

Apollo 150L Product Specification

Product Description

Apollo 150L is a fully automatic high-speed pre & post vacuum Steam Sterilizer.

This model is an electrically heated sterilizer, which operates with saturated steam as a sterilizing agent, and has a temperature range of up to 137°C (279°F) and pressure up to 2.3 bars (34 psi). The autoclave is classified as Class IIb according to MDD 93/42/EEC. The autoclave is designed as a Large Steam Sterilizer in accordance with EN285 and as Class I in accordance with EN60601-1, continuously operated, ordinary equipment without applied parts and without signal input-output parts. The device is not intended for use in the presence of flammable mixtures.

The sterilizer includes the following features:

- Large capacity sterilization chamber
- Built-in steam generator
- Vacuum pump for evacuation of the chamber
- Fully automatic door locking system
- Water reservoirs for process and used water retention
- Water pump for water circulation
- Condenser and collector for condensation and collection of water
- Temperature sensors and a pressure transducer to monitor both vacuum and pressurized states
- Control valves operating at programmed intervals

Application

The unit is designed to cover a large field of applications for hospitals, medical centers and as secondary sterilizer for emergency cases at Operating Theatres.

Dimensions

| | |
|------------------------------|---------------------|
| Chamber: Inner Dia. x Depth: | 500 x 700 mm |
| Chamber volume, net.: | 150 Litres. |
| External W x H x D: | 850 x 730 x 1050 mm |

Configuration and Options

| Model | Heating | Doors |
|--------------------------------------|---|---|
| <input type="checkbox"/> Apollo 150L | <input type="checkbox"/> Electric, 400V, AC | <input type="checkbox"/> Single or Double |

Available Accessories

Standard:

- Built-in Ink or Thermal Printer
- RS 232 Communication Port
- One Stainless Steel Tray Holder with Two Trays

Optional:

- Reverse-Osmosis System
- SD Card & Reader
- HMI PC Software
- Stainless Steel Cabinet
- Internal Shelf for 1 STU
- Sterilization Container/Basket
- 2 Stainless Steel Trays (more trays are available upon request)



Languages

The operator panel is set up with following standard languages (maximum 8 languages per Sterilizer):

- | | | | |
|----------------------------------|-----------------------------------|------------------------------------|---------------------------------|
| <input type="checkbox"/> English | <input type="checkbox"/> Italian | <input type="checkbox"/> German | <input type="checkbox"/> French |
| <input type="checkbox"/> Spanish | <input type="checkbox"/> Russian | <input type="checkbox"/> Hungarian | <input type="checkbox"/> Polish |
| <input type="checkbox"/> Turkish | <input type="checkbox"/> Romanian | <input type="checkbox"/> Bulgarian | |

Quality assurance

Apollo 150L sterilizer complies with following standards and codes:

General Applicable Directives:

- Medical Device Directive- MDD 93/42/EEC on Medical devices Annex II excluding (4) as amended (2007/47/EEC);
- Pressure Equipment Directive- PED 2014/68/EU
- EMC Directive 2004/108/EC Article 7 (1)
- RoHS II Directive 2011/65/EU

Standards:

- 47CFR part 15: 2004, subpart B, Class A;
- EN 61326: 1997 + A1(98) + A2(01) Industrial locations equipment, Class A;
- EN 60601-1:2006+AC:2010, EN 60601-1-2:2007+AC:2010, EN 60601-1-6:2010,
- EN 62366:2008, EN ISO 10993-1:2009; EN 1041:2008, EN ISO 15223-1:2012
- UL 61010-1:-:2004, EN/IEC 61010-1:2010;
- EN 61010-2-040:05, UL 61010A-24-1:2002 edition 1997-05:2004;
- EN 285:2006+A2:2009 - Large Steam Sterilizers

Notified Body: CE Certiso Ltd., Organisation for Certification and Testing on the Field of Medical and Hospital Engineering H-2040 Budaörs, Gyár u. 2. BITEP, Gábor Dénes krt. 101.

- Conformity Assessment Route: Annex II.3
- EC- Certificate Number: 144551-15-04-14

