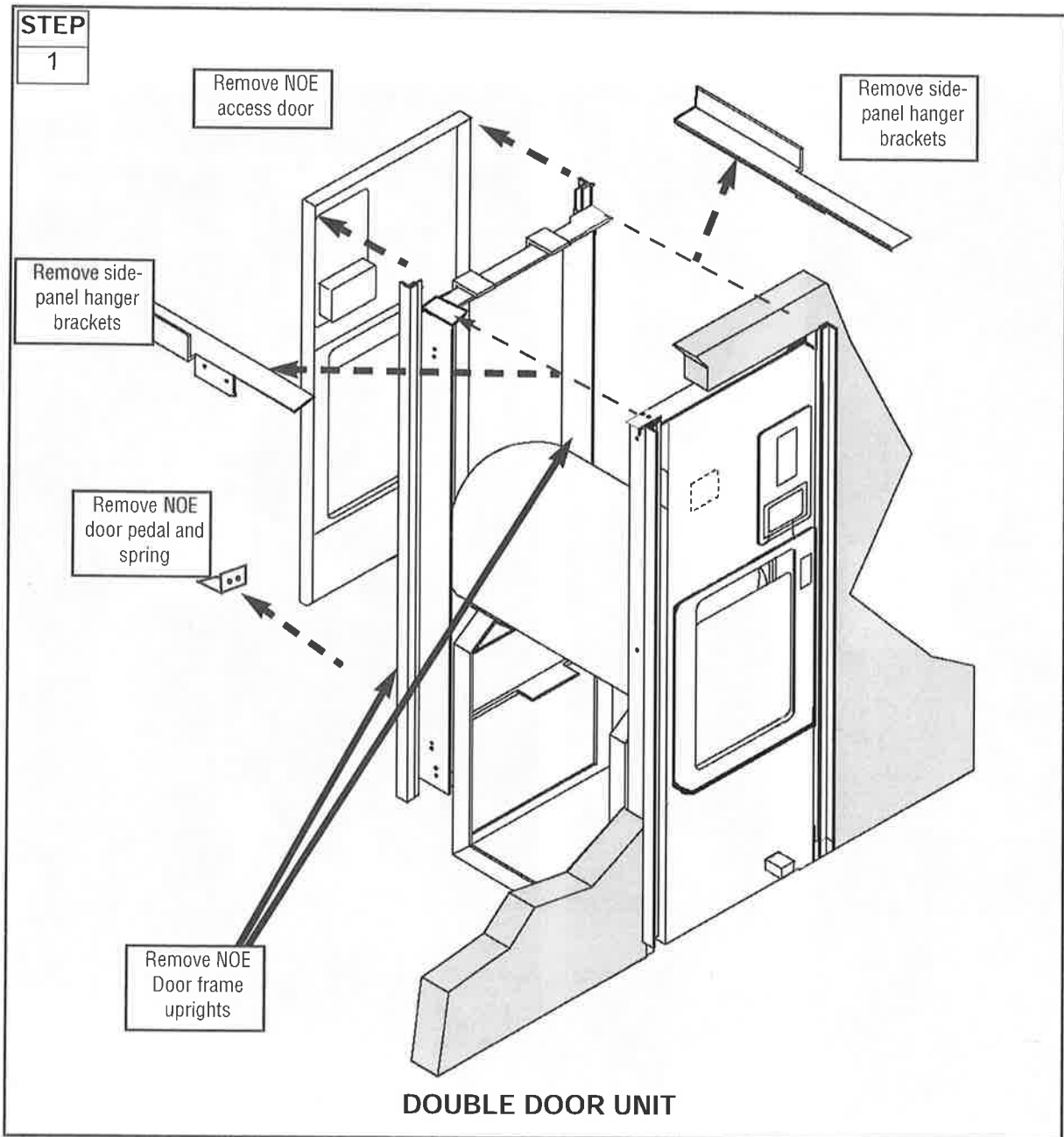
- 16" unit — 37".
- 20" unit — 46".

Go to Step 2 if **Single Door** configuration.

If **Double Door** recessed configuration, make sure operating end (with printer) and non-operating end (without printer) are oriented as wanted by the Customer.

- Open non-operating end (NOE) service access door and remove cable connectors from NOE control panel.
- Outline hinge positions on frame with permanent marker (or similar) and remove NOE access door. (For re-installation later)

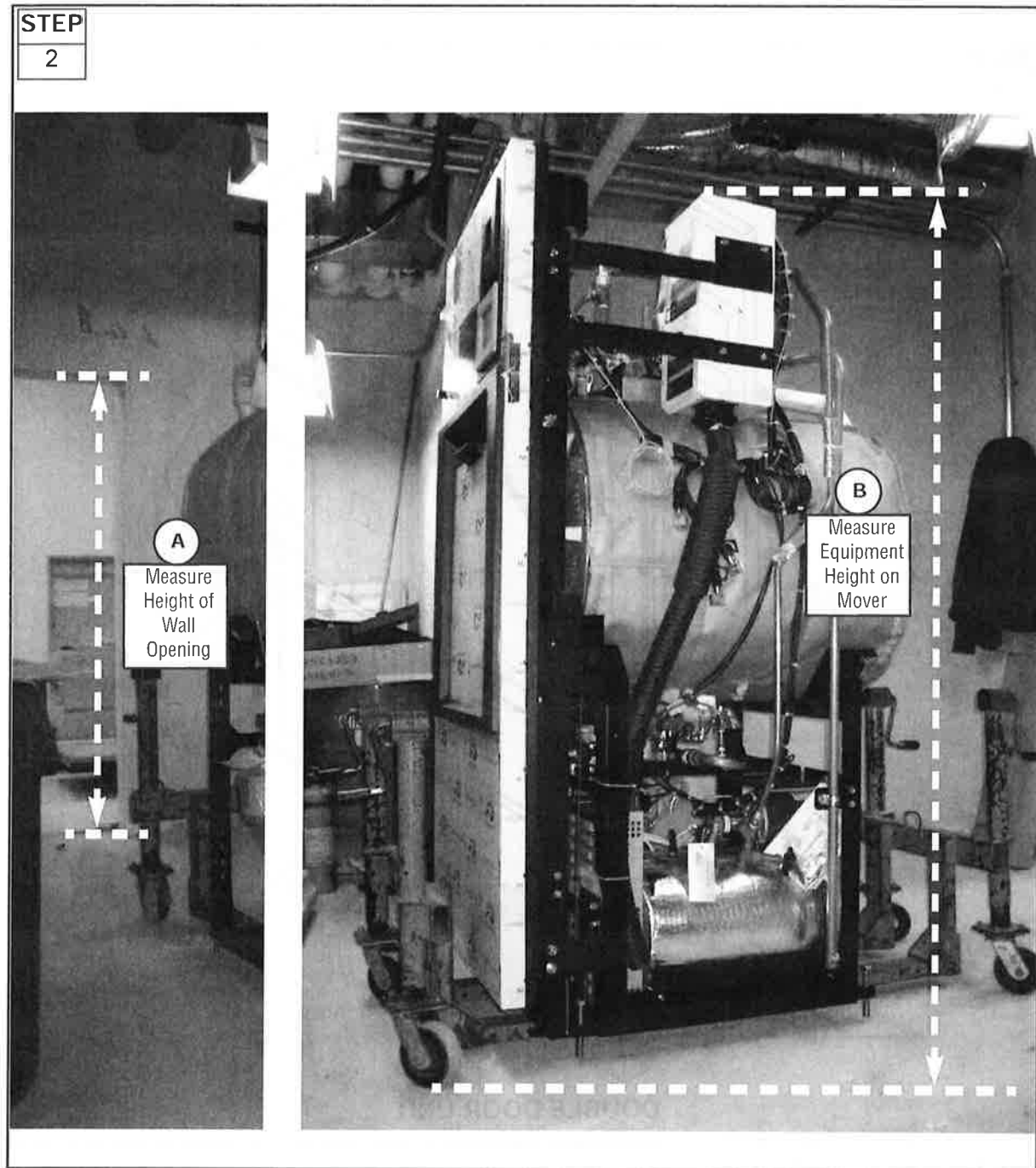
## Set Sterilizer In Place



**Step 1:** Remove NOE components for placement:

- Remove NOE access door.
- Remove side-panel hanger brackets.
- Unbolt and remove both NOE door supporting frame uprights.

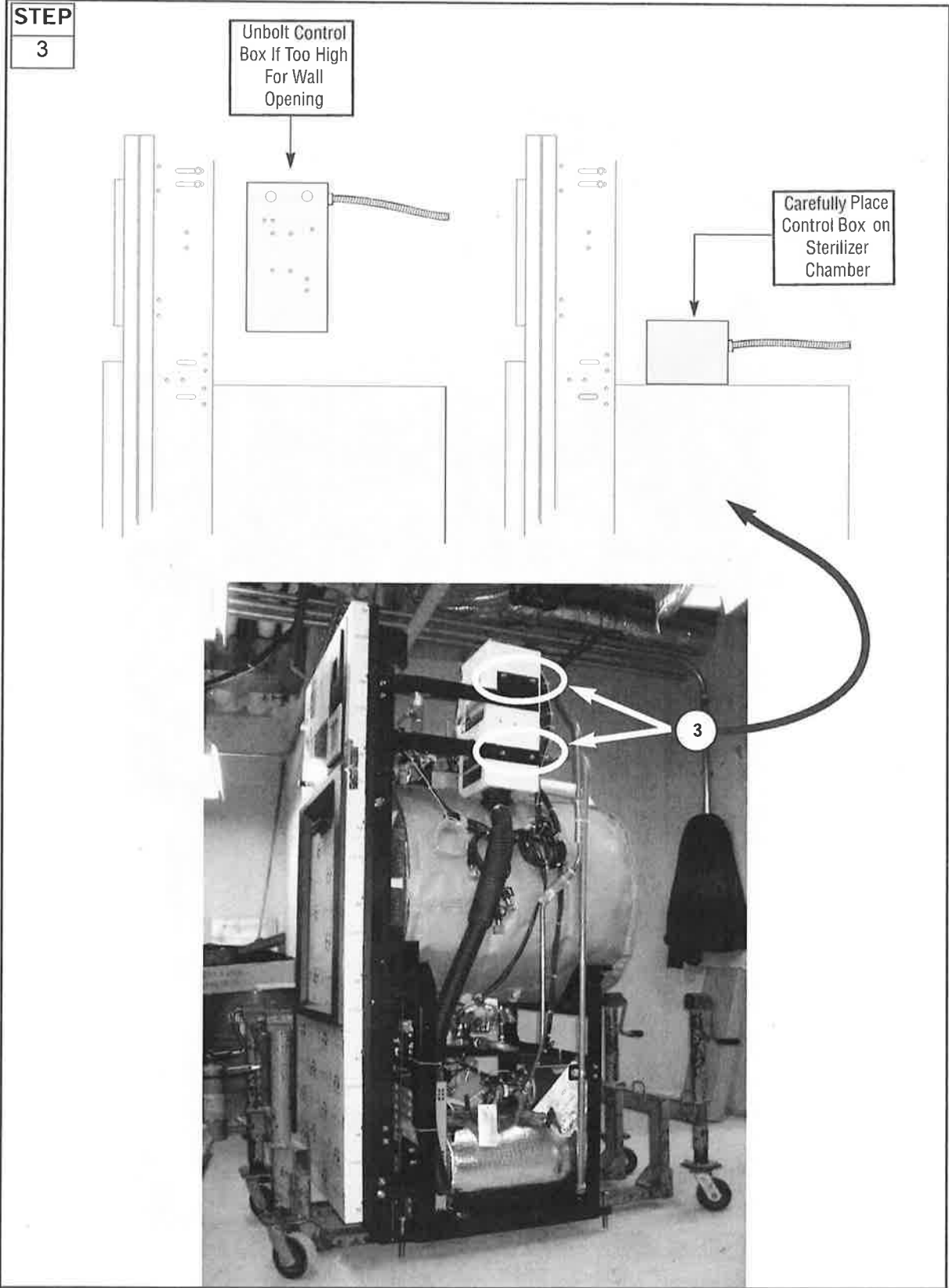
## Set Sterilizer In Place



**Step 2:** Measure height of existing wall opening (A).

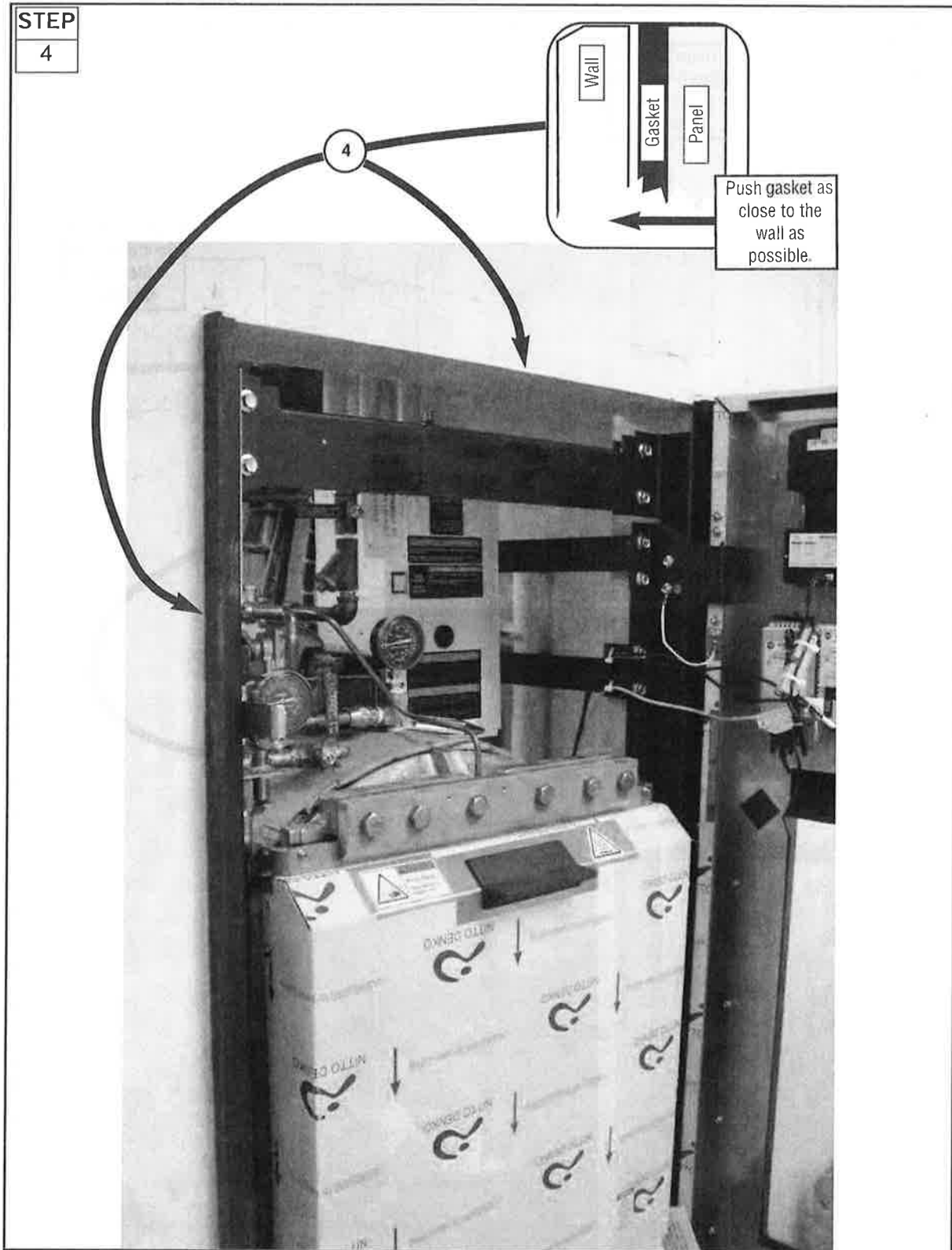
- Compare wall opening height to height of control box on equipment mover (B).

**Set Sterilizer In Place**



**Step 3:** If necessary, remove bolts securing control box to sterilizer and carefully place control box on top of sterilizer chamber.

## Set Sterilizer In Place



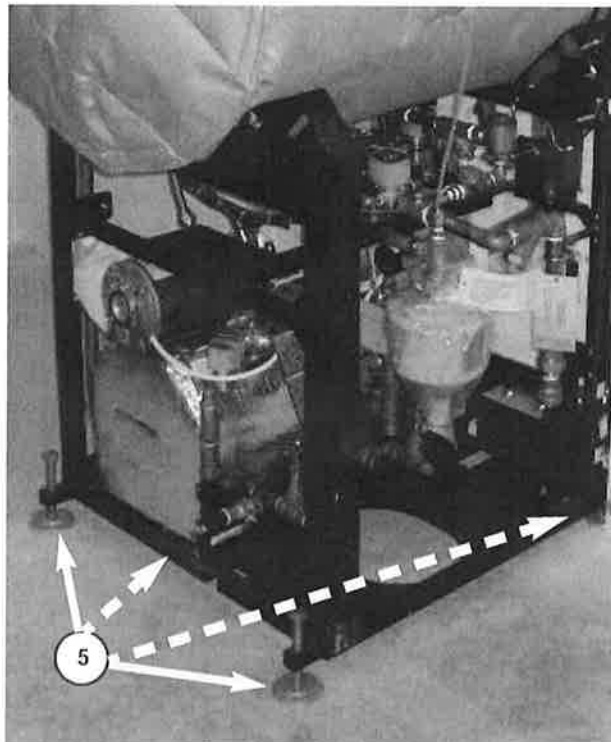
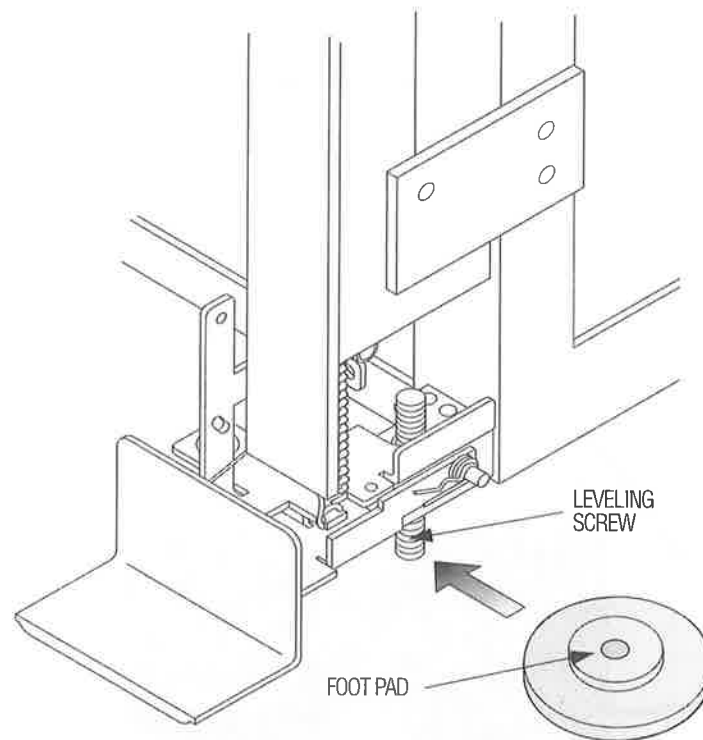
**Step 4:** Push sterilizer through wall opening until trim panel gaskets are as close as possible to the wall.

- Exercise caution when pushing sterilizer through wall so as not to damage wire bundles and other items that may extend beyond the frame.



## Set Sterilizer In Place

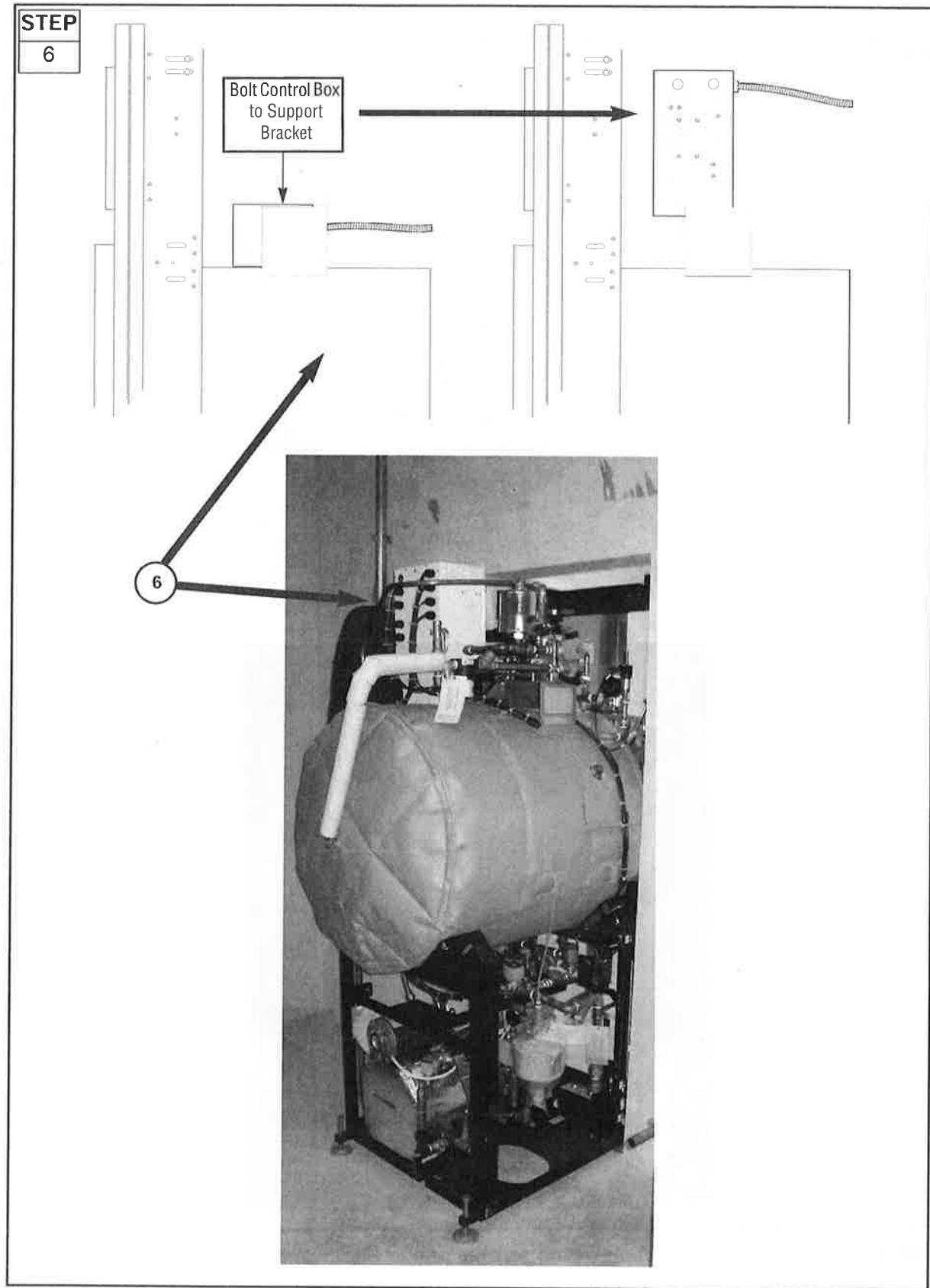
STEP  
5



**Step 5:** Place foot pads under leveling screws.

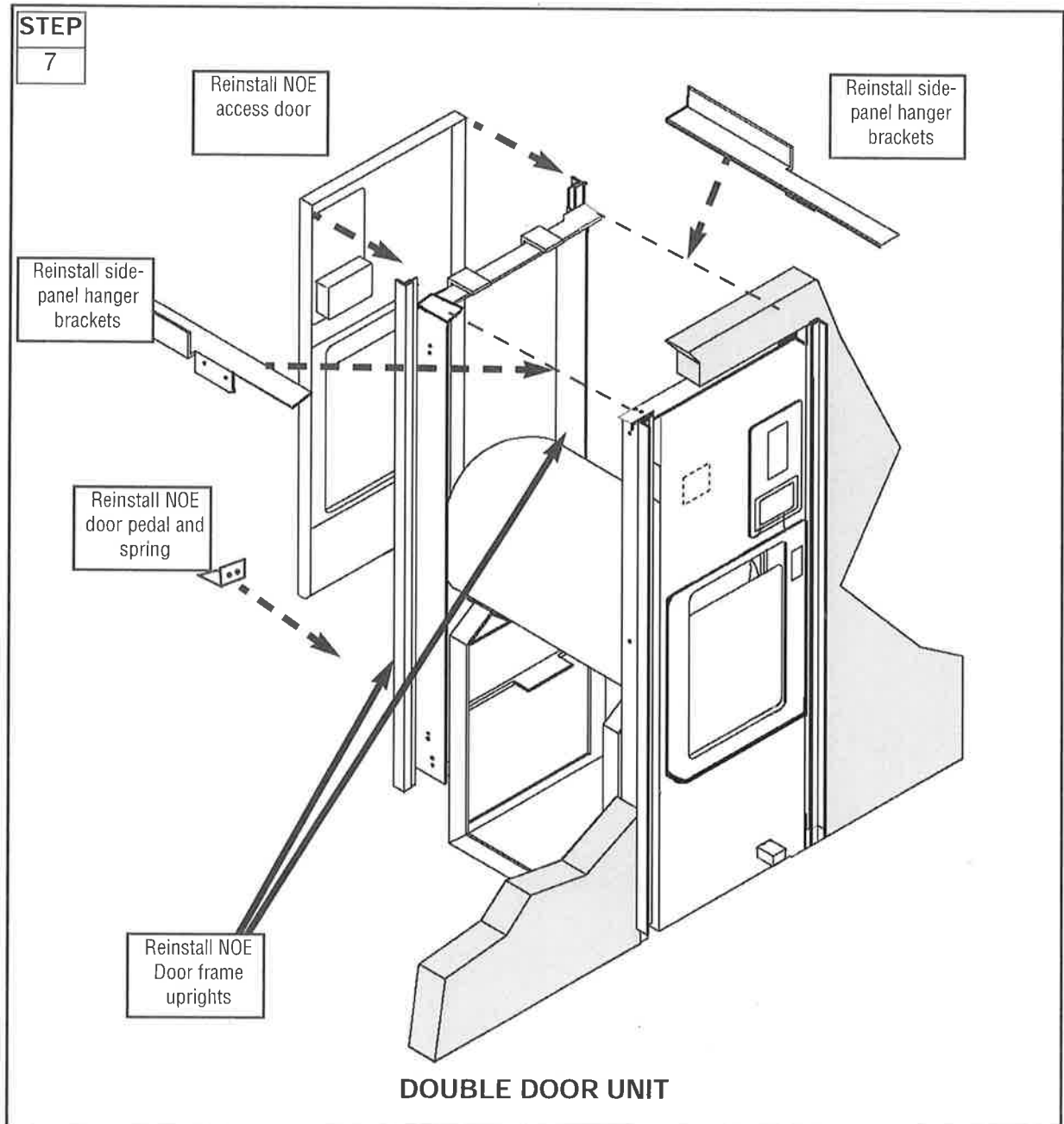
- Lower sterilizer to floor.
- Remove equipment mover.

## Set Sterilizer In Place



**Step 6:** If applicable, reinstall control box to bracket on sterilizer chamber.

## Set Sterilizer In Place

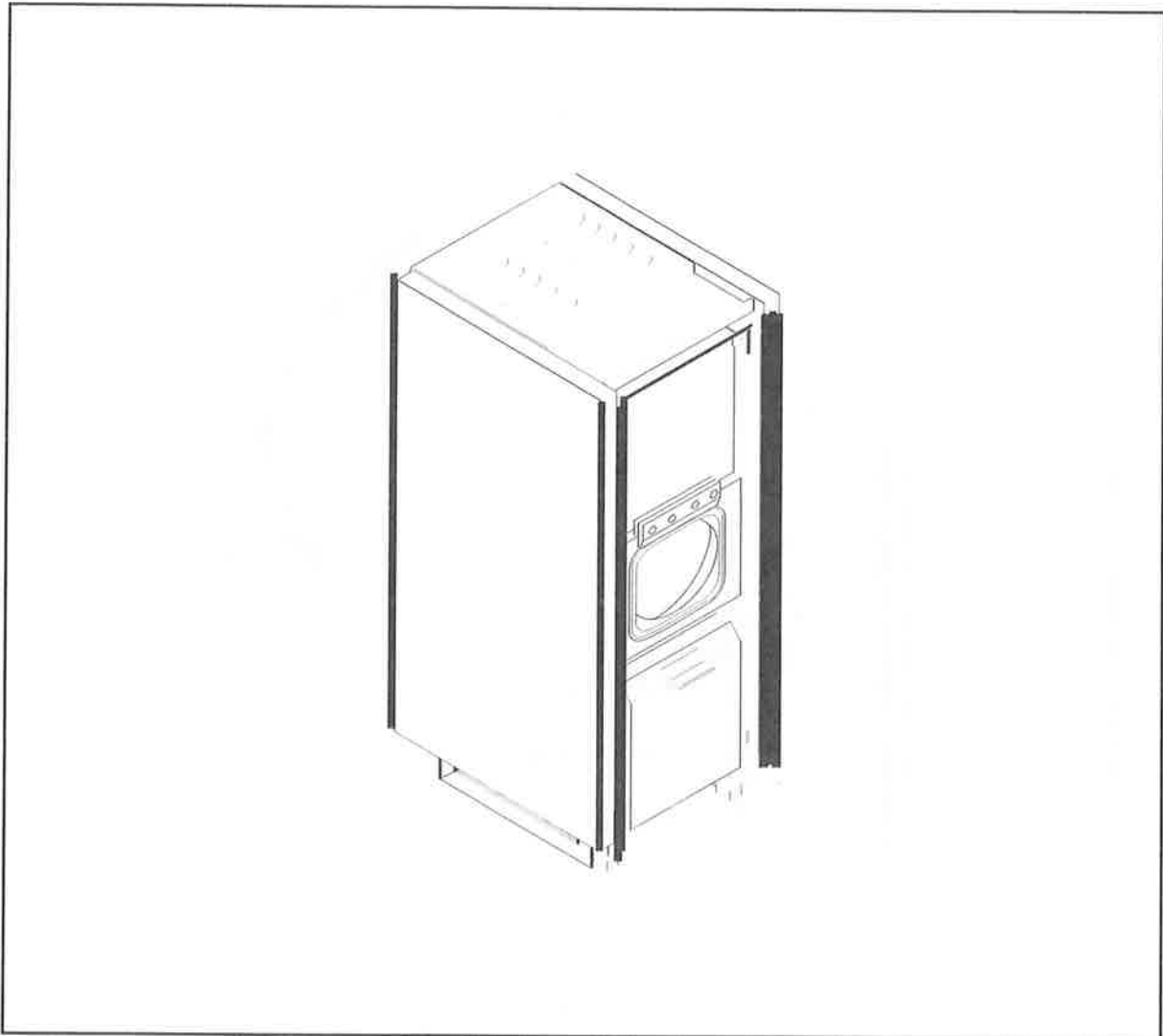


**Step 7:** Replace removed components:

- Replace NOE access door supporting uprights (leave hardware loose until sterilizer is leveled).
- Replace side-panel hanger brackets (leave hardware loose until sterilizer is leveled).
- Replace NOE access door (align hinges to marks made previously).

**Set Sterilizer In Place**

Healthcare  
Capital Equipment



**Personnel Required:**  (Two)

**Personal Protective Equipment Required:**

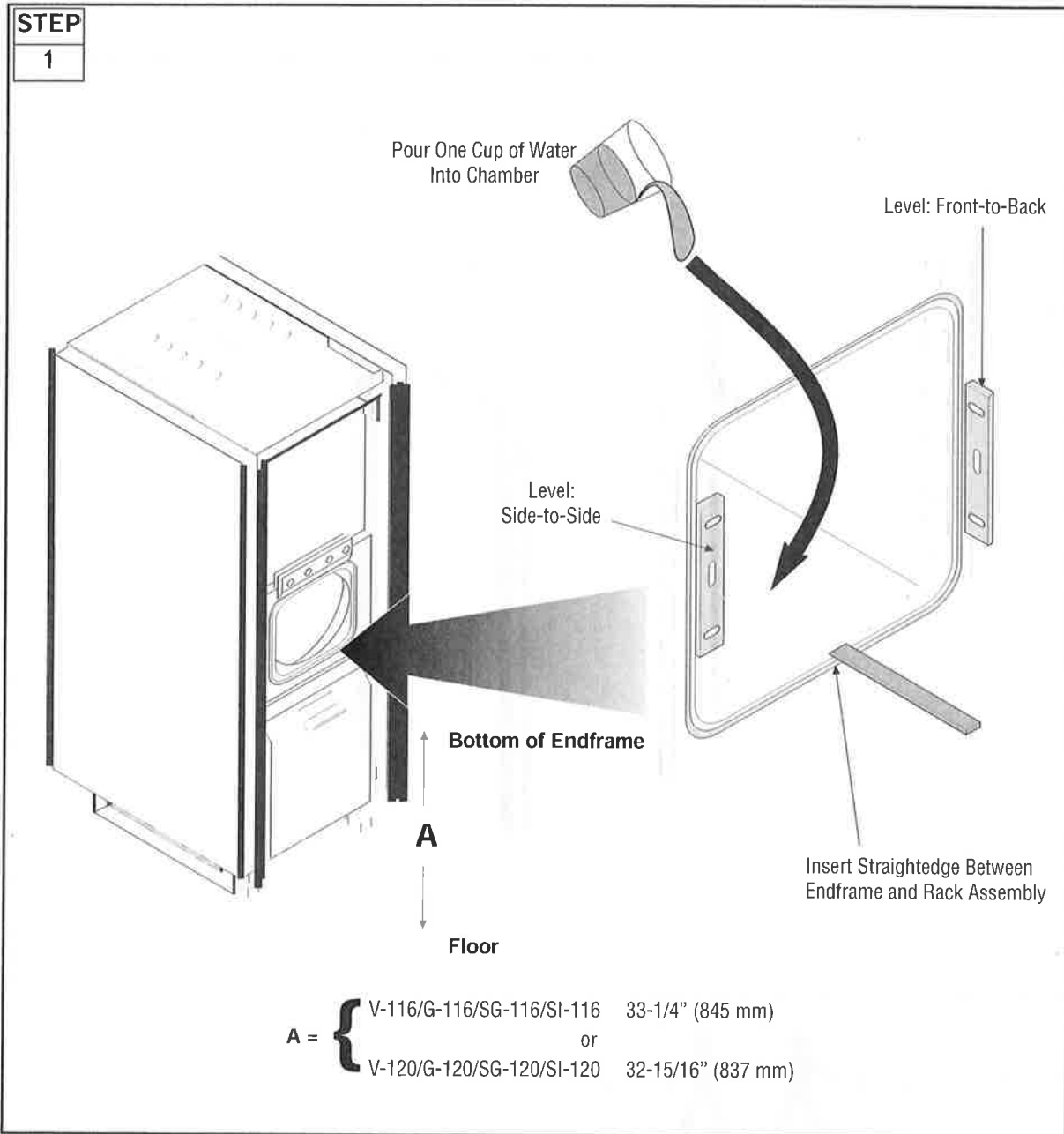
- Gloves
- Steel-Toe Shoes

**Parts Required:**

**Special Tools:**

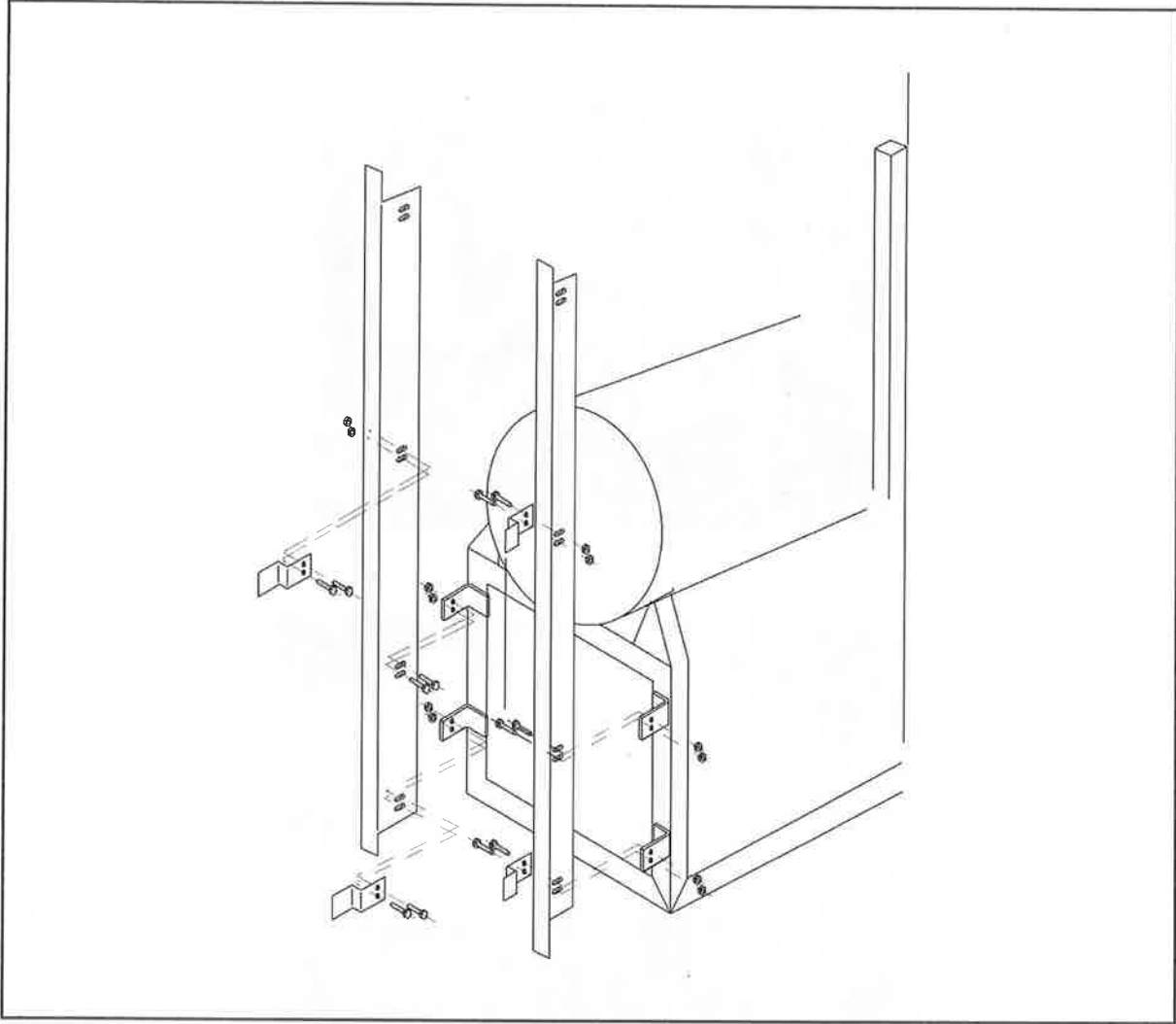
- Spirit Level
- Rigid Straightedge

## Level Sterilizer



**Step 1:** Insert straightedge between chamber shelf rack and endframe.

- Adjust leveling screws to obtain distance of 33-1/4" (845 mm) or 32-15/16" (837 mm) between floor and bottom of straightedge (endframe).
- Place level against edge of endring and check if sterilizer is level side-to-side and front-to-back.
- If sterilizer is not level, adjust leveling screws as necessary while maintaining the 33-1/4" (845 mm) or 32-15/16" (837 mm) dimension.
- Pour one cup of water into chamber and adjust rear leveling screws to ensure water runs toward strainer.
- Recheck trim panel gaskets to ensure they are as close as possible to wall after making leveling adjustments.



**Personnel Required:**  (Two)

**Personal Protective Equipment Required:**

- Safety Goggles or Glasses
- Gloves
- Steel-Toe Shoes
- Hard Hat

**Parts Required:**

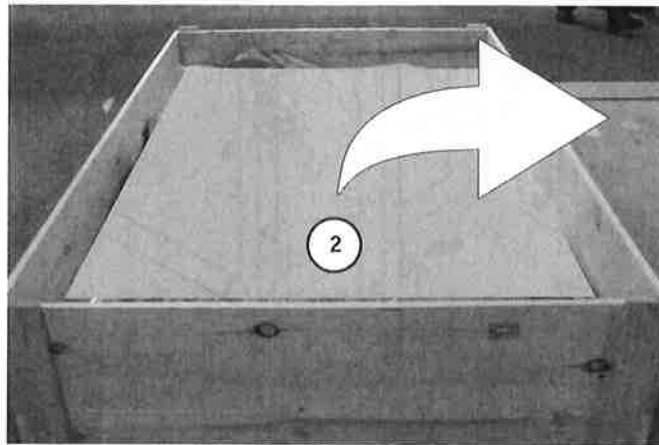
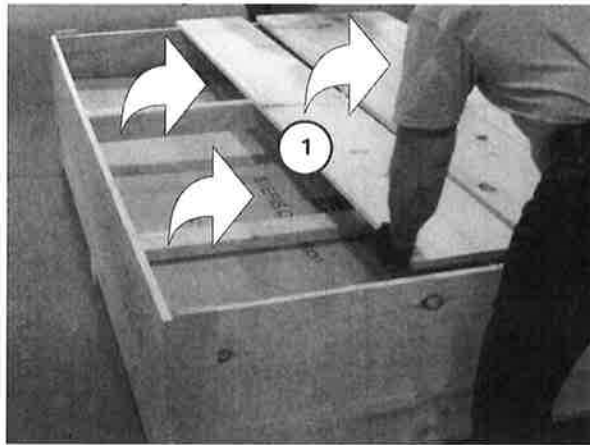
- All parts for panel kit

**Special Tools:**

- Only Standard Tools Required

## Install Panel Brackets — 16"

STEP
1
2



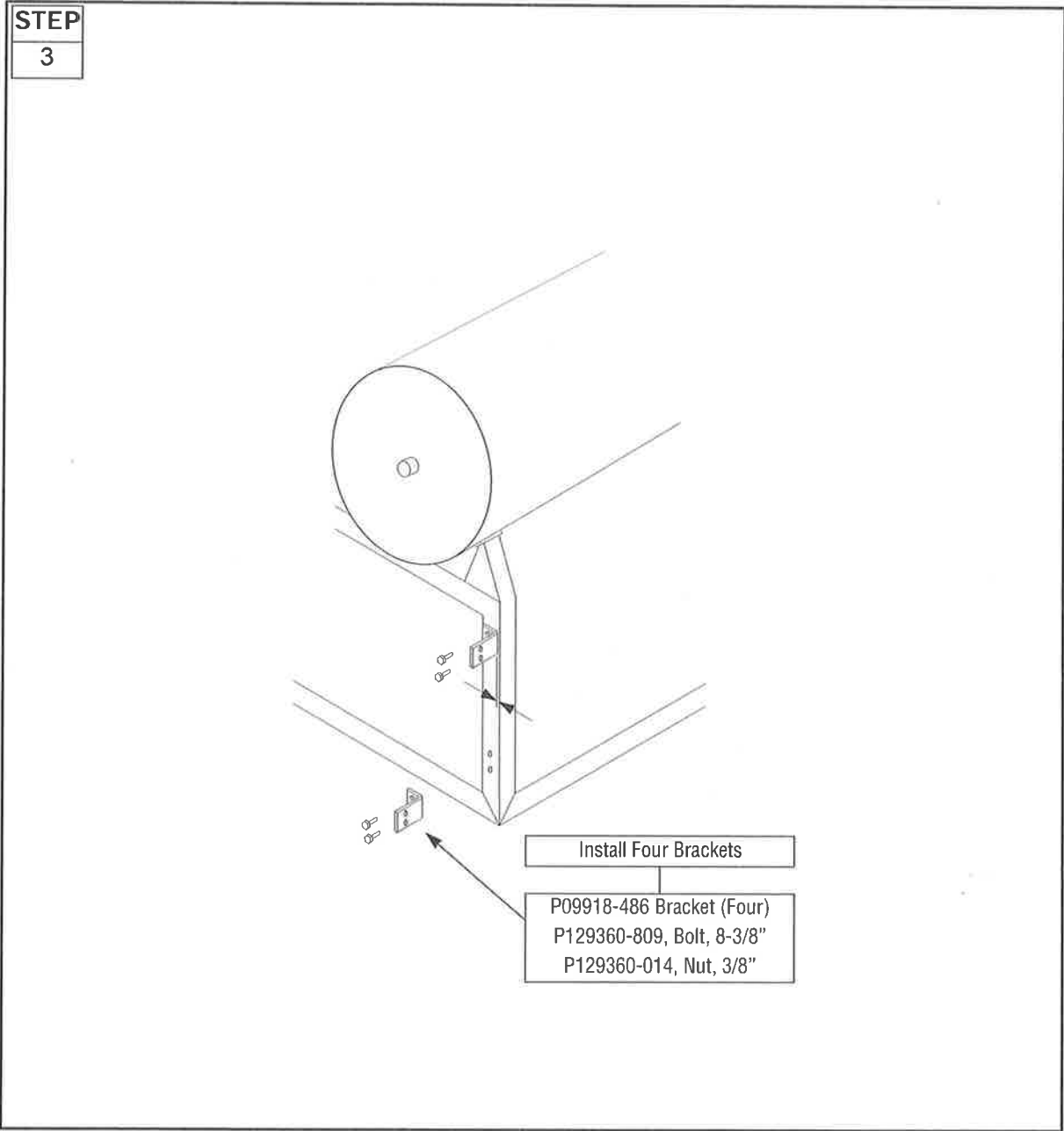
**Step 1:** Using a pry bar, remove top of crate and cross bracing.

