Reliable. High Performance.
Laboratory Steam Sterilizers.

LANCER
GETINGE GROUP

For Research. For Results. For Certain.

When it's done, **it's sterile,** it's documented, it's ready for the next load.

Rest assured.

Lancer offers a complete line of steam sterilizers designed for high performance sterilization of labware, process materials and byproducts used in laboratory, research and animal care facilities.

The laboratory sterilization process is a combined function of proper cycle selection, load preparation, steam exposure over time, load drying and documentation. Additional considerations such as effluent decontamination, wastewater cooling and loading orientation are important in the selection process.

Cycle Temperature Range

Low Temperature	Liquid	Vacuum
169°–212°F	*219°–275°F*	*230°–275°F*
(76°–100°C)	*(104°–135°C)*	*(110°–135°C)*

Model LSS 450 steam sterilizer, 15.5 cu. ft. (450 L) interior volume.
Shown with optional load car positioned on optional transfer trolley. See accessories.

Onboard monitoring, documentation and record-keeping protocols help assure compliance with internal and third-party criteria.

The Lancer sterilizer controller is factory programmed with a minimum of 18 preset cycles for gravity and vacuum assisted operation, plus vacuum leak test and Bowie-Dick test on selected models. The integrated controller permits easy operation through a graphic user interface with intuitive menus.

Valves and plumbing components are engineered and conveniently located for routine inspection and maintenance to minimize downtime.

The compact vertical door operates in a downward vanishing motion that requires no headspace and zero impingement on laboratory footprint, unlike swinging doors or vertical rising doors.

Doors are manually operated on LSS 130 and LSS 275 models. Powered door operation is standard on LSS 450 and LSS 590 models.

Stainless steel construction assures extended life cycle in harsh environments.

All sterilizer models require a steam supply. An optional independent steam generator is available if facility steam volume and flow is not available or is insufficient. The steam generator can be installed internal to the sterilizer or adjacent to the installation. See Options.

Foot switch for hands-free opening of powered door (select models).

Model LSS 275 steam sterilizer, 9.7 cu. ft. (275 L) interior volume. Shown with stainless steel loading racks, supplied standard and optional powered door.

Eight configurations in popular cabinet sizes for new or replacement installation.

LSS 130

4.6 cu. ft. (130 L)

130 Standard Features

- Manual Door(s)
- Recessed Installation
- Shelf Rack Supports
- Two Shelves

Options

- Power Door(s)
- Integral Steam Generator
- Freestanding Installation

LSS 275

9.7 cu. ft. (275 L)

275 Standard Features

- Manual Door(s)
- Recessed Installation
- Shelf Rack Supports
- Two Shelves

Options

- Power Door(s)
- Integral Steam Generator
- Freestanding Installation
- Load Car Rails

LSS 450 / LSS 590

15.5 cu. ft. (450 L) / 20.7 cu. ft. (590 L)

