



Systemc Laboratory Autoclaves

Systemc H-Series. Horizontal floor-standing autoclaves.

Systemc H-Series 2D. Pass-through autoclaves.

Systemc

the autoclave company

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HUBERLAB.

committed to science

Performance and competence.

Experience counts

We focus on only one thing: laboratory autoclaves. However, we do this exceptionally well! Our goal is always to make steam sterilization in the laboratory safer, easier, more precise and of course more economical. With over 20 years of experience and continuous intensive cooperation with experts in practice, we know how to provide optimal solutions for even the most complex sterilization tasks.

We have the knowledge and experience to produce the best results!

Our expertise and know-how are available for you worldwide through specialized and specially selected partners.



The power of innovation. For better sterilization.

Systec laboratory autoclaves

Specially developed for laboratory sterilization applications, Systec autoclaves make processes easier, safer, precise, reproducible and validatable.

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Systec H-Series. Horizontal floor-standing autoclaves.

HX

Autoclaves of the performance category HX can be used for all laboratory applications, even for sophisticated sterilization processes. All additional optional accessories can be fitted to obtain validatable processes.

In spite of the high loading capacity, these autoclaves are compact and have a comparatively low weight.



16 models
65 to 1580 l
chamber
capacity

Dimensions and performance

Systec	HX-65	HX-90	HX-100	HX-150	HX-200
Chamber dimensions Ø x depth in mm	400 x 500	400 x 700	500 x 500	500 x 750	500 x 1000
Chamber volume in liters total/nominal	70/65	95/90	110/100	160/150	210/200
External dimensions in mm					
Height	1430	1430	1530	1530	1530
Width	690	690	790	790	790
Depth	910	1110	930	1180	1430
Net weight	230	250	250	275	290

Systec	HX-210	HX-320	HX-430	HX-540	HX-650
Chamber dimensions Ø x depth in mm	740 x 500	740 x 750	740 x 1000	740 x 1250	740 x 1500
Chamber volume in liters total/nominal	280/210	385/320	495/435	602/540	710/650
External dimensions in mm					
Height	1683	1683	1683	1683	1683
Width	930	930	930	930	930
Depth	1035	1285	1535	1785	2035
Net weight	540	555	605	638	705

Systec	HX-580	HX-780	HX-980	HX-1180	HX-1380	HX-1580
Chamber dimensions Ø x depth in mm	1000 x 750	1000 x 1000	1000 x 1250	1000 x 1500	1000 x 1750	1000 x 2000
Chamber volume in liters total/nominal	755/580	950/780	1150/980	1345/1180	1541/1380	1735/1580
External dimensions in mm						
Height	1850	1850	1850	1850	1850	1850
Width	1255	1255	1255	1255	1255	1255
Depth	1450	1700	1950	2200	2450	2700
Net weight	810	850	920	990	1050	1110

Electrical connections for the Systec HX-65 to HX-200: 380 – 400 V, 50/60 Hz, 3-phase AC with neutral, 16 A.

Electrical connections for the Systec HX-210 to HX-1580: 380 – 400 V, 50/60 Hz, 3-phase AC with neutral, 32 A.

Different voltage available upon request.

Systec H-Series 2D. Pass-through autoclaves.

HX

Triple safety aspects

- One door only can be opened at a time. If one door is open, the other is automatically locked.
- If the autoclave is switched off or if no current is available (e.g. power failure), both doors remain locked.
- If the door at the non-sterile side is opened, a sterilization program has to be performed before the door at the sterile side can be opened.

The locking system can be adapted to customers' wishes. Doors and control panel are made of heat-insulating plastic, the housing completely of stainless steel and the stainless steel edges specially processed for smooth junctions with walls. Operation, however, can be carried out from both sides, the position (open or closed) of the opposite door being indicated on the display.

For use under the most stringent clean room and safety conditions

- For biological safety laboratories. Fitting as a sterilization and pass-through lock for protecting the external environment.
- For clean rooms in laboratories and production facilities as a sterilization and pass-through lock separating sterile and non-sterile areas.

