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SUN STERI & MEDI CARE
ASSOCIATE

CYLINDRICAL 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.

Steam Sterilizers are ideal for Hospitals, Research Laboratory, Chemical Industry and other Pharmaceutical Industry. They are designed for safe & efficient sterilization of various items such as Ampoules & Vials, Rubber goods, glassware, instruments & utensils, Fabrics wrapped or unwrapped materials, Sterilization of Bio waste material and Pre disposal treatment.

TEMPERATURE

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

PRESSURE

Measurement	Pressure Sensor/ Transmitter (2)
Sensor Position	Chamber (1) , Jacket (1)

DEVICE CONSTRUCTION

Chamber	4mm, AISI 316 L Stainless Steel Optional up to 5 mm Thickness.
Jacket	3mm, AISI 304 L Stainless Steel Optional up to 5 mm Thickness.
Door/s	12 mm , AISI 316 Stainless Steel
Hinge	AISI 304 Stainless Steel
Central Locking Parts	CI Casting, Wrinkle – Black panted
Shooting Bolts	AISI 304 Stainless Steel
Outers Insulation	304 Stainless Steel Sheet
Box Type Body (OPTIONAL at Additional Cost)	All Four Sides Covered. AISI 304 Stainless Steel Optional Powder Color Coated Mild Steel up to 1 -1.5 mm thickness.
Flush Mounting (Optional)	Operating Side Flush Mounting provided on Request.
Compound Gauge:	SS (4"Dial), -1 to 3 kg/cm2 for Chamber
Pressure Gauge:	SS (4"Dial), 0 to 4 kg/cm2 for Jacket
Temperature Gauge:	0 to 150 °C
Operating Pressure:	2.1kg/cm2
Panel Cover	AISI 304 Stainless Steel Optional AISI 316 Stainless Steel up to 3mm Thickness, Optional Mild Steel Powder Coted on request.
Pipes	For Attached with Chamber all pipes AISI 316 Stainless Steel & For Attached with jacket all Pipes AISI 304 Stainless Steel.
Chamber Polishing	Mirror Polished
Jacket Shape	Cylindrical Jacket over the CHAMBER.
Silicon Gasket	ISO 13485:2016 Medical Device & Safety. Up to 400 °C Compatible.
Valves	Pneumatic Valves, Pressure upto10kg/cm2, Design Y Type. Seal PTFE/CFT.
Steam Generator	AISI 316 L Stainless Steel up to 5 mm Thickness.
Performance Standard	Design Standard HTM 2010, EN 285
PLC & HMI	Provided 4" / 7" COLOUR TOUCH SCREEN HMI – (Human Machine Interface) with PLC – (Programmable Logic Controller.)

TECHNICAL SPECIFICATION IN DETAILING

Chamber	• Fully Argon/ Arc Welding. • All Joints are Radio Graphical for High Security. • Chamber Surface finish of 0.4 Ra. • Chamber is easy cleaning and 2 % slop for full drain. • Removable Screen Plug provided for prevents clogging of the drainpipe & Fittings. • A baffle plate / Sheet for improve distribution of steam in Chamber. • Chamber Safety Valve Provided. • Compound Gauge Provided on Operating Side for see the Pressure.
Jacket	• Full Argon/Arc Welding. • Jacket besides reinforcing the chamber also helps to maintain temperature uniformity. • Provide mechanical safety valve. • Pressure Gauge provide on operating side for see Jacket Pressure. • Vacuum Breaker to prevent possible buckling of Jacket due to accidental vacuum created.
DOOR/s	• Door/s sealing is affected with the help of a silicon door gasket. • Door/s movement HORIZONTALY way manual hand operates.
DOOR/s SAFETY	• Not open under high pressure cycle. • Door/s not be open during the process due to Automatic central Locking provided. • Door Sealing Gasket, Pressure Gauge Provided.
STEAM GENERATOR	• AISI 316 L Stainless Steel, up to 5 mm thickness. • The equipment is provided with cylindrical Steam-Generator. • The bottom is Argon welded with a dished-end. The front end is made out of machined plate. • 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. • Two/Three numbers of 9kw SS water-Industrial immersion heaters are fitted into the boiler-plate.
GENERATOR SAFETY	• The heaters are put ON/OFF automatically by the process-control system. • The boiler is provided with one SS float switches. This is a safety device. • The Safety switch ensures that the heaters are never put ON when there is no water in the boiler. • In addition to this the boiler is attached to a pressure-switch which control the pressure of the steam in the jacket. • The safety valve on the Jacket also is connected to the boiler. • All the above devices ensure that the boiler functions without any leakages and complete operator safety is maintained.

