

# HPHV - 3210

Horizontal HPHV Fully Automatic Double  
Door Rectangular Steam Sterilizer



EPCC / PRODUCTS / APPLICATION / SOFTWARE / ACCESSORIES / CONSUMABLES / SERVICES

**Analytical Technologies Limited**

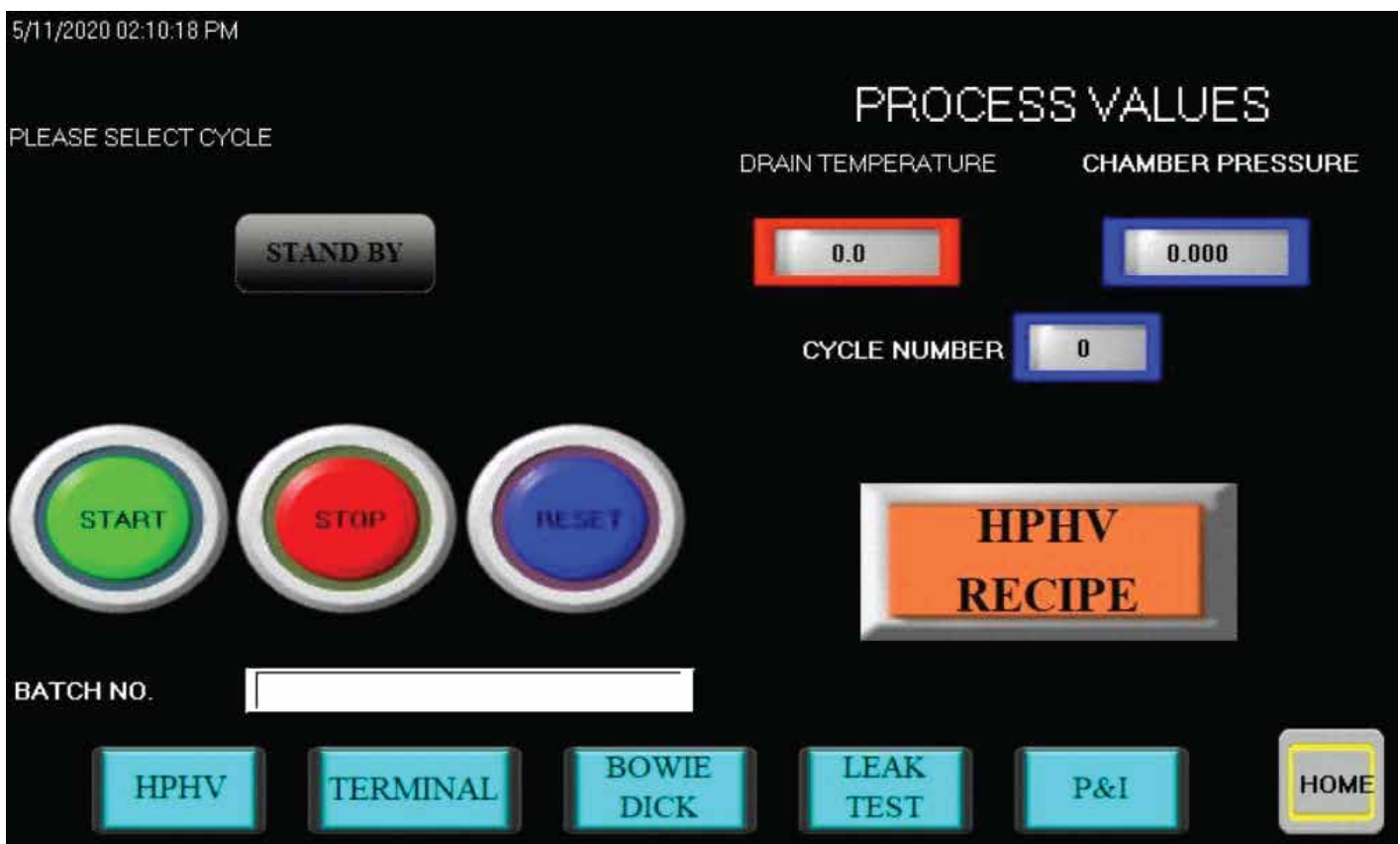
An ISO 9001 Certified Company

## ►► Benefit of Automatic Autoclave

### 1. Pre-Programmed cycles

Sterilization of varied equipment's like gloves, linen, gauze, cotton, instruments, glassware etc. using standard 121°C & 134°C which are preprogrammed in the PLC/ Microprocessor. The system includes the following pre-programmed cycles; additionally, unlimited number of user defined cycles can also be programmed into the memory of the system:

- H.P.H.V. Cycle
- Leak Test Cycle
