



# CONSOLIDATED<sup>®</sup> STERILIZER SYSTEMS

Models	
<b>3AV-HC</b> (20" x 20" x 38")	
<b>26AV-HC</b> (26" x 26" x 39")	
<b>26BV-HC</b> (26" x 26" x 49")	

## Consolidated HC Steam Sterilizers General Specifications

### General Specification

#### Steam Sterilizer with EZ-Glide Vertical Sliding Door

Consolidated HC Steam Sterilizers are designed to sterilize autoclavable medical devices used in healthcare facilities at temperatures between 250° F and 275° F (121° C and 135° C) through the use of steam. Choose a stainless steel vessel construction in a variety of sizes with standard pre-vacuum and gravity operation. Consolidated sterilizers offers a range of performance options to meet the demands of hospitals, ambulatory surgery centers (ASCs), and healthcare clinics.

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### Features and Benefits

#### Simplified Maintenance, Low Cost of Ownership.

*All Consolidated sterilizers are manufactured in the USA and built from commonly available parts to allow quick and cost effective field-level service and maintenance.*

#### Serviceability.

*Easy access to replaceable components, off-the-shelf component availability, and common electrical and plumbing parts permit qualified facility or area service companies to maintain the sterilizer.*

#### Validated Cycles.

*The Consolidated HC Steam Sterilizers are for general purpose gravity, vacuum, or liquid steam sterilization of heat and moisture-stabile goods, surgical instruments, and supplies. All models utilize both gravity/downward air displacement with positive-pressure pulse conditioning and pressure/vacuum pulsing for dynamic air removal.*

#### Green and Environmentally Friendly.




*Unique, new technologies reduce water and energy consumption without compromising performance.*



*Consolidated HC Steam Sterilizers are available in single door models. A versatile control system offers a range of performance options to meet the demands of hospitals, ambulatory surgery centers (ASCs), and healthcare clinics. Model 3AV-HC shown.*

## MODEL SIZES & WEIGHT

### Summary Selection Chart

Model	Chamber Dimensions (w x h x f-b)	Volume (cu. ft. / liters)	Ship Weight (lbs/kg)	Overall Dimensions (w x h x f-b)
<b>Sliding Door Model</b>				
				
<b>3AV-HC</b>	20" x 20" x 38" 50.8 x 50.8 x 96.5 cm	8.8 cu. ft. 249 liters	1,650 lbs 750 kg	31" x 72.875" x 51" 78.6 x 185.1 x 129.5 cm
<b>26AV-HC</b>	26" x 26" x 39" 66.04 x 66.04 x 99.1 cm	15.25 cu. ft. 431.8 liters	2,600 lbs 1,179 kg	46.375" x 77" x 54" 117.8 x 195.6 x 137.2 cm
<b>26BV-HC</b>	26" x 26" x 49" 66.04 x 66.04 x 124.5 cm	19.2 cu. ft. 543.7 liters	2,850 lbs 1,293 kg	46.375" x 77" x 64" 117.8 x 195.6 x 162.6 cm

### High Performance Sterilization

The Consolidated HC steam sterilizer is a device that is intended for use by health care providers to sterilize medical devices by means of pressurized steam.

Consolidated uses only commonly-available, open-source parts in all phases of sterilizer design and construction, thereby permitting quick, economical and locally-managed service throughout the life of the product. With maximum uptime engineered into the product, Consolidated sterilizers offer a superior return on investment as demonstrated through thousands of installations worldwide.

## STERILIZER CONSTRUCTION

### Sterilizer Chamber

Consolidated steam sterilizer vessels are manufactured with an inner chamber and a full outer jacket. The inner chamber and jacket are constructed of type 316L stainless steel and all vessels are polished to a high luster finish and passivated. Sterilizers are equipped standard with a 1/2" NPT port for use with validation or process measurement equipment in compliance with AAMI ST8. Pressure vessels are welded in compliance with ASME Section VIII, Division I.

### EZ-Glide™ Power Sliding Door with Foot Pedal

- The EZ-Glide™ sliding door simplifies chamber access with a sliding counterbalanced door that seals safely against an air-actuated, non-stick gasket.
- The gasket is recessed into a precision-machined slot and will maintain a secure seal even in the event of a total utility loss. The gasket is easy to replace and does not require special tools or lubrication.
- The door sealing mechanism includes redundancy for added security; a safety lock prevents the door from opening if the chamber is under pressure.
- Ergonomic benefits include a wide-grip handle and smooth, vertical open/close action on a counterbalanced assembly that is easy-to-operate with one-hand access.
- Standard configuration is automatic operation via button on touchscreen or via foot-pedal located below the sterilizer chamber.
- Safety features
  - Power door with low closing force can be stopped with minimal effort.
  - Powered door is closed using a push and hold button or press and hold foot-pedal actuation.

### Chamber Door and Gasket System

Consolidated HC Steam Sterilizers are equipped with an automatically opening and closing powered door. The door can be opened with the press of a button on the touchscreen or by food-pedal located in front of the sterilizer. A counterweight ensures that the door motion is smooth and controlled, and that the door requires low force for safe and efficient operation.

The sterilizer doors are designed with redundant, independent mechanical and software features to ensure maximum safety. Door design specifications meet all ASME code requirements.

- Door engagement is clearly visible to confirm closure.
- An electrical door switch ensures that the door is fully closed and locked prior to the start of the cycle. If the signal is lost during a sterilizing cycle, the cycle is automatically aborted.
- The door is mechanically locked during a cycle to prevent inadvertent opening.
- Abrasion resistant, low-friction, non-stick sealant on gasket prevents door jams and extends gasket life.

### Components

- Piping, fittings, and valves are available in stainless steel or brass/bronze. All parts and components subject to repair are publicly available (i.e. non-proprietary) from open-market sources, including controls, valves and fittings.
- Safety relief valves and drains are integral to the plumbing configuration.
- Cabinet insulation retains heat and minimizes heat loss (see Table 11) to the room, thereby reducing HVAC energy consumption. The sterilizer jacket and all steam service piping include a minimum 1" fiberglass-based insulation.
- Baffled steam inlets minimize condensation on the load, reduce load wetting, and help assure proper steam uniformity within the chamber.
- On units equipped with steam generators, a manual reset pressure switch is included to back up the safety relief valve by automatically shutting down the steam generator if an overpressure condition exists.
- Easy-to-read pressure gauges ensure simple and safe operation.
- Other components offered, dependent on facility utilities, include an integral steam generator, booster pump, RO system, etc.

### Control and Monitoring System

Consolidated offers a state-of-the-art control system built from industry standard, open source components for international availability of parts and service. Consolidated's controllers offer proven reliability, based on an industrial PLC platform programmed specifically for Consolidated's sterilizers, complete with modern user interface and an intuitive touchscreen display (see chart on page 5).

