

**APPLICATION**

AMSCO Lab 250 and AMSCO Lab 110 Small Sterilizers are designed for use in laboratory and industrial applications. Three sterilizer configurations are available.

- **Gravity** – designed for sterilization of non-porous 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** – 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. The vacuum level as well as the charge level for the prevac pulses are adjustable.
- **Isothermal** – 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.

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

*NOTE: Recess two wall mounting not available for Lab 110 double door sterilizers.*



(Typical - details may vary.)

**Selections Checked Below Apply To This Equipment**

**MODEL/CHAMBER SIZE (W x H x L)**

- Lab 110** – 16 x 16 x 26" (406 x 406 x 660 mm)
  - Gravity    Prevacuum    Isothermal  
(LG-110)   (LV-110)   (LI-110)
- Lab 250** – 20 x 20 x 38" (508 x 508 x 965 mm)
  - Gravity    Prevacuum    Isothermal  
(LG-250)   (LV-250)   (LI-250)

**STEAM SOURCE**

- Building Steam
- Stand Alone Electric Steam Generator
  - STERIS Provided    Customer Provided
- Integral Electric Steam Generator<sup>1</sup>
  - Carbon Steel    Stainless Steel
  - Voltage Options*
    - 208 Volt, 60 Hz
    - 240 Volt, 60 Hz
    - 400 Volt, 50 Hz
    - 480 Volt, 60 Hz
    - 600 Volt, 60 Hz
- Integral Indirect Stainless-Steel Clean Steam Generator (SD589)

**SINGLE DOOR**

- Cabinet Enclosed/Freestanding
- Recessed

**DOUBLE DOOR**

- Recessed through One Wall
  - Sterile side    Non-sterile side
- Recessed through Two Walls<sup>2</sup>

**OPTIONS**

- Power Door(s)
- Liquid Air Cool (w/vacuum)
- Decontamination Cycle<sup>3</sup>
- Pure Steam Piping to Chamber
  - without Pressure Reducing Valve
  - with Pressure Reducing Valve

- Air Detector System
- Reference Recorder
- Right Hand Piping
- Printer on Both Ends<sup>8</sup>
- Bio-Seal<sup>3, 4</sup>
- RTD Load Probe(s) and F<sub>0</sub> Sterilization
  - One Probe    Two Probes (max. 2)
- Drain Line Reference Probe
- Air-Differential Seal (NOE) for Double Door Units
- Back Panel for Single Door Cabinet Enclosed Unit
- 1" Chamber Penetration, Qty. 1 (Lab 110 only)<sup>5</sup>
- One Additional Chamber Penetration (Lab 250)<sup>5</sup>
- Vacuum Pump (3-Ph required)
  - 120 V, 1-Ph / 208 / 240 Vac, 3-Ph
  - 120 V, 1 Ph / 240 Vac 3-Ph
  - 120 V, 1-Ph / 480 Vac, 3-Ph
  - 120 V, 1-Ph / 600 Vac, 3-Ph
  - 230 V, 1 Ph / 400 Vac, 3-Ph (International)
  - Other - Specify \_\_\_\_\_
- Backflow Preventer
- Auto Flush for Steam Generator
- 0.2 Micron Bacterial Retentive Filter
- Visible Pressure Gauges
- Green Gravity Water Saver System
- Water Ejector & Closed Loop Chilled Water System (Drain Only)
- Vacuum Pump & Closed Loop Chilled Water System
  - Drain Only    Vacuum & Drain

**ACCESSORIES (for Lab 110)<sup>6</sup>**

- One Intermediate Shelf (16 x 16 x 26")
- Seismic Tie-Down Kit<sup>7</sup>
- Air Compressor, Portable, 115 Vac

**ACCESSORIES (for Lab 250)**

- One Intermediate Shelf (20 x 20 x 38")
- Seismic Tie-Down Kit<sup>7</sup>
- Air Compressor, Portable, 115 Vac
- Loading Rack and Two Shelves (20 x 20 x 38")
  - Single Door    Double Door
- Loading Car
- Transfer Carriage
- Chamber Track Assembly
  - Single Door    Double Door
- Loading Car, Transfer Carriage & Chamber Track Assembly
  - Single Door    Double Door
- Multiprobe Sealing Gland (20 x 20 x 38")
- AMSCO™ Stand Alone Water Conservation System

Notes:

1. Lab 110 double door sterilizers are not available with an integral electric steam generator.
2. Available for Lab 250 double door sterilizers only. Contact engineering if mounting through two walls is required for a Lab 110 sterilizer.
3. Units with decontamination and/or bio-seal options require UL/CSA field certification.
4. Available on Lab 250 double manual door sterilizers only.
5. One chamber penetration is standard on Lab 250.
6. Loading rack & 2 shelves is standard on Lab 110.
7. Based on CA requirements.
8. Printer at operating end is standard. Option adds additional printer to non-operating end.

Item \_\_\_\_\_

Location(s) \_\_\_\_\_

## DESCRIPTION

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AMSCO Lab 250 and Lab 110 Small Sterilizers for life science applications are the next advancement in the STERIS line of steam-jacketed sterilizers. Both sterilizers are equipped with the latest features in state of the art technology and ease of use.

### Primary Product Features

#### Interior Chamber Dimensions

- **Lab 110** – 16 x 16 x 26" (406 x 406 x 660 mm)
- **Lab 250** – 20 x 20 x 38" (508 x 508 x 965 mm)

**Allen-Bradley MicroLogix™ control system** with enhanced functionality and user-friendly A-B PanelView Plus™ 6 600 interface screen.<sup>1</sup>

- Touch-sensitive screen with 18-bit color graphic display
- Display features 320 x 240 resolution color-active matrix
- Display is designed with emphasis on human factors and user recognizable symbols
- **20 cycles** may be individually selected and programmed
- Compact Flash (CF-Card) memory card slot on operator panel for memory backup/restore
- Help screens for control operation
- Service reprogrammable flash ROM memory
- Program permanently stored in flash memory
- Variables permanently stored in flash memory

**Vertical sliding door** with manual operation.

- Non-lubricated, steam activated door seal

**Modularized vessel and piping** for increased dependability and reduced servicing time.

- Reduced piping components increase reliability
- Vessel design allows higher operating temperature (141°C [285°F])
- Non-clogging chamber drain line prevents media from plugging drain line
- Emergency manual exhaust valve

## STANDARDS

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Each sterilizer meets applicable requirements of the following listings and standards, and carries the appropriate symbols.

