

RAYPA

Leading
Lab Technologies

 Sterilization

VERTICAL BENCHTOP AUTOCLAVES WITHOUT DRYING

AVS-N SERIES **CLASSIC LINE**

COMPACT, ECONOMIC,
ROBUST PERFORMANCE
AND LIMITED LABORATORY
RESOURCES CONSUMPTION



Vertical benchtop autoclaves without drying

The **AVS-N** Series vertical benchtop autoclaves with top-loading access cover the fundamental needs for general labware and metal utensils sterilization in many facilities with the aim of streamlining the sterilization workflow. A compact footprint together with the optimization of resources such as water, power and operating time results in an affordable and efficient solution to manage laboratory workload in small facilities.

INTENDED USE

+ **STERILIZATION OF LABORATORY WASTE BAGS, PLASTICS, GLASSWARE, LIQUIDS AND METAL UTENSILS**



MAIN FEATURES

ECONOMIC AND DURABLE

AVS-N Series autoclaves are economic and durable autoclaves for general laboratory sterilization procedures with limited resources consumption such as water, power or operator time.

A COMPACT FOOTPRINT THAT FITS ANYWHERE

AVS-N Series autoclaves with chamber sizes from 8 to 15L pack the quality construction of a full-size vertical autoclave into a compact footprint that fits any workspace.

EASY INSTALLATION AND MAINTENANCE

Every **AVS-N** Series autoclave is a plug and play equipment that does not need dedicated installation connections. They simply need a power source and can work even without a connection to the drainage.

SAFETY FIRST

AVS-N Series autoclaves are equipped with several features to ensure the safety of the operators. These include an overpressure safety valve, a thermally insulated lid, an overtemperature safety thermostat, an open lid detection system and an independent safety pneumatic system that locks the main door while positive pressure exists inside the sterilization chamber.



ADVANTAGES



Sterilization chamber and door made of high quality stainless steel grade AISI-316L extremely resistant to corrosion*.



Equipment built following all applicable European Union quality, regulatory and safety standards.



Heating by powerful electric elements made of Incoloy® 825 assembled inside the sterilization chamber and shielded by a protective grid.



Control by a PID microprocessor with 4 predefined and 6 editable programs, adjustable by time, temperature and type of sterilization cycle (Agar mode and/or heart temperature probe control)*.



Programmable auto-start.



Temperature control by a PT-100 Class A temperature probe located within the sterilization chamber.



Faster cooling phase in solids sterilization cycles through a steam release manual valve at the end of the sterilization.



Adjustable temperature holding at the end of the sterilization cycle between 40-80°C (Agar mode)*.



Optional software for sterilization data management.



Optional integrated or external printer*.



Plug and play equipment, no plumbing required.

*These features are only offered with AES-12 model.



STERILIZATION APPLICATIONS

AVS-N Series autoclaves are intended for the sterilization of a wide range of liquids and solids such as culture media, glassware, plastics, metal utensils, waste bags and other laboratory items. They are designed for an easy operation and include many safety features to protect users in their daily routine.



Vertical benchtop autoclaves without drying

WORKING PRINCIPLE

AVS-N Series autoclaves provide a simple and straightforward solution for the multiple sterilization needs of general laboratories including biological waste, contaminated media, small metal utensils, glassware and other laboratory items.

The load has to be placed into the pressure vessel basket and, after manually filling the tank with purified water, the equipment starts to heat up and purge until the set combination of sterilization time and sterilization temperature is reached.



STANDARD AVS-N SERIES STERILIZATION CYCLE

HEATING PHASE

- In this initial step, the powerful heating elements assembled at the bottom of the sterilization chamber heat up dramatically, transferring energy to water to produce saturated steam throughout the chamber.

STERILIZATION PHASE

- Upon reaching the set sterilization temperature inside the chamber the sterilization phase begins, accurately sustaining the temperature throughout the duration of this phase.
- This crucial step is controlled by a PT-100 Class A temperature probe located within the chamber.

AES-12

- As an option for liquids sterilization processes this phase can be regulated by a flexible PT-100 Class A temperature probe located inside a sample.

