

APPLICATION

This sterilizer is offered in a Prevacuum configuration and is designed for fast, efficient sterilization of heat- and moisture-stable materials in scientific applications. Prevacuum configuration sterilizers are equipped with pre-vacuum, gravity, liquid, leak test, and daily air removal (Bowie-Dick) test cycles.

The 48" and 60" configurations include choice of a single or a double door; 36" configuration provides single door, only.

DESCRIPTION

Amsco Century Medium Steam Sterilizers are equipped with the latest features in both state-of-the-art technology, and ease of use.

Primary Product Features

Interior Chamber Dimensions

- 26 x 37.5 x 36" (660 x 950 x 910 mm)
- 26 x 37.5 x 48" (660 x 950 x 1220 mm)
- 26 x 37.5 x 60" (660 x 950 x 1520 mm)

The sterilizer can be ordered with one of two door configurations:



Hinged Door Model

Horizontal-sliding Door Model

(Typical only—some details may vary.)

- **Hinged door** with fast operating, low-effort door lock mechanism. Manual door handle lock lever requires a single 30° handle movement to lock or unlock.
- **Sliding door** with quiet, motor-driven cable and pulley mechanism. Power operated door travels horizontally right to left to open and is controlled from the touch screen.

The Selections Checked Below Apply To This Equipment

SIZE

- 26 x 37.5 x 36" (660 x 950 x 914 mm)
- 26 x 37.5 x 48" (660 x 950 x 1219 mm)
- 26 x 37.5 x 60" (660 x 950 x 1524 mm)

STEAM SOURCE

- Building Steam

VACUUM PUMP ELECTRIC SERVICE

- 208/240 VAC, 60 Hz, 3-Phase, 6A/Phase
- 480 VAC, 60 Hz, 3-Phase, 3A/Phase

DOOR CONFIGURATION

- Single-door**

Hinged

- Horizontal-sliding

Select direction of door swing or movement, as viewed from Operating End of sterilizer:

- Left-hand
- Right-hand (not available for sliding-door units)

* 26 x 37.5 x 36" sterilizers not available in double-door configuration.

- Double-door***

- Hinged Door

NOTE: Operating end hinge position listed first; non-operating end hinge listed second.

- Right-hand/Left-hand
- Right-hand/Right-hand
- Left-hand/Right-hand
- Left-hand/Left-hand

- Horizontal-sliding Door

NOTE: Operating end slide direction listed first; non-operating end slide direction listed second.

- Right-hand/Left-hand

SINGLE-DOOR MOUNTING

- Cabinet Enclosed/Freestanding
- Recessed

DOUBLE-DOOR MOUNTING

- Recessed through One Wall
- Recessed through Two Walls

OPTIONS

- Pure Steam Piping
- RTD Load Probe and F₀ Sterilization

- Bio-Seal (double door units only)
- Air Differential Seal (double door units only)
- Eighteen-cycle Capability
- 3" Tri-clamp Penetration
- Integral Electric Steam Generator

ACCESSORIES

- 36" (914 mm) Chamber Length
- 48" (1219 mm) Chamber Length
- 60" (1524 mm) Chamber Length

Loading Car

Transfer Carriage

- Chamber Track Assembly
 - Single Door
 - Double Door
- Loading Car, Transfer Carriage, and Track Assembly
 - Single Door
 - Double Door
- (36" Units, only) Chamber Rack and Shelf
- Seismic Tie-down Kit

Item _____

Location(s) _____

Century 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.
- Standard communication interface with most PC-compatible peripheral devices (e.g., disk drives, printers).
- Automatic check of control program and cycle data maintains process integrity.
- Vacuum pump is supplied on all units to effectively pull chamber to specified vacuum levels, as well as reduce water consumption.

STANDARDS

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

- **EMC Directive: 89/336/EEC, 92/31/EEC, 93/68/EEC.**
- **Low Voltage Directive: 72/23/EEC, 93/68/EEC.**
- **Machine Directive: 89/392/EEC, 91/368/EEC, 93/44/EEC, 93/68/EEC.**
- **Pressure Equipment Directive: 97/23/EC.**
- **Underwriters Laboratory (UL) Standard 3101** as certified by ETL Testing Laboratories, Inc.
- **Canadian Standards Association (CSA) Standard C22.2, No. 1010.**
- **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 45 psig (3.1 bar).

FEATURES

26 x 37.5 chamber cross-section allows for efficient, high-volume sterilization processing.

