

RAYPA

 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 probe 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 Probe 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 probe 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.

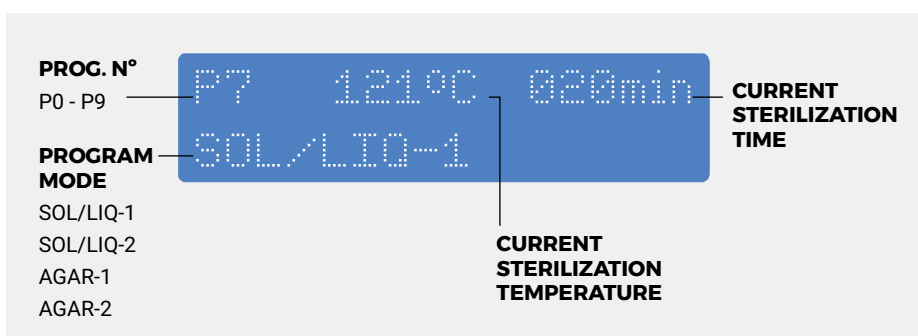
Sterilization cycle graph





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



ISO ERLENMEYER FLASKS

Autoclave model	Usable volume L	250mL (Ø85 x 143mm)			500mL (Ø105 x 183mm)			1000mL (Ø131 x 230mm)			2000mL (Ø166 x 280mm)						
		Total baskets	Units/ basket	Total units		Total baskets	Units/ basket	Total units		Total baskets	Units/ basket	Total units					
				A	B			A	B			A	B				
AES-28	31	2	7	14	=	1	4	4	8	1	1	1	=	1	1	1	=
AES-50	50	3	7	21	28	1	4	4	12	1	1	1	3	1	1	1	2
AES-75	75	3	12	36	48	2	8	16	24	2	5	10	=	1	3	3	6
AES-110	110	4	12	48	60	3	8	24	32	3	5	15	=	1	3	3	9
AES-150	153	4	21	84	105	4	14	56	=	3	8	24	=	1	5	5	=

A: Number of units using standard baskets.

B: Number of units using specially designed baskets for the specific combination of autoclave model and container.

The data contained within these tables, regarding load capacities, serves as a non-binding guide to assist you in the selection of the most appropriate autoclave model.



ISO BOTTLES

Autoclave model	Usable volume L	250mL (Ø70 x 143mm)			500mL (Ø80 x 185mm)			1000mL (Ø101 x 230mm)			2000mL (Ø136 x 260mm)						
		Total baskets	Units/ basket	Total units		Total baskets	Units/ basket	Total units		Total baskets	Units/ basket	Total units					
				A	B			A	B			A	B				
AES-28	31	2	9	18	=	1	7	7	14	1	4	4	=	1	1	1	=
AES-50	50	3	9	27	36	1	7	7	21	1	4	4	12	1	1	1	2
AES-75	75	3	20	60	80	2	14	28	42	2	8	16	=	1	4	4	8
AES-110	110	4	20	80	100	3	14	42	56	3	8	24	=	1	4	4	12
AES-150	153	4	33	132	165	4	24	96	=	3	15	45	=	1	8	8	24

A: Number of units using standard baskets.

B: Number of units using specially designed baskets for the specific combination of autoclave model and container.

The data contained within these tables, regarding load capacities, serves as a non-binding guide to assist you in the selection of the most appropriate autoclave model.

Vertical autoclaves without drying

Accessories

INTEGRATED BASKET LIFT SYSTEM

References	CLASSIC-LIFT	CLASSIC-LIFT-R
Dimensions L x D x H mm	800 x 300 x 2100	800 x 300 x 2600
Power W	480	480
Voltage V	230	230
Frequency Hz	50/60	50/60
Weight Kg	40	45
Maximum load Kg	30	40
For autoclaves with the following chamber volumes	79 L	✓
	115 L	✓
	175 L	-

- Stainless steel electric lift system built into the side of the autoclave with swivel arm to help load and unload heavy items. The device is built into the side of the autoclave. Push-button operation with opening up to 200°.
- Motor with auto brake system in the event of obstacles or overload.
- Available in two models: the standard lift system and reinforced lift system.
- It can be factory fitted or retrofitted.



MOBILE BASKET LIFT SYSTEM

Reference	MOB-LIFT
Dimensions L x D x H mm	420 x 800 x 2200
Power W	200
Voltage V	90 - 250
Frequency Hz	50/60
Weight Kg	70
Maximum load Kg	30

- Stainless steel electric lift system with casters to help load and unload heavy items up to 30Kg.
- Equipped with long-life battery for cordless use.
- Push-button operation.
- Motor with auto brake system in the event of obstacles or overload.
- Compatible with any autoclave model.





Accessories

STAINLESS STEEL WIRE BASKETS

Reference		CV-28	CV-75-130	CV-75S	CV-75	CV-150-130	CV-150S	CV-150M
Dimensions	Exterior Ø x H mm	270 x 185	370 x 130	370 x 180	370 x 265	470 x 130	470 x 190	470 x 235
	Interior Ø x H mm	260 x 180	360 x 125	360 x 175	360 x 260	460 x 125	460 x 185	460 x 230
For autoclaves with the following chamber volumes	33 L	2	-	-	-	-	-	-
	55 L	3	-	-	-	-	-	-
	79 L	-	4	3	2	-	-	-
	115 L	-	6	4	3	-	-	-
	175 L	-	-	-	-	6	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



HEIGHT ADJUSTABLE TRAY SUPPORT

Reference		SRA-R-300	SRA-R-400	SRA-R-500	
Dimensions Ext. Ø x H mm		250 x 190	350 x 180	450 x 180	
Max. number trays / support		4	4	4	
Trays	Reference	TRAY-SRA-R-300	TRAY-SRA-R-400	TRAY-SRA-R-500	
	Dim. Ø x H mm	240 x 20	340 x 20	440 x 20	
For autoclaves with the following chamber volumes		33 L	2	-	-
		55 L	3	-	-
		79 L	-	3	-
		115 L	-	4	-
		175 L	-	-	4



*The purchase of a tray support comes with a set of two trays and six fastening clips. Likewise, the purchase of a tray includes a set of three fastening clips.

- For sterilization of instruments, small bags and other small objects that must be placed straight up.
- Material: AISI-304 stainless steel.



Accessories

FLEXIBLE PROBE 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 core temperature probe.
- The temperature control by the flexible core 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 (\varnothing 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**

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**



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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 GLAND



- Installation of a Ø2mm or Ø4mm cable gland to provide access to as many as eight external temperature probes for calibration and validation procedures.
- Must be installed at our factory.

Reference: **PRENSACLAV**

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.

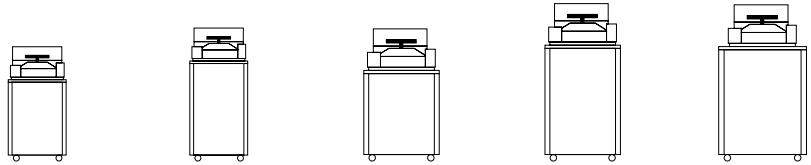


TECHNICAL SUMMARY OF AES SERIES AUTOCLAVES

General classification	Recommended setting	General laboratory
	Equipment placement	Floor-standing
	Load direction	Top-loading
	Chamber profile	Round
Recommended type of load	Culture media and liquids	++
	Laboratory waste bags	+
	Porous solids and wrapped loads	-
	Glassware	++
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	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	✓	
User interface and microprocessor	Screen display	Digital LCD
	Screen size	2 lines x 16 digits
	Total number of available programs	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 push-button for a faster cooling phase)	✓
	Temperature regulation by probe probe	○
Adjustable cycle parameters	Agar mode	40 - 80°C
	Temperature of sterilization phase	100 - 134°C
	Duration of sterilization phase	1 - 250 min
	Temperature regulation by probe probe	On/Off
Other specifications	Multiple-use water sterilization chamber capacity	3 - 9,5 L
	Flexible probe temperature probe	○
	Standard casters	✓
	Premium casters with brakes	○
	Pressure gauge	✓
Services	Electric customization (115-230M V/230-400T V)	○
	Special models with augmented power	○
	Third-party qualification (IQ/OQ/PQ)	○

+ Recommended
 ✓ Standard
 ○ Optional

TECHNICAL DATA



Specifications

References	AES-28	AES-50	AES-75	AES-110	AES-150
Total/usable volume of the chamber L	33/31	55/50	79/75	115/110	175/153
Usable dimensions of the chamber Ø x H mm	300 x 440	300 x 710	400 x 600	400 x 850	500 x 780
External 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
Net weight Kg	61	65	98	122	198
Available powers W	2000 or 3200	3200 or 5000	3200 or 6000	4500, 6000 or 9000	6000 or 9000
Standard voltage* V	230	230	230	400	400
Frequency Hz	50/60	50/60	50/60	50/60	50/60

*Other voltages and electrical configurations available on request. Special models with increased 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 probe 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

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AES SERIES
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YouTube



Find out more about our AE-B Series autoclaves on our **Youtube** Channel.



Installation guide available for download on our website.



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