- Bowie – Dick Cycle
- Terminal Cycle



### 2. Control

During sterilization, PLC controls the temperature, moisture, valve control, and all critical time and pressure-based parameters.

### 3. Temperature

is maintained uniformly & accurately ( $\pm 0.5^{\circ}\text{C}$ ). Continuous display of temperature, pressure, and humidity on-line allows the user to be aware of cycle status at all times.

### 4. Alarm

In case of any error, an Error Code & alarm is generated and the cycle stops automatically. Computer Screen displays Error message and the possible cause & remedy.

### 5. Reports

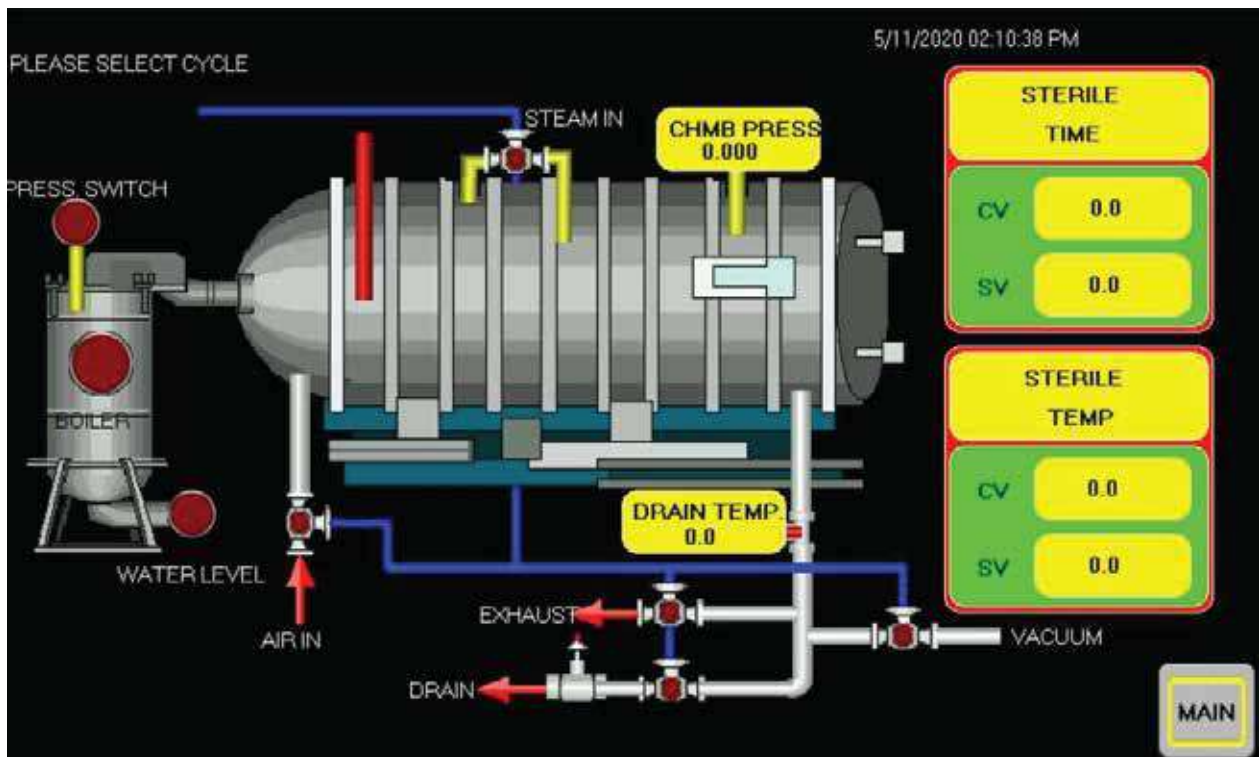
Reports are saved in Data, Summary & Graph formats for every batch of goods sterilized.

