



GENEVA SCIENTIFIC

LAB EQUIPMENT SOLUTIONS

MEDIUM CAPACITY LABORATORY STEAM STERILIZERS



Steelco steam sterilizers VS L series are designed for laboratory applications including research laboratories, bio-containment, and animal care facilities

VS L sterilizers are engineered to offer best in class solutions for the reduction of energy and water consumption to give users lowest operating costs per load, ECO water saving packages reduce water consumption to nearly zero depending on chosen model and options.

All Steelco steam sterilizers VS L range are equipped with high quality AISI 316L stainless steel pressure vessels.

Pressure vessels are full jacket double-wall design and chamber cross section is rectangular with 3 standard chamber sizes.

Sterilizers are available in single or double door configuration with swing or horizontal sliding. Doors can be manual or automatically actuated.

Steelco VS L sterilizers are controlled by commonly available industrial grade PLC digital controllers with color touch screen HMI.

Type	Door Type	Number of Doors	Chamber Dimensions (inches)			Overall Dimensions (inches)		
			Width	Height	Length	Width	Height	Length
VS 263639/1 L1	Hinged	1	26	36	39	53.5	67.2	53.3
VS 263649/1 L1	Hinged	1	26	36	49	53.5	67.2	63.3
VS 263660/1 L1	Hinged	1	26	36	60	53.5	67.2	74.3
VS 263639/1 L2	Sliding	1	26	36	39	73	69.5	50.2
VS 263649/1 L2	Sliding	1	26	36	49	73	69.5	60.2
VS 263660/1 L2	Sliding	1	26	36	60	73	69.5	71.2
VS 263639/2 L1	Hinged	2	26	36	39	53.5	67.2	53.3
VS 263649/2 L1	Hinged	2	26	36	49	53.5	67.2	63.3
VS 263660/2 L1	Hinged	2	26	36	60	53.5	67.2	74.3
VS 263639/2 L2	Sliding	2	26	36	39	73	69.5	50.2
VS 263649/2 L2	Sliding	2	26	36	49	73	69.5	60.2
VS 263660/2 L2	Sliding	2	26	36	60	73	69.5	71.2

*Overall dimensions depend on sterilizer model/configuration. Custom sizes also available.

MEDIUM CAPACITY LABORATORY STEAM STERILIZERS

STANDARDS

*Steelco manufactures according to the ISO 9001 quality system. Steam sterilizers VS L series meet the following standard requirements:

- UL/CSA Standards
- ASME (section VIII div. 1, Section I)
- cGLP

SPECIFICATIONS

Vessel Material and Construction

*Pressure vessel is made of AISI 316L solid stainless steel plate Ra <0.315 µin in finish. Pressure vessels chamber cross section is rectangular and full jacket double-wall design made of stainless steel AISI 316L.

*The external insulation of the vessel is realized with non-toxic fiber. The covering reduces heat emission and noise level. Covering can be easily removed for maintenance operations.

Service Access Panels / Control Panel and Technical Room

*According to model type, piping, valves, electrical components and wiring are easily accessible from front door panel or side access.

Door System

*Doors are made of stainless steel AISI 316L, with no welding and can be manual or automatically actuated.

*Automatic sliding doors are activated by motorized toothed belt. A high sensibility safety bumper guarantees the safety of the operator.

*Hinged-door models allow for low-effort manual operation. Door locking is automatic with motorized or pneumatic actuators.

*The perimetral silicone seal is pushed against the door by steam and ensures the tightness of the chamber. Silicone seal can be actuated by compressed air if available and/or the sterilizer is equipped with pneumatic valves.

RTD (Resistance Temperature Detectors) Temperature Probes

*A dual element PT1000 temperature probe is installed in the drain of the chamber to allow the precise control of temperature variations within the chamber.

*Jacket RTD provides temperature control within the chamber jacket.

*An additional load control probe is provided as standard for load temperature monitoring throughout the entire cycle.

