

# RAYPA

Leading  
Lab Technologies

 Sterilization

## VERTICAL AUTOCLAVES WITHOUT DRYING

**AES SERIES** **CLASSIC LINE**

ECONOMIC, DURABLE,  
ROBUST PERFORMANCE  
AND LIMITED LABORATORY  
RESOURCES CONSUMPTION



# Vertical autoclaves without drying

The **AES** Series vertical floor-standing autoclaves with top-loading access cover the fundamental needs for general labware sterilization in many industries, educational institutions and research facilities with the aim of increasing the productivity of the laboratory. A great chamber capacity together with the optimization of resources such as water, power and operating time results in an affordable and efficient solution to manage laboratory workload.

## INTENDED USE

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



## MAIN FEATURES

### ECONOMIC AND DURABLE

**AES** Series autoclaves are economic and robust autoclaves with excellent performance for general laboratory sterilization procedures. They can be used either for solids and liquids sterilization procedures and they consume limited valuable laboratory resources such as water, power or operator time.

### MULTIPLE TYPES OF STERILIZATION CYCLES

Several options available to perform solids or liquids sterilization. Optional flexible temperature probe for load sensed sterilization of liquids, temperature holding at the end of the sterilization cycle for culture media and manual unsteaming push-button for a faster cooling phase of solids.

### EASY INSTALLATION AND MAINTENANCE

Every **AES** Series autoclave is a plug and play equipment that do not need dedicated installation connections. They simply need a power source and can work even without a connection to the drainage. All models include casters so they can be used in different areas of the same facility.

### SAFETY FIRST

**AES** Series autoclaves are equipped with several features to ensure the safety of the operators. These include an overpressure safety valve, a thermally insulated door, an overtemperature safety thermostat, an open door 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).



Manual steam release push-button for a faster cooling phase in solids sterilization cycles.



Available special models with augmented power to achieve faster heating and sterilization phases.



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



Programmable auto-start for up to 24h.



Optional software for sterilization data management.



Optional integrated or external printer.



Plug and play equipment, no plumbing required.



Easy mobility, all models include casters.



## STERILIZATION APPLICATIONS

**AES** 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. These reliable workhorses for the general laboratory are designed for an easy operation and include many safety features to protect users in their daily routine.



# Vertical autoclaves without drying

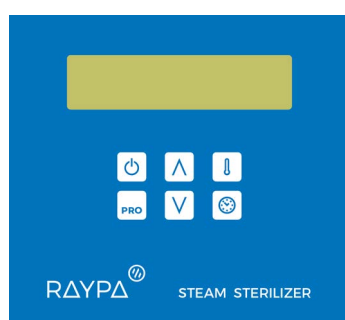
## WORKING PRINCIPLE

**AES** Series autoclaves provide a solution for the multiple sterilization needs of general laboratories including liquids, culture media, biological waste, contaminated media, instruments, glassware and other laboratory items.

The load has to be placed into the vessel's baskets 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.

## DIGITAL MICROPROCESSOR

Digital microprocessor with 6 push-buttons for an easy programming and parameters selection.



## AES SERIES PROGRAMS

**AES** Series autoclaves have 10 programs, from P0 to P9, and the first four are predefined and protected.

### PREDEFINED PROGRAMS

Program N°	Sterilization temperature °C	Sterilization time min	Program mode Agar mode or Heart probe
P0	115	60	SOL/LIQ-1
P1	121	30	SOL/LIQ-1
P2	133	20	SOL/LIQ-1
P3	121	20	SOL/LIQ-1

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).

## STANDARD AES 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.
- To shorten the duration of this step, RAYPA offers special models with increased power, a feature of particular interest for autoclaves operating in laboratories with high workloads.