**Step 2:** Carefully unpack sterilizer panels and frame components from crate.

- Set panels aside for later installation.

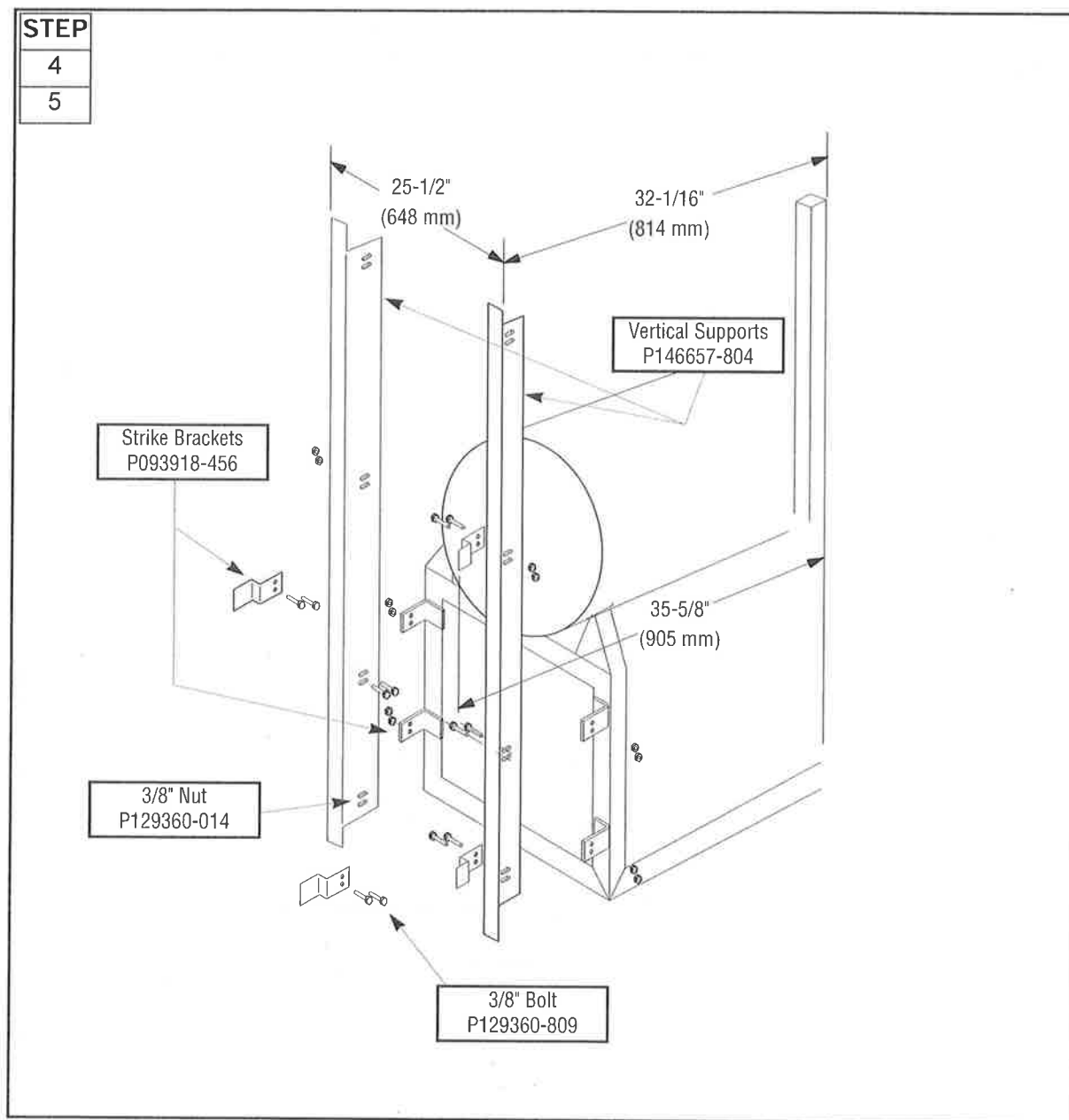


**Install Panel Brackets — 16"**



**Step 3:** Install four angle brackets to legs of sterilizer stand using eight 3/8" bolts and nuts.

## Install Panel Brackets — 16"



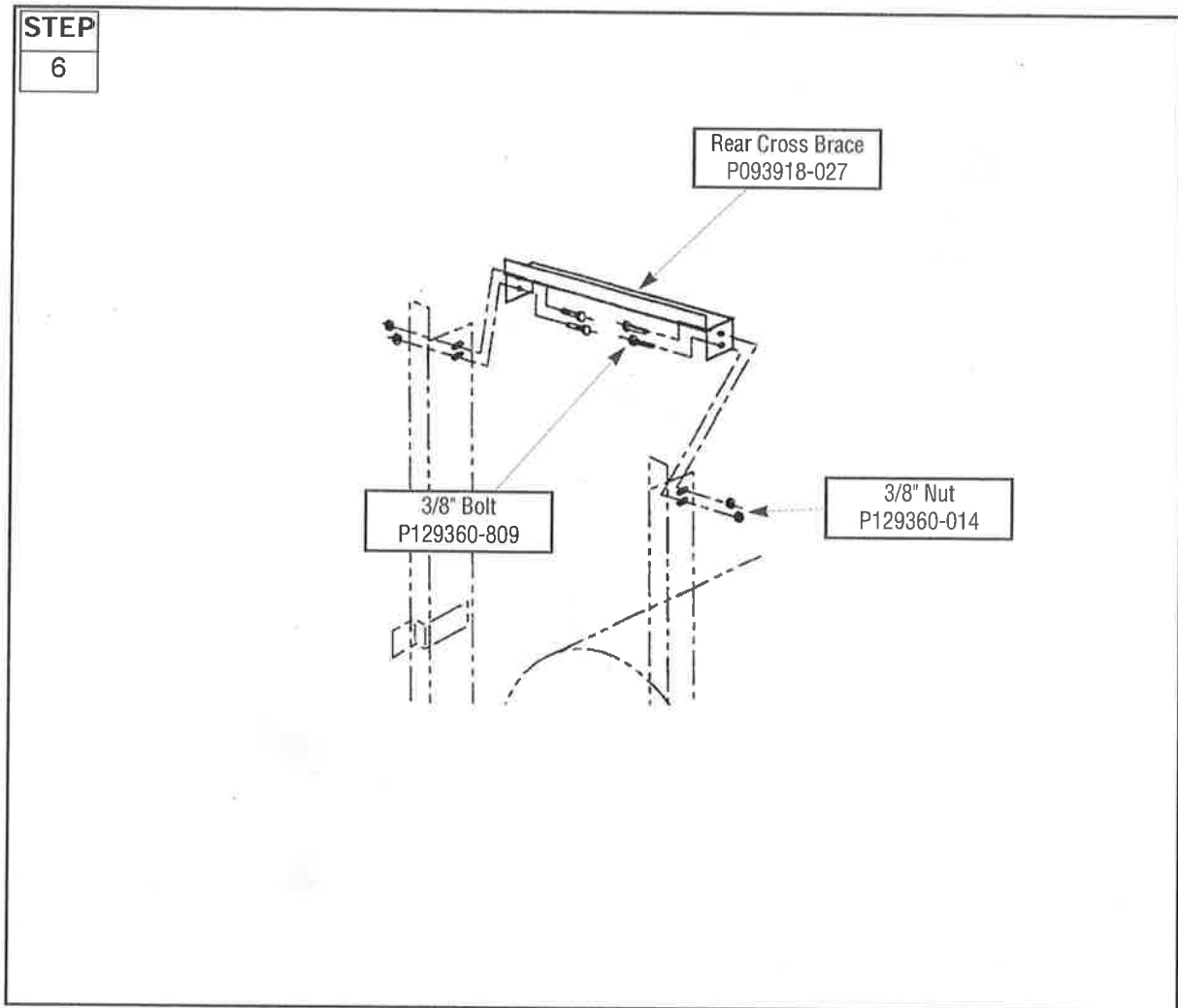
**Step 4:** Install vertical supports with eight 3/8" bolts and nuts.

- Fasteners must be loose (not quite hand-tight).

**Step 5:** Install four strike brackets with eight 3/8" bolts and nuts.

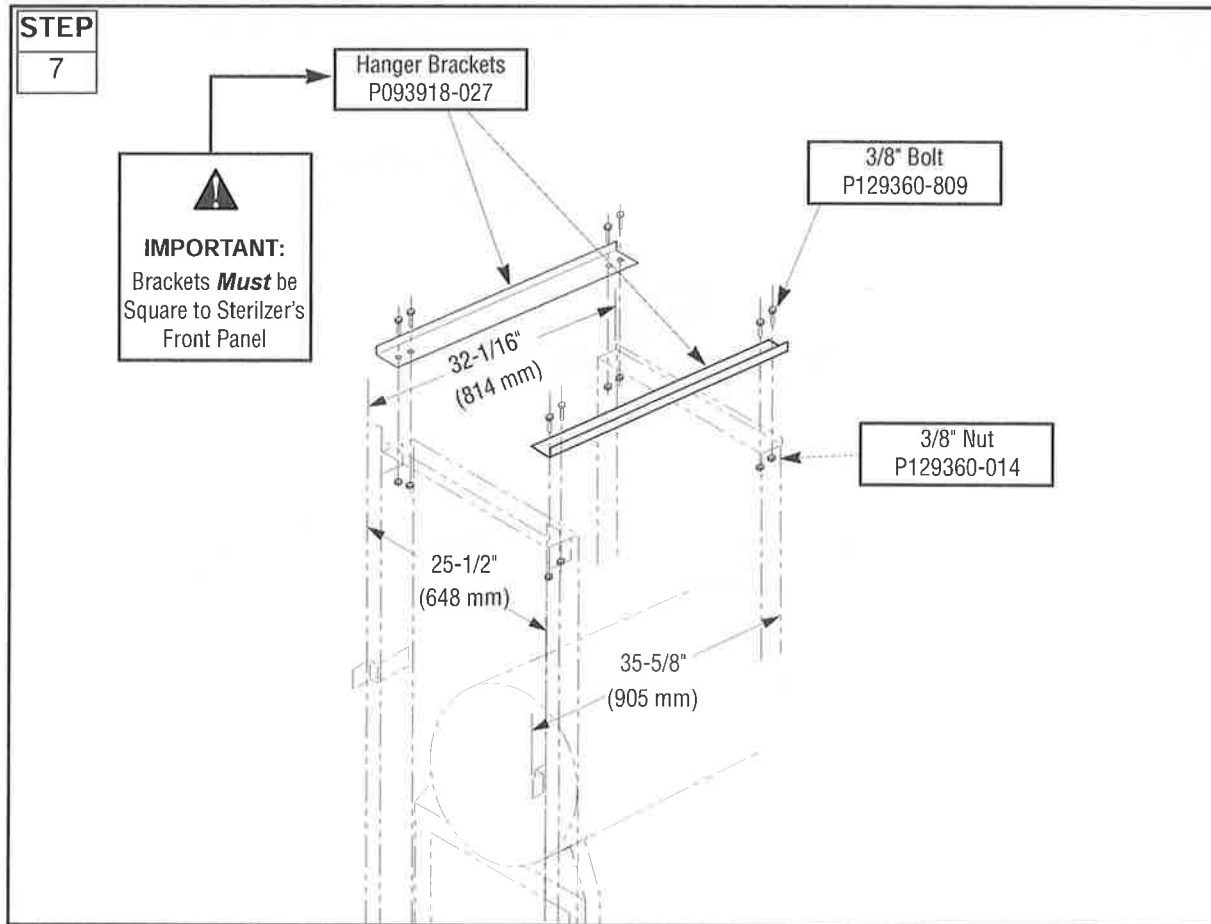
- Fasteners must be loose (not quite hand-tight).

## Install Panel Brackets — 16"



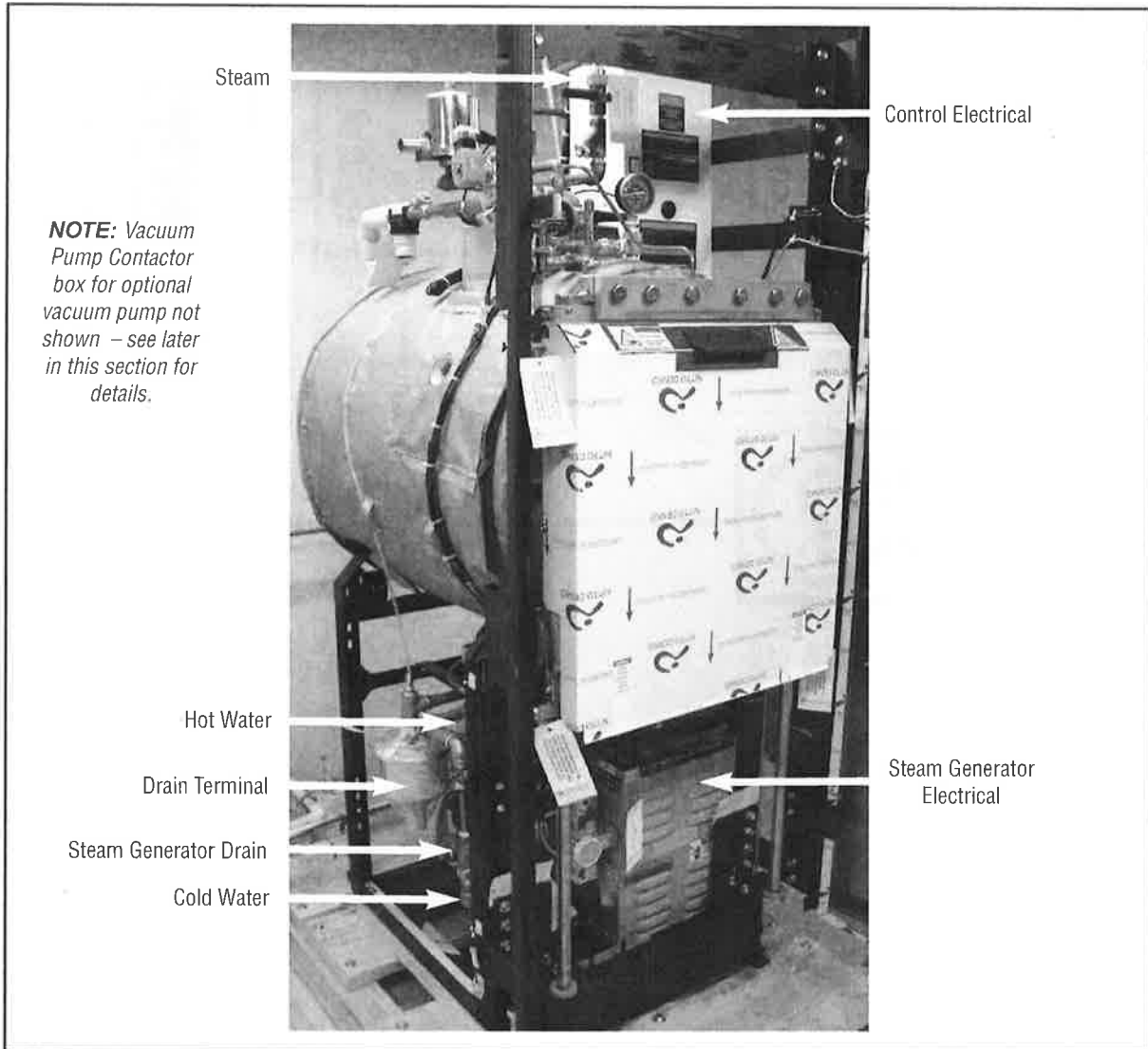
- Step 6:** Install rear crossbrace with four 3/8" bolts and nuts.
- Fasteners must be loose (not quite hand-tight).

## Install Panel Brackets — 16"



**Step 7:** Install two hanger brackets with eight 3/8" bolts and nuts.

- Hanger brackets *must* be square to sterilizer's front panel.
- Recheck all dimensions shown in picture, then tighten all nuts and bolts.



**Personnel Required:**  (One)

**Personal Protective Equipment Required:**

- Gloves
- Steel-Toe Shoes
- Safety Glasses

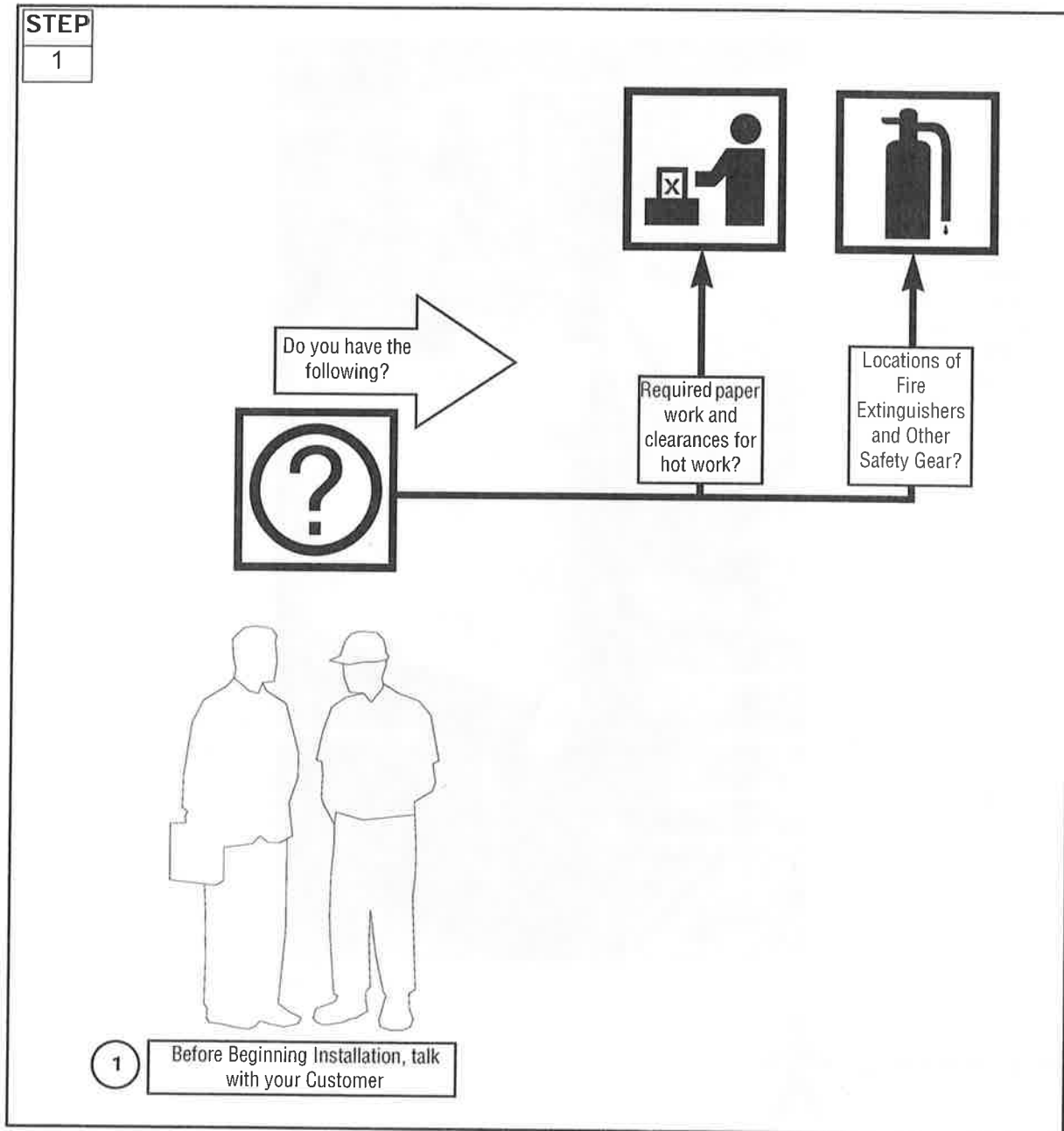
**Parts Required:**

- Plumbing pipe and fittings as necessary to connect with Customer utilities
- Electrical connectors based upon Customer site requirements

**Special Tools:**

- Fire extinguisher: ABC, electrically rated

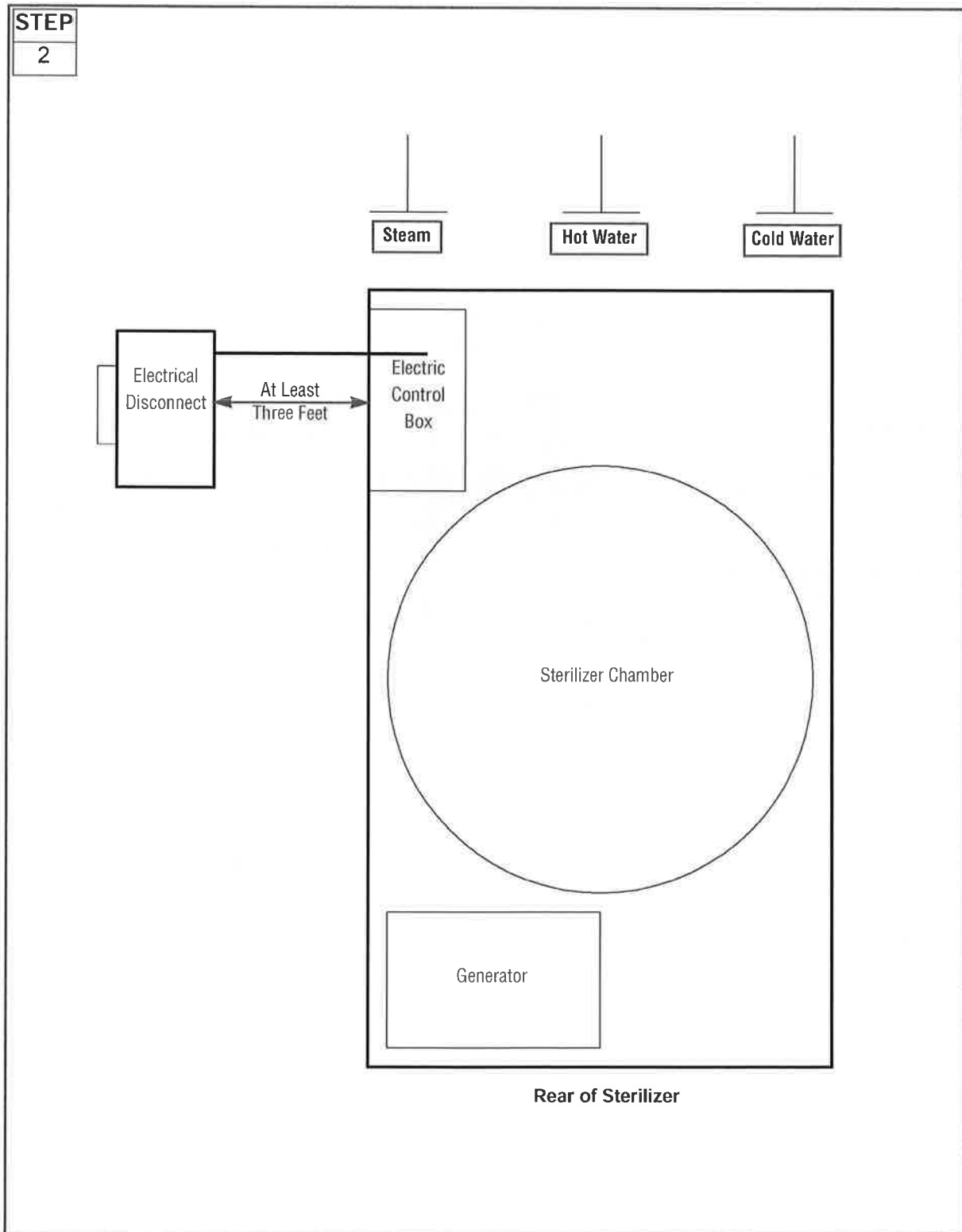
## Connect Utilities



**Step 1:** Before beginning procedures, verify Customer requirements for obtaining work clearance and location of fire alarms, etc.

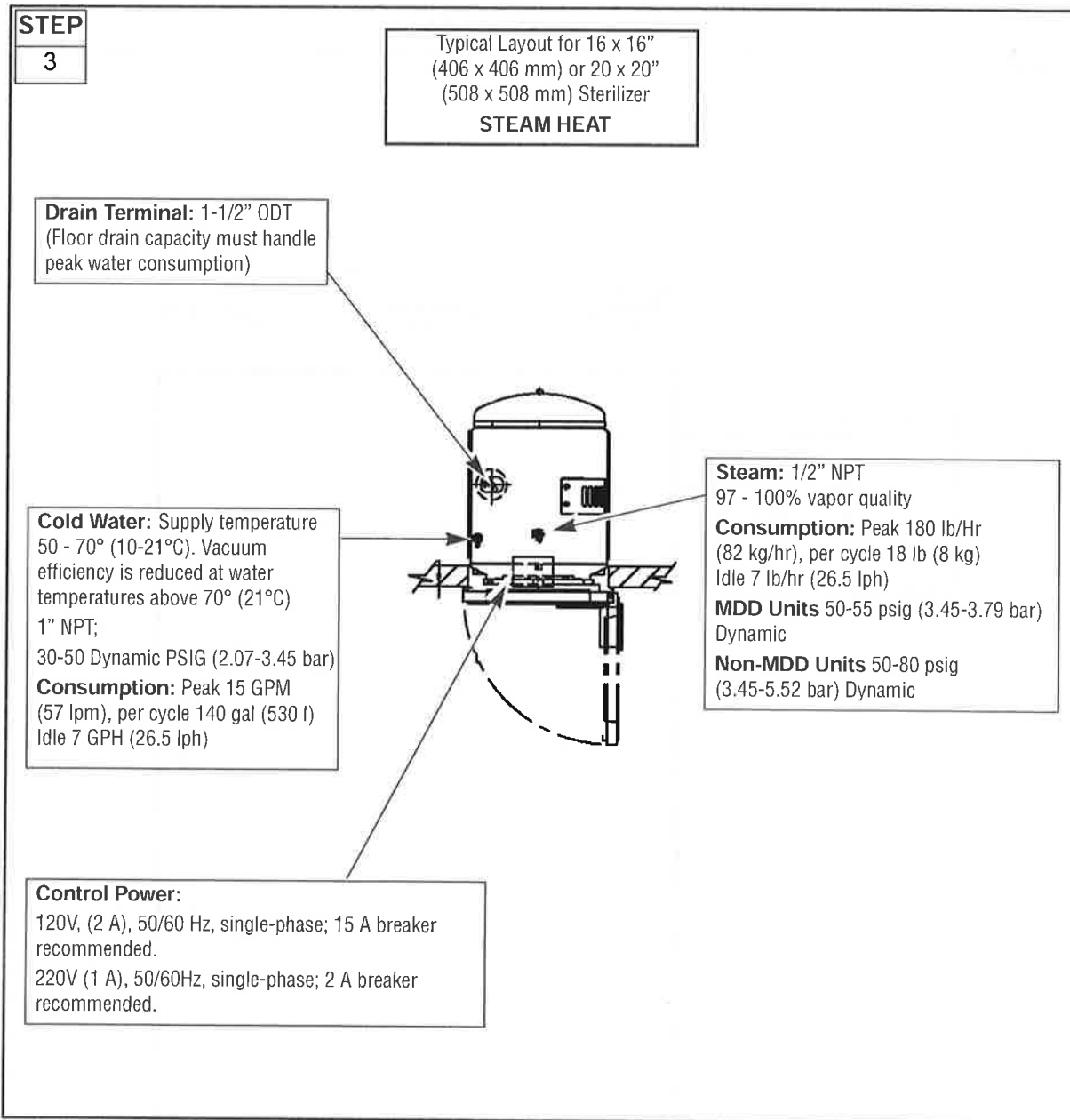
- Is properly-signed paperwork required?
- Is facility maintenance aware of hot work requirements?
- Do you know the location of all safety gear?

## Connect Utilities



**Step 2:** Facility utility supplies must, *whenever possible*, route from rear of recess wall in service area of sterilizer.

## Connect Utilities

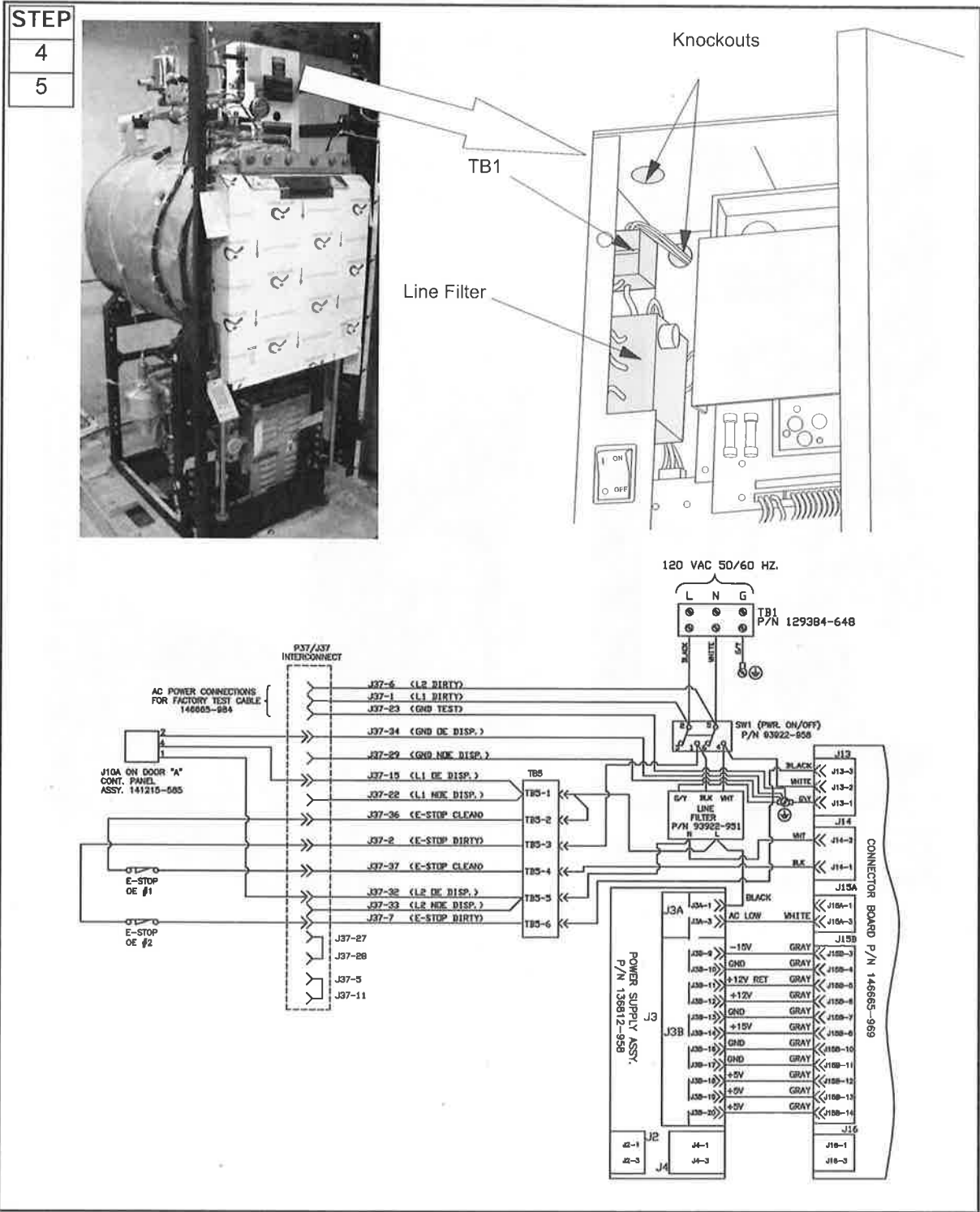


### Connect Utilities for Steam Heat

**Step 3:** Overview of plumbing and electrical lines to the sterilizer.



# Connect Utilities



- Step 4:** Route electrical utilities from the utility sources.
- Locate all utilities on rear or recess wall in the service area.
- Step 5:** Connect electrical utilities to terminal block in main control box (120V ac shown).

## Connect Utilities

STEP
6
7



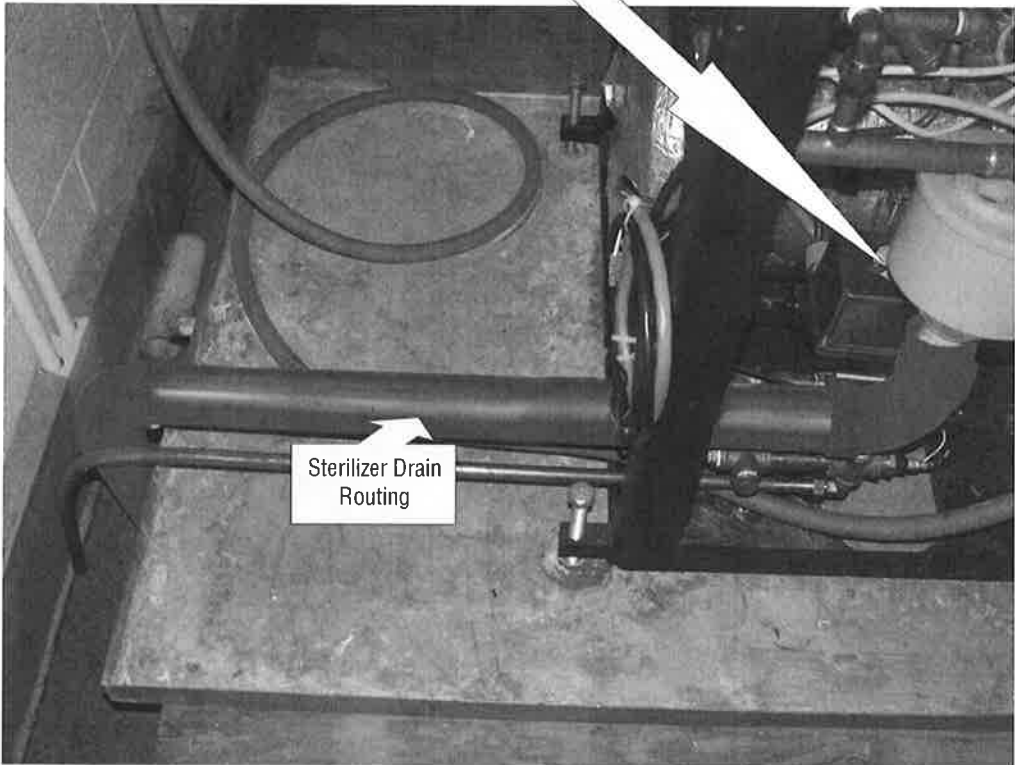
**Step 6:** Plumb the cold water utility from the utility sources.

- Locate all utilities at the rear of recess wall in the service area.

**Step 7:** Route cold water to connection point under main chamber.

- Accessible from front of sterilizer through access door.
- *Minimum 1" Type-L copper pipe material for water connection.*

STEP  
8

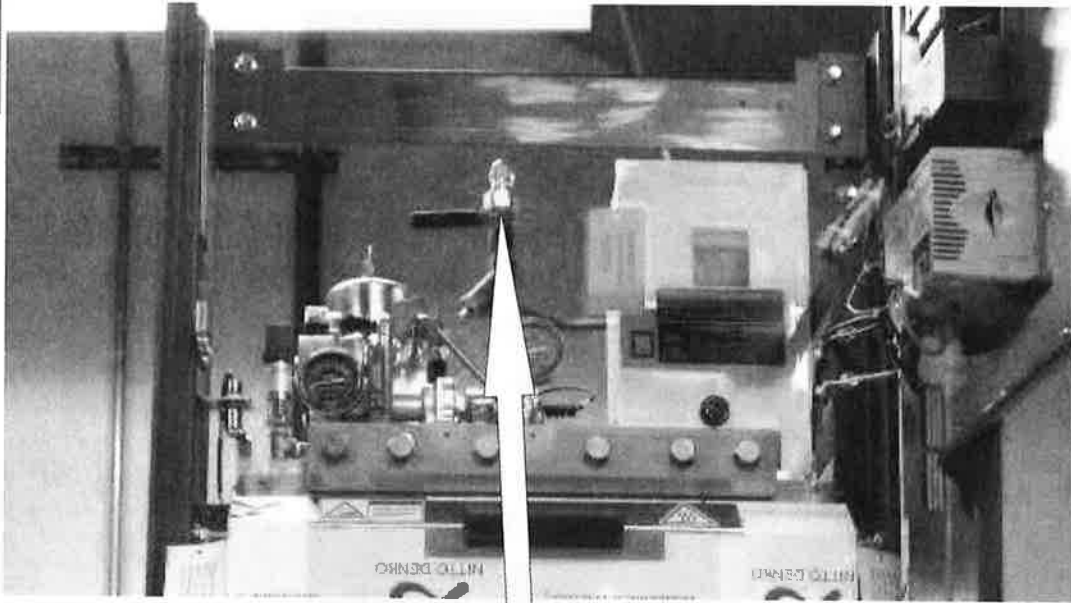


Mock-up showing typical sterilizer drain routing.  
**PVC pipe is not recommended for working installations.**

- Step 8:** Route drain connection from sterilizer to available drain.
- Minimum 1-1/2" DWV copper pipe material for drain – **PVC pipe is not allowed.**

## Connect Utilities

STEP
9
10

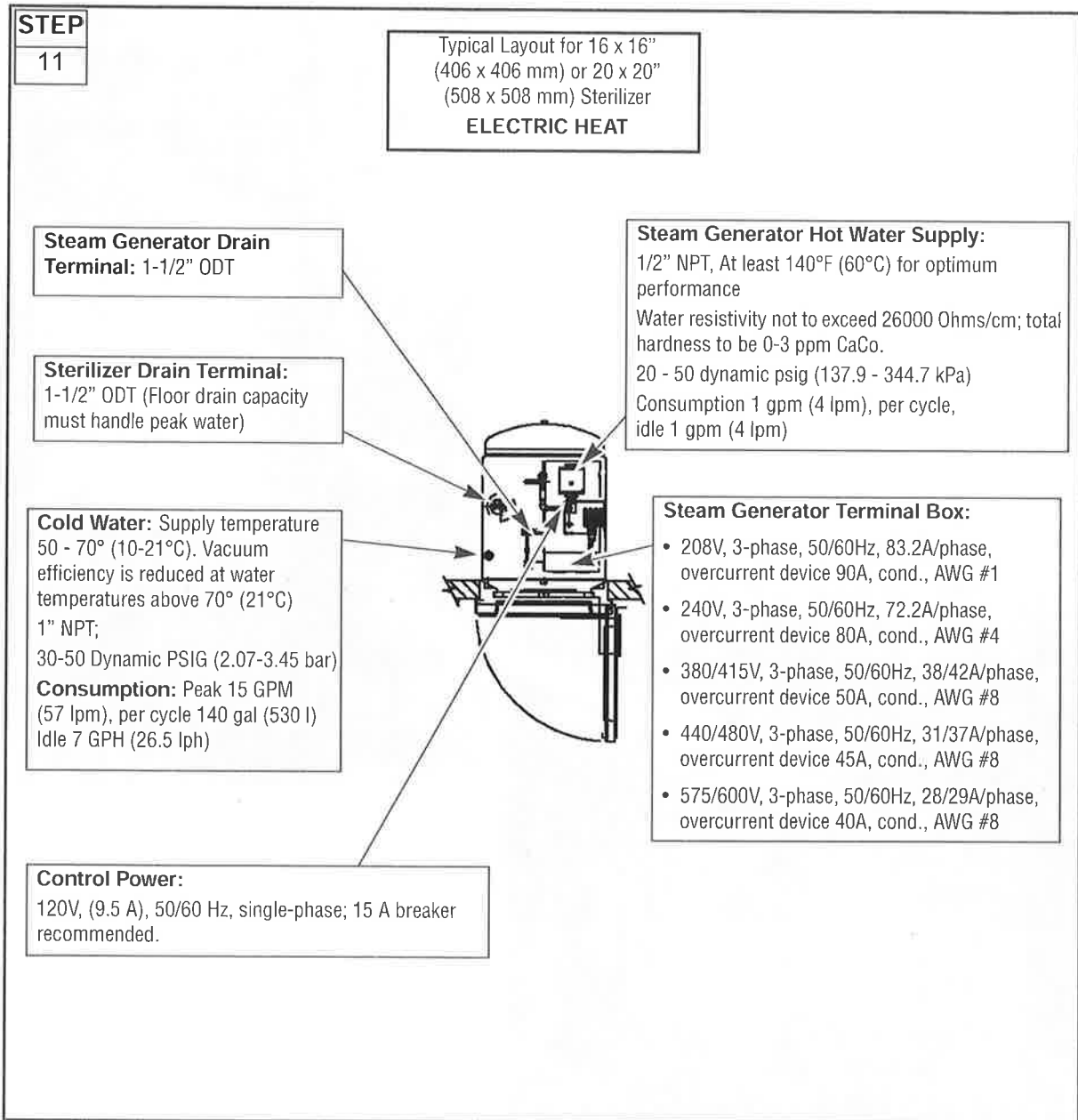


**Step 9:** Plumb the steam utility from the utility sources. (Optional)

- Utilities are ideally located on the rear wall of the service area.
- Minimum 3/4" Schedule 40 or 80 iron pipe material, depending on local codes.