Steam Supply Systems

*Standard steam supply:

- Steam from building (type "V")

*Optional steam supply:

- Integral electric steam generator (type "E") made of carbon steel or AISI 316L stainless steel
- Integral steam-to-steam AISI 316L generator for clean steam application (type "I")

SAFETY FEATURES

Safety Lock

*Steelco steam sterilizers VS L series are equipped with a safety lock which prevents the operator from starting a program before the door is fully closed. The door is mechanically locked during the whole cycle and cannot be opened until the cycle has completed and until pressure and temperature in the chamber are normalized.

ON/OFF Switch

*A main power ON/OFF switch is located on the electrical box.

Emergency Stop Button

*For power door sterilizers are located on the front panel, below the sterilizer control touch pad. When pressed, immediately shuts off all outputs on the sterilizer. A key is used to reset the switch. This is an option for power-door equipped sterilizers only.

Control Lockout Switch

*Equipped on chamber door(s), senses when door seal is energized and tight against the door. Control prevents cycle from starting until the limit switch signal is received. If control loses appropriate signal during cycle, alarm activates, cycle aborts and chamber safely vents with a controlled exhaust.

Pressure Relief Valve

*Limits the amount of pressure buildup so that the rated pressure in the vessel is not exceeded.

Power Door Safety Feature

*Causes door drive to slip if the sliding door encounters an obstruction during its movement.

ECO CONFIGURATIONS

*Water saving packages for a better environmental performance of autoclaves equipped with either water ejector or water ring vacuum pump vacuum systems.

*ADVISORY NOTE: ECO options as well as other options may not be available for all models and subject to overall dimensions changes of the equipment. Water saving vary in relation to the autoclave chamber size and utilities.

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ECO CD - Cool Down System

*The system consists of a tank that collects both chamber and condensate drains. Temperature within the tank is controlled by a thermostatic valve and drain temperature is kept below 140°F prior to discharge by adding cold water from building

ECO EVO System

*The system consists of a tank that collects both chamber and condensate drains.

*Collected water is recirculated to feed vacuum systems. Water temperature within the tank is controlled by a thermostatic valve by adding cold water from building.

*Added water is triggered according to vacuum systems need, drain temperature is kept below 140°F prior to discharge.

ECO EVO PLUS System

*The system consists of a water tank that collects both chamber and condensate drains.

*Collected water is recirculated to feed vacuum systems. Water temperature within the tank is controlled by a thermostatic valve and the system exchanges heat with a chilled water loop from building.

*Water is added mainly for system start up and water consumption is reduced to nearly zero. Drain temperature is kept below 140°F prior to discharge.

CONTROL SYSTEM

PLC Based Control System

*The control system consists of an industrial PLC (Allen & Bradley) with a color touchscreen panel with Input/Output modules and a printer.

*The PLC includes an Ethernet port to connect the sterilizer to a system of traceability and process control that can also handle multiple machines and allows to print the report cycle in paper format.

*The control system is equipped with a color touchscreen HMI installed on the loading side of the sterilizer, an additional HMI panel is installed on the unloading side on a pass through configuration to allow the operator to check the status of the sterilizer.

*As an option a second HMI panel providing full functionality of the system can be installed on the unloading side on the double door version.

Features

*Up to 50 cycles available with standard cycles and testing/maintenance cycles.

User Access

*The operator can access the normal use of the sterilizer by logging in. Access to the configuration of the machine is protected by 3 levels of password.

- 1) Supervisor: this level grants an access to the basic functions (recording and setting) of the equipment: date, time, operators list, cycles reprint, etc.
- 2) Maintenance Technician: this level allows the same functionalities as "Supervisor level" but also grants the possibility to modify the parameters of the customizable cycle and a more complete access to the machine parameters.
- 3) Steelco Service: this level grants full control of the equipment and the possibility to edit the factory cycles

Software Calibration of the Parameters

*Software calibration of the pressure and temperature parameters can be performed through the touch screen display by a qualified technician with the control panel in the Service Mode.