- **Underwriters Laboratory (UL) Standard 61010-1** as certified by ETL Testing Laboratories, Inc. (Some units with multiple options are not UL approved.)
- **Canadian Standards Association (CSA) Standard C22.2 No. 61010-1.**
- **ASME Code, Section VIII, Division 1** for unfired pressure vessels. The pressure vessel is so stamped; ASME Form U-1 is furnished. Shell and door are constructed to withstand working pressure of 50 psig (344.7 kPa).
- **ASME Code, Section I, Part PMB** for power boilers, if optional steam generator is supplied.
- **Seismic Pre-Approval R-0272** (for Lab 110)  
**Seismic Pre-Approval R-0275** (for Lab 250)
- **EMC Directive:** 2004/108/EC, 93/68/EEC, 92/31/EEC, 89/336/EEC.

- **Low Voltage Directive:** 2006/95/EC, 93/68/EEC, 72/23/EEC.
- **Machinery Directive (MD):** 2006/42/EC, 98/37/EEC, 93/68/EEC, 91/368/EEC, 89/392/EEC.
- **Pressure Equipment Directive (PED):** 97/23/EC.

## FEATURES

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**Hinged front cabinet panel** entirely opens for convenient access to sterilizer piping and control system.

**Resistance Temperature Detectors (RTDs)** are installed for sterilizer temperature control. The chamber drain line RTD senses and controls temperature variations within the sterilizer chamber. A jacket RTD provides temperature control within the jacket space. These RTD signals, converted into electrical impulses, provide accurate control inputs and readouts throughout entire cycle.

**Software calibration** is provided for all temperature and pressure inputs. Calibration is performed in the service mode, accessible through the touch screen displays, and accomplished using external or internal temperature and pressure sources. Control system provides a printed record of all calibration data for verification to current readings.

**RS-232 interface port** is provided for downloading cycle information to Customer-furnished data acquisition system.

**Optimal solution cooling** is designed to safely cool various liquids in vented, borosilicate glass containers with minimum liquid loss due to boil-over, and to keep normal evaporation loss below 5%. Optimal solution cooling is an integral part of the factory-programmed liquid cycle. During the exhaust (cooling) phase, the control utilizes this feature to optimize the exhaust rate regardless of load size or container fill volume. During cooling, the initial rate, initial rate transition point, as well as the second rate and final vacuum level are adjustable.

**Automatic utilities startup/shutdown** permits slow cooling of the entire vessel and load. Shutdown may be programmed to activate at the end of any designated cycle or time of day. When activated, control system automatically shuts off all utility valves, conserving steam and water usage. Sterilizer utilities can be restarted either by programmed time or manual operation. A different shutdown and restart time can be programmed for each day.

**Steam purge** feature is provided to assist in air removal and preheat the load.

**Automatic steam shutoff to jacket** is provided for isothermal and liquid cycles. When activated for isothermal cycles, the jacket control conducts a timed jacket drain, automatically allowing for the operation of cycles at lower temperatures. When activated for liquid cycles, steam supply to the jacket is turned off during exhaust phase, allowing load to cool more efficiently.

**Insulation, one-inch thick, asbestos-free spin-glass** (rated at 500 °F [260 °C] continuous) encompasses the exterior of the sterilizer vessel and is sealed in an oil and water resistant outer jacket.

**Lighted DIN connectors** are installed on all steam, water, and exhaust valves for reliability and ease of maintenance.

**Air Backup** to seals is provided on all double door sterilizers, with either bioseal or air differential seals.

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1. Allen-Bradley MicroLogix™ and Allen-Bradley PanelView Plus™ are registered trademarks of Rockwell Automation, Inc.

## CYCLE DESCRIPTION

Sterilizer is factory-programmed with the following applicable sterilizing cycles:

- **Gravity Cycle**, provided on gravity, prevacuum, and isothermal sterilizers, for sterilization of heat- and moisture-stable goods at 100°C to 141°C (212°F to 285°F), and decontamination of bagged non bio-hazardous laboratory wastes. Gravity cycle utilizes gravity air-displacement principle.
- **Liquid Cycle**, provided on gravity, prevacuum, and isothermal sterilizers, for sterilization of liquids and media in vented borosilicate glass or metal containers at 100°C to 135°C (212°F to 275°F). Liquid cycle utilizes optimal solution cooling feature, during exhaust (cooling) phase, to control exhaust rate.
- **Prevacuum Cycle**, provided only on prevacuum sterilizer, for efficient, high-volume sterilization of porous, heat- and moisture-stable materials at 100°C to 141°C (212°F to 285°F). Prevacuum cycle utilizes a mechanical air-evacuation system.
- **Isothermal Cycle**, provided only on isothermal sterilizer, for processing of heat-sensitive and heat-coagulable solutions in vented borosilicate glass or metal containers at 78°C to 104°C (170°F to 219°F). Isothermal cycle utilizes steam to enhance temperature control and prevent layering of steam and air within the chamber. Process maintains positive pressure in chamber to inhibit media boiling.
- **Liquid Air Cool (Optional)** provides water to jacket, and air pressure to chamber to improve exhaust time for liquid loads, and to reduce boil-over.
- **Effluent Decontamination Cycle (Optional)** is used for processing contaminated laboratory waste (BL-3 and BL-4). Condensate produced during processing cycle is decontaminated before discharge to floor drain. Steam is admitted through bottom of sterilizer chamber, and chamber is exhausted out top side of vessel. During purge and vacuum pulses, all purge and exhaust gases are vented through a 0.2 micron bacterial retentive filter. Filter housing is steam jacketed to prevent wetting of filter membrane. Available with fast exhaust or optimal solution cooling (slow exhaust) exhaust types. User is responsible for development of process parameters.
- **Leak Test Cycle**, provided only on prevacuum sterilizer, for verification of door seal and piping system integrity. Cycle parameters are pre-programmed and fixed. Acceptable maximum leak rate is 1.0 mm Hg/minute over a 10-minute period following a fixed stabilization time.
- **Daily Air Removal Test (Dart) Cycle**, provided only on prevacuum sterilizer, for verification of effective removal of residual air in chamber and load during testing. Test cycle determines if even and rapid steam penetration into test load occurred. Cycle parameters are preprogrammed and fixed.
- **Bowie-Dick Test** is available for 121°C (250°F) prevacuum cycles.