**Step 10:** Route steam to connection point on top of main chamber.

- Accessible at top of sterilizer chamber through side and front access door.



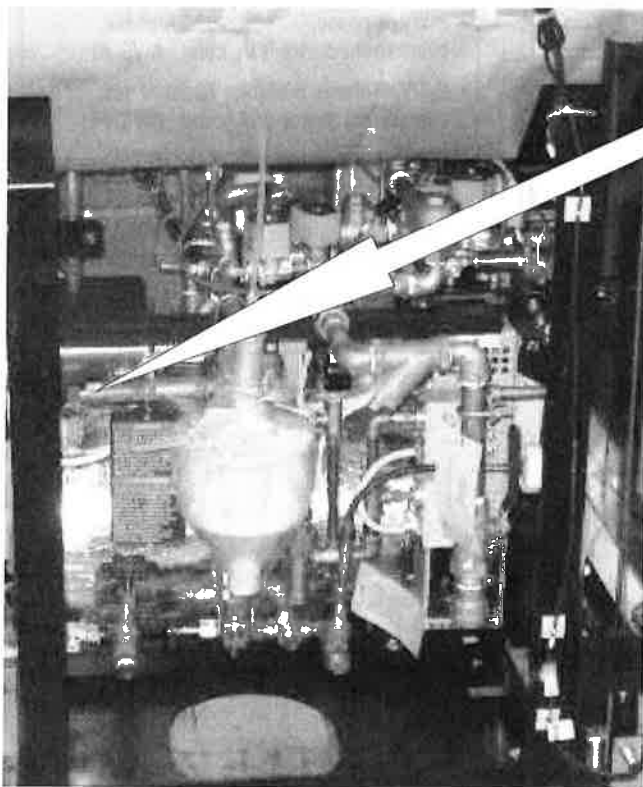
**Connect Steam Generator (Electric Heat) Utilities — Optional**

**Step 11:** Connect plumbing and electrical lines to sterilizer as shown before.

- Make additional connections for the steam generator if necessary.

## Connect Utilities

STEP
12
13



**Step 12:** Plumb the hot water line to the generator input.

- Minimum 1/2" Type-L copper pipe material for hot water connection. If water quality cannot be met, STERIS recommends installation of a Descal-A-Matic<sup>®1</sup>.

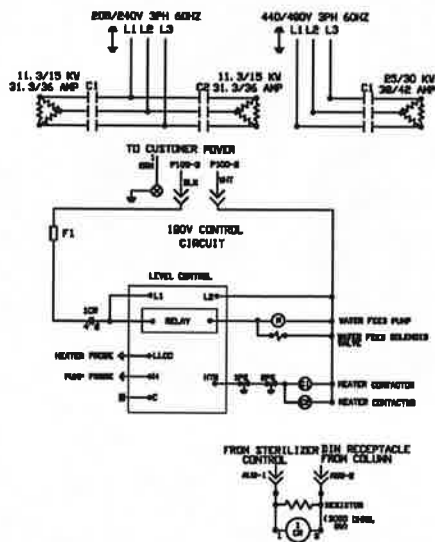
**Step 13:** Connect incoming water line to the steam generator water input (30 kW shown).

---

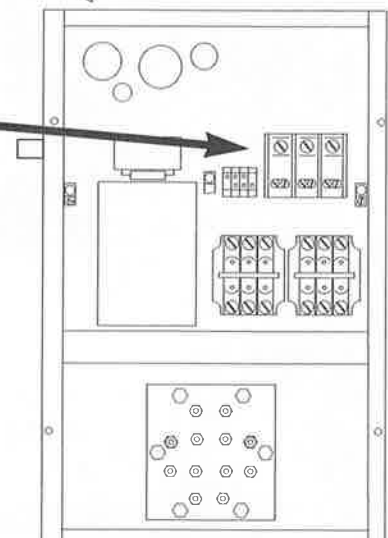
1. Descal-A-Matic<sup>®</sup> is a registered trademark of Descal-A-Matic.

## Connect Utilities

STEP
14
15



Wiring Diagram



Control Box

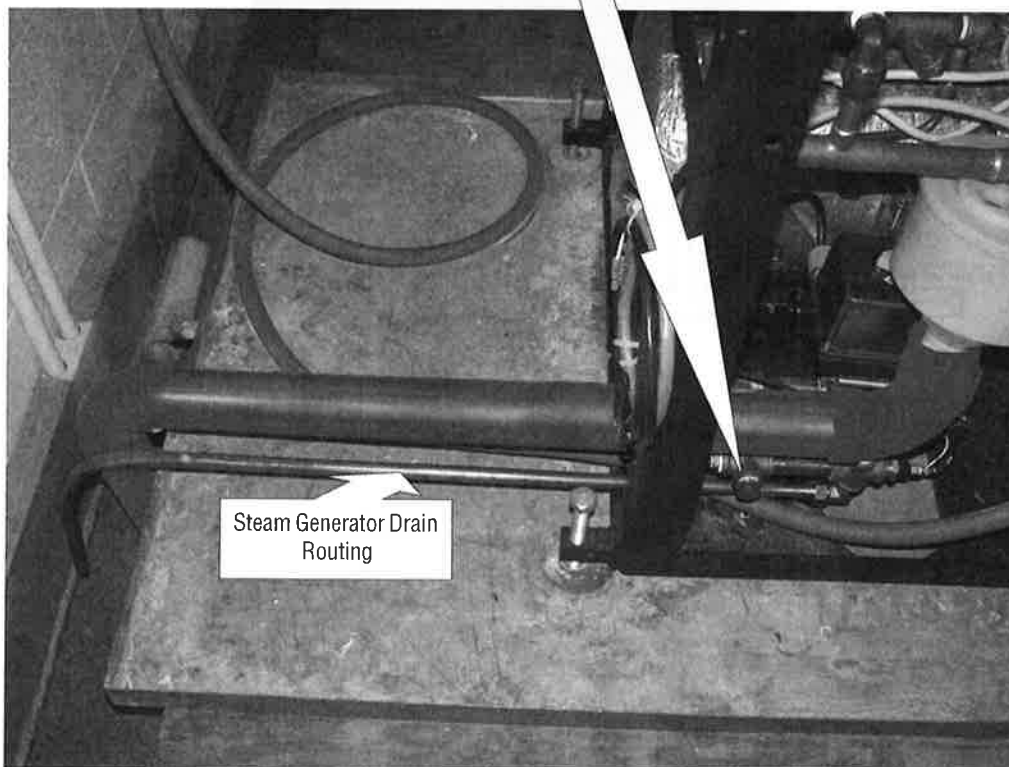
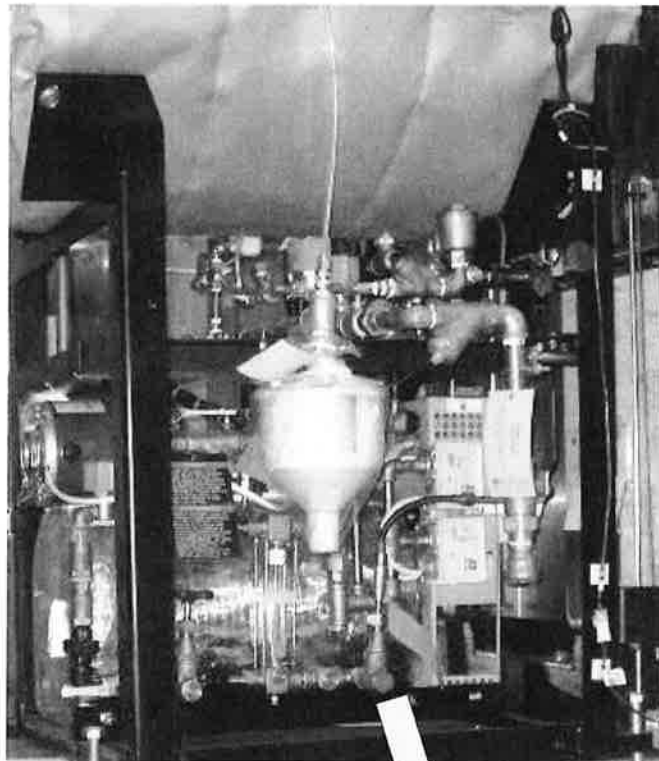
**Step 14:** Route electrical utilities from the back wall of the service area.

**Step 15:** Connect incoming electrical utilities to the steam generator control box terminal block.

## Connect Utilities

STEP

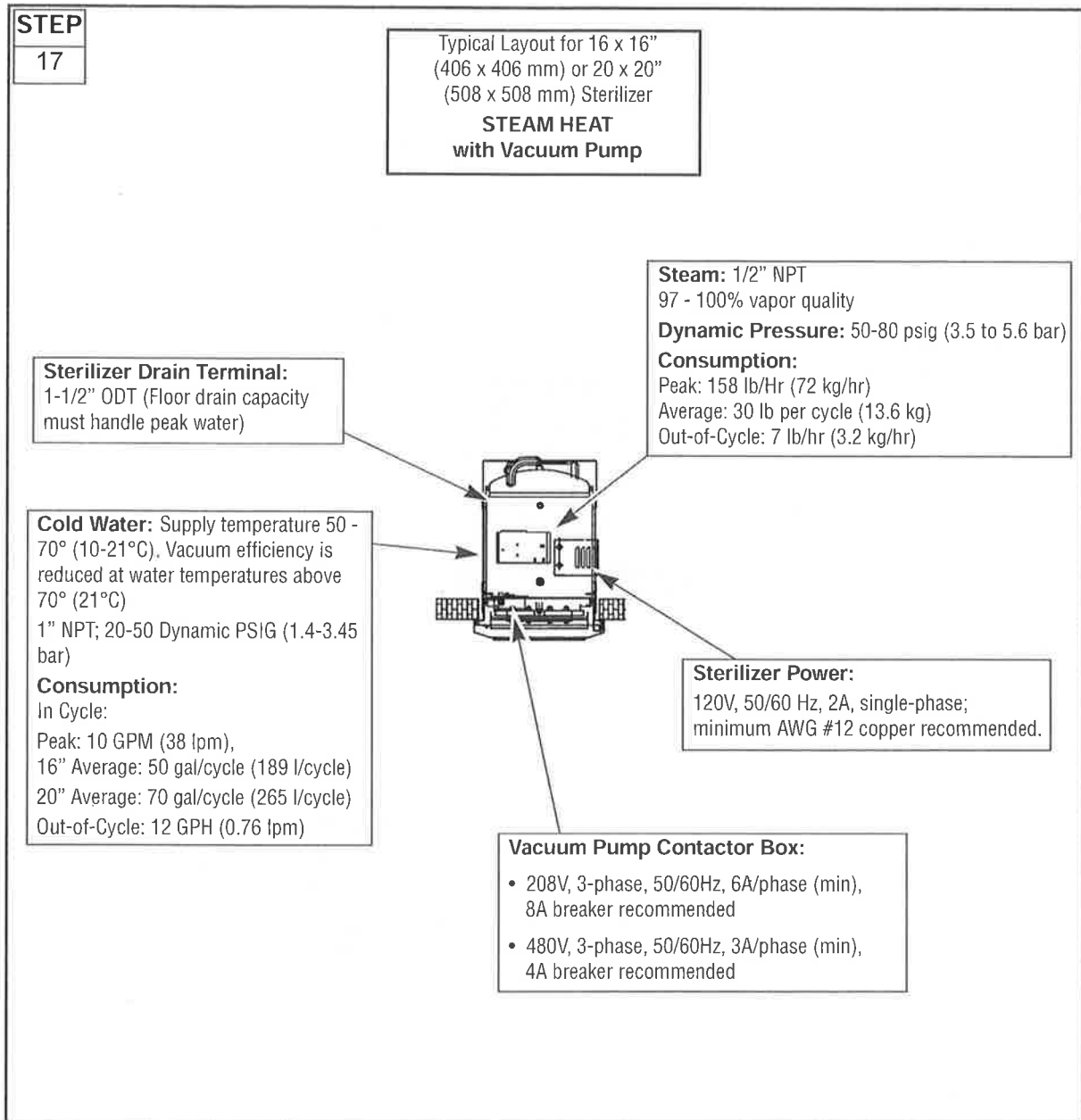
16



Mock-up showing typical steam generator drain routing.

- Step 16:** Route drain connection from steam generator to available drain.
- Floor drain should be located within footprint of sterilizer frame.



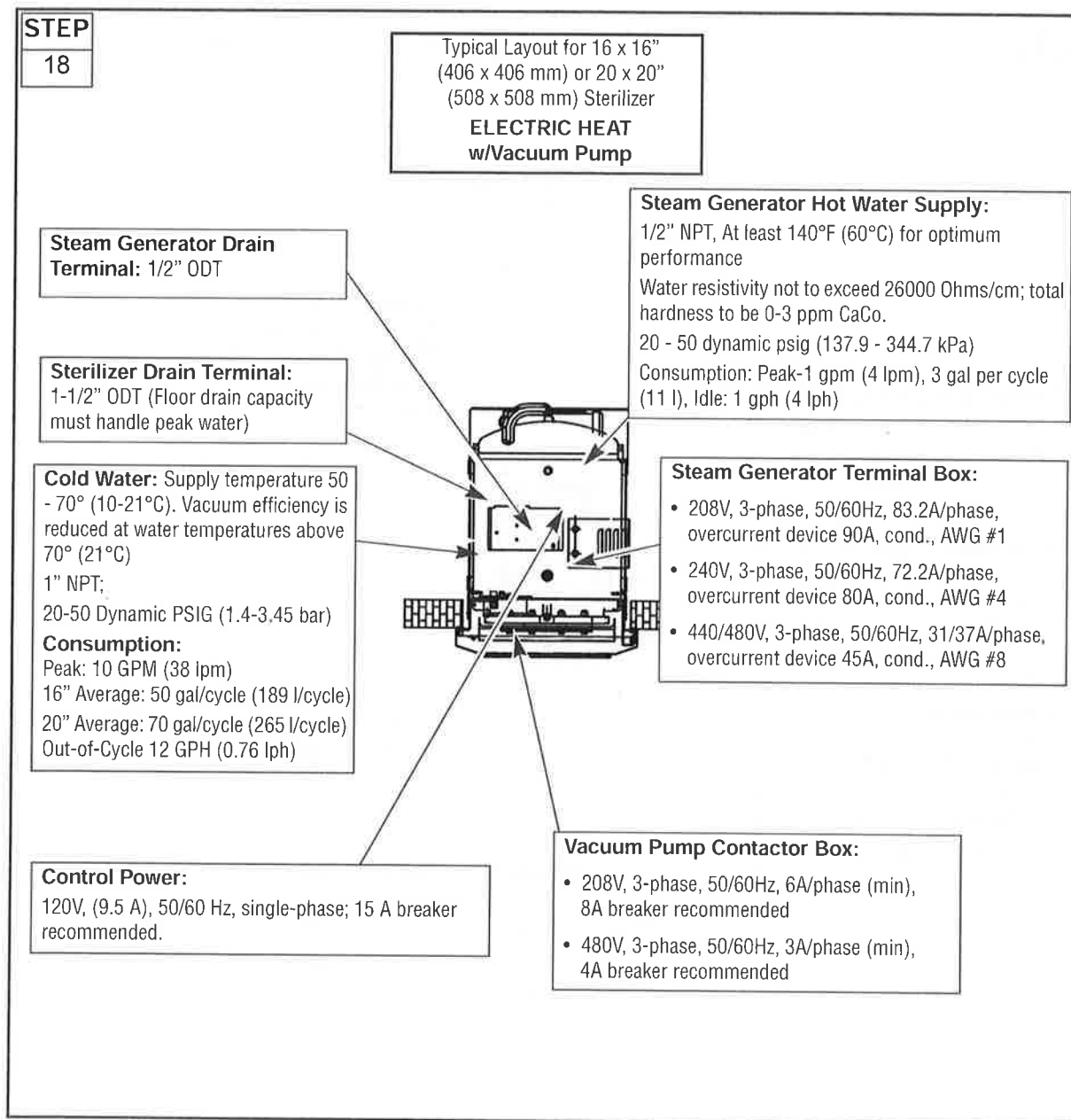


**Connect Vacuum Pump Utilities — Optional**

**Step 17:** Connect plumbing and electrical lines to sterilizer as shown before.

- Make additional connections for the vacuum pump if necessary.

## Connect Utilities



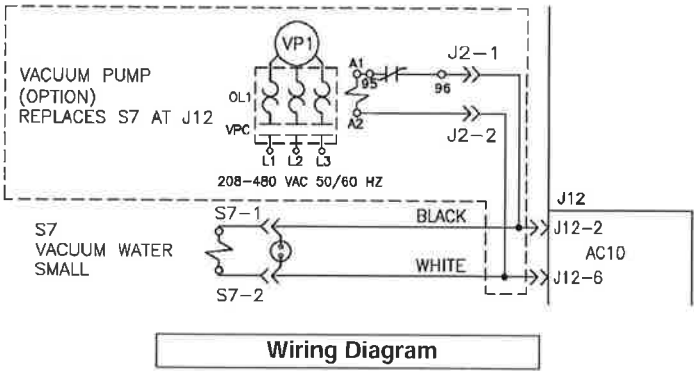
### Connect Steam Generator (Electric Heat) and Vacuum Pump Utilities — Optional

**Step 18:** Connect plumbing and electrical lines to sterilizer as shown before.

- Make additional connections for the steam generator and vacuum pump if necessary.

## Connect Utilities

<b>STEP</b>
19
20



VACUUM PUMP (OPTION)  
REPLACES S7 AT J12

VP1

OL1

VPC

L1

L2

L3

208-480 VAC 50/60 HZ

S7-1

S7-2

S7

BLACK

WHITE

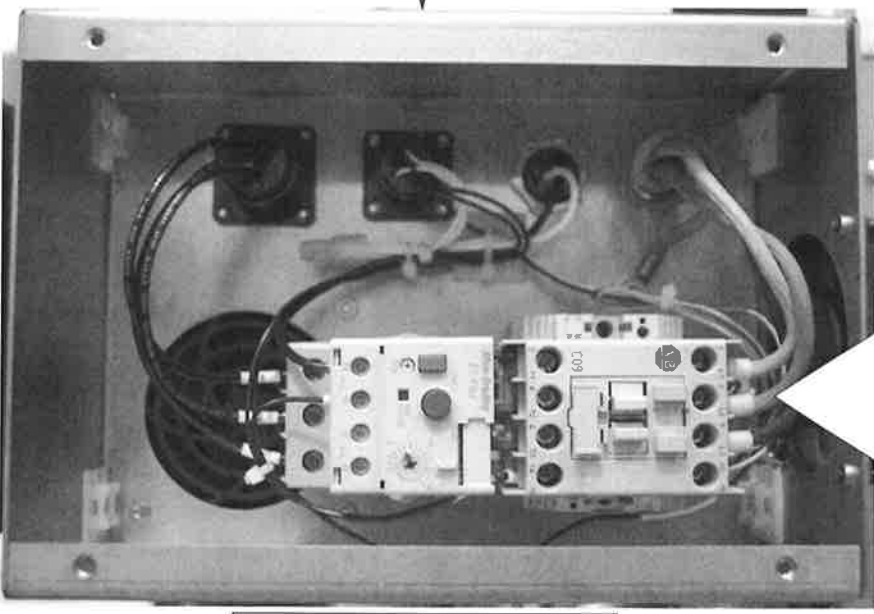
J12

J12-2

AC10

J12-6

**Wiring Diagram**



**Vacuum Pump Contactor Box**

**Make Three-Wire  
Connection at this side  
of the terminal block**

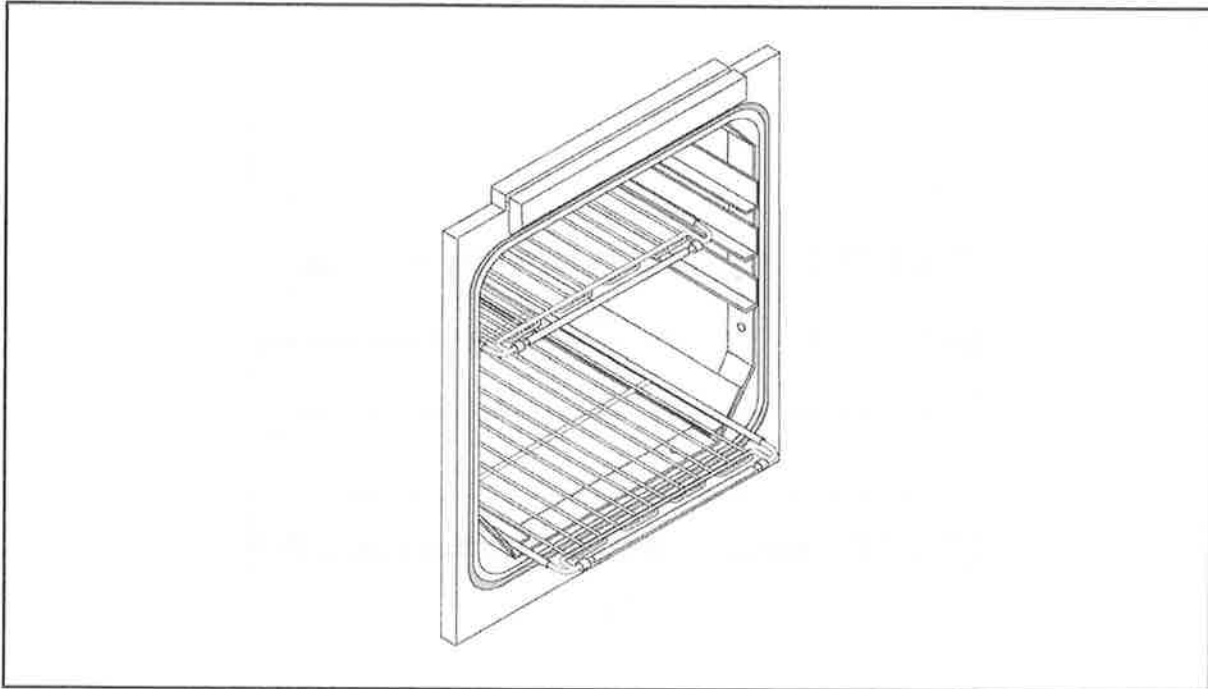
**Step 19:** Route electrical utilities from the back wall of the service area.

**Step 20:** Connect incoming electrical utilities to the optional vacuum pump contactor box terminal block.

Healthcare  
Capital Equipment







**Personnel Required:**  (One)

**Personal Protective Equipment Required:**

- Safety Goggles or Glasses
- Gloves
- Steel-Toe Shoes
- Hard Hat

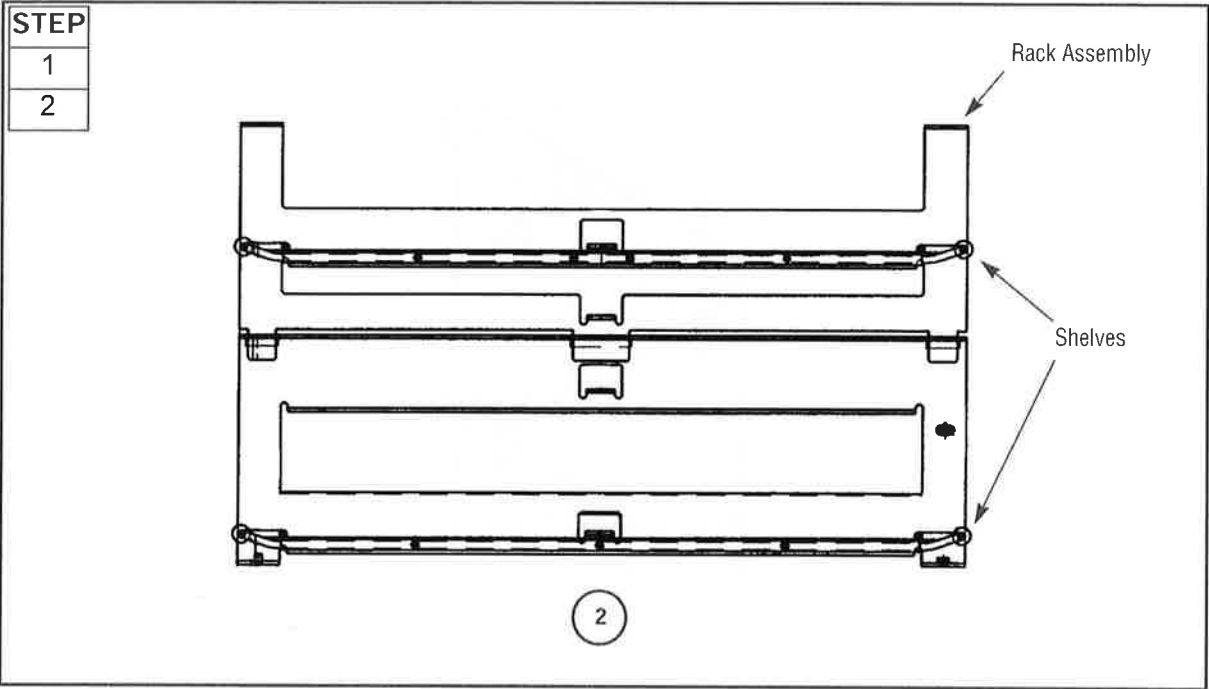
**Parts Required:**

- Rack/Shelf Hardware Kit

**Special Tools:**

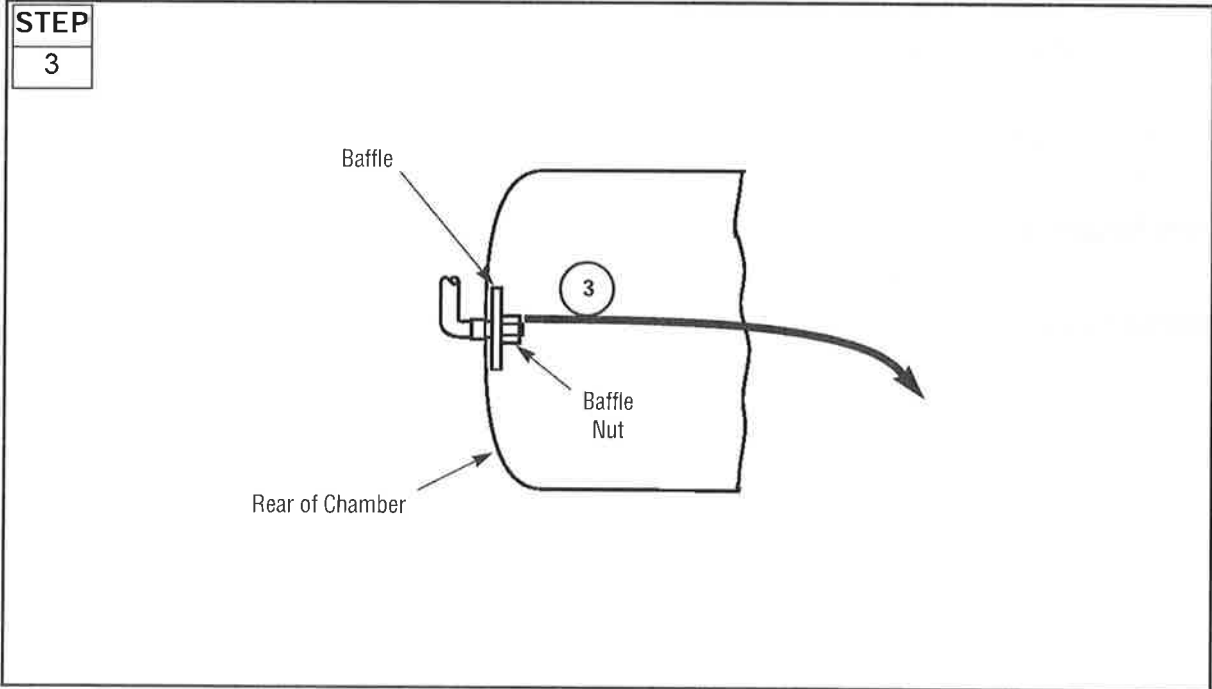
- Standard Hand Tools

# Rack Installation



**Step 1:** Remove chamber tracks if installed.

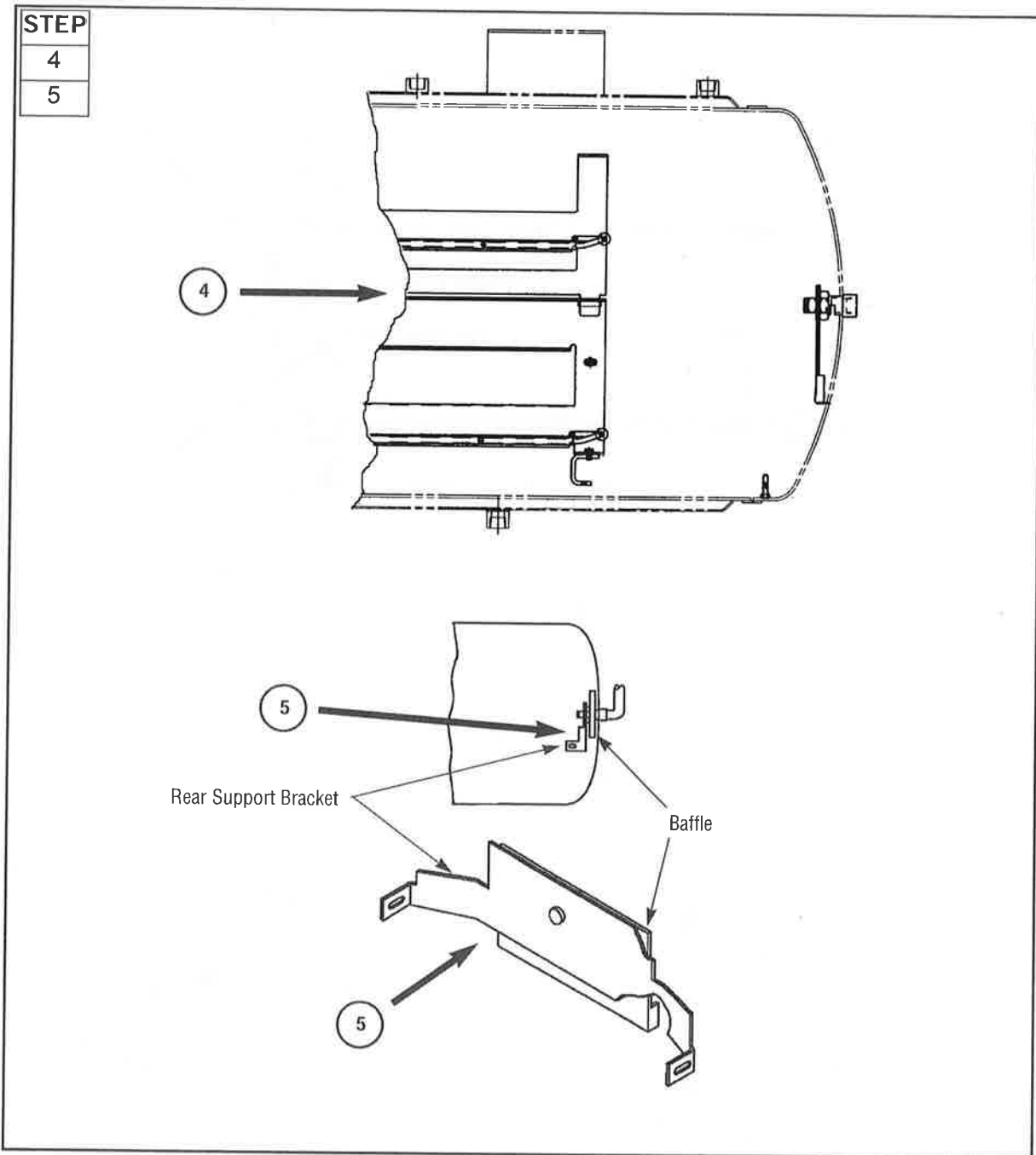
**Step 2:** Assemble rack and shelf unit.



**Step 3:** Remove baffle nut from rear of chamber.



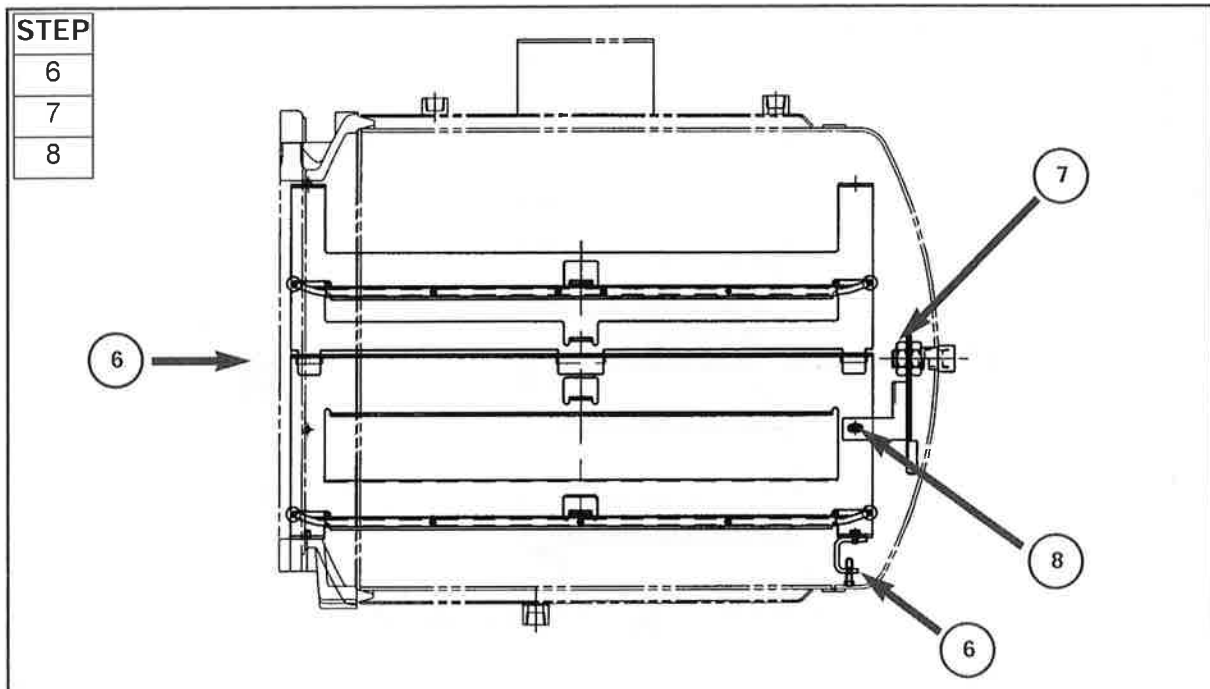
## Rack Installation



**Step 4:** Insert rack assembly half-way into chamber.

**Step 5:** Install rear support bracket with adjusting screw facing front.

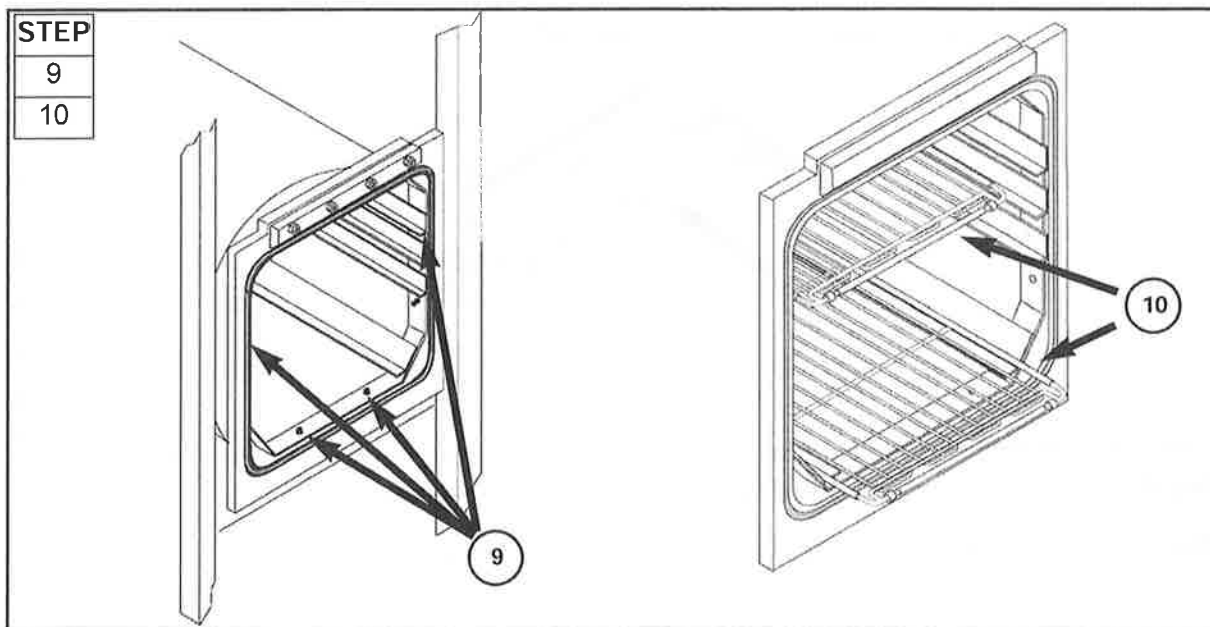
## Rack Installation



**Step 6:** Slide rack completely in and onto baffle while ensuring that lower support bracket is engaged.

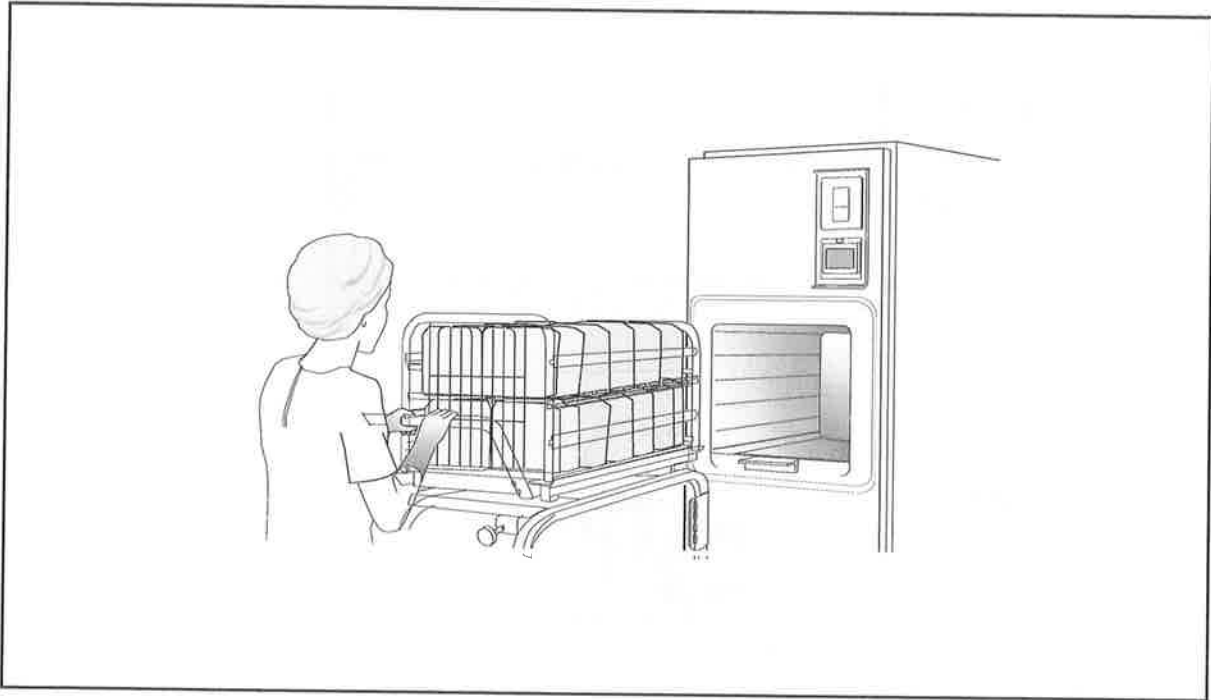
**Step 7:** Reinstall baffle nut.