13 models
90 to 1580 l
chamber
capacity



Dimensions and performance

Systec	HX-90 2D	HX-150 2D	HX-200 2D
Chamber dimensions Ø x depth in mm	400 x 750	500 x 750	500 x 1000
Chamber volume in liters total/nominal	98/90	155/150	205/200
External dimensions in mm			
Height	1430	1530	1530
Width	690	790	790
Depth	1160	1200	1450

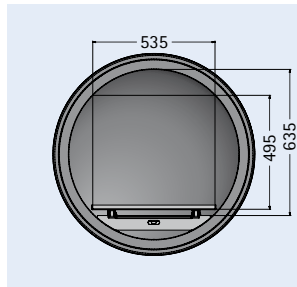
Systec	HX-320 2D	HX-430 2D	HX-540 2D	HX-650 2D
Chamber dimensions Ø x depth in mm	740 x 750	740 x 1000	740 x 1250	740 x 1500
Chamber volume in liters total/nominal	370/320	480/430	590/540	700/650
External dimensions in mm				
Height	1683	1683	1683	1683
Width	930	930	930	930
Depth	1210	1460	1710	1960

Systec	HX-580 2D	HX-780 2D	HX-980 2D	HX-1180 2D	HX-1380 2D	HX-1580 2D
Chamber dimensions Ø x depth in mm	1000 x 750	1000 x 1000	1000 x 1250	1000 x 1500	1000 x 1750	1000 x 2000
Chamber volume in liters total/nominal	670/580	870/780	1070/980	1270/1180	1470/1380	1670/1580
External dimensions in mm						
Height	1850	1850	1850	1850	1850	1850
Width	1255	1255	1255	1255	1255	1255
Depth	1500	1750	2000	2250	2500	2750

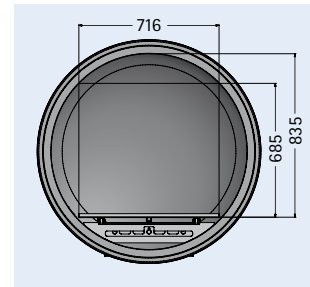
Electrical connections for the Systec HX-90 2D to HX-200 2D: 380–400 V, 50/60 Hz, 3-phase AC with neutral, 16 A.
 Electrical connections for the Systec HX-320 2D to HX-1580 2D: 380–400 V, 50/60 Hz, 3-phase AC with neutral, 32 A.
 Different voltage available upon request.

Systemec H-Series, Systemec H-Series 2D.

Available with two chamber diameter: 740 mm and 1000 mm.
 1000 mm diameter chamber provides the usable chamber dimension of a 6x6 square chamber autoclave.



Diameter 740 mm



Diameter 1000 mm



Technical standard feature.

HX

Standard Features	
Integrated, separate steam generator	■
Housing, support frame and pressure vessel made of corrosion-resistant stainless steel	■
Temperature and pressure range 140 °C, 4 bar	■
Touch-Screen control	■
Number of sterilization programs	up to 100
Code-secured access rights for changing parameters and further safety-relevant intervention	■
Internal memory for storing up to 500 sterilization cycles	■
Timer for starting programs	■
Autofill: automatic demineralized water feed for steam generation	■
Flexible PT-100 temperature sensor	■
Additional temperature sensor in condense exhaust	■
Temperature holding function for liquids after program finish	■
Special program for Durham tubes	■
Calculation of FO value	■
Special program for waste sterilization with pulsed heat-up for more efficient air exhaust	■
Water-cooled steam exhaust, thermostatically controlled	■
Programmable automatic door-opening on completion of program	■
RS-232 and RS-485 interfaces for external data transmission (network-compatible)	■
Available options	
Extension of temperature and pressure ranges to 150 °C/5 bar (from chamber volume 65 liters to 650 liters)	□
Options for process optimization	
Rapid cooling for efficient and safe cooling of liquids	□
Vacuum system for validatable sterilization of solids and waste materials in disposal bags	□
Superdry: for drying solids (only in combination with optional vacuum system)	□
Exhaust filtration (including condensate inactivation) for safe sterilization of hazardous biological substances	□
Options for documentation	
Integrated printer for batch documentation	□
PC software for comprehensive documentation	□
Comlog: includes USB – and Ethernet-Connection and internal memory for up to 10,000 sterilization cycles, including documentation software on Comlog. The software can be called up independent of platform (PC, laptop, tablet, smart phone), facilitating remote service	□
AuditTrail: unalterable and traceable documentation acc. to FDA 21 CFR Part 11	□

- Systec autoclaves are delivered ready for subsequent installation of all options.
 - Further options and special programs as well as baskets and inserts, transport and loading systems on request.

■ = Standard
 □ = Optional

Design – pure innovation.

State-of-the-art engineering

All Systemec autoclaves have been newly developed and designed and represent state-of-the-art engineering. All mechanical and electronic components guarantee enhanced sterilization processes, hence enabling the lab to fulfill all appropriate requirements for today and for the future.



All-round quality

The pressure vessel is made of corrosion-resistant stainless steel 1.4571 (V4A) AISI 316 Ti and is thus easy to clean. An approved safety valve for excess pressure is included. The autoclave support framework and housing are also made of stainless steel. The highly efficient, high-quality Hanno-Tect insulation material releases no particles; Systemec autoclaves can thus be used under clean-room conditions.