Fast-operating, low-effort manual door lock mechanism (hinged-door models) allows door to be locked or unlocked, using a single 30° handle motion.

Power Horizontal-sliding Door – control panel operated horizontal-sliding door is available in left-hand, single- or double-door models.

Resistive Thermal Devices (RTD) are installed for sterilizer temperature control. The dual element 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.

Electronic water saving control includes a condenser RTD to control the amount of water used in condensing the exhausted chamber steam.

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.

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.

Two-piece insulation sleeve is fitted around exterior of the sterilizer vessel. The sleeve is sealed and held in place by hook-and-loop closures. Insulation is asbestos- and chloride-free, silicone impregnated, oil- and water-resistant fiberglass.

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

PROCESSING CYCLES

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

- **Gravity Cycle** – for the sterilization of heat- and moisture-stable goods at 100° to 137°C (212° to 279°F), and decontamination of bagged basic laboratory wastes. Gravity cycle utilizes the gravity air-displacement principle.
- **Liquid Cycle** – for the sterilization of liquids and media in vented borosilicate glass or metal containers at 100° to 123°C (212° to 254°F). Liquid cycle utilizes the optimal solution cooling feature, during exhaust (cooling) phase, to control the exhaust rate.
- **Prevacuum Cycle** – for efficient, high-volume sterilization of porous, heat- and moisture-stable materials at 121° to 137°C (250° to 279°F). Prevacuum cycle utilizes a mechanical air-evacuation system.

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. All timing is preprogrammed and cannot be adjusted.
- **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.

CONTROL SYSTEM

Design Features

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

IMPORTANT: If factory-programmed cycle values are changed, it is necessary for the operator to validate the efficacy of the changed cycle.

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 the cycle is complete. On completion of the 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 is set to stop and automatically reset once normal operating temperature is reached.

Critical control system components are housed within a sealed compartment to protect the components from moisture and heat generated during the sterilization process. A cooling fan with filter is installed in the housing compartment to maintain positive pressure within the compartment, keeping components cool and dust-free.

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

- **Touch-sensitive Screen** features a 30-line x 40-character 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 "touch



Prevac Configuration Sterilizer

pads." 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" (57 mm) wide paper. 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.

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 military (MIL).

- **Access Code** – requires entry of a four-digit access code to operate the sterilizer and/or change the cycle values. Operating the sterilizer, or accessing Change Values menu, causes display to request the entry of an access code. If the access code is not properly entered, display returns to the standby or main menu screen, denying user access to the sterilizer or programming.

- **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 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 or bar. Recalibration is not required when changing pressure units.

Technical Data

Control system consists of microcomputer control boards and peripheral function circuit boards, located within the control column PC board housing.

An **internal battery** backs up all cycle memory for up to 10 years. If a power failure occurs during a cycle, the battery backup system assures 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 1 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 Lockout Switch – equipped on chamber door, senses when the door seal is energized, and is tight against the door. Control prevents the cycle from starting until the limit switch signal is received. If the control loses the appropriate signal during the cycle, the alarm activates, the cycle aborts, and the chamber safely vents with a controlled exhaust.

Chamber Float Switch – activates the alarm, aborts the cycle, and safely vents the chamber with a controlled exhaust if excessive condensate 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 dished head.

Sterilizer vessel is ASME rated at 45 psig (3.1 bar) and insulated. Vessel includes one 1"-NPT welded chamber bushing for customer use.

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

Chamber Door(s)

Door is constructed 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 the sterilizer cycle is complete, the seal retracts under vacuum into a machined groove in the sterilizer's end frame.

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

The door assembly is equipped with a mechanical locking mechanism that prevents the door from opening, as long as the seal is intact and energized, and more than 2 psi (0.14 bar) pressure is in the chamber.

The sterilizer door is fitted with a stainless-steel panel that 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, consisting of a stainless-steel plate-type condenser, 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 in the recessed area of the unit (see illustrations on pages 7 and 8).

Vacuum System

Vacuum pump 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.

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. Steam piping is constructed of brass, and includes a shutoff valve, steam strainer, 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** 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. (For double-door mounting, the recessed installation can be through one wall or two walls.) Each sterilizer is height-adjustable. Sterilizer subframe is equipped with a synthetic rubber gasket to support a 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.

OPTIONS

Pure Steam Piping – 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.

RTD Load Probe and F₀ Sterilization – automatically senses 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, F₀ set points are available for each cycle, allowing for exposure phase termination based on the calculated F₀ value.