**Step 8:** Tighten support bracket adjusting screws.



**Step 9:** Install front set screws, short on bottom - long on top.

**Step 10:** Install shelves into rack assembly.



**Personnel Required:**  (One)

**Personal Protective Equipment Required:**

- Safety Goggles or Glasses
- Gloves
- Steel-Toe Shoes
- Hard Hat

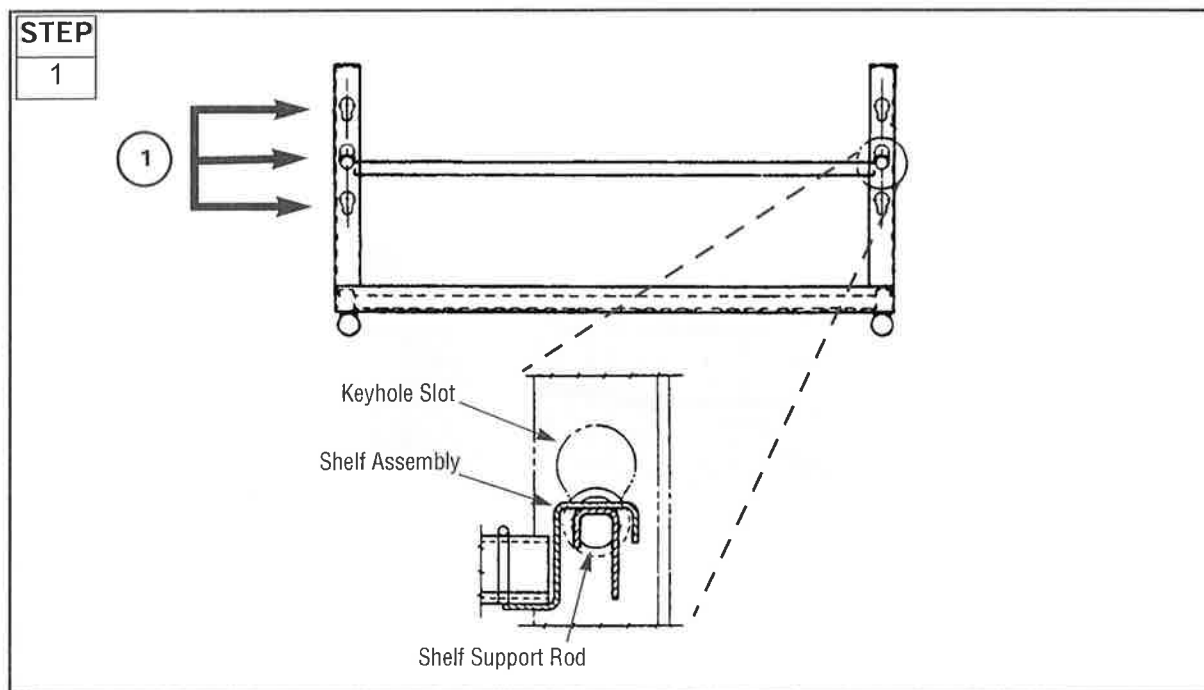
**Parts Required:**

- Loading Equipment
- Chamber Tracks

**Special Tools:**

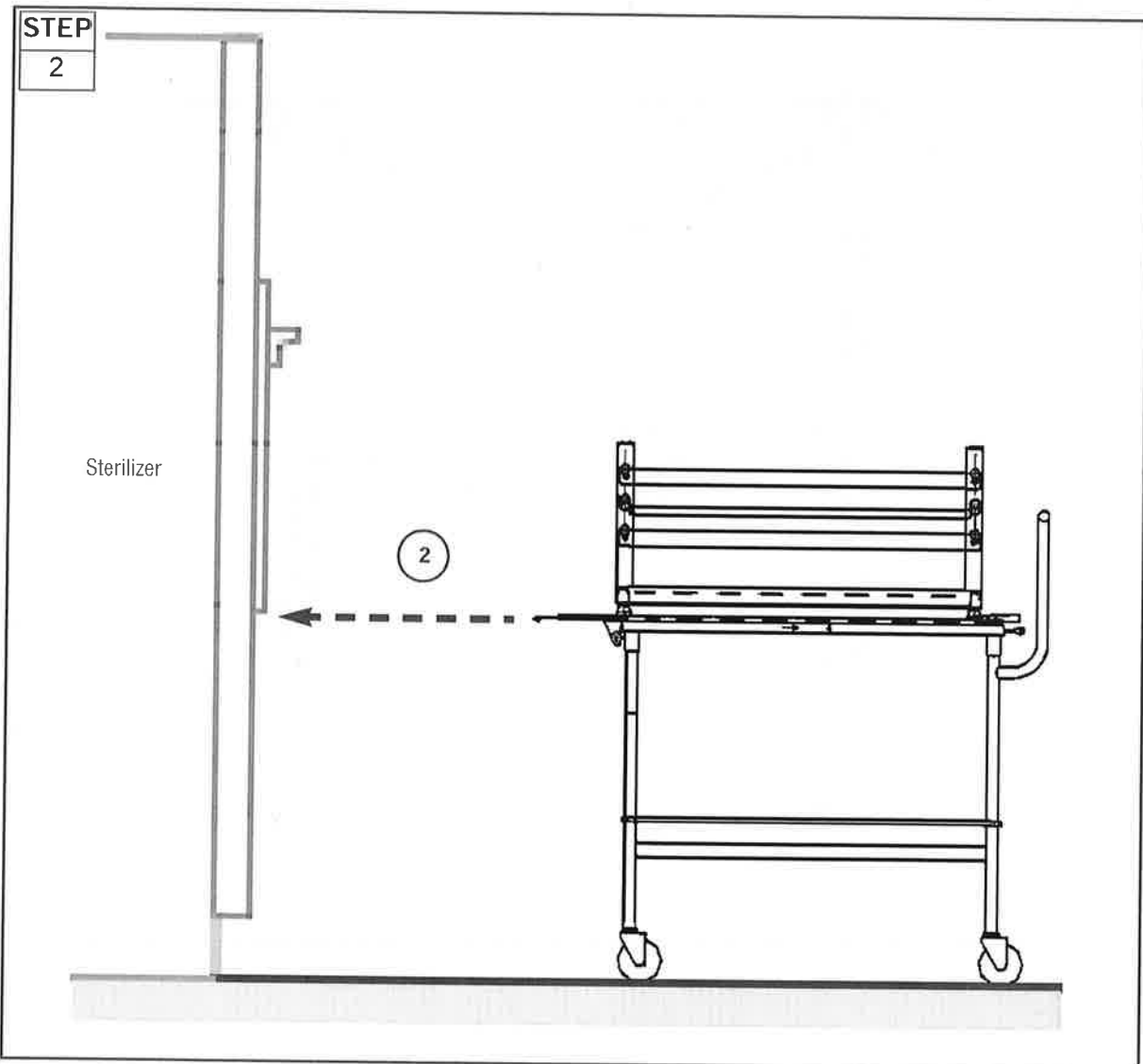
- Level

## Loading Equipment Installation and Adjustment



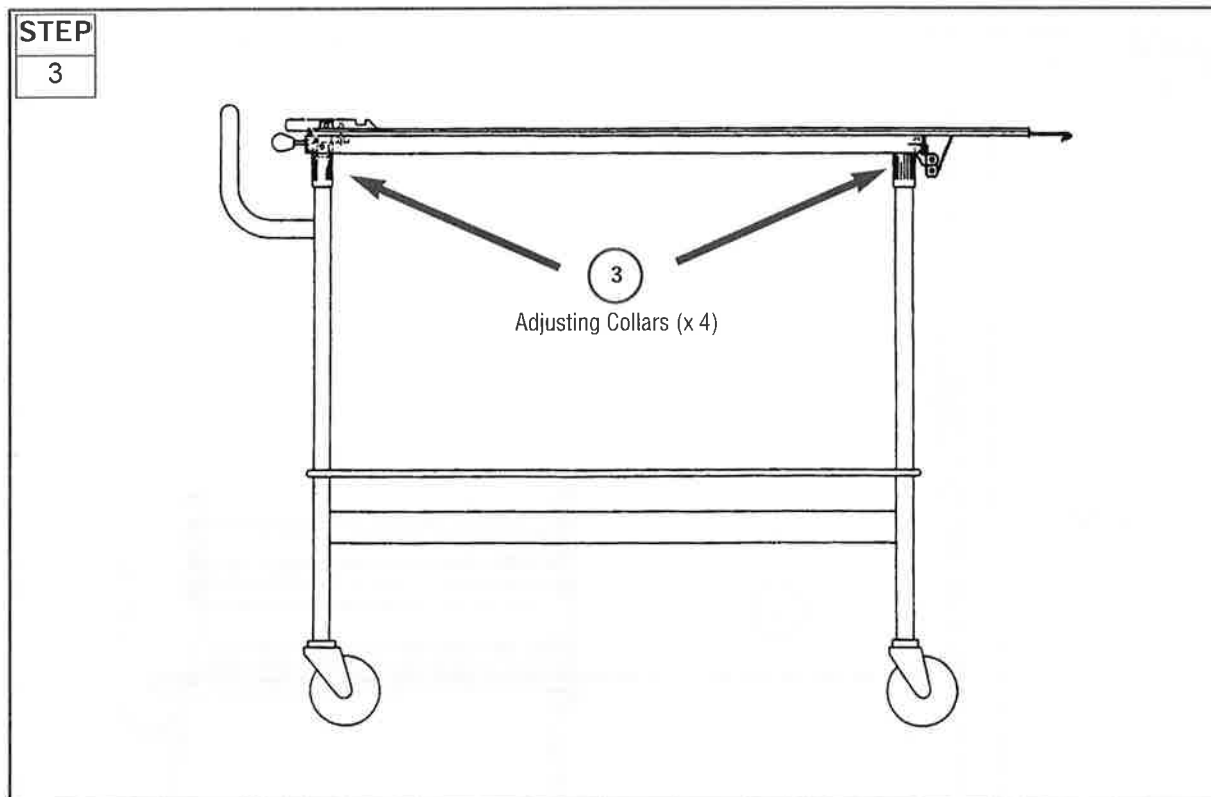
- Step 1:** Install shelf assembly at desired height.
- Ensure shelf is level.

## Loading Equipment Installation and Adjustment



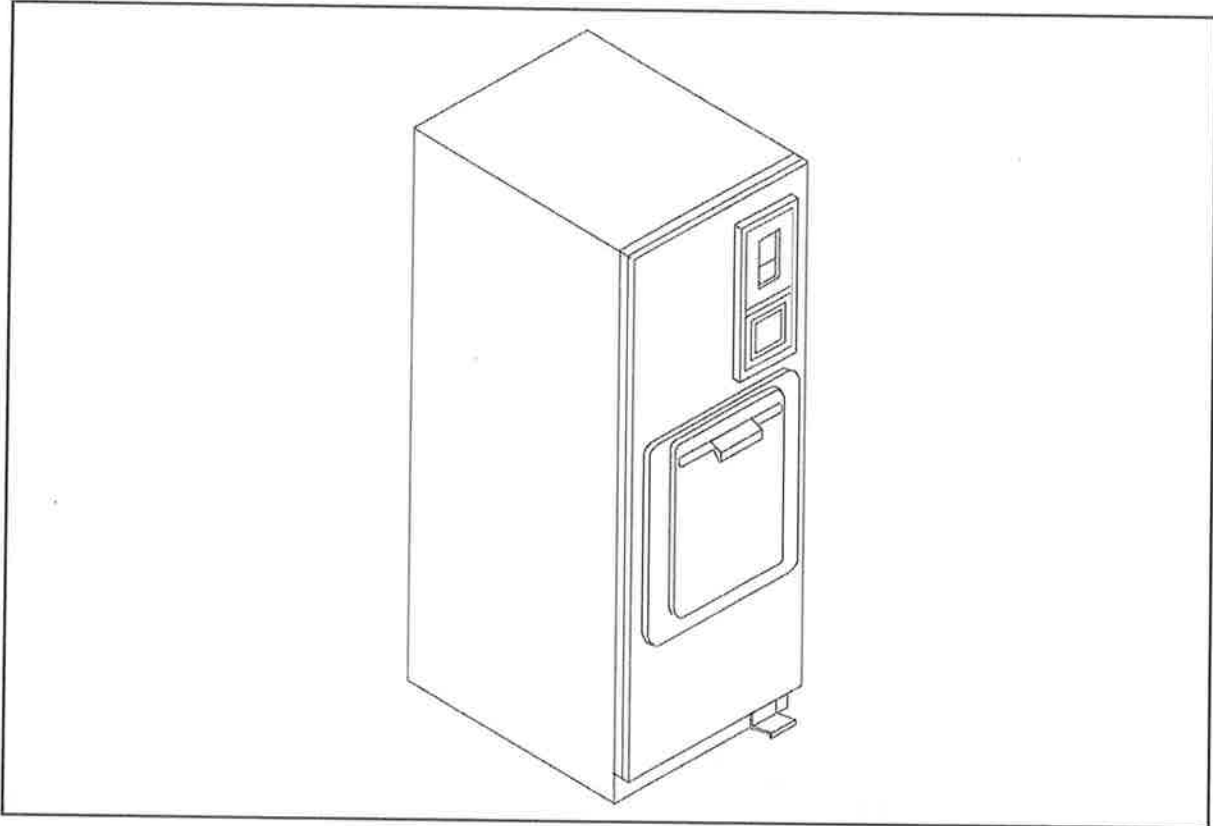
- Step 2:** Push transfer carriage and loading car to chamber end ring and verify height.
- If height is incorrect, proceed to step 3.
  - If heights match, stop.
  - Push loading car into chamber and verify smooth operation.

## Loading Equipment Installation and Adjustment



**Step 3:** Adjust height of transfer carriage to match height of chamber tracks.

- Verify proper operation.
- Verify loading equipment and chamber tracks are level.



**Personnel Required:**  (One)

**Personal Protective Equipment Required:**

- Safety Goggles or Glasses
- Gloves
- Steel-Toe Shoes
- Hard Hat

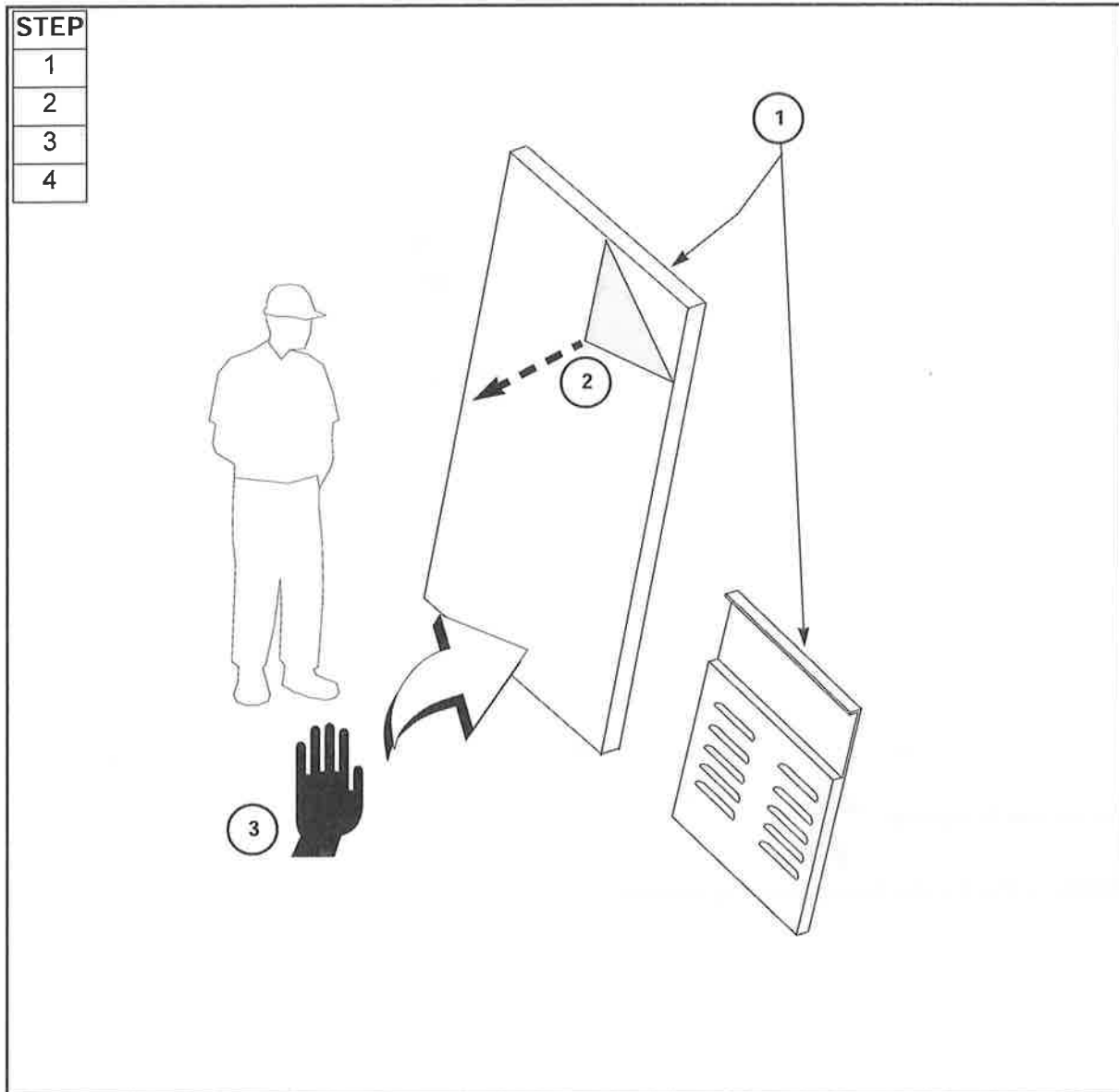
**Parts Required:**

- Paneling Package

**Special Tools:**

- Stainless Steel Cleaner
- Dry Cloth

## Panel Installation



**Step 1:** Lean panels against a sturdy wall.

**Step 2:** Remove plastic coating by pulling slowly and steadily at an angle.

**Step 3:** Clean stains or residue from panels as necessary:

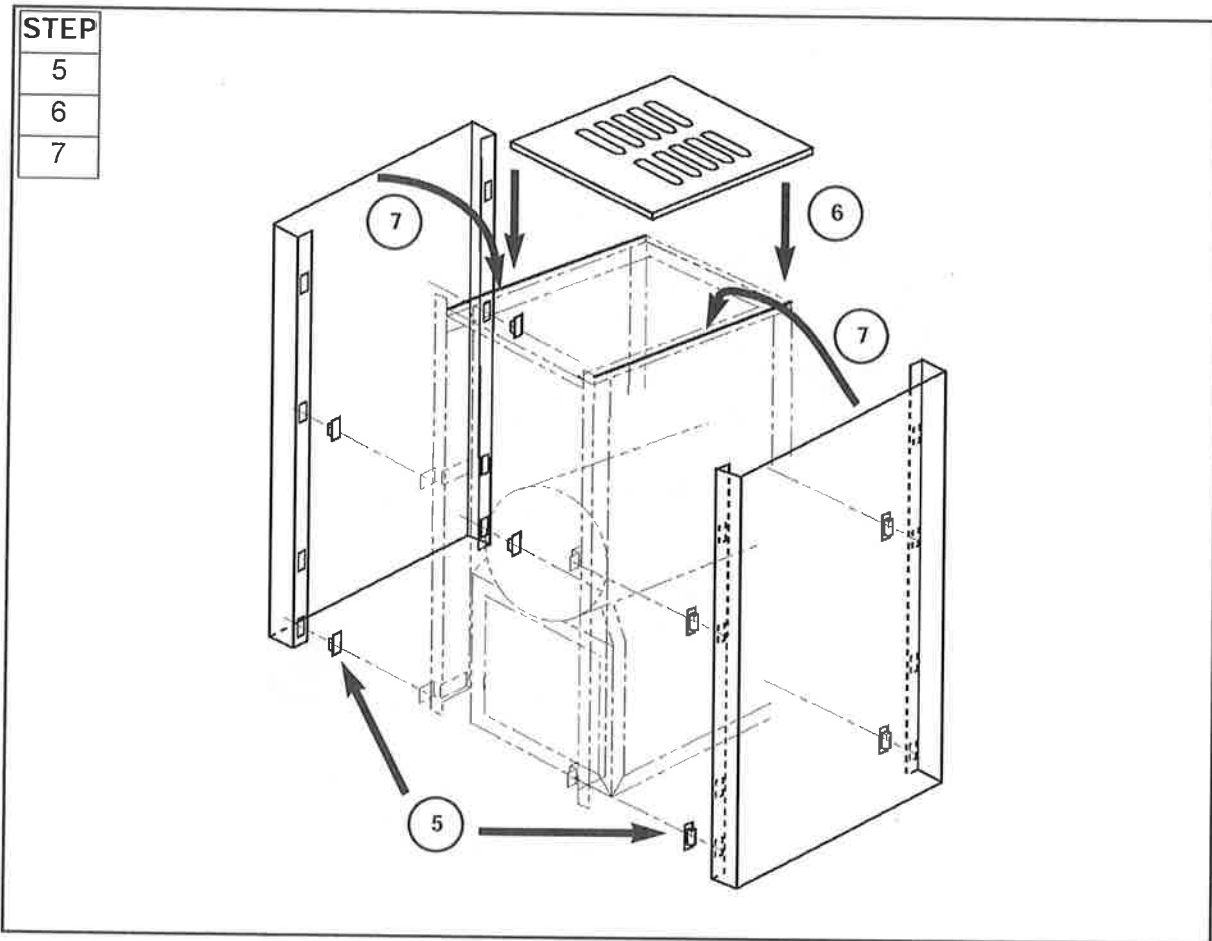
- Use Stainless Steel Cleaner.

**Step 4:** Clean up the area.

- Discard scrap piping or wiring.
- Discard all packaging according to hospital guidelines.



## Panel Installation

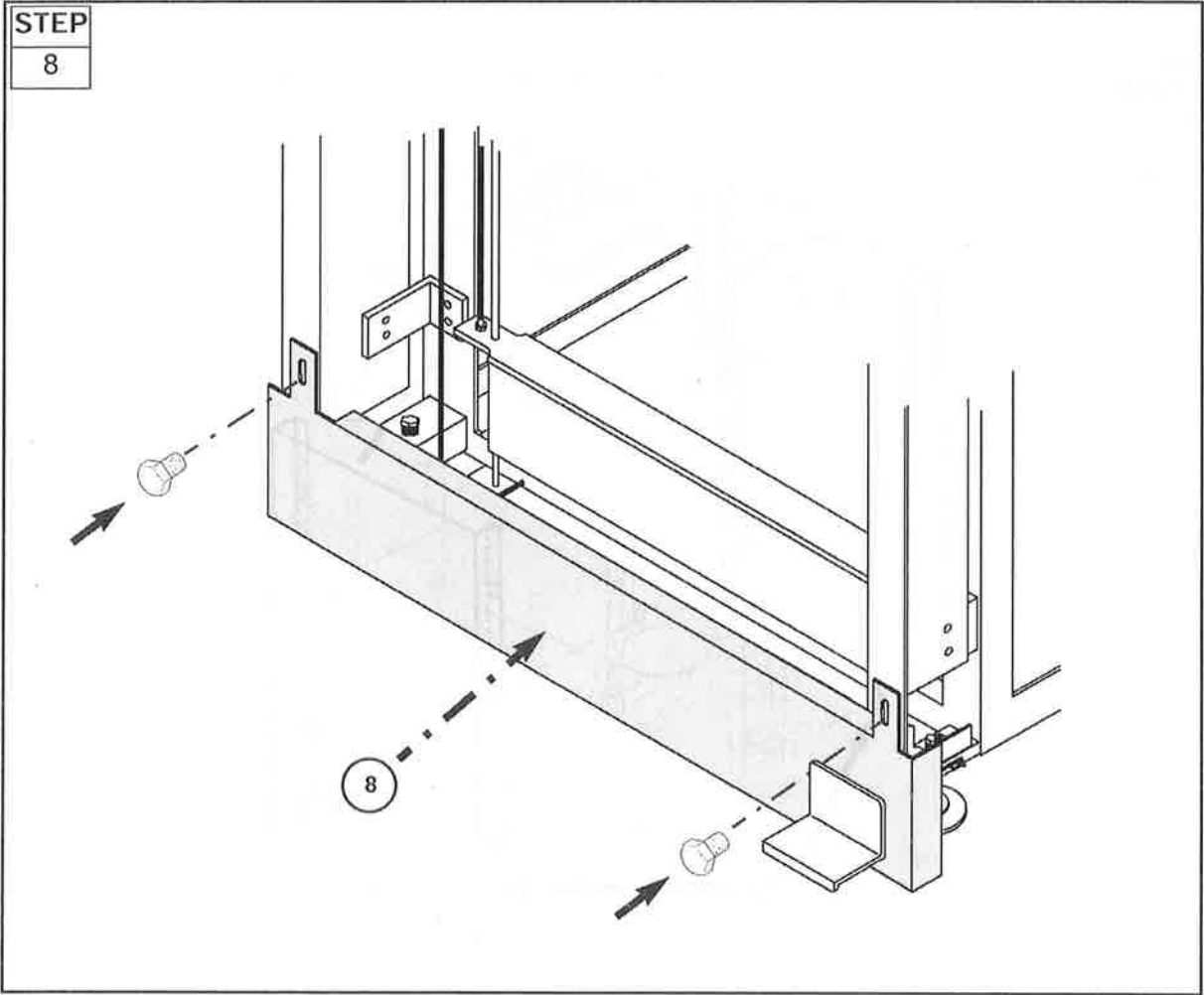


**Step 5:** Install magnets (x 8) into side panels.

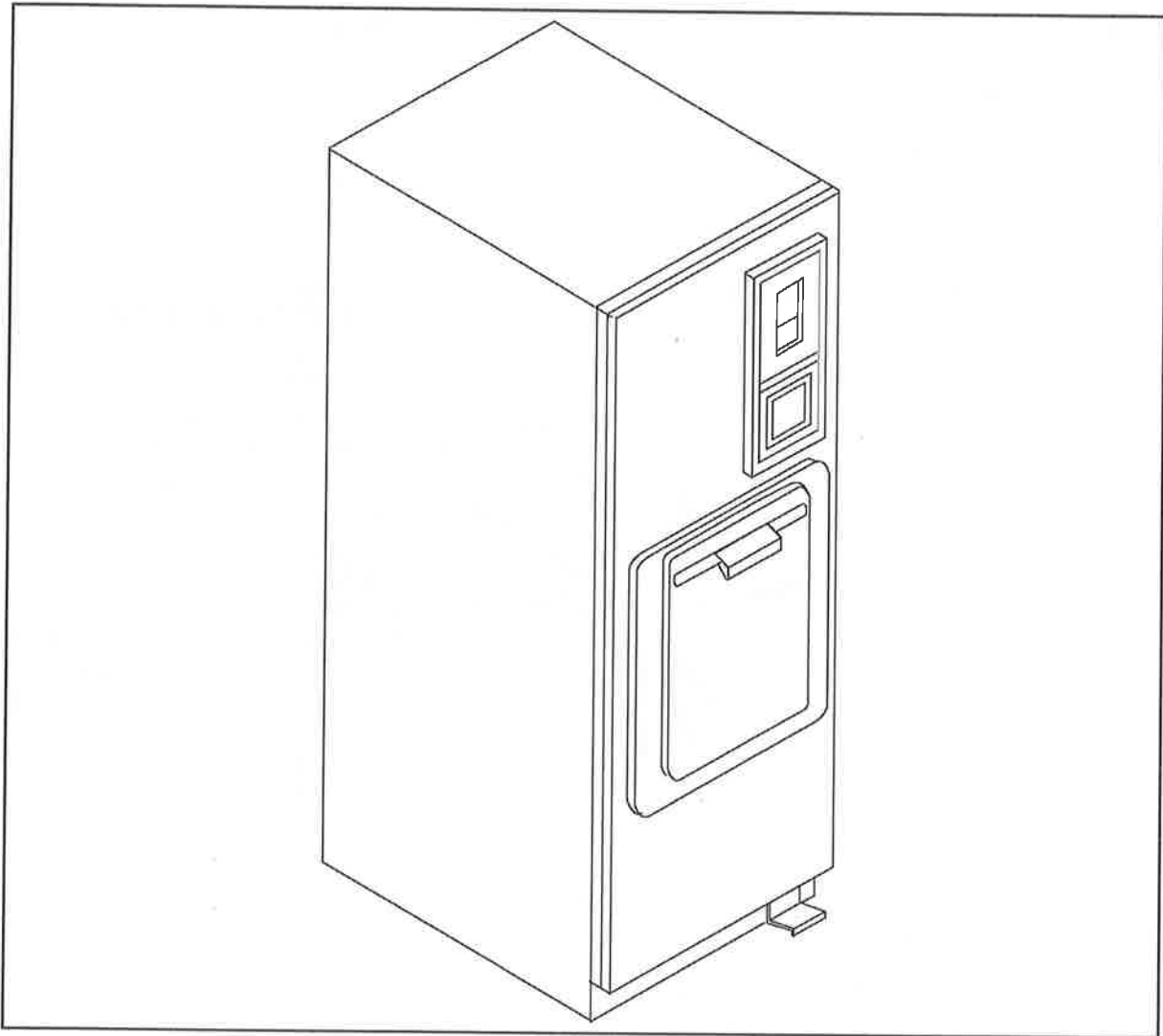
**Step 6:** Install top cover. Some models will require support brackets for top cover.

**Step 7:** Hang side panels over support brackets. Support bracket configuration will vary dependent on sterilizer size and model.

# Panel Installation



**Step 8:** Install bottom kick panel with supplied 1/4 x 20 bolts.



**Personnel Required:**  (One)

**Personal Protective Equipment Required:**

- Safety Goggles or Glasses
- Gloves
- Steel-Toe Shoes
- Hard Hat

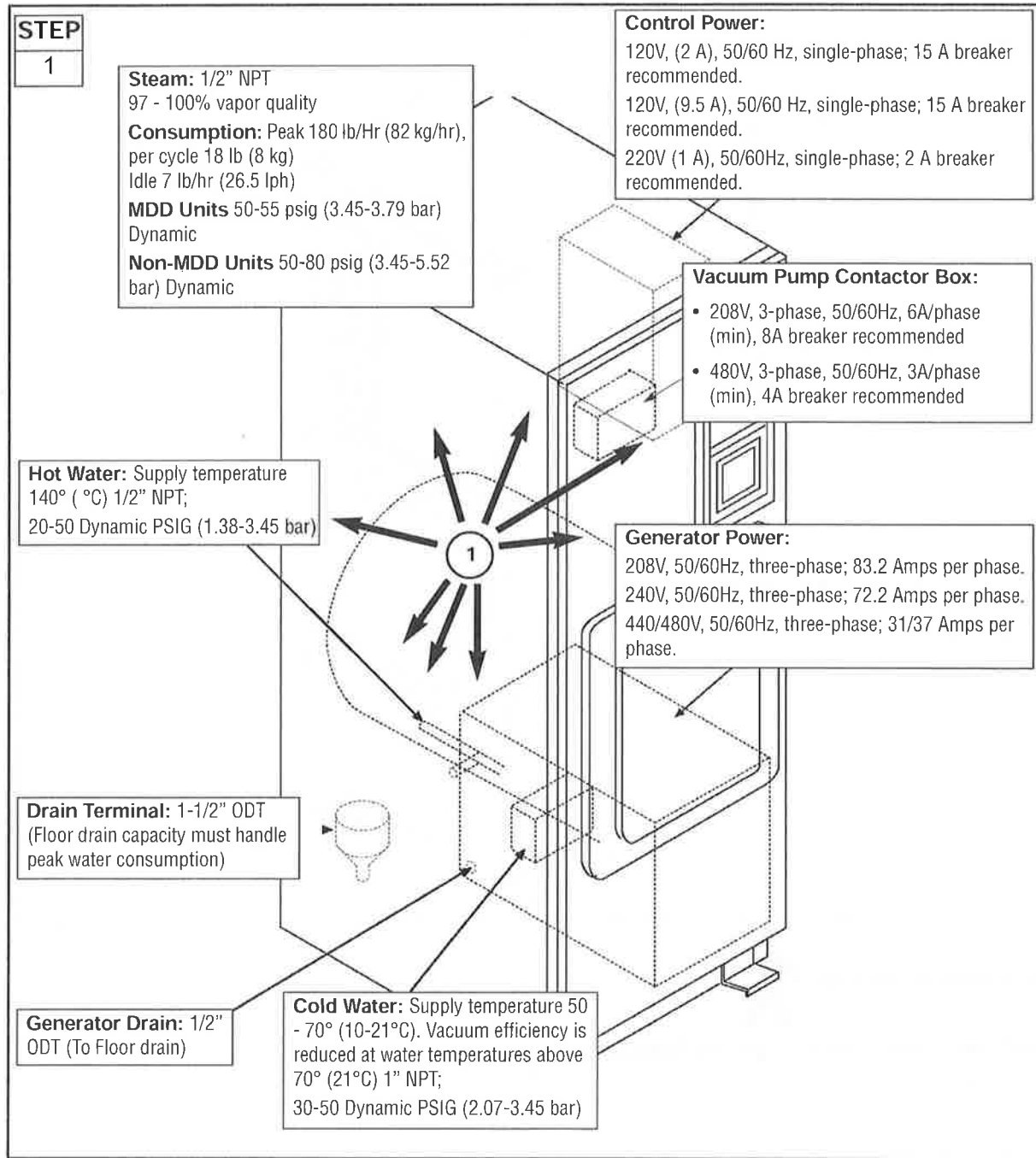
**Parts Required:**

**Special Tools:**

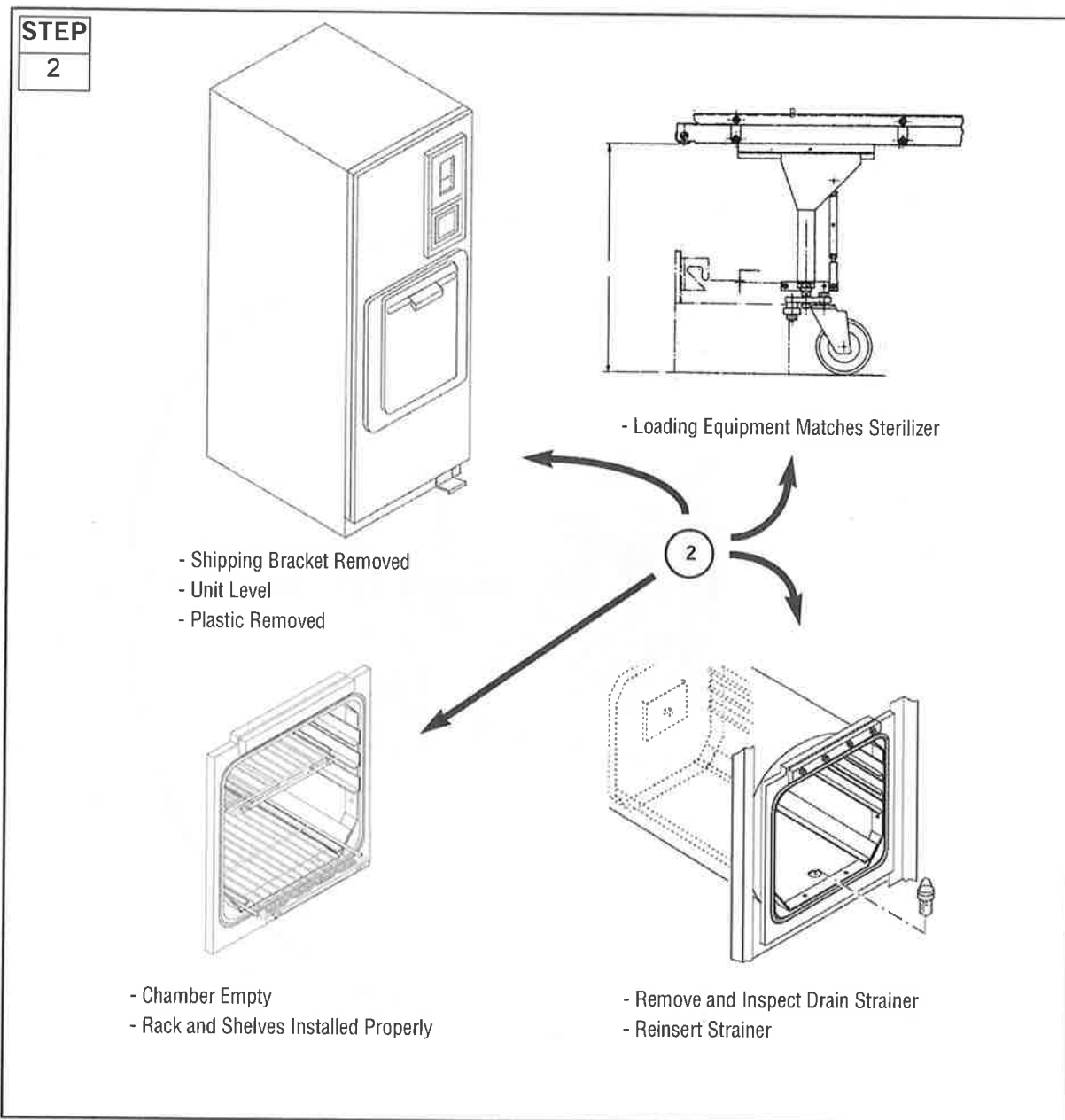
- Fish Scale

**START UP TO BE PERFORMED BY STERIS PERSONNEL**

# Start Up



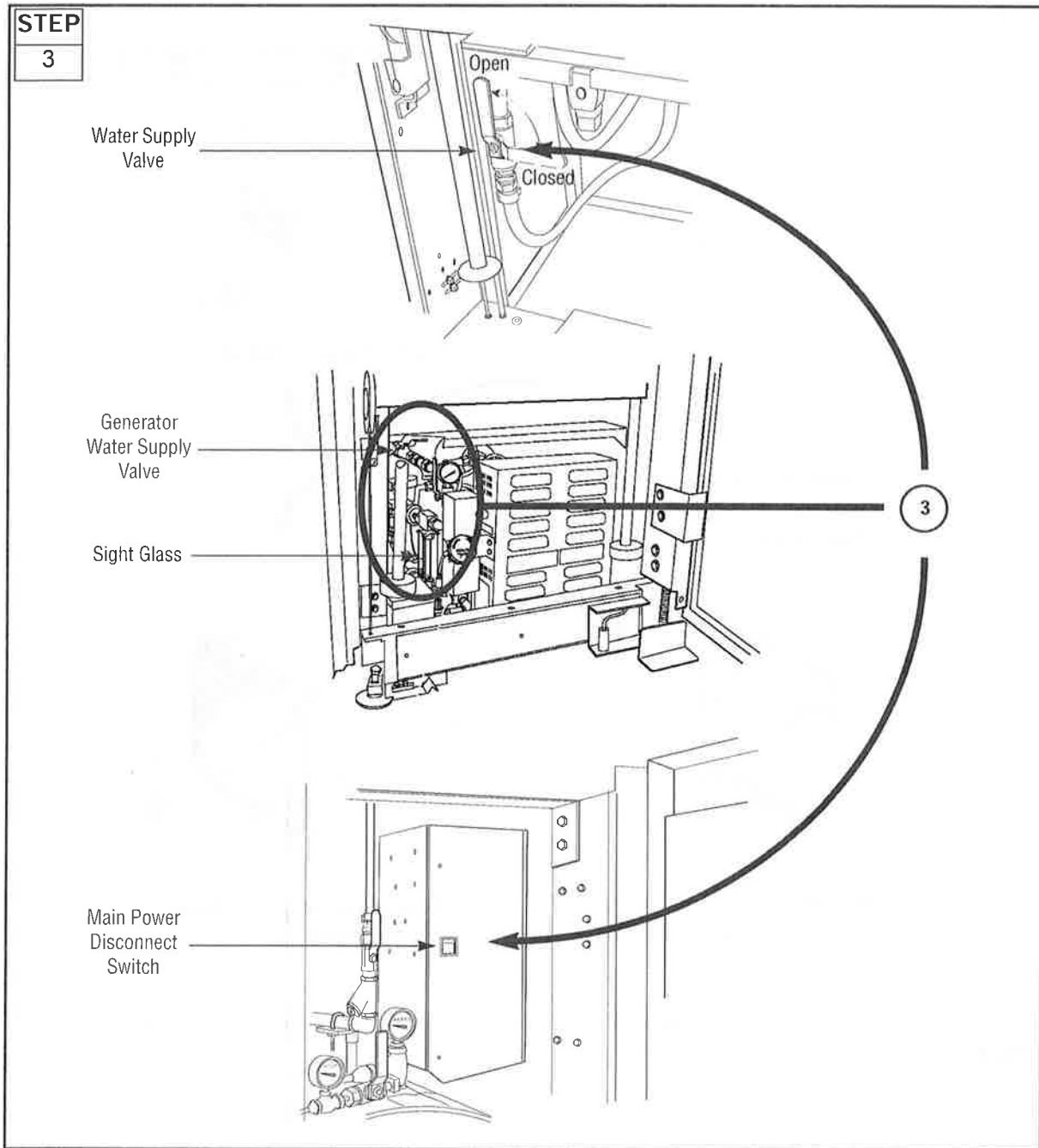
**Step 1:** Verify utility connections.



- Step 2:** Prepare unit for start up.
- Verify shipping bracket is removed
  - Verify unit is level
  - Verify all plastic protective covering is removed.
  - Verify loading equipment height matches sterilizer (if applicable)
  - Verify chamber is empty
  - Verify rack and shelves (or track) is installed properly
  - Remove and inspect drain strainer
  - Reinsert drain strainer

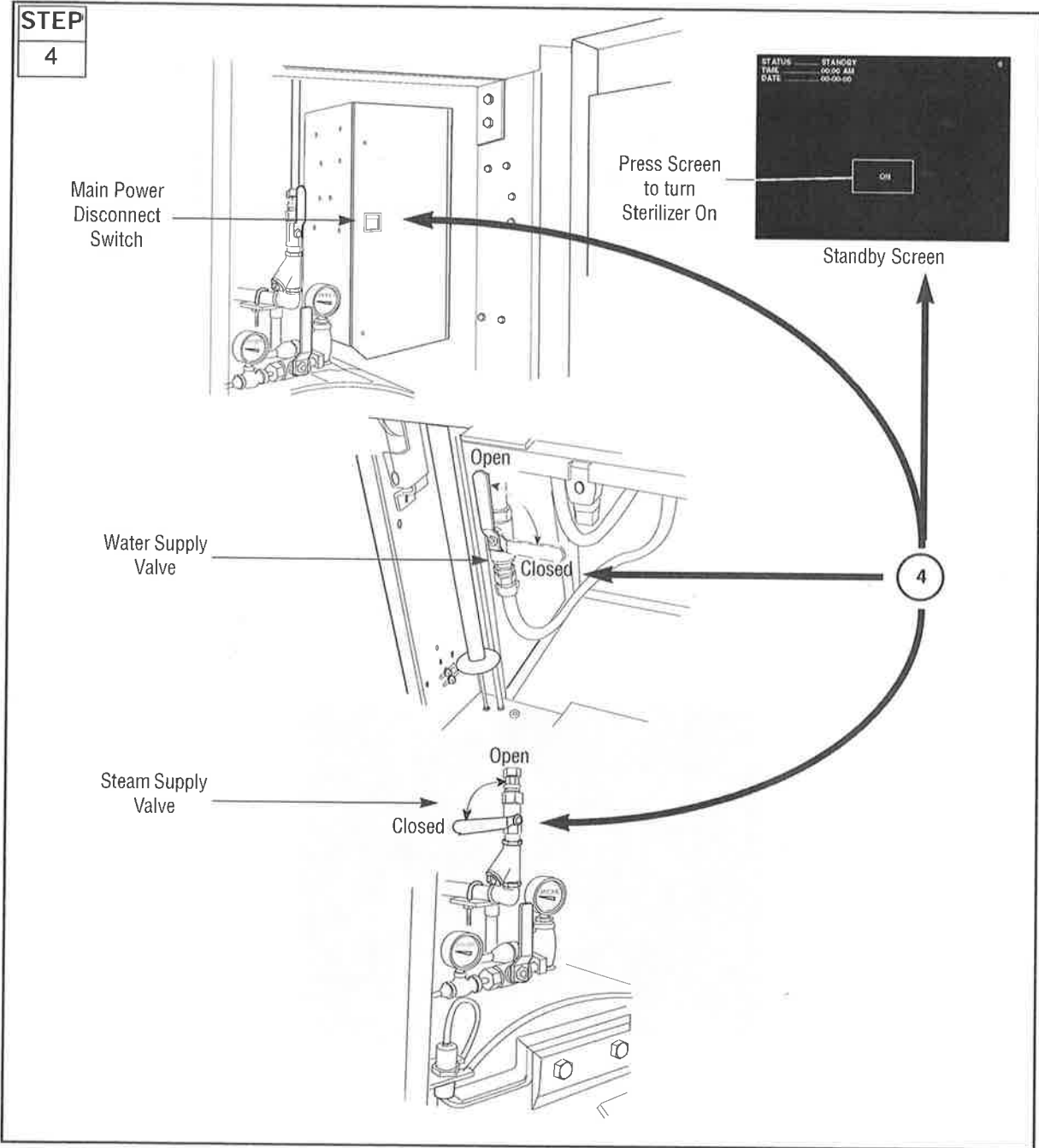
## Start Up

If unit is Steam go to step 4.