450 Standard Features

- Powered Door(s)
- Recessed Installation
- Shelf Rack Supports
- Two Shelves

Options

- Integral Steam Generator
- Freestanding Installation
- Load Car Rails

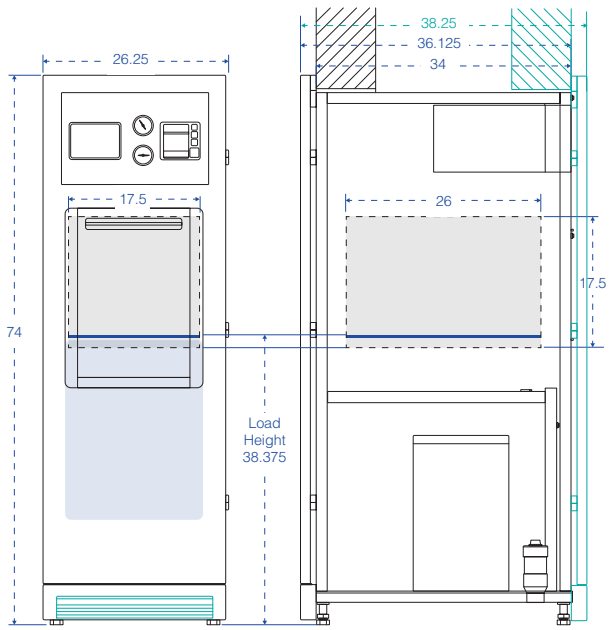
590 Standard Features

- Powered Door(s)
- Recessed Installation
- Load Car Rails

Options

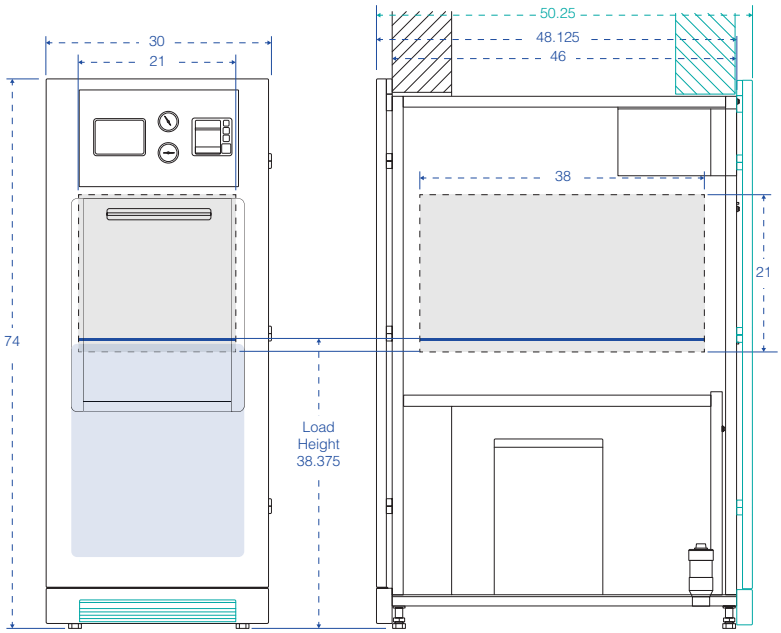
- Integral Steam Generator
- Freestanding Installation

Choose size, single door or pass-through.



LSS 130

Drawing shown with foot switch for optional powered door.