- Includes industry standard cycles per ANSI/AAMI ST-8: Hospital Steam Sterilizers.
- Simplifies operation with intuitive operator interfaces. Optional features allow the operator to add favorite shortcuts for frequently-used cycles and prevent users from modifying sterilization parameters on individual cycles.
- Automatically cracks the door open at the end of the cycle to cool the load prior to removal from the sterilizer.
- Assures quality control and process integrity.
- Features sterilizer cycle quality reporting via thermal printer and SD card electronic download.
- Internal battery retains all data in memory for at least 6 months.

## Alarms

Detailed performance and function alarms are included with each controller, as well as an alarm history report visible on the touchscreen. Standard safety alarms are included in all Consolidated sterilizers. Process alarms are documented and communicated both audibly and visually.

## Service and Preventative Maintenance Reminders

In healthcare facilities, uptime is of utmost importance. As such, the Consolidated HC Steam Sterilizers are equipped with service and preventative maintenance reminders to help stay facilities stay proactive about maintenance and service. The alerts will be displayed on the touch screen and printed at adjustable use-based or time-based intervals. If desired, this functionality can be disabled.

## Flood Switch

In the event of excessive liquid in the chamber or jacket, an alarm will sound and a message will be displayed warning the user about the flood condition. Factory installed.

## Cycle Safeguards

The following cycle safeguards help assure safe operation.

- Cycles cannot start unless the door is properly closed and locked.
- Chamber gauges are installed on the operating end of the sterilizer to display pressure in psig and vacuum in inches-Hg.
- Exhaust is automatically condensed and cooled to a safe drainage temperature.
- Multi-rate liquid exhaust allows users to select an exhaust rate above and below an adjustable temperature set-point. This prevents boil-over of liquids and reduces total cycle time.
- Emergency Stop button cuts power to all valves and pumps and stops all processes.

## Calibration

All temperature and pressure sensors on the sterilizer can be calibrated using an intuitive, integrated, three-point calibration method.

## Printer

A thermal printer is integrated into the main control panel. Printout includes all important information regarding the sterilization cycle recorded at user-defined intervals. Information includes: operator identification, cycle type, cycle parameters, cycle phase, time, chamber pressure and temperature, alarms or messages and cycle completion status.

## Electronic Data Storage via SD/USB

Cycle data is stored on a non-volatile flash memory device and saved in CSV format. The flash memory device can be used to transfer the data to other computers or tablets. The user can use the data to create graphs and perform data analysis. This feature allows users to extract Raw Cycle Data (Time, Temp, Pressure), Cycle History (User ID, Cycle Name, Time, Temp, Alarm Code, Cycle Result), and Duplicate Cycle Data (an electronic copy of the paper print-out).

## Steam Sources

Consolidated sterilizers can operate on house steam or steam produced by integral or remote steam generators. Incoming water quality is always a primary consideration in selection of a steam generator (see Table 10).

Selection of the steam source is based on facility steam availability and other factors associated with sterilizer use and throughput.

## House Steam

In most situations standard house steam, when available, is adequate. An inlet steam filter may be required to clean and dry the steam prior to injection into the sterilizer plumbing system.

## Electric Steam Generator

When house steam is not available, an electric boiler may serve as the steam source. Higher wattage generators produce a higher rate of steam to the chamber. Standard voltages available are 208, 240, 380, 480. Three-phase or single-phase voltage connections are available.

- Integrated Boiler

Consolidated can provide an integral (fits under the sterilizer chamber) steam generator up to 45 kW.

A standard steam boiler, constructed of carbon steel, is utilized on units fed with tap, softened or RO water. (See Table 10 for water quality requirements).

A clean steam boiler, constructed of type 316L stainless steel, is required when the feed water quality is >1 MΩ•cm. This option typically requires that the sterilizer be constructed with a stainless-steel chamber, jacket, and plumbing.

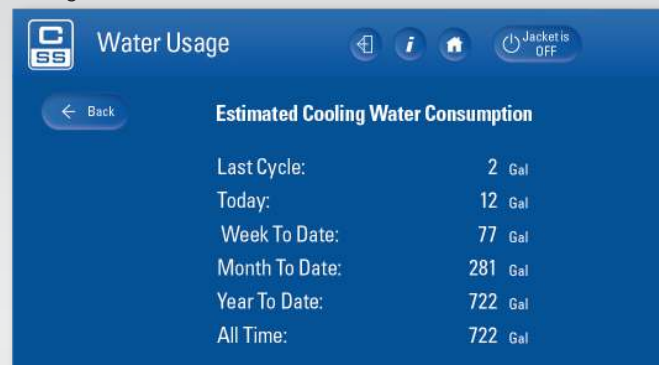
## Generator Blowdown

In facilities where water quality is poor, a generator blowdown function is required to flush impurities from the system and prevent collection of contaminants on the heating elements. An automatic blowdown feature is included with all Consolidated carbon steel steam generators.

## Sustainable Features (Included with Every Autoclave)

### Water Conservation & Monitoring System

All units are equipped with an integral WaterEco® water saving system that cools effluent discharge temperature (to drain) to less than 140° F (60° C) while keeping water consumption to a minimum (reduces cooling water by up to 90% over conventional sterilizers). This system also monitors, measures and reports quenching-water consumption through the touch screen.



User-Interface: Water Usage Screen

### EcoCalendar™

The controls are equipped with a calendar-based automatic start-up and shut-down feature known as EcoCalendar. This feature helps minimize utility consumption and HVAC load through a software controlled, automatic steam shut-off program. Utilities can be programmed for automatic start-up and shut-down based on time of day and day of the week.

### Auto Idle Shut-Off

Like the EcoCalendar, this feature helps save energy by shutting the autoclave off when not in use. It functions similarly to a "sleep-mode" for your home computer. Simply set the desired idle time and the autoclave will enter Sleep Mode after the set idle time has elapsed.

### EcoJacket™

EcoJacket automatically lowers the temperature of the sterilizer jacket in between cycles, reducing steam and water usage, as well as heat load to the room, while keeping the jacket pre-heated to quickly start the next cycle.



- A. Hinged front panels for easy access
- B. EZ-Glide™ vertical sliding door
- C. Integral electric steam generator (optional)
- D. Control column (Models 26AV-HC & 26BV-HC only, on Model 3AV-HC controls are top mounted)

**Model 26AV-HC (Front View)** Service access panel hinge and control column may be placed on left or right to ease service. Controls, printers, communications, electrical, mechanical and plumbing circuits are positioned for proactive maintenance.

### Air Removal

Depending on the application and required cycle, air removal may be achieved by gravity displacement or mechanical assistance through vacuum for pre- and post-cycle use as required.

- For gravity air removal, the buoyancy of steam coupled with positive steam pressure pulses is used to displace the air.
- For pre-cycle vacuum, Consolidated offers a choice of a water-ejector vacuum system, or a water-minimizing liquid ring pump.
- For post-cycle vacuum where drying assistance is desired, the sterilizer can use a water-ejector vacuum system or a water-minimizing liquid ring pump.
- Following completion of the post-vacuum function and throughout return to ambient pressure equilibrium, the returning air is filtered through a 0.3 micron bacteria-retentive HEPA filter.

