

# HIGH SPEED STERILIZERS



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Sterilizer Technologies CC

# INTRODUCTION

The SD series of sterilizers has been developed by Sterilizer Technologies over the past 30 years to provide a highly reliable sliding door Autoclave with the high performance and features required by hospitals, laboratories, pharmaceutical, biotechnology, and scientific industries worldwide.

The flexibility of this design enables these autoclaves to be built to suit a wide variety of specifications and requirements from users who command the best solution to meet their needs. A number of options provide the user with the choice of Chamber size, Door configurations, Vacuum systems, Steam generation, Sterilizing cycles, Recording systems, Loading equipment and Accessories.

## CONSTRUCTION



The Autoclaves are manufactured to the highest standards, using high quality stainless steel chambers designed in accordance with British Standards and tested in accordance to EN285. Internationally recognised & approved inspection authorities such as LRQA appraise the designs of all pressure vessels and undertake the inspection during manufacture, hydraulic pressure testing and final certification.

### MATERIALS

A variety of materials are available for construction of the pressure vessels. The chambers are manufactured from high quality stainless steel, in a choice of grades such as 304L and 316L or any special requested material such as Duplex stainless steel. The inner surfaces of the Chambers are electro-polished to facilitate cleaning. The chambers are designed for a maximum operating pressure of 2,40 bar and full vacuum; and can operate at temperatures up to 138°C.

The chamber is jacketed over all four sides and back which provides the strength required by the pressure vessel to withstand the continuous pulsing pressures and vacuums that the chamber is subjected to over the many years of operational life. Steam is also admitted to the jacket and controlled at precise temperatures and pressures, which perform two important functions:

- The pressure vessel is always maintained at the correct operating temperature for the selected sterilizing cycle ensuring the fastest cycle times.
- Heat from the jacket is radiated to the load to enhance drying of the load when required.

### INSULATION

The chamber, doors, and steam generators are insulated with high-density mineral wool to keep the exposed surfaces at safe temperatures. The chamber insulation is covered with aluminium sheeting.

## FRAMEWORK

The autoclave is mounted on a robust tubular steel framework with adjustable feet for levelling. The frame has been designed to allow the use of a pallet trolley or forklift for easy moving into position.

## PANELLING

The door cover and front panelling are made of satin finish, Grade 304 stainless steel fitted to an anodised aluminium trim. Where machines are free-standing and not recessed into a partition wall, stainless steel side covers are fitted which can be easily removed for maintenance purposes.



## PIPES AND VALVES

Valves used to control the sterilizing process are electric solenoid operated. Alternatively, pneumatically operated valves can also be specified. Standard valves are made of brass; and piping thick-walled copper tubing. Optionally, stainless steel valves and fittings can be specified.

## VACUUM SYSTEMS

Vacuum is created by means of either a liquid ring vacuum pump, or a water ejector driven by a centrifugal pump. Liquid ring vacuum pumps are fitted with a high efficiency heat exchanger between the chamber drain and the pump to prevent overheating and cavitation of the pump thus resulting in a long service life.

## AIR FILTRATION

At the end of the cycle, air is admitted to the sterilizing chamber through a bacteriological filter, ensuring that all loads are sterile when the chamber is restored to atmospheric pressure and the load removed.

## CHAMBER SIZES

There are two basic series of chamber configurations i.e. SD 460 (160 litre) and SD 660 (600 litre) with the difference being in the cross-section internal dimensions (width x height). Although there are standard chamber depths, which give a wide variety of sterilizing volumes, any depth can be specified to meet the ideal requirements for any application.

Various Chamber sizes are available and although there are standard chamber depths, Autoclaves can be uniquely designed and manufactured to meet individual client requirements.



## DOORS



The autoclaves can be supplied with either Single or Double (pass-through) doors. The doors of the SD 460 (160 litre) and SD 660 (400 litre) models are the vertical sliding type. The internal surfaces of the doors are polished and are manufactured of the same high grade stainless steel as the chamber.

### MANUAL OR AUTOMATIC

The SD 460 (160 litre) doors can be operated manually or automatically, while the SD 660 (400 litre) doors are operated automatically. In the case of manual operation, the doors are perfectly counterbalanced, enabling the user to close or open the door with the slightest of effort. Automatic doors are actuated automatically by electric motors.

### SAFETY

Limit switches are fitted to detect when the doors are fully open or fully closed. Safety interlocks prevent the sterilizing cycle from being started unless the doors are fully closed and prevent the doors from being opened unless the pressure within the chamber is within safe limits. A safety flap is fitted to the top leading edge of automatic doors so that in the event of the door being jammed by personnel or equipment, the door will automatically open.

### PASS-THROUGH SYSTEMS

Automatic double door systems can be programmed to operate depending on the specific material flow requirements. However, the two doors are interlocked to prevent both doors being opened at the same time.

Cross-contamination seals can be fitted to double door Autoclaves in installations where complete sealing between the two sides is required, such as in pharmaceutical manufacturing facilities.

### HIGH TEMPERATURE SEALS

The doors are sealed by high temperature silicone gaskets fitted into grooves machined into the body of the autoclave. The gasket is inflated by steam to provide a leak-free seal during a cycle, and retracted by vacuum at the end of the cycle to ensure it is clear of the door surface.