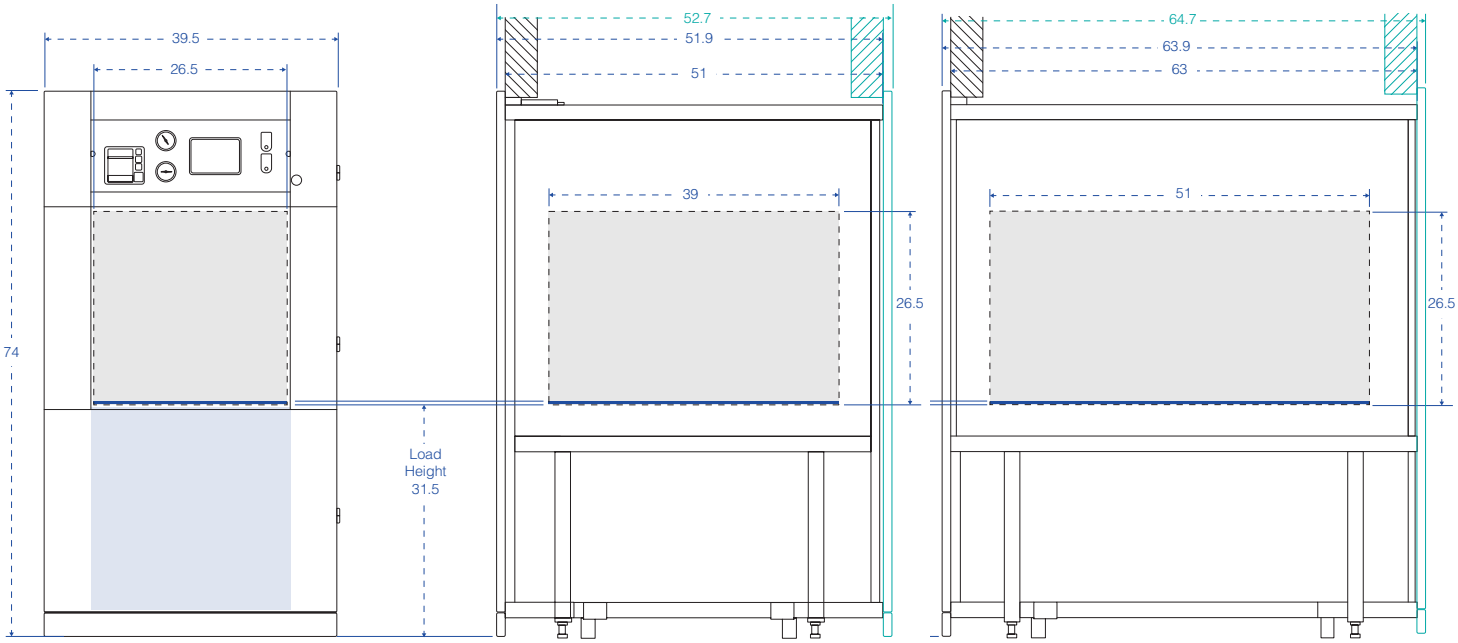


LSS 275

Drawing shown with foot switch for optional powered door.

	Specifications				
	Interior Volume cu. ft. (L)	**Interior Dimensions** W x H x D	**Exterior Dimensions** W x H x D	**Door Operation** manual	power
LSS 130	4.6 (130)	17.5" x 17.5" x 26" 445 x 445 x 660 mm	26.25" x 74" x 36.125" 667 x 1880 x 918 mm	■	□
LSS 130 Pass-through	4.6 (130)	17.5" x 17.5" x 26" 445 x 445 x 660 mm	26.25" x 74" x 38.25" 667 x 1880 x 972 mm	■	□
LSS 275	9.7 (275)	21" x 21" x 38" 532 x 532 x 965 mm	30" x 74" x 48.125" 762 x 1880 x 1222 mm	■	□
LSS 275 Pass-through	9.7 (275)	21" x 21" x 38" 532 x 532 x 965 mm	30" x 74" x 50.25" 762 x 1880 x 1276 mm	■	□
LSS 450	15.8 (447)	26.5" x 26.5" x 39" 672 x 672 x 1000 mm	39.5" x 74" x 51.9" 1003 x 1880 x 1318 mm	–	■
LSS 450 Pass-through	15.8 (447)	26.5" x 26.5" x 39" 672 x 672 x 1000 mm	39.5" x 74" x 52.7" 1003 x 1880 x 1339 mm	–	■
LSS 590	20.7 (586)	26.5" x 26.5" x 51" 672 x 672 x 1300 mm	39.5" x 74" x 63.9" 1003 x 1880 x 1623 mm	–	■
LSS 590 Pass-through	20.7 (586)	26.5" x 26.5" x 51" 672 x 672 x 1300 mm	39.5" x 74" x 64.7" 1003 x 1880 x 1643 mm	–	■

* Load car and trolley are optional and must be purchased separately. See accessories.



LSS 450 / 590 **LSS 450** **LSS 590**

Steam Source			Installation			Chamber Inventory		Wastewater	Ship
House Steam pressure and flow min.	**Electric Generator** integral	remote	**Free-standing**	**Recessed** one-wall	two-wall	**Rack Supports** for shelves*	**Rails** for trolley*	**Automatic Cooling**	**Weight** lb (kg)
40-50 psig 120 lb/hr	□	□	□	■	–	■	–	■	965 (438)
	□	□	–	■	–	■	–	■	1020 (462)
	□	□	□	■	–	■	□	■	1223 (554)
	□	□	–	□	■	■	□	■	1298 (589)
50-70 psig 180 lb/hr	□	□	□	■	–	■	□	■	1365 (619)
	□	□	–	□	■	■	□	■	1508 (684)
	□	□	□	■	–	–	■	■	1506 (683)
	□	□	–	□	■	–	■	■	1649 (748)

■ / ■ Standard (Single Door / Double Door)
□ / □ Optional (Single Door / Double Door)

Fingertip controls and multifunction displays simplify operation.