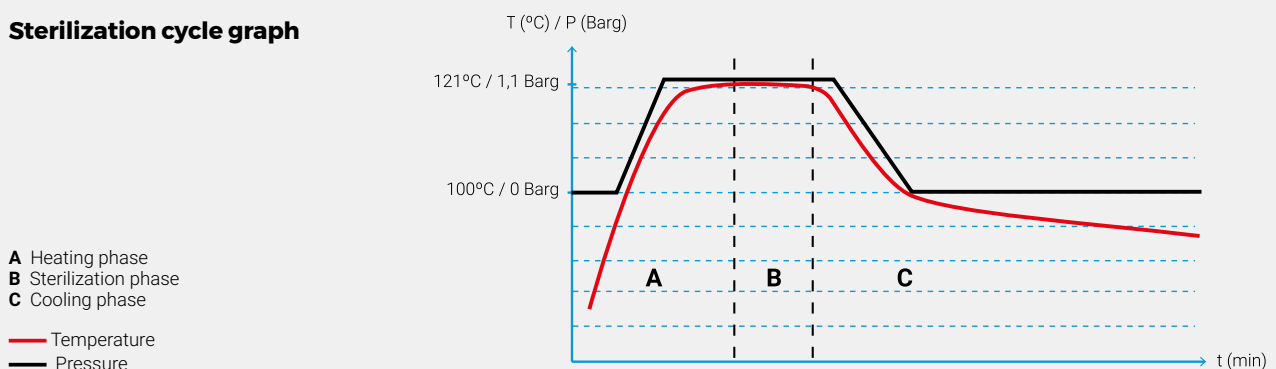
COOLING PHASE

- After sterilization phase finishes, natural cooling begins and an acoustic beep will sound when a safety temperature is reached and the door can be opened.
- While sterilizing solid loads, discharge can be manually forced through a valve to reduce the duration of the cooling phase.

AES-12

- If Agar mode is on, the equipment will hold the preprogrammed temperature indefinitely, selectable between 40 and 80°C.

Sterilization cycle graph





AES-8 CONTROL PANEL



Detail of AES-8 main control panel.

DIGITAL MICROPROCESSOR AND COMPACT SCREEN

- The screen shows current chamber temperature, sterilization parameters and error messages.

MULTIPLE PUSH-BUTTONS AND PILOT LIGHTS FOR YOUR COMFORT AND EASE OF USE

- To assist you while programming a sterilization cycle, the control panel has 2 pilot lights and 5 intuitive push-buttons.
- At the end of the sterilization cycle an acoustic alarm sounds.

4 MODES TO REGULATE THE STERILIZATION CYCLE

- Indefinitely at a set temperature.
- Indefinitely at a set temperature after an initial delay.
- During a finite period of time at a set temperature.
- During a finite period of time at a set temperature after an initial delay.

AES-12 CONTROL PANEL



Detail of AES-12 main control panel.

BIGGER SCREEN AND GREATER PROGRAM SET UP OPTIONS

- AES-12 autoclaves have 10 programs and the first four are predefined and protected. The rest of the programs are editable with the following parameters settings:
 - Sterilization temperature.
 - Sterilization time.
 - Sterilization controlled by main chamber temperature probe or both main chamber temperature probe plus heart temperature probe.
 - Sterilization with temperature holding at the end of the cycle (Agar mode).

- The alphanumeric screen apart from showing the sterilization parameters also shows several visual alerts, including warning or failure messages.
- The available languages include English, Spanish, French and Catalan. For other languages please contact us.

ADVANTAGES FOR LIQUIDS STERILIZATION CYCLES

- Adjustable temperature holding at the end of the sterilization cycle between 40-80°C (Agar mode).
- Optional flexible heart temperature probe to sterilize liquids and avoid liquids boiling over.

AES-8 & AES-12 VALVE

3 POSITION MANUAL VALVE FOR A FAST UNSTEAMING AND FOR DRAINAGE

- For a faster cooling phase in solids sterilization cycles, a quick unsteaming can be carried out through a manual valve and thus shorten the duration of the cooling phase.
- With the same valve, the water located inside the sterilization chamber can be drained completely.



Detail of the 3 position manual valve installed in both AES-8 and AES-12.

Vertical benchtop autoclaves without drying

AES-8

THE PERFECT AUTOCLAVE FOR ENTRY LEVEL USERS OF SMALL FACILITIES LOOKING FOR AN ECONOMIC, RELIABLE AND EASY TO USE BENCHTOP AUTOCLAVE WITH A SMALL FOOTPRINT.