### Sterilizer Mounting

Consolidated sterilizers are available for installation as floor-standing cabinet-enclosed units with a stainless-steel superstructure to conceal plumbing and wiring. The sterilizers may also be recess-mounted through a wall. Hook-ups for utility connections can be located anywhere on the unit as required, however house connections must be within 5 feet of the unit unless otherwise specified prior to installation. Model 3AV-HC sterilizers are mounted on rollers for ease of installation, placement and service. When service clearance is limited, sterilizer may be moved for greater accessibility. Available only on the 3AV-HC model without seismic anchoring.

### Shelving

Shelves and racks are constructed of electro-polished type 316L stainless steel:

- Three (3) extendable shelves are available on all sizes.
- Optional loading cart and transfer carriage is available. See Options below for further details.


### Water Quality Compatibility (Stainless Steel vs. Non-Stainless Selection)

Materials that contact the water supply to the sterilizer, including the steam generator, valves and piping must be compatible with the purity of the water. See Table 10.

- If deionized or distilled water or water with a purity greater than 1 MΩ•cm is supplied, then all such points of contact must be of stainless steel construction.
- If softened water, water purified by reverse osmosis or tap water with purity of less than 0.2 MΩ•cm is supplied, then such points of contact may be of carbon steel, bronze or brass construction, as appropriate.

### Compliance and Certifications

Depending on desired application, Consolidated sterilizers can be certified for compliance to the following standards for performance and safety:

- Buy America Act compliant 
- ASME (American Society of Mechanical Engineers): Section VIII, Division I (Unfired Pressure Vessel) code.
- ASME: Section I Code (Miniature Boilers).
- ASME: CSD-1 Code (Controls and Safety for Boilers).
- IEC/UL 61010-1 Edition 3—Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use—Part 1: General Requirements.
- IEC/UL 61010-2-040 Edition 3—Particular Requirements for Sterilizers and Washer-Disinfectors Used to Treat Medical Materials.
- IEC 61326-1:2020 Edition 3—Electrical Equipment for Measurement, Control, and Laboratory use—EMC Requirements—Part 1: General Requirements
- UL and cUL (Underwriters Laboratory) Listed
- US NEC (National Electrical Code) and National Plumbing Code; NFPA-70.
- ANSI/AAMI/ST8:2013/(R)2018 Hospital Steam Sterilizers.

## Consolidated Sterilizer Systems — Control System for Consolidated HC Steam Sterilizers

Consolidated’s controllers offer proven reliability, based on an industrial PLC platform programmed specifically for each Consolidated sterilizer based upon the application. The entire system is built from industry-standard, open-source components for international availability of parts and service.

Operator Interface	
Display	7" (17.8 mm) Widescreen Color Touchscreen
Resolution	WVGA 800 x 400
Mounting Options	3AV-HC — Top 26AV-HC & 26BV-HC — Left or Right

Validated Sterilizer Cycles	
<ul style="list-style-type: none"> <li>Gravity</li> <li>Pre-Vacuum</li> <li>Vacuum Leak Test</li> </ul>	<ul style="list-style-type: none"> <li>Liquid</li> <li>Bowie-Dick (Air Removal Test)</li> </ul>

Green Features	
WaterEco® Water Conservation & Monitoring System	Standard
Energy Saver EcoCalendar for Scheduled On/Off Steam Supply	Standard
Auto Idle Shut-Off	Standard
EcoJacket	Standard
Insulated Steam Piping	Standard

Security and Process Integrity	
Multi-layered Password Security for Manager and Service	Standard
Cycle Configuration is Locked for End Users. Certain Parameters are Adjustable for Managers.	Standard
User Traceability Password Protection	Standard
Up to 50 Usernames and Passwords	Standard

System Monitoring and Data Storage	
Thermal Printer	Standard
Electronic Data Storage via SD/USB	Standard
Dry Contacts for remote indication of Door Open, Alarm Condition, Cycle Running, Cycle Over, and/or Jacket On	Optional

Sterilizer Control	
E-Stop	Standard
Three Point Calibration of Sensors	Standard
Automatic Condensate Exhaust Management for all Cycles	Standard
Battery Backup of Program, Memory, & Configuration Data	Standard
Ability to Favorite Cycles	Standard

Visual and Audible Alarms	
Cycle Complete, Sensor Failure, Over Temperature, Under Temperature, Over Pressure, Time Limit, Door Seal	Standard
Alarm History Report on Touchscreen	Standard
Preventative Maintenance & Service Reminders	Standard

Documented Cycle Information	
User Defined Cycle Name	Standard
Start Time and Date	Standard
Cycle Type	Standard
Chamber Temperature/Pressures	Standard
Cycle Summary	Standard
Operator ID (If Applicable)	Standard
Cycle Set-Points and Parameters	Standard
Alarms	Standard



## Sterilization Cycles

Consolidated sterilizers are equipped with 11 validated cycles with the ability to program up to 48 sterilization cycles. Operators may customize cycle parameters above their pre-programmed minimum values, however these cycles are to be used for research purposes only. All cycle parameters are easily viewed prior to and during the cycle run.

### Warm Up

For convenience, Consolidated HC Steam Sterilizers are programmed with a warm up cycle — a very short, empty-chamber, cycle to be run at the start of each day. The warm up cycle ensures that all components are pre-heated which helps remove condensate and residual moisture from plumbing lines. The following cycles are pre-configured and installed on all sterilizers:

### Pre-Vacuum

This cycle performs a series of steam pulses and vacuum draws prior to sterilization to assure that air has been removed from the load. This also permits the ability to vacuum dry (see Figure 1).

### Gravity

This cycle utilizes gravity displacement coupled with positive-pressure pulses to effectively remove air from the chamber. The cycle draws a vacuum following sterilization

## Sterilizer Cycle Operation

### Pre-Vacuum with Post-Vacuum Drying. (Figure 1)

*Steam flows through the sterilizer; temperature and pressure ramps slightly to a continuous flow purge.*

*The controller closes the exhaust valve and interior temperature and pressure ramp to an intermediate setpoint without dwell.*

*A vacuum system draws the interior atmosphere to negative pressure to remove air from concealed pockets within the load.*

*The process is repeated per program and protocol. Following the final pre-vacuum pulse, the sterilizer ramps to desired setpoint.*

*The program maintains exposure conditions until desired time is reached, when pressure is released.*

*If a post-vacuum program is used, the vacuum system draws the interior atmosphere through ambient to negative pressure, maintaining drying conditions for the drying time as programmed, after which the vacuum is released and the load is restored to ambient pressure.*

*If a post-vacuum program is not used, the load is restored to ambient pressure.*

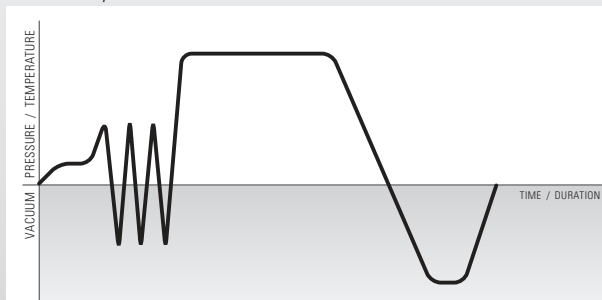


Figure 1: Pre-Vacuum with Post-Vacuum Drying Cycle

that significantly decreases drying time (see Figure 2). Post-vacuum is usually used for wrapped goods, fabric packs, and instrument trays.