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Standard features

- **Microprocessor controlled steam sterilizer** - Using steam under pressure as the sterilizing agent for wrapped or unwrapped goods such as fabrics, surgical instruments, utensils, and other heat and moisture stable materials at temperatures from 121°C to 134°C. The Apollo 150Lsterilizer is a pre-and post-vacuum sterilizer designed to cover a large field of applications for hospitals, medical centers and as secondary sterilizer for emergency cases at Operating Theatres. Within the health care services, sterilization of medical supplies is an essential issue in the battle against the advance of many infectious diseases. In order to improve the quality of sterile supply, international standards, which specify the requirements for the equipment, and procedures in the sterilization departments in health care facilities, have been developed.
- **Design and Construction** - The Apollo 150Lsterilizer meets the highest standards requirements for quality, safety and operation. Stainless Steel Pressure Vessels 316 Ti/L conforms to the Pressure Equipment Directive (PED). The inner shell, door(s) and jacket are designed for a maximum working pressure of 2.76 bar and full vacuum. The Sterilizer's framework and housing are also made of Stainless Steel. The highly efficient, high-quality Hanno-Tech insulation material releases no particles; thus, the Apollo 150Lsterilizer can be used under clean room conditions.
- **Chamber**- The Vessel, with a coil jacketed round chamber, is made of corrosion-resistant electro-polished Stainless Steel 316 Ti/L, and is thus easy to clean.
- **Exterior** – Combination of stainless steel cover and plastic for front panel.
- **Steam generator** –Equipped with a built-in 9 kW steam generator, made of Stainless Steel 316 L. The large capacity of the heaters enables steam to always be ready for operation, and thus contributes to a very fast cycle.
- **Vacuum system** –Equipped with a Liquid ring vacuum pump, combined with a heat exchanger, and is a pre-vacuum sterilizer having the following features:
 - An air removal stage (pre-vacuum), before starting the sterilizing stage.
 - A post-sterilization drying phase, based on the combined operation of heat and vacuum with air inlet pulses.In order to improve the efficiency of the vacuum pump – capability and speed– a heat exchanger is installed on the outlet piping of the chamber.

The advantages of the pre-vacuum sterilizer are as follows:

 - Removal of air pockets from packs and porous load and most kinds of hoses (rubber, plastic etc.) by vacuum at the first stage of the cycle.
 - Better steam penetration into the load; resulting in effective sterilization.
 - Better temperature uniformity.
 - Better drying of materials due to the vacuum achieved in the chamber at the end of the sterilization cycle.
- **Safety Devices** - Numerous safety features including: a safety valve, thermostat, a temperature sensor, a water detection electrode in the steam generator, pressure sensors, a door locking device and software safety features.
- **Alarms** – Depending on the state of the input and of the installed accessories, the controller is capable of providing an audio alarm, as well as displaying and/or printing several alarms, including:
 - Door Unlock □ Temperature/Pressure Error □ Low/High Temperature □ Low/High Pressure □ Low Vacuum and more.
- **Door locking mechanism** –The door system is automatic and based on a ring locking mechanism, driven by a pneumatic piston, preventing the opening of the door by a safety pin.

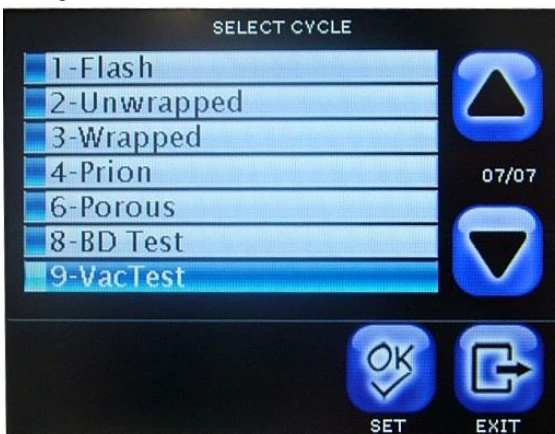
A lock ring grips the door and locks it securely.

To facilitate the locking process, a partial vacuum is created when closing the door which holds the door down while it is being closed, until the safety ring has mechanically locked the door. A locking device prevents the door from being opened accidentally. The door lock can only be unlocked if the unloading temperature has been reached and the sterilization chamber is in a depressurized state.
- **Water system** – The sterilizers are equipped with 2 Water Reservoirs: one for the tap water for the liquid ring vacuum pump and one for drain water. Water is circulated in the water pump and converted to saturated steam.

The Sterilizers are supplied as a stand-alone unit. A Reverse-Osmosis water purification system is available in order to avoid the need to refill the water reservoirs. This system improves the quality of the water used to generate steam. The use of mineral-free water will contribute to better performance and longer life of the Sterilizers' chamber.
- **Energy saving mode** - The Sterilizers are equipped with an Energy Saving Mode which is activated when the unit is not used after a certain period of time. This Mode reduces power consumption by approximately 12% to 30% and is thus environmental friendly.

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- Control system / Touch screen panel** – A microprocessor based control system, state of the art “Free scale” technology, automatically controls all programs including the sterilization cycle. The system includes a 5.7” digital touch-screen graphic display, communication, self and remote diagnosis and PC connection for external documentation and printing. It ensures a reliable, safe and user-friendly operation. The displayed information is available for users in a variety of languages. During the sterilization cycle the control system measures, controls and shows in digital display: the time, chamber pressure and sterilization status. While the power is off, the non-volatile memory keeps the status of the Sterilizer, and the real-time clock, driven by its own back-up battery, keeps running the date and time.