### 6. Print

User can re-print reports as and when required using any printer. Digital data cuts cost & space, ensures safety of data, and negates the cost of expensive thermal printer.

### 7. HMI

The operator can run machine through HMI (Human Machine Interface). He can also change the programs according to the Hospitals suitability.



### 8. Security

Advanced multi-level password protection enhances security. This avoids unauthorized access.

HPHV Fully Automatic Double Door Rectangular Autoclave (3' x 3' x 5',) with, vacuum pump, PLC Based with 2 stage lock



## TECHNICAL SPECIFICATIONS

The High-Pressure Vacuum Steam Sterilizer is used for sterilization of machine parts, change parts, fabric, tubing, bulk drugs, etc. in a pharmaceutical facility. The autoclave has been built in accordance to ASME guidelines and GMP norms.

CAPACITY / SIZE	
CHAMBER SIZE	1520mm (depth) x 910mm (width) x 910mm (height)

## ►► CHAMBER

- Fabricated from AISI 316L with full argon/arc welding. Thickness – 6MM.
- Chamber Surface will be polished to a finish of 0.4 Ra.
- Chamber is provided with round corners for easy cleaning and a 2% slope for full draining of the condensate.
- A baffle plate/sheet is provided for improved distribution of steam in the chamber. This also ensures that the incoming steam does not directly damage the load.
- The chamber is also provided with a safety valve to ensure load, machine and user safety in case of overpressure situations in an extreme case.
- The compound gauges provided on the sterile and operating side allows the operator visual confirmation that the pressure is within the specified limits during the cycle operation.

## ►► JACKET

- The chamber is re-enforced with Stainless Steel jacket 304L. Thickness – 6MM.
- The jacket besides reinforcing the chamber also helps to maintain temperature uniformity in the sterilizing space.
- The jacket too is provided with a mechanical-safety valve.
- A pressure gauge on the operating side indicates the pressure to the operator at all times.

## Doors

AISI 316L with Thickness 12MM with Suitable steel stiffeners {two stage safety door}

## Door Safety

- The following door safety features are provided for maximum operator safety: -
- Door inter-lock to prevent simultaneous opening of both doors.
- Process-lock to prevent opening of the door during the process.
- Process-lock to prevent the opening of the non-sterile door after successful completion of the cycle.
- Door obstruction safety.
- Door lock cylinder will be provided for door safety.

## ►► INSULATION

- The sterilization chamber is insulated with 100-mm thick Glass Wool, which is held in place by an outer cover of SS 304.
- The average surface temperature of the machine will not be more than 35°C.

## Vacuum: Water Ring Vacuum Pump of 5 HP.

- 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.

## A Water ring vacuum pump is provided with all our Automatic autoclave for following reasons

### 1. Pre vacuum

Before exposure of steam, the vacuum pump (available only in automatic system) creates vacuum through pulsing process (filling of vacuum with dry steam), thus removing the bio burden from the chamber and increasing the sterilization potency of the process.

### 2. Post vacuum

The vacuum pump removes the residual moisture after steam exposure from the chamber at the end of sterilization cycle to enhance the dryness of resultant load.