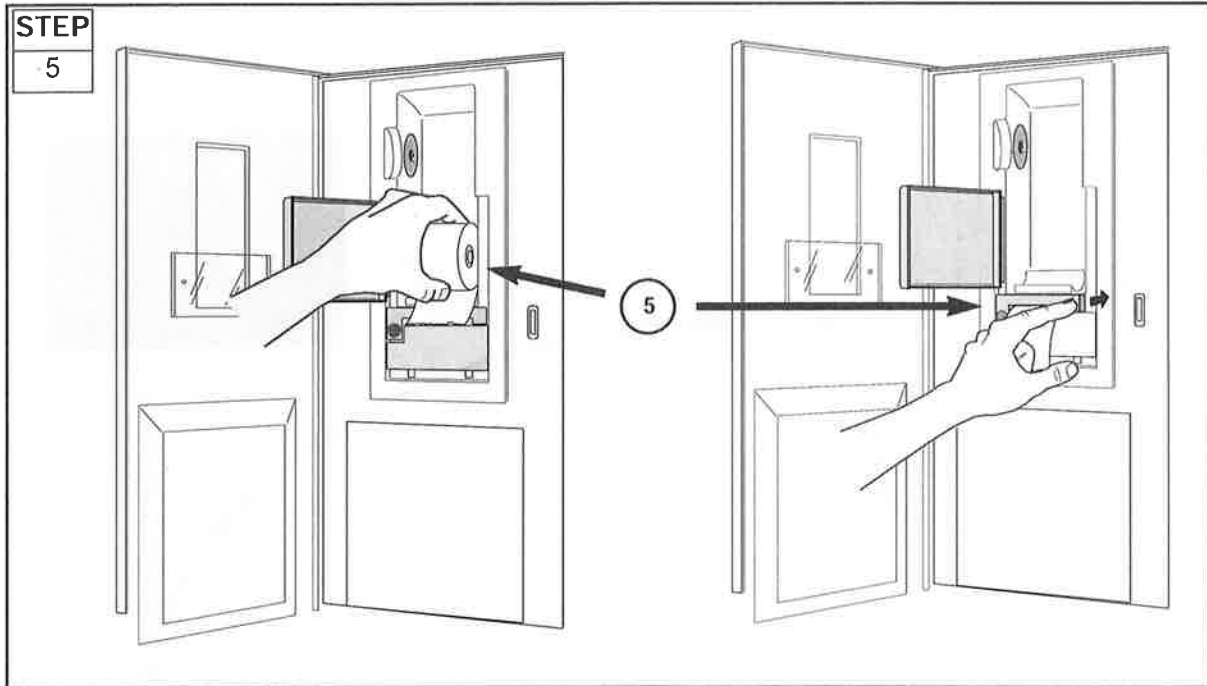
### Step 3: Start utilities for unit with Electric Steam Generator

- Open water slowly and inspect for leaks.
- Turn on main disconnect and open generator water supply.
- Ensure water is entering by visually inspecting sight glass. Contactors should not engage until generator has filled.

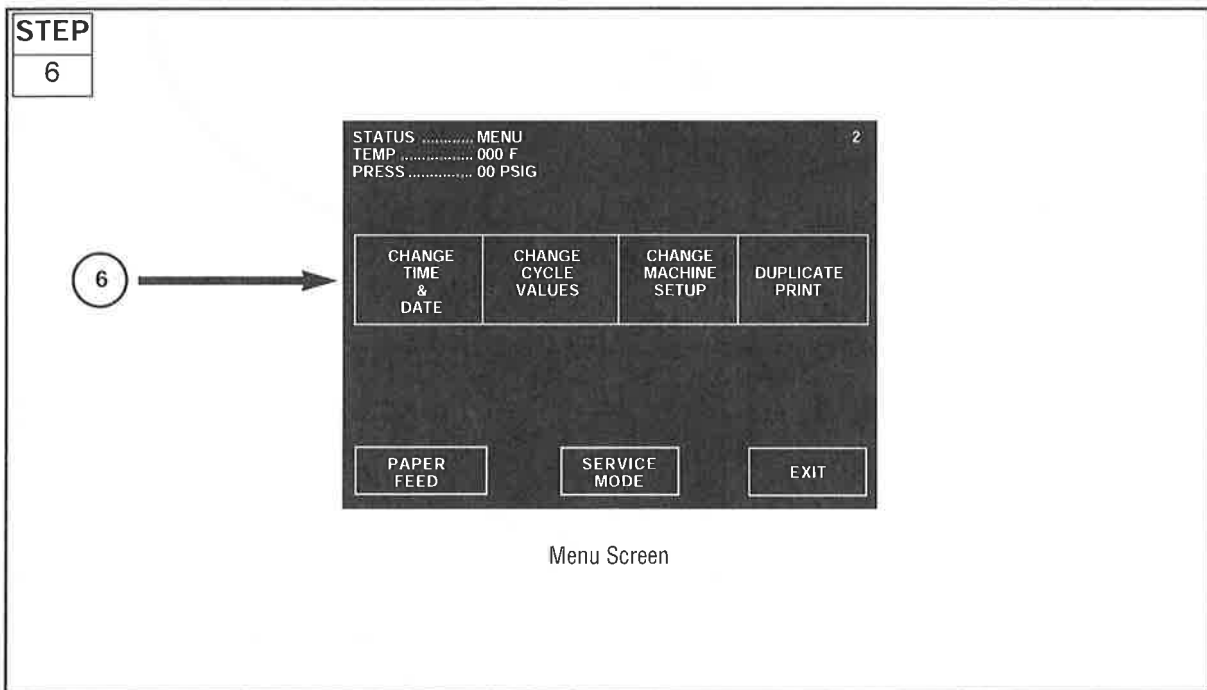


- Step 4:** Start utilities for unit using facility steam.
- Turn on main disconnect switch.
  - Remove unit from standby.
  - Slowly open water valve and inspect for leaks.
  - Slowly open steam supply valve and inspect for leaks.

## Start Up

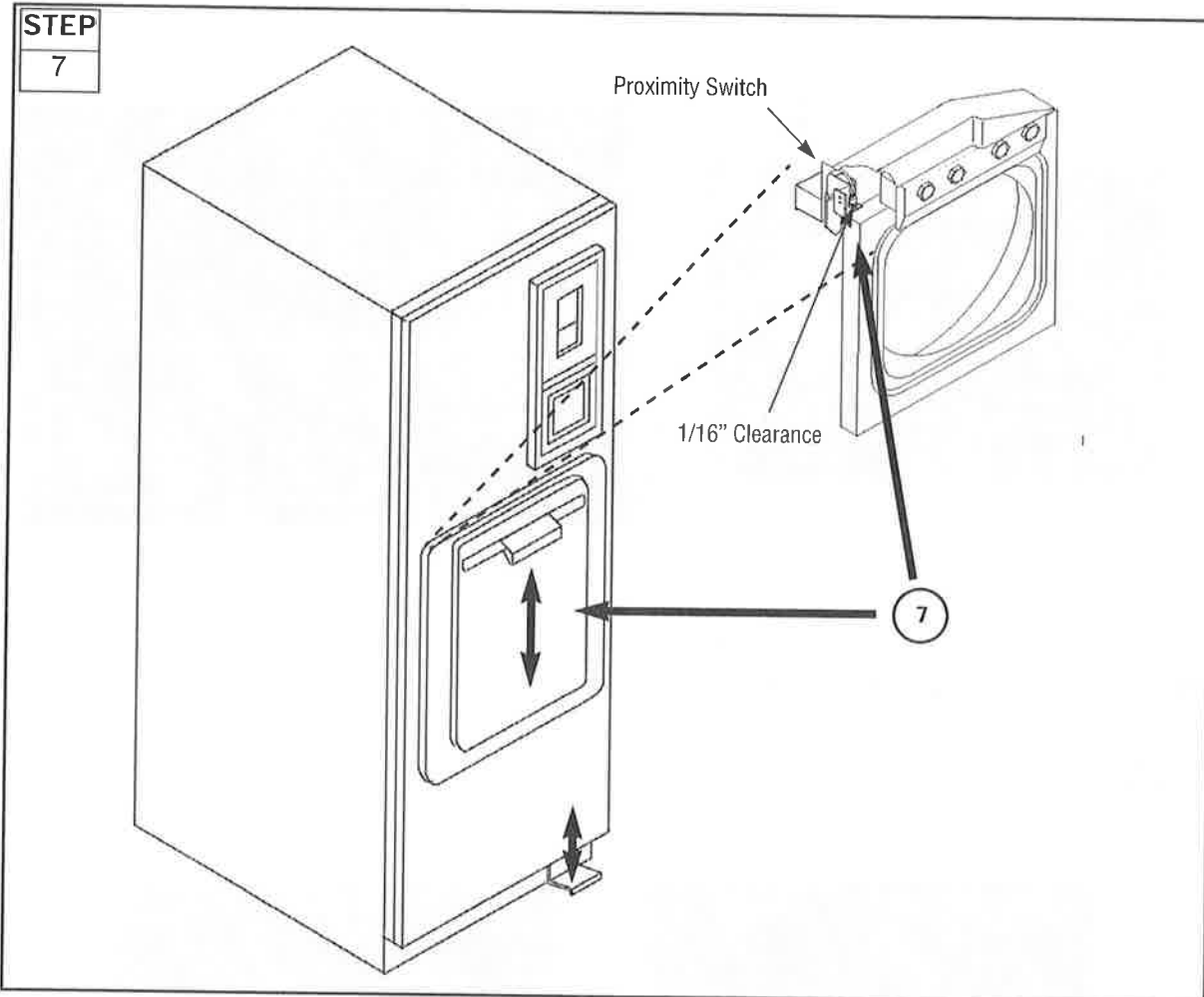


**Step 5:** Install printer paper and printer ribbon.



**Step 6:** Set date and time.

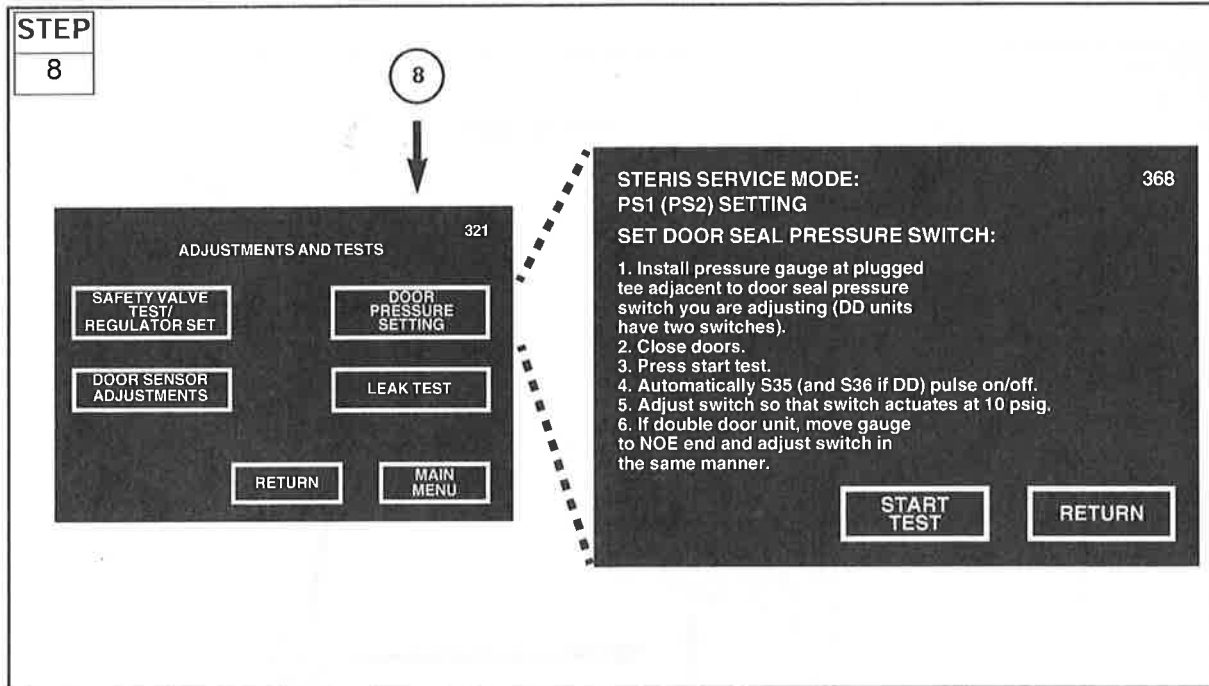




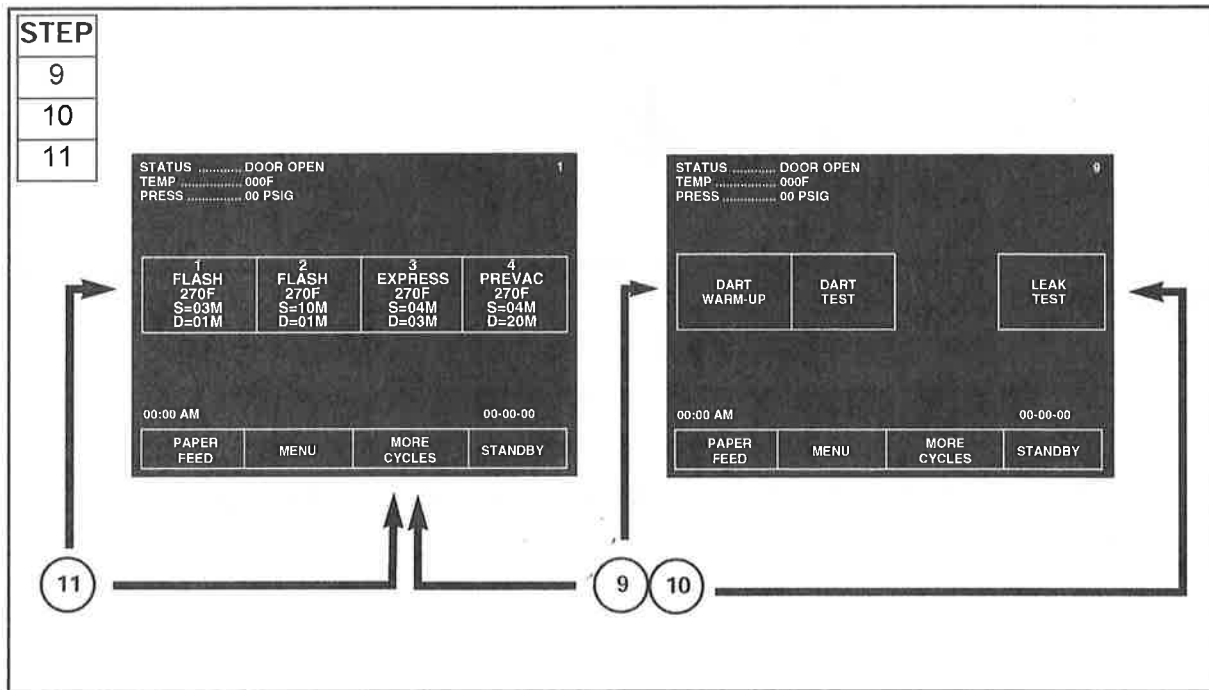
**Step 7:** Check door operation.

- Verify door operates up and down smoothly.
- Verify door goes up and down in approximately 9 seconds.
- Verify door close proximity switch is activated with door in up position.
- Verify door closing force is between 5 to 7 pounds using fish scale.

# Start Up



**Step 8:** Verify door pressure switch adjustment is 10 pounds. Adjust if necessary.



**Step 9:** Run Dart Warm-Up and Dart cycles.

**Step 10:** Run leak test cycle.

**Step 11:** Run each preprogrammed cycle once.

- While cycles are running, ensure equipment is prepped and Customer ready.

# A WORD FROM STERIS

---

This manual contains important information on proper use of this Lab Series Life Sciences Small Steam Sterilizer. **All personnel involved in the use of this equipment must carefully review and comply with the Warnings, Cautions and instructions contained in this manual.** These instructions are important to protect the health and safety of personnel operating the sterilizer and should be retained in a conveniently accessible area for quick reference.

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.

It is the end user responsibility to validate any cycle(s) outside the preset default parameters.

STERIS carries a complete line of accessories for use with this sterilizer to simplify, organize, and verify sterility of the sterilization process. Instrument trays and biological/chemical monitoring systems are all available to fulfill a typical life-science facility's processing needs. Contact a STERIS representative to review these possibilities.

---

## Service Information

---

A thorough preventive maintenance program is essential for safe and proper sterilizer operation. Comprehensive instructions for routine preventive maintenance can be found in the *ROUTINE MAINTENANCE* section provided. You are encouraged to contact STERIS concerning our Preventive Maintenance Agreement. Under the terms of this agreement, preventive maintenance, adjustments, and replacement of worn parts are done on a scheduled basis to help ensure equipment performance at peak capability and to help avoid untimely or costly interruptions. STERIS maintains a staff of well equipped, factory-trained technicians to provide this service, as well as expert repair services. Please call STERIS to learn about additional details.

---

## Indications for Use

---

Designed for use in laboratory and industrial applications. Three sterilizer configurations are available.

**Gravity** – designed for sterilization of nonporous heat- and moisture- stable goods, sterilization of liquids and media in borosilicate glass containers with vented closures, and decontamination of supplies after laboratory procedures. The gravity sterilizer is equipped with gravity and liquid cycles.

**Prevacuum** (Optional) – designed for fast, efficient sterilization of porous, heat- and moisture- stable materials, in addition to the same sterilization capabilities as the gravity sterilizer. The prevacuum sterilizer is equipped with prevacuum, gravity, liquid, leak test, and daily air removal test cycles.

**Isothermal** (Optional) - designed for low temperature sterilization of heat-sensitive and heat-coagulable materials in addition to the same sterilization capabilities as the gravity sterilizer. The isothermal sterilizer is equipped with isothermal, gravity, and liquid cycles.

Each configuration includes choice of a single or double door, for open or recessed mounting.

**Table 1. Sterilizer Chamber Volume**

<b>Chamber Size</b>	<b>Volume (Liters)</b>
16 x 16 x 26" (406 x 406 x 660 mm)	109
20 x 20 x 38" (508 x 508 x 965 mm)	249

**Table 2. Sterilizer Configurations**

The Small Steam Sterilizers are offered in the following configurations:	
Configurations	
16 x 16 x 26" (406 x 406 x 660 mm)	<b>Single or Double Door</b>
20 x 20 x 38" (508 x 508 x 965 mm)	<b>Single or Double Door</b>

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

**Advisory**

A summary of the safety precautions to be observed when operating and servicing this equipment can be found in *SECTION 1* of this manual. Do not operate or service the equipment until becoming familiar with this information. Do not attempt to operate this equipment in a manner not specified by the manufacturer.

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

Manufactured by:  
STERIS Mexico S. de R.L. de C.V.  
Avenida Avante 790  
Parque Industrial Guadalupe  
Guadalupe, Nuevo Leon, Mexico C.P. 67190

Sales and Service:  
STERIS Corporation  
5960 Heisley Road  
Mentor, Ohio 44060  
440-354-2600 • 800-444-9009

[www.steris.com](http://www.steris.com)

STERIS Limited

STERIS House  
Jays Close  
Viables  
Basingstoke  
Hampshire  
RG22 4AX

United Kingdom

# TABLE OF CONTENTS

Section	Paragraph	Page
<b>1</b>	<b>LISTING OF WARNINGS AND CAUTIONS .....</b>	<b>1-1</b>
	Definition of Symbols .....	1-4
<b>2</b>	<b>INSTALLATION VERIFICATION .....</b>	<b>2-1</b>
	2.1 Installation Checklist .....	2-1
	2.1.1 Service Clearance .....	2-1
	2.1.2 Plumbing Services .....	2-1
	2.2 Technical Specifications .....	2-2
	2.2.1 Electrical Service .....	2-2
	2.2.2 Sterilizer Final Check .....	2-2
	2.2.3 Cycle Operation .....	2-2
	2.2.4 Overall Size and Weight .....	2-2
	2.2.5 Utility Requirements .....	2-3
	2.2.6 Environmental Conditions .....	2-3
	2.2.7 Utility Requirements For Units Equipped With Optional Electric Steam Sterilizers .....	2-3
	2.2.8 Environmental Conditions .....	2-3
<b>3</b>	<b>TECHNIQUES OF STERILIZATION .....</b>	<b>3-1</b>
	3.1 Recommended Sterilization Variables .....	3-1
	3.1.1 Prevacuum Cycle .....	3-1
	3.1.2 Gravity Cycle .....	3-1
	3.1.3 Liquid Cycle .....	3-2
	3.2 Control Measures for Verifying Sterilization Process .....	3-3
	3.2.1 Biological Monitors .....	3-3
	3.2.2 Testing for Prevacuum Efficiency .....	3-3
	3.3 Dart & Bowie-Dick Test .....	3-4
	3.4 Vacuum Leak Test .....	3-4
	3.5 Recommendations for the Sterilization Process .....	3-5
	3.6 Techniques of Sterilization for Liquid Cycle .....	3-6
	3.7 Recommendations for Sterilizing Liquids .....	3-7
<b>4</b>	<b>OPERATOR INSTRUCTIONS .....</b>	<b>4-1</b>
	4.1 Component Identification .....	4-1
	4.1.1 Main Power Disconnect Switch .....	4-2
	4.1.2 Supply Valves .....	4-2
	4.2 Control Panel .....	4-3
	4.2.1 Touch Screen .....	4-3
	4.2.2 Printer .....	4-4
	4.2.3 Operating Mode .....	4-5
	4.2.4 Cycle Start .....	4-5
	4.2.5 End-of-Cycle Performance Summary .....	4-5
	4.2.6 Alarm Condition .....	4-5
	4.3 Languages .....	4-6
	4.4 Manual Operation of Manual Door .....	4-9
	4.5 Emergency Door Operation .....	4-10
	4.6 Optional Electric Steam Generator .....	4-12

Section	Paragraph	Page
<b>5</b>	<b>CONTROL INTERFACE .....</b>	<b>5-1</b>
5.1	General Description .....	5-1
5.1.1	Password Entry .....	5-1
5.2	Operating Modes .....	5-3
5.2.1	Gravity Sterilizer Only .....	5-3
5.2.2	Prevac Sterilizer Only (Optional) .....	5-5
5.2.3	Isothermal Sterilizer Only (Optional) .....	5-8
5.3	Status Buttons .....	5-10
5.4	Printer Operation .....	5-13
5.4.1	Printer Operation (OmniPrint Printer) .....	5-13
5.4.2	Printer Operation (Optional Cybertech Printer) .....	5-14
5.4.3	Printer Operation (Optional Mylox Printer) .....	5-15
5.5	Compact Flash Card .....	5-16
5.6	RS232 Download To PC .....	5-18
<b>6</b>	<b>STERILIZER OPERATION .....</b>	<b>6-1</b>
6.1	Before Operating Sterilizer .....	6-1
6.1.1	Load Sterilizer .....	6-3
6.1.2	Sterilizer Equipped with Loading Car .....	6-3
6.2	Gravity Cycle .....	6-4
6.3	Prevac Cycle (Optional) .....	6-10
6.3.1	Fast Exhaust Selection .....	6-14
6.3.2	Slow Exhaust Selection .....	6-16
6.4	Liquid Cycle .....	6-19
6.5	Isothermal Cycle (Optional) .....	6-25
6.6	Warm-up Cycle (Only On Prevacuum Sterilizers) .....	6-30
6.7	Dart Cycle (Only On Prevacuum Sterilizers) .....	6-35
6.8	Bowie-Dick Cycle (Only On Prevacuum Sterilizers) .....	6-41
6.9	Leak Test Cycle (Only On Prevacuum Sterilizers) .....	6-47
6.10	Cycle Abort .....	6-53
6.11	Double Doors .....	6-53
	(for Interlock Door types - refer to Cycle Parameters Section, Page 6-64)	
6.12	Load Probe and Fo Sterilization (Sterilizers With Load Probe Only) .....	6-53
6.12.1	F <sub>0</sub> Sterilization .....	6-54
6.13	Separate Steam Feed Option .....	6-54
6.14	Supervisor Mode .....	6-54
6.14.1	Cycle Parameters .....	6-56
6.14.2	Too Long In Step .....	6-67
6.14.3	Cycle Count .....	6-71
6.14.4	Units .....	6-71
6.14.5	Set Time and Date .....	6-72
6.14.6	Set Passwords .....	6-73
6.14.7	Machine Number .....	6-74
6.14.8	Default Values .....	6-74
6.14.9	Cycle Complete Buzzer .....	6-74
6.15	Utility Shutdown .....	6-75
6.16	Additional Cycles (20 Cycle Option) .....	6-78
6.16.1	Screens for Prevac Operating Mode .....	6-78

Section	Paragraph	Page
6.16.2	Screens for Prevac Cycle Valves, Supervisor Mode .....	6-79
6.16.3	Screens for Gravity Operating Mode .....	6-81
6.16.4	Screens for Gravity Cycle Vlues, Supervisor Mode .....	6-82
6.16.5	Screens for Isothermal Operating Mode .....	6-83
6.16.6	Screens for Isothermal Cycle Values, Supervisor Mode .....	6-84
<b>7</b>	<b>ALARMS .....</b>	<b>7-1</b>
<b>8</b>	<b>ROUTINE MAINTENANCE .....</b>	<b>8-1</b>
8.1	Service Mode .....	8-1
8.1.1	Calibration .....	8-1
8.1.2	I/O Test .....	8-8
8.1.3	Serial Number .....	8-9
8.1.4	Configure Machine .....	8-10
8.2	Change Printer Paper Roll/Ribbon (OmniPrint Printer) .....	8-14
8.3	Change Printer Paper Roll (Optional Cybertech Printer) .....	8-15
8.4	Change Printer Paper Roll (Optional Mylox Printer) .....	8-17
8.5	Change Printer Ribbon (Optional Mylox Printer) .....	8-17
8.6	Clean Chamber Drain Strainer .....	8-18
8.7	Flush Chamber Drain .....	8-18
<b>9</b>	<b>PREVENTIVE MAINTENANCE .....</b>	<b>9-1</b>
9.1	Maintenance Schedule .....	9-1
9.2	Spare Parts .....	9-3
<b>10</b>	<b>APPENDIX A .....</b>	<b>10-1</b>
10.1	PLC Specifications .....	10-1





# LISTING OF WARNINGS AND CAUTIONS

1

The following is a list of the safety precautions which must be observed when operating this equipment. WARNINGS indicate the potential for danger to personnel, and CAUTIONS indicate the potential for damage to equipment. These precautions are repeated (in whole or in part), where applicable, throughout the manual. This is a listing of all safety precautions appearing in the manual. Carefully read them before proceeding to use or service the unit.

## 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 appropriate Lockout-Tagout and electrical safety-related work practice standards.

## WARNING—PERSONAL INJURY HAZARD:

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

## WARNING—BURN HAZARD:

- ⚠ 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 cycle.
- ⚠ 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.
- ⚠ 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.
- ⚠ 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 (0 bar) 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) is required. Testing is to be performed by qualified service personnel only.
- ⚠ 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 seal.
  - Use only Type 1 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.

---

**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 microohms) conductivity minimum. Do not connect 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.

---

**WARNING–EXPLOSION HAZARD:**

- ⚠ This sterilizer is not designed to process flammable compounds.

---

**WARNING–SLIPPING HAZARD:**

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

---

**WARNING–PERSONAL INJURY and/or equipment damage HAZARD:**

- ⚠ Regularly scheduled preventive maintenance is required for safe and reliable operation of this equipment. Contact STERIS to schedule preventive maintenance.
- ⚠ 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.
- ⚠ The configure machine section should only be done in the factory or by a qualified service technician.

---

**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.

---

## CAUTION-POSSIBLE EQUIPMENT DAMAGE:

- ⚠ Gasket must be fully retracted prior to operating sterilizer door.
- ⚠ Do not try to raise or lower door rapidly as fast operation may damage the manual door mechanism.
- ⚠ If 0 dry time is selected, sterilizer automatically initiates a vapor removal phase in place of drying. This phase can still draw a vacuum to 5 inHg. Consult device manufacturer's recommendations to verify 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, put the chamber float into its normal position. The alarm will automatically clear.
- ⚠ 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 (0 bar).
- ⚠ 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.
- ⚠ Immediately wipe up saline solution spills on loading car, to prevent damage to stainless steel.
- ⚠ 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.
- ⚠ Avoid damage to the integral steam generator. Flush the generator daily. Failure to flush generator daily will void the manufacturer's warranty. The optional stainless steel generator must be flushed every two weeks.

## Definition of Symbols

Symbol	Definition
	Transfer of Heat, Hot Surface
	Protective Earth (Ground)
	Electrostatic Sensitive Device
	Attention, Consult Manual for Further Instructions
<b>A</b>	Amperage Rating of the unit
<b>V</b>	Voltage Rating of the unit
~	Alternating Current
<b>Hz</b>	Frequency of the unit
$\phi$	Phase of the unit
<b>SN</b>	Serial Number of Unit

## 2.1 Installation Checklist



**CAUTION - POSSIBLE EQUIPMENT DAMAGE HAZARD: Insufficient service clearance will make repairs more difficult and time-consuming.**

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 help ensure proper operation and maintenance of equipment. Uncrating and Installation Instructions were also furnished with the sterilizer. If any of these documents are missing or misplaced, contact STERIS giving the serial and model numbers of the equipment. Replacement copies will be sent out promptly.

After installing this unit according to the instructions provided, complete the following checklist to help ensure installation is complete and correct. Or, if desired, call STERIS to schedule a technician to test the installation and demonstrate proper equipment operation.

### 2.1.1 Service Clearance

- Clearance as specified on the equipment drawing must be available.

### 2.1.2 Plumbing Services

#### • Feed Water:

- All supply line shutoffs must be provided with lockout capability.
- Backflow prevention is not provided by STERIS.
- 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 is affected.
- Water Quality—supplied must be within specifications. Improper water quality adversely affects equipment operation. Damage to the equipment due to improper water quality is not covered under warranty.

#### • Steam Supply:

- **Shutoffs** (with provisions for lockout and tagout) located nearby.
- **Supply piping** adequately sized.
- **Supply pressure** measured (specification is 3.5 to 5.2 bar [50 to 80 psig], dynamic).
- **Drain piping** must be sloped properly, and sized to handle the maximum waste flow from the sterilizer.

---

## 2.2 Technical Specifications

---

### 2.2.1 Electrical Service

- Electric single-phase service to the unit must be as specified on the Equipment Drawing and on the Machine Data Plate.
- Electric single-phase service requires a clearly marked disconnect with lockout/tagout capability located near the sterilizer.
- Electric single-phase service should be on a separate circuit, and not tied into circuits containing large reactive loads (e.g., motors).
- The sterilizer's protective ground must be connected to terminal block TB-1 in the sterilizer power box. Use green/yellow wire for European installations.
- 3-phase service requires a clearly marked disconnect with lockout/tagout capability located near the sterilizer.

### 2.2.2 Sterilizer Final Check

- Chamber must be leveled properly.
- Door must open and close smoothly.
- Door locked switches must be adjusted correctly.
- Chamber strainer must be in place.
- Rack and shelves and/or loading car operates correctly.
- Warranty labels properly applied.

### 2.2.3 Cycle Operation

- Unit powers up correctly.
- Run Leak Test cycle—leak rate is to be less than 1.0 mm Hg/minute (1.3 mbar/minute). Only on prevac sterilizers.
- Verify operation of a typical cycle (121°C [250°F] gravity).

### 2.2.4 Overall Size and Weight

- **16 x 16 x 26"** 660 mm wide x 1892 mm high x 902 mm deep  
**Sterilizer:** (26" wide x 74.5" high x 35.5" deep)
- **20 x 20 x 38"** 762 mm wide x 1892 mm high x 1152 mm deep  
**Sterilizer:** (30" wide x 74.5" high x 45.375" deep)

## 2.2.5 Utility Requirements

### • Electric:

Vacuum Pump (optional): 120 VAC, 9.5A, 1-phase, 50/60 hz  
440/480 VAC, 31/37A, 3-phase, 50/60 hz  
240 VAC, 72.2A, 3-phase, 50/60 hz

### • Steam:

Pressure: 50 to 80 psig (344.7 to 551.6 Kpa)

Consumption:

- 16 x 16 x 39" (406 x 406 x 660mm) 83 lb/hr (38 kg/hr) peak
- 20 x 20 x 38" (508 x 508 x 965) 116 lb/hr (53 kg/hr) peak

### • Cold Water:

Pressure: 206.8 to 344.7 Kpa (30 to 50 psig)

Temperature: 70°F (21°C, maximum)

Consumption: Peak 6 gpm, per cycle 140 gal/hr, Idle 10 gph

## 2.2.6 Environmental Conditions

Temperature: 10° to 32°C (50° to 90°F)

Humidity: 10 to 90% noncondensing

Pollution Degree: 2

Installation Category (Overvoltage Category): II

A-Weighted Sound Power Level: 85 dBA (maximum)

## 2.2.7 Utility Requirements For Units Equipped With Optional Electric Steam Sterilizers

### • Electric:

Controls: 120 VAC, 2.5A, 1-phase, 50/60 hz

Generator Heaters: 208 VAC, 83.2A, 3-phase, 50/60 hz  
440/480 VAC, 31/37A, 3-phase, 50/60 hz  
240 VAC, 72.2A, 3-phase, 50/60 hz

### • Hot Water:

Pressure: 137.9 to 344.7 Kpa (20 to 50 psig)

Temperature: 140°F, maximum

Consumption: Peak 1 gpm, per cycle 4 gal, Idle 1 gph

### • Stainless-Steel Option Only:

Distilled, Reverse-Osmosis (RO), or Deionized Water with a minimum specific resistivity of 1 mΩ/cm.

## 2.2.8 Environmental Conditions

### • Cold Water:

Pressure: 206.8 to 344.7 Kpa (30 to 50 psig)

Temperature: 70°F (21°C, maximum)

Consumption: Peak 6 gpm, per cycle 140 gal/hr, Idle 10 gph

Temperature: 10° to 32°C (50° to 90°F)

Humidity: 10 to 90% noncondensing

Pollution Degree: 2

Installation Category (Overvoltage Category): II

A-Weighted Sound Power Level: 85 dBA (maximum)

10/15/15  
10/15/15  
10/15/15



## 3.1 Recommended Sterilization Variables

### 3.1.1 Prevacuum Cycle

The Prevacuum cycle is recommended to process heat- and moisture-stable goods, except liquids, which are capable of being sterilized with steam. This cycle can also be used to decontaminate wastes, including wastes containing liquids, provided the materials are properly contained.

Refer to **Table 3-1** for recommended Prevacuum cycle parameters.

**Table 3-1. Prevacuum Cycle Parameters**

Temperature	Pressure Point Psig (psia)	Minimum Recommended Sterilize Time* Minutes at Temperature
121°C (250°F)	12-14 (27-29)	15
132°C (270°F)	26-28 (40-42)	4

\* Minimum sterilize times are based on obtaining a 10<sup>6</sup> Sterility Assurance Level (SAL) with standard test loads. Your specific loads may require different sterilize times to achieve this level of sterility, or you may require a different SAL.

### 3.1.2 Gravity Cycle

Refer to **Table 3-2** for the type of items which can be processed in a Gravity cycle and the recommended parameters.

**Table 3-2. Gravity Cycle Parameters**

Items	Minimum Recommended Sterilize Time at 121°C (250°F) (minutes)	Minimum Recommended Sterilize Time at 132°C (270°F) (minutes)	Dry Time (minutes)
<b>Glassware</b> Empty, inverted, vented*	15 Min.	3 Min.	0 Min.**
<b>Instruments</b> metal combined with suture, tubing or other porous materials (unwrapped)	20 Min.	10 Min.	0 Min.**
<b>Hard Goods</b> Unwrapped	15 Min.	3 Min.	0 Min.**

**Table 3-2. Gravity Cycle Parameters (cont.)**

Items	Minimum Recommended Sterilize Time at 121°C (250°F) (minutes)	Minimum Recommended Sterilize Time at 132°C (270°F) (minutes)	Dry Time (minutes)
<b>Hard Goods</b> Wrapped in muslin or equivalent	30 Min.	15 Min.	30 Min.

\* If items which can trap air must be sterilized upright, they should be sterilized in a prevacuum cycle.

\*\* Goods will be wet when removed from sterilizer.

\*\*\* Dry time can vary for wrapped goods depending on pack density, weight of goods, pack preparation techniques including type of wrapping material used, and sterilizer loading procedures.

### 3.1.3 Liquid Cycle

Refer to **Table 3-3** for recommended Liquid cycle parameters. The recommended times indicated in **Table 3-3** assume the use of vented bottles or Erlenmeyer flasks. The *minimum sterilization time* includes the time required to bring the solution up to the sterilization temperature plus the time required to achieve sterilization.

*NOTE: Use load probes and F<sub>0</sub> option to optimize cycle times.*

**Table 3-3. Liquid Cycle Parameters - No Load Probes**

Volume of Liquid in One Container (mL)	Minimum Recommended Sterilize Time* at 121°C (250°F) (minutes)
75	25
250	30
500	40
1000	45
1500	50
2000	55
>2000	55+10 min/L

\* Minimum sterilize times are based on obtaining a 10<sup>6</sup> Sterility Assurance Level (SAL) with standard test loads. Specific labs may require different sterilize times to achieve this level of sterility, or may require a different SAL.

---

## 3.2 Control Measures for Verifying Sterilization Process

---

### 3.2.1 Biological Monitors

A live spore test utilizing *B. stearothermophilus* is the most reliable form of biological monitoring. This type of product utilizes controlled populations of a controlled resistance, so that survival time and kill time can be demonstrated.


To verify the process, insert the biological indicator in a test pack and place pack on the bottom shelf. Run test pack through a typical cycle. On completion, forward test pack and monitor to appropriate personnel for evaluation.

Tests such as the Dart (using a STERIS Dart® test pack\*) are designed to document the removal of residual air from a sample challenge load.

Run a Dart or Bowie-Dick test cycle daily before processing any loads in a sterilizer equipped with prevacuum cycles. The first prevacuum cycle of each day should be used to test the adequacy of air removal from the chamber and load, so that steam can penetrate the load. It is not a test for adequate exposure to heat in terms of time-at-temperature.

### 3.2.2 Testing for Prevacuum Efficiency

In the case of these tests, following exposure in a prevacuum sterilizing cycle, the pack is opened, the indicator examined, and conclusions are drawn as to the pattern of residual air, if any, that remained in the pack during the sterilizing cycle. Any indication of a malfunction must be reported to the supervisor. Sterilizer must not be used again until approved by supervisor.

 **WARNING – STERILITY ASSURANCE HAZARD:** Load sterility may be compromised if the biological indicator or vacuum 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.

\* Call STERIS for pricing and availability.

---

### 3.3 Dart and Bowie-Dick Test

---



**WARNING – STERILITY ASSURANCE HAZARD:** Load sterility may be compromised if the biological indicator or vacuum 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.

The Dart and Bowie-Dick Test is designed to document the removal of residual air from a sample challenge load in a prevacuum sterilizer. This test does not apply to gravity, liquids, or Isothermal cycles.

In the case of this test, following exposure in a prevacuum test cycle, the pack is opened, the indicator examined and conclusions are drawn as to the pattern of residual air, if any, that remained in the pack during the sterilizing cycle. Any indication of a malfunction must be reported to the supervisor. Sterilizer must not be used to run prevacuum cycles until approved by supervisor.

Refer to instructions for running the Dart and Bowie-Dick test cycle in SECTION 6, *STERILIZER OPERATION*. Dart and Bowie-Dick test packs\* are designed to expose the pattern and document the removal of residual air from the sample load.

*NOTE: The Dart and Bowie-Dick test cycle is not a test for adequate exposure to heat in terms of time-at-temperature.*

\* Call STERIS for pricing and availability.

---

### 3.4 Vacuum Leak Test

---



**WARNING – STERILITY ASSURANCE HAZARD:** Load sterility may be compromised if the biological indicator or vacuum 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.

The Vacuum Leak Test (see appropriate cycle description in SECTION 5, *CONTROL INTERFACE*) measures the integrity of the sealed pressure vessel and associated piping to verify air is not being admitted to the sterilizer during the vacuum drawdowns.

After running a Leak Test cycle, a value or leak rate prints on the printer tape. This value helps define a trend over a period of time if the integrity of the system begins to deteriorate (i.e., allowing air to enter the system). By running a Leak Test cycle daily or weekly, the operator or maintenance personnel can always monitor the air tightness of the system and make repairs or adjustments when necessary.

*NOTE: A leak rate of greater than 1 mmHg per minute indicates a problem with the sterilizer that must be addressed.*

---

## **3.5 Recommendations for the Sterilization Process**

---

Saturated steam is a well controlled, reliable method for processing items which can withstand the temperatures and pressures associated with steam sterilization. The requirements for achieving reproducible results are well known by many users, but are not always understood by all users.

The condition most likely to result in sterilization problems is a failure to remove all of the air from the items being processed. For example, placing an empty beaker or bowl in an upright position in a gravity displacement sterilizer may result in the object not being sterilized, or may require exceptionally long sterilization times. This problem is due to the fact air has almost twice the density as does saturated steam under the same conditions. Thus, the air sits in the bottom of the container, and the steam forms a stable layer over the air. This effect is similar to oil forming a stable layer over water. As long as there is no mechanism for actively mixing the two, the bottom of the container only is exposed to dry heat only, which is not an effective sterilization method at the time and temperatures typically used in steam processes.

There are two traditional methods for enhancing the sterilization of solid bottom containers in gravity displacement cycles. These are:

- Place 1 mL of water for each liter of volume in the bottom of each container. The expansion of the water into steam, as the product is heated, forces most of the air out of the object, thus allowing steam to reach all surfaces and effect sterilization.
- The better, more reliable method is to orient all objects in a manner which would allow water to flow out. When the steam enters the chamber, it tends to layer over the air. When inverted, however, the object is oriented so air can flow out. As air flows out of the container, it is replaced by steam. Steam can now reach all surfaces, and effect sterilization.

## 3.6 Techniques of Sterilization for Liquid Cycle

Refer to **Table 3-4** for suggested Liquid cycle parameters. The suggested times indicated in **Table 3-4** assume the use of vented bottles. The *minimum sterilization time* includes the time required to bring the solution up to the sterilize temperature plus the time required to achieve sterilization. This time may vary due to viscosity of liquid and other parameters.

**Table 3-4. Liquid Cycle Parameters**

Number of Containers	Volume of Liquid in One Container	Minimum Recommended Sterilize Time at 250°F (121°C) in Minutes
3	1000 mL	45

**⚠ WARNING—EXPLOSION HAZARD:** This sterilizer is not designed to process flammable compounds.

**⚠ 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.

**⚠ WARNING:** When sterilizing liquids, you must observe the following procedures:

- Use Liquid cycle only.
- Use only vented closures.
- Use only Type I borosilicate glass bottles.
- Do not allow hot bottles to be jolted.

**⚠ 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.

**⚠ CAUTION:** 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.

## 3.7 Recommendations for Sterilizing Liquids

**⚠ WARNING – EXPLOSION HAZARD:** This sterilizer is not designed to process flammable compounds.

**⚠ WARNING – PERSONAL INJURY HAZARD:** Avoid personal injury from bursting bottles. Liquid sterilization cycle must only be used for liquids in borosilicate flasks with vented closures.

**⚠ WARNING – BURN HAZARD:** When sterilizing liquids, *always* observe the following procedures:

- Use Liquid cycle only.
- Use only vented closures.
- Use only Type I borosilicate glass bottles.
- Do not allow hot bottles to be jolted.
- **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.

