



**SUN STERI & MEDI CARE**  
**ASSOCIATE**



## **RECTANGULAR HORIZONTAL STEAM STERILIZER**



Sterilization is defined as the destruction of microorganisms (including bacterial spores) for the purpose of gaining absolute sterility. An item is considered sterile if the theoretical probability of a living germ existing on it in question is less than 1 in 1 million. Steam sterilization is the safest and most common sterilization method. Known as an autoclave, a steam sterilizer is an instrument that uses heat and pressure and utilizes steam vapor.

Here's how an autoclave works: First, air is sucked in by a vacuum pump. The water then boils, and because the container does not allow water vapor to escape, the water vapor temperature rises above 100 degrees and saturated vapor saturates the inside of the autoclave.

Steam sterilization is done in two ways:

A sterilization time of 3 minutes with an absolute pressure of 3, 04 bar and a temperature of 134°C.

A sterilization time of 15 minutes with an absolute pressure absolute pressure of 2, 1 bar and a temperature of 121°C.

Pressure Transmitters & Temperature Sensors for Steam Sterilizers Special sensors are necessary to regulate the temperature and pressure of autoclaves.

## TEMPERATURE

<b>Range</b>	121° C & 134°C
<b>Measurement</b>	PT 100 (BS 1904 class B (DIN 43760), IEC 60751:2022 Industrial platinum resistance thermometers and platinum temperature sensors {OPTIONAL: PT 100 Class A})
<b>Sensor Position</b>	Chamber (1) , EXHAUST (1)
	Extra (Seal Point) for DATA LOGGER (1)

## PRESSURE

<b>Measurement</b>	Pressure Sensor/ Transmitter (4)
<b>Sensor Position</b>	Chamber (1) , Jacket (1)
	Generator (1) , Gasket (1)

## DEVICE CONSTRUCTION

<b>Chamber</b>	6mm, AISI 316 L Stainless Steel Optional up to 12 mm Thickness.
<b>Jacket</b>	3mm, AISI 304 L Stainless Steel Optional up to 5 mm Thickness.
<b>Door/s</b>	12 mm , AISI 316 Stainless Steel with Suitable Steel Support Structure , Stiffeners optimal up to 18mm.
<b>Box Type Body</b>	All Four Side Covered. AISI 304 Stainless Steel Optional Powder Color Coated Mild Steel up to 1 -1.5 mm thickness.
<b>Panel Cover</b>	AISI 304 Stainless Steel Optional AISI 316 Stainless Steel up to 3mm Thickness.
<b>Pipes</b>	For Attached with Chamber all pipes AISI 316 Stainless Steel & For Attached with jacket all Pipes AISI 304 Stainless Steel.
<b>Chamber Polishing</b>	Mirror Polished
<b>Jacket Shape</b>	Jacket Shape "C" Section / Limpet Jacket over the CHAMBER.
<b>Silicon Gasket</b>	ISO 13485:2016 Medical Device & Safety. Up to 400 °C Compatible.
<b>Valves</b>	Pneumatic Valves, Pressure upto 10kg/cm <sup>2</sup> , Design Y Type. Seal PTFE/CFT.
<b>Steam Generator</b>	AISI 316 L Stainless Steel up to 5 mm Thickness.
<b>Performance Standard</b>	Design Standard HTM 2010, EN 285
<b>PLC &amp; HMI</b>	Provided 4" / 7" COLOUR TOUCH SCREEN HMI – (Human Machine Interface) with PLC – (Programmable Logic Controller.)