### Liquid

The liquid cycle prevents boil-over when vented liquids are sterilized. The controller is factory-configured to automatically release steam pressure at an adjustable exhaust rate. Each Consolidated HC steam sterilizer comes with validated liquid cycles (see Figure 3). IMPORTANT: The liquid cycle is for non-patient contact use only.

Automatic Jacket Blowdown is standard on all sterilizers and is activated during liquid cycles. This feature is used to exhaust steam in the jacket to allow the load to cool properly, preventing liquid loads from boiling over. Factory installed.

### Bowie-Dick (Air Removal Test)

This air-removal test cycle validates the air removal function using test packs as per requirements listed in ANSI/AAMI/ISO 11140-5.

### Vacuum Leak Test

This cycle provides easy verification of vacuum depth, vacuum seal and chamber piping integrity. Reports success or failure based on a leak rate of 1 mmHg (1 Torr) per minute per AAMI ST-8 requirements.

### Gravity (Figure 2)

*Steam flows through the sterilizer; temperature and pressure ramps slightly to a continuous flow purge.*

*The controller closes the exhaust valve and interior temperature and pressure ramp up to desired setpoint.*

*The program maintains exposure conditions until desired time is reached, when pressure is released.*

*A vacuum system draws the interior atmosphere through ambient to negative pressure, accelerating drying time as programmed.*

*Once completed the vacuum is released and the load is restored to ambient pressure.*

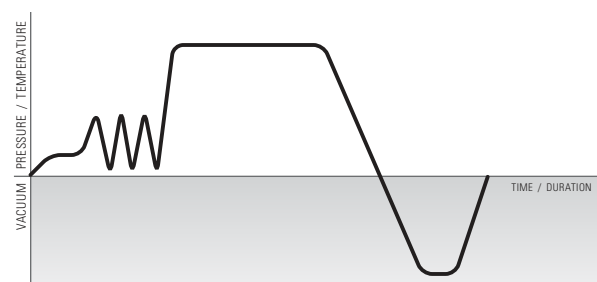


Figure 2: Gravity

### Liquid. (Figure 3)

*Steam flows through the sterilizer; temperature and pressure ramps slightly to a continuous flow purge.*

*The controller closes the exhaust valve and interior temperature and pressure ramp up to desired setpoint.*

*The program maintains dwell until desired time is reached. Pressure is gradually released to allow the load to cool to prevent boil-over.*

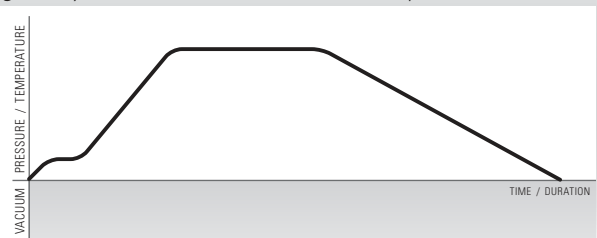


Figure 3: Liquid Cycle

### Consolidated HC Validated Pre-Set Cycles

Cycle Type and Use	Sterilization Temperature	Sterilization Time	Dry Time
<b>Gravity</b>			
Fabric Packs	250° F (121° C)	30 minutes	30 minutes
Double Wrapped Instrument Trays*	250° F (121° C)	30 minutes	30 minutes
Immediate Use Single Unwrapped Tray*	270° F (132° C)	3 minutes	1 minute
Double Wrapped Instrument Trays*	270° F (132° C)	15 minutes	30 minutes
<b>Pre-Vacuum</b>			
Fabric Packs	270° F (132° C)	4 minutes	20 minutes
Double Wrapped Instrument Trays*	270° F (132° C)	4 minutes	30 minutes
Immediate Use Single Unwrapped Tray*	270° F (132° C)	4 minutes	1 minute
Double Wrapped Instrument Trays*	275° F (135° C)	3 minutes	30 minutes
Single Fabric Pack and Single Unwrapped Tray*	275° F (132° C)	4 minutes	5 minutes
<b>Liquids**</b>			
1L Volume	250° F (121° C)	30 minutes	N/A
<b>Test</b>			
Warm Up	270° F (132° C)	3 minutes	1 minute
Bowie-Dick/Air Removal	273° F (134° C)	3.5 minutes	0 minutes
Leak Test	270° F (132° C)	N/A	N/A

\*Maximum weight per tray: 25lbs (11.3 kg)

\*\*The liquid cycle is for non-patient contact use only

### Consolidated HC Validated Load Sizes

Cycle Type and Use	Sterilizer Size	Double Wrapped Instrument Trays	Fabric Packs***	Liquid Containers (1 Liter/Container)
3AV-HC	20" X 20" X 38"	3*	9	28
26AV-HC	26" X 26" X 39"	9*	12	70
26BV-HC	26" X 26" X 49"	12*	16	90

\*Maximum weight per tray: 25lbs (11.3 kg)

\*\*\*Maximum fabric pack size and density, L x W x H: 9" X 9" X 6", 11.3 lbs/ft<sup>3</sup> (23cm X 23cm X 15cm, 181 kg/m<sup>3</sup>)

## Options

Consolidated offers a range of options and accessories to optimize and customize your sterilizer, to meet requirements for internal or third-party compliance, and to improve workflow. Options are factory installed and must be specified when ordering. For further information about available options and tailoring your sterilizer to meet your needs contact Consolidated.

### Sterilizer Configuration Options

#### Interior Chamber Tracks

Chamber tracks may be installed into the sterilizer to permit use of an existing CSS cart & carriage or use with a future cart and carriage. Chamber tracks must be factory installed.

#### Controller Mounting

Sterilizer control system for Model 3AV-HC is top-mounted. For Models 26AV-HC and 26BV-HC, controls may be mounted on left or right side.

#### Stainless Steel Piping

Upgrade from brass/bronze piping & components to type 316 stainless steel for all product wetted surfaces.

### Generator Options

#### Steam Generator

For installations where house steam is not available, a variety of integral or remote mounted steam generators are available in both carbon steel and 316L stainless steel construction. Consolidated will assist with selection according to site preparation requirements. Generators are available in electric, or steam-powered configurations. Integral generators are factory installed and must be specified when ordering.

### Vertical Door Options

#### Integral Air Compressor

If a facility compressed air source is not available, compressed air for the the EZ-Glide door and gasket can be supplied by an integral whisper quiet air compressor.

