2.1 GRAVITY/VACUUM STEAM STERILIZER

A. Product Description:

1. Provide a microprocessor-controlled, automatic vacuum/gravity steam sterilizer designed to sterilize heat and moisture-stabile laboratory, research and animal care supplies using gravity or downward displacement with positive pulsing conditioning and pressure/vacuum pulsing for dynamic air removal and sterilize liquids in self-venting or unsealed containers using controlled exhaust for linear and consistent cool down. The temperature range is selectable from 110°C to 135°C (212°F to 275°F), for liquid cycles from 104°C to 135°C (230°F to 275°F).

2. Cycle Progression:

   a. Gravity/Wrapped Goods (pressure pulse pre-conditioning)
      - Conditioning – steam flows into the chamber for a timed period, followed by a series of positive pressure pulses to remove chamber air.
      - Heat Up – to selected temperature.
      - Exposure – selected chamber temperature is attained and timed.
      - Exhaust – chamber vented to atmospheric pressure.
      - Dry – filtered air is drawn through chamber for the duration of time selected (either Gravity or Vacuum Dry is selectable, Vacuum Dry is recommended).
      - Cycle Complete – signaled by a tone, display message and light.

   b. Vac/Wrapped Goods (Vacuum/Pressure Pulsing Pre-conditioning)
      - Conditioning – steam flows into the chamber for a timed period, followed by a series of pressure/vacuum pulses to remove chamber air.
      - Heat Up – to selected temperature.
      - Exposure – selected chamber temperature is attained and timed.
      - Exhaust – chamber vented to atmospheric pressure.
      - Dry – a vacuum is created for the duration of the time selected. Filtered air is admitted at the end of the drying time, chamber to atmospheric pressure.
      - Cycle Complete – signaled by a tone, light and display message.

   c. Liquids
      - Conditioning – steam flows into chamber for a timed period to remove air.
      - Heat Up – to selected temperature.
      - Exposure – selected chamber temperature is attained and timed.
      - Exhaust – an adjustable linear exhaust.
      - Cycle Complete – signaled by a tone, light and display message.

3. Construction: Construction must consist of 316L stainless steel sectional “U” channels (jacket) welded around the 316L stainless steel inner chamber vessel. The vessel shall withstand working pressure of 45 psig and full vacuum. Provide welded construction and comply with ASME Code Section VIII division 1, U1 stamped vessel. Rigidly support vessels on stainless steel height adjustable feet.

4. Safety Valve: The safety valve (ASME approved and so stamped) for pressure vessel is set at the approved maximum operating pressure of the vessel. Valve is sealed so that setting cannot be altered and will blow down at least 2 psig before closing. Valve is sized so that pressure in vessel will not rise more than 10 percent over the set pressure.

5. Hinged Door:
   a. The door operation is powered by an electric motor and is actuated by a switch.
   b. The open motion must be conducted in two steps. First a slide to clear the door locking pins, then it swings open.

c. The door must stop automatically if an obstruction is encountered.
d. In an emergency, the power door can be opened manually by a technician.
e. Once the cycle begins and the chamber is pressurized, the door cannot be opened.
f. A safety switch prevents steam from entering the chamber when the door is not in the closed and sealed position.

6. Mounting: free standing.

7. Shell and Door Insulation: The exterior of the sterilizers and door(s) shall be covered with a minimum of 2” chloride free mineral wool and foil faced.

8. Chamber Penetration: Sterilizer is equipped with one standard chamber instrumentation port. This port is provided to facilitate insertion of test equipment and instrumentation leads.

9. Controls: Microcomputer controls shall be PACS 3500 with AVANTI user interface panel with an 8.4 inch diagonal SVGA color touch screen display. cycles preprogrammed specifically designed for lab and animal facilities. Fabricate controls using state-of-the-art PLC technology. The PACS 3500 controller shall incorporate F sub 0 functions as part of the software base. Utilize connected printed circuit boards (Control and Printer). The control side shall be provided with an AVANTI user interface panel is a durable 8.4 inch diagonal SVGA color touch screen display. The screen must be divided into specific sections to display cycle selection, operation and process performance information in a consistent manner. The user interface must be switchable between Four process display screens which show important cycle information in different formats for ease of recognition. The optional screens are: Bar Graph, Circle Graph, Details Display and Plot Graph.