### STERILIZATION PHASE

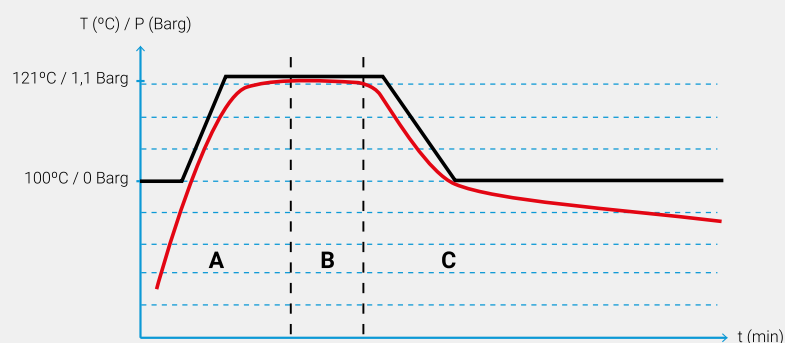
- Upon reaching the set sterilization temperature inside the chamber the sterilization phase begins, accurately sustaining the temperature throughout the duration of this phase.
- This crucial step is controlled by a PT-100 Class A temperature probe located within the chamber. As an option for liquids 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.
- In solid programs, discharge can be manually forced through a push-button to reduce the duration of the cooling phase.
- If Agar mode is activated, the equipment will hold the preprogrammed temperature indefinitely, selectable between 40 and 80°C.

### Sterilization cycle graph

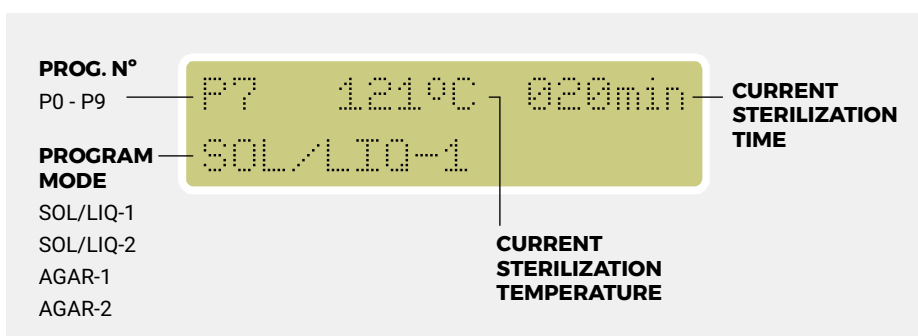
- A Heating phase
  - B Sterilization phase
  - C Cooling phase
- Temperature  
— Pressure





## FUNCTIONS DISPLAYED BY THE ALPHANUMERIC LCD SCREEN

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



## LOADING CAPACITIES



### ERLENMEYER FLASKS

Autoclave model	AES-28	AES-50	AES-75	AES-110	AES-150	
Usable chamber dimensions Ø x H mm	300 x 440	300 x 710	400 x 600	400 x 850	500 x 780	
Usable capacity L	31	50	75	110	153	
250 ml (Ø 85 x 143 mm)	Total baskets	2	3	3	4	4
	Total units per basket	7	7	12	12	20
	Total units	14	21	36	48	80
500 ml (Ø 105 x 183 mm)	Total baskets	2	3	2	3	4
	Total units per basket	4	4	8	8	14
	Total units	8	12	16	24	56
1000 ml (Ø 131 x 230 mm)	Total baskets	1	1	2	3	3
	Total units per basket	1	1	4	4	8
	Total units	1	1	8	12	24
2000 ml (Ø 166 x 280 mm)	Total baskets	1	1	1	1	1
	Total units per basket	1	1	3	3	5
	Total units	1	1	3	3	5



### BOTTLES

Autoclave model	AES-28	AES-50	AES-75	AES-110	AES-150	
Usable chamber dimensions Ø x H mm	300 x 440	300 x 710	400 x 600	400 x 850	500 x 780	
Usable capacity L	31	50	75	110	153	
250 ml (Ø 70 x 143 mm)	Total baskets	2	3	3	4	4
	Total units per basket	10	10	19	19	30
	Total units	20	30	57	76	120
500 ml (Ø 86 x 182 mm)	Total baskets	2	3	2	3	4
	Total units per basket	7	7	12	12	20
	Total units	16	24	24	36	80
1000 ml (Ø 101 x 203 mm)	Total baskets	1	1	2	3	3
	Total units per basket	2	2	8	8	14
	Total units	2	2	16	24	42
2000 ml (Ø 136 x 260 mm)	Total baskets	1	1	1	1	1
	Total units per basket	1	1	4	4	8
	Total units	1	1	4	4	8

\*All data on loading capacities of these tables are non-binding guidance to help you choose your autoclave model. The total units per basket and per model have been calculated using standard baskets, for special loads that require custom baskets please contact us.