### Water and Energy Saving Options

#### Steam Sterilizer Water Conservation & Monitoring Systems

The Consolidated WaterEco® Systems reduce water consumption to the autoclave by up to 99%. All WaterEco® systems communicate with the sterilizer control system to provide real-time data for cooling water consumed per cycle, day, month, and year. The system also triggers an alarm (displayed on the touchscreen, printout, and history report) if the waste temperature exceeds set-point or if there is a sensor failure. Available in the following configurations:

- **WaterEco®:** This device is included on all Consolidated sterilizers and reduces cooling water usage by up to 90%. In addition to saving water, it monitors water consumption through the touchscreen display. The system is designed to cool effluent using a minimal amount of cold water, air, and previously cooled effluent.
- **WaterEco® Plus:** Reduces cooling water consumption by up to 99% through a stainless steel heat exchanger that utilizes a facility chilled water supply. This system virtually eliminates once-through cooling water.

#### Form C Dry Contacts — Door Closed

This feature integrates the sterilizer with a local canopy hood to reduce unnecessary venting of conditioned air. Form C Dry Contacts signal your building automation system to power-down the hood when the door of the autoclave is closed.

## System and Data Monitoring

### Electronic Data Storage via SD/USB

Cycle data is stored on a non-volatile flash memory device and saved in CSV format. The flash memory device can be used to transfer the data to other computers or tablets. The user can use the data to create graphs and perform data analysis. This feature allows users to extract Raw Cycle Data (Time, Temp, Pressure), Cycle History (User ID, Cycle Name, Time, Temp, Alarm Code, Cycle Result), and Duplicate Cycle Data (an electronic copy of the paper print-out).

### Form C Dry Contacts

Offers dry connection to building monitoring system. Specify desired outputs when ordering: door open/close, alarm condition, cycle running, cycle over, and/or jacket on.

### Safety Options

#### Seismic Anchorage Details

May be required to meet building codes in seismically active areas. Contact your facility manager to determine if required. If ordered, Consolidated will provide anchor attachment points and suggested seismic anchorage details. Installation done by others.

## Accessories

### Water Purification System

High-purity water purification systems are available for facilities that do not meet the minimum water purity requirements (see Table 10) or that require clean steam. Specify when ordering.

- **Option 1:** A reverse osmosis (RO) water filtration system designed to pre-treat autoclave feed-water can be supplied.
- **Option 2:** If deionized water is required for clean steam generation, an RO/DI system that incorporates extra filtration to produce Type II deionized water (>1 MΩ resistivity) can be supplied.

### Loading Cart & Transfer Carriage

A loading cart, mounted on rollers, with three stainless steel shelves and a wheeled transfer carriage. The transfer carriage mates to guides on the interior chamber tracks to ease loading and unloading of sterilization loads up to 500 lbs evenly distributed. Chamber tracks must be configured in chamber at time of build to utilize loading cart and carriage; specify when ordering.



### Uninterruptible Power Supply (UPS)

Provides power to the control system and valves in the event of a brief power loss or brownout. UPS does not power integral steam generator. Specify when ordering.

### Sump Pump

Required when gravity drain is not available. Provides a positive-displacement pump to remove condensate effluent to hard-plumbed drain. Specify when ordering.

### Steam Inlet Filter

Recommended to clean dirty steam (i.e. remove particulates) and help remove moisture from facility steam sources. Specify when ordering.



## Commissioning

Consolidated supplies basic testing of the sterilizers after installation to ensure nominal function. A thorough qualification program per AAMI ST79:2021 section 13.8.1 is available from Consolidated or may be carried out by the healthcare facility.

## Site Preparation and Utilities

### General

Utilities of the correct capacity required for operation of the sterilizer shall be provided at the place of installation at the facility. Key considerations include electric power availability, steam source, water type and flow capacity, and compressed air. For information on required utilities and locations refer to the sterilizer architectural drawings and Tables 4–11.

- Drain and ventilation considerations include wastewater and the facility HVAC system.
- Clearances include door and cart allowances, recommended 18–24" for access to plumbing and adequate load-bearing capacity of floor at installation site.
- Consider the location of sprinklers, smoke detectors, and canopy capture hoods.
- Contact Consolidated or your Consolidated sales representative for planning and selection assistance.

## Installation

Consolidated offers a choice of installation options to accommodate the facility schedule. In general, Consolidated can arrange for any of the following installation preferences:

- **Level 1:** Sterilizer start-up and user training.
- **Level 2:** Sterilizer uncrating, setting in place, leveling, final assembly, start-up, and user training.
- **Level 3A:** Sterilizer uncrating, setting in place, leveling, final assembly, final utility connections, start-up, and user training.
- **Level 3B:** Receiving the shipment, sterilizer uncrating, setting in place, leveling, final assembly, start-up, and user training.
- **Level 4 (Turnkey):** Receiving the sterilizer, uncrating, setting in place, leveling, final assembly, final utility connections, start-up, and user training.
- **Installation Supervision:** Consolidated will supervise on-site installation work performed by facility designated labor.

## Preventative Maintenance

At Consolidated, we believe that sterilizers should be easy to use, service, and maintain. To maximize uptime and keep your equipment in peak condition, we offer SterilCARE™ service plans and PartsPAX solutions to simplify autoclave maintenance.

### Parts

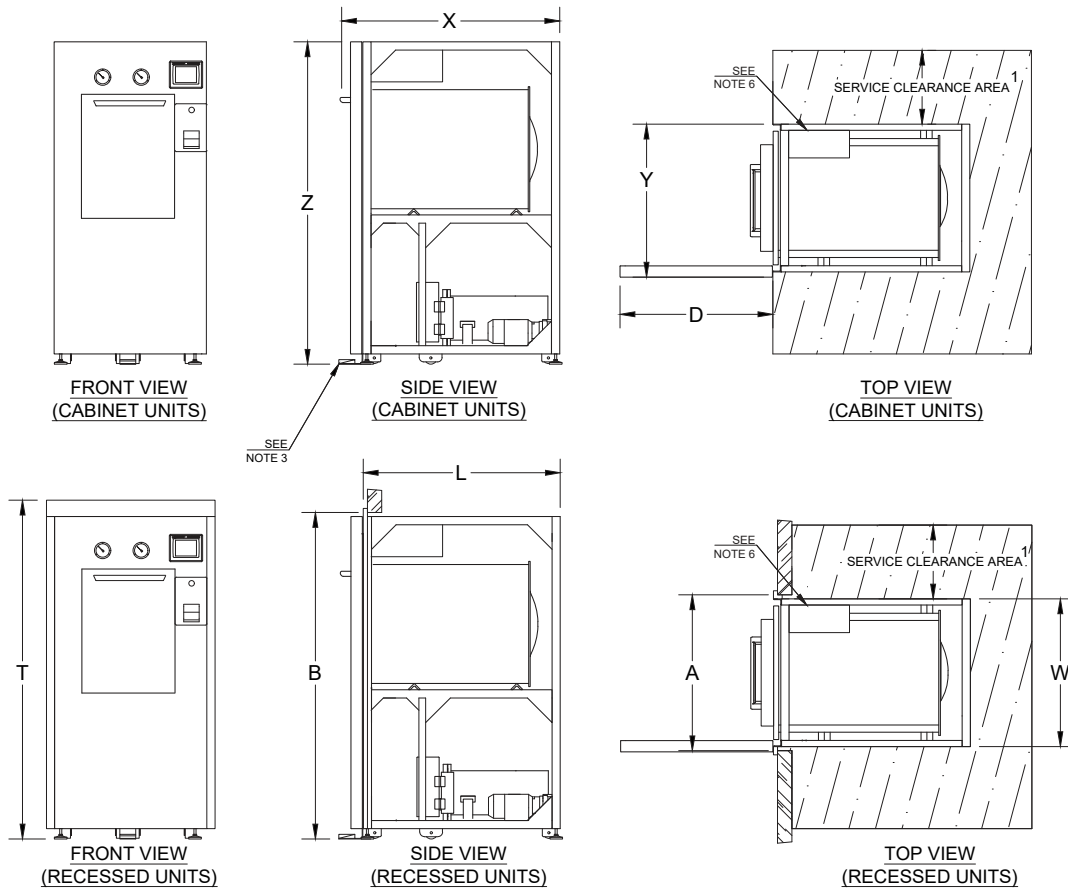
Consolidated offers the convenience of three PartsPAX for both the steam sterilizer and integral steam generator. Each PartsPAX includes the recommended certified components to keep the sterilizer working reliably and safely over time.