Control Systems

The microprocessor-based controller is provided with preprogrammed cycles to meet most laboratory requirements. The controller interface is designed to permit easy user access and simplified one-motion start function. Multiple displays are arrayed on the graphic user interface to clarify cycle selection and real-time performance through plot, detail and line graph expression.

AVANTI Touch Screen Interface:

- PACS 3500 Programmable Logic Controller (PLC)
- 8.4" SVGA Color Display
- Touch Screen Interface

The AVANTI User Interface plot graph displays temperature and pressure performance over time.

The AVANTI User Interface is managed by a touch screen button array to produce a series of screens, each divided into utility sections indicating sterilizer setup, performance and documentation. A navigation bar is anchored to the bottom of each touch screen to simplify progression throughout screen selection through touch screen sequences.

An administrative supervisor password is required for setup, additional cycle programming, managing user privileges, sterilizer identification and choosing language options.

Features	AVANTI
Password Protection	■
Administrator Override	■
Built-in Menu	■
Remote Troubleshooting	■
Dual Display (Pass-through Models)	■
Ethernet	■
RS-232	■
Thermal Printer	■
USB Flash Drive	■
Memory Backup	■
Service Routines and Diagnostics	■

■ / ■ Standard (Single Door / Double Door)

Functional cycles are preprogrammed to ensure **repeatable results.**

Sterilization and Test Cycles

Cycle selection is based on the type of load to be sterilized and how air removal is most efficiently managed for proper sterilization. Preprogrammed cycles account for both gravity and vacuum-assisted air removal once the desired cycle has been chosen.

Gravity Cycles. Six preprogrammed gravity cycles follow a basic operational sequence. Profiles are generally the same, but time duration of individual phases is tailored to the preset determination.

Vacuum Cycles. Cycles selected for sterilization of nonliquids are programmed to force removal of ambient air trapped within the load through initiation of a vacuum sequence. Time sequencing and duration of individual phases is tailored to the preset determination.

Liquids Cycles. Cycles selected for sterilization of vented liquids are designed to slow the rate of exhaust to prevent boilover as chamber pressure is returned to atmospheric pressure.

Sealed Liquid Cycle (optional). The cycle is intended for sterilization of liquids in rigid sealed bottles. It uses a combination of air overpressure and jacket cooling to prevent deformation of a sealed liquid during cooldown.

Low Temperature Cycle (optional). The low temperature cycle is intended for laboratory processes such as Pasteurization and moist-heat conditioning within a temperature range of 169°F (76°C) to 212°F (100°C).

Test Cycles. Individual test cycles are preprogrammed in accordance with standard best practices to verify the efficacy of the sterilizer and its performance.

- Bowie-Dick Test. The Bowie-Dick test is a widely accepted process to assure that ambient air has been properly removed from the chamber and load, prior to sterilization.
- Vacuum Leak Test. The integrity of the sterilizer chamber and associated plumbing, both under pressure and vacuum, is verified by running a vacuum leak test as directed by local lab safety or facilities management officers.

