

Technical Manual

Euroklav[®] 23 VS+ **Euroklav[®] 29 VS+**

Steam sterilizer

from software version 5.20



EN

Read this manual carefully and in the correct order before setting up and commissioning the device. The instructions include important safety information. You also receive a user manual with the device. Please store this manual and the user manual carefully and in close proximity to the device. They represent a component of the product.

CE 0197

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1 General guidelines

Read this manual carefully and in the correct order before setting up and commissioning the device. The instructions include important safety information. You also receive a user manual with the device. Please store this manual and the user manual carefully and in close proximity to the device. They represent a component of the product.

Should the manual no longer be legible, is damaged or has been lost, you can download a new copy from MELAG download centre at www.melag.com.

Symbols used

Symbol	Explanation
	Indicates a dangerous situation, which if not avoided, could entail slight to life-threatening injuries.
	Draws your attention to a situation, which if not avoided, could result in damage to the instruments, the practice fittings or the device.
	Draws your attention to important information.

Formatting rules

Example	Explanation
see Chapter 2	Reference to another text section within this document.
Universal-Program	Words or phrases appearing on the display of the device are marked as display text.

2 Installation requirements

Installation location



WARNING

Failure to comply with the setup conditions can result in injuries and/or damage to the steam sterilizer.

- The steam sterilizer should only be setup, installed and commissioned by persons authorised by MELAG.
- The steam sterilizer is not suitable for operation in explosive atmospheres.
- The steam sterilizer is conceived for use outside the patient area. The device should be located a minimum of 1.5 m radius away from the treatment area.

Property	Euroklav 23 VS+	Euroklav 29 VS+
Installation surface	level and horizontal	
Installation location	interior of a building (dry and protected from dust)	
Floor loading (normal operation)	2.6 kN/m ²	3.2 kN/m ²
Max. floor loading (hydraulic pressure test) ¹⁾	3.2 kN/m ²	3,6 kN/m ²
Max. altitude	2000 m	
Waste heat (with max. load)	0.9 kWh	0.8 kWh
Ambient temperature	5-40 °C (ideal range 16-26 °C)	
Relative humidity	max. 80 % at temperatures of up to 31 °C, max. 50 % at 40 °C (decreasing in linear fashion in-between)	

Steam egress can occur during operation. Do not set up the device in the immediate proximity of a smoke detector. Maintain clearance from materials which could suffer damage from steam.

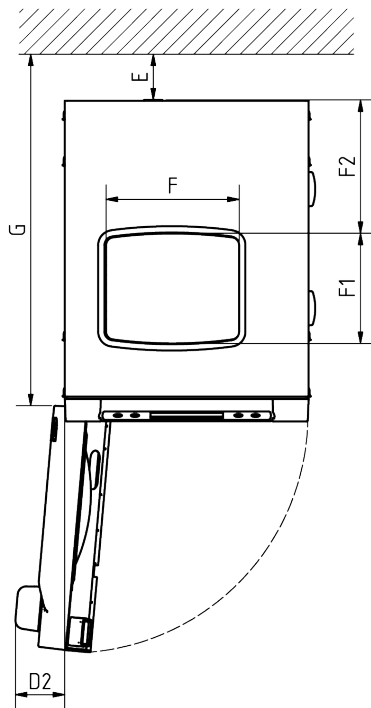
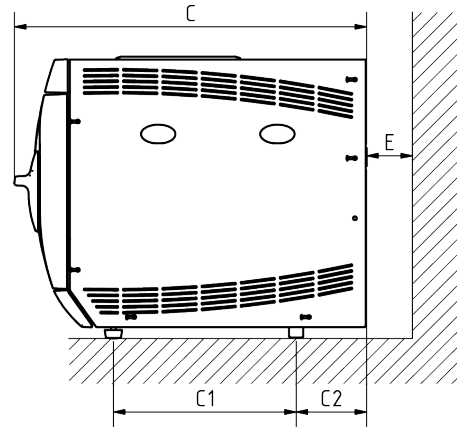
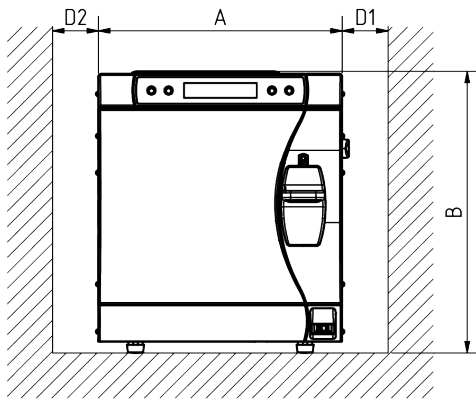
Electromagnetic environments

When assessing the Electromagnetic Compatibility (EMC) of this device, the emitted interference threshold values for Class B devices and the stability for operation in an electromagnetic environment as described in IEC 61326-1 were taken as the basis. The device is thus suitable for operation in all institutions and domestic settings connected to a public mains power supply. The floor should be made of wood or concrete or be tiled with ceramic tiling. If the floor is fitted with synthetic material, the relative humidity must amount to a minimum of 30 %.