## STEAM GENERATORS

The Autoclaves require a reliable source of pressure regulated steam. When this is not available, integral steam generators can be supplied, either built-in to the Sterilizer or as free-standing packages. Steam generators are also made to the high standards of the chambers. The same high quality stainless steel is used for the construction of the chambers and can be specified for the steam generators.

### AUTOMATIC LEVEL CONTROL

Water is fed to the generator by a pressure booster pump that draws water from the autoclave water storage tank. The water level within the steam generator is automatically controlled by a set of level switches. Should there be a failure of the water supply, which causes the water level within the generator to drop to a dangerously low level, an independent level control switch will automatically cut the power to the heating elements. The water tank is temperature controlled thus reducing the water consumption.

### WATER QUALITY

It is recommended that softened water be supplied as feed water for the steam generator, if this is not available the steam generator can be operated off normal mains water supplies. The control system has a special function whereby the steam generator is automatically blown down to keep the level of contaminants within the generator down to acceptable levels which will not cause damage to the generator or autoclave chamber materials.

## CONTROL SYSTEMS



The SD 460 and SD 660 series of steam Sterilizers are fitted with the latest state-of-the-art embedded microprocessor based control systems. These computerised systems provide fully automatic controls and monitoring of the sterilizing processes, while at the same time being extremely simple and easy to operate.

The modular structure of the control system enables any sterilizer to be fitted with the perfect configuration. Both inputs and outputs can be expanded to accommodate more functions depending on the complexity of the sterilizer. In the unlikely event of failure of a module, it can easily be replaced by simply plugging in a replacement module, eliminating the need for any new wiring. The status of every input and output of the controller is indicated by LED's. Four communication ports connect the controller to operator displays, printers, modems and data loggers.

## ACCURATE MEASUREMENT

High resolution analogue input modules enable pressure and temperature measurement to an accuracy of 0.1kPa and 0.1°C respectively, enabling perfect control over the sterilizing process. Standard measured parameters control the autoclaves, chamber temperature, chamber pressure and jacket temperature. An independent sensor is used for measuring and recording chamber temperature.

## OPERATOR PANEL

The operator panel on the fascia of the sterilizers consists of a vacuum fluorescent digital display which provide clear messages in bright lettering which can be read under any room lighting conditions. The display gives an indication of the status of the sterilizer, all alarm conditions, temperatures, pressures, time and prompts the operator with messages that makes operation simple.

## DOCUMENTATION

A panel printer is mounted on the operator control panel to provide a hard copy record of the cycle performance. Critical variables are printed such as date, time, cycle stage, chamber temperature and pressure, Autoclave ID number, and type of cycle selected. The printer is also used for recording cycle variables and other information such as calibration data.



## DATA STORAGE

An optional data storage device can be supplied with the control system which records all the cycle data and system parameters in electronic digital format. This data can be downloaded to a PC via one of the controller's communication ports for viewing and archiving.

## STERILIZING CYCLES

The control system can be programmed for a number of sterilizing cycles from low temperature steam formaldehyde @ 50°C to high temperature steam sterilization @ 138°C. The Autoclave is suitable for sterilizing a wide variety of products and typical cycles installed on the machine are the following:

### CSSD AND THEATRE STERILIZING CYCLES

- Porous loads @ 134°C for instruments, linen and metalware
- Porous loads @ 121°C for rubber goods
- Bottled fluids @ 121°C for sterile water
- Instruments @ 134°C for pouched instruments
- Flash Cycle @ 134°C for open instruments



## LABORATORY STERILIZING CYCLES

- Porous loads @ 134°C for wrapped items
- Porous loads @ 121°C for rubber goods
- Bottled fluids @ 121°C for sterile liquids
- Metalware @ 134°C for metal bowls
- Glassware @ 121°C for glass items
- Media @ 105°C - 121°C for culture media
- Solid waste @ 134°C for solid waste disposal
- Liquid waste @ 121°C for liquid waste disposal



## PERFORMANCE TEST CYCLES

- Vacuum leak test
- Bowie & Dick test



## LOW TEMPERATURE STEAM & FORMALDEHYDE CYCLES

Heat sensitive goods which may be damaged by the high temperatures found in standard steam sterilizers, can be sterilized using the low temperature steam & formaldehyde (LTSF) cycles. These cycles are not installed as standard on the high temperature sterilizers but can be included if required. Special piping and additional components are required for the LTSF process, which is capable of sterilizing items at temperatures ranging from 50°C to 80°C.

## ACCESSORIES

### LOADING EQUIPMENT

The sterilizers can be supplied with a variety of accessories for handling the loads. The chamber can be fitted with internal shelves onto which the load can be directly placed. Internal and external trolley systems and Baskets in a variety of sizes are available for instruments and packages.



## WATER TREATMENT SYSTEMS

The sterilizers require an acceptable level of water quality in order to perform without failure and to extend the life of the components. Water softening systems and reverse osmosis (RO) packages are available where the water quality is below the acceptable standards.

## SERVICES & INSTALLATIONS

The required services will be specified for each individual machine and are dependent on several factors. The recommended ratings for steam, water, air, power, and drainage requirements are given with each installation. Drawings are also issued showing the positions of service connections and dimensions of the sterilizers.

## CONTACT DETAILS



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