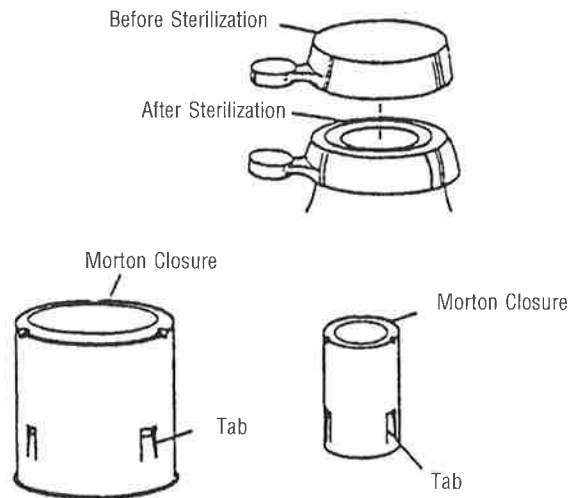
**⚠ CAUTION:** Sterilization of chloride-containing solutions (e.g., saline) can cause chamber corrosion and is not recommended by the manufacturer. If, however, chloride-containing solutions must be processed, clean the chamber after each use.

**IMPORTANT:** Please read the following paragraphs before sterilizing any liquids in the sterilizer.

Borosilicate glass is required because it is a superior glass capable of resisting thermal shock. If glass not as thermally resistant is used, a greater potential for bursting exists.

Vented closures are required because, by design, they release internal pressure buildup by automatically venting the containers, whereas pressure in unvented containers remains until the contents have cooled. Examples of vented closures are shown in Figure 3-1.

When loading, place small bottles in a separate basket to minimize sliding. Always use side rails on the loading car to prevent containers or baskets from falling off.



**Figure 3-1. Vented Closures**

STERILIZATION

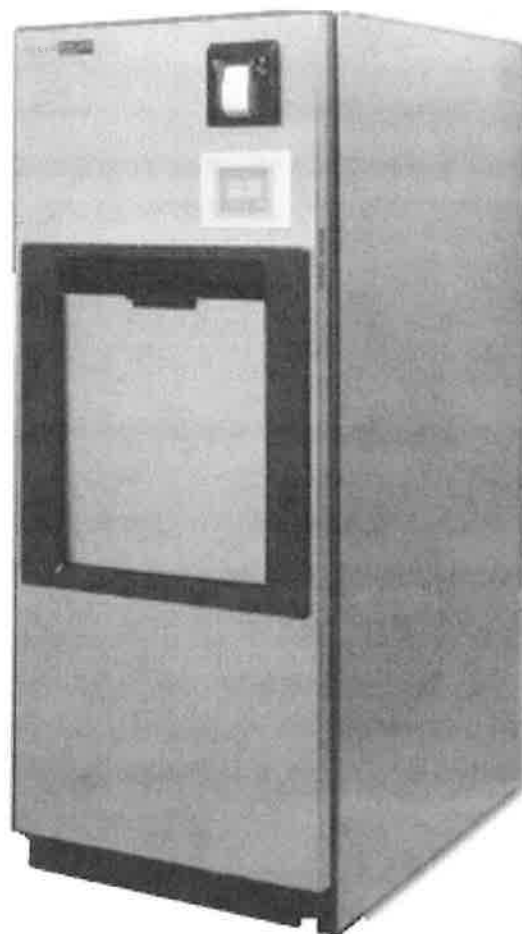


## 4.1 Component Identification

The Lab 250 and Lab 110 Life Sciences Small Steam Sterilizers are steam-jacketed sterilizers designed to process a variety of loads using saturated steam under pressure and gravity air removal principals.

The Sterilizer is equipped with a fully-programmable microcomputer control system capable of storing process cycles for sterilizing hard goods, lightly wrapped porous loads and liquid loads in vented containers. The control system monitors and automatically controls all cycle operations and functions.

Before operating the sterilizer, it is important to become familiar with the location and function of all major components and controls (see Figure 4-1).



**Figure 4-1. Lab 250 Series Sterilizer**

### 4.1.1 Main Power Disconnect Switch

The main power disconnect switch, located behind the front cabinet panel, controls power supply to the sterilizer and control system (see Figure 4-2).

**Important:** This switch should remain in the ON position at all times for normal unit operation.

**⚠ 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 appropriate Lockout-Tagout and electrical safety-related work practice standards.

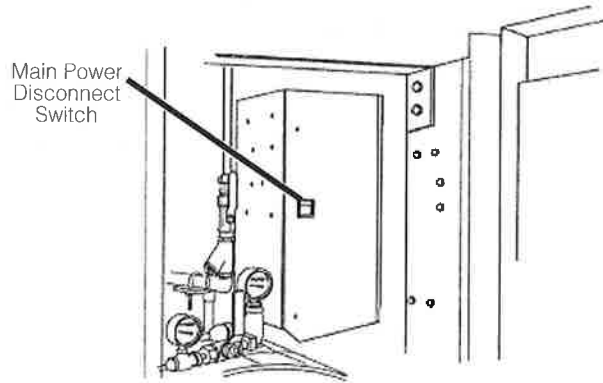


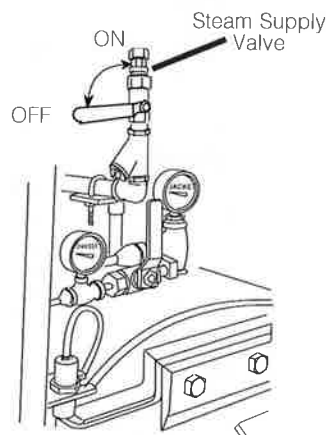
Figure 4-2. Main Power Disconnect Switch

### 4.1.2 Supply Valves

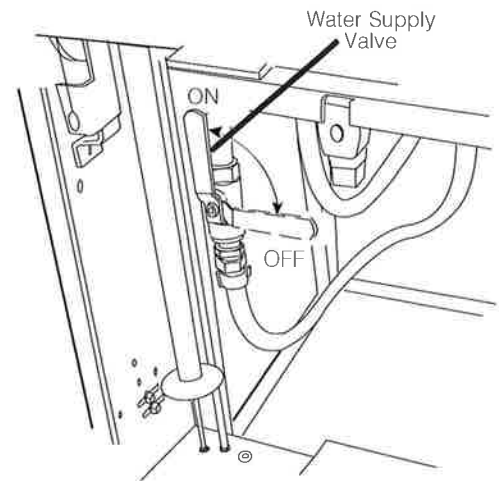
Supply valves to the sterilizer are located behind the front cabinet panel. Steam supply valve is located above the chamber door (see Figure 4-3); water supply valve is located below the chamber door (see Figure 4-3).

**NOTE:** If unit is equipped with electric steam generator, refer to SECTION 4.5-OPTIONAL ELECTRIC STEAM GENERATOR, included in this section, for location of the generator supply valve.

**Important:** Both supply valves to the sterilizer should remain in the ON position at all times for normal unit operation.



Steam Valve Located Above Chamber Door



Water Valve Located Below Chamber Door

Figure 4-3. Steam and Water Supply Valves to the Sterilizer

## 4.2 Control Panel

### 4.2.1 Touch Screen

The control panel, located on load end of the sterilizer, is used to direct all sterilizer functions (see Figure 4-3). The operator may control cycle operation, program cycles and sterilizer operating parameters and monitor cycle performance from the control panel.

The touch screen allows the user to operate and program the sterilizer control by touching (pressing) the appropriate touch-sensitive areas on the display. On each screen, all buttons are touch-sensitive areas (see Figure 4-3).

Refer to *SECTION 5, CONTROL INTERFACE*, for further details on interfacing with the control system's touch screen.



**Figure 4-3. Example of In-cycle Touch Screen**

**ACTIVATE SEAL PHASE:** Door gasket seals with steam until door seal switch is closed. An additional 20 seconds elapses, after seal switch is closed, before the phase is complete.

**4.2.2 Printer** Ink-on-paper printer records all cycle data on 2-1/4" wide paper.

The following is an example of a typical in-cycle printout (see Figure 4-4).

```
===== GRAVITY =====
CYCLE START AT   XX:XX:XX A/P
                  ON     XX/XX/XX
CYCLE COUNT      0
LOGIN NAME:      xxxxxx
STERILIZER       xxxxxx
CYCLE TYPE       GRAVITY
CYCLE NO.        2

STEP TEMP        = 121.0 C
CONTROL TEMP     = 122.5 C
STER TIME        = 0:30:00
DRY TIME         = 0:01:00

- TIME           T=C     V-inHg
                  P=psig
C 11:48:24A      66.7     0.3V
C 11:49:24A      112.7    10.01
S 11:49:43A      121.2    16.61
S 11:51:43A      122.6    17.71
S 11:53:43A      123.3    17.81
S 11:55:43A      123.6    16.81
S 11:57:43A      122.6    17.01
S 11:59:43A      122.6    17.21
S 12:01:43?      122.5    17.01
S 12:03:43P      122.4    17.21
S 12:05:43?      122.5    16.81
S 12:07:431      122.4    16.91
S 12:11:43P      122.4    17.01
S 12:17:43?      122.5    17.11
S 12:15:43?      122.6    17.01
S 12:17:431      122.7    17.01
S 12:19:43?      122.6    16.81
E 12:19:44?      122.6    16.91
E 12:19:54?      113.7    3.21
E 12:20:03?      99.9     11.1V
E 12:21:031      40.5     28.1V
Z 12:21:461      68.4     0.5V

LOAD              020903

CHAMBER TEMP MAX=124.8 C
CHAMBER TEMP MIN=121.2 C

CONDITION         = 1:19
STERILIZE         = 30:01
EXHAUST           = 1:42
TOTAL CYCLE       = 33:02

=====
===== READY TO UNLOAD =====
=====
```

**Figure 4-4. Typical In-Cycle Printout**

All printer functions are controlled using the touch screen. For details on each of the printer functions, refer to *SECTION 5, CONTROL INTERFACE*.

### 4.2.3 Operating Mode

When sterilizer is placed in the Operating mode, the generated printout lists the sterilizer type and manufacturer.

```
CONTROL ON
Day, Month XX, XXXX
XX:XX:XX AM
*****
*      STERIS SCIENTIFIC      *
*    AMSCO® LAB SERIES      *
*    GRAVITY STERILIZER      *
*****
```

**Figure 4-5. Printout: Sterilizer Type and Manufacturer**

### 4.2.4 Cycle Start

When a cycle is started, the generated printout lists name of cycle started, time and date the cycle was started, the current cycle count (number of cycles run since original start up of unit), the operator's name, the sterilizer ID number, the default cycle number and type, and the programmed parameters for the cycle started.

*NOTE: Cycle count value may be changed in the Supervisor Mode.*

### 4.2.5 End-of-Cycle Performance Summary

At the end of a cycle, the generated printout lists number of cycles run that day, the maximum and minimum chamber temperatures reached during the sterilize phase, processing times for key phases and the total cycle time.

### 4.2.6 Alarm Condition

When an alarm condition occurs, the generated printout (see Figure 4-6) lists the type of alarm and time, chamber temperature and chamber pressure when it occurred.

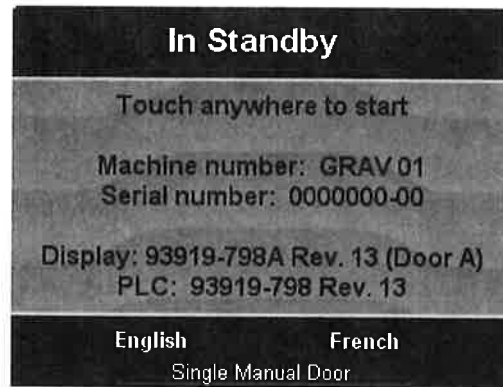
*NOTE: Refer to SECTION 7, ALARMS, for listing of possible alarm conditions.*

```
* ALARM
PRESSURE IN CHAMBER
F 10:07:23A    61.7C    34.0P
```

**Figure 4-6. Printout: Type of Alarm, Chamber Temperature and Chamber Pressure, and Time of Occurrence**

## 4.3 Languages

The Lab 110/250 Sterilizer has multiple language capability. The displays and prints may be shown in the English language, French language or another language by selecting it on the standby screen.



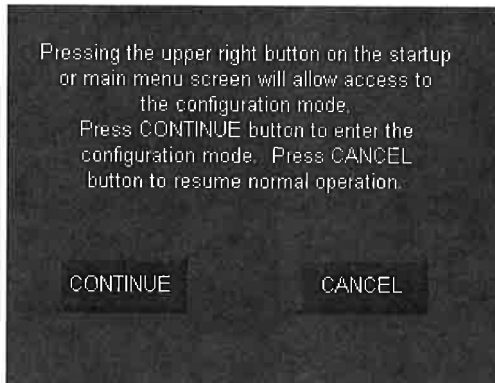
The screen 1 above shows the selectable languages as English and French. Another language, such as Spanish, may also be available. The English language is currently selected on this screen.

If the French word is selected, the display will change the text to the French language. There is about a 5 second delay before the language selection takes effect and changes the text on screen 1. The displays and prints will now be in the French language. See display 1 below in the French language.

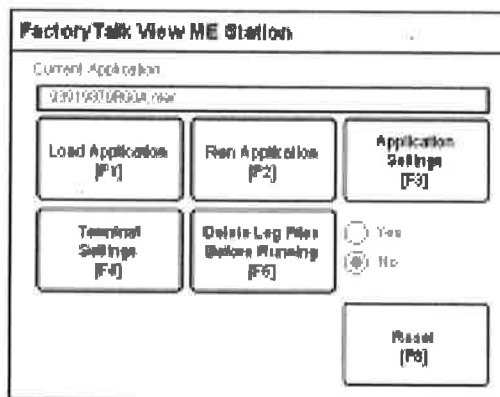


The control has the ability to power up in the default language (English) or the selected language. This option is selectable in the configuration mode. The following are the steps to select this option:

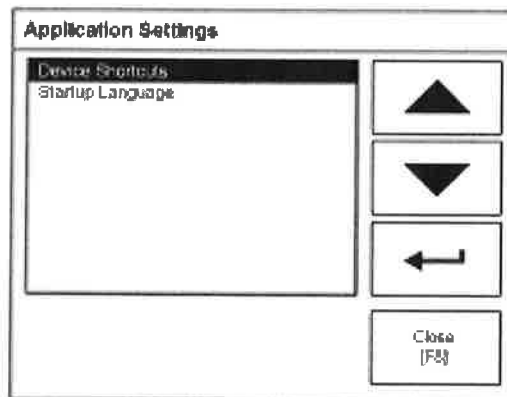
- 1.) Press the upper right button on screen 1. The following display will be shown:



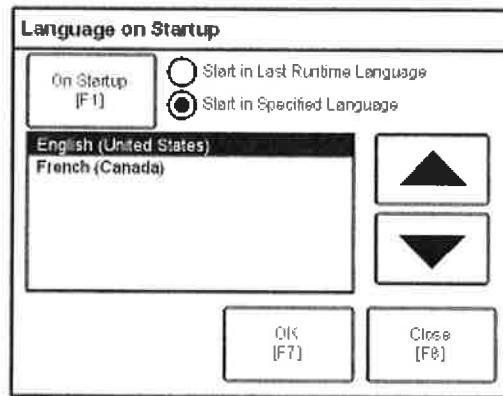
- 2.) Press CONTINUE button. After about 30 seconds the following display will be shown:



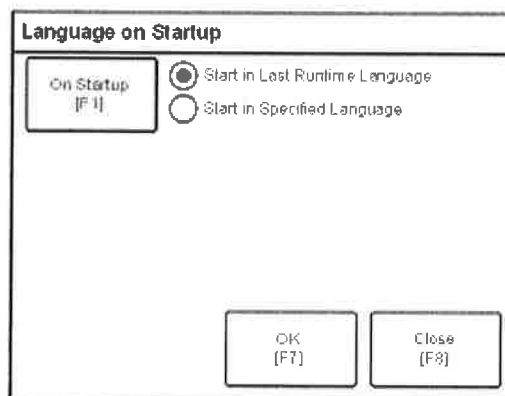
- 3.) Press the Application Settings button (upper right button on screen above). The following display will be shown:



- 4.) Select Startup Language on screen above. The following display will be shown:



- 5.) The screen above is set to start the control in the English language. Even if the French language is selected, if the power is turned off and on, the English language will be shown.
- 6.) Press "Start in Last Runtime Language" if the selected language is to be displayed when the power is turned off and on (i.e. if French language is selected and that language is always to be displayed, even when the power is turned off and on, then select this option. The following screen shows this option selected:



- 7.) Press OK and return back to the configuration screen. The setting is now saved. Turn the power off and on.
- 8.) If the sterilizer is a double door, the display 'B' needs to be setup as described in this procedure if any language changes need to be made.



## 4.4 Manual Operation of Manual Door

Carefully review *SECTION 1, SAFETY PRECAUTIONS*, and below before operating door manually.

**⚠ WARNING - PERSONAL INJURY HAZARD:** When closing the chamber door, keep hands and arms out of the door opening and make sure opening is clear of obstructions.

**⚠ 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.
- 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.
- 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.

**⚠ CAUTION - POSSIBLE EQUIPMENT DAMAGE HAZARD:**

- Gasket must be fully retracted prior to operating sterilizer door.
- 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 (0 bar).
- Do not try to raise or lower door rapidly as fast operation may damage the manual door mechanism.

Using hand pressure, pull or push on the door handle to operate the door.

*NOTE: Do not try to move the door rapidly as fast operation may damage the door drive mechanism.*

---

## 4.5 Emergency Door Operation


---

Carefully review *SECTION 1, SAFETY PRECAUTIONS*, and below before operating emergency door. (Refer to page 4-8 for procedure.)

### WARNING - BURN HAZARD:

- 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.
- 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.
- 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.
- Failure to shut off the steam supply when cleaning or replacing strainers can result in serious injury.
- Jacket pressure must be 0 psig (0 bar) 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) is required. Testing is to be performed by qualified service personnel only.
- 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 seal.
  - Use only Type 1 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.

 **WARNING - EXPLOSION HAZARD:** This sterilizer is not designed to process flammable compounds.

 **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.

 **CAUTION - POSSIBLE EQUIPMENT DAMAGE HAZARD:**

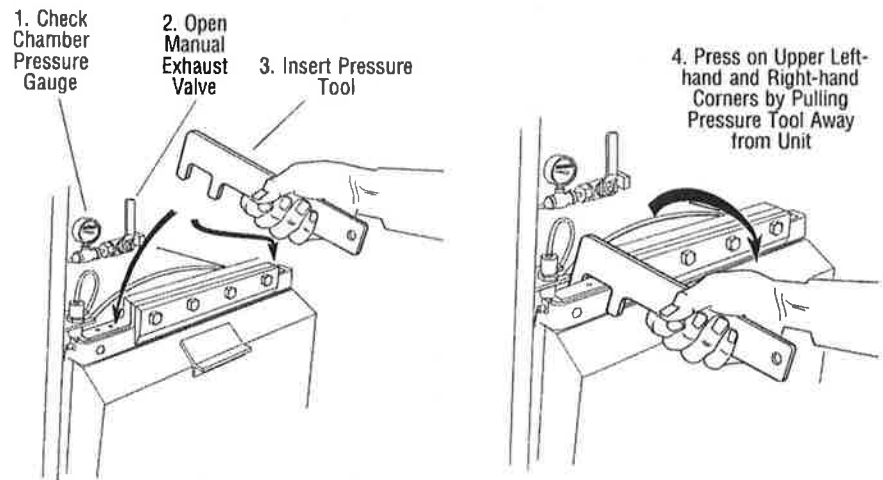
- Gasket must be fully retracted prior to operating sterilizer door.
- Do not attempt to open sterilizer door during manual operation unless chamber is at 0 psig (0 bar).



**WARNING --BURN HAZARD:**  
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.

The following emergency procedure should only be used in instances where the sterilizer has lost either electrical or water utilities, and a load is sealed in the chamber. This procedure requires manually releasing the door seal by pressing on the door and pushing the seal back into the groove.

1. Open front cabinet panel. Open manual exhaust valve to exhaust remaining steam from the chamber (see Figure 4-8). Leave valve open during emergency procedure.
2. Using pressure tool provided, press on upper left hand and right hand corners of chamber door as shown in figure 4-8. Door should give inward slightly, indicating seal has been compressed into groove.
3. Close front cabinet panel and pull down on door handle.
4. Once door is open, do not use sterilizer until unit has been examined by a qualified service technician. Further use without proper attention may damage sterilizer.
5. Close manual exhaust valve.



**Figure 4-8. Emergency Door Operation**


## 4.6 Optional Electric Steam Generator

Carefully review *SECTION 1, SAFETY PRECAUTIONS* and below before operating steam generator. 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.

### WARNING - BURN HAZARD:

- 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.
- 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.
- 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.
- Failure to shut off the steam supply when cleaning or replacing strainers can result in serious injury.
- Jacket pressure must be 0 psig (0 bar) 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) is required. Testing is to be performed by qualified service personnel only.
- 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 seal.
  - Use only Type 1 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.

 **WARNING - EXPLOSION HAZARD:** This sterilizer is not designed to process flammable compounds.

 **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.

 **CAUTION - POSSIBLE EQUIPMENT DAMAGE HAZARD:**

- Gasket must be fully retracted prior to operating sterilizer door.
- Do not attempt to open sterilizer door during manual operation unless chamber is at 0 psig (0 bar).

Steam generators are highly susceptible to mineral scaling if the supplied water has any level of hardness. Refer to Table 4-1 for water quality requirements.

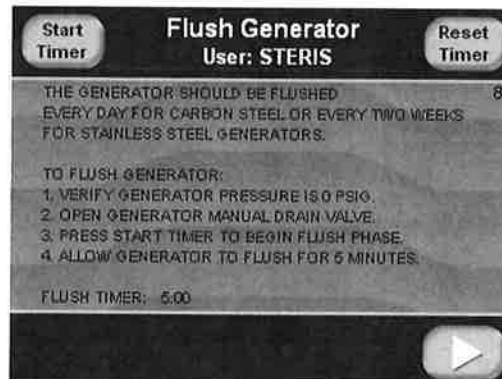
**IMPORTANT:** Regardless of the hardness level of supplied water, the generator must be flushed every day for carbon steel generators and every two weeks for stainless steel generators before use to prevent mineral scaling or carryover of debris into the chamber.

**Table 4-1. Required Feed Water Quality for Carbon Steel Steam Generators**

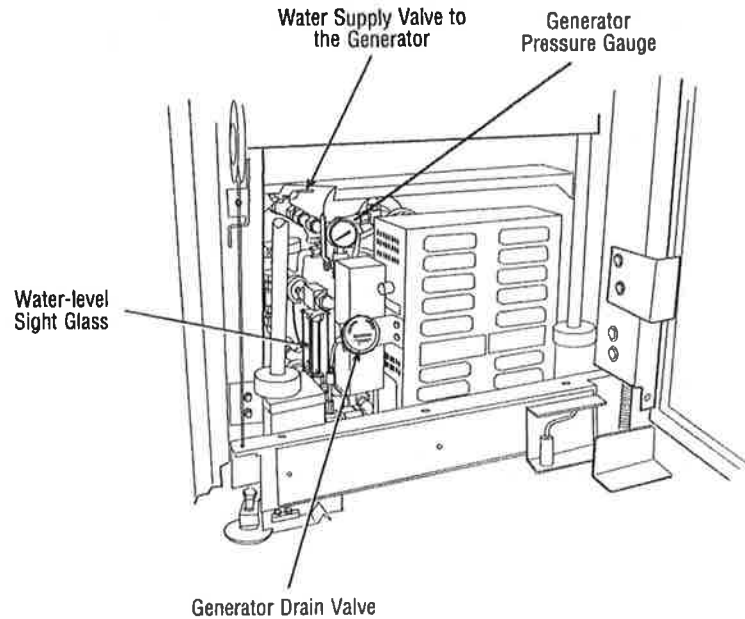
Condition	Nominal Recommended	Maximum Recommended
Temperature	As Supplied	140° F (60° C)
Total Hardness as CaCO <sub>3</sub> *	0-17 mg/L	130 mg/L
Total Dissolved Solids	50-150 mg/L	250 mg/L
Total Alkalinity as CaCO <sub>3</sub>	50-100 mg/L	180 mg/L
pH	6.8 - 7.5	6.5 - 8.5
Total Silica	0.1 - 1.0 mg/L	2.5 mg/L
Resistivity - ohms/cm	2000-6000	26,000

\*17.1 mg/L = 1 grain hardness

1. After the operating mode is entered, see CONTROL INTERFACE section for instructions on entering the operating mode, the display shows the following screen (the screen is shown only one time per day for carbon steel generators or once every two weeks for stainless steel generators):



2. Check generator pressure gauge (see Figure 4-9). Generator must be at 0 psig and room temperature before flushing.



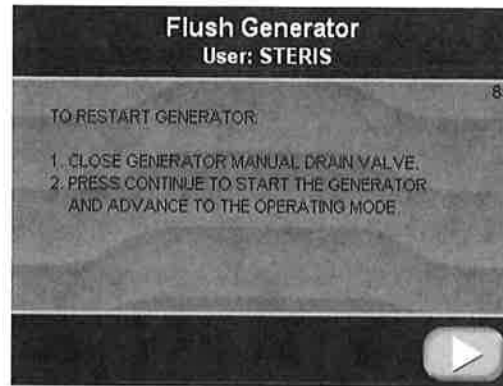
**Figure 4-9. Optional Electric Steam Generator**

*NOTE: If generator is not at 0 psig, the flush phase can be bypassed by pressing **CANCEL**; however, the flush should not be bypassed on a continuous basis or damage to the generator occurs.*

To verify generator is at 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 side of generator electric box (see Figure 4-9).
4. Verify water supply valve to sterilizer is open.
5. Verify water supply to generator is open (see Figure 4-9).
6. Press START TIMER button on screen. Water automatically flushes through generator and out the drain for five minutes. Flush timer on screen counts down time remaining in flush phase.

7. After five minutes, display advances to the following screen. Instructions on how to start generator are also listed on the screen.



8. Close generator drain valve.
9. Press **CONTINUE** button on screen. Generator automatically fills to proper level and starts to heat. Display screen advances to operating mode screen. Allow 10 minutes warm-up time once generator starts to fill.
10. Close front cabinet panel.

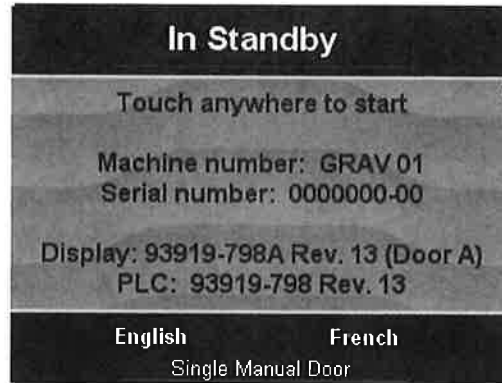




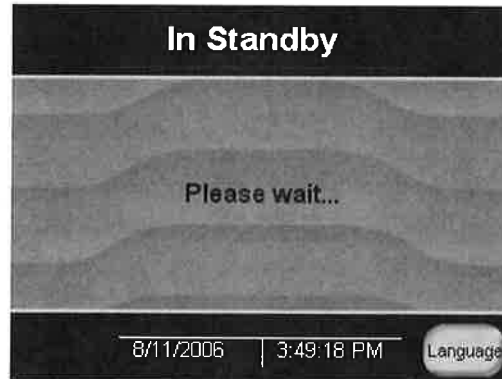
## 5.1 General Description

Touch screens allow the user to operate and program the sterilizer by lightly touching (pressing) the appropriate touch-sensitive areas on the display. On each screen, all buttons are touch sensitive areas. When a button is pressed, the display area within the button changes state.

After the sterilizer has been powered up, the display shows the following screen:



Touch any portion of screen to proceed (*Note: Pressing the upper right on the screen will enable the control panel*). Display shows the following screen (*Note: See Password entry*):

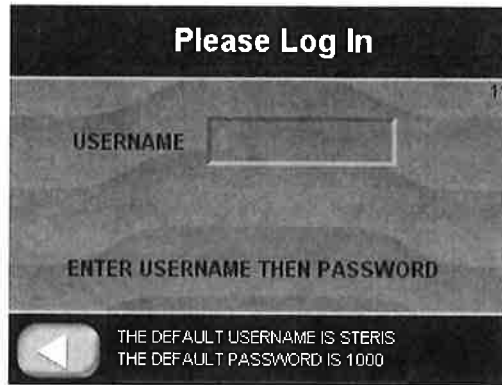


### 5.1.1 Password Entry

Display shows the following screen:



Touch white area next to Username to enter username. An alphanumeric touch screen is shown. Enter username and press RETURN button. The following display is shown:

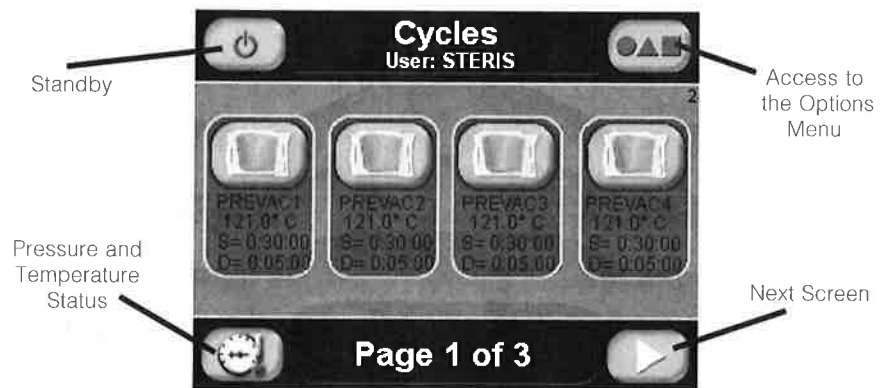


Touch the area next to Password to enter password. An alphanumeric touch screen is shown. Enter password and press button. If username and/or password are invalid the following message is shown on Screen 11: **INCORRECT PASSWORD**. Re-enter username and password or press **LEFT ARROW** button to return to start up screen.

After the username and password have been successfully entered, every screen during the operating mode will show the username (login name).

*Note: The default username is STERIS and the password is 1000. This username and password gains entry to the operating, supervisor, and service modes. Once logged in, this username and password may be changed by the supervisor.*

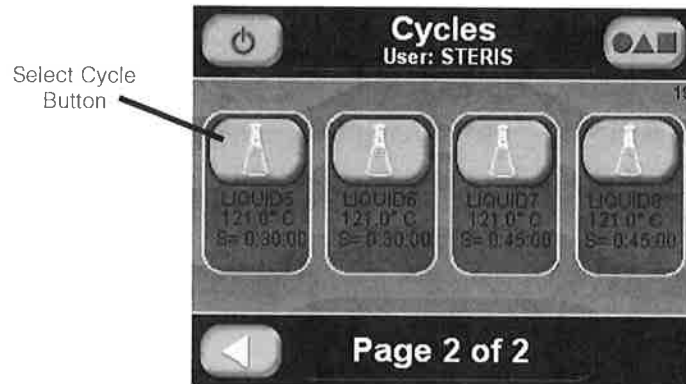
The operating mode display appears.



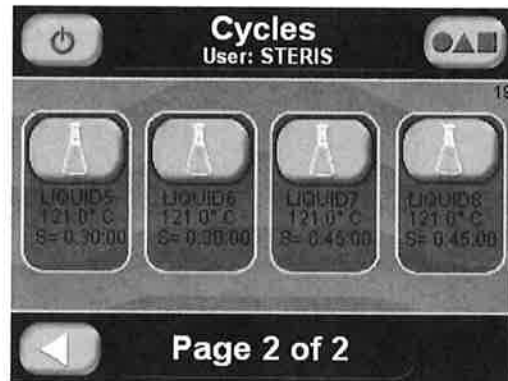
## 5.2 Operating Modes

### 5.2.1 Gravity Sterilizer Only

Press **OPERATING MODE** button to enter operating mode. The operating mode display is shown below:



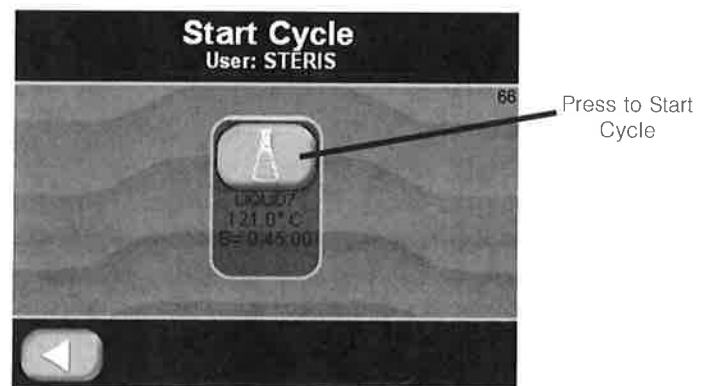
Press **RIGHT ARROW** to advance to the following screen (additional cycles 5 through 8).



Press **LEFT ARROW** to return to previous screen (cycles 1 through 4).

The jacket charges with steam to maintain 115.0°C (239.0°F). A cycle cannot be run with door open. The cycle may be run with the jacket still charging.

Press **CYCLE** button to select a cycle. The following display is shown for cycles 1 through 8. Corresponding cycle values appear on display.



**NOTE:** If display shows **CLOSE DOOR(S)** message, close the door. The cycle does not start until door is closed.

Press **PRINT CYCLE VALUES** button to print all cycle values. The following is a print example of all cycles values. (NOTE: STRL, CTRL, and Fo only appear if load probes are selected):

```

=====
==== CYCLE VALUES PRINTOUT ====
=====
XX:XX:XX XM                XX/XX/XX

LOGIN NAME:  STERIS

1.GRAVITY1
PURGE TIME= 2:00
STER TIME = 0:30:00
STER TEMP = 121.0 C
  OVERTEMP = 6.0 C
OVERDRIVE = 1.5 C
UNDERTEMP = 1.0 C RESUME
PRINT INT = 2 MIN
  VAC DRY = 10.0 inHg
  DRY TIME = 0:15:00
STRL CTRL = DRAIN
  Fo = 0
-----

2.GRAVITY2
PURGE TIME= 2:00
STER TIME = 0:30:00
STER TEMP = 121.0 C
  OVERTEMP = 6.0 C
OVERDRIVE = 1.5 C
UNDERTEMP = 1.0 C RESUME
PRINT INT = 2 MIN
  VAC DRY = 10.0 inHg
  DRY TIME = 0:15:00
STRL CTRL = DRAIN
  Fo = 0
-----

3.GRAVITY3
PURGE TIME= 2:00
STER TIME = 0:30:00
STER TEMP = 121.0 C
  OVERTEMP = 6.0 C
OVERDRIVE = 1.5 C
UNDERTEMP = 1.0 C RESUME
PRINT INT = 2 MIN
  VAC DRY = 10.0 inHg
  DRY TIME = 0:15:00
STRL CTRL = DRAIN
  Fo = 0
-----

4.GRAVITY4
PURGE TIME= 2:00
STER TIME = 0:30:00
STER TEMP = 121.0 C
  OVERTEMP = 6.0 C
OVERDRIVE = 1.5 C
UNDERTEMP = 1.0 C RESUME
PRINT INT = 2 MIN

```

```

VAC DRY = 10.0 inHg
DRY TIME = 0:15:00
STRL CTRL = DRAIN
  Fo = 0
-----

5.LIQUID5
PURGE TIME= 2:00
STER TIME = 0:30:00
STER TEMP = 121.0 C
  OVERTEMP = 6.0 C
OVERDRIVE = 1.5 C
UNDERTEMP = 1.0 C RESUME
PRINT INT = 2 MIN
STRL CTRL = DRAIN
  Fo = 0
-----

6.LIQUID6
PURGE TIME= 2:00
STER TIME = 0:30:00
STER TEMP = 121.0 C
  OVERTEMP = 6.0 C
OVERDRIVE = 1.5 C
UNDERTEMP = 1.0 C RESUME
PRINT INT = 2 MIN
STRL CTRL = DRAIN
  Fo = 0
-----

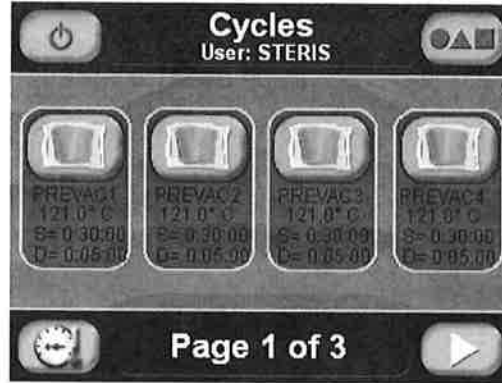
7.LIQUID7
PURGE TIME= 2:00
STER TIME = 0:45:00
STER TEMP = 121.0 C
  OVERTEMP = 6.0 C
OVERDRIVE = 1.5 C
UNDERTEMP = 1.0 C RESUME
PRINT INT = 2 MIN
STRL CTRL = DRAIN
  Fo = 0
-----

8.LIQUID8
PURGE TIME= 2:00
STER TIME = 0:45:00
STER TEMP = 121.0 C
  OVERTEMP = 6.0 C
OVERDRIVE = 1.5 C
UNDERTEMP = 1.0 C RESUME
PRINT INT = 2 MIN
STRL CTRL = DRAIN
  Fo = 0
-----

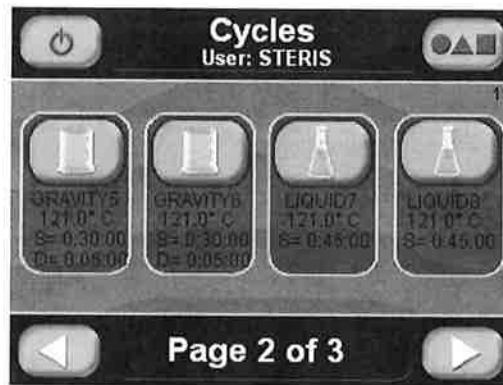
```

### 5.2.2 Prevac Sterilizer Only (Optional)

Press **OPERATING MODE** button to enter operating mode. The operating mode display is shown below:



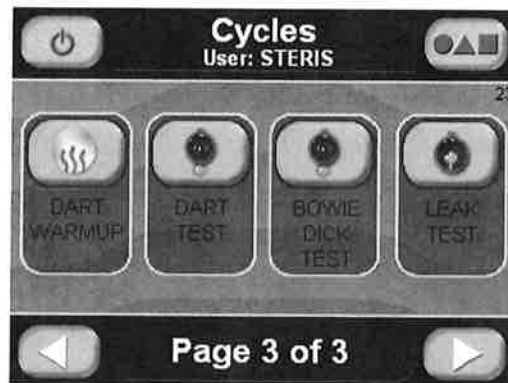
Press **RIGHT ARROW** to advance to the following screen (additional cycles 5 through 8).



Press **LEFT ARROW** to return to the previous screen (cycles 1 through 4).

Press **RIGHT ARROW** button to show test cycles (LEAK TEST, DART, BOWIE-DICK WARMUP, and BOWIE-DICK).

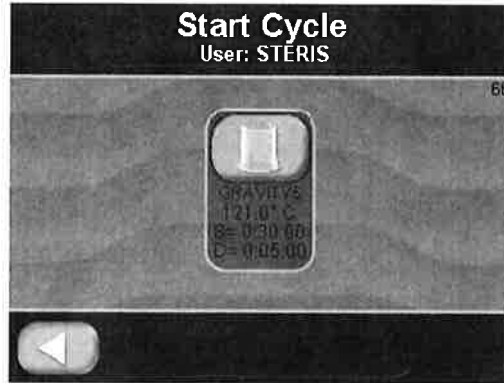
The following display is shown:



Press **LEFT or RIGHT arrow** button to return to standard cycles (PREVAC, GRAVITY, and LIQUID).

The jacket charges with steam to maintain 115.0°C (239.0°F). A cycle cannot be run with door open. The cycle may be run with the jacket still charging.

Press **CYCLE** button to select a cycle. The following display is shown for cycles 1 through 8. Corresponding cycle values appear on display.



NOTE: If display shows **CLOSE DOOR(S)** message, close the door. The cycle does not start until door is closed.