## ►► PIPING PACKAGE

- All process piping in contact with the chamber is fabricated from SS 304 with argon welding.
- Piping in contact with the jacket is fabricated from SS 304 with argon welding.
- All connections and fittings used are sanitary tri-clamp with silicone seals.
- The piping is designed to ensure that the customer can provide utility connections at one single point.
- All drain lines and exhausts are connected to a drain manifold. The pipelines also have a 2% slope for full draining to prevent contamination.
- All pneumatic lines are of polyurethane with aluminum die-cast connectors.

## ►► (OPTIONAL) VALVE PACKAGE

- The process valves in contact with the chamber have SS 304 contact parts with Teflon seat and tri-clamp connections. All non-contact valves have SS 304 contact parts with Teflon seat.
- All automatic valves are pneumatically actuated angle valves.

## ►► STEAM ACCESSORIES

- The jacket and chamber are provided with an over pressure safety valve.
- Thermodynamic steam trap with special air vent arrangement required for condensate removal.
- The pure steam supply to the machine can be provided with SS 304, sanitary construction, PRV.  
(PRV IS IN CUSTOMER SCOPE)

## ►► RAILING

- The chamber is provided with SS 304 railing with circular cross-section.
- The rails can be easily removed for cleaning the chamber.

## ►► AUTOMATION

### HARDWARE: PLC & HMI

The control system consists of a PLC (Programmable Logic Controller) and a user friendly, 7" Touch-Screen HMI (Human-Machine Interface) that allows the user to operate and monitor the machine with maximum ease. The above Hardware devices and software used sequentially operate these devices to:

- Receive input signals and readings from the various measuring/monitoring devices like the sensors, switches, and safety-devices.
- Decipher and process the above inputs and values, and compare them to the cycle set-points.
- In addition, based on the above information give output commands to the various controlling devices like valves, cylinders etc. as the cycle progresses.
- The automation also continuously logs data in digital and print formats.

## ►► INSTRUMENTATION

- Input and output devices as mentioned above:
- Temperature Sensors (4 Nos) are provided for Analog input for temperature at different points
- A pressure Transmitter that gives a 420mA signal is used to obtain an Analog input of process pressure/vacuum.
- All Control valves in the process lines are pneumatically operated 2/2-way angle-seat valves. The contact parts are SS 304, with Teflon seals. These valves are in turn controlled by solenoid valves.
- Process indication Lamps on the panel and the sterile and operating side indicate status of the Doors and the sterilization Cycle during various phases as the cycle progresses.
- All process parameters, instrument status, Pressure/temperature values, Phase titles and values and elapsed and remaining time indications are at all times visible on the Touch-Screen
- For operation in the Manual Mode in case of PLC failure, Rotary Switches, Temperature Controller, Timer etc. are provided for ease of operation.

## ►► SOFTWARE: SCADA (Optional)

- “Supervisory Control & Data-Acquisition” software. Software for On-line controlling, monitoring and recording of cycle parameters by the supervisor / administrator who do not have access to the machine, and is situated in a location remote from the machine.
- The operator only has to load the machine and press start from the panel on the machine. He too can view all the various parameters like time, temperature, pressure, instrument status, current phase etc. on the MMI situated on the machine panel.

## ►► Working Pressure & Temperature

1. Chamber – 15 PSI to 17 PSI (1.5 KG/ CM<sup>2</sup>)

Temperature: 121 DEG. C

Time Duration – 20 min

2. Chamber – 30 PSI (2.2 KG/ CM<sup>2</sup>)

Temperature: 134 DEG. C

Time Duration – 7.5 min

## ►► WORKING CONDITIONS & TEST PRESSURES

	JACKET	CHAMBER
Operating Pressure	2.2 KG/ CM <sup>2</sup>	1.5 KG/ CM <sup>2</sup>
Hydro test Pressure	6.0 KG/ CM <sup>2</sup>	3.0 KG/ CM <sup>2</sup>
Design Temperature	135 DEG.C	121 DEG.C – 134 DEG.C
Vacuum	N. A	-700mmHg