- Operation** – Operating is simple: close the door, select the cycle on the Touch-Screen Panel, and press the Start Key. The cycle will run automatically. At the end of the cycle, by pressing the ‘Open Door’ button on the Touch-Screen Panel, the door will automatically open.
- Printer** – The unit supplied with an integrated ink printer (or with thermal printer upon request). Each cycle can be documented by the printer which records the preset and actual parameters of the cycle: the selected cycle, cycle parameters, date, time, temperature, pressure, errors, etc. The last 60 cycles’ data is automatically stored in memory, and can be re-printed.



Options and Accessories

- Monitoring and Documentation Software (HMI Software)** – Powerful PC Windows based software is available for monitoring, logging control and service.
- Data collection** – Sterilization cycles’ data can be collected online through standard RS232 connection, enables connecting the computer and the Sterilizer using the PC Software (optional). Sterilization cycles’ data can be also



collected online on a SD Card through an optional SD Card Slot.

Collected data can be downloaded into a computer equipped with proprietary PC Software. 2 Gigabyte SD card collects up to 40 years logging data, including: the selected cycle, start time, cycle stages, temperature / pressure, end time, cycle status (pass / fail), etc.

An optional Ethernet Connection enables controlling, monitoring and connecting your Azteca AC-470 with no need of additional software.

- Reverse Osmosis (water softener)** – A Reverse Osmosis system shall be used to improve the quality of the water used to generate steam in the electric steam generator. The use of mineral-free water will contribute to better performance and longer life of the autoclave’s chamber. The water purification system uses a high quality booster pump which can provide 6.8 bar water pressure to pass through the membrane even under low water pressure area. The booster pump prevents damage, prolongs the life of the membrane and improves solids +99% of all organics +99% of all bacteria.



- Cabinet** – Stainless Steel Cabinet with storage space available upon request. Size: 755 x 785 x 785mm



- Internal Shelf** – The unit can be supplied with 1 internal shelf for 1 STU container upon request. Size: 236 x 10 x 550mm



- Sterilization Containers / Baskets** – Aluminum sterilization containers and stainless steel wire baskets are available in different sizes.



- Tray holder** – Stainless steel tray holder for up to 4 trays (2 big and 2 small) is available. The unit standard supplied with one tray holder and 2 trays (1 big and 1 small).

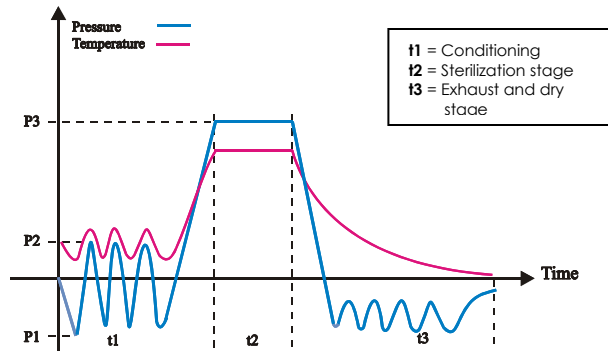
- Stainless Steel Trays** – Stainless steel trays in 2 sizes. Big tray: 320 x 20 x 700mm, Small tray: 220 x 20 x 700mm



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Cycle descriptions

Apollo 150L offers 7 different cycles: 5 sterilization cycles, and 2 test cycles. Additional cycles are available upon request. The two available test programs are the Vacuum Test for checking the integrity of the chamber and piping system and the Bowie & Dick test which checks the efficiency of the sterilization process.



1 - Flash 134°C /3 min (Warm Up).



Sterilizing unwrapped instruments.
Load weight <24 kg. Without drying stage.

- Sterilization temperature: 134 °C, -0°C +3°C.
- Sterilization time: 3 minutes.
- Vacuum pulses: 4.
- Average cycle time: 20 minutes.

2 - Unwrapped 134°C /3 min, 2 min dry (Dinamic sterilizer chamber pressure).



Sterilizing unwrapped instruments.
Load weight <24 kg. With drying stage.

- Sterilization temperature: 134 °C, -0°C +3°C.
- Sterilization time: 3 minutes.
- Dry Time: 2 minutes.
- Vacuum pulses: 4
- Average cycle time: 21 minutes.

3 - Wrapped 134°C /3.5 min, 15 min dry



Sterilizing wrapped instruments.
Load weight <24 kg. With drying stage.

- Sterilization temperature: 134 °C, -0°C +3°C.
- Sterilization time: 3.5 minutes.
- Dry Time: 15 minutes.
- Vacuum pulses: 4.
- Average cycle time: 35 minutes.