¹⁾When using a water treatment unit, take into account its additional weight.

Space requirements

View from the front, the right and above



Dimensions		Euroklav 23 VS+	Euroklav 29 VS+
Width	A	42.5 cm	
Height	B	49 cm	
Depth	C	70 cm	62 cm
Clearance between the device feet	C ₁	43.5 cm	32.5 cm
Clearance from rear device foot up to the rear panel	C ₂	9.5 cm	12.5 cm
Min. clearance to the side	D ₁	5 cm	
Min. clearance to the side of the door hinge	D ₂	10 cm	
Min. clearance to the rear	E	10 cm	
Tank lid (width)	F	23 cm	
Tank lid (depth)	F ₁	19.5 cm	
Tank lid (clearance to the rear)	F ₂	27.5 cm	
Free space when door open fully	G	68 cm	63.5 cm

The space requirements of the steam sterilizer corresponds to its dimensions plus an additional 10 cm to the left and rear and an extra 5 cm to the right. The area above the steam sterilizer should be freely accessible in order to enable easy filling of the storage tank and good ventilation.



PLEASE NOTE

The steam sterilizer is not suitable for installation in a cupboard device.

Additional space requirement for the feed water supply

Additional space is required for a storage container or a water treatment unit. It is also necessary to guarantee free access to the hoses and cables leading from the steam sterilizer to the water treatment unit.

Space requirements	MELAdem 40	MELAdem 47	
		Water treatment unit	Pressure tank
Height	35 cm	46 cm	40 cm
Width	32 cm	40 cm	--
Depth	16 cm	18 cm	--
Diameter	--	--	approx. 28 cm

On-site requirements

Mains supply

Implement the following safety measures when dealing with the cable and power plug:

- ▶ Never damage or alter the power plug or cable.
- ▶ Never bend or twist the power cable.
- ▶ Never remove the plug by pulling on the power cable. Always take a grip on the plug.
- ▶ Never place any heavy objects on the power cable.
- ▶ Never run the power cable over areas in which it could become trapped (e.g. doors or windows).
- ▶ Never lead the cable along a source of heat.
- ▶ Never use any nails, paper fasteners or similar objects to fix the cable.
- ▶ Should the power plug or cable suffer damage, switch off the device. The power cable or plug should only be replaced by authorised technicians.
- ▶ The mains socket must be freely accessible after installation so that the steam sterilizer can be disconnected from the electricity supply at any time.

On-site requirements of the mains connection

Property	On-site requirements	
	Euroklav 23 VS+	Euroklav 29 VS+
Power supply	220-240 V, 50/60 Hz	
Max. voltage range	207-253 V	
Building fuse protection	separate power circuit with 16 A fuse, 30 mA RCD protection (to guarantee continued practice operation during steam sterilizer malfunction)	
Length of the power cable	1.35 m	
Other	additional socket for the MELAprint 42/44 log printer etc.	

Water connection

Requirements for the water connection

	Feed water	Wastewater
Connection in the practice	Manual filling via the internal storage tank. Optional: automatic via a water treatment unit e.g. MELAdem 40/47	Manual emptying via the internal storage tank. Optional: automatically via the one-way outlet with the MELAG upgrade kit for the tank outlet Wall outlet, nominal width DN 40 or to a siphon (flush outflow)
Installation height	--	min. 30 cm under the steam sterilizer
Max. water temperature	35 °C	70 °C
Min. flow pressure	corresponding to the water treatment unit	--
Recommended flow pressure ^{*)}	1.5 bar at 3 l/min	--
Min. water pressure (static) ^{*)}	2 bar	--
Max. water pressure (static) ^{*)}	10 bar	--
Max. water consumption per program cycle ^{**)}	approx. 700 ml (Euroklav 23 VS+) approx. 600 ml (Euroklav 29 VS+)	--
Water quality	distilled or demineralized feed water in accordance with EN 13060, Appendix C (with central demineralization system max. conductivity 5 µS/cm)	--
^{*)} Optional when using a water treatment unit		
^{**)} In the Prion-Program a with porous full load		

For connection of a water treatment unit

	MELAdem 40	MELAdem 47
Water pressure min./ max.	1.5-10 bar	2-6 bar
Measures for protecting the drinking water	We recommend the use of a safety combination consisting of a back-flow preventer and a pipe aerator (e.g. the assembly set in accordance with EN 1717 for MELAdem) in accordance with EN 1717 to protect against backflow into the drinking water supply.	
Leakage water detector	MELAG recommends the installation of a leakage water detector with a cut-off valve (e.g. MELAG water stop).	