Press **PRINT CYCLE VALUES** button to print all cycle values. The following is a print example of all cycles values. (NOTE: STRL, CTRL, and Fo only appear if load probes are selected):

```

=====
==== CYCLE VALUES PRINTOUT ====
=====
XX:XX:XX XM                XX/XX/XX

LOGIN NAME:  STERIS

1.PREVAC1
PURGE TIME= 2:00
  PULSES = 4
  PRES VAC = 10.0 inHg
  PRES CHG = 15.0 PSIG
  STER TIME = 0:30:00
  STER TEMP = 121.0 C
  OVERTEMP = 6.0 C
  OVERDRIVE = 1.5 C
  UNDERTEMP = 1.0 C RESUME
  PRINT INT = 2 MIN
    VAC DRY = 10.0 inHg
    DRY TIME = 0:15:00
  STRL CTRL = DRAIN
    Fo = 0
-----

2.PREVAC2
PURGE TIME= 2:00
  PULSES = 4
  PRES VAC = 10.0 inHg
  PRES CHG = 15.0 PSIG
  STER TIME = 0:30:00
  STER TEMP = 121.0 C
  OVERTEMP = 6.0 C
  OVERDRIVE = 1.5 C
  UNDERTEMP = 1.0 C RESUME
  PRINT INT = 2 MIN
    VAC DRY = 10.0 inHg
    DRY TIME = 0:15:00
  STRL CTRL = DRAIN
    Fo = 0
-----

3.PREVAC3
PURGE TIME= 2:00
  PULSES = 4
  PRES VAC = 10.0 inHg
  PRES CHG = 15.0 PSIG
  STER TIME = 0:30:00
  STER TEMP = 121.0 C
  OVERTEMP = 6.0 C
  OVERDRIVE = 1.5 C
  UNDERTEMP = 1.0 C RESUME
  PRINT INT = 2 MIN
    VAC DRY = 10.0 inHg
    DRY TIME = 0:15:00
  STRL CTRL = DRAIN
    Fo = 0
-----

4.PREVAC4
PURGE TIME= 2:00
  PULSES = 4
  PRES VAC = 10.0 inHg
  PRES CHG = 15.0 PSIG
  STER TIME = 0:30:00
  STER TEMP = 121.0 C
  OVERTEMP = 6.0 C
  OVERDRIVE = 1.5 C
  UNDERTEMP = 1.0 C RESUME
  PRINT INT = 2 MIN

```

```

    VAC DRY = 10.0 inHg
    DRY TIME = 0:15:00
  STRL CTRL = DRAIN
    Fo = 0
-----

5.GRAVITY5
PURGE TIME= 2:00
STER TIME = 0:30:00
STER TEMP = 121.0 C
OVERTEMP = 6.0 C
OVERDRIVE = 1.5 C
UNDERTEMP = 1.0 C RESUME
PRINT INT = 2 MIN
  VAC DRY = 10.0 inHg
  DRY TIME = 0:15:00
STRL CTRL = DRAIN
  Fo = 0
-----

6.GRAVITY6
PURGE TIME= 2:00
STER TIME = 0:30:00
STER TEMP = 121.0 C
OVERTEMP = 6.0 C
OVERDRIVE = 1.5 C
UNDERTEMP = 1.0 C RESUME
PRINT INT = 2 MIN
  VAC DRY = 10.0 inHg
  DRY TIME = 0:15:00
STRL CTRL = DRAIN
  Fo = 0
-----

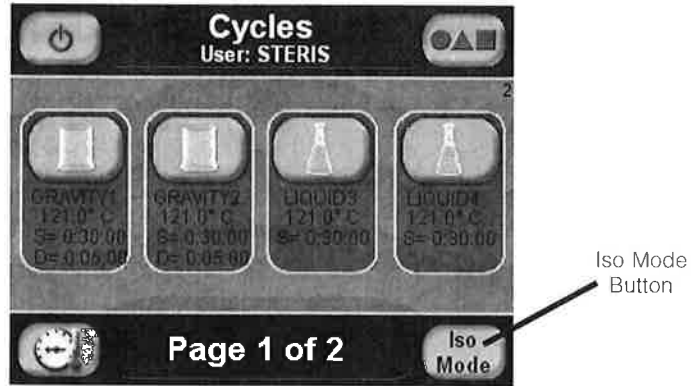
7.LIQUID7
PURGE TIME= 2:00
STER TIME = 0:45:00
STER TEMP = 121.0 C
OVERTEMP = 6.0 C
OVERDRIVE = 1.5 C
UNDERTEMP = 1.0 C RESUME
PRINT INT = 2 MIN
STRL CTRL = DRAIN
  Fo = 0
-----

8.LIQUID8
PURGE TIME= 2:00
STER TIME = 0:45:00
STER TEMP = 121.0 C
OVERTEMP = 6.0 C
OVERDRIVE = 1.5 C
UNDERTEMP = 1.0 C RESUME
PRINT INT = 2 MIN
STRL CTRL = DRAIN
  Fo = 0
-----

```

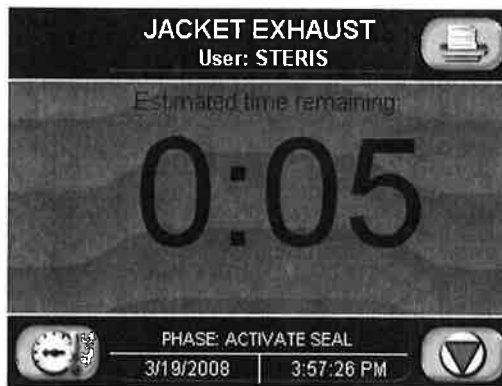
### 5.2.3 Isothermal Sterilizer Only (Optional)

The Isothermal mode can be entered by pressing the **ISO MODE** button shown below:

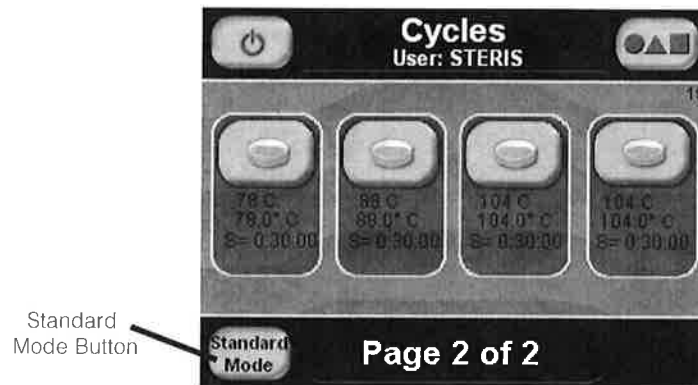


*NOTE: The door(s) must be closed for the **ISO MODE** button to be shown.*

*NOTE: If the jacket temperature is greater than 80.0° C (176.0° F), jacket drains for five minutes.*



After the jacket drain cycle is complete, the following screen is shown:



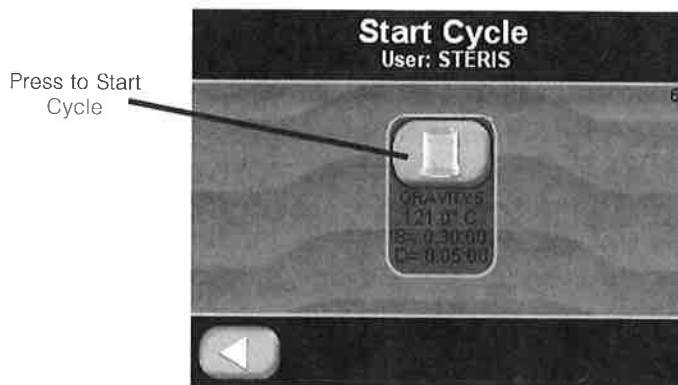
Standard Mode Button

The jacket steam is off. Press **STANDARD MODE** button to return to standard mode (gravity and liquid cycles).

In the standard mode, the jacket charges with steam to maintain 115.0° C (239.0° F). STATUS on the display shows **DOOR OPEN, READY, or JACKET CHARGE** depending upon status of the sterilizer. A cycle cannot be run with door open. The cycle may be run with the jacket still charging.

Press **CYCLE** button to select a cycle. The following display is shown for cycles 1 through 8. Corresponding cycle values appear on display.





**NOTE:** If display shows **CLOSE DOOR(S)** message, close the door. The cycle does not start until door is closed.

Press **PRINT CYCLE VALUES** button to print all cycle values. The following is a print example of all cycles values. (NOTE: STRL, CTRL, and Fo only appear if load probes are selected):

```

=====
==== CYCLE VALUES PRINTOUT ====
=====
XX:XX:XX XM                XX/XX/XX

LOGIN NAME:  STERIS

1.GRAVITY1
PURGE TIME= 2:00
STER TIME = 0:30:00
STER TEMP = 121.0 C
OVERTEMP = 6.0 C
OVERDRIVE = 1.5 C
UNDERTEMP = 1.0 C RESUME
PRINT INT = 2 MIN
  VAC DRY = 10.0 inHg
  DRY TIME = 0:15:00
STRL CTRL = DRAIN
  Fo = 0

-----

2.GRAVITY2
PURGE TIME= 2:00
STER TIME = 0:30:00
STER TEMP = 121.0 C
OVERTEMP = 6.0 C
OVERDRIVE = 1.5 C
UNDERTEMP = 1.0 C RESUME
PRINT INT = 2 MIN
  VAC DRY = 10.0 inHg
  DRY TIME = 0:15:00
STRL CTRL = DRAIN
  Fo = 0

-----

3.LIQUID3
PURGE TIME= 2:00
STER TIME = 0:45:00
STER TEMP = 121.0 C
OVERTEMP = 6.0 C
OVERDRIVE = 1.5 C
UNDERTEMP = 1.0 C RESUME
PRINT INT = 2 MIN
STRL CTRL = DRAIN
  Fo = 0

-----

```

```

4.LIQUID4
PURGE TIME= 2:00
STER TIME = 0:45:00
STER TEMP = 121.0 C
OVERTEMP = 6.0 C
OVERDRIVE = 1.5 C
UNDERTEMP = 1.0 C RESUME
PRINT INT = 2 MIN
STRL CTRL = DRAIN
  Fo = 0

-----

5.78 C
STER TIME = 0:30:00
STER TEMP = 78.0 C
OVERTEMP = 6.0 C
OVERDRIVE = 1.5 C
UNDERTEMP = 1.0 C RESUME
PRINT INT = 2 MIN

-----

6.88 C
STER TIME = 0:30:00
STER TEMP = 88.0 C
OVERTEMP = 6.0 C
OVERDRIVE = 1.5 C
UNDERTEMP = 1.0 C RESUME
PRINT INT = 2 MIN

-----

7.104 C
STER TIME = 0:30:00
STER TEMP = 104.0 C
OVERTEMP = 6.0 C
OVERDRIVE = 1.5 C
UNDERTEMP = 1.0 C RESUME
PRINT INT = 2 MIN

-----

8.104 C
STER TIME = 0:30:00
STER TEMP = 104.0 C
OVERTEMP = 6.0 C
OVERDRIVE = 1.5 C
UNDERTEMP = 1.0 C RESUME
PRINT INT = 2 MIN

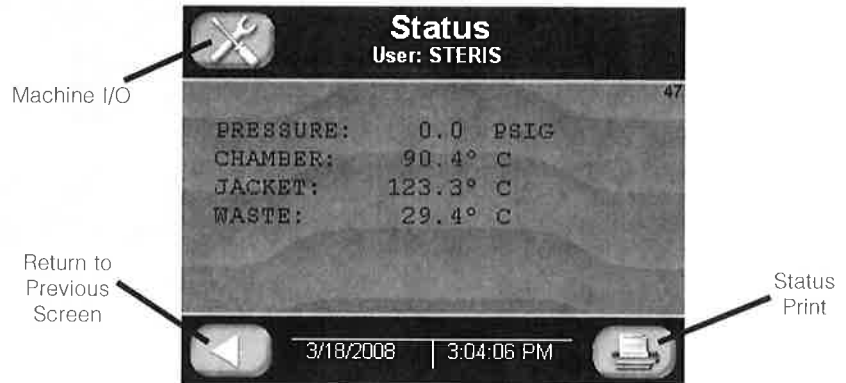
-----

```

## 5.3 Status Buttons

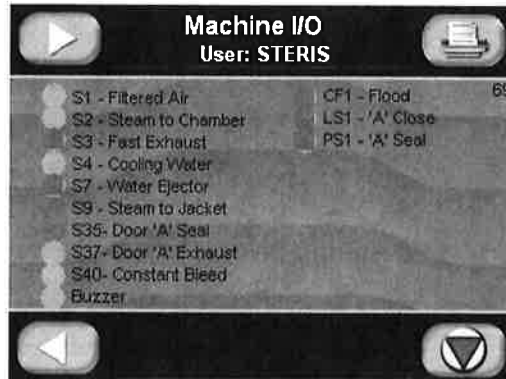
Status screens are accessed by **PRES/TEMP**, **MACHINE I/O**, and **GRAPH** buttons. Press **PRES/TEMP** button to show Pressure/Temperature status screen.

*NOTE: LOAD 1 and F<sub>o</sub> appears if the load probe is configured.*

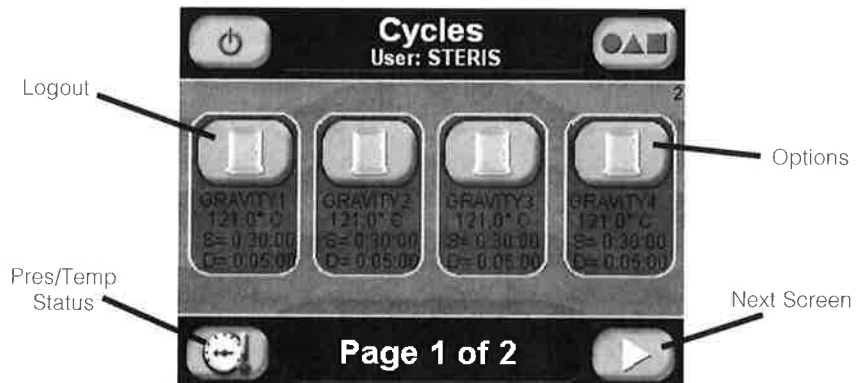


The status screen shows the current pressure and temperatures. Press **EXIT** button to return to the previous screen.

Press **MACHINE I/O** button to show machine I/O status. The following screen appears:



Gray circle next to device indicates that device is off or open. When gray circle turns red, that indicates that device is on or closed. Press **LEFT ARROW** button to return to the previous screen. Press **LEFT ARROW** button again to return to operating mode main menu screen shown below:



Press **PRINT STATUS** button to print current status. Following is an example status print:

```
D 11:25:52A  50.0  0.0P
```

Press **PRINT CYCLE VALUES** button to print all cycle values. The following is a print example of all cycles values. (NOTE: STRL, CTRL, and Fo only appear if load probes are selected):

```

=====
==== CYCLE VALUES PRINTOUT
====
=====
XX:XX:XX PM      XX/XX/XX

LOGIN NAME:  STERIS

1.GRAVITY1
PURGE TIME= 2:00
STER TIME = 0:30:00
STER TEMP = 121.0 C
OVERTEMP = 6.0 C
OVERDRIVE = 1.5 C
UNDERTEMP = 1.0 C RESUME
PRINT INT = 2 MIN
  VAC DRY = 10.0 inHg
  DRY TIME = 0:15:00
STRL CTRL = DRAIN
  Fo = 0
-----

2.GRAVITY2
PURGE TIME= 2:00
STER TIME = 0:30:00
STER TEMP = 121.0 C
OVERTEMP = 6.0 C
OVERDRIVE = 1.5 C
UNDERTEMP = 1.0 C RESUME
PRINT INT = 2 MIN
  VAC DRY = 10.0 inHg
  DRY TIME = 0:15:00
STRL CTRL = DRAIN
  Fo = 0
-----

3.GRAVITY3
PURGE TIME= 2:00
STER TIME = 0:30:00
STER TEMP = 121.0 C
OVERTEMP = 6.0 C
OVERDRIVE = 1.5 C
UNDERTEMP = 1.0 C RESUME
PRINT INT = 2 MIN
  VAC DRY = 10.0 inHg
  DRY TIME = 0:15:00
STRL CTRL = DRAIN
  Fo = 0
-----

4.GRAVITY4
PURGE TIME= 2:00
STER TIME = 0:30:00
STER TEMP = 121.0 C
OVERTEMP = 6.0 C
OVERDRIVE = 1.5 C
UNDERTEMP = 1.0 C RESUME
PRINT INT = 2 MIN

```

```

  VAC DRY = 10.0 inHg
  DRY TIME = 0:15:00
STRL CTRL = DRAIN
  Fo = 0
-----

5.LIQUID5
PURGE TIME= 2:00
STER TIME = 0:30:00
STER TEMP = 121.0 C
OVERTEMP = 6.0 C
OVERDRIVE = 1.5 C
UNDERTEMP = 1.0 C RESUME
PRINT INT = 2 MIN
STRL CTRL = DRAIN
  Fo = 0
-----

6.LIQUID6
PURGE TIME= 2:00
STER TIME = 0:30:00
STER TEMP = 121.0 C
OVERTEMP = 6.0 C
OVERDRIVE = 1.5 C
UNDERTEMP = 1.0 C RESUME
PRINT INT = 2 MIN
STRL CTRL = DRAIN
  Fo = 0
-----

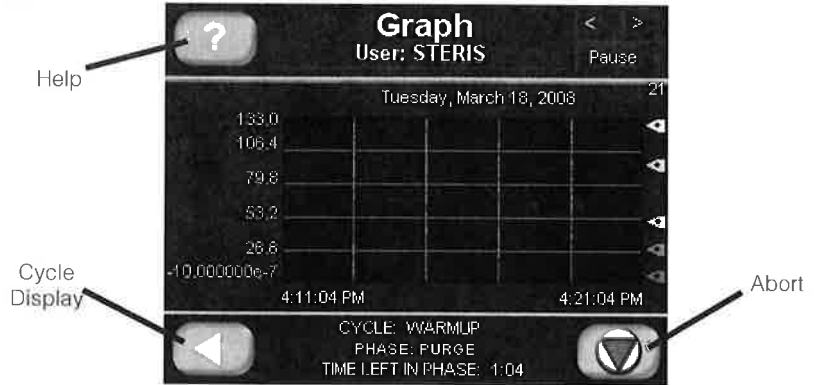
7.LIQUID7
PURGE TIME= 2:00
STER TIME = 0:45:00
STER TEMP = 121.0 C
OVERTEMP = 6.0 C
OVERDRIVE = 1.5 C
UNDERTEMP = 1.0 C RESUME
PRINT INT = 2 MIN
STRL CTRL = DRAIN
  Fo = 0
-----

8.LIQUID8
PURGE TIME= 2:00
STER TIME = 0:45:00
STER TEMP = 121.0 C
OVERTEMP = 6.0 C
OVERDRIVE = 1.5 C
UNDERTEMP = 1.0 C RESUME
PRINT INT = 2 MIN
STRL CTRL = DRAIN
  Fo = 0
-----

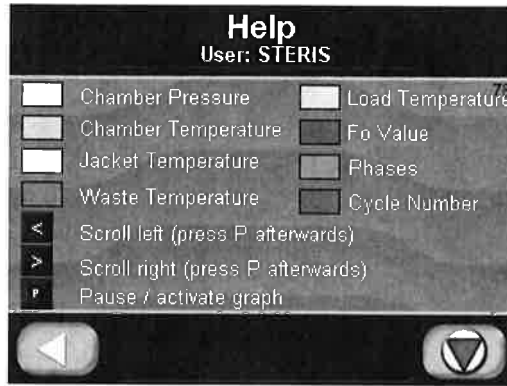
TOO LONG IN:
-----
  ACTIVATE SEAL = 1 m
  AIR BREAK = 5 m
  CHARGE = 60 m
DEACTIVATE SEAL= 1 m
  EVACUATE = 30 m
  EXHAUST = 10 m
  JACKET CHARGE = 60 m

```

Press **GRAPH** button during cycle to display a cycle graph of chamber, jacket, waste, and pressure analog values. An example screen is shown below:



The graph displays analog values over a 10-minute period of time. Each analog value is represented by a different color. Press "?" button to access the help screen shown below:



Refer to SECTION 5.5, COMPACT FLASH CARD, for a description of saving and retrieving data from compact flash card.

During a cycle, the screen will change colors. The condition phase will be green, the sterilize phase will be blue, the exhaust phase will be purple and the complete phase will be blue.

## 5.4 Printer Operation

The sterilizer may be equipped with a printer. The following three printer descriptions provide instructions for operating the printer(s). Observe the design of the printer used with your sterilizer and refer to the appropriate instructions.

### 5.4.1 Printer Operation (OmniPrint Printer)

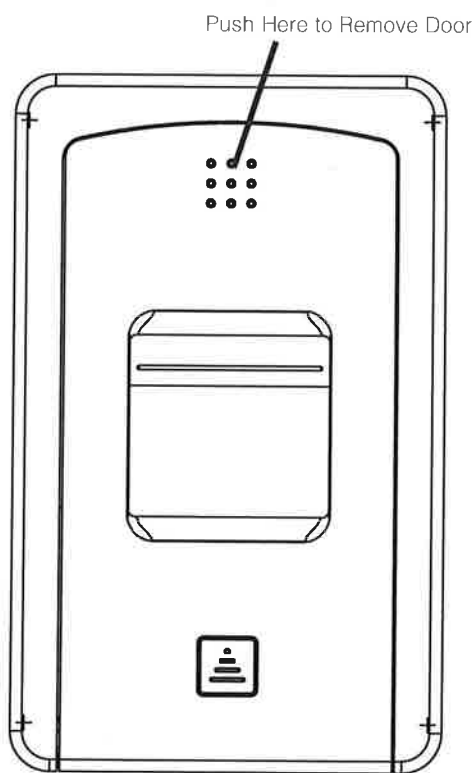
The sterilizer may be equipped with an OmniPrint printer. See Section 8, Routine Maintenance for information on how to change printer paper and ribbon. Refer to Figure 5-2.

Press the print button on the control to produce a status print. Cycle values, start up banner, calibration values, and cycle progression are all given on the printout. Abnormal conditions, such as alarms, are also printed.

Press the button on top of the printer to open the printer door. Refer to Figure 5-1.

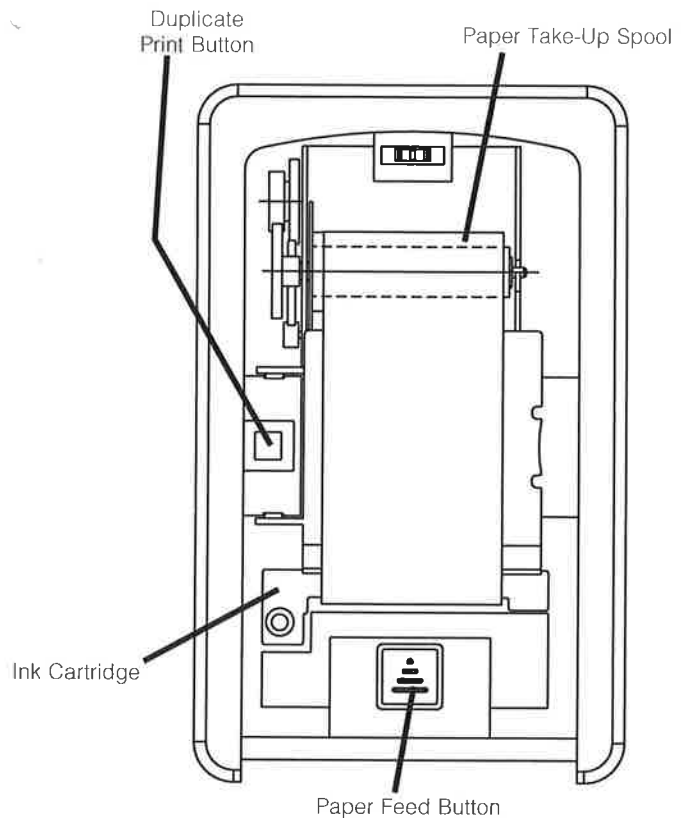
PAPER FEED BUTTON - press the button on the printer to advance the paper.

DUPLICATE PRINT BUTTON - press the button on the printer to obtain a duplicate print of the last cycle.



Front View

Figure 5-1.

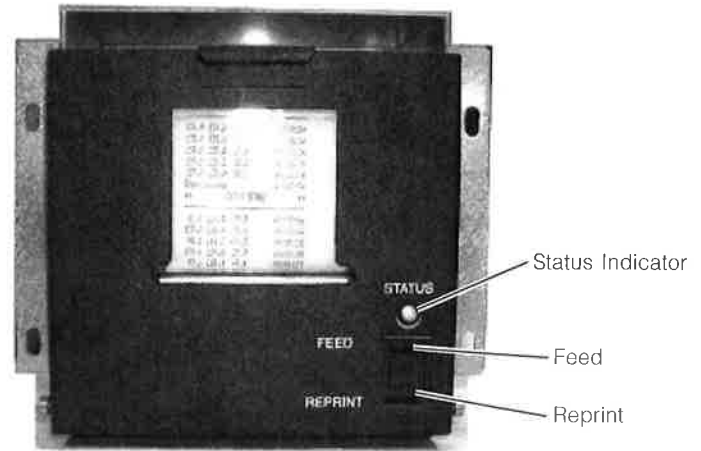


Front View  
(With Door Removed)

Figure 5-2.

### 5.4.2 Printer Operation (Optional Cybertech Printer)

The sterilizer may be equipped with a Cybertech printer. See *SECTION 8, ROUTINE MAINTENANCE* section of this manual for information on how to change printer paper and ribbon. Refer to Figure 5-3.



**Figure 5-3. Optional Cybertech Printer**

The printer produces a status print when the status print button is pressed, the cycle values, a start up banner, calibration values, and cycle values. It also prints any abnormal conditions, like alarms.

**FEED** – press the switch on the printer toward FEED label to generate a paper feed.

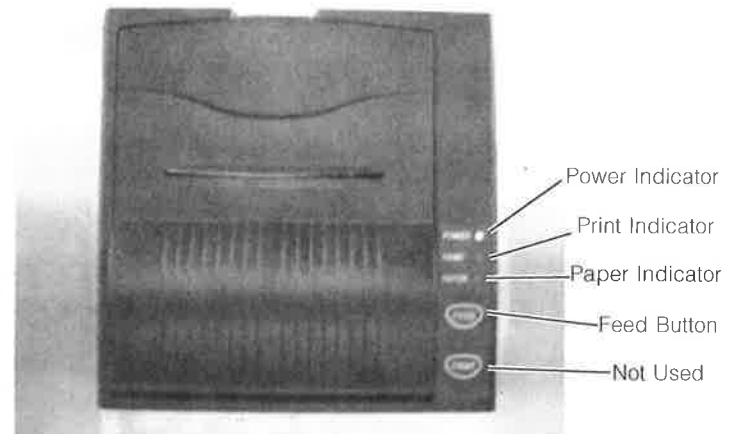
**REPRINT** – press the switch on the printer toward REPRINT label to generate a duplicate print of the last cycle run. The cycle remains in memory and multiple duplicate prints may be produced for that cycle, until another cycle is run.

**STATUS** light – If the status light blinks, the paper may need to be replaced. See *SECTION 8, ROUTINE MAINTENANCE*.

### 5.4.3 Printer Operation (Optional Mylox Printer)

The sterilizer may be equipped with a Mylox printer. See Section 8, Routine Maintenance for information on how to change printer paper and ribbon. Refer to Figure 5-4.

Press the print button on the control to produce a status print. Cycle values, start up banner, calibration values, and cycle progression are all given on the printout. Abnormal conditions, such as alarms, are also printed.



**Figure 5-4. Optional Mylox Printer**

**FEED** – press the switch on the printer toward the feed label to advance the paper.

**PRINT** – not used.

**POWER INDICATOR** – lit when the printer is on.

**PRINT INDICATOR** – lit during any printer activity (printing or paper feed).

**PAPER INDICATOR** – flashes red when paper may need to be replaced. Refer to *SECTION 8, ROUTINE MAINTENANCE* for paper changing procedure.

## 5.5 Compact Flash Card

The PanelView Plus® 600 display is equipped with a compact flash port. A compact flash card may be inserted into this port for saving cycle data.

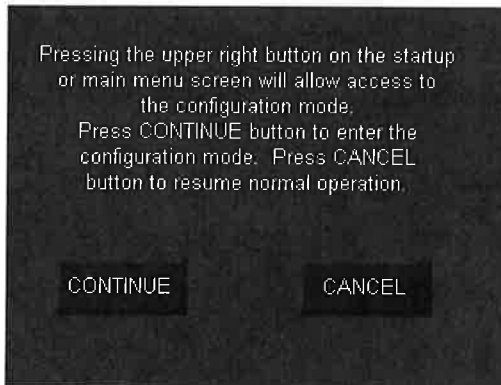
**VERY IMPORTANT: The compact flash card must be inserted with the power off. Once the power is turned on, the display recognizes that the compact flash card is present and data may be stored to the card during cycle. If the compact flash card is inserted with the power on, the control cannot sense the card, and no data is stored to the card until the power is turned off and on.**

The compact flash card has the capability of holding 300,000 data items. It doesn't matter what size the compact flash card is, the card may only hold 300,000 data items. If more than 300,000 data items are stored on the card, the first data is lost and new data is inserted in its place. 300,000 data items are equivalent to over eight one-hour cycles.

**VERY IMPORTANT: The display must be shut down in order to save the cycle data. If power is turned off, the data is lost. Shutdown the display by pressing the right upper most corner on the following display:**

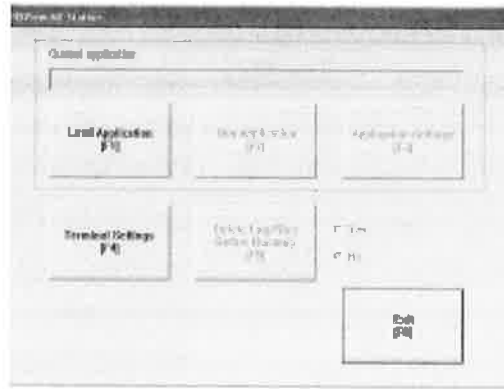


Press continue to shutdown. The following display appears:



The display shuts down. The following display appears:





The compact flash card is now safe to remove. When the card is reinserted, turn power OFF, reinsert the card and turn power back ON.

The PC needs the following files to convert saved data from compact flash card to a file Microsoft® Excel can read.

- DlgConverter.exe
- DBFtoXLS.exe

1. Run DlgConvert program first. The file from the compact flash card is **.log**. Convert this file to a **.dbf** file.
2. Run the DBFtoXLS program second. Enter in the created **.dbf** file, the **.log** file and a **.xls** file to be created.
3. After **.xls** file is created, this file may be imported into excel for use.

## 5.6 RS232 Download To PC

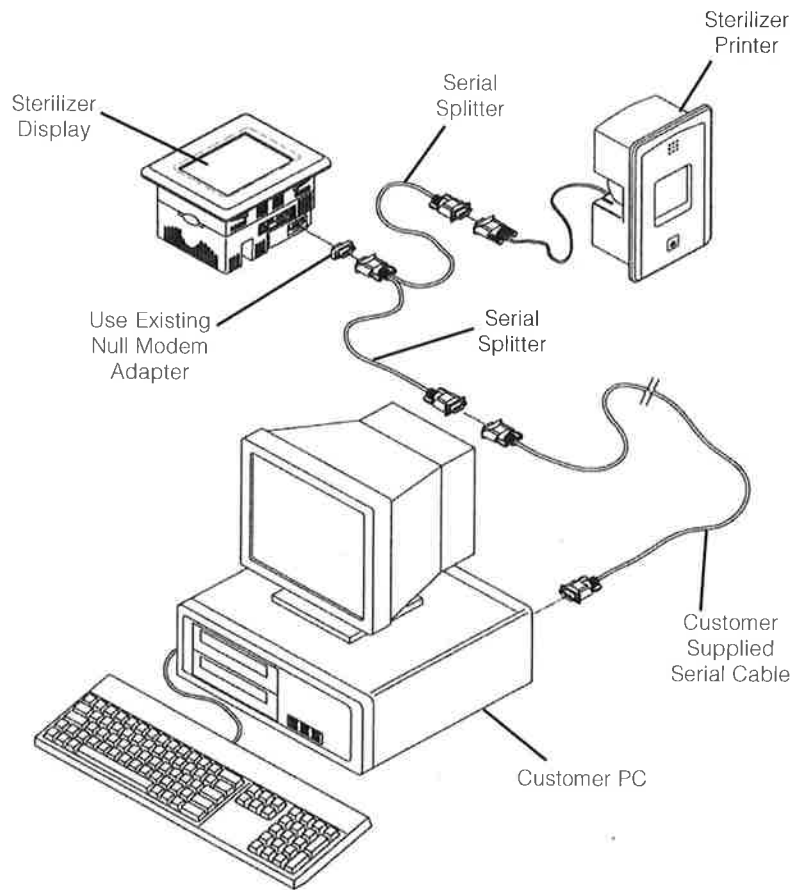
Retrieving printer data on a PC can be accomplished by ordering Serial Splitter (P/N P338523-311).

See Figure 5.6 on cable assembly.

PC needs serial communication software to retrieve data. HyperTerminal (provided with most PCs) may be used to collect data.

Settings for the PC need to be as follows:

Parity:	No parity
Parity Type:	Even
Bits per character:	8
Stop bit length:	1
Baud rate:	9600



**Figure 5-6. Cable Assembly**

## 6.1 Before Operating Sterilizer

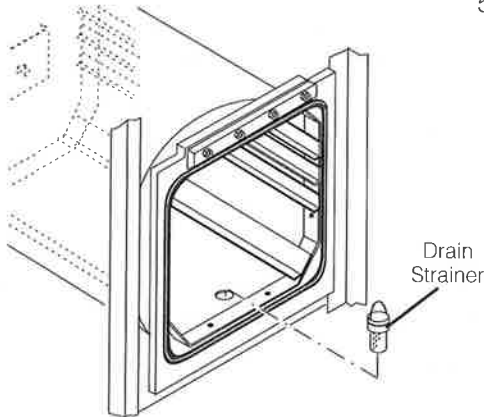
Carefully review *SECTION 1, SAFETY PRECAUTIONS*, of this manual and below before operating sterilizer.

### CAUTION - POSSIBLE EQUIPMENT DAMAGE:

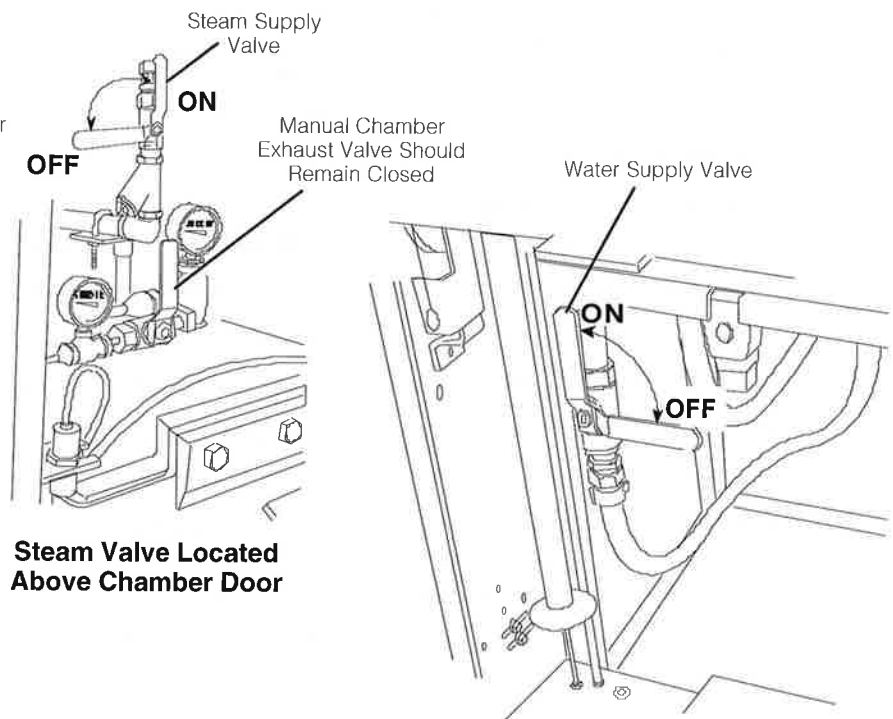
- Gasket must be fully retracted prior to operating sterilizer door.
- If 0 dry time is selected, sterilizer automatically initiates a vapor removal phase in place of drying. This phase can still draw a vacuum to 5 inHg. Consult device manufacturer's recommendations to ensure devices being processed 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.
- 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 (0 bar).
- 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.
- Immediately wipe up saline solution spills on loading car, to prevent damage to stainless steel.
- 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.
- Avoid damage to the integral steam generator daily. Flush the generator daily. Failure to flush generator daily will void the manufacturer's warranty.

The following steps must be performed prior to daily sterilizer usage.

1. Open chamber door and check drain strainer is clean and in place (see Figure 6-1).
2. Check chamber interior is clean and close chamber door. Refer to SECTION 8, ROUTINE MAINTENANCE, if cleaning is necessary.
3. Open front cabinet panel on load end of sterilizer. Verify steam and water supply valves to sterilizer are on (see Figure 6-2). Close cabinet panel.
4. If sterilizer is equipped with an integral electric steam generator, flush and start up generator as outlined in *Daily Generator Start Up Procedure* in this manual.
5. Open printer access door, if optional printer has been installed. Check sufficient amount of printer paper is available. A colored warning stripe is visible when paper roll is near end. Refer to SECTION 8, ROUTINE MAINTENANCE, if paper roll needs replaced.



**Figure 6-1. Check Chamber Drain Strainer**



**Steam Valve Located Above Chamber Door**

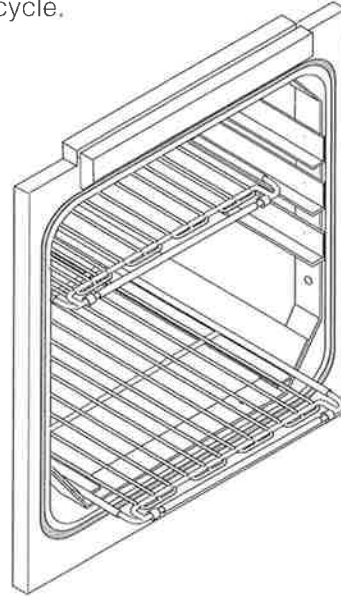
**Water Valve Located Below Chamber Door**

**Figure 6-2. Steam and Water Supply Valves**

6. Close printer access door. See control interface and operator mode – password entry sections of this manual for entering operating mode. Once operating mode is entered, steam enters sterilizer jacket and heats jacket to 115°C (239°F). The isothermal mode does not turn jacket on. Printer records sterilizer type.
7. Load sterilizer chamber as outlined in SECTION 6.1.1, LOAD STERILIZER.

### 6.1.1 Load Sterilizer

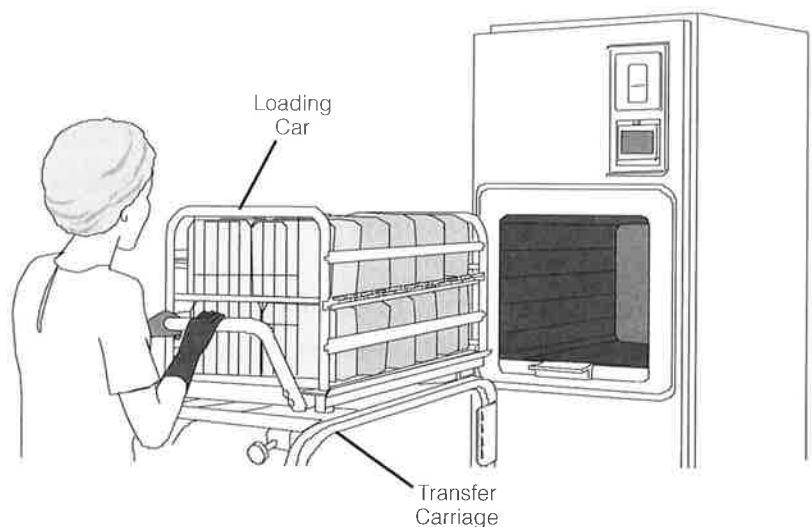
1. Open chamber door.
2. Slide shelf half way out of sterilizer chamber (see Figure 6-3).
3. Place load on shelf and slide shelf back into chamber. Make sure shelves are completely inside chamber before closing door.
4. Close chamber door. Sterilizer is now ready to run a processing cycle. Refer to appropriate *CYCLE OPERATION*, included in this section, for instructions on running the cycle.



**Figure 6-3. Slide Shelf Half Way Out of Chamber**

### 6.1.2 Sterilizer Equipped with Loading Car

1. Open chamber door.
2. Verify loading car is securely fastened to transfer carriage.
3. Move transfer carriage forward until carriage latches with chamber end frame (see Figure 6-4).



**Figure 6-4. Move Loaded Transfer Carriage in Position**

4. Verify transfer carriage is latched to chamber end frame by pulling carriage backward. If properly latched, carriage should remain stationary.
5. Once carriage is latched in place, release loading car from transfer carriage by lifting up carriage lock.
6. Carefully push loading car into sterilizer chamber. Make sure loading car is positioned in back detent inside chamber.
7. Pull carriage latch knob to disengage transfer carriage from chamber end frame. Move transfer carriage away from chamber.
8. Close chamber door. Sterilizer is now ready to run a processing cycle. Refer to appropriate *CYCLE OPERATION*, included in this section for instructions on running cycle.

---

## 6.2 Gravity Cycle

---

Carefully review *SECTION 1, SAFETY PRECAUTIONS*, and below before operating sterilizer.



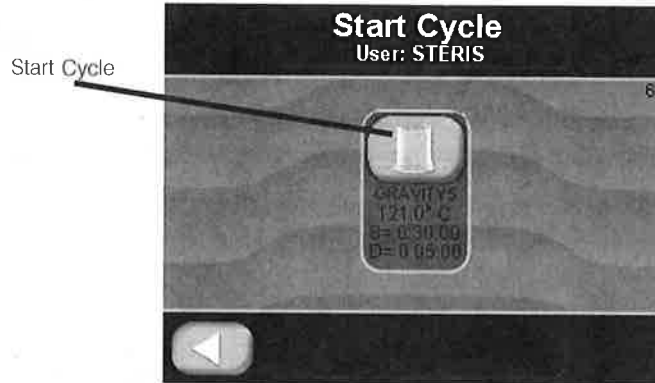
### **WARNING – BURN HAZARD:**

- 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.
- 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 (0 bar) 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) is required. Testing is to be performed by qualified service personnel only.
- 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 seal.
  - Use only Type 1 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.



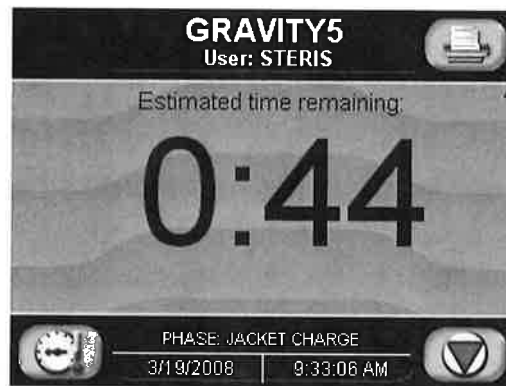
**WARNING – EXPLOSION HAZARD:** This sterilizer is not designed to process flammable compounds.

The cycle is for sterilizing hard goods (e.g., empty glasses, nonporous loads). Run a GRAVITY CYCLE by pressing **GRAVITY** button from one of the operating mode screens (see OPERATING MODE section). The following screen appears (values are examples only):



Press **LEFT ARROW** button to cancel cycle selected and return to the operating mode screen. Press **START CYCLE** to start the prevac cycle. If **CLOSE DOOR(S)** button is shown, close door(s).