- **Safety PAX:** Includes components that ensure your autoclave is running safely.
- **Performance PAX:** Includes all essential components to ensure the sterilizer is running smoothly.
- **Complete PAX:** Includes all Performance PAX and Safety PAX components plus a few other key recommended replacement parts.

### Service

Consolidated offers two simple SterilCare service plans: Safety Plus and Proactive. Consolidated Sterilizer Systems recommends a quarterly preventative maintenance inspection by an authorized factory-trained service representative.

**Standard Mounting Configurations : 3AV-HC**

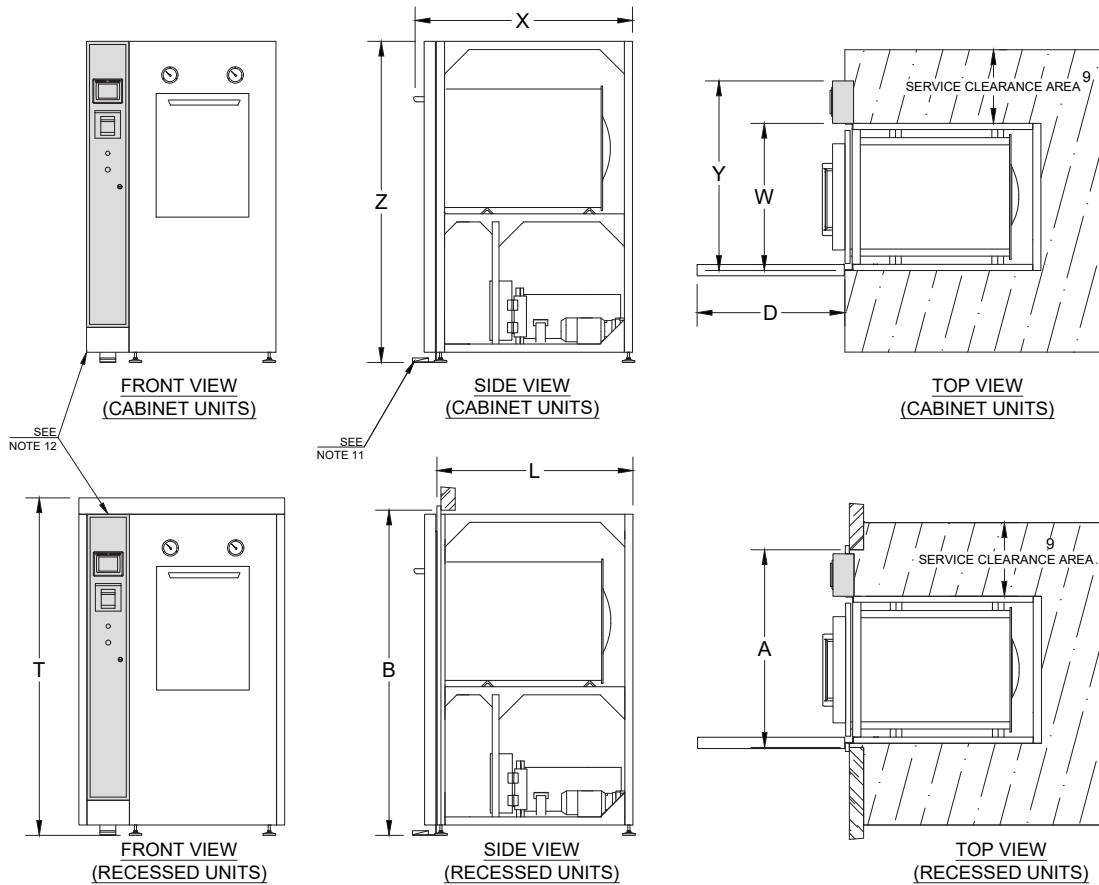


**Table 1: Sterilizer Dimensions<sup>2</sup>**

Model	3AV-HC
Chamber Dimensions (w x h x f-b)	20" x 20" x 38" 50.8 x 50.8 x 96.5 cm
Volume	8.8 cu. ft (249 L)
Overall Length (X)	51" 129.5 cm
Overall Width (Y)	31" 78.6 cm
Overall Height (Z) <sup>5</sup> with installation rollers	72.875" 185.1 cm
Overall Height (Z) <sup>5</sup> with leveling feet only	71" 180.3 cm
Frame Length (L)	45" 114.3 cm
Frame Width (W)	29" 73.7 cm
Wall Opening <sup>8</sup> Width (A)	31" 78.6 cm
Wall Opening Height (B)	75.875" 192.7 cm
Max Recessed Trim Height (T)	77.875" 197.8 cm
Access Door Swing <sup>7</sup> (D)	31" 78.6 cm

1. Recommended service clearance is 18-24" both sides and back. If necessary, service clearance can be decreased to accommodate facility space requirements. If no service access is available on either side, flexible utility connections must be used to allow unit to roll forward for service.
2. Additional options may require a larger footprint.
3. Power door control foot pedal shown, does not add to Overall Length (X) and is shipped detached from the sterilizer.
4. All views contain configuration specific components. These are for illustrative purposes only; actual configuration may vary.
5. After adjustment, leveling feet may add up to 1" to Overall Height (Z).
6. Left side control housing on 3AV-HC is standard, if left side service access is limited control box may be on right.
7. Service panel swings open at front for ease of access to components.
8. Wall Opening Width (A) may be reduced to 29.5". Contact CSS for details.