INTENDED USE

- Suitable to sterilize glassware, plastics, laboratory waste bags, small metal utensils and small volumes of liquids and culture media.

RECOMMENDED SETTINGS AND USERS

- Entry level users of small facilities such as small laboratories or small clinics looking for an economic benchtop autoclave with top-loading access.

FEATURES

- Sterilization chamber made of AISI-18/10 stainless steel.
- Equipment controlled by digital PID microprocessor, cycles adjustable by sterilization time and sterilization temperature.
- LCD screen that shows sterilization parameters, current chamber temperature and error messages.
- Sterilization control by a PT-100 Class A temperature probe located within the sterilization chamber.
- Automatic air purge controlled by the microprocessor.
- Heating by powerful heating elements made of Incoloy® 825 extremely resistant to corrosion.
- Manual feed of sterilization water directly inside the sterilization chamber.

- Manual valve to drain the sterilization chamber water tank and for a faster cooling of solid sterilization procedures.
- RS-232 port to connect to PC.
- Includes a sterilization chamber inlet for external validation probes.
- Lockable bayonet to open the main door and thermally insulated secondary door.
- Adjustable sterilization temperature: 100-127°C.
- Adjustable sterilization time: 1-∞ min.
- Adjustable delayed start: 1-∞ min.

ADVANTAGES

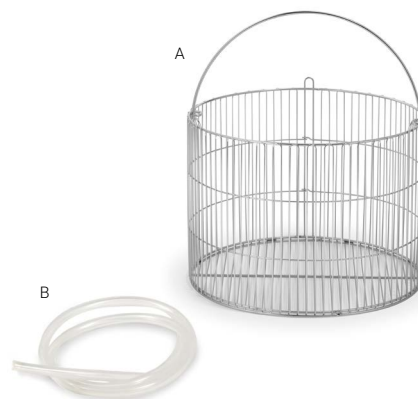
- Economic.
- Compact and small footprint.
- Optional faster cooling phase for solids sterilization cycles.
- Easy to use control panel with 5 different push-buttons with different intuitive symbols.
- PC connection to export and register sterilization cycle data.

SAFETY

- Safety valve.
- Safety thermostat with manual rearm.
- Pneumatic door blocking system while positive pressure exists in the sterilization chamber.
- Independent thermally insulated lid.
- Pilot light while sterilization cycle is ongoing.
- Pilot light while delay function is ongoing.

COMPONENTS SUPPLIED WITH THE EQUIPMENT

- A. Stainless steel wire basket (CV-8).
 - B. Silicone tube of 1m to drain the sterilization chamber and also to collect condensates during purge phase.
- Stainless steel protecting grid for the heater element.





AES-12

THE PERFECT AUTOCLAVE FOR SMALL CLINICS AND RESEARCH FACILITIES LOOKING FOR AN ECONOMIC, VERSATILE AND RELIABLE BENCHTOP AUTOCLAVE WITH A SMALL FOOTPRINT THAT IS COMPATIBLE WITH MULTIPLE APPLICATIONS.



INTENDED USE

- Suitable to sterilize plastics, small metal utensils, laboratory waste bags, culture media, glassware and liquids.

RECOMMENDED SETTINGS AND USERS

- Professional users of small and medium-sized facilities such as small laboratories or small clinics looking for an economic benchtop autoclave with top-loading access.

FEATURES

- Sterilization chamber made of AISI-316L stainless steel extremely resistant to corrosion and external housing made of AISI-304 stainless steel.
- Equipment controlled by digital PID microprocessor with 4 predefined and 6 editable programs, adjustable by sterilization time, sterilization temperature, Agar mode or heart temperature probe selection.
- Alphanumeric LCD screen that shows sterilization parameters and several alert and error messages. Furthermore, several languages are available and temperature display is compatible with °C or °F temperature scales.
- Sterilization control by a PT-100 Class A temperature probe located within the chamber. Optional installation of an additional flexible PT-100 Class A temperature probe for liquids sterilization procedures.