Systemec autoclaves are fitted with the following connections at the rear:

	HX
Demineralized water inlet for steam generation	■
Compressed air	■
Cooling water	□
Common outlet	■
RS-232 / RS-485 interfaces	■
Flexible cord with CEE plug	■

■ = Standard
□ = Optional

All according to norms and regulations

Equipped for the future! Systemec H-Series autoclaves are the first to be designed for higher temperatures and pressures. The pressure vessel is designed for operations at 150 °C and 5 bar. Optional temperature and pressure range extension accessories adapt all control and safety components to the higher temperature and pressure. This option can be retrofitted.

Available for Systemec H-Series autoclaves 65 to 650 liter.

Systemec autoclaves comply with the following standards:

Pressure vessel:

- 97 / 23 / EG Pressurized Vessel Guideline.
- ASME Boiler Et Pressure Vessel Code, Section VIII, Division 1.
- China Stamp.

Other guidelines:

- 2006 / 95 / EG Low Voltage Directive.
- 2004 / 108 / EG on Electromagnetic Compatibility.
- 2006 / 42 / EG Machinery Directive.

All autoclaves are CE-certificated.



Safety and convenience

HX

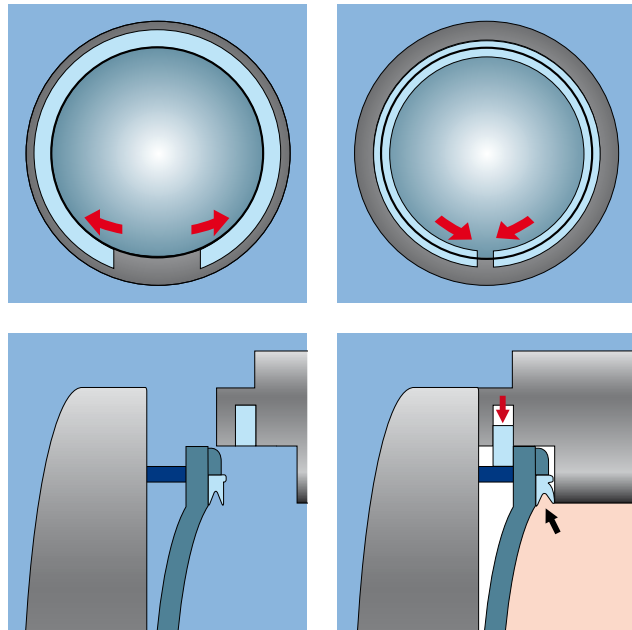
Novel automatic door-opening system

Easy but safe – on closing, the door is automatically locked by a circumferential ring system. A special lip seal made of heat-resistant silicone provides reliable tightness; the more the steam pressure increases, the tighter the seal becomes – without the need for additional compressed air or other media!

The door-locking system is temperature-dependent according to pressure vessel regulation TRB 402 and DIN 58946, Part II. The door remains locked as long as there is excess pressure in the chamber. The door and other parts of the pressure vessel and housing are made of stainless steel. The attractively designed front cover, which also incorporates the control panel, display and parts of the control processing system, is made of heat-resistant, insulating plastic. There is thus no risk of the operator coming into contact with hot components.

Automatic door-opening

The autoclave door functions automatically – either by pressing a button or automatically at the end of a program. A simple system but most useful in practice. Residual steam is exhausted automatically without intermission. Residual heat is used to dry the items being sterilized during the final short phase in the autoclave. Automatic door-opening is restricted to an angle of approx. 15°; this avoids possible contamination from the outside. Especially when items to be sterilized have to remain in the autoclave for cooling and drying this facilitates the working process. Subsequently, for removing the sterilized items, the door can be completely opened manually.



Door open, circumferential locking ring in the "ready" position.

Door closed, circumferential locking ring in locking position. The internal steam pressure presses the lip seal between door and chamber.



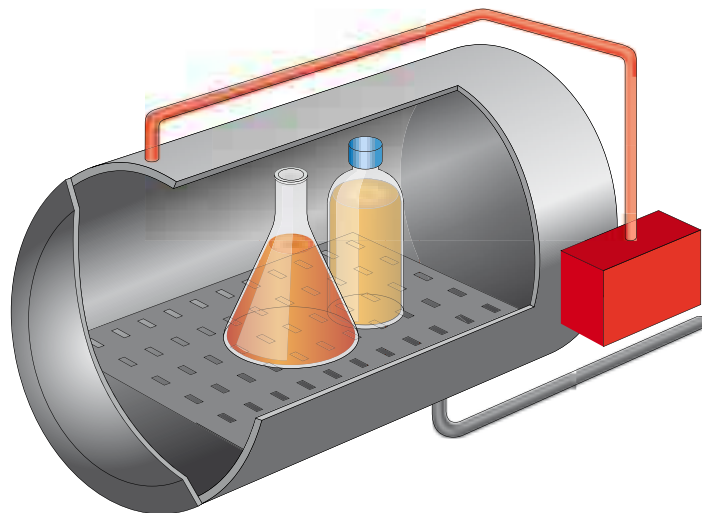
Design – pure innovation.