## ►► **STERILIZATION PROGRAMMES**

- The system includes the following pre-programmed cycles; additionally, unlimited number of user defined cycles can also be programmed into the memory of the system
- Leak Test Program
- Bowie & Dick test program
- Terminal Test Program
- HPHV Test Program

## ►► **ADVANTAGES**

- 3 level password protection for preventing unauthorized access
- Software ensures remote monitoring and control, and digital data storage
- In-built Real Time Clock with date and time function required for On-line printing.
- Power-failure logging.
- Alarms are generated and logged for incoming utilities and errors.

## ►► **OPTIONAL**

A Six Point Strip Chart Recorder for recording temperature at 5 points and pressure at one point can be provided in the control panel as an independent monitoring and recording device if desired.

## ►► **MANUAL BACK UP**

The control system is provided with manual back up in case of PLC failure. Here all valves, pumps etc. can be operated via switches. A temperature indicator controller is also provided for automatic control of the steam in valve for temperature control.

## ►► SAFETY

- In case of power failure, the sterilizer is put into a failsafe position, by means of locking all utilities to avoid any damage to the equipment and product.
- One safety valve for the Chamber (set point 3 bars).
- Door obstruction safety provided for all doors.
- Emergency stop buttons on sterile and operating side. If pressed then all the outputs to the valves and motors are RESET and all activates cease. After releasing the emergency stop button, the alarm has to be ACKNOWLEDGED with a separate button on the operator panel. Only then, the cycle will restart exactly at that point of the program where the process was interrupted.
- Password protection for modification of the software and editing of the sterilization program parameters.

## ►► ALARMS (Audio/Visual)

- High temperature and pressure.
- Sterilization timer stop in case of temperature drop.
- Sterilization timer reset in case of temperature drop.
- Too long time to create vacuum.
- Too long time to heat up.
- Vacuum pump trip.
- Utility failure alarm

## ►► STANDARD DOCUMENTATION

It will be supplied with following documents along with the machine The user's manual completes with

- Drawing: Autoclave chamber, panel interface, electric circuit drawing.
- Equipment description & operation.
- Instruction for PLC operation & calibration.

## HPLC Servicing, Validation, Trainings and Preventive Maintenance :

**HPLC Servicing** :HPLC Servicing : We have team of service engineers who can attend to any make of HPLC promptly @the most affordable cost.

**Trainings** :We also take up preventive Maintenance to reduce downtime of HPLC's Trainings.

**AMC's/CMC** :AMC's/CMC :We offer user training both in-House and at customer sites on HPLC principles, operations, trouble-shooting.

**Validations** :Validations :We have protocols for carrying out periodic Validations as per GLP/GMP/USFDA norms.

**Instruments** :Instruments :We offer instruments/Renting Services Modules like pumps,detector etc. on Rent.



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## Our Products & Technologies



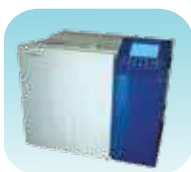
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## Regulatory compliances



## Corporate Social Responsibility

Analytical Foundation is a nonprofit organization (NGO) found for the purpose of:



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1. Research & Innovation Scientist's awards/QC Professional Award : Quality life is possible by innovation only and the innovation is possible by research only, hence ANALYTICAL FOUNDATION is committed to identify such personalities for their contributions across various field of Science and Technology and awarding them yearly. To participate for award, send us your details of research / testing / publication at [Info@analyticalfoundation.org](mailto:Info@analyticalfoundation.org)

2. Improving quality of life by offering YOGA Training courses, Work shops/Seminars etc.

3. ANALYTICAL FOUNDATION aims to DETOXYFY human minds,souls and body by means of yoga, Meditation, Ayurveda, Health Care, Awards, Media, Events, Camps etc.



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