- Automatic air purge controlled by the microprocessor.
- Heating by powerful heating elements made of Incoloy® 825 extremely resistant to corrosion.
- Manual valve to drain the sterilization chamber water tank and for a faster cooling of solid sterilization procedures.
- RS-232 port to connect PC, integrated printer or external printer.
- Adjustable temperature holding at the end of the sterilization cycle (Agar mode).
- Locking wheel to open the main door.
- Includes a sterilization chamber inlet for external validation probes.
- Adjustable sterilization temperature: 100 - 134°C.
- Adjustable sterilization time: 0 - 250 min.
- Adjustable delayed start: 0 - 24 h.
- Adjustable Agar mode: 40 - 80°C.

ADVANTAGES

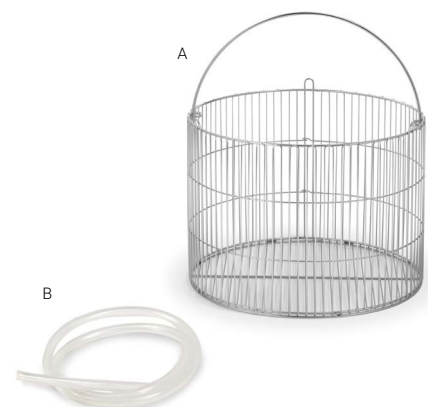
- Economic.
- Compact and small footprint.
- Advanced microprocessor with up to 10 different sterilization programs.
- Faster cooling phase for solids sterilization cycles.
- Agar mode.
- PC and printer connection.

SAFETY

- Safety valve.
- Safety thermostat with manual rearm.
- Pneumatic door blocking system while positive pressure exists in the chamber.
- Thermally insulated door.
- Open door sensor.
- Pilot light for overtemperature.
- Multiple error and alert messages displayed on screen.

COMPONENTS SUPPLIED WITH THE EQUIPMENT

- A. Stainless steel wire basket (CV-12).
 - B. Silicone tube of 1m to drain the sterilization chamber and also to collect condensates during purge phase.
- Stainless steel protecting grid for the heating elements.



Vertical benchtop autoclaves without drying

Accessories

STAINLESS STEEL WIRE BASKETS

| Reference | | CV-8 | CV-12 |
|---|----------------------|-----------|-----------|
| Dimensions | Exterior Ø x H mm | 200 x 150 | 220 x 200 |
| | Interior Ø x H mm | 190 x 145 | 210 x 195 |
| For autoclaves with the following chamber volumes | 8L | 1 | - |
| | 15L | - | 1 |



FLEXIBLE "HEART" TEMPERATURE PROBE PT-100 CLASS A

- After installing this accessory, the temperature regulation of the sterilization cycle can either be controlled by the main chamber temperature sensor or both the main chamber temperature sensor and the temperature sensor of the flexible heart temperature probe.
- The temperature control by the flexible heart temperature probe is especially advantageous for processes involving the sterilization of large volumes of liquids, where the sterilization process is regulated by both the temperature achieved in the center of the liquid sample as well as the temperature achieved in the sterilization chamber. Furthermore, should the autoclave be opened at chamber temperatures higher than 80°C there is a risk of liquids boiling over which can be avoided if the temperature of the sample is controlled throughout the sterilization procedure.
- Compatible only with **AES-12**.
- Must be installed in our facilities.

Reference: **PT-2**



CABLE GLANDS



- Installation of up to 8 cable glands within the sterilization chamber walls to enable external temperature probe access in multiple locations for autoclave calibration and validation procedures.
- These ports can either be of 2 or 4 mm of diameter.

References:

PRENSACLAV (8 holes ø 2mm),
PRENSACLAV2 (8 holes ø 4mm).

TRANSPORT TROLLEY



- Auxiliary trolley to assist the loading and unloading of the autoclave.
- Built in chromed iron and plastic.
- The surface of each shelf is textured to prevent the load from shifting.
- Rubber coated wheels to reduce noise.
- Dimensions (LxDxH):
730 x 490 x 700 mm.

Reference: **TR-TR**



Accessories

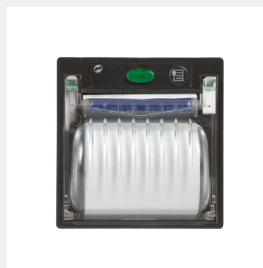
WATER DISTILLER



- Forced air water distiller with stainless steel interior, a capacity of 4L and a distillation volume output of 1,5L/h.