## TECHNICAL SPECIFICATION IN DETAILING

<b>Chamber</b>	<ul style="list-style-type: none"> <li>Fully Argon/ Arc Welding.</li> <li>All Joints are Radio Graphical for High Security.</li> <li>Chamber Surface finish of 0.4 Ra.</li> <li>Chamber Corners for easy cleaning and 2 % slop for full drain.</li> <li>Removable Screen Plug provided for prevents clogging of the drainpipe &amp; Fittings.</li> <li>A baffle plate / Sheet for improve distribution of steam in Chamber.</li> <li>Chamber Safety Valve Provided.</li> <li>Compound Gauge Provided on Operating Side for see the Pressure.</li> </ul>
<b>Jacket</b>	<ul style="list-style-type: none"> <li>Full Argon/Arc Welding.</li> <li>Jacket besides reinforcing the chamber also helps to maintain temperature uniformity.</li> <li>Provide mechanical safety valve.</li> <li>Pressure Gauge provide on operating side for see Jacket Pressure.</li> <li>Vacuum Breaker to prevent possible buckling of Jacket due to accidental vacuum created.</li> </ul>
<b>DOOR/s</b>	<ul style="list-style-type: none"> <li>Door/s sealing is affected with the help of a silicon door gasket.</li> <li>The Silicon Gasket is pressurized by compressed air and retracted by Special vacuum mechanism.</li> <li>Door/s movement VERTICALLY up and down automatic with use of Compressed air via Pneumatic Cylinder.</li> </ul>
<b>DOOR/s SAFETY</b>	<ul style="list-style-type: none"> <li>Not open under high pressure cycle.</li> <li>Door Obstruction Safety Provided.</li> <li>Door Sealing Gasket, Pressure Gauge Provided.</li> </ul>
<b>STEAM GENERATOR</b>	<ul style="list-style-type: none"> <li>AISI 316 L Stainless Steel, up to 5 mm thickness.</li> <li>The equipment is provided with cylindrical Steam-Generator.</li> <li>The bottom is Argon welded with a dished-end. The front end is made out of machined plate.</li> <li>For safety and immaculate sealing there is a groove created in the plate and the boiler, which houses an endless square section SILICON gasket. Hence there are never any leakages from the boiler seal.</li> <li>Two - Three numbers of 9kw SS water-Industrial immersion heaters are fitted into the boiler-plate.</li> </ul>
<b>GENERATOR SAFETY</b>	<ul style="list-style-type: none"> <li>The heaters are put ON/OFF automatically by the process-control system.</li> <li>The boiler is provided with one SS float switches. This is a safety device.</li> <li>The Safety switch ensures that the heaters are never put ON when there is no water in the boiler.</li> <li>In addition to this the boiler is attached to a pressure-switch which control the pressure of the steam in the jacket.</li> <li>The safety valve on the Jacket also is connected to the boiler.</li> <li>All the above devices ensure that the boiler functions without any leakages and complete operator safety is maintained.</li> </ul>

## TECHNICAL SPECIFICATION IN DETAILING

<b>INSULATION</b>	<ul style="list-style-type: none"> <li>The Sterilization Chamber is insulated with 50 mm thick mineral wool which is held in place by an outer cover of SS 304 Sheet.</li> <li>The average surface temperature of the machine will not be more than 55 ° C ( Room Temperature 23+- ° C</li> </ul>
<b>STEAM CONDESER</b>	<ul style="list-style-type: none"> <li>The Condenser fabricated SS 304 is fitted in the Exhaust / vacuum Line to condense the Steam Before entering inside the vacuum pump.</li> </ul>
<b>OPERATING PRESSURE</b>	<ul style="list-style-type: none"> <li>1.50 Kg/cm2</li> </ul>

	<b>JACKET</b>	<b>CHAMBER</b>
<b>Working Pressure</b>	1.5 kg/cm2	1.5 kg/cm2
<b>Hydro Test Pressure</b>	3.0 Kg/cm2	3.0 kg/cm2
<b>Design Temperature</b>	134 ° C	134 ° C

## Temperature & Time require for AUTOCLAVING

<b>STERILIZER</b>	<b>TEMPRECTURE</b>	<b>PRESSURE</b>	<b>TIME</b>
<b>Steam Autoclave</b>	121 ° C( 250°F)	15 PSI	15 Minutes
<b>Unwrapped Items</b>	121 ° C (250°F)	30 PSI	3 Minutes
<b>Light Wrapped Items</b>	134° C (273°F)	30 PSI	8 Minutes
<b>Totally Wrapped Items</b>	134° C (273°C)	30 PSI	10 Minutes

\*The temperature is Crucial to microbicidal activity. Temperatures from 121 °C & 134°C usually are employed in STEAM STERILISATION. The temperatures must be maintained for a minimum period to kill off unwanted microbes.