Bio-Seal (Double Door units only) – 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.

Air Differential Seal (Double Door units only) – provided on the non-operating end of the sterilizer, prevents passage of vermin from nonsterile area to the sterile area.

Eighteen-Cycle Capability – provides an additional 12 cycles to the control system memory, for a total of 18 cycles.

3" Tri-Clamp Penetration – permits insertion of temperature probes, such as thermocouples or resistive thermal devices (RTD), into the chamber. The assembly includes a stainless-steel threaded clamp, seal, and seat to accept a maximum of 12 customer-supplied probes.

Integral Electric Steam Generator – An optional 45 kW steam generator is available for this sterilizer. The generator is manufactured of carbon or stainless steel, and is positioned beneath the sterilizer. Additional floor space, either at the rear of the sterilizer (single door chamber), or at the side (double door chamber) is required. Additional utility requirements are also needed. Refer to the appropriate equipment drawings if an integral steam generator is required.

ACCESSORIES

Seismic Tie-down Kit – conforms to Title 24 California Code of Regulations, 1993 Amendment Section 2336(B).

Material Handling Accessories – include stainless-steel chamber tracks and stainless-steel loading cars with painted-steel carriages. Stainless-steel chamber rack and shelf are available for 36" (914mm) sterilizers. See separate product literature for details.

PREVENTIVE MAINTENANCE

A global network of skilled service specialists can provide periodic inspections, and adjustments to assure low-cost peak performance. STERIS representatives can provide information regarding Annual Maintenance Agreements.

NOTES

Refer to equipment drawing for full information.

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 by others.
2. Pipe sizes shown indicate terminal outlets only. Building service lines, provided by others, must supply the specified pressures and flow rates.
3. Disconnect switches (with OFF position lockout only; by others) 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. Depending on the loading equipment used, additional clearance is required:
 - If shelves are used, length of sterilizer plus 24" (610 mm) at each door.
 - If loading car and carriage will be used, twice the length of sterilizer at each door.
7. Floor drain should be provided within confines of sterilizer framework.

UTILITY REQUIREMENTS

Drain (D)

2" ODT drain terminal (floor drain capacity must handle peak water consumption)

Electric Control (EC) Domestic

120 V, 1-phase, 60 Hz, 2 A

Electric Control (EC) International

230 V, 50 Hz, 1-phase, 1.5 A

Electric Control, Vacuum Pump (VP) Domestic

480 V, 60 Hz, 3-phase, 3 A per phase, **or**
208/240 V, 60 Hz, 3-phase, 6 A per phase

Electric Control, Vacuum Pump (VP) International

400 V, 50 Hz, 3-phase, 4 A per phase

Steam (S)

Pressure – 50 to 80 psig (3.45 to 5.52 bar, dynamic), condensate free, and 97% to 100% vapor quality

Consumption – 185 lbs/hr (84 kg/hour)

Peak Flow – 335 lbs/hr (152 kg/hour)

Size – 1" NPT

Sterilizer Feedwater (FW)

Pressure – 20 to 50 psig (1.38 to 3.45 bar), dynamic

Consumption – 130 gal/hr (495 L/hour)

Peak Flow – 15 gal/min (57 L/min)