## CONTROL SYSTEM

### Design Features

Together, Allen-Bradley MicroLogix™ 1200 PLC control and PanelView Plus™ 6 600 display, monitor and control all sterilizer operations and functions. Control system is factory-programmed with standard sterilizing cycles. Each cycle is adjustable to meet specific processing requirements. All control configuring is performed through touch screen displays.

Cycle values and operating features may be adjusted and verified prior to cycle operation. Once cycle is started, cycles and cycle values cannot be changed until cycle is complete. On completion of cycle, timers reset to the previously selected values, eliminating the need to reset values between repeated cycles. If chamber temperature drops below the under temperature setting during the exposure phase, timer can be set to stop and automatically reset or resume once normal operating temperature is reached.

Critical control system components are housed within a sealed compartment to protect components from moisture and heat generated during sterilization process.

**Operator interface control panel**, consisting of touch screen and impact printer, is located on operating (load or nonsterile) end of sterilizer. If sterilizer is equipped with double doors, an additional touch screen is provided on sterilizer's non-operating (unload or sterile) end.

- **Touch-Sensitive Screen** features a color active matrix 18-bit graphics display. All sterilizer functions, including cycle initiation and cycle configuration, are operated by pressing the touch-sensitive areas on the display, referred to as buttons. Display indicates appropriate control buttons, operator prompts and status messages necessary to assist in sterilizer operation. All displayed messages are complete phrases with no codes to be cross-referenced. Display also indicates any abnormal conditions that may exist either in or out of a cycle.

- **Ink-On-Paper Impact Printer**, located above touch screen, provides an easy-to-read printed record of all pertinent cycle data on 2-1/4" wide paper. Data is automatically printed at the beginning and end of each cycle and at transition points during the cycle. A duplicate print can be obtained of the last cycle run.

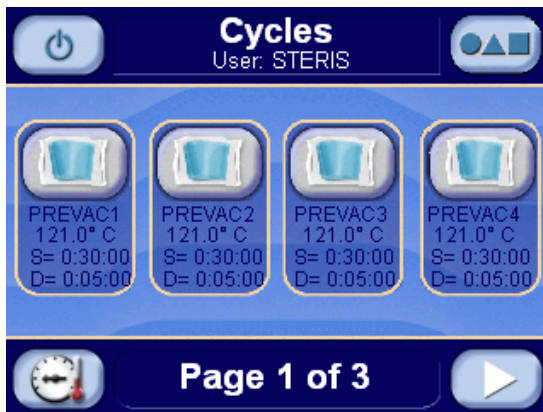
Printer take-up spool stores an entire roll of paper, providing cycle records which can be saved for future reference. Three paper tape rolls are furnished with each unit.

- **Non-operating end (NOE) control panel** (equipped on double-door sterilizers only) includes a touch-sensitive screen similar to the operating end screen. Preprogrammed cycles can be started from the NOE control panel. Display concurrently shows the same information as the operating end screen display.

**Cycle configuration** is performed by accessing the **change values** menu on either end of a double door sterilizer. Utility shutdown parameters can only be changed on the OE display. In addition to adjustment of cycle values, the following operating parameters can also be changed through the change values menu:

- **Time Display and Printout Units** in standard AM/PM or 24-hour military (MIL) time.

- **Selectable Cycle Name** permits user to name each cycle with any combination of letters, numbers, blank spaces, and underscores, up to eight characters long.
- **Print Interval** permits adjustment of the time period between cycle-status printouts generated during the sterilize phase.
- **Security access code** is required to enter the operating mode (running cycles), supervisor mode (changing values), and service mode. Operating the sterilizer or accessing change values menu causes display to request the entry of an access code. If access code is not properly entered, display returns to the standby screen, denying user access to the sterilizer or programming. Access to the sterilizer can be limited to 12 operators, each with a different access code.
- **Buzzer** pulses on and off during alarm conditions. Buzzer pulses at a different rate for one minute at cycle completion.
- **Temperature Display and Printout Units** in Celsius (°C) or Fahrenheit (°F). Temperature is set, displayed, controlled, and printed to the nearest 0.1°. Recalibration is not required when changing temperature units from °C to °F and vice versa.
- **Pressure/Vacuum Display and Printout Units** in psig/In/Hg, Bar (Gauge). Recalibration is not required when changing pressure units.
- **Compact flash port** is provided for downloading cycle information to a Customer-furnished Excel spreadsheet file1. Approximately eight (one hour) cycles can be stored on the flash card before the card has to be downloaded to PC.
- **Flash memory** permanently backs up all cycle memory. If a power failure occurs during a cycle, proper cycle completion occurs once power is restored. When power is lost, the cycle is held in phase until power is restored, exceeding the minimum government specification of one minute. Once power returns, the event is recorded on the printout and the cycle automatically resumes or restarts, depending on what phase the cycle was in at the time of power loss. If necessary, the operator can manually abort the cycle.



Typical Cycle Menu Display

## SAFETY FEATURES

**Control lockout switch** (equipped on chamber door) senses when door seal is energized and tight against the door. Control prevents cycle from starting until the limit switch signal is received. If control loses appropriate signal during cycle, alarm

activates, cycle aborts, and chamber safely vents with a controlled exhaust.

**Chamber float switch** activates alarm, aborts cycle, and safely vents chamber with a controlled exhaust if excessive condensate is detected in the vessel chamber.

**Door interlocks (double door units only)** allow only one door to be opened at a time and, during processing, prevent the non-operating end (NOE) door from being opened until a satisfactory cycle is complete. If a cycle is aborted, the NOE door cannot be opened. (Compressed air utility required).

**Pressure relief valve** limits the amount of pressure buildup so that the rated pressure in the vessel is not exceeded.

**Emergency stop button** (located on front of the sterilizer) is included on all sterilizers manufactured with a power door. For units marked with CE label, a key is required to release the emergency stop (once pushed) before the unit can return to normal operation.

## CONSTRUCTION

### Shell Assembly

Two fabricated Type 316L stainless-steel shells, welded one within the other, form the sterilizer vessel. Type 316L stainless-steel end frame(s) is welded to door end. On single door units, back of chamber is fitted with welded, 316L stainless-steel formed head.

Sterilizer vessel is ASME rated at 50 psig (3.2 Bar) and insulated. The Vessel (for Lab 250 only) includes one 1.0" (25 mm) NPT welded chamber bushing for Customer use.

Steam-supply opening inside the chamber is shielded by a Type 316L stainless-steel baffle.

### Chamber Door(s)

Door is constructed of a single formed piece of Type 316L stainless steel. Door is insulated to reduce the surface temperature of the stainless-steel door cover.

During cycle operation, door is sealed by a steam-activated door seal. Door seal is constructed of a special long-life rubber compound. When sterilizer cycle is complete, the seal retracts under vacuum into a machined groove in the sterilizer's end frame. Door seal can be manually retracted to open the door and remove critical load in an emergency situation (if loss of vacuum or loss of power occurs).

A handle is used to manually open (by lowering) and manually close (by raising) the door which is suspended by cables attached to a counterweight.

A long-life proximity switch is used, by the control, to determine if the door is closed. An additional seal pressure switch prevents inadvertent cycle initiation if door is not sealed.

The door assembly is equipped with a mechanical locking mechanism that ensures the door cannot be opened, as long as the seal is intact and energized, and more than 2.0 psi pressure is in the chamber. Door interlocks on double door sterilizers can be programmed to prevent inadvertent opening of door(s). Access code is required to override door interlocks.

*NOTE: Bio-Seal option is available for Lab 250, double manual door sterilizers, as discussed on page 5.*

## Chamber Drain System

Drain system is designed to prevent pollutants from entering into the water-supply system and sterilizer. An optional backflow preventer is available. Water supply shutoff valve is located behind the front cabinet service panel under the chamber.

## Automatic Drain Effluent Cooling

The piping system to the drain provides automatic condensing of chamber steam and disposal of condensate to waste. Cooling water is added to ensure discharge temperature is discharged at or below 60°C (140°F). A separate resistance temperature detector (RTD) is included to limit the volume of water to only the amount required to achieve target temperature, thus conserving water.

## Vacuum System (Prevacuum Units Only)

Water ejector reduces chamber pressure during prevacuum and post-drying phases. Air is drawn from the chamber through the vacuum system. Following dry phase, chamber vacuum is relieved to atmospheric pressure by admitting air through a bacteria-retentive filter.

## Vacuum System (International Prevacuum Units Only)

The vacuum pump reduces chamber pressure during prevacuum and post-drying phases. Air is drawn from the chamber through the vacuum system. Following the dry phase, the chamber vacuum is relieved to atmospheric pressure by admitting air through a bacteria-retentive filter.

## Steam Source

Sterilizers are piped valved, and trapped to receive building-supplied steam delivered at 50 to 80 psig (344.7 to 551.6 kPa) dynamic. If building steam source is not available, an electric carbon-steel steam generator or electric stainless-steel steam generator may be provided to supply steam to the sterilizer. Steam piping is constructed of brass and includes a shutoff valve, steam strainer and a brass pressure regulator.

Optional stainless-steel indirect-type steam generator can be installed as a pure steam source. Pure steam reduces the probability of contamination which could adversely affect research, such as tissue culture and trace metals studies.

Steam feeds from the jacket to the chamber. A check valve is added between the jacket and chamber on sterilizers with decontamination cycle option.

## Piping

All piping connections terminate within the confines of the sterilizer and are accessible from the front and side of sterilizer.

- **Solenoid Valves** in manifold with DIN connectors simplify sterilizer piping and can be serviced individually.
- **Manual Shutoff Valves** are pressure rated at 125 psig (862 kPa) for saturated steam. Valve handles are low-heat conducting.

## MOUNTING ARRANGEMENT

Sterilizers are arranged for either freestanding or recessed installation, as specified. Each sterilizer is equipped with a height-adjustable, steel floor stand. Sterilizer subframe is equipped with a synthetic rubber gasket to ensure tight fit between the cabinet panels on freestanding units or between

the front cabinet panel and wall partition on recessed units.

On freestanding units, stainless-steel side panels enclose the sterilizer body and piping.

Each Lab 110 and Lab 250 sterilizer has a lockable front service panel.

## OPTIONS

**Pure steam piping to chamber** delivers steam generated from Customer purified water source to the chamber and its contents. All steam-to-chamber piping components are constructed of 300 series stainless steel. Option can be provided with or without Pressure Reducing Valve.

**Integral indirect stainless-steel clean steam generator** automatically produces clean steam using Customer-supplied steam and purified water. Generator is integrally connected to the clean steam-to-chamber piping system.

**30 kW carbon-steel electric steam generator** typically fed by a potable water source with hardness not to exceed 171 mg/L. The generator is available for both single and double door sterilizers. The generator is mounted underneath both single and double door units. The generator option is not available for Lab 110 double door units.

**30 kW electric stainless-steel steam generator** is electrically powered, automatically filled with water having 1 MΩ·cm resistivity, and operates whenever the sterilizer power is on. Generator is integrally connected to the clean steam-to-chamber piping system. The generator option is not available for Lab 110 double door units.

**Auto Flush for Steam Generator** provides automatic flush of steam generator upon startup of sterilizer. Can be by-passed by pressing Cancel. Not required for SS generators.

**RTD load probes and F<sub>0</sub> sterilization** (maximum of 2) automatically sense the load temperature during cycle operation. A single thermal load probe is sealed through the sterilizer vessel and manually placed in the product container within the chamber prior to cycle operation.

In conjunction with the load probe option, individual cycles can be set to start exposure phase according to chamber drain temperature or according to load temperature. Also, F<sub>0</sub> set points are available for each cycle, allowing for exposure phase termination based on the calculated F<sub>0</sub> value.

**Bio-seal (for Lab 250 double manual door units only)** is a 1/4" steel plate which is welded to the chamber and a 1/4" thick silicone gasket that extends between the plate and a carbon steel wall frame which is welded to wall imbeds. The bioseal is provided on the non-operating end of the sterilizer, prevents passage of airborne microorganisms from the space between the vessel body and the structural wall opening. Steam is the primary source of pressure behind the door seal. All sterilizers with bioseals have air back-up to maintain seal pressure when out of cycle or if the steam source is not available.

**Air-differential seal (double door units only)**, provided on the non-operating end of the sterilizer, minimizes airflow between the dirty and clean sides of the barrier.

**Back cabinet panel** is provided on single door, freestanding units where the unit is accessible on all sides.

**Air detector** (integral factory piping option) is used to determine whether any air or non-condensable gas present in the chamber is sufficient to impair the sterilizing process.

**Seismic tie-down kit** conforms to the California Code of Regulations.

**Backflow preventer** option can be installed on sterilizer piping to prevent the unwanted reverse flow of water or other substances into the potable water supply.

**Power door** provides automatic opening and closing by depressing a foot pedal. (Not available for sterilizers with Bio-Seal option).

**Drain line reference probe** automatically senses the drain line temperature during cycle operation. Individual cycles can be set to start the exposure phase according to chamber drain temperature, or according to load temperature. This option replaces the standard drain RTD probe with a dual element RTD probe, in the same sheathing.

**0.2 micron bacterial retentive filter** provides sterile air during airbreak at end of cycle.

**Visible pressure gauges** show chamber and jacket pressure on control panel.

**Green Gravity Water Saver System** provides additional water savings by collecting steam effluent and holding it in a cooling tank, reducing the amount of water required to cool the effluent.

**Water ejector and closed loop chilled water system (drain only).** Closed loop cooling source is used to cool the sterilizer effluent to <140°F (<60°C). This eliminates the need for water mixing with the effluent that is sent to drain. Plate heat exchanger is included. See equipment drawings for closed loop utility requirements.

**Vacuum pump and closed loop chilled water system (drain only).** Closed loop cooling source is used to cool vacuum pump seal water to <59°F (<15°C). This greatly reduces the amount of vacuum pump seal water that is sent to the drain. Plate heat exchanger and recirculation tank are included. See equipment drawings for closed loop utility requirements.

**Vacuum pump and closed loop chilled water system (vacuum and drain).** Closed loop cooling source is used to cool vacuum pump seal water to <59°F (<15°C) and sterilizer effluent to <140°F (<60°C). This greatly reduces the amount of vacuum pump seal water and eliminates the need for water mixing with the effluent that is sent to drain. Plate heat exchangers and recirculation tank are included. See equipment drawings for closed loop utility requirements.

**Right hand piping.** Piping is located on right side of sterilizer.

**Reference recorder:** An optional independent recorder is provided to record chamber drainline temperature and chamber pressure. The recorder is integrally mounted to the sterilizer fascia paneling.

**Additional chamber penetration:** One 1" NPT capped chamber penetration port is located at the side of the vessel so as not interfere with other piping. The port provides for up to twelve (12) owner provided thermocouple probes or other test instrumentation.

One port is provided as standard on Lab 250.

**Printer on both ends.** An additional printer is provided on the non-operating end of the sterilizer.

## ACCESSORIES

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One 1" threaded chamber penetration is optional on Lab 110; but standard on Lab 250.

**Multiprobe sealing gland (for Lab 250 units only)** permits insertion of temperature probes, such as thermocouples or resistance temperature detectors (RTD), into the chamber. The assembly includes a stainless steel threaded gland, seal, and seat to accept a maximum of 12 Customer-supplied probes.

**Air Compressor, Portable, 115 Vac.** This accessory is intended for pneumatic valves on sterilizers when an air utility is not provided by the facility. It may also be used for back-up pressure source for the door seal in bioseal applications.

This is a portable 1.5 Gallon compressor tank that delivers 59.5 LPM @ 345 KPa (1.7CFM @ 100 PSI). Refer to STERIS drawing no. 755718-038 for complete specifications.

**AMSCO Stand Alone Water Conservation System** recirculates and cools sterilizer process water to reduce water consumption. The system includes a collection tank, a heat exchanger with integral cooling fan, recirculation pump and temperature and pressure switches.

When the system is operating, sterilizer water effluent passes through a fan-cooled heat exchanger. The fan cools the water before it returns to the collection tank. Additional cooling water is added only when a maximum temperature set-point is reached. Refer to tech data sheet SD929 for more details.

## PREVENTIVE MAINTENANCE

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A global network of skilled service specialists can provide periodic inspections and adjustments to help ensure low-cost, peak performance. STERIS representatives can provide information regarding annual maintenance agreements.

## NOTES

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1. The sterilizer is not supplied with a vacuum breaker or backflow preventer and, where required by local codes, installation of such a device in water line is not provided by STERIS.
2. Pipe sizes shown indicate terminal outlets only. Building service lines, not provided by STERIS, must supply the specified pressures and flow rates.
3. Disconnect switches (with OFF position lockout only; not provided by STERIS) should be installed in electric supply lines near the equipment.
4. Access to the recessing area from the control end of the sterilizer is recommended.
5. Clearances shown are minimal for installing and servicing the equipment.
6. If loading car and carriage are to be used with a Lab 250 sterilizer, front clearance should equal twice the length of the sterilizer. This will permit complete withdrawal of the loading car from the chamber and allow convenient maneuverability of the transfer assembly to and from the sterilizer.
7. Floor drain should be provided within confines of sterilizer framework.

## UTILITY REQUIREMENTS

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Refer to Equipment Drawing for complete information.

### Sterilizer Using Facility Steam<sup>1</sup>

#### Steam

1/2" NPT, 50 to 80 psig (344.7 to 551.6 kPa) dynamic, 97 to 100% vapor quality

#### Drain

1-1/2" ODT drain terminal. (Floor drain capacity must handle peak water consumption; refer to engineering data.)

#### Electrical - Controls

120 Volt, 50/60 Hz, 1-phase, 3.0 Amp

#### International:

230 Volt, 50/60 Hz, 1-Ph, 1.5 Amp

#### Sterilizer Feed Water

1.0" NPT, 30 to 50 psig (206.8 to 344.7 kPa) dynamic. Water is used for ejectors, vacuum pumps, exhaust condensers, 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.

*NOTE: Backflow prevention is not standard on the unit, but a backflow preventer option can be ordered.*

### Sterilizer Equipped With Integral Carbon Steel Steam Generator

#### Drain

1-1/2" ODT drain terminal. (Floor drain capacity must handle peak water consumption; refer to engineering data.)

#### Generator Drain

1/2" ODT

#### Electrical - Controls

120 Volt, 50/60 Hz, 1-phase, 9.5 Amp

#### International:

230 Volt, 50/60 Hz, 1-Ph, 1.5 Amp

#### Electrical - Generator

208 Volt, 50/60 Hz, 3-phase

240 Volt, 50/60 Hz, 3-phase

480 Volt, 50/60 Hz, 3-phase

600 Volt, 60 Hz, 3-phase

#### International:

380/415 Volt, 50/60 Hz, 3-Ph, (Prevacuum Units)

#### Sterilizer Feed Water

1.0" NPT, 30 to 50 psig (206.8 to 344.7 kPa) dynamic. Refer to **Table 1** for water specification guidelines.

#### Steam Generator Feed Water

1/2" NPT, 20 to 50 psig (137.9 to 344.7 kPa) dynamic. Refer to **Table 2** for required water quality. Use of feed water within the nominal conditions will optimize equipment performance and reduce maintenance.

*NOTE: Backflow prevention is not standard on the unit, but a backflow preventer option can be ordered.*

### Sterilizer Equipped With Integral Stainless-steel Steam Generator

#### Sterilizer Feed Water

1.0" NPT, 30 to 50 psig (206.8 to 344.7 kPa) dynamic. Refer to **Table 1** for required water quality.

#### Steam Generator Feed Water

1/2" NPT, 20 to 50 psig (137.9 to 344.7 kPa) Refer to **Table 3** for required water quality.

#### Drain

1-1/2" ODT generator drain terminal. (Floor drain capacity must handle peak water consumption; refer to engineering data).

#### Generator Drain

1/2" ODT

#### Electrical - Controls

120 Volt, 50/60 Hz, 1-phase, 9.5 Amp

#### International:

230 Volt, 50/60 Hz, 1-Ph, 1.5 Amp

#### Electrical - Generator

208 Volt, 50/60 Hz, 3-phase

240 Volt, 50/60 Hz, 3-phase

480 Volt, 50/60 Hz, 3-phase

600 Volt, 60 Hz, 3-phase

#### International:

380/415 Volt, 50/60 Hz, 3-Ph, (Prevacuum Units)

**CUSTOMER IS RESPONSIBLE FOR COMPLIANCE WITH APPLICABLE LOCAL AND NATIONAL CODES AND REGULATIONS.**

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

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1. External Supplied Steam (Facility Steam/Stand-Alone Steam Generator)

**Table 1. Recommended Feed Water Quality for Sterilizers**

Condition	Nominal Conditions	Maximum Conditions
Temperature	40°-60°F (4°-16°C)	70°F (21°C)
Total Hardness as CaCO <sub>3</sub> *	50-120 mg/L	171 mg/L
Total Dissolved Solids	100-200 mg/L	500 mg/L
Total Alkalinity as CaCO <sub>3</sub>	70-120 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

\* 17.1 mg/L = 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)	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 †	2 - 6 kΩ·cm	26 kΩ·cm

\* 17.1 mg/L = 1.0 grain hardness

† **WARNING-BURN HAZARD:** Never use supply water with resistivity exceeding 26 kΩ·cm, as doing so may cause malfunction of steam generator level control, resulting in sterilizer operator being severely burned by scalding water. If supply water resistivity exceeds 26 kΩ·cm immediately contact STERIS Service Engineering.

**Table 3. Required Feed Water Quality Stainless Steel Generators**

Type of Water	Deionized Water, Distilled or Reverse Osmosis
Temperature	≤ 140°F (≤ 60°C)
Minimum Specific Resistivity	1.0 MΩ·cm

**NOTE:** Do not connect tap water to stainless-steel steam generator. Use of water not meeting the required feed water quality will invalidate the warranty and is a violation of ASME Boiler Codes.

MODEL	CHAMBER SIZE in. (mm)	DIMENSIONS - inches (mm)							
		A <sup>a</sup>	B <sup>a</sup>	C	F	H <sup>a</sup>	J <sup>a</sup>	K <sup>a</sup>	L <sup>b</sup>
Lab 110	16 x 16 x 26 (406 x 406 x 660)	25 <sup>c</sup> (635)	30 (762)	35-3/4 (908)	26 (660)	25-1/2 (646)	18 (457)	40 (1016)	24-1/8 ± 1/4 (613 ± 6)
Lab 250	20 x 20 x 38 (508 x 508 x 965)	27 <sup>c</sup> (686)	32 (813)	45-1/8 (1146)	30 (762)	29-1/2 (747)	20 (508)	52 (1321)	28-1/8 ± 1/4 (714 ± 6)

<sup>a</sup> Minimum Service Clearance

<sup>b</sup> Wall Opening

<sup>c</sup> If recessed through one wall and using facility steam: 18" (457 mm) for Lab 110; 20" (508 mm) for Lab 250.

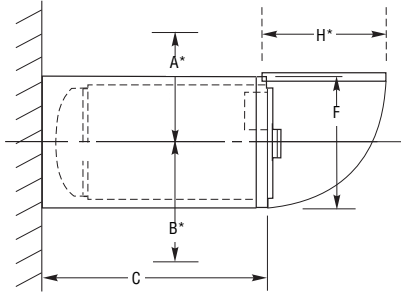


# Life Sciences

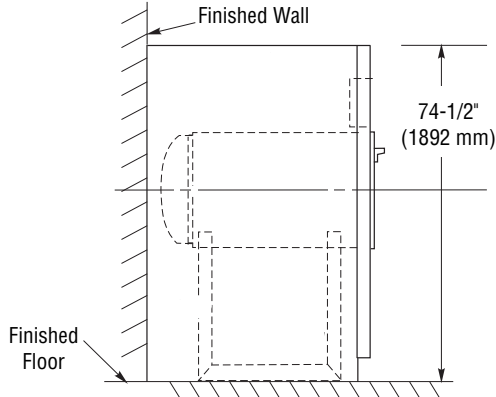
**Refer to the Following Equipment Drawings for Installation Details**

<b>Equipment Drawing Number</b>	<b>Equipment Drawing Title</b>
387352-612	Lab 250 Series Sterilizer 20 x 20 x 38 (508 x 508 x 965) Vacamatic or Gravity, Single Door, Recessed, Electric Steam Heat
387352-613	Lab 250 Series Sterilizer 20 x 20 x 38 (508 x 508 x 965) Vacamatic or Gravity, Single Door, Cabinet, Electric Steam Heat
387352-614	Lab 250 Series Sterilizer 20 x 20 x 38 (508 x 508 x 965) Vacamatic or Gravity, Single Door, Recessed, Steam Heat
387352-615	Lab 250 Series Sterilizer 20 x 20 x 38 (508 x 508 x 965) Vacamatic or Gravity, Single Door, Cabinet, Steam Heat
387352-616	Lab 250 Series Sterilizer 20 x 20 x 38 (508 x 508 x 965) Vacamatic or Gravity, Double Door, Recessed Two Walls, Electric Steam Heat
387352-617	Lab 250 Series Sterilizer 20 x 20 x 38 (508 x 508 x 965) Vacamatic or Gravity, Double Door, Recessed One Wall, Electric Steam Heat
387352-618	Lab 250 Series Sterilizer 20 x 20 x 38 (508 x 508 x 965) Vacamatic or Gravity, Double Door, Recessed Two Walls, Steam Heat
387352-619	Lab 250 Series Sterilizer 20 x 20 x 38 (508 x 508 x 965) Vacamatic or Gravity, Double Door, Recessed One Wall, Steam Heat
387352-640	Lab 110 Series Sterilizer 16 x 16 x 26 (406 x 406 x 660) Vacamatic or Gravity, Single Door, Recessed, Steam Heat
387352-641	Lab 110 Series Sterilizer 16 x 16 x 26 (406 x 406 x 660) Vacamatic or Gravity, Single Door, Cabinet, Steam Heat
387352-642	Lab 110 Series Sterilizer 16 x 16 x 26 (406 x 406 x 660) Vacamatic or Gravity, Single Door, Recessed, Electric Steam Heat
387352-643	Lab 110 Series Sterilizer 16 x 16 x 26 (406 x 406 x 660) Vacamatic or Gravity, Single Door, Cabinet, Electric Steam Heat
387352-644	Lab 110 Series Sterilizer 16 x 16 x 26 (406 x 406 x 660) Vacamatic or Gravity, Double Door, Recessed One Wall, Steam Heat

**Cabinet Enclosed**

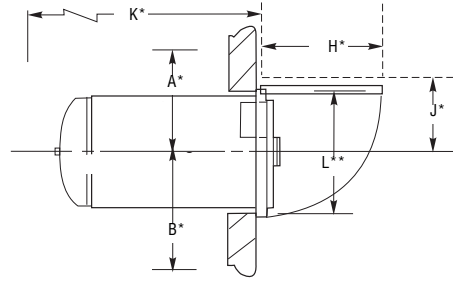


**PLAN VIEW**

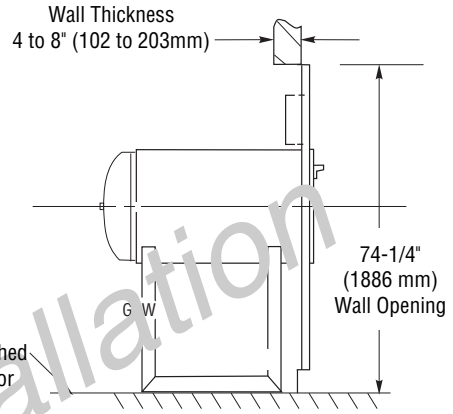


**SIDE VIEW**

**For Recessing**



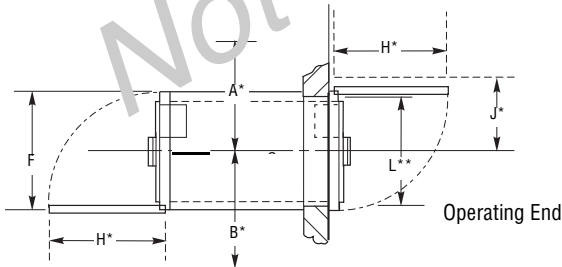
**PLAN VIEW**



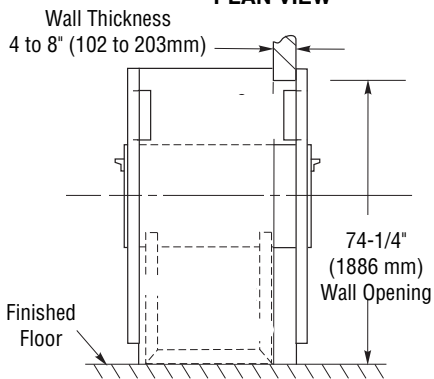
**SIDE VIEW**

**SINGLE DOOR**

**For Recessing Through One Wall**

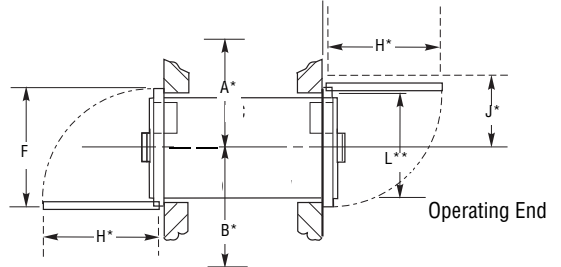


**PLAN VIEW**

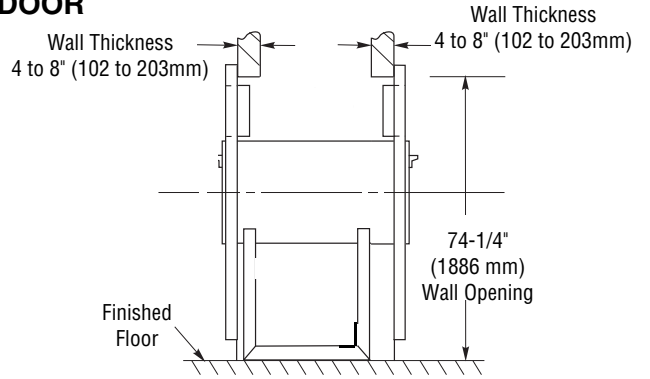


**SIDE VIEW**

**Recessing Through Two Walls  
(for Lab 250 Sterilizer only)**



**PLAN VIEW**



**SIDE VIEW**

**DOUBLE DOOR**

## ENGINEERING DATA

Model & Chamber Size in (mm)	Heating	MAXIMUM OPERATING WEIGHT <sup>a</sup> lbs (kg)		HEAT LOSS <sup>b</sup> BTU/hr at 70°F (21°C)						
				Single Door			Double Door			
		Single Door	Double Door	Cab't Enc	Recessed		Recessed One Wall		Recessed Two Walls	
				To Room	Front of Wall	Back of Wall	Front of Wall	Back of Wall	At Each End	Between Walls
Lab 110 16 x 16 x 26 (406 x 406 x 660)	Steam	750 (340)	989 (449)	4300	1600	2700	1600	3500	N/A	N/A
	Electric	890 (404)	N/A	6050	2300	3750	N/A	N/A	N/A	N/A
Lab 250 20 x 20 x 38 (508 x 508 x 965)	Steam	1231 (558)	1606 (728)	7000	2500	4500	2500	5300	2500	2800
	Electric	1371 (622)	1726 (782)	8750	3300	5450	3300	6250	3300	2950

Model & Chamber Size in (mm)	Heating	UTILITIES CONSUMPTION								
		Water <sup>c</sup>						Steam		
		Cold			Hot <sup>d</sup>			Peak <sup>f</sup> lb/hr (kg/hr)	Per Cycle <sup>e</sup> lb/cycle (kg/cycle)	Idle lb/hr (kg/h)
		Peak gpm (lpm)	Per Cycle <sup>e</sup> gal/cycle (l/cycle)	Idle gph (lph)	Peak gpm (lpm)	Per Cycle <sup>e</sup> gal/cycle (l/cycle)	Idle gph (lph)			
Lab 110 16 x 16 x 26 (406 x 406 x 660)	Steam	6 (23)	140 (530)	7 (27)	N/A	N/A	N/A	180 (81)	18 (8)	7 (3)
	Electric	6 (23)	140 (530)	7 (27)	1 (4)	3 (11)	1 (4)	N/A	N/A	N/A
Lab 250 20 x 20 x 38 (508 x 508 x 965)	Steam	6 (23)	140 (530)	10 (38)	N/A	N/A	N/A	180 (81)	21 (10)	7 (3)
	Electric	6 (23)	140 (530)	10 (38)	1 (4)	4 (15)	1 (4)	N/A	N/A	N/A

<sup>a</sup> Based on chamber fully loaded with water flasks.

<sup>b</sup> At 70°F (21°C).

<sup>c</sup> Backflow preventer device in water line, when required by local codes, is not provided by STERIS.

<sup>d</sup> Hot water recommended for units equipped with electric steam heat.

<sup>e</sup> Per cycle values were based on a 270°F (132°C) Prevac cycle with 4 minute sterilize time and 20 minute dry time, and chamber fully loaded with 17 lb. (8 kg) instrument tray.

<sup>f</sup> Peak steam demand (lbs/hr) may vary depending on operating conditions.

Additional utilities are required for units with the following options:

- Double Door Units w/Interlocks (Compressed Air)
- Liquid Air Cool (Compressed Air)
- Decontamination Cycle (Compressed Air)
- Bio-Seal (Optional Compressed Air Backup)
- Vacuum Pump (3-Phase Voltage)
- Stainless-Steel Piped Units (Treated Water)
- Indirect Steam Generator Units (Minimum 75 psig Steam Required)

Consult Customer service for specially configured equipment drawings.

### For further information, contact:



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