# Vertical autoclaves without drying

## Accessories



### INTEGRATED BASKETS CRANE

Reference	ELEV-CLAV
Dimensions L x D x H mm	800 x 300 x 2100
Power W	480
Weight Kg	40
For autoclaves with the following chamber volumes L	79, 115 and 175
Max. load Kg	30
Voltage V	230
Frequency Hz	50/60

\*Must be installed in our facilities.

#### Intended use

- Powerful lift system with adjustable arm to assist the movement of heavy loads into the autoclave.

#### Features

- Ease of use.
- Compatible with 79L, 115L and 175L vertical autoclaves. Contact us for other models.
- Up to 200 degrees of rotation.

#### Safety

- Emergency stop button.
- Motor with auto braking system.

### MOBILE BASKETS CRANE

- Electrically operated crane made of stainless steel to assist the loading and unloading of heavy loads up to 50 Kg.
- Push-button operation control for ease of use.
- With swiveling casters for more maneuverability.

Reference: **MOB-LIFT**





## Accessories

### STAINLESS STEEL WIRE BASKETS

Reference		CV-28	CV-75S	CV-75	CV-150S	CV-150M
Dimensions	Exterior Ø x H mm	270 x 185	370 x 180	370 x 265	470 x 190	470 x 235
	Interior Ø x H mm	260 x 180	360 x 175	360 x 260	460 x 185	460 x 230
For autoclaves with the following chamber volumes	33 L	2	-	-	-	-
	55 L	3	-	-	-	-
	79 L	-	3	2	-	-
	115 L	-	4	3	-	-
	175 L	-	-	-	4	3



### STAINLESS STEEL LIQUIDS COLLECTOR TRAY FOR WIRE BASKETS

Reference		TR-270	TR-370	TR-470
Dimensions	Exterior Ø x H mm	240 x 50	320 x 50	420 x 50
	Interior Ø x H mm	238 x 48	318 x 48	418 x 48
For the following wire baskets models	CV-28	✓	-	-
	CV-75S & CV-75	-	✓	-
	CV-150S & CV-150M	-	-	✓



### UNPERFORATED STAINLESS STEEL BASKETS FOR LABORATORY WASTE STERILIZATION

Reference		CCI-28	CCI-75S	CCI-75	CCI-150S	CCI-150M
Dimensions	Exterior Ø x H mm	270 x 185	370 x 180	370 x 265	470 x 190	470 x 235
	Interior Ø x H mm	260 x 180	360 x 175	360 x 260	460 x 185	460 x 230
For autoclaves with the following chamber volumes	33 L	2	-	-	-	-
	55 L	3	-	-	-	-
	79 L	-	3	2	-	-
	115 L	-	4	3	-	-
	175 L	-	-	-	4	3



### STAINLESS STEEL "SCHIMMELBUSCH" DRUM FOR MEDICAL INSTRUMENTS STERILIZATION

Reference		TBE-24x16	TBE-34x24	TBE-48x24
Dimensions	Exterior Ø x H mm	240 x 165	340 x 240	480 x 240
	Interior Ø x H mm	230 x 155	330 x 230	470 x 230
For autoclaves with the following chamber volumes	33 L	2	-	-
	55 L	4	-	-
	79 L	-	2	-
	115 L	-	3	-
	175 L	-	-	3



# Vertical autoclaves without drying

## Accessories

### STAINLESS STEEL CYLINDERS FOR PETRI DISHES STERILIZATION

Reference		CEP-1027	CEP-1041	CEP-1427	CEP-1441	
Dimensions	Exterior Ø x H mm	100 x 270	100 x 410	140 x 270	140 x 410	
	Maximum number dishes / cylinder	10	18	10	18	
Petri dishes	Diameter Ø mm	80	80	120	120	
	For autoclaves with the following chamber volumes	33 L	4	4	2	2
		55 L	8	4	4	2
		79 L	16	8	10	5
		115 L	24	16	15	10
		175 L	28	14	16	8