Steam generation by steam generator

A separate steam generator is incorporated in the housing.

This has numerous advantages:

- No heating elements and no reservoir for dirty water in the chamber.
- In conjunction with the stand-by pre-heating function, only 10 min. heating time to 121 °C with an empty chamber is required.
- Improved air removal by suppressing the air to the bottom with its natural gravitation.
- Accuracy better than ± 0.3 K with empty chamber.
- Quicker cooling as neither the hot water in the chamber nor the separate steam generator need to be cooled.
- After cooling, steam is immediately available for the next sterilization run.



Systemec H-Series

Condensation of steam instead of removal

Exhaust steam is condensed automatically via a PT-100-regulated cooling system. This prevents odors and protects waste water piping that may be made of plastic.

Everything under control.

Operation by Touch-Screen

Operation is even quicker and easier using a 5.7-inch easy-to-read display with touch function. This innovation offers additional possibilities and increased flexibility when working with the autoclave.

For example, process data can be displayed numerically or graphically. 7 programs are pre-defined but can be expanded as required up to 100 by the user.

To initiate a new program, the user is guided through the process by menu dialog. Every new program is automatically allocated a permanent, unalterable name and can also be given an individual designation by the user. All process parameters can be individually altered.

Pre-defined programs

- 1 Solids
- 2 Waste bags
- 3 Liquid waste
- 4 Liquids
- 5 Cleaning
- 6 Vacuum test*
- 7 Bowie-Dick test*

These can be expanded to 100 sterilization programs.

*Only in combination with a vacuum device.



Everything under control.

Alternative documentation

By printer

Optional with integrated printer for documentation of program type, batch number, date / time, temperature / pressure progress and sterilization phase.



By PC and documentation software

Via RS-232 and RS-485 interface directly connected to a PC or an ethernet network. Special software available for Windows for the documentation of all process data, including informative diagrams. The Systemec ADS software processes documented data both graphically and numerically and can be used for parameterization and control of Systemec autoclaves.



By Comlog

Optionally available for all Systec HX models.

This solution adds a USB and an Ethernet port for connection to an ethernet network. Includes documentation software on Comlog that is platform-independent and can be accessed by the user from any PC, laptop, tablet or smart phone. The internal memory card stores up to 10,000 sterilization cycles.

Comlog enables remote access via Internet, for example for Systec service personnel (if approved by customer IT).

By AuditTrail

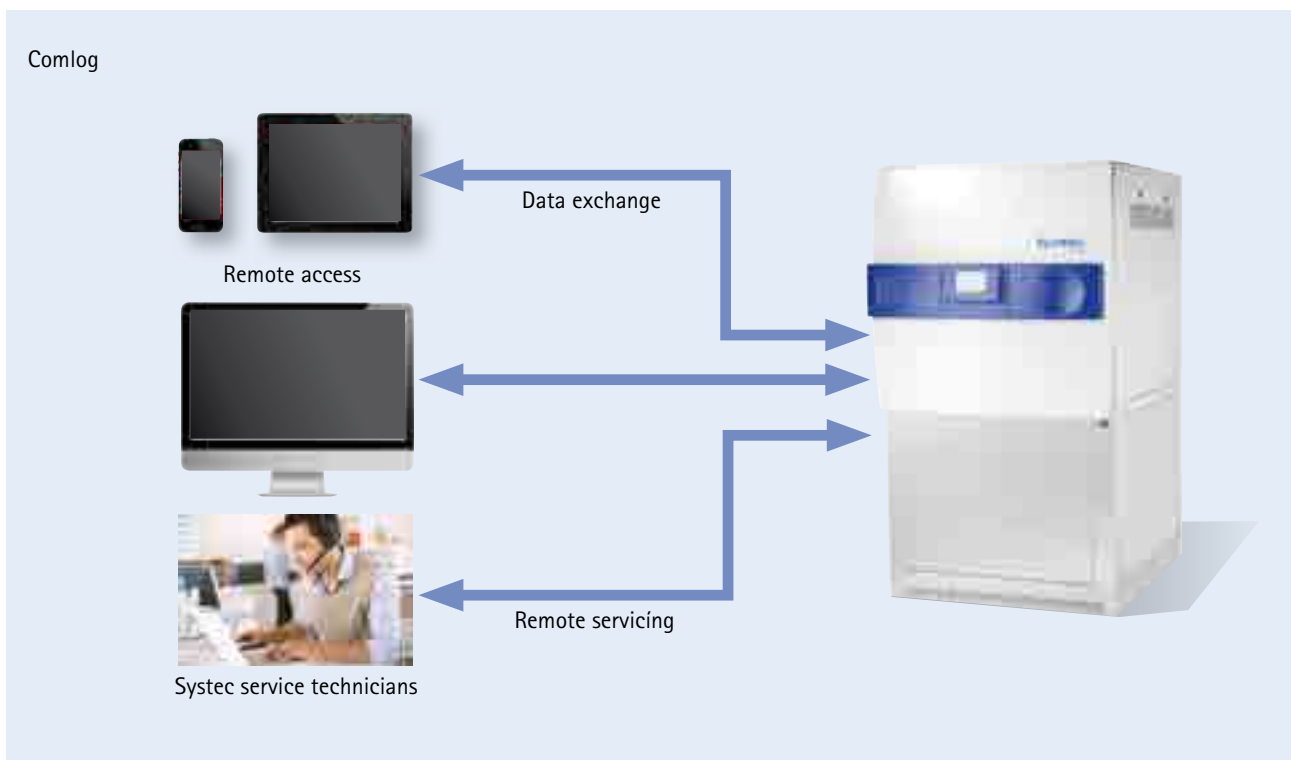
For Systec models HX in combination with optional accessory Comlog.

