

## VS LD series vertical steam sterilizers



Steelco vertical Steam Sterilizers VS LD series are designed to answer the typical sterilization needs of a laboratory: glassware, stainless steel instruments, culture media and liquids, etc.

These units are equipped with 121°C and 134°C cycles as well as service programs as Warm-Up and Warm-Keeping.

The sterilizers are designed and manufactured in Italy, according to the standards listed below.

### DESCRIPTION

Steelco Steam Sterilizers type VS LD are equipped with a PLC digital microprocessor and 7" colour touch screen HMI.

Other features include:

- 20 programs, 12 pre-defined and other 8 that can be set according to the customer needs.

### STANDARDS

Steelco Steam Sterilizers type VS LD meet the applicable requirements of the following standards:

- 97/23/EC (PED)
- 2004/108/EC (EMC)
- 2006/42/EC

Technical norms and standards:

- IEC EN 61010-1
- IEC EN 61010-2-040
- IEC EN 61326-1
- EN ISO 12100
- EN 13445-3 annex B&C – EN 13445-3 Cl. 18
- EN 288-3 / EN 15614-1
- EN 473
- EN ISO 9712

- EN ISO 5817
- EN 10028-7
- EN 571-1
- EN 1435 A1
- EN ISO 17637
- EN 287-1
- EN 15609-1

### Upon request:

ASME code Sec. VIII div. 1 & div. 2  
NEMA 4X  
UL compliant  
cGMP

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Type	Chamber dimensions (mm)		capacity (litres)	Overall dimensions (mm)			
	Ø	Height		Width	Height	Height open door	Lenght
VS 9 LD	420	636	89	720	1000	1467	723
VS 13 LD	420	896	125	720	1235	1702	723

## BASIC MACHINE CONFIGURATION

- Hinged door with sliding cover, the opening and closing of the loading door is supported by a springs and pneumatic pistons in order to have an easy and effortless operation. The door is locked automatically at the activation of a sterilization cycle.
- Easy service access and maintenance from the front and right side of the sterilizer
- 4 lockable antistatic castors
- Pressure vessel PED marked
- Pressure relief valves PED marked
- Round section chamber
- Chamber made of AISI 316L stainless steel
- Fine satin finishing (2 µm) for chamber and process pipes
- One RTD flexible probe PT1000 for the monitoring the temperature of the loads.
- Degreasing and passivation of the chamber and of the process pipes
- Frame and external panels made of AISI 304 stainless steel
- Built in electrically heated steam generator
- Water for steam generator supplied from direct connection to the mains
- Process piping with tri-clamp fittings
- Solenoid valve type
- Built in air compressor with stainless steel air storage tank
- Compressed air silicone door seals
- PLC control system
- #4 standard cycles for: liquid, solids, glassware, waste
- #2 service programs

- F<sub>0</sub> software control
- Ethernet interface to traceability system
- Utility connections
- Electrical power supply (3P+N 400V, 50Hz)

## STEAM FEEDING SYSTEMS

The steam sterilizer is configured with an integrated electrically heated steam generator.

## FEATURES

**PLC based control system:** equipped with a 7" colour touch-screen HMI. The color touch screen display allows an easy monitoring of all the cycles. During the cycle the display shows the estimated remaining time to the end of the cycle.

**Sterilization chamber:** round section and made of AISI 316L, Ra < 2 µm finish stainless steel. The chamber is easy to clean and self draining. Clean steam process pipes are made of stainless-steel.

The external insulation of the chamber is realized with non toxic fiber. The covering reduces the heat loss and the noise level and, thanks to its fabric coat, can be removed for easy maintenance operations.

## Service access panels

Piping, valves, electrical components and wiring are easily accessible through either the front panel and the right side panel as well.

## Control panel and technical room

The control panel and the area containing most of the hydraulic circuits and the electric control board is configured on the right side of the chamber.

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### Door system

The door are made of stainless steel AISI 316L.  
The perimetral silicone seal is pushed against the door by compressed air and ensures the tightness of the chamber.

### SAFETY FEATURES

Steelco Steam Sterilizers type VS LD are equipped with a Safety Lock to avoid the operator to start a program execution before the door is fully closed. The door is locked during the whole cycle and cannot be opened until cycle completion and pressure and temperature in the chamber are normalized. A main power ON/OFF switch, is located on the front panel.

### PROCESS CYCLES

**Process cycles are factory programmed and available for the operator selection in the control panel.**

#### Cycle configuration:

sterilizers are factory programmed with the cycle parameters presented below.

#### Solids

Sterile temperature: 134°C  
Sterilization time: 10 Minutes

#### Liquids

Sterile temperature: 121°C  
Sterilization time: 20 Minutes

#### Glassware

Sterile temperature: 121°C  
Sterilization time: 20 Minutes

#### Waste

Sterile temperature: 121°C  
Sterilization time: 30 Minutes

#### Warm up

Test/service program to warm up the autoclave for the execution of sterilization cycles

Temperature 121°C

#### Warm keeping

program for maintaining the autoclave at the ideal temperature waiting for the execution of following working cycles

Temperature 121°C

### CYCLE DESCRIPTION

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

All cycles include the following typical treatments:

- **Conditioning** – This phase is performed to reach the optimal conditions needed for a sterilization cycle.
- **Sterilization** – The temperature and the pressure of the chamber are kept steady for the needed sterilization time.
- **Cooling** – The load undergoes a controlled cooling phase to reach the desired temperature. This stage may differ in case the sterilizer is equipped with a vacuum pump or chamber cooling options. At the end the atmospheric pressure is re-established.