### STAINLESS STEEL CYLINDERS FOR PIPETTE STERILIZATION

Reference		CEPP-726	CEPP-740	CEPP-1025	CEPP-1435	
Dimensions	Exterior Ø x H mm	70 x 260	70 x 400	100 x 250	140 x 350	
	Interior Ø x H mm	60 x 250	60 x 390	90 x 240	130 x 340	
For autoclaves with the following chamber volumes		33 L	11	11	6	6
		55 L	22	11	12	12
		79 L	42	21	20	10
		115 L	63	42	30	20
		175 L	90	30	51	34



### STAINLESS STEEL TRAY SUPPORT WITH HEIGHT ADJUSTABLE TRAYS\*

Reference		SRA-1	SRA-5	SRA-2	SRA-3	SRA-4	SRA-2-3	SRA-4-3
Dimensions Ext. Ø x H mm		270x390	270x680	370x560	370x810	470x740	370x190	470x250
	Max. number trays / support	8	14	11	16	15	4	5
Trays	Ref.	TSRA-1/5	TSRA-1/5	TSRA-2/3	TSRA-2/3	TSRA-4	TSRA-2/3	TSRA-4
	Dim. Ø x H mm	252x20	252x20	356x20	356x20	454x20	356x20	454x20
For autoclaves with the following chamber volumes		33 L	1	-	-	-	-	-
		55 L	-	1	-	-	-	-
		79 L	-	-	1	-	-	3
		115 L	-	-	-	1	-	4
		175 L	-	-	-	-	1	-



**BSRA**  
Set of 30 individual  
fastening clips.

\*The purchase of a tray support includes a set of 3 trays and 9 fastening clips. Likewise, the purchase of a tray includes a set of 3 fastening clips.





## Accessories

### **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.
- Must be installed in our facilities.

Reference: **PT-2**



### **EXTERNAL TEMPERATURE PROBE ADAPTER**



- External adapter for continuous validation processes that allows the access of an external probe (Ø 3-6 mm) to obtain a temperature reading independent from that of the equipment microprocessor.
- It is located on the door of the autoclave.
- Must be installed in our facilities.

Reference: **EXT-TP**

### **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.
- 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.

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.
- Must be installed in our facilities.

References: **IT/M**

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

# Vertical autoclaves without drying

## Accessories

### PREMIUM CASTERS (2 WITH BRAKES)



- Although all AES Series autoclaves include casters, this accessory offers the option of upgrading them with a more resistant and higher quality casters that include brakes.
  - Enables an easier movement of the equipment between different locations.
  - Must be installed in our facilities.
- Reference: **4WHBR**

### 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**

### CONDENSATES BOTTLE



- 12L bottle with tap to collect condensates during purge phase and also to collect water while cleaning the sterilization chamber. Useful in situations where no easy drainage is available.
- Reference: **TANK-AE**

### 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  $\varnothing$  2mm),  
**PRENSACLAV2** (8 holes  $\varnothing$  4mm).

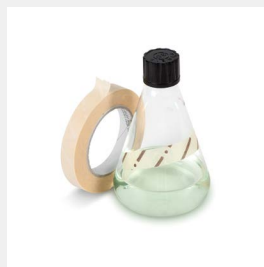
### SW7000 SOFTWARE



- 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.