This solution comprises all the functions of Comlog and enables documentation according to FDA 21 CFR Part 11.

AuditTrail allows to set-up and administer users for the autoclave. 5 different authorization levels are available specifying which actions can be carried out by which users. In addition, access rights for specific sterilization programs can be individually allocated.

Before any specific action, the user must register with user name and password. All actions carried out (e.g. change of parameters or starting/stopping programs) are documented and can be traced to the user, including time stamp (day/time).

All data generated through actions carried out by the user or the documentation of a sterilization cycle is protected from manipulation and is tagged with the electronic signature of the user.



Sterilization of liquids.

Heating up

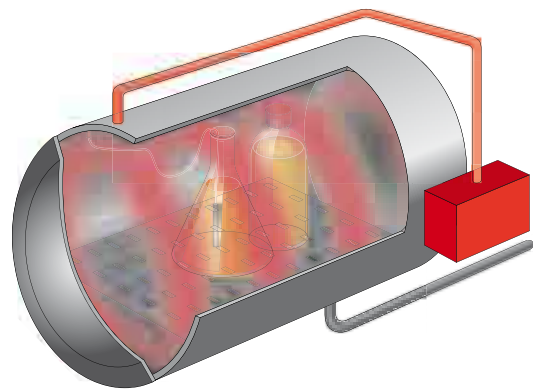
The actual sterilization time of e.g. 15 to 20 minutes at 121 °C is only a fraction of the total time involved for an autoclave procedure. Especially in the case of sterilizing liquids, the heating up and cooling down phases are considerably longer.

The conventional procedure

In previously used conventional systems, even if the intended sterilization temperature has been reached within the autoclave, the liquids to be sterilized are often only at about 100 °C; the temperature equilibrium time between chamber and liquids normally takes much longer.

Up to 50% shorter heat-up times as standard

Due to the combined temperature and pressure regulation, the chamber pressure is increased during the heat-up phase. The result: more rapid temperature equilibrium in the liquids and a shorter heat-up time.