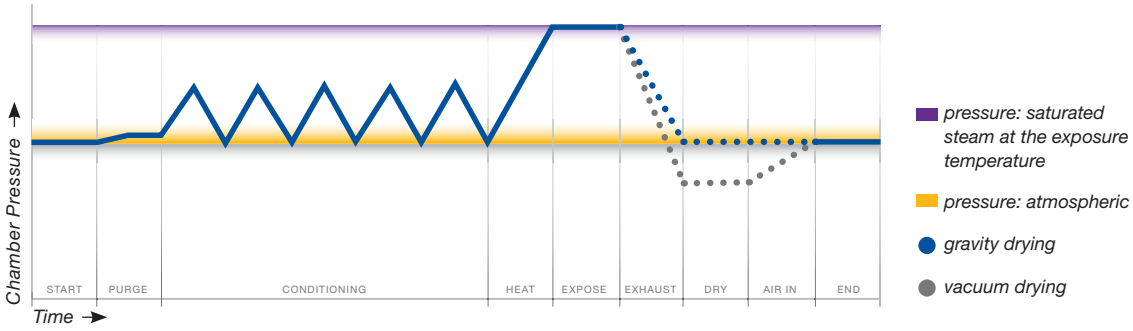
Optional load probe monitors liquid temperature during cycle. See options.

Typical Cycle Profiles. All Lancer steam sterilizers are designed to perform a minimum of 19 preprogrammed cycles for purge, preconditioning, pressure and heat exposure, exhaust, drying and return to atmosphere. Ramps, dwells, relief durations and slopes are functions of standard protocols or custom cycles programmed on-site through administrative preference via password access.

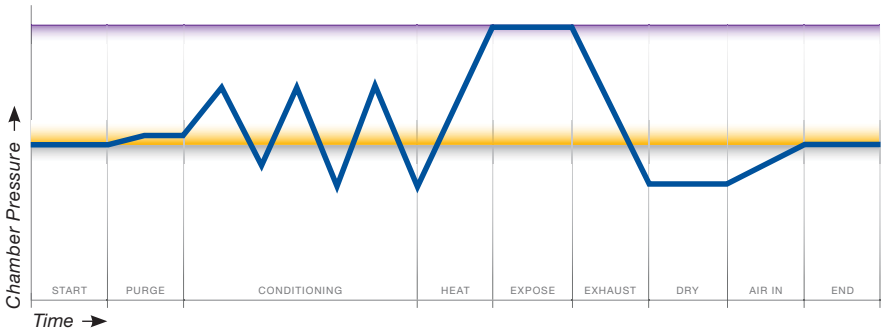
Typical Sterilizer Cycles. Depending on your choice of vacuum system, basic cycle profiles are illustrated as follows:

- Gravity Cycle Phases, Figure 1
- Vacuum Cycle Phases, Figure 2
- Liquid Cycle Phases, Figure 3
- Sealed Cycle Phases, Figure 4

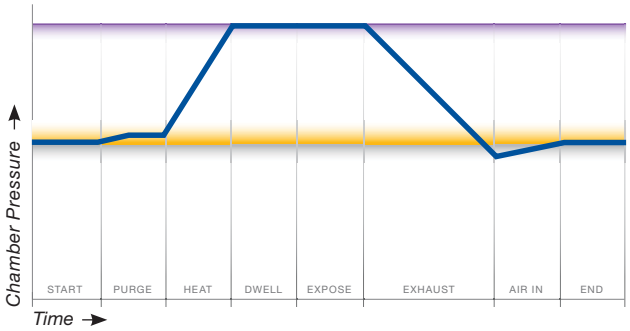
Gravity Cycle Phases, Figure 1



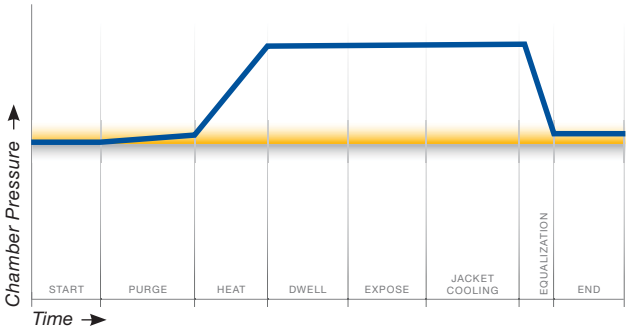
Vacuum Cycle Phases, Figure 2



Liquids Cycle Phases, Figure 3



Sealed Cycle Phases, Figure 4



World class engineering, robust construction for safety and efficiency.