*Control system provides printed record of all calibration data for verification to current readings.

*Thanks to our user friendly operator interface, the dedicated screens permit the maintenance people to access the functions of calibration and verification of the components operation status.

*The dedicated screens permit the supervisors responsible for the maintenance to easily set up the machine.

*During the cycle, the temperature and pressure values are recorded at set time intervals.

*At the end of the cycle, the printer prints a report of the cycle.

TEST PROGRAMS

Vacuum Leak Test

*This standard cycle is used to verify the vacuum integrity of the sterilizer. While running the cycle, the sterilizer chamber must be empty.

D.A.R.T (BowieDick Test)

*This standard cycle is used to verify the effectiveness of the steam penetration and air removal for the sterilizers provided with a vacuum pump.

WORKING PROGRAMS

*Working programs are factory set and available for the operator selection in the control panel.

*Sterilizers are factory programmed with the cycles at 275°F and 250°F. The temperature inside the chamber is uniform in every part, the temperature deviation is less than 32°F.

*Once a program is started, the sterilizer automatically processes the load through a predefined combination of the standard phases mentioned next.

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WORKING PROGRAMS cont.

Conditioning

*This phase is executed to reach the optimal conditions needed for a sterilization cycle as well as for a testing cycle. A series of pulses of vacuum and pressure with steam is generated inside the chamber. The last steam injection will bring both the chamber pressure and temperature at the sterilization values.

Sterilization

*The temperature and pressure of the chamber are maintained constant for the needed sterilization time.

Drying

*The vacuum is continuously created into the chamber for a specified time; at the end, the atmospheric pressure is re-established.

Additional cycles can be customized.

Programs included

1. Gravity Cycle

*For the sterilization of heat and moisture stable goods and decontamination of bagged non-biohazardous laboratory wastes. Gravity cycle utilizes the gravity air-displacement principle.

2. Pre-Vacuum / Post-Vacuum Cycle (275°F)

*Utensils, Glassware, Textiles

*For efficient, high-volume sterilization of porous, heat and moisture-stable materials. Pre-vacuum cycle utilizes a mechanical air evacuation system.

3. Pre-Vacuum / Post-Vacuum Cycle (250°F)

*Plastic, Rubber Products, Macrolon Cages

*For efficient, high-volume sterilization of heat-sensitive materials. Pre-vacuum cycle utilizes a mechanical air evacuation system.

4. Liquid Cycle (250°F)

*Liquids in open or vented containers

*For the sterilization of liquids and media in vented borosilicate glass or metal containers. Liquid cycle utilizes the optimal solution cooling feature, during exhaust (cooling) phase, to control the exhaust rate.

STANDARD MACHINE CONFIGURATION

*Steam Autoclave mod. VS L, single or double door, floor mounted

*Sliding or swing door configuration, auto or manual

*Service room (technical area) on the right or left side of the chamber

*Frame and external panels made of AISI 304 stainless steel

STANDARD MACHINE CONFIGURATION cont.

*"V": connection for steam from building

*ASME stamped pressure vessel

*ASME stamped pressure relief valves

*Chamber made of AISI 316L stainless steel fine satin finishing (Ra<0.315 µin)

*Degreasing and passivation of the chamber

*Piping and valves in copper-brass

*Stainless steel full jacket chamber

*Solenoid valves

*Chamber rails with shelves

*Water ejector vacuum system

*Water-saving system ECO CD with drain cooling system (T<140°F)

*PLC control system

*Electrical components UL compliant

*Product RTD probe

*Vacuum breaker filter DOP tested (filtration grade 99.999%, filter can be sterilized)

*Thermal printer on loading side

OPTIONS

***PLC System**

-Siemens industrial PLC package

-HMI full capacity on unloading side

***Service/Control Side (when applicable)**

-Right side service

-Left side service

***Chamber Options**

-Chamber made of 316Ti stainless steel

-Chamber polishing (Ra<0.5 µin)

***Paneling**

-Application of side and top panels for free standing versions.