Systec H-Series

Cooling

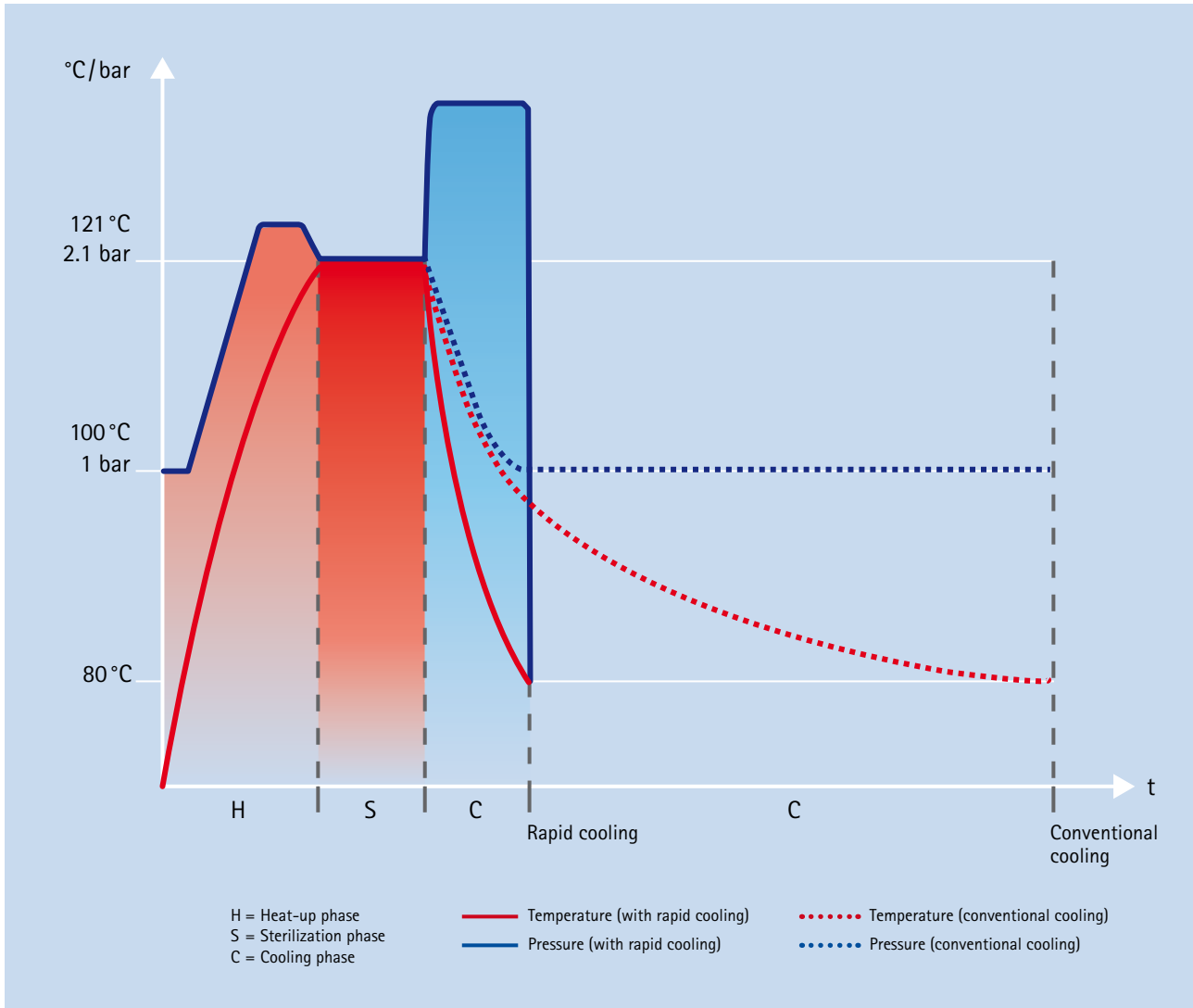
The cooling process for liquids is also very slow; this is because, without active rapid cooling, the heat can only be reduced to below 100°C by dissipating the heat via the chamber insulation by radiation (see diagram: conventional cooling).

New system- and process technology now make it possible to substantially reduce the overall time required for the sterilization process. This means that several hours of time can be saved! It also means that the media is not exposed to heat unnecessarily long time (see diagram: rapid cooling).

Systec offers many functions for its autoclaves guaranteeing safe liquid sterilization processes at higher productivity. Many of these functions are standard or available as options depending on the model range selected.

Standard functions in all models

- Temperature- and pressure-dependent door locking in line with international standards and regulations.
- Redundant process control; temperature and pressure are continuously monitored and controlled during the entire sterilization cycle.
- Rapid heat-up via optimized heat transfer to the liquid media.
- Flexible PT-100 temperature sensor for temperature measurement in a reference vessel:
 - Guarantees attainment of the desired sterilization temperature in the liquid media.
 - Guarantees cooling of the liquid media to a temperature that is safe for removal.



*The times given in the diagrams are dependent on the number and size of the items to be sterilized.

Sterilization of liquids.

Cooling

Systec supplies autoclaves guaranteeing precise sterilization processes, safe handling and increased productivity. Numerous cooling functions are available for liquid sterilization.

Various optional rapid cooling systems enable the cooling times for liquids to be significantly reduced. This conserves culture media and makes for efficient utilization of the autoclave.

In addition to conventional cooling by regulated steam exhaust down to 100 °C and subsequent very slow self-cooling down to 80 °C, optional cooling systems for rapid cooling are available.

- Cooling with ambient air ventilation.
- Mantle cooling with cooling water.
- Mantle cooling with cooling water and support pressure.
- Radial ventilator for air circulation and accelerated heat removal from the chamber.
- Ultracooler.
- Spray cooling with recirculated and re-cooled sterile water and support pressure.

Water cooling with support pressure

Permanently under control

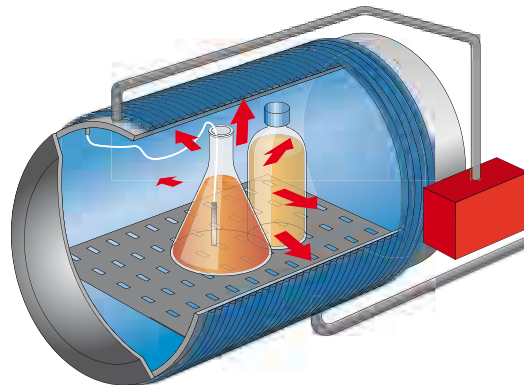
During the entire sterilization process, a flexible PT-100 temperature sensor monitors the water temperature in a reference vessel. It is thus guaranteed that the sterilization period begins only once the sterilization temperature has been attained in the liquid to be sterilized.

The cooling temperature is also constantly monitored. In accordance with relevant standards, to prevent delayed boiling, the lid can only be opened once the temperature of the liquid has been reduced to at least 80 °C.

The use of support pressure in the form of sterile-filtered compressed air during the cooling phase reliably prevents the culture medium from boiling.

Advantages

- No loss of liquid due to boiling of the culture media.
- Improved productivity from reduced cycle times and the full utilization of the filling volume in each bottle.
- Prevention of delayed and over-boiling.
- Prevention of the risk of bottles bursting during or after sterilization.
- Prevention of re-contamination by the use of hermetically sealed bottles during sterilization.
- Reduction of cooling time by up to 60%.

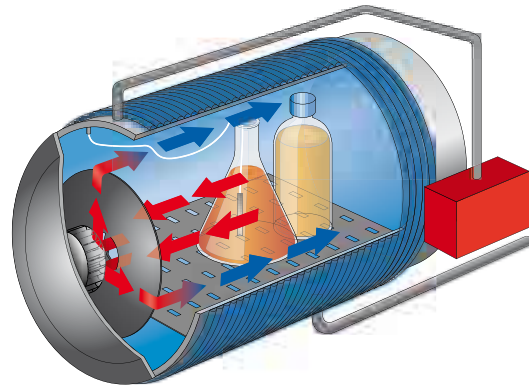


Systec H-Series

Radial Ventilator

Together with water cooling with support pressure, the ventilator ensures accelerated removal of heat from the sterilization items to the cooled chamber mantle. The ventilator is located in the lid of the chamber (no reduction of chamber depth!) and is driven by a magnetic motor fitted outside under the cover.

- Ventilation performance 250 m³/h.
- Reduction of cooling time by up to 70%.



Systec H-Series

Ultracooler

In conjunction with optional water cooling system with support pressure and Radial Ventilator Systec succeeded to reduce again the cooling time and hence the overall sterilization time considerably through integration of an additional heat exchanger.

- Reduction of cooling time by up to 90%.
- Depending on the load, cooling times between 15 and 60 minutes can be achieved.

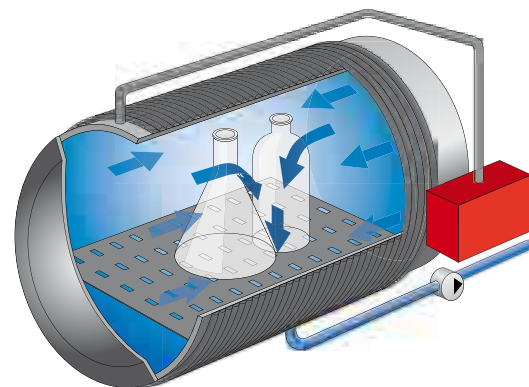


Sterilization of solids and waste in disposal bags.

Vacuum system

Typical solids are e.g. pipette tips (in boxes), empty glassware and waste in bags as well as porous materials such as filters or fabrics. For this type of sterilization, it is important to remove all air from the products to be sterilized to ensure precise, reproducible and validatable sterilization.

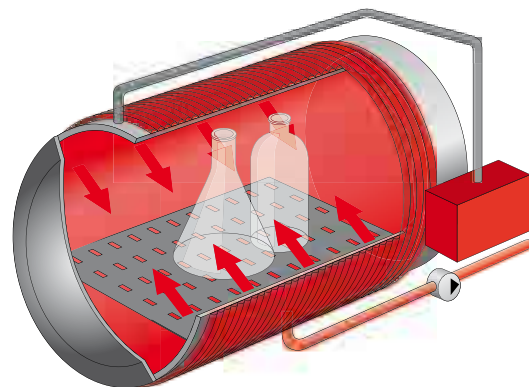
The vacuum device removes the air highly effectively from solids, tubing, porous materials, fabrics and disposal bags; in this way, the steam is able to penetrate completely. The process includes a fractionated pre-vacuum phase in combination with the standard steam generator. Only in this way is it possible to achieve validatable sterilization of porous materials, solids, fabrics or waste in bags.