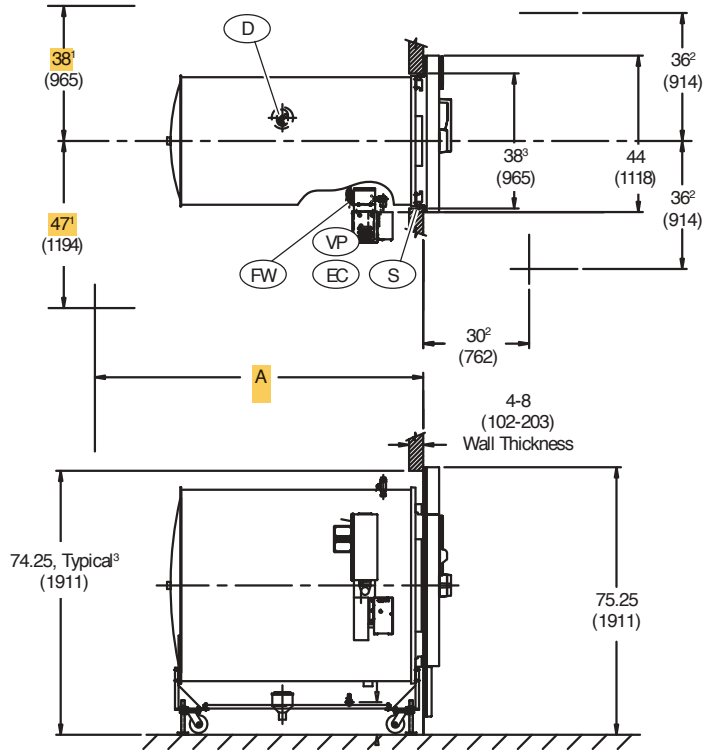
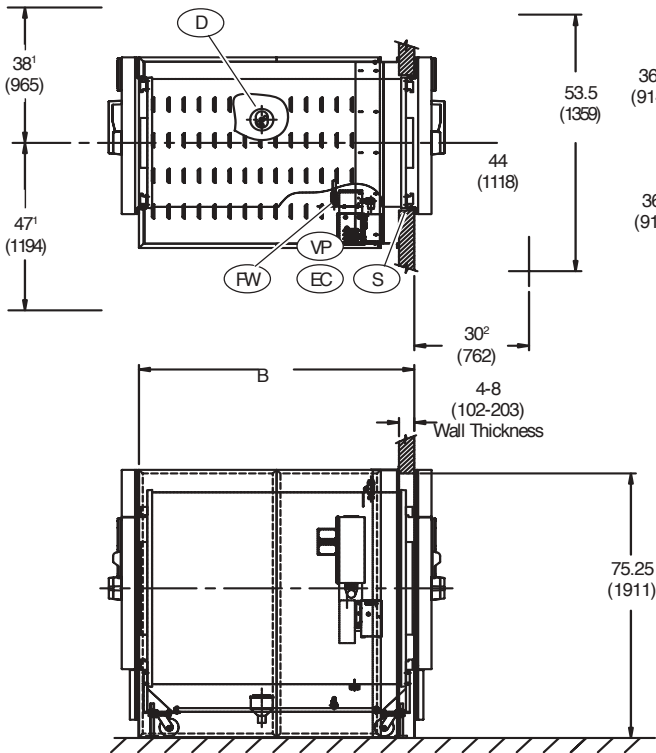
Size – 1" NPT

NOTE: Backflow prevention is by others; not supplied on unit.

... CHECK LOCAL CODES ...

Single Hinged-Door, Cabinet Enclosed

Single Hinged-Door, Recessed, One Wall



- ¹ Service Clearance
- ² Door Swing (left hand swing shown)
- ³ Wall Opening

Dimensions are inches (millimeters).

ENGINEERING DATA

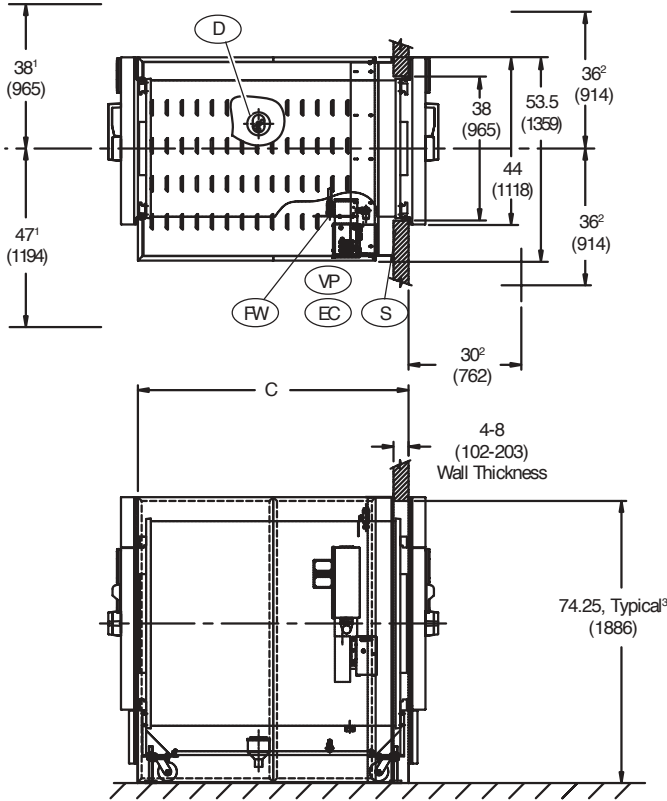
Drain:	2" ODT drain terminal (floor drain capacity must handle peak water consumption)	
Electric:		
• USA:	Control:	120 volt, 1-phase, 60 Hz, 2 A.
	Vacuum Pump:	208/240 volt, 3-phase, 60 Hz, 6 A per phase, or 480 volt, 3-phase, 60 Hz, 3 A per phase.
• UK:	Control:	230 volt, 1-phase, 50 Hz, 1.5 A.
	Vacuum Pump:	400 volt, 3-phase, 50 Hz, 6 A per phase.
• International:	Control:	230 volt, 1-phase, 50 Hz, 1.5 A.
(Outside UK)	Vacuum Pump:	400 volt, 3-phase, 50 Hz, 4 A per phase.
Steam:	Pressure – 50 to 80 psig (3.45 to 5.52 bar, dynamic), condensate free, and 97 percent to 100 percent vapor quality Consumption – 185 lb/hr (84kg/hour) Peak Flow – 335 lb/hr (152 kg/hour) Size – 1" NPT	
Water:	Pressure – 20 to 50 psig (1.38 to 3.45 bar), dynamic Consumption – 130 gal/hr (495 L/hr) Peak Flow – 15 gal/min (57 L/min) Size – 1" NPT	
Operating Weight:	26 x 37.5 x 36" (660 x 950 x 914 mm)	3800 lb (1720 kg)
	26 x 37.5 x 48" (660 x 950 x 1219 mm)	4200 lb (1900 kg)
	26 x 37.5 x 60" (660 x 950 x 1524 mm)	4700 lb (2125 kg)