TECHNICAL SPECIFICATION IN DETAILING

INSULATION	• The Sterilization Chamber is insulated with 50 mm thick mineral wool which is held in place by an outer cover of SS 304 Sheet. • The average surface temperature of the machine will not be more than 55 ° C (Room Temperature 23+- °C)
STEAM CONDENSER	• The Condenser fabricated SS 304 is fitted in the Exhaust / vacuum Line to condense the Steam Before entering inside the vacuum pump.
OPERATING PRESSURE	• 1.50 Kg/cm2

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

Temperature & Time require for AUTOCLAVING

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

STAND	• SS Pipe/ Angle , Optional Mild Steel
PIPING PACKAGE	• Contact with CHAMBER is fabricated from SS 316 L with argon welding. • The Piping in contact with JACKET is fabricated from SS 304 L with argon welding. • All Connections & Fittings used are sanitary tri-clamp with silicon seals. • The piping is designed to ensure that the customer can provide utility connection at one single point. • All drain lines and exhaust are connected to a drain manifold. • The pipelines also have a angle slope for full draining to prevent contamination.
VALVE PACKAGE	• All automatic valves are pneumatically actuated angle valve.
STEAM ACCESSORIES	• JACKET & CHAMBER are provided with an o ver pressure safety valve with non- return valve. • One safety valve for the Chamber (set point 2.0 bar) • One safety valve for the jacket (set point 2.0 bar) •Thermodynamic Steam Trap with special air vent arrangement require for condensate removal.
VACUUM PUMP	• A water ring vacuum pump is provided along with the system. • 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
PRINTER	• Attached Thermal printer 4inch.

SAFETY PROVISIONS	• 1. Pressure relief valve (PRV) to release the pressure inside the chamber if exceed over 4 bar. • 2. Pressure Relief valve (PRV) to release the pressure inside the Jacket if exceed over 4 bar. • 3. Thermostat, if chamber temperature exceeds beyond 140/150 °C it will cut off the mains supply of the unit. • 4. Emergency STOP switch has been provided to abort the cycle in case of emergency or in abnormal condition. • 5. Low Water lever Cutoff automatic in Generator.
ALARMS	•Various Alarms Indication Provided for Safety. •Audio Alarm & Visual Display of Error messages on video screen and on the computer screen too.
TRANSFER TROLLY (OPTIONAL QTY-1)	• Floor trolley is fabricated from AISI Gr 2062 steel sturdy tubular members welded together. • The top frame is on four heavy studs for level adjustment. • The rails on the top frame match with the rails in the chambers. • The trolley is also provided with two fixed and two swiveling castor wheels. • The castor wheels consist of Stainless Steel bracket fitted with Polyurethane wheels. OR • Manufacture as per Client's Requirement

CARRIAGE (CHAMBER) (OPTIONAL ON CLIENT REQUEST)

- 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 TROLLY & 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 (WXD) in mm / inch	Capacity in Liters	Steam generator Water Ltr / Load (Kw)	Floor Space Require for Operate & maintenance
400 x 600 in mm / 16" x 24"	80 Ltr	45 / 18	1130 x 1900 mm
400 x 1100 in mm / 16" x 44"	145 Ltr	44 / 18	1130 x 1900 mm
500 x 900 in mm / 20" x 36"	185 Ltr	55/ 27	1200 x 2300 mm
600 x 900 in mm / 24" x 36"	268 Ltr	44 / 27	1250 x 2400 mm
500 x 1200 in mm / 20"x 48"	248 Ltr	55 / 27	1200 x 2700 mm
600 x 1200 in mm / 24" x 48"	355 Ltr	55 / 36	1250 x 2700 mm
Customized Size Available.			

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CYLINDRICAL HORIZONTAL STEAM STERILIZER
(SEMI AUTOMATIC)

- Cycle Temperature 121°C & 134°C
- The Chamber operates at 1.76 to 1.8 kg/cm² of steam (Design Pressure)
- Operating Pressure: Chamber 1.2 Kg/cm² & Jacket -1.2Kg/cm²
- Hydraulic Test: Jacket at 2.4 Kg/cm² & Chamber: 1.8 Kg/cm²
- The Machine is manufactured in Accordance with IS 3829 Part I
- MOC: Chamber: SS 316 4 mm, Jacket: SS 304 3 mm, Back Plate: SS-304 3mm, Door SS304 12mm Optional up to 15 mm thickness.
- Steam Generator: MOC_SS 304. 440V. Heater Plate SS 304 12 mm , optional up to 15mm thickness Heating load: 18 Kw.
- All pipes connected to chamber and jacket are made of SS 304
- Insulation: The Jacket is insulated with 25/50 mm
- Thick Resin-bonded Glass-wool, which is covered by an SS 304 Sheet 1.2mm thickness.
- Door: One/ Two number/s, Self-Aligning, Pressure Locking Type, Safety door with Radial Locking arms.
- Door/s : SS304 12mm optional up to 15 mm thickness.
- Door Gasket: Solid Section Silicon Rubber Gasket
- Machine operates with Multiport Valve / Multi-Function operated system with valves.
- Safety Valves: Two, spring-loaded safety valves safeguard the jacket and chamber mechanically.
- Display: Digital Display for Temperature and Time.
- Vacuum Pump & Vacuum Breaker (Optional) : Automatic vacuum breaker attached to jacket prevents accidental buckling of jacket due to vacuum. Without to proper vacuum, Product may not proper dry.
- Baffle: SS baffle is placed in the chamber for even distribution of steam in the chamber.
- A temperature indicator (Dual type) indicates the sterilizer temperature
- Compound gauge indicates pressure / vacuum in the chamber. Pressure gauge indicates Pressure of jacket.
- Sterilizer is mounted on a sturdy M.S pipe stand with colour with leveling flanges.
- Caster Wheels (Optional): Provided heavy Duty Caster Wheel under the Stand Pipes for Proper Movement and Transport.

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