**Standard Mounting Configurations : 26AV-HC and 26BV-HC Controls Left**



**Table 2: Sterilizer Dimensions**<sup>10</sup>

Model	26AV-HC	26BV-HC
Chamber Dimensions (w x h x f-b)	26" x 26" x 39" 66 x 66 x 99 cm	26" x 26" x 49" 66 x 66 x 124.5 cm
Volume	15.3 cu. ft (433L)	19.2 cu. ft (543L)
Overall Length (X)	54" 137.2 cm	64" 162.6 cm
Overall Width (Y)	46.375" 117.8 cm	46.375" 117.8 cm
Overall Height (Z) <sup>14</sup> <i>Includes leveling feet</i>	77" 195.6 cm	77" 195.6 cm
Frame Length (L)	48" 121.9 cm	58" 147.3 cm
Frame Width (W)	36" 91.4 cm	36" 91.4 cm
Wall Opening Width (A)	48.5" 123.2 cm	48.5" 123.2 cm
Wall Opening Height (B)	80" 203.2 cm	80" 203.2 cm
Max Trim Height (T)	81" 205.7 cm	81" 205.7 cm
Access Door Swing <sup>16</sup> (D)	36" 91.4 cm	36" 91.4 cm

9. Recommended service clearance is 18-24" both sides and back. If necessary, service clearance can be decreased to accommodate facility space requirements, but some access on both sides is necessary for door service.
10. Additional options may require a larger footprint.
11. Power door control foot pedal shown, does not add to Overall Length (X) and is shipped detached from the sterilizer.
12. The control housing is shipped detached from the sterilizer to allow passage through doorways, reducing pre-installation Overall Width (Y) by 10.375". When the sterilizer is installed, the control housing and electrical connections are easily attached.
13. All views contain configuration specific components. These are for illustrative purposes only, actual configuration may vary.
14. After adjustment, leveling feet may add up to 1 inch to the Overall Height (Z).
15. Left side control housing with vertical sliding door is standard.
16. Service panel swings open at front for ease of access to components.

This page shows a variation of recessed mounting to allow a sterilizer to fit into an existing narrow wall opening only available on 26AV-HC and 26BV-HC models

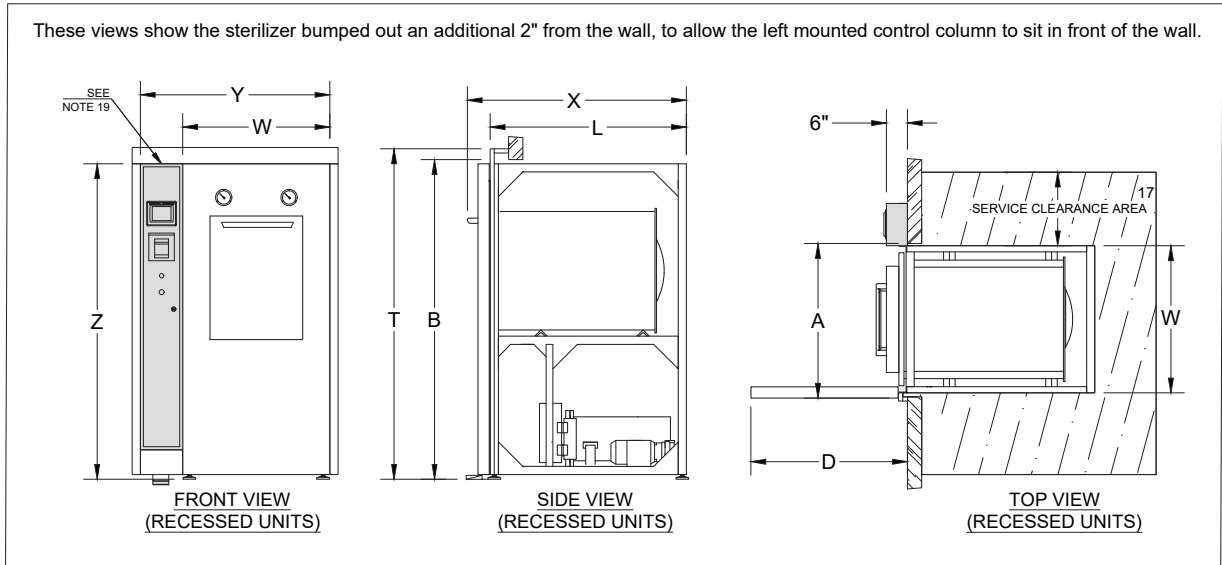


Table 3: Sterilizer Dimensions<sup>18</sup>

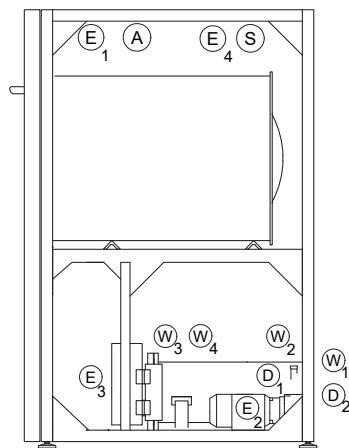
Model	26AV-HC	26BV-HC
Chamber Dimensions (w x h x f-b)	26" x 26" x 39" 66 x 66 x 99 cm	26" x 26" x 49" 66 x 66 x 124.5 cm
Volume	15.3 cu. ft (433L)	19.2 cu. ft (543L)
Overall Length (X)	54" 137.2 cm	64" 162.6 cm
Overall Width (Y)	46.375" 117.8 cm	46.375" 117.8 cm
Overall Height (Z) <i>Includes leveling feet</i>	77" 195.6 cm	77" 195.6 cm
Frame Length (L)	48" 121.9 cm	58" 147.3 cm
Frame Width (W)	36" 91.4 cm	36" 91.4 cm
Wall Opening Width (A)	37" 94.1 cm	37" 94.1 cm
Wall Opening Height (B)	80" 203.2 cm	80" 203.2 cm
Max Trim Height (T)	81" 205.7 cm	81" 205.7 cm
Access Door Swing <sup>19</sup> (D)	36" 91.4 cm	36" 91.4 cm

17. Recommended service clearance is 18-24" both sides and back.

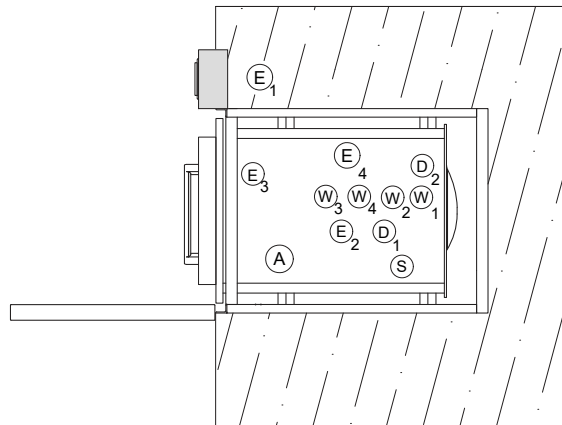
18. Additional options may require a larger footprint.

19. The control housing is shipped detached from the sterilizer to allow passage through doorways, reducing pre-installation Overall Width (Y) by 10.375". When the sterilizer is installed, the control housing and electrical connections are easily attached.