The following display appears (see SECTION 5.3, STATUS BUTTONS, for description of buttons):



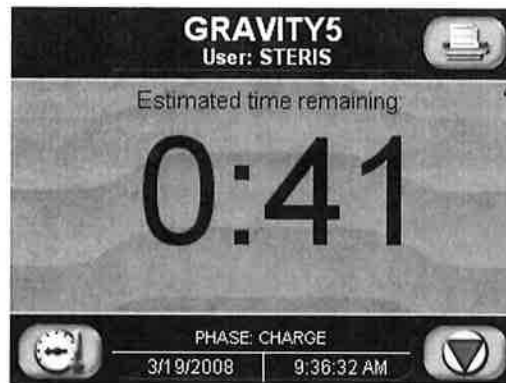
**JACKET CHARGE PHASE:** Jacket charge phase continues until jacket temperature is greater than set sterilizer temperature (example 120.0°C (248.0°F)). After jacket charge phase, the following display appears:



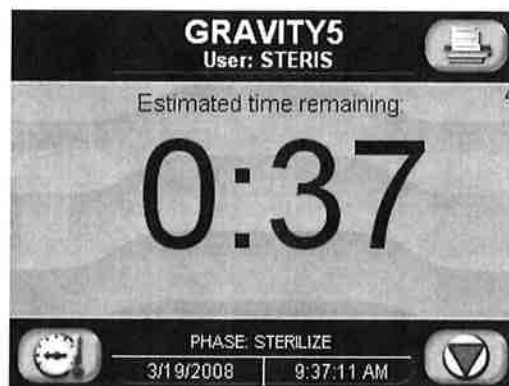
**ACTIVATE SEAL PHASE:** Door gasket seals with steam until door seal switch is closed. An additional 20 seconds elapses, after seal switch is closed, before phase is complete. After activate seal phase, the following display appears:



**PURGE PHASE:** Steam enters chamber from jacket to control pressure at 6 psig (0.41 bar). Fast exhaust and water ejector aid in removing air from chamber. After purge time, the following display appears:

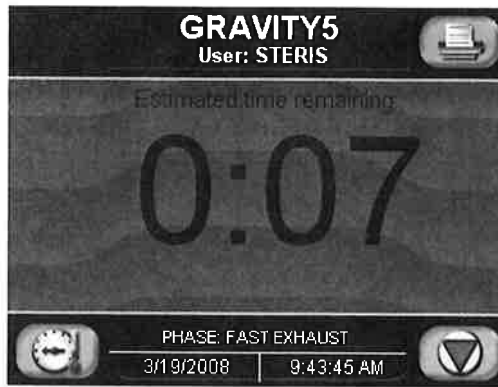


**CHARGE PHASE:** Chamber charges with steam until chamber temperature reaches sterilize temperature setpoint. If load option is selected, phase holds until load temperature is greater than or equal to sterilize temperature. Waste temperature is controlled to maintain approximately 45.0°C (113.0°F). After phase is complete, the following screen is shown:

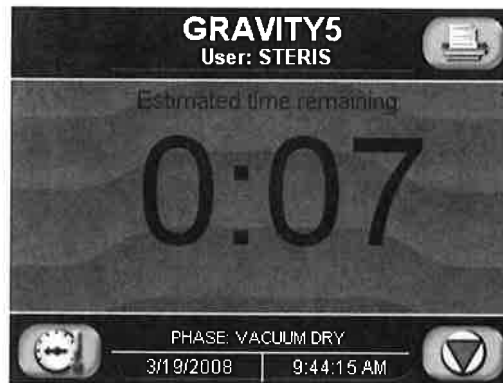


**STERILIZE PHASE:** Chamber temperature controls at sterilize temperature, plus overdrive (control temperature). Waste temperature is controlled to maintain approximately 45.0°C (113.0°F). After sterilize time is complete, the following screen appears:

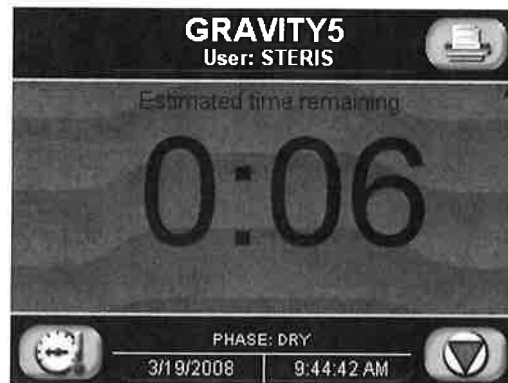




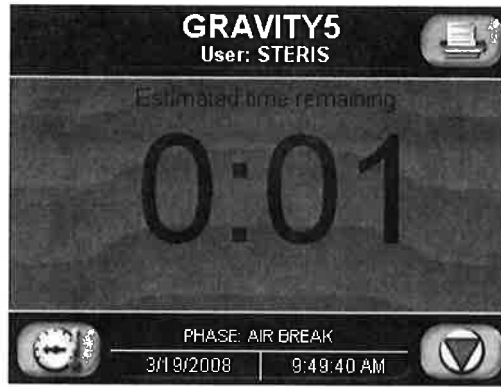
**FAST EXHAUST PHASE:** Steam fast exhausts from chamber to 4.0 psig (0.28 bar). After chamber pressure is less than 4.0 psig (0.28 bar), the following display appears:



**VACUUM DRY PHASE:** A vacuum is pulled in the chamber to 10.0 inHg (-0.34 bar) (VACUUM DRY setpoint). After chamber pressure is less than 10.0 inHg (-0.34 bar), the following display appears:



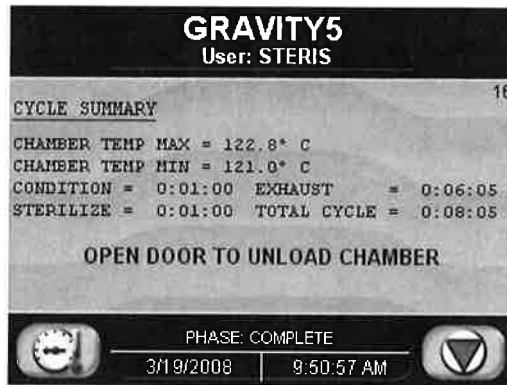
**DRY PHASE:** During dry phase, vacuum continues to be pulled to the limit of the system or controlled at the vacuum dry pressure for dry time. After dry time, the following screen appears:



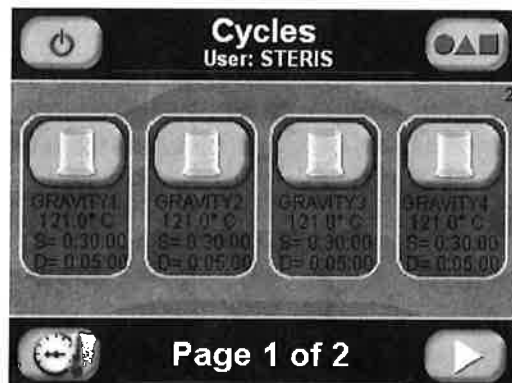
**AIR BREAK PHASE:** Chamber vacuum air breaks to 2.0 inHg (-0.17 bar) (-0.07 bar). After chamber pressure rises above 2.0 inHg (-0.17 bar), the following screen appears:



**DEACTIVATE SEAL PHASE:** Door unseals until seal pressure switch opens, and 20 seconds has elapsed. After phase is complete, the following display appears:



**COMPLETE PHASE:** Cycle is complete. Open door and unload chamber. Once door is open, display returns to main operating mode screen.



### Example of cycle tape.

```
=====
===== GRAVITY1 =====
=====
CYCLE START AT XX:XX:XXX
          ON XX/XX/XX

CYCLE COUNT          0
LOGIN NAME:          TOM

CYCLE NO.            2

STER TEMP = 121.0 C
CONTROL TEMP = 122.5 C
STER TIME = 0:30:00
DRY TIME = 0:01:00

- TIME                T=C          V=inHg
                      P=psig
-----
C 11:48:24A          66.7           0.3V
C 11:49:24A          112.7          10.0P
S 11:49:43A          121.2          16.6P
S 11:51:43A          122.6          17.7P
S 11:53:43A          123.3          17.8P
S 11:55:43A          123.6          16.8P
S 11:57:43A          122.6          17.0P
S 11:59:43A          122.6          17.2P
S 12:01:43P          122.5          17.0P
S 12:03:43P          122.4          17.2P
S 12:05:43P          122.5          16.8P
S 12:07:43P          122.4          16.9P
S 12:11:43P          122.4          17.0P
S 12:13:43P          122.5          17.1P
S 12:15:43P          122.6          17.0P
S 12:17:43P          122.7          17.0P
S 12:19:43P          122.6          16.8P
E 12:19:44P          122.6          16.9P
E 12:19:54P          113.7           3.2P
E 12:20:03P          99.9           11.1V
E 12:21:03P          40.5           28.1V
Z 12:21:46P          68.4           0.5V

LOAD                  020903

CHAMBER TEMP MAX=124.8 C
CHAMBER TEMP MIN=121.2 C

CONDITION             = 1:19
STERILIZE              = 30:01
EXHAUST                = 1:42
TOTAL CYCLE            = 33:02

=====
=====  READY TO UNLOAD  =====
=====
```

## 6.3 Prevac Cycle (Optional)

Carefully review *SECTION 1, SAFETY PRECAUTIONS*, and below before operating sterilizer.



### **WARNING – BURN HAZARD:**

- 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.
- 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 (0 bar) 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) is required. Testing is to be performed by qualified service personnel only.
- 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 or **PREVAC** cycle with slow exhaust option only; no other cycle is safe for processing liquids.
  - Use only vented closures; do not use screw caps or rubber stoppers with crimped seal.
  - Use only Type 1 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.

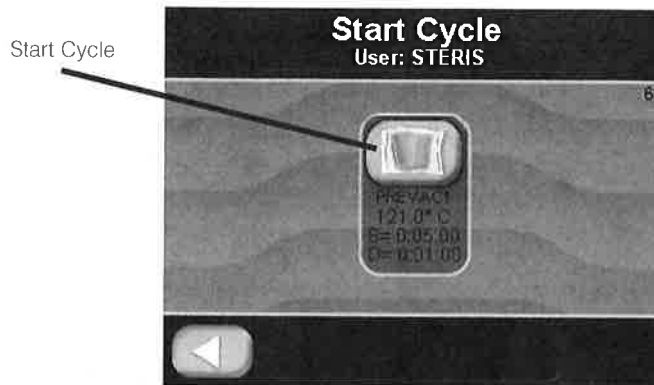


**WARNING – EXPLOSION HAZARD:** This sterilizer is not designed to process flammable compounds.

The cycle is for sterilizing wrapped goods (e.g., instrument trays, textile packs, and instrument containers) with fast exhaust option.

This cycle is used for sterilizing liquids in heat-resistant containers with vented closure with slow exhaust option.

Run a **PREVAC CYCLE** by pressing **PREVAC** button from one of the operating mode screens (see **OPERATING MODE** section). The following screen appears (values are examples only):



Press **LEFT ARROW** button to cancel cycle selected and return to operating mode screen. Press **START CYCLE** to start prevac cycle. If **CLOSE DOOR(S)** button is shown, close door(s).

The following display appears (see **SECTION 5, STATUS BUTTONS**, for description of buttons):



**JACKET CHARGE PHASE:** Jacket charge phase continues until jacket temperature is greater than set sterilizer temperature (example 121.0°C (250.0°F)). After jacket charge phase, the following display appears:



**ACTIVATE SEAL PHASE:** Door gasket seals with steam until door seal switch is closed. An additional 20 seconds elapses, after seal switch is closed, before the phase is complete. After activate seal phase, the following display appears:



**PURGE PHASE:** Steam enters chamber from jacket to control pressure at 6 psig (0.41 bar). Fast exhaust and water ejector aid in removing air from chamber. After purge time, the following display appears:



**PULSE EXHAUST PHASE:** Chamber exhausts to 4.0 psig (0.28 bar) (0.27 bar). Waste temperature is controlled to maintain approximately 45.0°C (113.0°F). Jacket temperature is controlled to maintain approximately 122.5 °C (253.0°F) in jacket. After phase is complete, the following screen appears:



**PULSE EVACUATE PHASE:** Chamber evacuates to PULSE VACUUM setpoint (default 10.0 inHg (-0.34 bar) (0.34 bar). Waste temperature is controlled to maintain approximately 45.0°C (113.0°F). Jacket temperature is controlled to maintain approximately 122.5 C (253.0°F) in the jacket. After phase is complete, the following screen appears:



**PULSE CHARGE PHASE:** Chamber charges with steam to PULSE CHARGE setpoint (default 26.0 psig (0.34 bar). PULSE EXHAUST, PULSE EVACUATE, and PULSE CHARGE repeats for the number of pulses selected. After final PULSE EVACUATE phase is complete, the following screen appears:



**CHARGE PHASE:** Chamber charges with steam until chamber temperature reaches sterilize temperature setpoint. If load option is selected, phase holds until load temperature is greater than or equal to sterilize temperature. Waste temperature is controlled to maintain approximately 45.0°C (113.0°F).

After phase is complete, the following screen is shown:



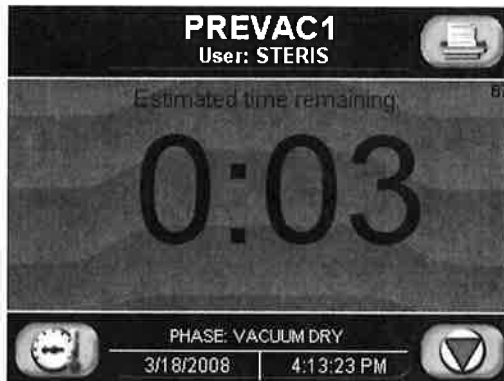
**STERILIZE PHASE:** Chamber temperature controls at sterilize temperature, plus overdrive (control temperature). Waste temperature is controlled to maintain approximately 45.0°C (113.0°F). After sterilize time is complete, the following screen appears:

### 6.3.1 Fast Exhaust Selection

See alternate Slow Exhaust Selection if selected. The Slow Exhaust description is shown after the Fast Exhaust Description.



**FAST EXHAUST PHASE:** Steam fast exhausts from chamber to 4.0 psig (0.28 bar). After chamber pressure is less than 4.0 psig (0.28 bar), the following display appears:



**VACUUM DRY PHASE:** A vacuum is pulled in the chamber to 10.0 inHg (-0.34 bar) (VACUUM DRY setpoint). After chamber pressure is less than 10.0 inHg (-0.34 bar), the following display appears:



**DRY PHASE:** During dry phase, vacuum continues to be pulled to the limit of the system or controlled at the vacuum dry pressure for dry time. After dry time, the following screen appears:

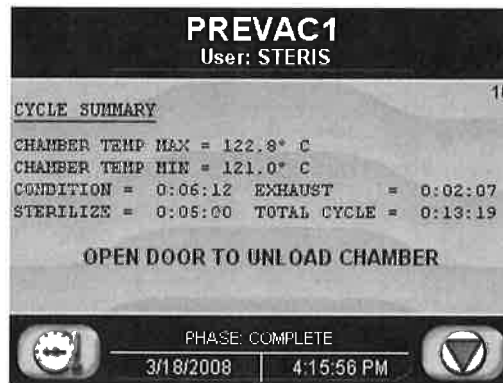




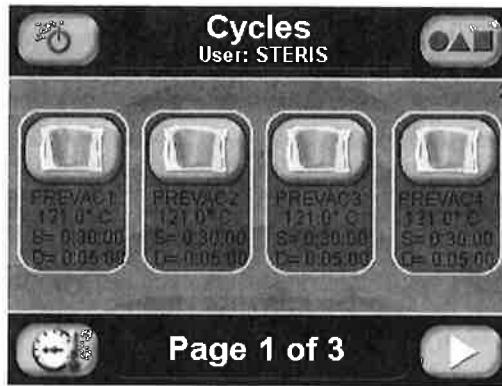
**AIR BREAK PHASE:** Chamber vacuum air breaks to 2.0 inHg (-0.17 bar). After chamber pressure rises above 2.0 inHg (-0.17 bar), the following screen appears:



**DEACTIVATE SEAL PHASE:** Door unseals until seal pressure switch opens, and 20 seconds has elapsed. After phase is complete, the following display appears:



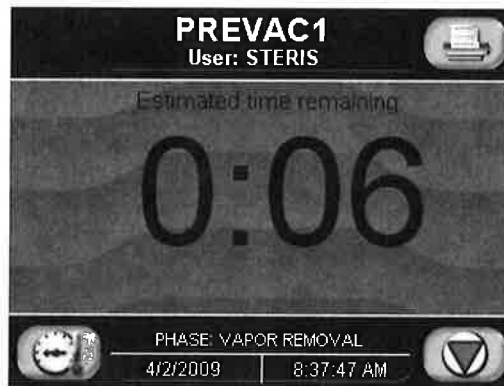
**COMPLETE PHASE:** Cycle is complete. Open door and unload chamber. Once door is open, display returns to main operating mode screen (See next page).



### 6.3.2 Slow Exhaust Selection



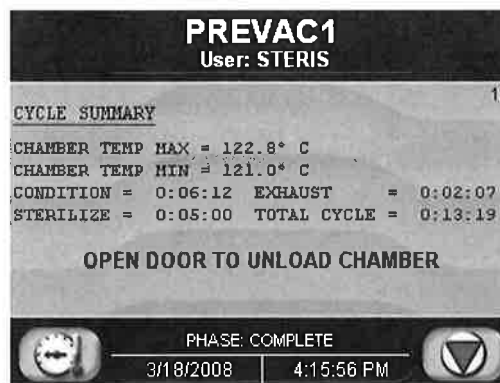
**SLOW EXHAUST PHASE:** Steam slowly exhausts from chamber to 5.0 inHg (0.17 bar). Pressure rate controls at 1.6 psi/minute (0.11 bar) to 4.2 psig (0.29 bar) and at 0.6 psi/minute (0.04 bar) to 5.0 inHg (0.17 bar). After chamber pressure is less than 4.0 psig (0.28 bar) (0.28 bar), the following display appears:



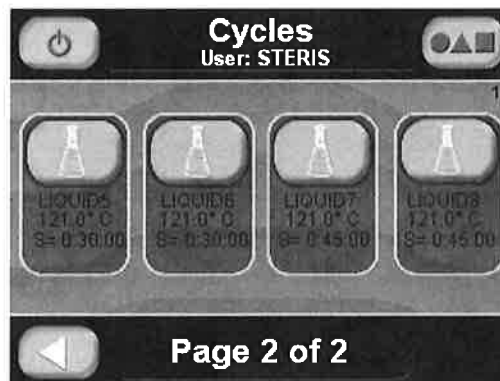
**VAPOR REMOVAL PHASE:** Vapors in chamber vents for 10 minutes. After phase time is complete, the following screen appears:



**DEACTIVATE SEAL PHASE:** Door unseals until seal pressure switch opens and 20 seconds has elapsed. After phase is complete, the following display appears:



**COMPLETE PHASE:** Cycle is complete. Open door and unload chamber. Once door is open, display returns to main operating mode screen.



**Example of cycle tape (Fast Exhaust Selection).**

```

=====
===== PREVAC1 =====
=====
CYCLE START AT XX:XX:XXX
                ON XX/XX/XX

CYCLE COUNT           0
LOGIN NAME:           TOM

CYCLE NO.             2

    STER TEMP = 121.0 C
    CONTROL TEMP = 122.5 C
    STER TIME = 0:15:00
    DRY TIME = 0:05:00

- TIME                T=C          V=inHg
                        P=psig
-----
C 11:48:24A           66.7          0.3V
C 11:50:24A           112.7         6.0P
C 11:51:22A           100.0        10.0V
C 11:51:50A           90.0         15.0P
C 11:52:15A           112.7         4.0P
C 11:52:55A           100.0        10.0V
C 11:53:17A           90.0         15.0P
C 11:53:45A           112.7         4.0P
C 11:54:08A           100.0        10.0V
C 11:54:47A           90.0         15.0P
C 11:55:00A           112.7         4.0P
C 11:55:43A           100.0        10.0V
S 11:57:43A           121.2        16.6P
S 11:59:43A           122.6        17.7P
S 12:01:43A           123.3        17.8P
S 12:03:43A           123.6        16.8P
S 12:05:43A           122.6        17.0P
S 12:07:43A           122.6        17.2P
S 12:09:43P           122.5        17.0P
S 12:11:43P           122.5        17.0P
E 12:12:44P           122.6        16.9P
E 12:13:14P           113.7         3.2P
E 12:15:03P           99.9         11.1V
E 12:20:03P           40.5         28.1V
Z 12:21:46P           68.4         0.5V

LOAD                                020903

CHAMBER TEMP MAX=124.8 C
CHAMBER TEMP MIN=121.2 C

CONDITION           = 9:20
STERILIZE            = 15:00
EXHAUST              = 9:03
TOTAL CYCLE          = 23:23

=====
===== READY TO UNLOAD =====
=====

```

## 6.4 Liquid Cycle

Carefully review *SECTION 1, SAFETY PRECAUTIONS*, and below before operating sterilizer.

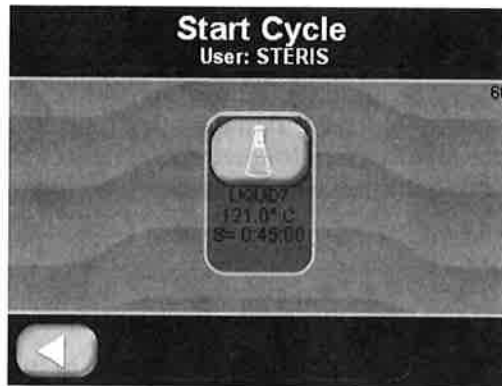
### WARNING – BURN HAZARD:

- 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.
- 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 (0 bar) 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) is required. Testing is to be performed by qualified service personnel only.
- 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 or **PREVAC** cycle with slow exhaust option only; no other cycle is safe for processing liquids.
  - Use only vented closures; do not use screw caps or rubber stoppers with crimped seal.
  - Use only Type 1 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.

 **WARNING – EXPLOSION HAZARD:** This sterilizer is not designed to process flammable compounds.

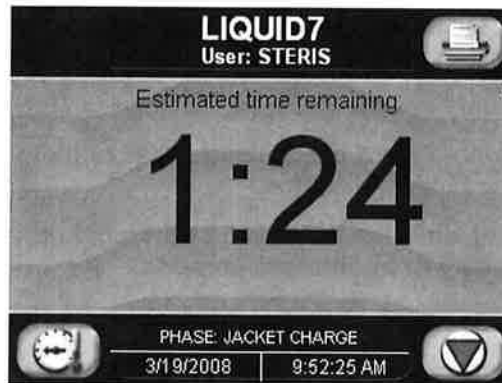
This cycle is used for sterilizing liquids in heat-resistant containers with vented closures.

Run a LIQUID CYCLE by pressing **LIQUID** button from one of the operating mode screens (see OPERATING MODE section). The following screen appears (values are examples only):

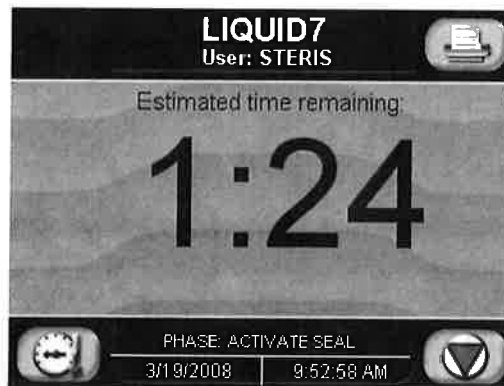


Press **LEFT ARROW** button to cancel cycle selected and return to operating mode screen. Press **START CYCLE** to start the prevac cycle. If **C L O S E DOOR(S)** button is shown, close door(s).

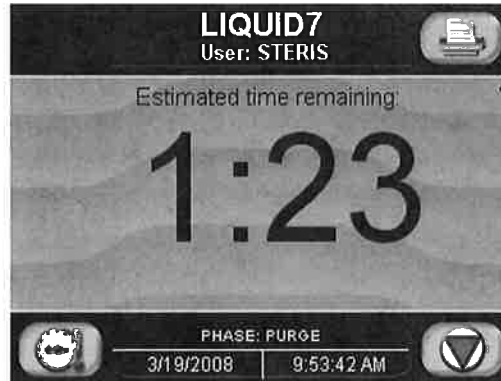
The following display appears (see SECTION 5.3, STATUS BUTTONS, for description of buttons):



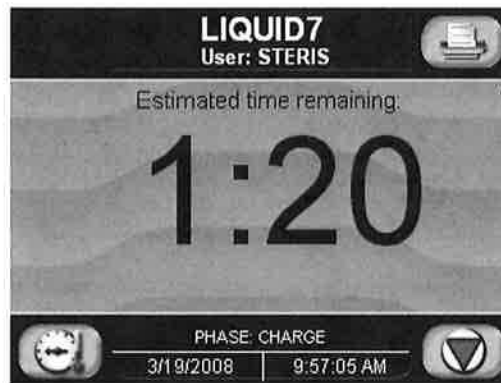
**JACKET CHARGE PHASE:** Jacket charge phase continues until jacket temperature is greater than set sterilizer temperature (example 120.0°C (248.0°F)). After jacket charge phase, the following display appears:



**ACTIVATE SEAL PHASE:** Door gasket seals with steam until door seal switch is closed. An additional 20 seconds elapses, after seal switch is closed, before phase is complete. After activate seal phase, the following display appears:



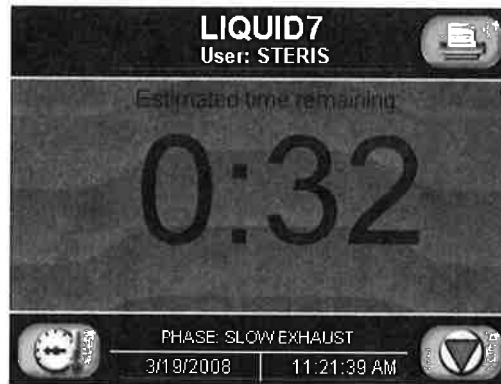
**PURGE PHASE:** Steam enters chamber from jacket to control pressure at 6 psig (0.41 bar). Fast exhaust and water ejector aid in removing air from chamber. After purge time, the following display appears:



**CHARGE PHASE:** Chamber charges with steam until chamber temperature reaches sterilize temperature setpoint. If load option is selected, phase holds until load temperature is greater than or equal to sterilize temperature. Waste temperature is controlled to maintain approximately 45.0°C (113.0°F). After phase is complete, the following screen is shown:



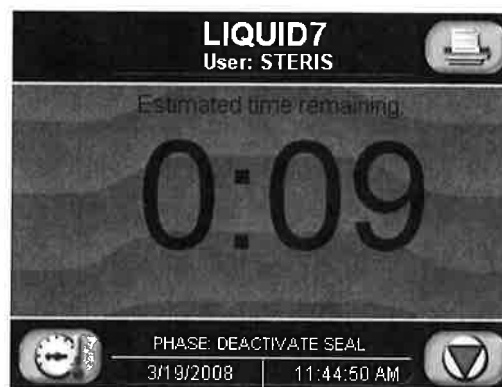
**STERILIZE PHASE:** Chamber temperature controls at sterilize temperature, plus overdrive (control temperature). Waste temperature is controlled to maintain approximately 45.0°C (113.0°F). After sterilize time is complete, the following screen appears:



**SLOW EXHAUST PHASE:** Steam slowly exhausts from chamber to 5.0 inHg (0.17 bar). Pressure rate controls at 1.6 psi/minute (0.11 bar) to 4.2 psig (0.29 bar) and at 0.6 psi/minute (0.04 bar) to 5.0 inHg (0.17 bar). After chamber pressure is less than 4.0 psig (0.28 bar) (0.28 bar), the following display appears:

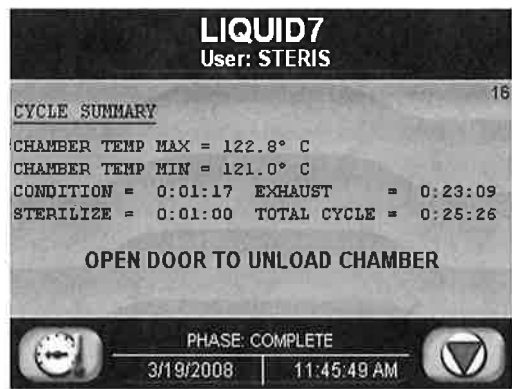


**VAPOR REMOVAL PHASE:** Vapors in chamber vents for 10 minutes. After phase time is complete, the following screen appears:

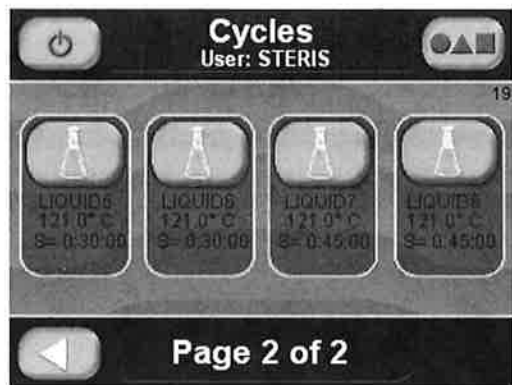


**DEACTIVATE SEAL PHASE:** Door unseals until seal pressure switch opens and 20 seconds has elapsed. After phase is complete, the following display appears:





**COMPLETE PHASE:** Cycle is complete. Open door and unload chamber. Once door is open, display returns to main operating mode screen.



### Example of cycle tape.

```
=====
===== LIQUID3 =====
=====
CYCLE START AT XX:XX:XXX
              ON  XX/XX/XX

CYCLE COUNT          0
LOGIN NAME:         TOM

CYCLE NO.           2

STER TEMP = 121.0 C
CONTROL TEMP = 122.5 C
STER TIME = 0:45:00

- TIME              T=C      V=inHg
                    P=psig
-----
C 11:48:24A        66.7      0.3V
C 11:49:24A        112.7     10.0P
S 11:49:43A        121.2     16.6P
S 11:51:43A        122.6     17.7P
S 11:53:43A        123.3     17.8P
S 11:55:43A        123.6     16.8P
S 11:57:43A        122.6     17.0P
S 11:59:43A        122.6     17.2P
S 12:01:43P        122.5     17.0P
S 12:03:43P        122.4     17.2P
S 12:05:43P        122.5     16.8P
S 12:07:43P        122.4     16.9P
S 12:11:43P        122.4     17.0P
S 12:13:43P        122.5     17.1P
S 12:15:43P        122.6     17.0P
S 12:17:43P        122.7     17.0P
S 12:19:43P        122.6     16.8P
E 12:19:44P        122.6     16.9P
Z 12:39:03P        89.9      5.1V

LOAD                                080804

CHAMBER TEMP MAX=124.8 C
CHAMBER TEMP MIN=121.2 C

CONDITION          = 1:19
STERILIZE          = 30:01
EXHAUST           = 21:42
TOTAL CYCLE       = 42:01

=====
===== READY TO UNLOAD =====
=====
```

## 6.5 Isothermal Cycle (Optional)

Carefully review *SECTION 1, SAFETY PRECAUTIONS*, and below before operating sterilizer.

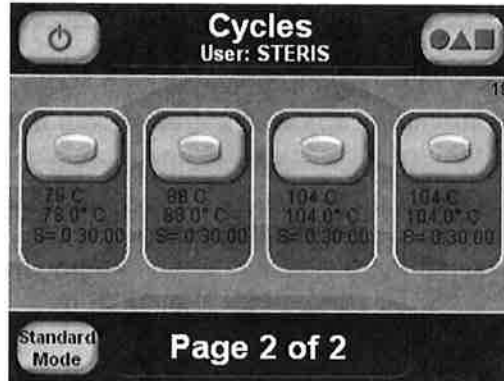
### WARNING – BURN HAZARD:

- 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.
- 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 (0 bar) 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) is required. Testing is to be performed by qualified service personnel only.
- 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 seal.
  - Use only Type 1 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.

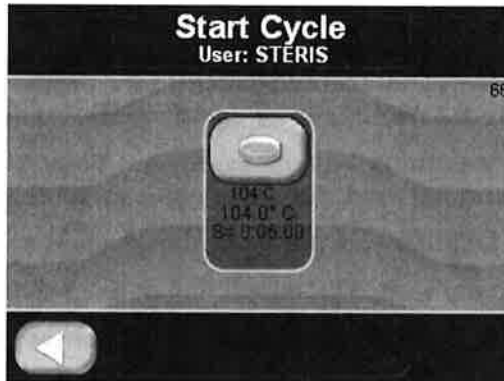
 **WARNING – EXPLOSION HAZARD:** This sterilizer is not designed to process flammable compounds.

The cycle is designed for low temperature processing (e.g., fractional sterilization, pasteurization) at 78 to 110°C (172 to 230°F).

Run an ISOTHERMAL CYCLE by pressing **ISOTHERMAL** button from iso mode operating screen. The screen is shown below:



The following screen is shown (values are examples only):



Press **LEFT ARROW** button to cancel cycle selected and return to operating mode screen. Press **START CYCLE** to start the isothermal cycle. If **CLOSE DOOR(S)** button is shown, close door(s). See section on OPERATING MODE - ISOTHERMAL MODE to change from the STANDARD MODE to ISO MODE. The following display is shown:



**ACTIVATE SEAL PHASE:** Door gasket seals with steam until door seal switch is closed. An additional 20 seconds elapses, after seal switch is closed, before phase is complete. After activate seal phase, the following display is shown:



**CHARGE PHASE:** Chamber charges with steam until chamber temperature reaches sterilize temperature. Waste temperature is controlled to maintain approximately 45.0°C (113.0°F).

After phase is complete, the following screen is shown:



**STERILIZE PHASE:** Chamber temperature controls at sterilize temperature plus overdrive. Waste temperature is controlled to maintain approximately 45.0°C (113.0°F). After sterilize time is complete, the following screen is shown:

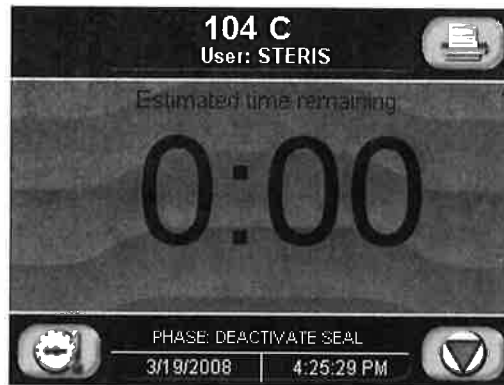


**SLOW EXHAUST PHASE:** Steam slowly exhausts from chamber to 5.0 inHg (0.17 bar). Pressure rate controls at 1.6 psi/minute (0.11 bar) to 4.2 psig (0.29 bar) and at 0.6 psi/minute (0.04 bar) to 5.0 inHg (0.17 bar).

After chamber pressure is less than 5.0 inHg (0.17 bar), the following display is shown:

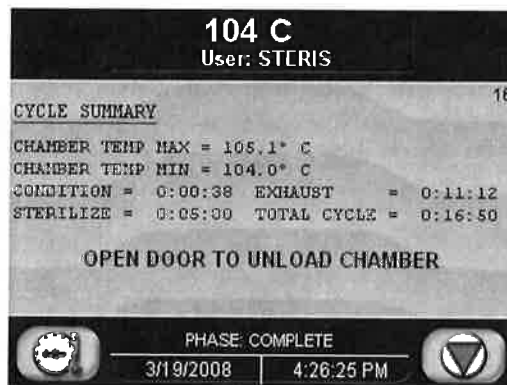


**VAPOR REMOVAL PHASE:** Vapors in chamber vents for 10 minutes. After time is complete, the following screen is shown:

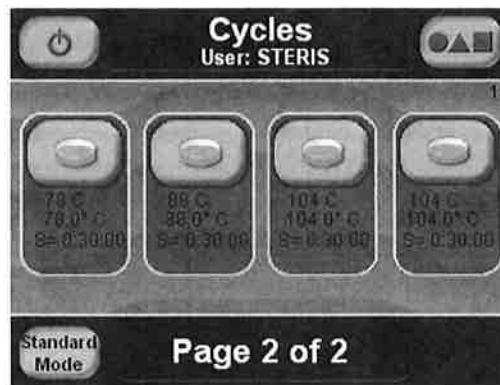


**DEACTIVATE SEAL PHASE:** Door unseals until seal pressure switch opens and 20 seconds has elapsed.

After phase is complete, the following display is shown:



**COMPLETE PHASE:** Cycle is complete. Open door and unload chamber. Once door is open, display returns to main operating mode screen shown on next page:



**Example of cycle tape.**

```

=====
===== ISOTHRML =====
=====
CYCLE START AT XX:XX:XXX
ON XX/XX/XX

CYCLE COUNT          0
LOGIN NAME:          TOM

CYCLE NO.            5

STER TEMP = 104.0 C
CONTROL TEMP = 104.0 C
STER TIME = 0:45:00

- TIME                T=C          V=inHg
                    P=psig
-----
C 11:48:24A          66.7          0.3V
C 11:49:24A          112.7         10.0P
S 11:49:43A          121.2         16.6P
S 11:51:43A          122.6         17.7P
S 11:53:43A          123.3         17.8P
S 11:55:43A          123.6         16.8P
S 11:57:43A          122.6         17.0P
S 11:59:43A          122.6         17.2P
S 12:01:43P          122.5         17.0P
S 12:03:43P          122.4         17.2P
S 12:05:43P          122.5         16.8P
S 12:07:43P          122.4         16.9P
S 12:11:43P          122.4         17.0P
S 12:13:43P          122.5         17.1P
S 12:15:43P          122.6         17.0P
S 12:17:43P          122.7         17.0P
S 12:19:43P          122.6         16.8P
E 12:19:44P          122.6         16.9P
Z 12:39:03P          89.9          5.1V

LOAD                  080804

CHAMBER TEMP MAX=124.8 C
CHAMBER TEMP MIN=121.2 C

CONDITION             = 1:19
STERILIZE              = 30:01
EXHAUST                = 21:42
TOTAL CYCLE            = 42:01

=====
===== READY TO UNLOAD =====
=====

```

## **6.6 Warmup Cycle (Only On Prevacuum Sterilizers)**

Carefully review *SECTION 1, SAFETY PRECAUTIONS*, and below before operating sterilizer.



### **WARNING – BURN HAZARD:**

- 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.
- 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 (0 bar) 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) is required. Testing is to be performed by qualified service personnel only.
- 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 seal.
  - Use only **Type 1 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.

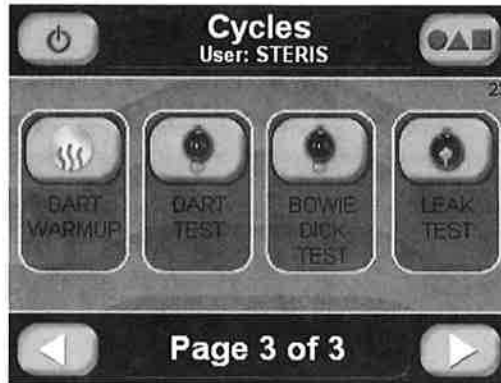


**WARNING – EXPLOSION HAZARD:** This sterilizer is not designed to process flammable compounds.

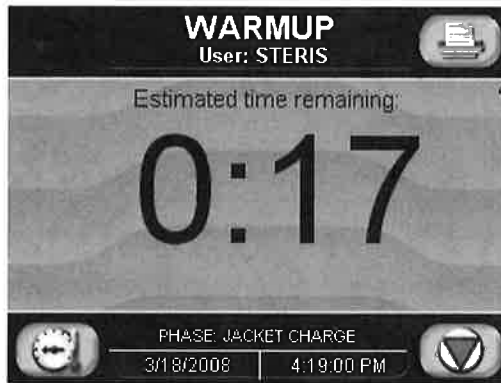


The cycle is used to warm up sterilizer shelves, door, and jacket before a DART or Bowie-Dick cycle is run.

Run a DART WARMUP CYCLE by pressing **DART WARMUP** button from the following screen.



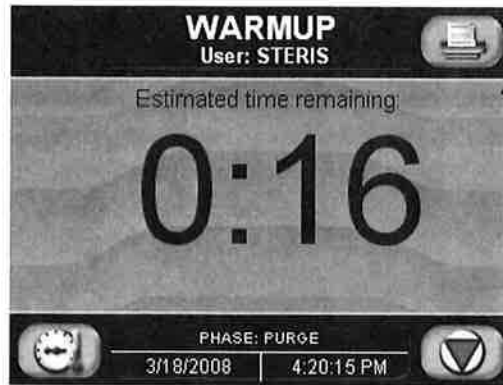
This screen is obtained by pressing **RIGHT ARROW** button on screen #2 of 3 the operating mode screens. The following display is shown:



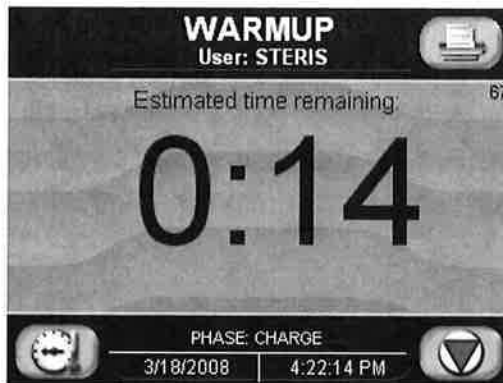
**JACKET CHARGE PHASE:** Jacket charge phase continues until jacket temperature is greater than 132.0°C (270.0°F). After jacket charge phase, the following display appears:



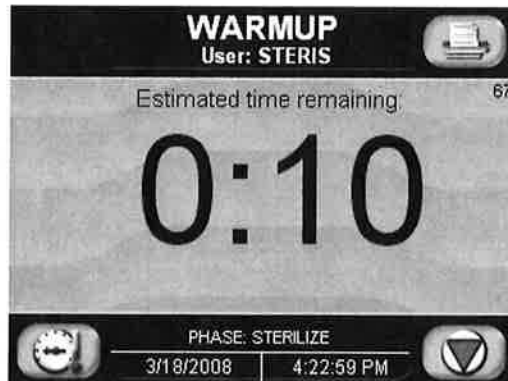
**ACTIVATE SEAL PHASE:** Door gasket seals with steam until door seal switch is closed. An additional 20 seconds elapses, after seal switch is closed, before phase is complete. After activate seal phase, the following display appears:



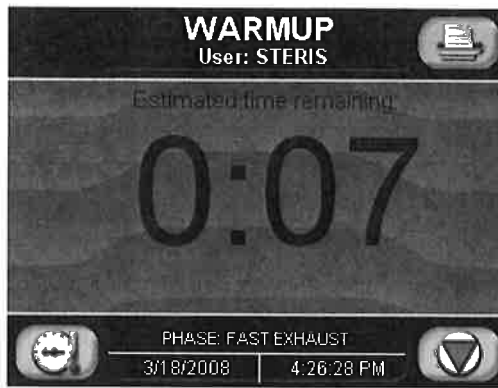
**PURGE PHASE:** Steam enters chamber from jacket to control pressure at 6 psig. Fast exhaust and water ejector is on to aid in removing air from chamber. After purge time, the following display appears:



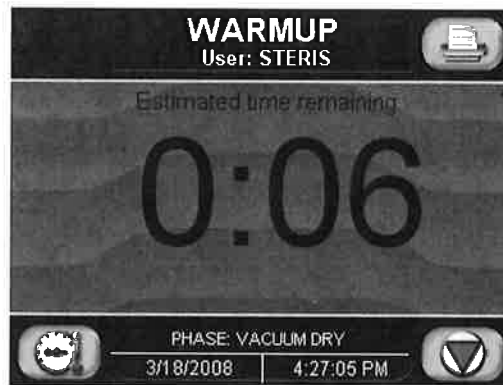
**CHARGE PHASE:** Chamber charges with steam until chamber temperature reaches sterilize temperature. Waste temperature is controlled to maintain approximately 45.0°C (113.0°F). After phase is complete, the following screen appears:



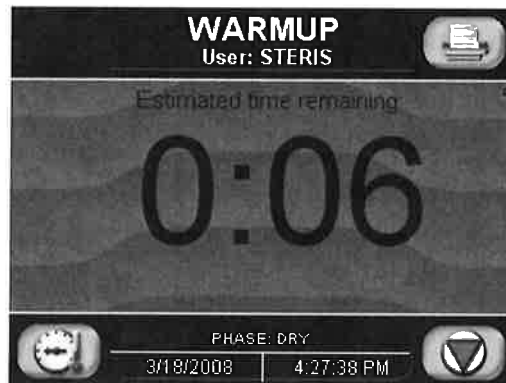
**STERILIZE PHASE:** Chamber temperature controls at sterilize temperature plus overdrive (control temperature). Waste temperature is controlled to maintain approximately 45.0°C (113.0°F). After sterilize time is complete, the following screen appears:



**FAST EXHAUST PHASE:** Steam fast exhausts from chamber to 4.0 psig (0.28 bar). After chamber pressure is less than 4.0 psig (0.28 bar), the following display appears:



**VACUUM DRY PHASE:** A vacuum is pulled in chamber to 10.0 inHg (-0.34 bar) (VACUUM DRY setpoint). After chamber pressure is less than 10.0 inHg (-0.34 bar), the following display appears:



**DRY PHASE:** During dry phase, vacuum continues to be pulled to limit of system for dry time. After dry time, the following screen appears: