STERIS®

AMSCO® 400 SERIES SMALL STEAM STERILIZERS

APPLICATION

AMSCO 400 Series Small Steam Sterilizers are designed for sterilization of materials used in healthcare facilities.

The sterilizer is designed for fast, efficient sterilization of heat- and moisture-stable materials in addition to sterilization of items for immediate use. AMSCO 400 small sterilizers are equipped with prevacuum, gravity, leak test and daily air removal test cycles. An optional Steam Flush Pressure Pulse (SFPP) configuration sterilizer adds SFPP cycles.

Each sterilizer is equipped with either a single or double door, for open or recessed mounting.*

** Recess mounting is not available for 16 x 16 x 26" (406 x 406 x 660 mm) double door sterilizers.*

DESCRIPTION

AMSCO 400 Series Small Steam Sterilizers are the next advancement in the STERIS line of steam-jacketed sterilizers and are equipped with the latest features in both state-of-the-art technology and ease of use.

Primary Product Features

AMSCO 400 control system with enhanced functionality and user-friendly interface screen.

- Touch-sensitive screen with 30-line x 40-character display area
- Ink-on-paper impact printer
- Help screens for programming and troubleshooting alarm conditions
- Automatic check of control program and cycle data maintains process integrity
- Service reprogrammable flash ROM memory

Vertical sliding door with hands-free loading and unloading capability.

(Typical – details may vary.)

- Foot pedal activated door opening and closing
- Non lubricated, steam-activated door seal

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

- Reduced piping components increase reliability
- Emergency manual exhaust valve
- Electronic water saving control

The Selections Checked Below Apply To This Equipment

Size/Type
- ❑ 16 x 16 x 26", Prevacuum with Liquid Cycle
- ☑ 20 x 20 x 38", Prevacuum with Liquid Cycle
- ❑ 16 x 16 x 26", SFPP and Prevacuum with Liquid Cycle
- ❑ 20 x 20 x 38", SFPP and Prevacuum with Liquid Cycle

Steam Source
- ☑ Building Steam
- ❑ Electric Steam[1]
  - ❑ 208 Volts
  - ❑ 240 Volts
  - ❑ 480 Volts

Doors
- ☑ Single ❑ Double

Single Door Mounting
- ❑ Cabinet Enclosed/Freestanding
- ☑ Recessed

Double Door Mounting
- ❑ Recessed through One Wall
- ❑ Recessed through Two Walls[2]

Remote Monitoring
- ❑ ProConnect® Response Center (Remote Monitoring, Priority Technical Support, Customer Care Center Access, Equipment Performance Reports)

Accessories
- ❑ Loading Rack and Two Shelves 20 x 20 x 38" (standard on 16 x 16 x 26" sterilizers)
  - ❑ Single Door ❑ Double Door
- ❑ One Intermediate Shelf
  - ❑ 16 x 16 x 26" sterilizer
  - ❑ 20 x 20 x 38" sterilizer
- ❑ Loading Car (20 x 20" units only)
- ❑ Transfer Carriage (20 x 20" units only)
- ❑ Chamber Track Assembly (20 x 20" units only)
  - ❑ Single Door ❑ Double Door
- ❑ Loading Car, Transfer Carriage, and Track Assembly (20 x 20" units only)
  - ❑ Single Door ❑ Double Door
- ❑ Seismic Tie-Down Kit

Item 1635

Location(s)_____

[1] *16 x 16 x 26" Double Door Sterilizers are not available with electric steam generator.*

[2] *Available for 20 x 20 x 38" Double Door Sterilizers only.*

Interior Chamber Dimensions

- 16 x 16 x 26" (406 x 406 x 660 mm)
- 20 x 20 x 38" (508 x 508 x 965 mm)

STANDARDS

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

- **ANSI/UL 61010-1**–Standard for Electrical Equipment for Measurement, Control, and Laboratory Use, Part 1: General Requirements
- **ANSI/UL 61010A-2-041**–Standard for Electrical Equipment for Measurement, Control and Laboratory Use, Part 2: Particular Requirements for Autoclaves using Steam for the Treatment of Medical Materials and Laboratory Processes
- **ANSI/AAMI-ST8:2008** "Hospital Steam Sterilizers" American National Standard
- **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.

FEATURES

Rack and shelf design accepts wider loads:

16 x 16" sterilizers – chamber clearance is12" (304 mm) for intermediate shelves, and 14" (357 mm) for bottom shelf.
20 x 20" sterilizers – chamber clearance is 18" (457 mm) for intermediate shelves, and 15" (381 mm) for bottom shelf.

User-programmable cycle names allow for load specific naming of cycles. These cycle names are displayed and printed in addition to the factory-default cycle type and aid in identifying the proper cycle to be used with a specific load.

Hinged front cabinet panel fully opens for convenient access to sterilizer piping and control.

Software 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 printed record of all calibration data for verification to current readings.

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

Steam generator units are equipped with **an automatic flush and drain system**. This system helps the generator to operate at peak performance and extends the life of the heaters.

ProConnect® Response Center - Minimize response time and minimize unscheduled downtime on your equipment. Secure, internet-based, 24/7 remote monitoring enables both Predictive Maintenance as well as instant alert to STERIS when there is an equipment alarm. Also included are priority technical support, online parts ordering, equipment performance dashboards and scheduling service at eservice.steris.com.

UTILITIES CONSERVATION FEATURES

Resistance Temperature Detectors (RTD) 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 and minimizes utilities usage.

Electronic water saving control includes a condenser RTD to control the amount of water used in condensing the exhausted chamber steam. Control software minimizes amount of water used to cool condensate.

Automatic utilities startup/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.

One-piece insulation sleeve is fitted around exterior of the sterilizer vessel. The sleeve is sealed and held in place by hook-and-loop closures. Fiberglass insulation is asbestos-free and chloride-free. Insulation outer shroud is impregnated with silicone to aid in resisting oil or water and conserves system heat.

PROCESSING CYCLES

All cycles validated to AAMI standard ST8:2008.

Prevacuum Sterilizer Models feature the following cycles:

Immediate Use, Prevac Cycle (4-minute exposure): Cycle type is for sterilizing porous and non-porous loads. Examples – A single unwrapped instrument tray or up to a full load of unwrapped instrument trays, each with a maximum weight of 25 lbs (11 kg).

» Sterilize exposure temperature: 270°F (132°C)

» Sterilize exposure time: 4 minutes

» Dry time:1 minute

*NOTE: Items sterilized for **immediate use** must be used within the shortest possible time after removal from the sterilizer and **must** be taken to the sterile field using aseptic transfer protocols.*

- *A sterilized item intended for immediate use must not be stored.*
- *An item sterilized for immediate use cannot be held for use on a future case.*
- *The Prevac immediate use cycle is the preferred immediate use cycle. The Gravity immediate use cycle is only safe for simple instruments that contain no hinges or other features that could trap air.*
- *Always refer to instrument manufacturer's instructions for use to determine processing requirements.*

Prevac Cycle (4-minute exposure): Cycle type is for sterilizing porous and non-porous loads. Example – Wrapped 25 lb (11 kg) instrument tray(s) or fabric packs.

» Sterilize exposure temperature: 270°F (132°C)

» Sterilize exposure time: 4 minutes

» Dry time: 30 minutes (full load of instruments trays), 20 minutes (full load of fabric packs) or 5 minutes (Customer option, for a single fabric pack)

Prevac Cycle (3-minute exposure): This cycle is for sterilizing porous and non-porous loads. Example – Wrapped 25 lb (11 kg) instrument trays.

» Sterilize exposure temperature: 275°F (135°C)

» Sterilize exposure time: 3 minutes

» Dry time: 30 minutes

Immediate Use, Gravity Cycle (3-minute or 10-minute exposure): Cycle type is for sterilizing non-porous loads. Example – A single unwrapped instrument tray or up to a full load of unwrapped instrument trays, each with a maximum weight of 25 lbs (11 kg).

» Sterilize exposure temperature: 270°F (132°C)

» Sterilize exposure time: 10 minutes or 3 minutes

» Dry time:1 minute

See *Note* on previous page regarding immediate use.

SFPP Sterilizer Models also feature the following cycles (in addition to those found on Prevacuum models):

SFPP Cycle (4-minute exposure): This cycle is for sterilizing porous and non-porous loads. Example – A wrapped 25 lb (11 kg) instrument tray.

» Sterilize exposure temperature: 270°F (132°C)

» Sterilize exposure time: 4 minutes

» Dry time: 30 minutes (full load of instruments trays), 20 minutes (full load of fabric packs) or 5 minutes (Customer option, for a single fabric pack)

SFPP Cycle (3-minute exposure): This cycle is for sterilizing porous and non-porous loads. Example – A wrapped 25 lb (11 kg) instrument tray.

» Sterilize exposure temperature: 275°F (135°C)

» Sterilize exposure time: 3 minutes

» Dry time: 30 minutes.

OPTIONAL CYCLES:

The following cycles appear on Prevac and SFPP sterilizers, and can be programmed by the departmental supervisor:

Gravity Cycles:

Full load, non-porous instrument trays.

» Sterilize exposure temperature: 270°F (132°C)

» Sterilize exposure time: 15 minutes

» Dry time: 30 minutes

Full load, non-porous instrument trays.

» Sterilize exposure temperature: 250°F (121°C)

» Sterilize exposure time: 30 minutes

» Dry time: 30 minutes

Full load, fabric packs.

» Sterilize exposure temperature: 270°F (132°C),

» Sterilize exposure time: 25 minutes

» Dry time: 15 minutes

Full load, fabric packs.

» Sterilize exposure temperature: 250°F (121°C)

» Sterilize exposure time: 30 minutes

» Dry time: 15 minutes

Liquid Cycle: This cycle is used for sterilizing liquids in borosilicate containers with vented closures. The 16" sterilizer can process a maximum load of 15 1000 mL containers. The 20" sterilizer can process a maximum load of 32 1000 mL containers.

» Sterilize temperature: 250°F (121°C)

» Factory programmed sterilize time: 45 minutes

» Dry time: not applicable

Important: The liquid cycle is for non-patient contact use only.

PREVACUUM TESTING CYCLES

- **Vacuum Leak Test:** This cycle is used for testing the vacuum integrity of the sterilizer's piping. Sterilizer chamber must be empty while running this test cycle. Temperature: 270°F (132°C); all timing is preprogrammed and cannot be adjusted. This cycle is validated to AAMI standard ST8:2008.
- **DART® (Bowie-Dick) Test Cycle:** This cycle is used to conduct a Bowie-Dick test on the sterilizer. Recommended load is a STERIS Dart® pack, or a properly prepared Bowie-Dick test pack. Sterilize exposure temperature: 270°F (132°C); sterilize exposure time: 3-1/2 minutes; dry time: 1 minute. This cycle is validated to AAMI standard ST8:2008.

CONTROL SYSTEM

Design Features

AMSCO 400 control system monitors and controls all sterilizer operations and functions. The control system is factory-programmed with standard sterilizing cycles. Each cycle is adjustable, and cycle names are user-programmable, to meet specific processing requirements. All control configuring is performed through the touch screen displays.

Important: Always refer to instrument manufacturer's instructions for use to determine processing requirements.

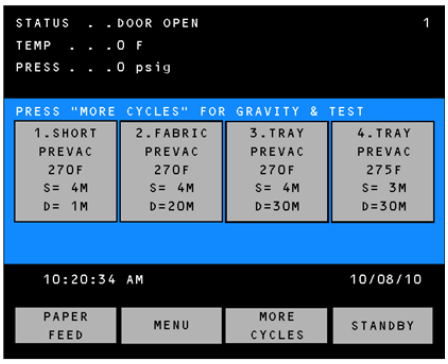
Cycle values and operating features may be adjusted and verified prior to cycle operation. Once cycle is started, cycles and cycle values cannot be changed until cycle is complete. On completion of cycle, timers reset to the previously selected values, eliminating the need to reset values between repeated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

Critical control system components are housed within a compartment to protect the components from moisture and heat generated during sterilization. A cooling fan with filter maintains air flow within the compartment, keeping components cool.

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

- **Touch-Sensitive Screen** features a 30-line x 40-character graphics display. The control's touch screen color display features a wide viewing angle and high-visibility backlighting. 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 near touch screen, provides an easy-to-read printed record of all pertinent cycle data. Data is automatically printed at the beginning and end of each cycle and at transition points during the cycle.

  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.



Typical Touch Screen Display

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 through the operating end touch screen. 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 –** Standard AM/PM or 24-hour.
- **Access Code –** accessing Change Values menu causes display to request the entry of an access code. If access code is not properly entered, display returns to menu screen, denying user access to the sterilizer programming. Supervisors can allow operators to change chosen cycle and parameters; or lock them out from making any changes.
- **Audible Signals –** are adjustable. **Touch pad** and **end-of-cycle signals** can be adjusted to one of four sound levels (off, low, medium or high) as required for the operating environment. **Alarm signal** can be adjusted to low, medium or high (it cannot be turned off).
- **Print Format** – allows selection of either a full or condensed printout of the cycle information during processing.
- **Temperature Display and Printout Units** – Fahrenheit (°F) or Celsius (°C). Temperature is set, displayed, controlled and printed to the nearest 0.1°. Recalibration is not required when changing temperature units from °F to °C and vice versa.
- **Pressure/Vacuum Display and Printout Units** – psig/In Hg, millibar or psia. Recalibration is not required when changing pressure units.
- **Utilities Control** – This parameter permits the operator to program the sterilizer to automatically shut off its steam and water at the end of the work day, to conserve utilities. It also allows control for shut down and power-up of an integral steam generator.
- **Languages** – This parameter can be used to select English, French or Spanish as the default for displays and printouts. The sterilizer can also be set to allow quick changes between available languages.
- **Machine Number** – This parameter assigns a six-character, alphanumeric code to the sterilizer. This code appears in the heading of all printouts.
- **Automatic Duplicate Print** – Sterilizer can be set to automatically furnish a duplicate printout of each cycle at the end of the cycle. First line reads "DUPLICATE PRINT".

Technical Data

Control system consists of a microcomputer control board and peripheral function circuit boards, located within the control board housing behind the front cabinet service panel above the chamber.

A memory backup system maintains cycle settings indefinitely and current cycle information for approximately five days. If a power failure occurs during a cycle, the battery backup system ensures that cycle memory will be retained and proper cycle completion will occur 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.

SAFETY FEATURES

Control senses when door seal is closed and sealed, preventing cycle start until a 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 water is detected in the vessel chamber.

Pressure Relief Valve limits the amount of pressure buildup so that the rated pressure in the vessel is not exceeded.

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 (3.5 bar) and insulated. Vessel (20 x 20" [508 x 508 mm] units only) includes one 1.0"-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.

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 door and remove critical load in emergency situation if loss of vacuum or loss of power occurs.

Door is suspended by cables attached to a counterweight. Chamber door is opened (lowered) and closed (raised) by pressing a foot pedal located on the same end as the door being operated. In case of a power or mechanical failure, door can be operated manually.

A long-life proximity switch is used by the control to determine if 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.

The sterilizer door opening is fitted with a textured thermoplastic bezel. This bezel insulates the operator from the chamber end ring, lessening the chance of accidental contact with a hot metal surface.

Chamber Drain System

Drain system is designed to prevent pollutants from entering into the water-supply system and sterilizer. The automatic condensing system converts chamber steam to condensate and disposes condensate to waste. Cooling water flow is regulated by the waste line RTD to minimize water usage. Water supply shutoff valve is located behind the front cabinet service panel under the chamber.

Vacuum System

Water ejector reduces chamber pressure during prevacuum and post-drying phases. Air is drawn from chamber through the vacuum system. Following dry phase, 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 (3.5 to 5.6 bar) dynamic. If building steam source is not available, an electric carbon-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, flush system and a brass pressure regulator.

Piping

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

- **Solenoid Valves** in the manifold with DIN connectors simplify sterilizer piping and can be serviced individually.
- **Manual Shutoff Valves** are pressure rated at 125 psig (8.62 bar) 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 and a louvered top panel enclose the sterilizer body and piping.

ACCESSORY

Seismic Tie-Down Kit - conforms to 2010 California Building Code of Regulations, Part 2.

PREVENTIVE MAINTENANCE

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

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 the 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 20 x 20 x 38" (508 x 508 x 965 mm) sterilizer, front clearance should be at least 76" (1930 mm). 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

Sterilizer Using *House* Steam

Steam – 1/2" NPT, 50 to 80 psig (3.5 to 5.6 bar) 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, 2.0 Amps

Sterilizer Feed Water – 1" NPT, 30 to 50 psig (2.1 to 3.5 bar) dynamic.

Minimum 40 psig (2.8 bar) for SFPP sterilizers.

Water is used for ejector (creating chamber vacuum), exhaust cooling and cooling the generator drain. 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 (not supplied on unit) is not provided by STERIS.

Sterilizer Equipped with Integral Carbon Steel Steam Generator

Every AMSCO 400 sterilizer equipped with an electric steam generator includes an automatic flush and drain package.

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 Amps

Electrical - Generator

208 Volt, 50/60 Hz, 3-phase
83.2 Amps; 240 Volt, 50/60 Hz
3-phase, 72.2 Amps; or 480 Volt
50/60 Hz, 3-phase, 37 Amps

Sterilizer Feed Water – 1.0" NPT, 30 to 50 psig (2.1 to 3.5 bar) dynamic. Refer to **Table 1** for water specification guidelines.

1635

Steam Generator Feed Water – 1/2" NPT, 20 to 50 psig (1.4 to 3.5 bar) 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 (not supplied on unit) is not provided by STERIS.

Telecommunications Requirements for ProConnect® Response Center

- An active wired or wireless TCP/IP network, 10/100BaseT Ethernet connection at each piece of connected equipment, Internet access and an IP address on the facility network.
- 5 GB of available hard drive space to run the service agent. Can be installed on:
  - » Dedicated PC running Windows XP or Windows 7 (32-bit mode only) with 2.8GHz processor, 512MB of RAM
  - » Virtual Machine
  - » Server
- Local STERIS login at the PC with a username of STERIS and the password should be ProConnect (STERIS Customer Number).
- Ethernet cable to connect each piece of STERIS equipment and the dedicated PC to the facility network.

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.

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 $CaCO_3$[1]	50-120 mg/L	171 mg/L
Total Dissolved Solids	100-200 mg/L	500 mg/L
Total Alkalinity as $CaCO_3$	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

1. 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	140°F (60°C)[1]	140°F (60°C)
Total Hardness as $CaCO_3$[2]	0-17 mg/L	130 mg/L
Total Dissolved Solids	50-150 mg/L	250 mg/L
Total Alkalinity as $CaCO_3$	50-100 mg/L	180 mg/L
pH	6.8-7.5	6.5-8.5
Total Silica	0.1 - 1.0 mg/L	2.5 mg/L
Resistivity - ohms/cm[3]	2000-6000	26000

1. For optimal operation. Water provided at lower temperatures will lengthen cycle times.

2. 17.1 mg/L = 1.0 grain hardness

3. 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 micro-mhos conductivity min.). Do not connect to treated water (e.g., distilled, reverse osmosis, deionized) unless water resistivity is determined to be acceptable. If water exceeds 26,000 ohms/cm, contact STERIS Service Engineering for information concerning modifications required to the generator control system.

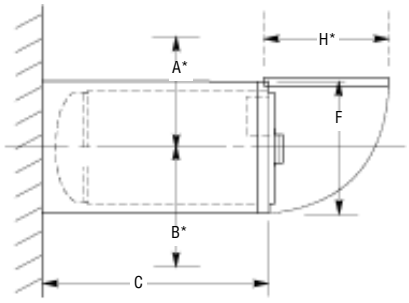
CHAMBER SIZES	DIMENSIONS - inches (mm)							
	A[1]	B[a]	C	F	H[a]	J[a]	K[a]	L[2]
16 x 16 x 26 (406 x 406 x 660)	25[3] (635)	30 (762)	35-3/4 (908)	26 (660)	25-1/2 (646)	18 (457)	40 (1016)	24-1/8 ± 1/4 (613 ± 6)
20 x 20 x 38 (508 x 508 x 965)	27[c] (686)	32 (813)	45-1/8 (1146)	30 (762)	29-1/2 (747)	20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

1. Minimum Service Clearance

2. Wall Opening

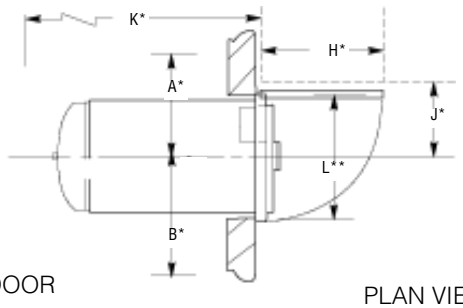
3. If recessed through one wall and using house steam:
18" (457 mm) for 16 x 16 x 26" unit
20" (508 mm) for 20 x 20 x 38" unit

Cabinet Enclosed



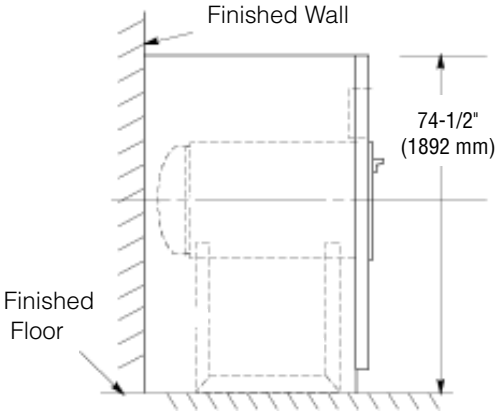
PLAN VIEW

For Recessing

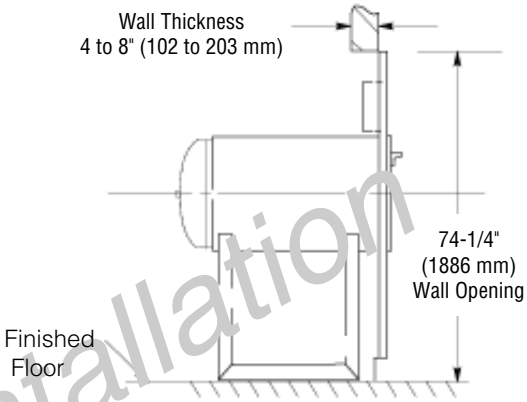


SINGLE DOOR

PLAN VIEW

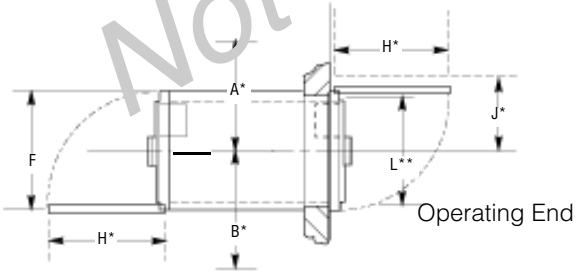


SIDE VIEW



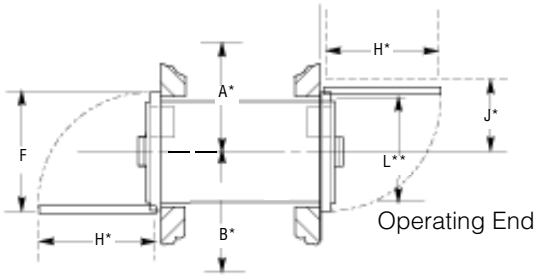
SIDE VIEW

For Recessing Through One Wall



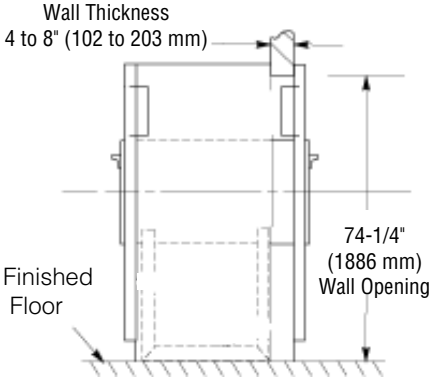
PLAN VIEW

For Recessing Through Two Walls
(for 20 x 20 x 38" [508 x 508 x 965 mm]
Sterilizer only)

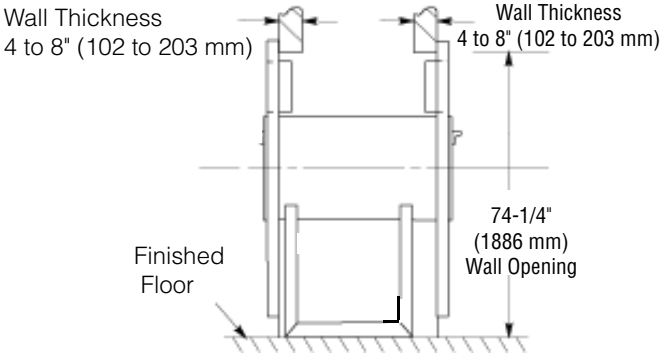


PLAN VIEW

DOUBLE DOOR



SIDE VIEW



SIDE VIEW

1635

Refer to the Following Equipment Drawings for Installation Details	
Equipment Drawing Number	**Equipment Drawing Title**
129394-044	16 x 16 x 26", single door, cabinet enclosed with steam heat
129394-045	16 x 16 x 26", single door, recessed one wall with steam heat
129394-046	16 x 16 x 26", single door, recessed one wall with electric heat
129394-047	16 x 16 x 26", single door, cabinet enclosed with electric heat
129394-048	16 x 16 x 26", double door, recessed one wall with cabinet and steam heat
129394-049	20 x 20 x 38", single door, cabinet enclosed with steam heat
129394-050	20 x 20 x 38", single door, recessed one wall with steam heat
129394-051	20 x 20 x 38", double door, recessed one wall with cabinet and steam heat
129394-052	20 x 20 x 38", double door, recessed two walls, with steam heat
129394-053	20 x 20 x 38", single door, cabinet enclosed with electric heat
129394-054	20 x 20 x 38", single door, recessed one wall with electric heat
129394-055	20 x 20 x 38", double door, recessed one wall with electric heat and cabinet
129394-056	20 x 20 x 38", double door, recessed two walls with electric heat

ENGINEERING DATA

SIZE in (mm)	Heating	MAXIMUM OPERATING WEIGHT[1] lbs (kg)		HEAT LOSS[2] BTU/hr at 70°F (21°C)						
				Single Door			Double Door			
				Cab't Enc	Recessed		Recessed One Wall		Recessed Two Walls	
		Single Door	Double Door	To Room	Front of Wall	Back of Wall	Front of Wall	Back of Wall	At Each End	Between Walls
16 x 16 x 26 (406 x 406 x 660)	Steam	750 (340)	989 (449)	4300	1600	2700	1600	3700	N/A	N/A
	Electric	890 (404)	N/A	6050	2300	3750	N/A	N/A	N/A	N/A
20 x 20 x 38 (508 x 508 x 965)	Steam	1230 (558)	1606 (728)	7000	2500	4500	2500	5300	2500	4500
	Electric	1371 (622)	1726 (782)	8750	3300	5600	3300	6300	3300	6300

1. Based on chamber fully loaded with water flasks.

2. At 70°F (21°C).

SIZE in (mm)	Heating	UTILITIES CONSUMPTION[1]											
		Water[2]								Steam			
		Cold					Hot[3]						
		Peak gpm (lpm)	Maximum Usage[1] gal/cycle (l/cycle)	Average Usage gal/cycle (l/cycle)	Gal/lb (l/kg)	Idle gph (lph)	Peak gpm (lpm)	Per Cycle gal/cycle (l/cycle)	Idle gph (lph)	Peak[4] lb/hr (kg/hr)	Per Cycle lb/cycle (kg/cycle)	Lb (kg)/ lb Instr.	Idle lb/hr (kg/h)
16 x 16 x 26 (406 x 406 x 660)	Steam	15 (57)	135 (511)	87 (329)	2.7 (10.2)	12 (45)	N/A	N/A	N/A	158 (72)	20 (9)	0.4 (0.18)	7 (3)
	Electric						1 (4)	3 (11)	1 (4)	N/A	N/A		N/A
20 x 20 x 38 (508 x 508 x 965)	Steam		175 (662)	121 (458)	2.3 (8.7)		N/A	N/A	N/A	158 (72)	42 (19)	0.56 (0.25)	9 (4)
	Electric						1 (4)	5 (19)	1 (4)	N/A	N/A		N/A

1. Data is based on 270°F (132°C), 4 minute sterilize, 30 minute dry cycle, processing 25 lb (11kg) instrument trays, maximum load in chamber.

2. Backflow preventer device in water line, when required by local codes, is installed by others.

3. Hot water recommended for units equipped with electric steam heat.

4. Peak steam demand (lbs/hr) may vary depending on operating conditions.

For further information, contact:

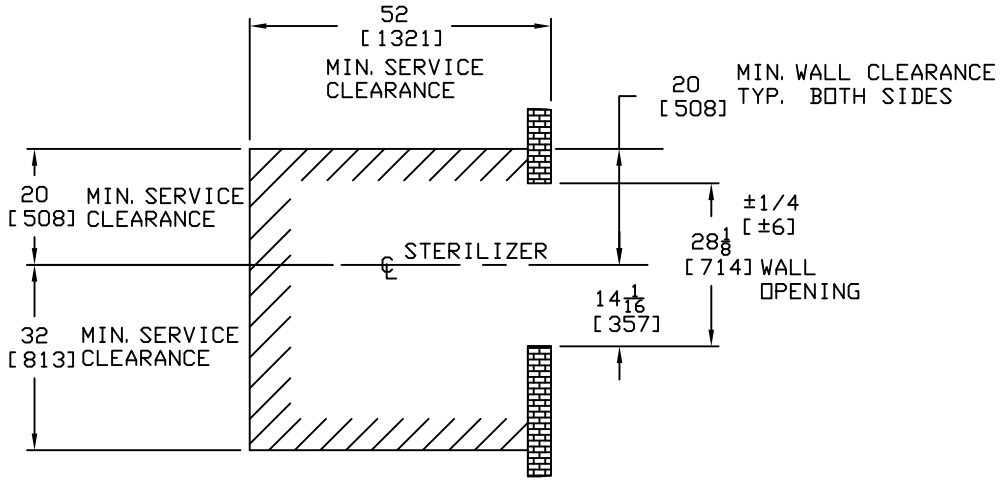
STERIS®

STERIS Corporation
5960 Heisley Road
Mentor, OH 44060-1834 • USA
440-354-2600 • 800-548-4873
www.steris.com

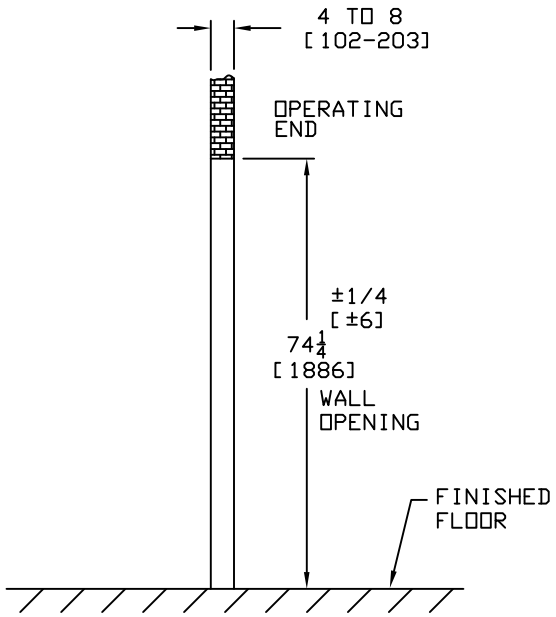
DATE: 02-22-11 DRAWN BY: E. S. CHECKED BY: JMS

E. C. A. NO. 120110 DATE 07-30-12 REV. 2 DWG. NO. 129394-050

PLAN VIEW



CHAMBER SIZE IN. (mm)
20 X 20 X 38 (508 X 508 X 965)
MAX. OUTSIDE DIM. OF STERILIZER
45 5/8 X 30 X 74 1/2 (1159 X 762 X 1891)



SIDE VIEW

NOTES:

1. WALL THICKNESS: 4" TO 8" (102-203).
2. ALL DIMENSIONS IN INCHES AND (MM).
3. THESE SERVICE CLEARANCES MUST BE MAINTAINED TO ALLOW ACCESS TO STERILIZER FOR SERVICEABILITY.
4. IF LOADING CAR AND CARRIAGE ARE TO BE USED, FRONT CLEARANCE SHOULD EQUAL TWICE THE LENGTH OF THE STERILIZER.

SERVICE CLEARANCE

SHT. 1 OF 6

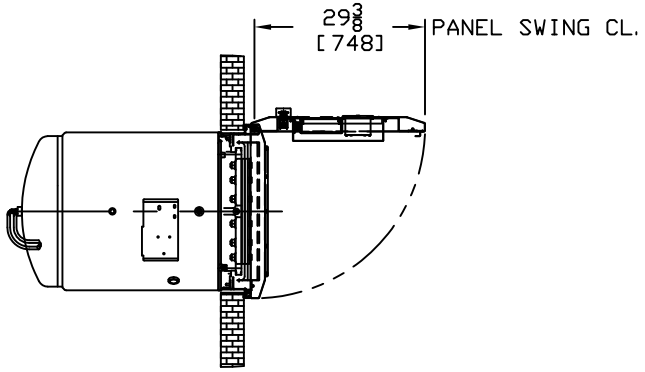
ALL DIMENSIONS ARE IN INCHES (MILLIMETERS) ALSO REFER TO GENERAL NOTES APPLICABLE TO EQUIPMENT DRAWINGS DWG. NO. 62941-091		20 x 20 x 38 AMSCO 400 SERIES PREVACUUM STERILIZER SINGLE SLIDING DOOR RECESSED ONE WALL STEAM HEAT	EQUIPMENT DRAWING NO. 129394-050
STERIS	STERIS Corporation Mentor, OH		ITEM _____ LOCATION(S) _____

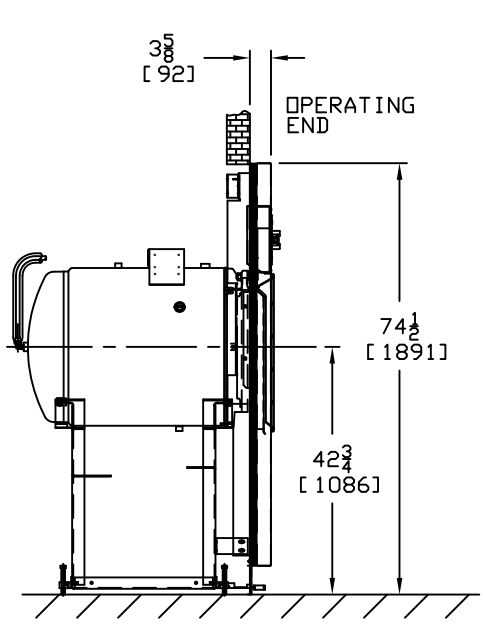
AUTOCAD. DWG.

DATE: 02-22-11 DRAWN BY: E. S. CHECKED BY: JMS

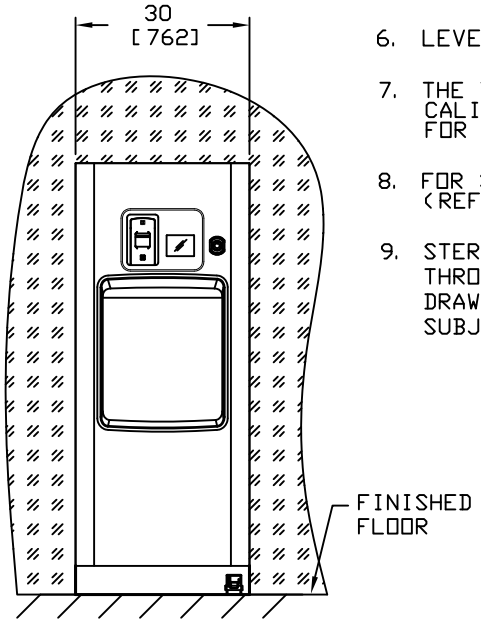
E. C. A. NO. 120110 DATE 07-30-12 REV. 2 DWG. NO. 129394-050

PLAN VIEW





SIDE VIEW



FRONT VIEW

GENERAL NOTES:

1. ALL DIMENSIONS IN INCHES AND (MM).
2. CURB WEIGHT:
   20 x 20 x 38 SD VESSEL = 1100 LBS. (499 KG.)
3. MAXIMUM OPERATING WEIGHT BASED ON CHAMBER FULLY LOADED WITH WATER FLASKS:
   20 x 20 x 38 SD VESSEL = 1231 LBS. (588 KG.)
4. FACILITY MUST PROVIDE REGULATED STEAM PRESSURE IN THE DYNAMIC RANGE SPECIFIED. FAILURE TO DO SO WILL RESULT IN IMPROPER EQUIPMENT OPERATION.
5. HEAT LOSS AT 70°F (21°C):
   20 x 20 x 38 - TO ROOM: 7000 BTU/HR (7,385 KILOJOULE)
6. LEVELING FEET ARE PROVIDED FOR PROPER INSTALLATION.
7. THE TIE-DOWN OF THIS STERILIZER HAS BEEN PRE-APPROVED IN CALIFORNIA (REF. OPA-0531). SEE STERIS DWG. NO. 83280-194 FOR SEISMIC LOADING AND TIE-DOWN SPECIFICATIONS.
8. FOR SEISMIC INSTALLATIONS: A SEISMIC ADD ON KIT (REF. 146660-184) MUST BE INSTALLED ON THE STERILIZER.
9. STERIS ASSUMES NO RESPONSIBILITY FOR CHANGES MADE NECESSARY THROUGH FAILURE TO OBSERVE THE SPECIFICATIONS ON EQUIPMENT DRAWING AND NOTE PAGES. SPECIFICATIONS AND DESCRIPTIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.

STERILIZER INSTALLATION

SHT. 2 OF 6

ALL DIMENSIONS ARE IN INCHES (MILLIMETERS) ALSO REFER TO GENERAL NOTES APPLICABLE TO EQUIPMENT DRAWINGS DWG. NO. 62941-091		20 x 20 x 38 AMSCO 400 SERIES PREVACUUM STERILIZER SINGLE SLIDING DOOR RECESSED ONE WALL STEAM HEAT	EQUIPMENT DRAWING NO. 129394-050
STERIS	STERIS Corporation Mentor, OH		ITEM _____ LOCATION(S) _____

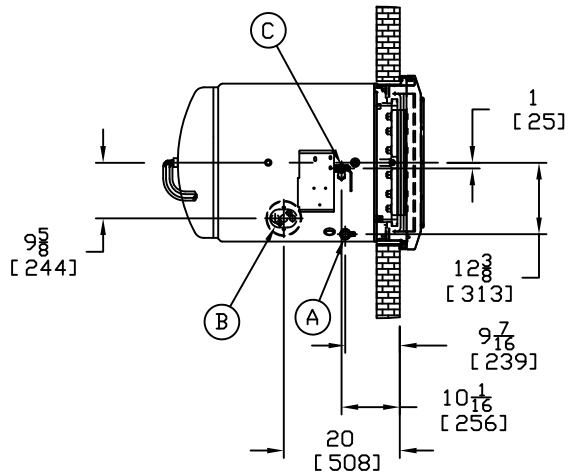
1635

AUTOCAD. DWG.

DATE: 02-22-11 DRAWN BY: E. S. CHECKED BY: JMS

E. C. A. NO. 120110 DATE 07-30-12 REV. 2 DWG. NO. 129394-050

PLAN VIEW



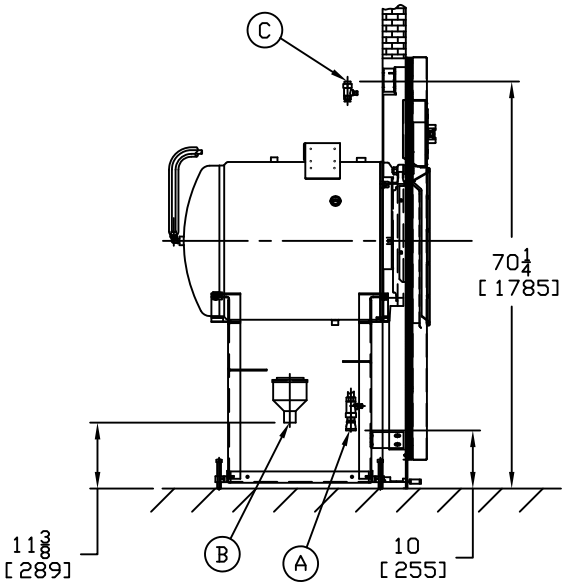
PLUMBING CONNECTIONS

Ⓐ STERILIZER COLD WATER

Ⓑ STERILIZER DRAIN

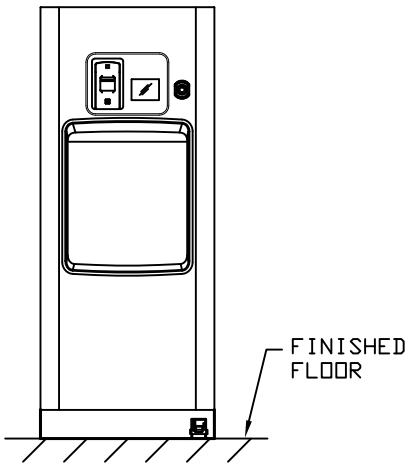
Ⓒ STERILIZER STEAM

NOTE: SEE SHEET 4 FOR PLUMBING INSTALLATION SPECS. AND PLUMBING REQUIREMENTS.



TO BOTTOM OF FUNNEL

SIDE VIEW



FRONT VIEW

SHT. 3 OF 6

ALL DIMENSIONS ARE IN INCHES (MILLIMETERS) ALSO REFER TO GENERAL NOTES APPLICABLE TO EQUIPMENT DRAWINGS DWG. NO. 62941-091		20 x 20 x 38 AMSCO 400 SERIES PREVACUUM STERILIZER SINGLE SLIDING DOOR RECESSED ONE WALL STEAM HEAT	EQUIPMENT DRAWING NO. 129394-050
STERIS	STERIS Corporation Mentor, OH		ITEM _____ LOCATION(S) _____

AUTOCAD. DWG.

DATE: 02-22-11 DRAWN BY: E. S. CHECKED BY: JMS

E. C. A. NO. 120110 DATE 07-30-12 REV. 2 DWG. NO. 129394-050

INSTALLATION SPECIFICATIONS:

THE INSTALLATION OF THE CHIMERON STERILIZER MUST MEET ALL APPLICABLE REGULATIONS.

INSTALLATION SPECIFICATION IS LISTED AS ENGINEERING AND INSTALLATION GUIDES. REFERENCED COMPONENTS AND SERVICE CONNECTIONS ARE NOT FURNISHED AS PART OF EQUIPMENT UNLESS UNDER WRITTEN AGREEMENT WITH STERIS.

1. PIPE SIZES LISTED UNDER **PLUMBING REQUIREMENTS** INDICATE THE EQUIPMENT TERMINATION SIZES ONLY. SIZE PIPING TO EQUIPMENT DEPENDING ON LENGTH OF PIPE RUN FROM PRESSURE REGULATING STATION FOR STEAM LINE, AND MAIN WATER HEADERS. TO SUPPLY THE SPECIFIED SERVICE PRESSURE AND FLOW RATE AT EQUIPMENT TERMINALS, INCLUDE EFFECT OF COINCIDENT DRAW OF MULTIPLE UNIT INSTALLATIONS.

2. PROVIDE PIPING, SHUT-OFF VALVE, PIPE PLUGGED TEE, AND UNION IN STEAM AND WATER SUPPLY CONNECTIONS BETWEEN EQUIPMENT AND STUB OUTS. PLUGGED TEE CAN LATER BE USED FOR TEST PRESSURE GAUGE CONNECTION. ARRANGE CONNECTION PIPING TO ALLOW ACCESS TO MACHINE COMPONENTS AND ELECTRICAL CONTROL PANEL.

3. RECOMMEND PROVISION OF BLOW DOWN VALVE AT EACH STEAM AND WATER STRAINER TO ENABLE STRAINER CLEAN OUT.

4. FOR RECOMMENDED FEED WATER QUALITY FOR STERILIZERS AND CARBON STEEL STEAM GENERATORS, SEE STERIS DWG. NO. 62941-091

5. BLOW DOWN BUILDING STEAM AND WATER SUPPLY LINES BEFORE FINAL CONNECTION TO EQUIPMENT.

6. 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 BY OTHERS.

7. FOR GENERAL INSTALLATION INFORMATION SEE STERIS DRAWING NO. 62941-091. (THIS DWG. SHOULD ALWAYS ACCOMPANY THE EQUIPMENT DWGS.) IF DWG. IS NOT ATTACHED, CONTACT STERIS SERVICE ENGINEERING AT 1-800-333-8848 TO OBTAIN A COPY.

8. **PLACEMENT OF PIPING SHUTOFFS**: WHEN INSTALLING; SHUTOFFS MUST BE LOCATED IN A SUITABLE LOCATION WITHIN LINE OF SIGHT AND CLEAR OF ANY OBSTRUCTIONS THAT WOULD PUT THE SERVICE PERSON IN **HARMS WAY** IN ORDER TO SHUT IT OFF.

PLUMBING REQUIREMENTS

Ⓐ STERILIZER COLD WATER: (SEE NOTE #4)

SUPPLY TEMPERATURE REQUIREMENTS ARE 50-70°F (10-21°C). VACUUM EFFICIENCY IS REDUCED AT WATER TEMPERATURES ABOVE 70°F (21°C).

1" NPT
30-50 PSIG DYNAMIC (2.1 TO 3.5 bar)

CONSUMPTION IN CYCLE:
PEAK-15 gpm (57 lpm)
AVERAGE-175 gal/cycle (662 l/cycle)

CONSUMPTION OUT OF CYCLE:
AVERAGE-12 gal/hr (.76 lpm)

SFPP CYCLES REQUIRE A MINIMUM OF 40 psig COLD WATER PRESSURE.

Ⓑ STERILIZER DRAIN:

1 1/2" ODT
(FLOOR DRAIN CAPACITY MUST HANDLE PEAK WATER CONSUMPTION).

Ⓒ STERILIZER STEAM:

1/2" NPT
97 TO 100% VAPOR QUALITY
DYNAMIC PRESSURE 50-80 PSIG (3.5 TO 5.6 bar)

CONSUMPTION IN CYCLE:
PEAK-158 lb/hr (72 kg/hr)
AVERAGE-42 lb/cycle (19 kg/cycle)

CONSUMPTION OUT OF CYCLE:
AVERAGE-9 lb/hr (4.1 kg/hr)

CHECK ALL NATIONAL CODES AND STANDARDS SHT. 4 OF 6

ALL DIMENSIONS ARE IN INCHES (MILLIMETERS) ALSO REFER TO GENERAL NOTES APPLICABLE TO EQUIPMENT DRAWINGS DWG. NO. 62941-091		20 x 20 x 38 AMSCO 400 SERIES PREVACUUM STERILIZER SINGLE SLIDING DOOR RECESSED ONE WALL STEAM HEAT	EQUIPMENT DRAWING NO. 129394-050
STERIS®	STERIS Corporation Mentor, OH		ITEM _____ LOCATION(S) _____

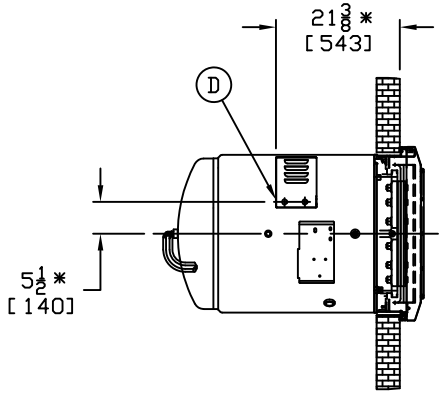
1635

AUTOCAD. DWG.