Systec H-Series

Superdry – for drying solids

This optional accessory increases the drying efficiency for solids and porous materials such as filters and fabrics. Heat energy from the standard steam generator is transferred to the heating coils around the body of the sterilization chamber and is used for drying. Deep-vacuum drying using the optional vacuum device in conjunction with Superdry avoids the necessity for subsequent drying in a separate drying cabinet.



Systec H-Series

Sterilization of hazardous biological substances.

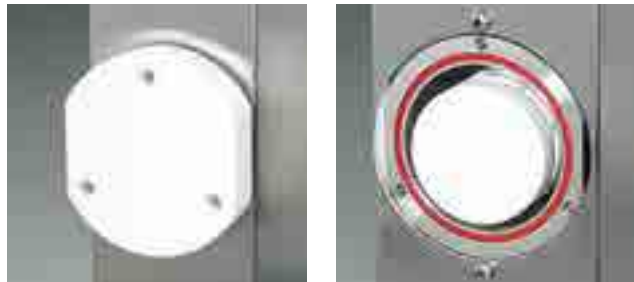
Permanently monitored – exhaust air filtration with condensate inactivation

For the sterilization of hazardous biological substances, Systec autoclaves can be fitted with an optional air exhaust filtration system.

The autoclavable sterile filter comprising a filter cartridge with PTFE membrane, pore size 0.2 µm, incorporated in a pressure-resistant housing, easy replaceable. The filter is automatically sterilized during each sterilization process, monitored by a PT-100 temperature sensor.

The condensate is retained inside the pressure vessel during the heating and sterilization phases and thus also sterilized. Through air exhaust filtration and condensate inactivation, it is ensured that no microorganisms can escape before end of the sterilization phase.

This ensures that all gases and liquids representing a hazard if they were to be released into the atmosphere are filtered or sterilized in-line.



Important note for effective sterilization.

Select the right process for every sterilization application:

As already described, several options are available that are necessary to obtain correct and validatable results and rapid cooling times, especially in the case of liquids. The options available depend on the items to be sterilized. It is thus important for you to think carefully about your requirements so that the autoclave can be optimally configured to the tasks on hand.

A validatable sterilization process of confirmable biological efficiency can only be obtained if the correct instrument configuration is used. The table below provides help in establishing the desired configuration; however, we recommend obtaining additional advice from our experts.

Procedure:	Ventilation				Cooling		Drying		Other Exhaust air filtration
	Gravitation	Simple pre-vacuum	Pulsed excess pressure	Fractionated pre-vacuum	Conventional cooling with slow pressure release	Rapid cooling system with support pressure	Surface drying without vacuum	Drying with subsequent vacuum + Superdry	
Applications:									
Liquids	+	?	-	-	?	+	-	-	
Unpacked non hollow items	+	+	+	+			?	+	
Porous materials (filters, fabrics)	-	?	?	+			-	+	
Hollow items (pipette tips, empty glassware, tubes and hoses)	-	-	-	+			-	+	
Contaminated waste in destruction bags	-	-	?	+			-	-	+

+ Recommended procedure ? Possibly acceptable - Not possible

System accessories for ease of handling.

Systemec H-Serie, H-Serie 2D

Transport and loading trolley

Large autoclaves in particular can be easily and securely loaded using a special loading trolley. The items to be sterilized can either be placed directly on the sliding platform of the trolley or using a basket. The trolley can now be moved and docked to the autoclave and fixed in position. The handle can then be loosened to allow the platform to slide into the autoclave on fixed rails.



Loading shelves

To fully utilize the available space in the chamber, especially when sterilizing small items, the autoclaves can be fitted with loading shelves. The entire shelving system or individual trays can be removed.



Stainless steel quality

All components are made of stainless steel and cleanly welded. The transport trolleys have large rollers, two of them fitted with brakes to ensure smooth running.

Loading baskets and inserts available upon request.



Custom developments for special applications.

Additional features and programs

For example for the food industry for the sterilization of liquids in closed vessels, plastic bottles, bags, cans, blister packs and food packs, e.g.:

- Devices and programs for sterilization in a steam/air mixture.
- Devices and programs for sterilization with hot water spraying and spray-cooling.

Custom constructions for individual tasks

Development and construction of modified systems such as:

- Autoclaves in dual system.
- Autoclaves for waste water sterilization (flow-through principle with integrated stirring and high-performance heating elements).
- Autoclaves for the sterilization of hand-wash water.
- Autoclaves for environmental simulation with programs for up to 99 days of testing, e.g. for:
 - Generation of steam and heat.
 - Generation of pressure and heat.
 - Heating up and cooling down in repetitive mode.

Detailed information on customized design available on request.

Test autoclaves are at your disposal in our test laboratory for the evaluation of your process parameters.