Views shown to establish general locations of typical utility connections and may not reflect the exact construction of the unit



**SIDE VIEW  
(CABINET UNITS)**



**TOP VIEW  
(CABINET UNITS)**

**UTILITY LEGEND**

- (E)** Electrical
- (D)** Drain
- (W)** Water
- (S)** Steam
- (A)** Air

**Table 4: General Connections**

Name	Symbol	Connection on Sterilizer	MEP Requirements <sup>22</sup>
Water Eco/Vacuum System	(W <sub>1</sub> )	½" NPT	45 psig dynamic min, 80 psig static max, ¾"-1" NPT, 12 gpm capacity, with shut off valve and union <sup>20</sup>
Controls System	(E <sub>1</sub> )	NEMA 5-15 Plug	120VAC 10A non-GFCI outlet
Sterilizer Drain	(D <sub>1</sub> )	1 ½" NPT	2 ½" air gap, 3" diameter minimum funnel required, 15 gpm, min 1 ½" drain piping, location external to unit footprint recommended
Direct Steam (Optional)	(S)	¾" NPT	50-80 psig dynamic, ¾"-1" NPT, 180 lbs/hr capacity, insulated line with shut-off valve and union
Dry Contacts (Optional)	(E <sub>4</sub> )	2-Wire Terminal	2 signal wires per contact compatible with Form C Dry Contacts
Compressed Air	(A)	½" NPT	50-75 psig, 10 SCFM min, 99% dry & oil free, backflow preventer not provided by CSS

20. Water quality must comply with the General Vacuum Device & Quench specification in Table 10. Backflow preventer not provided by CSS.

**Table 5: Vacuum Systems**

Name	Symbol	Connection on Sterilizer	MEP Requirements <sup>22</sup>
Booster Pump - Optional 3AV-HC Only	(E <sub>2</sub> )	Hard Wire	120VAC/208-230VAC, single phase, minimum 20 Amp circuit required
Vacuum Pump - Electrical	(E <sub>2</sub> )	Hard Wire	208/240/480VAC, 3-phase, minimum 20 Amp circuit required

**Table 6: Optional Electric Steam Generator**

Name	Symbol	Connection on Sterilizer	MEP Requirements <sup>22</sup>
Power Supply	(E <sub>3</sub> )	Hard Wire	Available in 208/240/380/480VAC, 3-phase, see Table 8 for Amp Draw, Fused Disconnect Required.
Generator Water Feed	(W <sub>2</sub> )	½" NPT	45 psig dynamic min, 80 psig static max, ½" NPT, 1 gpm, with shut off valve and union <sup>21</sup>
Manual Generator Drain	(D <sub>2</sub> )	½" NPT	See D1 in Table 4

21. Generator feedwater must comply with the Generator Water Feed specification in Table 10. Backflow preventer not provided by CSS.

**Table 7: Optional Chilled Water (WaterEco Plus Only)**

Name	Symbol	Connection on Sterilizer	MEP Requirements <sup>22</sup>
Chilled Water Feed	(W <sub>3</sub> )	1" NPT	20 psig dynamic min, 35°F-55°F, 10 gpm, insulated with ball valve and union
Chilled Water Return	(W <sub>4</sub> )	1" NPT	-5 psi drop on return side, +15°F max rise

22. For a more detailed list of MEP requirements and specifications see document 92006-01 "Autoclave Installation and Utility Overview".



**Table 8: Power and Steam Usage** <sup>23</sup>

Power and Steam Usage			Electrically Heated				Steam Heated			
Model	Chamber Dimensions (w x h x f-b)	Air Removal Method	Generator Size (KW)	Generator Current (amps) <sup>24</sup>				Steam Consumption		
				208V	240V	380V	480V	Peak (lb/hr)	Per Cycle (lb/cycle)	Idle (lb/hr)
3AV-HC	20" X 20" X 38" 50.8 X 50.8 X 96.5 cm	Gravity	30	83	72	46	36	180	20	7
		Vacuum						180	35	7
26AV-HC	26" X 26" X 39" 66 X 66 X 99 cm	Gravity	45	125	108	68	54	180	35	9
		Vacuum						180	55	9
26BV-HC	26" X 26" X 49" 66 X 66 X 124.5 cm	Gravity	45	125	108	68	54	180	40	9
		Vacuum						180	70	9

23. Assumes 30 minute sterilizing time at 250°F (112°C) and 30 minute drying time (Fabric Packs).

24. Nominal current drawn by a 3-phase generator. Local codes and regulations may affect breaker size.

**Table 9: Water Consumption (Per Chamber)** <sup>25</sup>

Model	Chamber Dimensions (w x h x f-b)	Air Removal Method	Water Consumption					
			Cold Water			Hot/Treated Water		
			Peak (gpm)	Per Cycle (gal/cycle)	Idle (gph)	Peak (gpm)	Per Cycle (gal/cycle)	Idle (gph)
3AV-HC	20" X 20" X 38" 50.8 X 50.8 X 96.5 cm	Gravity	6	146	1	1	3	1
		Ejector	6	224	1	1	4	1
		Vac Pump	6	63	1	1	4	1
26AV-HC	26" X 26" X 39" 66 X 66 X 99 cm	Gravity	6	148	1	1	4	1
		Vac Pump	6	74	1	1	7	1
26BV-HC	26" X 26" X 49" 66 X 66 X 124.5 cm	Gravity	6	149	1	1	5	1
		Vac Pump	6	80	1	1	9	1

25. Gravity assumes 30 minute sterilizing time at 250°F (112°C) and 30 minute drying time (Fabric Packs). Ejector and Vac Pump assume 4 minute sterilizing time at 270°F (132°C) and 30 minute drying time (Double Wrapped Instruments).

**Table 10: Nominal Water Quality Requirements**

Characteristic	Carbon Steel Steam Generators <sup>26</sup>		General Vacuum Device & Quench	
	Recommended Condition	Maximum Condition	Recommended Condition	Maximum Condition
Temperature [°F (°C)]	As Supplied	140 (60)	40-60 (4-16)	70 (21)
Total Hardness (mg/L)	17	85	10-85	171
Alkalinity (mg/L)	50-180	350	50-180	350
Total Dissolved Solids (mg/L)	50-150	250	50-200	500
pH	7.5-8.5	7.5-9.0	6.8-7.5	6.5-9.0
Total Silica (mg/L)	0.1-1.0	2.5	0.1-1.0	2.5
Resistivity (Ω•cm)	2,000-6,000	26,000 <sup>27</sup>	2,000-26,000	500,000

26. Stainless-steel generators require deionized water with resistivity ≥ 1MΩ•cm.

27. If water supplied is greater than 26,000 Ω•cm contact Consolidated for recommendation.

Table 11: Weight & Heat Loss Data			Peak Heat Loss (BTU/hr at 70°F [21°C])		
Model	Heat Source Options	Max. Operating Weight <sup>28</sup>	Cabinet	Recessed	
			To Room	Front of Wall	Back of Wall
3AV-HC	Steam	1800 lbs	7000	2500	4500
	Electric	1975 lbs	8750	3300	5450
26AV-HC	Steam	2700 lbs	11950	4300	7650
	Electric	2875 lbs	14200	5100	9100
26BV-HC	Steam	2950 lbs	14390	4300	10090
	Electric	3125 lbs	16640	5100	11540

28. Assuming chamber fully loaded with flasks filled 25% with water.

Notes

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