DATE: 02-22-11 DRAWN BY: E. S. CHECKED BY: JMS

E. C. A. NO. 120110 DATE 07-30-12 REV. 2 DWG. NO. 129394-050

PLAN VIEW

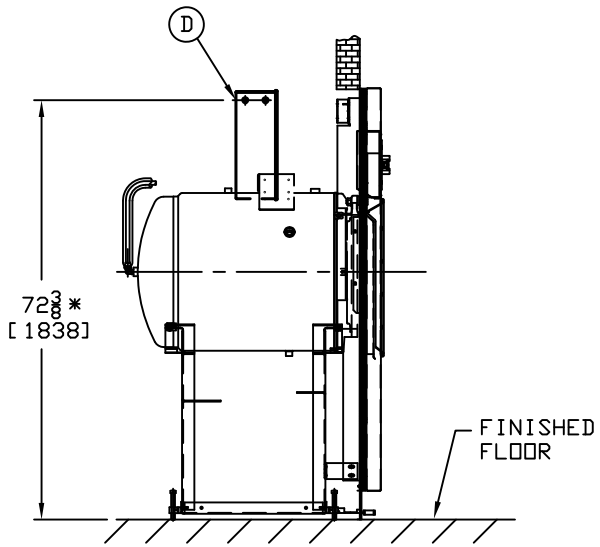


* = TO CONTROL BOX HOLE (D)

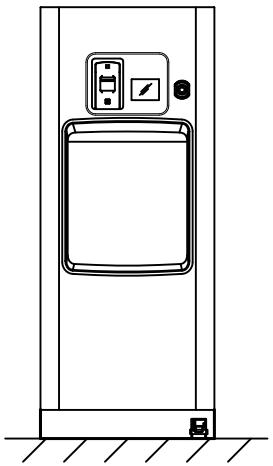
ELECTRICAL CONNECTIONS

(D) STERILIZER POWER

NOTE: SEE SHEET 6 FOR ELECTRICAL INSTALLATION SPECS. AND ELECTRICAL REQUIREMENTS.



SIDE VIEW



FRONT VIEW

SHT. 5 OF 6

ALL DIMENSIONS ARE IN INCHES (MILLIMETERS) ALSO REFER TO GENERAL NOTES APPLICABLE TO EQUIPMENT DRAWINGS DWG. NO. 62941-091		20 x 20 x 38 AMSCO 400 SERIES PREVACUUM STERILIZER SINGLE SLIDING DOOR RECESSED ONE WALL STEAM HEAT	EQUIPMENT DRAWING NO. 129394-050
STERIS	STERIS Corporation Mentor, OH		ITEM _____ LOCATION(S) _____

AUTOCAD. DWG.

INSTALLATION SPECIFICATIONS:

THE INSTALLATION OF THE CHIMERON STERILIZER MUST MEET ALL APPLICABLE REGULATIONS.

INSTALLATION SPECIFICATION IS LISTED AS ENGINEERING AND INSTALLATION GUIDES. REFERENCED COMPONENTS AND SERVICE CONNECTIONS ARE NOT FURNISHED AS PART OF EQUIPMENT UNLESS UNDER WRITTEN AGREEMENT WITH STERIS.

1. PROVIDE GROUPED OR GANGED CIRCUIT PROTECTION AND DISCONNECT FOR STERILIZER POWER AS REQUIRED BY CODES AND STANDARDS. INDIVIDUAL POWER SHUTOFFS REQUIRED NEAR EACH MACHINE FOR SERVICING.

2. PROVIDE GROUNDED METAL CONDUIT AND WIRING BETWEEN EQUIPMENT TERMINALS AND STUB OUTS OR DISCONNECTS. CHECK LOCAL CODES FOR MINIMUM AWG. WIRE SIZE, #16 AWG. MINIMUM RECOMMENDED.

3. **PLACEMENT OF ELECT. DISCONNECTS**: WHEN INSTALLING; DISCONNECTS MUST BE LOCATED IN A SUITABLE LOCATION WITHIN LINE OF SIGHT AND CLEAR OF ANY OBSTRUCTIONS THAT WOULD PUT THE SERVICE PERSON IN **HARMS WAY** IN ORDER TO SHUT IT OFF. ALSO, THE LOCATION OF THE DISCONNECTS SHOULD ALLOW THE SERVICE PERSON TO SHUTOFF POWER FROM THE SIDE TO PREVENT POSSIBLE ARC FLASH.

4. **CAUTION**: DO NOT USE GROUND FAULT CURRENT INTERRUPTERS (GFCI).

5. **ATTENTION**: THE ELECTRICAL CLEARANCES REQUIRED BY THE **NEC** ARE THE RESPONSIBILITY OF THE INSTALLER. ALSO, ADHERENCE TO LOCAL CODES AND PROCUREMENT OF PERMITS ARE THE RESPONSIBILITY OF THE CUSTOMER UNLESS AGREED TO IN WRITING WITH **STERIS.**

6. FOR GENERAL INSTALLATION INFORMATION SEE STERIS DRAWING NO. 62941-091. (THIS DWG. SHOULD ALWAYS ACCOMPANY THE EQUIPMENT DWGS.) IF DWG. IS NOT ATTACHED, CONTACT STERIS SERVICE ENGINEERING AT 1-800-333-8848 TO OBTAIN A COPY.

ELECTRICAL REQUIREMENTS

Ⓓ STERILIZER POWER:

CONTROL BOX FOR: 120V, 50/60 HZ, 2 AMP SINGLE PHASE SERVICE. MINIMUM RECOMMENDED LINE AND GROUND CONDUCTOR SIZE AWG #12 COPPER (2.05MM).

120VAC REQUIRE A THREE (3) WIRE CONNECTION (L1, NEUT, GND.)

MINIMUM 15A CIRCUIT BREAKER IS RECOMMENDED. INSTALLED NEAR THE EQUIPMENT WITHIN EASY REACH OF THE OPERATOR AND MARKED AS THE DISCONNECTING DEVICE FOR THE EQUIPMENT.

CHECK ALL NATIONAL CODES AND STANDARDS

ALL DIMENSIONS ARE IN INCHES (MILLIMETERS) ALSO REFER TO GENERAL NOTES APPLICABLE TO EQUIPMENT DRAWINGS. DWG. NO. 62941-091		20 x 20 x 38 CHIMERON PREVACUUM STERILIZER SINGLE SLIDING DOOR RECESSED ONE WALL STEAM HEAT	EQUIPMENT DRAWING NO. 129394-050
STERIS®	STERIS Corporation Mentor, OH		ITEM _____ LOCATION(S) _____

AUTOCAD. DWG.