Reference: **DEM-4**

INTEGRATED THERMAL PRINTER



- Prints program number, cycle number, temperature, date and hour of the run and error messages.
- Selectable printing cadence between 10 and 240 seconds.
- Compatible only with **AES-12**.
- Must be installed in our facilities.

Reference: **IT**

Consumable:

Paper: **PAPER-IT**

TABLE TOP DOT MATRIX PRINTER



- Prints program number, cycle number, temperature, date and hour of the run and error messages.
- Used with RS-232 connection.
- Selectable printing cadence between 10 and 240 seconds.
- Compatible only with **AES-12**.

Reference: **ITS**

Consumables:

Paper: **PAPER-ITS**, Ribbon: **70945**

INTEGRATED DOT MATRIX PRINTER



- Prints program number, cycle number, temperature, date and hour of the run and error messages.
- Selectable printing cadence between 10 and 240 seconds.
- Compatible only with **AES-12**.
- Must be installed in our facilities.

References: **IT/M**

Consumables:

Paper: **PAPER-ITS**, Ribbon: **70934**

SW7000 SOFTWARE

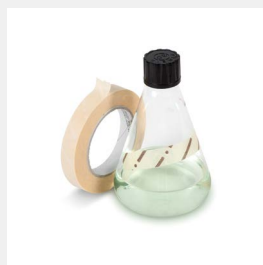


- Communication software between the equipment and the PC that allows the real-time and posterior visualization and registry of each cycle. Cycles can also be exported to Excel or printed.
- Connection to PC via RS-232.
- Supplied with a RS-232 cable, an USB stick that includes the software and installation drivers and a RS-232 to USB adapter.

Reference: **SW7000**



STERILIZATION CONTROL TAPE














- Class 1 indicator for steam sterilization. The change of color indicates that the materials have been processed, without being a guarantee of proper sterilization, additional methods are needed such as biological indicators (EN ISO 11138).
- Tape roll of 50 m x 19 mm.

Reference: **TEST-CT**

20 min 121°C
Color change.

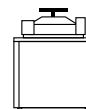
Vertical benchtop autoclaves without drying

TECHNICAL SUMMARY OF AVS-N SERIES AUTOCLAVES

| Available models | | AES-8 | AES-12 |
|--|---|----------------------|---------------------|
|  General classification | Recommended setting | Small facilities | General laboratory |
| | Equipment placement | Benchtop | |
| | Load direction | Top-loading | |
| | Chamber profile | Round | |
|  Recommended type of load | Liquids and culture media | | ✓ |
| | Laboratory waste bags | | ✓✓ |
| | Glassware | | ✓ |
| | Metal utensils | | ✓✓ |
| | Plastics | | ✓ |
|  Sterilization technology features | Method to generate steam | Heating elements | |
| | Type of purge | Gravity displacement | |
|  Transfer of data | RS-232 | | ✓ |
|  Batch printers | Integrated printer | - | ○ |
| | External printer | - | ○ |
|  Sterilization chamber and door specifications | Sterilization chamber volume | 8 L | 15 L |
| | External building material | AISI-304 | |
| | Sterilization chamber material | AISI-18/10 | AISI-316L |
| | Heating elements material | Incoloy® 825 | |
| | Gasket material | Silicone rubber | |
| | Min. - max. sterilization temperature | 100 - 127°C | 100 - 134°C |
| | Maximum pressure (above atmospheric pressure) | 1,5 Barg | 2,1 Barg |
| | Mechanism to open the door | Bayonet | Wheel |
| | Direction in which the door opens | Vertical | |
| | Automatic locking with pressure | | ✓ |
| Thermally insulated door | | ✓ | |
|  User interface and microprocessor | Screen display | Digital LCD | |
| | Screen size | 1 line x 3 digits | 2 lines x 16 digits |
| | Total number of available programs | 1 | 10 |
| | Automatic microprocessor control | | ✓ |
| | Timer start | | ✓ |
|  Special cycles and process optimization | Agar mode (temperature holding after cycle ends 40-80°C) | - | ✓ |
| | Solids fast cooling (manual valve for a faster cooling phase) | | ✓ |
| | Temperature regulation by heart probe | - | ○ |
|  Adjustable cycle parameters | Agar mode | - | 40 - 80°C |
| | Temperature of sterilization phase | 100 - 127°C | 100 - 134°C |
| | Duration of sterilization phase | 1 - ∞ min | 1 - 250 min |
| | Temperature regulation by heart probe | - | On/Off |
|  Other specifications | Multiple-use water sterilization chamber capacity | 1,3 L | 2,2 L |
| | Flexible heart temperature probe | - | ○ |
| | Height adjustable feet | | ✓ |
| | Pressure gauge | | ✓ |
|  Services | Electric customization (115-230M V/230-400T V) | | ○ |
| | Third-party qualification (IQ/OQ/PQ) | | ○ |