Vertical Door. The vertical door design offers a high volume to footprint ratio without added clearances for door swing or a height allowance for lift above the cabinet elevation.

- When lowered, the door vanishes within the front cabinet assembly.
- The Lancer door is manually operated on model LSS 130 and LSS 275 series, single door and double door cabinets. Optional power door is available.
- Powered doors are standard on model LSS 450 and LSS 590 series, single door and double door cabinets.
- A one piece, closed cell, high-performance gasket closes around the peripheral door face to automatically seal the chamber when steam pressure is applied from the pressurization sequence.
- Once closed and under pressure, the door cannot be opened.
- A safety interlock prevents steam from entering the chamber if the door is not sealed.
- A unique gasket retraction motion withdrawals the gasket when the door is opened, protecting against wear and damage.
- The gasket is designed for easy, field-level replacement if maintenance is required.

Cabinet Construction and Plumbing. Designed for extended life cycle operation, Lancer sterilizers are constructed of research grade materials inside and out. Operating components are oriented for easy access for predictive maintenance or replacement to minimize downtime.

- The interior chamber and jacket is formed of 316L stainless steel.
- The chamber meets ASME code requirements for pressurization up to 45 psig (3.12 bar).
- All visible external surfaces are constructed of stainless steel.
- Interior piping is bronze, brass and copper; stainless steel plumbing is optional.
- Adjustable leveling feet maintain a proper elevation above the installed floor. Internal casters are provided to aid in initial location and positioning (LSS 450/590).
- Seismic restraint brackets can be anchored to the floor where local codes require.
- The walls and door(s) are insulated to retain heat, minimize heat loss and assure safe surface temperatures to protect personnel.
- An optional port is provided for insertion of an independent thermocouples. See Options.

Pass-through Installation. Double door configuration models LSS 275, LSS 450 and LSS 590 Pass-through can be installed in one-wall or two-wall arrangements, depending on preference. Trim panels are not required in the Lancer design.

Steam Options. Proper sterilizer operation is based on steam generation capacity, flow rate and recovery time between cycles and source. Where facility (house) steam is not available or is insufficient for proper operation, Lancer offers an electric steam generator. Depending on the model selected, this generator can be mounted within the sterilizer or independently mounted adjacent to or close enough to the sterilizer to meet input performance requirements. See Options.

- When an integral steam generator is selected, all components are self-contained. An automatic sensor monitors minimum water levels.
- The generator is factory set to provide and maintain a minimum 40 psig (2.76 bar).
- An automatic feedwater pump is included.
- An optional ASME blowdown separator is available for LSS 450 and LSS 590 series models.
- If a stand-alone steam generator is chosen, the generator location, plumbing, safety valves, drains and electrical connections must meet local codes. Contact your Lancer technical sales representative for information.

Water-saver System For Sterilizers With Ejector (Optional). Sustainability objectives can be improved with the installation of the Lancer water-saver system designed to reduce water consumption by more than 75%, depending on load and cycle selection. Sterilizer performance is not affected by the use of the water-saver system. Independent electrical service is required. The site must permit installation of the water-saver device. See Options.

Options and **accessories** complement your application.

Options

Sterilizer options which are factory configured or specific to the type of installation must be specified when ordering.