NOTES:

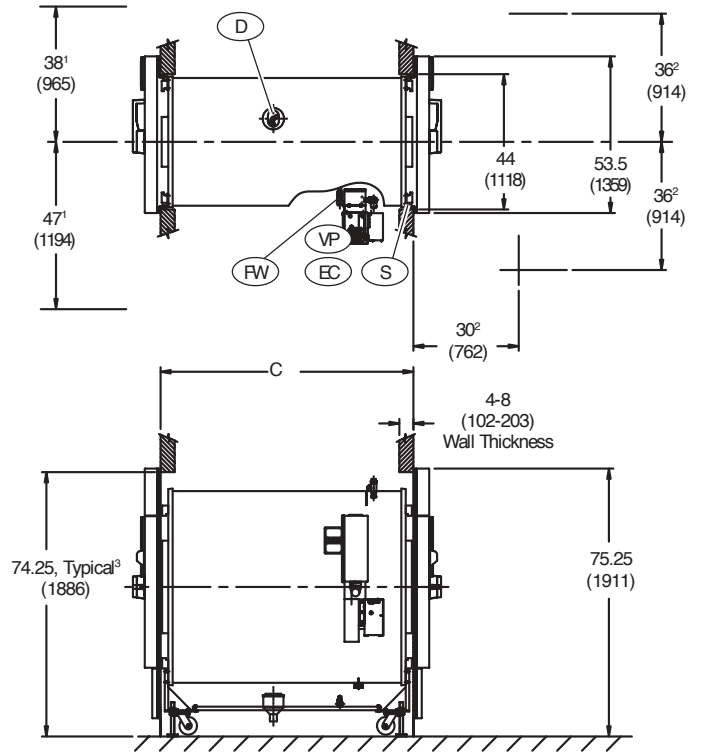
Operating weight includes a full load in the chamber.

Water consumption data is based on running one fully loaded Prevac cycle per hour and the machine idling for the remainder of the hour.

Double Hinged-Door, Recessed, One Wall



Double Hinged-Door, Recessed, Two Walls



- ¹ Service Clearance
- ² Door Swing (left hand swing shown)
- ³ Wall Opening

Dimensions are inches (millimeters).

WATER QUALITY RECOMMENDATIONS

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 *	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

NOTE: Because of STERIS's continuing program of research and development, all specifications and descriptions are subject to change without notice. Some options may affect utility consumptions. Obtain certified drawings for design and installation.

OVERALL INSTALLED LENGTH

Refer To Illustrations.
Dimensions are: inches (mm).

	Chamber Length		
	36 (914)	48 (1219)	60 (1524)
A	69 (1753)	81 (2057)	93 (2362)
B	58 (1473)	70 (1778)	82 (2082)
C	48 (1219)	60 (1524)	72 (1829)
D	59 (1499)	71 (1803)	83 (2108)
E	71.5 (1816)	83.5 (2121)	95.5 (2425)
F	53.25 (1352)	65.25 (1657)	77.25 (1962)