✓: Standard ○: Optional

TECHNICAL DATA



Specifications

| Reference | AES-8 | AES-12 |
|---|-----------------|-----------------|
| Total/usable chamber volume L | 8/6,8 | 15/13 |
| Usable chamber dimensions Ø x H mm | 220 x 180 | 250 x 280 |
| Sterilization chamber water tank volume L | 1,3 | 2,2 |
| Exterior dimensions L x D x H mm | 410 x 355 x 430 | 490 x 475 x 630 |
| Loading height mm | 320 | 435 |
| Power W | 1000 | 1000 |
| Gross weight Kg | 12 | 38 |
| Voltage* V | 230V (1P+N) 16A | 230V (1P+N) 16A |
| Frequency Hz | 50/60 | 50/60 |

*Other voltages available under request.

Safety features

- Safety valve.
- Safety thermostat with manual rearm for the heating elements.
- Pneumatic door blocking system while positive pressure exists inside the sterilization chamber.
- Open door sensor (Only AES-12 model).
- Thermally insulated door.
- Heating elements cover.
- Several visual and acoustic safety and warning alarms.

Regulations

All our AVS-N Series autoclaves are designed to comply with the strictest international directives and standards, including the following regulations:

- **EN-61010-1** Safety requirements for electrical equipment for measurement, control and laboratory use. **Part 1:** General requirements.
- **EN-61010-2-040 Part 2-040:** Requirements for laboratory autoclaves.
- **EN-61326** Electrical equipment for measurement, control and laboratory use. EMC requirements.
- **AD 2000 Merkblatt** Pressure vessels.
- **2014/35/UE** Low voltage.
- **2014/30/UE** Electromagnetic compatibility.
- **2014/68/UE** Pressure equipment.

General features

| Available models | AES-8 | AES-12 |
|--|--|---|
| Adjustable sterilization temperature | 100 - 127°C | 100 - 134°C |
| Adjustable sterilization time | 1 - ∞ min | 1 - 250 min |
| Max. pressure | 1,5 Barg | 2,1 Barg |
| Sterilization control system | Fully automatic by chamber temperature probe | Fully automatic by either chamber temperature probe or flexible heart temperature probe |
| Air purge system | Gravity displacement | |
| External building material | AISI-304 stainless steel | |
| Sterilization chamber material | AISI-18/10 | AISI-316L |
| Heating elements material | Incoloy® 825 | |
| Gasket material | Silicone rubber | |
| Connection to PC | RS-232 | |
| Connection to printer | - | RS-232 or integrated |
| Number of programs | 1 | 10 (4 preset and 6 user free) |
| Programmable auto-start | 1 - ∞ min | Up to 24 h |
| Screen type | LCD display | |
| Opening door mode | External vertical swiveling door plus internal blocking bayonet lid | Horizontal swiveling door with blocking wheel |
| Monitoring of sterilization parameters | Self-control of obtained values (T° & t) vs programmed values. Cycle is automatically interrupted if obtained values differ from programmed values | |
| Pressure display | Pressure gauge on control panel | |
| Water management | Water is directly poured into the sterilization chamber | |
| Drainage system | Drainage connection operated by an independent drainage valve on control panel for manual release of sterilization chamber water tank | |
| Feet | Height adjustable feet with resistant rubber | |

+ info

Find out more about our autoclaves on our **Youtube Channel**



Installation guide available under request, please contact us.



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RAYPA

Avinguda del Vallès, 322
Pol. Ind. "Els Bellots"
08227 Terrassa (Barcelona) Spain

raypa@raypa.com
www.raypa.com

Tel. +34 937 830 720

R. ESPINAR, S.L.