4 - Prion 134°C /18 min, 20 min dry



Sterilizing wrapped instruments.
Load weight <24 kg. With drying stage.

- Sterilization temperature: 134 °C, -0°C +3°C.
- Sterilization time: 18 minutes.
- Dry Time: 20 minutes.
- Vacuum pulses: 4.
- Average cycle time: 55 minutes.

6- Porous 121°C /20 min, 20 min dry



Sterilizing of heat sensitive materials and textiles.
Load weight <8 kg. With drying stage.

- Sterilization temperature: 121 °C, -0°C +3°C.
- Sterilization time: 20 minutes.
- Dry Time: 20 minutes.
- Vacuum pulses: 4.
- Average cycle time: 55 minutes.

8 - Bowie and Dick Test 134°C /3.5 min, 1 min dry (Hollow load A)



This is a test program, with fixed sterilization parameters of 134°C and 3.5 min., drying time of 1 min., which cannot be modified by the operator.

- Sterilization temperature: 134 °C, -0°C +3°C.
- Sterilization time: 3.5 minutes.
- Dry Time: 1 minute.
- Vacuum pulses: 4.
- Average cycle time: 21 minutes.

9 - Leak Test (Vacuum test)



The vacuum pump is activated until the pressure reaches a level of at least 15 kPa, all the valves and pump shut down. The following 5 min. is for the stabilization condition of the chamber.

From now on along the next 10 min. the allowable decrease of pressure is 0.13 kPa / min. (or 1.3 kPa for 10 min.)

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| Technical Data | Azteca AC-575 |
|--|--|
| External dimensions W x H x D | 850 x 730 x 1050 mm (33.5 x 28.7 x 41.3 inch) |
| Maximum depth (door open) | 1650 mm (65 inch) |
| Chamber volume, net. | 150 Litres. (39.6 gal) |
| Chamber shape | Cylindrical 316Ti/L, welded, electro-polished |
| Chamber Dimensions, Inner Dia. x Depth | 500 x 700 mm (19.7 x 27.6inch) |
| Weight, | 200 kg (440.9 lb) |
| Shipping weight | 225 kg (496.0 lb) |
| Shipping dimensions W x H x D | 980 x 1200 x 1190 mm (38.6 x 47.2 x 46.9 inch) |
| Mineral free water reservoir volume | 6 Litres (1.32 gal) |
| Min. water quantity allowing the cycle | 1 Litres |
| Average water consumption during the cycle | 15 Litres (4.0 gal) |
| Max. Water temp. at the reservoirs | 65°C (149°F) |
| Max. Working pressure | 2.76 bar (40 psi) |
| Min. Working pressure | -0.9 bar (-13.5 psi) |
| Heaters power | 9 kW |
| Jacket | Steam Heated Coil |
| Peak sound level | < 70 dB |
| Max electric power (to 230 V) | 12 kW, 3 phase, 400V - 32A, 50/60 Hz |
| Voltage fluctuation | ±10% |
| Operation | Electronic with microprocessor |
| Controls | Digital |
| Display | 5,7" LCD Color Display, Resistive Touch Screen |
| Integrated printer | Yes -(Standard) |
| Connection to PC | Standard RS232, USB connection for service technicians and Ethernet connection as an option |
| No. of trays | 5 (3 big and 2 small) - optional |
| Tray Holder dimensions W x H x D | 435 x 350 x 680 mm (17.1 x 13.8 x 26.8 inch) |
| Available trays optional | Big stainless steel tray (3 in total) (420 x 20 x 750mm) or Small stainless steel tray (2 in total) (250 x 20 x 750mm) or 1 shelf/chamber plate (290 x 14 x 750mm) |
| Maximum load for tray | 6 kg (13.2 lb) |
| Maximum solid load | 24 kg (52.9 lb) |
| Maximum textile load | 8 kg (17.6 lb) |
| Number of Cycles | 7 cycles - 5 sterilization cycles and 2 test cycles |
| Cycle type (stated load types) | Wrapped or non-wrapped, solid, hollow load products Type A and porous products. |
| Sterilization temperatures | 134° - 121° C |
| Special / Test Cycles | Bowie & Dick test and Vacuum test |

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| Technical Data | Apollo 150L |
|--------------------------------|--|
| Air removal | Fractionated vacuum |
| Drying system | Vacuum |
| Suggested Cycle time (minutes) | Total time: Flash134-(20 min) unwrapped +hollow134 (21 min) , prion, porous 134 (55 min), wrapped 134-(35 min) |
| Stand-by | Yes |
| Appearance of Face | Stainless Steel and plastic |
| Automatic water filling | Standard |
| Automatic water draining | Standard |
| Door locking device | Fully automatic, ring door locking device. |