***Steam Source**

-Steam filter for direct steam feeding

-"E": integral electric steam generator

-"I": AISI 316L integral steam to steam generator

***Piping**

-Process steam wetted piping of AISI 316L stainless steel

-Valves and components of AISI 316L stainless steel

***Vacuum System**

-Double stage water ring vacuum pump

***Valve Options**

-Pneumatic valves

-Air Compressor (compressed air necessary for pneumatic valves actuation)

***ECO Water Saving Options**

-ECO EVO

-ECO EVO PLUS

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*Cycle Options

-**Jacket Cooling Cycle:** this cycle, specific for porous loads, provides a rapid cooling by introducing cool softened water into the jacket.

-**Air Over Pressure with Jacket Cooling Cycle:** this cycle is specific for treating liquids in either sealed or vented rigid containers. It is designed for cooling liquids in vented containers where boiling and liquid loss need to be prevented or to prevent liquids in sealed rigid containers from rupturing. Cool softened water is introduced into the jacket and process compressed air (PCA) into the chamber - it prevents boiling of vented liquids and provides counter pressure for sealed liquids in rigid containers.

-**Effluent Decontamination Cycle:** this cycle is used for processing contaminated items; condensates of the chamber are not discharged to prevent harmful pathogens and viruses from exiting the sterilizer during the exhaust and vacuum phases of the sterilization chamber and prior to sterilization time and temperature requirements are met. The drain is controlled by a hydrophobic 0.08 µm filter and both filter and condensate are sterilized during the cycle.

-**Diaphragm Valves:** these valves are indicated for demanding sanitary and high purity applications, as they prevent fluid from contacting the actuating components within the valve. They are standard in case of a decontamination cycle, while they can be ordered as option in case of porous load or liquid cycles.

-**In Situ Air Intake Filter Sterilization Cycle:** this additional factory preset program is used to sterilize the chamber air intake filter while it is in place. The program will automatically sterilize the filter with no user intervention. The hydraulic configuration comprehends additional valves, temperature probe and condensate drain system. This program is applicable with both the Disposable HEPA Filter and the Stainless Steel HEPA Filter with disposable cartridge.

-**Low Temperature Cycle (Isothermal or F0):** in this cycle the exposure length is based on a settable value for the total accumulation of Fo during the charge and exposure phases. The cycle is completed when accumulated Fo value is reached.

-**Disposable HEPA Filter/Stainless Steel HEPA Filter with disposable cartridge filters:** filters for vacuum brake with a predisposition for water intrusion test; can be sterilized in-situ.

*Containment Options

-**Bio-Seal Frame:** this option is designed to hermetically seal the autoclave and prevent the cross contamination between contaminated and non-contaminated areas. It consists of stainless steel panels that are hermetically sealed by means of a special silicone on the autoclave body.

*Process Feature Options

- Pipework with sample points for testing clean steam quality
- Thermocouple fitting (up to 16 thermocouples)

*Control Options

- Free contacts (for critical alarms): these relay contacts (also called "dry contacts") can be used to signal alarms or to provide information on the cycle status
- Connection for remote monitoring (tele-service)

*Uninterruptible Power Supply

- UPS for a temporary power supply of the PLC control system

*Seismic Options

- Seismic tie down kit
- Seismic package

*Validation and Documentation Options

- IQ documentation
- OQ documentation
- FAT documentation
- SAT site acceptance test

*Water Softener

- It reduces the hardness of the water to be supplied to the steam generator

*Loading and Unloading Systems

- Loading shelf (AISI 316L)
- Double level loading rack (AISI 316L)
- Triple level loading rack (AISI 316L)
- Fixed height transport trolley (AISI 304)
- Adjustable height transport trolley (AISI 304)
- Loading/unloading automation

**NOTE: These options and accessories may not be available for all models and may be subject to overall dimensional changes on the equipment.



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