Model Configuration		130	130	275	275	450	450	590	590
Controller Load Probe	Monitors liquid load temperature during the sterilization cycle and allows for reduction of cycle time through the F_0 function. Load probe is automatically detected without the need to setup separate load probe cycles.	■	□	■	□	■	□	■	□
Thermocouple Sealing Gland	Threaded port designed to permit insertion of independent thermocouples into chamber.	■	□	■	□	■	□	■	□
Stainless Steel Piping	304 stainless steel piping to the jacket and chamber connection components are recommended for installations where high purity water is used.	■	□	■	□	■	□	■	□
Liquid Ring Vacuum Pump	Removes air from the chamber and load by a series of vacuum pulses with frequency and duration determined by the cycle selected.	■	□	■	□	■	□	■	□
Steam Generator, Integral	Electric steam generator, mounted within sterilizer chassis. Option dependent on available space if equipped with other options.	■	□	■	□	■	□	■	□
Stainless Steel Boiler	Long lasting, non-reactive stainless steel ensures heated water is effectively decontaminated prior to release.	■	□	■	□	■	□	■	□
Steam Generator, Adjacent/Remote	Electric steam generator for installation adjacent to sterilizer.	■	□	■	□	■	□	■	□
ASME Blowdown Separator (for use with generator)	ASME-certified, safely reduces generator water to atmospheric pressure before transfer to drain.	■	□	■	□	■	□	■	□
Cross Contamination Barrier	Adds an extra measure of protection between contained and non-contained areas.	—	—	—	□	—	□	—	□
Biological Sealing Flange	Creates an airtight seal between the contaminated and clean side of the pass-through cabinet.	—	—	—	□	—	□	—	□
Validation	Testing and certification documenting compliance with IQ/OQ protocols.	■	□	■	□	■	□	■	□
Water-saver System	Closed-loop system designed to save vacuum ejector water by tempering and recirculating the water during long drying phases following sterilization.	■	□	■	□	■	□	■	□
Sealed Liquid Cycle	The cycle is intended for sterilization of liquids in rigid sealed bottles. It uses a combination of air overpressure and jacket cooling to prevent deformation of a sealed liquid during cooldown.	■	□	■	□	■	□	■	□
Low Temperature Cycle	The low temperature cycle is intended for laboratory processes such as Pasteurization and moist-heat conditioning within a temperature range of 169°F (76°C) to 212°F (100°C).	■	□	■	□	■	□	■	□

■ / ■ Standard (Single Door / Double Door)
□ / □ Optional (Single Door / Double Door)

Accessories

A variety of open wire shelves, transfer carts and other accessories are available to minimize labor and to make the most efficient use of interior chamber space. Racks and shelves are specific to cabinet size.

Model Configuration		130	130	275	275	450	450	590	590
Interior Rack, Two Shelves	Stainless steel rack supports with two extendable open-wire stainless steel shelves.	■	■	■	■	■	■	—	—
Supplemental Shelf, Extendable	Additional shelf, order separately.	□	□	□	□	□	□	—	—
Load Car	For use with loading trolley. Sized to fit sterilizer interior dimensions. Stainless steel construction.	—	—	□	□	□	□	□	□
Transfer Trolley	Fixed-height trolley for use with load car. Trolley releases load car when locked to interior chamber rail. Reinforced stainless steel construction.	—	—	□	□	□	□	□	□

Site Preparation and Utilities

Minimum requirements for steam, power, water, drain clearances and local code compliance apply and must be considered when selecting the Lancer sterilizer to meet your specifications.

Lancer Model	LSS 130 / 275	LSS 450 / 590
Steam Nominal: depends on options selected	40-50 psig dynamic, 120 lb/hr (97-100% saturated vapor)	50-70 psig dynamic, 180 lb/hr (97-100% saturated vapor)
Power, controls	115V, 60 Hz 1-phase	115V, 60 Hz 1-phase
Power, options; depends on options selected	208V, 60 Hz 3-phase or 480V, 60 Hz 3-phase	208V, 60 Hz 3-phase or 480V, 60 Hz 3-phase
Water Nominal: depends on options selected	Cold water, 40-70 psig; dynamic flow rate, 5 gpm Hot water, 20-50 psig; dynamic flow rate, 0.4 gpm	Cold water, 40-70 psig; dynamic flow rate, 8 gpm Hot water, 20-50 psig; dynamic flow rate, 0.5 gpm
Drain	Floor or sink drain required	Floor or sink drain required
Backflow Preventer	Required per local codes	Required per local codes

Certifications
UL/IEC 61010-1
UL/IEC 61010-2
CSA C22 No's 61010-1, 61010-2-45
Seismic Restraints, California Code
ASME Code, Section VIII, Division 1

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