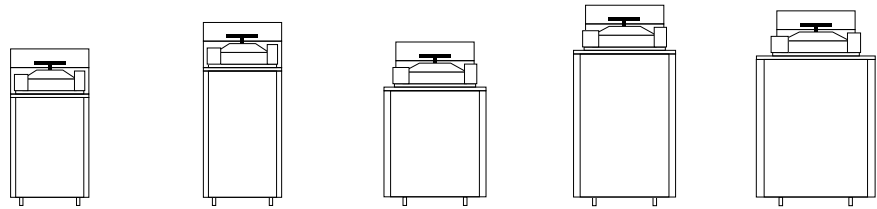


## TECHNICAL SUMMARY OF AES SERIES AUTOCLAVES

<b>General classification</b>	Recommended setting	General laboratory
	Equipment placement	Floor-standing
	Load direction	Top-loading
	Chamber profile	Round
<b>Recommended type of load</b>	Liquids and culture media	✓
	Laboratory waste bags	✓✓
	Glassware	✓
	Plastics	✓
<b>Sterilization technology features</b>	Method to generate steam	Heating elements
	Type of purge	Gravity displacement
<b>Transfer of data</b>	RS-232	✓
<b>Batch printers</b>	Integrated printer	○
	External printer	○
<b>Sterilization chamber and door specifications</b>	Sterilization chamber volume	33 - 175 L
	External building material	AISI-304
	Sterilization chamber material	AISI-316L
	Heating elements material	Incoloy® 825
	Gasket material	Silicone rubber
	Min.- max. sterilization temperature	100 - 134°C
	Maximum pressure (above atmospheric pressure)	2,1 Barg
	Mechanism to open the door	Manual wheel
	Direction in which the door opens	Lateral
	Automatic locking with pressure	✓
Thermally insulated door	✓	
<b>User interface and microprocessor</b>	Screen display	Digital LCD
	Screen size	2 lines x 16 digits
	Total number of available programs	10
	Automatic microprocessor control	✓
	Timer start	✓
<b>Special cycles and process optimization</b>	Agar mode (temperature holding after cycle ends 40-80°C)	✓
	Solids fast cooling (manual push-button for a faster cooling phase)	✓
	Temperature regulation by heart probe	○
<b>Adjustable cycle parameters</b>	Agar mode	40 - 80°C
	Temperature of sterilization phase	100 - 134°C
	Duration of sterilization phase	1 - 250 min
	Temperature regulation by heart probe	On/Off
<b>Other specifications</b>	Multiple-use water sterilization chamber capacity	3 - 9,5 L
	Flexible heart temperature probe	○
	Standard casters	✓
	Premium casters with brakes	○
	Pressure gauge	✓
	Electric customization (115-230M V/230-400T V)	○
<b>Services</b>	Special models with augmented power	○
	Third-party qualification (IQ/OQ/PQ)	○

✓: Standard ○: Optional

## TECHNICAL DATA



### Specifications

Reference	AES-28	AES-50	AES-75	AES-110	AES-150
Total/usable chamber volume L	33/31	55/50	79/75	115/110	175/153
Usable chamber dimensions Ø x H mm	300 x 440	300 x 710	400 x 600	400 x 850	500 x 780
Sterilization chamber water tank volume L	3	3	5,5	5,5	9,5
Exterior dimensions L x D x H mm	505 x 580 x 1110	505 x 580 x 1290	610 x 700 x 1185	610 x 700 x 1435	750 x 820 x 1400
Loading height mm	795	975	870	1120	1085
Power W	2000 or 3200	3200 or 6000	3200 or 6000	4500, 6000 or 9000	6000 or 9000
Gross weight Kg	75	90	115	135	230
Voltage* V	230V (1P+N) 16A	230V (1P+N) 16A	230V (1P+N) 16A or 400V (3P+N) 32A	400V (3P+N) 32A	400V (3P+N) 32A
Frequency Hz	50/60	50/60	50/60	50/60	50/60

\*Other voltages available under request. Special models with augmented power may operate with other voltages.

### 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.
- Thermally insulated door.
- Heating elements cover.
- Several visual and acoustic safety and warning alarms.

### Regulations

All our AES 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

Adjustable sterilization temperature	100 - 134°C
Adjustable sterilization time	1 - 250 min
Max. pressure	2,1 Barg
Sterilization control system	Fully automatic microprocessor control 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-316L stainless steel
Heating elements material	Incoloy® 825
Gasket material	Silicone rubber
Connection to PC	RS-232
Connection to printer	RS-232 or integrated
Number of programs	10 (4 preset and 6 user free)
Programmable auto-start	Up to 24 h
Screen type	LCD display
Opening door mode	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
Casters	Included standard casters, optional upgrade to premium casters with brakes

CLICK!  
ACCESS  
THE AES  
SERIES  
VIDEO

+ info

YouTube



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



Installation guide available under request, please contact us.



REV 06.2021

# 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.