Additional cycles can be customized.

### OPTIONALS

- External tank for DI water (capacity to perform one sterilization cycle)
- Vacuum pump for efficient pre vacuum air removal and post vacuum faster drying of solid loads.
- Additional chamber heating with external steam coil to cut down cycle time and enhance drying phase of solid loads. This option is useful also for a more efficient warm keeping cycle
- Enhanced microbiologically filtered compressed air plus chamber cooling using cold water in an external coil for cutting down cooling time of liquid loads.
- Enhanced microbiologically filtered compressed air plus chamber cooling and chamber heating as previously described.
- Other electrical connections available to match electrical requirements of installation site
- Set of spare parts for two years of activity
- Additional independent RTD PT 1000 probe for the monitoring and the recording of the temperature during the cycle. An additional alarm is activated if the value on the control probe differs from the reference probe more than the specified tolerance.

- Independent pressure probe: (Pressure Reference Probe) allows the recording of the pressure during the cycle. An additional alarm is activated if the value on the control probe differs from the reference probe more than the specified tolerance.
- Thermocouple holder
- Effluents cooling system (T<60°C) designed to cool down the effluents coming out from the Sterilizer.
- Barcode reader system identification (hand scanner) for the recognition of the sterilizer load and automatic selection of the cycle.
- Barcode printer
- Integrated thermal printer (112mm paper width)
- SteelcoData LAB supervisor software
- WiFi connection
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## ACCESSORIES

### Lifting device

- Electrically powered lifting device with electronic control and swivel arm for fully assisted loading and unloading with easy handling of all load types

### Water softener

- External water softener to reduce the hardness of the water.

### Loading baskets

- Wire mesh, fine mesh and closed cylinders with venting holes available in different height to maximize loading capacity

## CONTROL SYSTEM

### Design Features

The control system consists of an industrial PLC with a 7" color touch-screen panel with Input/ Output modules.

The system controls the sterilization process and records data related to every cycle.

PLC based control features:

- The control system includes #4 pre-programmed and validated working sterilizing cycles, #6 factory set programs, #2 service cycles and #8 additional cycles to meet extra customer requirements.
- The parameters of each cycle are programmed to run through each phase automatically.
- Users access control. The access to the control system is granted with 4 levels of restrictions. In order:
  - 1) **Default** can access the normal operation of the machine: switch on/off, run cycles, reset non critical alarms, open the doors.
  - 2) **Supervisor**: as Default + set date and time, reset critical alarms, setup printer.
  - 3) **Cycle editor**: as Supervisor + edit the cycles parameters.
  - 4) **STEELCO Service**: Complete control. The last three levels require the operator login with username and password. Username and passwords are managed by users with STEELCO service level.
- Simplified user interface prompt the operator for the possible operations also if an alarm occurs. "Cycle selection and execution", "door open and close", "reset alarm", "Abort the cycle" are executed simply touching the icons on the screen.
- Filter replacement notification function (based on number of cycles)
- Built-in service screens permit the maintenance people to gain access to the function of calibration and of verification of components operation.
- Built-in service screens permit the supervisors to easily setup the machine.
- All the operations on the touch screen are logged by the control system in a file for service/maintenance and information use.

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- Optionally during the cycle the temperature and pressure are recorded at 1 sec. intervals.
- Printout of the cycle report. At the end of the cycle the impact printer prints-out a report of the cycle. It also prints out the time at machine switching on and switching off.

#### Technical Data

The control system includes a **Ethernet port** for the connection to a tracking system or a network.

**System interface, print reports and manuals are available in multiple languages:** English, German, Spanish, French, Italian.

Other languages may be available on request.

#### PREVENTIVE MAINTENANCE

Customers are encouraged to contact STEELCO concerning annual maintenance programs.

Under the terms of these programs, preventive maintenance, adjustments and replacement of worn parts are provided on a scheduled basis to help ensure optimal equipment performance and help minimize untimely or costly schedule interruptions.

STEELCO maintains a worldwide staff of well-equipped, factory-trained technicians to provide these services, as well as on-site installation, training and expert repair services. Contact STEELCO for details.

#### NOTES

1. Customer must ensure that sterilizer stands on a leveled floor suitable to sustain the load of the device. Pipe sizes shown indicate terminal outlets only. Building service lines, which are not provided by STEELCO, must supply the specified pressures and flow rates.

For "special" installations (eg equipment installed on existing equipment compartment, recessed or placed beside other equipment) all internal parts shall be adequately protected to prevent direct accessibility to them by non-qualified personnel. Check the device installation drawing and contact STEELCO for further clarification.

2. STEELCO recommends that cut-off valves and vacuum breakers (not provided) are installed on service lines, and that disconnect switches (with lockout in OFF position; not provided by STEELCO)

are installed in electric supply lines near the equipment.

3. In the design of the installation environment heat dispersion must be considered.

4. STEELCO recommends illumination of the service area (if applicable) along with the provision of a convenience outlet for maintenance.

#### Required utilities

For connection details please refer to installation drawing of the selected model/version.

#### **Electrical power supply**

Standard configuration for European power supply voltage 3P+N 400V, 50Hz. On request it can be configured for 3P+N 400V, 60Hz power supply. For different voltages a transformer must be installed by the customer.

#### **Cold water**

#### **Drain**

#### **Softened or demineralized water**

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

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