10. Control Mounting: Controls are located next to the door in a vertical column for convenience. If specified, the control column can be located remotely from the sterilizer with up to 32.8 feet (10m) of cable. Controls shall provide multi-flow operation; sterilizer shall be operated from both sides with pass thru capability. A digital printer shall be located on the unload side of the unit.

11. Cycle Backup: Program control so that, in case of a power failure, back-up system holds cycle in phase for up to 1 minute until power is restored; when power returns, event is recorded on printout and cycle resumes or restarts, depending on what phase cycle was in at time of power failure. Program microcomputer to monitor and control all phases of separate steam sterilizing cycles.

12. Printer Control: Control system is to provide selection of printer output and display window information in English, French or Spanish. Also to provide selective access codes for setting cycles and cycle values to prevent unauthorized changes and use of cycles, adjustment of cycle-status printout intervals. Temperature display and printout units in either degrees F or degrees C, pressure/vacuum display in psig/in Hg or Bars, and either standard AM/PM or Military format. Hospital or laboratory modes of operation. In the laboratory mode of operation, sterilize temperature overdrive, over-temperature point, under-temperature point and chamber pressure points can be set by the operator.

13. Printer: In the control column, mount 32-column alphanumeric thermal printer and provide duplicate print switch to furnish a duplicate printout of entire cycle data (when unit is not in cycle) or of current cycle status (during a cycle). Furnish printout with date, cycle count, daily cycle number, starting time of each cycle, sterilize temperature selected, sterilize and dry time selected, key transition points in the

cycle, and any deviations which may jeopardize sterilization process. Design printer to use 2-1/4" single-ply paper; include motorized take-up spool for automatic storage of an entire roll of paper. Shall be located on the unload side of the unit.

14. Piping System Materials and Construction: Piping is copper and brass threaded with standard National Pipe Thread and sealed with pipe sealant prior to tightening. All process piping shall be provided with appropriate isolation valves and injection ports for decontamination prior to servicing. Piping, fittings and connections required to connect the sterilizer to building supply lines are by others.

15. Vacuum System: Vacuum system shall consist of a straight-line water ejector. Design to condition load during pre-vacuum cycles with an adjustable number of vacuum/pressure pulses, exhaust chamber following sterilize phase and evacuate chamber throughout drying phase.

16. Automatic Valves: Steam, water, air and vacuum lines entering sterilizer chamber and jacket are equipped with electric solenoid-actuated valves.

17. Provide the following with each unit:

    a. Drain discharge cool-down system to reduce all discharges to 140°F, or less.

18. Accessories:

    a. Rack with three shelves.
    b. Loading Car Qty 1.
    c. Transfer Carriage Qty 1**.**

19. Unit shall carry a one (1) year warranty for parts and labor and the ASME pressure vessel will carry a fifteen (15) year warranty for workmanship or structural failure.

20. Utility requirements:

a.	Plant Steam Supply:	1 ¼”/50-70PSI
b.	Cold Water:	1 ¼”/40-70PSI Flow Rate max 11gpm
c.	Compressed Air	½”/ 50-90PSIG
d.	Drain:	1 ¼”/ 3”-4” Floor Sink
e.	Electric:	120VAC 208VAC/3Phase/ 60/80A

B. Unit(s) shall be equal to Getinge 733LS-E Gravity/Vacuum Steam Sterilizer. Unit(s) manufactured by ABC Corporation shall be considered equal provided that they meet requirements of this specification.

C. Equipment Schedule:

1. Getinge USA, Inc. Model #733LS
2. Chamber Size: 26.5”W x 36”H x 53”L.
3. Single Door
4. Freestanding includes side panels (cabinet package)
5. House Steam Generator.