<b>STAND</b>	<ul style="list-style-type: none"> <li>SS Pipe/ Angle , Optional Mild Steel</li> </ul>
<b>PIPING PACKAGE</b>	<ul style="list-style-type: none"> <li>Contact with CHAMBER is fabricated from SS 316 L with argon welding.</li> <li>The Piping in contact with JACKET is fabricated from SS 304 L with argon welding.</li> <li>All Connections &amp; Fittings used are sanitary tri-clamp with silicon seals.</li> <li>The piping is designed to ensure that the customer can provide utility connection at one single point.</li> <li>All drain lines and exhaust are connected to a drain manifold.</li> <li>The pipelines also have a angle slope for full draining to prevent contamination.</li> </ul>
<b>VALVE PACKAGE</b>	<ul style="list-style-type: none"> <li>All automatic valves are pneumatically actuated angle valve.</li> </ul>
<b>STEAM ACCESSORIES</b>	<ul style="list-style-type: none"> <li>JACKET &amp; CHAMBER are provided with an over pressure safety valve with non- return valve.</li> <li>One safety valve for the Chamber (set point 2.0 bar)</li> <li>One safety valve for the jacket (set point 2.0 bar)</li> <li>Thermodynamic Steam Trap with special air vent arrangement require for condensate removal.</li> </ul>
<b>VACUUM PUMP</b>	<ul style="list-style-type: none"> <li>A water ring vacuum pump is provided along with the system.</li> <li>This Vacuum Pump is used for creating vacuum in the chamber for mechanical air-removal prior to sterilization and subsequently for post sterilization vacuum-drying.</li> </ul>
<b>PRINTER</b>	<ul style="list-style-type: none"> <li>Attached Thermal printer 4inch.</li> </ul>

<b>SAFETY PROVISIONS</b>	<ul style="list-style-type: none"> <li>1. Pressure relief valve (PRV) to release the pressure inside the chamber if exceed over 4 bar.</li> <li>2. Pressure Relief valve (PRV) to release the pressure inside the Jacket if exceed over 4 bar.</li> <li>3. Thermostat, if chamber temperature exceeds beyond 140/150 °C it will cut off the mains supply of the unit.</li> <li>4. Emergency STOP switch has been provided to abort the cycle in case of emergency or in abnormal condition.</li> <li>5. Door/s Obstruction Safety Mechanism.</li> <li>6. Low Water lever Cutoff automatic in Generator.</li> </ul>
<b>ALARMS</b>	<ul style="list-style-type: none"> <li>Various Alarms Indication Provided for Safety.</li> </ul>
<b>TRANSFER TROLLY</b>	<ul style="list-style-type: none"> <li>Transfer Trolley (Qty.: 1 Nos.)</li> <li>Floor trolley is fabricated from AISI Gr 2062 steel sturdy tubular members welded together.</li> <li>The top frame is on four heavy studs for level adjustment.</li> <li>The rails on the top frame match with the rails in the chambers.</li> <li>The trolley is also provided with two fixed and two swiveling castor wheels.</li> <li>The castor wheels consist of Stainless Steel bracket fitted with Polyurethane wheels.</li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>Manufacture as per Client's Requirement</li> </ul>

### CARRIAGE (CHAMBER)

- CARRIAGE (Qty.: 1 No)
- Loading carriage is fabricated from specially formed SS316L sections and welded to form a supporting frame.
- Shelves are provided for loading which are fabricated from SS 316L with adequate holes drilled for steam circulation.
- Each carriage is provided with four concave shaped wheels with sealed bearings impregnable to the steam.  
OR
- Manufacture as per Client's Requirements.

### VALIDATION PORTS

- The chamber is provided with validation ports with tri-clamp connections.
- The validation ports are provided with special leak tight ferrules for insertion of 12 flexible temperature sensors for validation of the system



### TRANSFER TROLLEY & CHAMBER CARRIAGE:

PROGRAMES: Sterilization Cycle must be Start in One Touch by Selecting One from the Pre Set Programs. And Cycle must be completed automatic without any interfere.

The System Include the following pre-programs cycles. Additionally unlimited number of user defined cycle/s can also be programmed into the memory of the system.

- 134°C Unwrapped (Standard Cycle)
- 134° C Wrapped (With Drying) – High Pressure High vacuum cycle
- 121°C Unwrapped
- 121°C Wrapped ( with Drying)
- Bowie & Dick test Programed Cycle.
- Vacuum Test Program.
- User Define any number of program cycle.

\*All above programmed with drying time & drying phase included. So, Material would be out with Dry.

\* Test (FAT) with the client at the workshop in accordance to the Manufacturer Standard consisting of Physical verification of all components as per Final Offer, PO and OA. Acceptance by client scope for polishing/finishing of machine and its components at factory premises. Check Final Sterilization Cycle Verification as far as practicable in the workshop. Standards Equipment is designed and manufactured according to EN-285 Pressure Vessel on basis of ASME Section VIII Division1

### Chamber Size Chart

Size of Inner Chamber ( WXHxD )	Capacity in Liters	Load
450X450X900 mm	180 Liters	18 KYV
450X600X900 mm	240 Liters	18 KYV
600X600X900 mm	320 Liters	18 KYV
600X600X1200 mm	430 Liters	27 KYV
600X600X1500mm	540 Liters	27 KYV
600X900X1500 mm	810 Liters	36 KYV

Customized Size Available.