PLEASE NOTE

Fit the outlet hose at a constant decline without kinks or sagging. In case of deviations to the installation arrangements, consult with MELAG.

Failure to do so can result in malfunctions of the device.

System and network safety

The device is fitted with multiple external interfaces. Comply with the following information pertaining to the use of these interfaces to ensure safe operation of the device, especially to ensure incorporation in the local network (LAN).

Interfaces and connections



NOTICE

Only connect the hardware to the device which is listed in the following table. Only use the software which has been intended for the purpose and approved by the manufacturer.

Interface	Type	Hardware	Purpose/software
COM port	RS-232	PC	MELAview saving log data and querying device data
			MELAtrace saving log data
		Modem	Data transfer via points of presence
		MELAnet Box	Provides a LAN (Ethernet) interface for the device, see below (Ethernet)
			MELAview/MELAtrace Saving log data
			FTP server saving log data
		MELAprint 42/44	Log printing
MELAflash CF card printer	Writing log data on a MELAflash CF card		



NOTICE

When performing a device software update, use only the update data authorized by MELAG for the corresponding device type.

Operating the device with memory media

To prevent data loss, only use memory media to save the log data with the following characteristics:

- Functional capability (without malware etc.)
- Writeable
- Formatted with a correct file system

Perform regular data backup. Restrict access to the device and systems with access authorization to the necessary circle of persons.

Only use MELAflash CF cards.

Operating the device in the local network (LAN)



NOTICE

Do not connect the device to a public network (e.g. the internet).

An Ethernet/IP-based network connection (LAN) is required to operate the device in a local network. In its delivery state, the MELAnet Box IP address is 192.168.40.100.



NOTICE

Check the IP address carefully during the conversion for a manual configuration before connecting the device to the LAN.

An incorrectly-entered IP address can cause IP conflicts in the network and thus disturb another device in your network.

In the LAN with a firewall, only permit connections to and from the device which correspond to the intended use of the device. All ports not used are blocked on the device side.

The device is able to make the following connections as standard via MELAnet Box:

Log	Source port	Destination port	Direction	Aims
TCP	≥ 1025	21	Outgoing	FTP control
TCP	any	≥ 1025	Listening / incoming	FTP (active) data transfer (MELAnet Box set to FTP logging)
TCP	any	80	Listening / incoming	Data transfer to the web browser
TCP	any	65001	Listening / incoming	Data transfer of log data (MELAnet Box set to TCP logging)

Network bandwidth / Quality of Service (QoS)

The device does not place any requirements on the LAN bandwidth for data transfer, that exceed the standard time-out times of the respective logs.

Process	Volume max.	Volume normal
Transfer status, program, standby log	2 kB	1.9 kB
Graphic log	110 kB	110 kB

3 Setup and installation



WARNING

Improper installation may lead to a short-circuit, fire, water damage or electrical shock.

This could result in serious injury.

- Only have the device set up, installed and commissioned by people authorised by MELAG.
-

Removing from the packaging



CAUTION

Danger of injury from incorrect carrying.

Lifting and carrying too heavy a load can result in spinal injury. Failure to comply with these provisions can result in crushing.

- The device should always be carried by two people.
 - Use the correct carrying straps to carry the device.
-

1. Remove the steam sterilizer from the box using the carrying straps.
2. Unscrew the four screws from each side of the unit cover to remove the straps.
3. Then re-screw these screws without the flat washers.
4. Store the carrying straps and washers in a safe place.
5. Open the door and remove the trays and accessories immediately after switching on the device.

Aligning the door seal sealing lips

Long periods of storage with the door closed can result in the sealing lips of the door seal becoming stuck. Align the sealing lips to prevent leaks.

Proceed as follows:

1. Remove the door seal.



2. Press your thumb between the two sealing lips and separate the sealing lips once around with your thumb.

**PLEASE NOTE**

Note the differences in the widths of the sealing surfaces when inserting the door seal. The door can only be shut correctly and the sterilization chamber sealed, if the door seal sits correctly in the groove.

3. Insert the door seal into the groove.



- ↪ The wide sealing surface points towards the chamber.

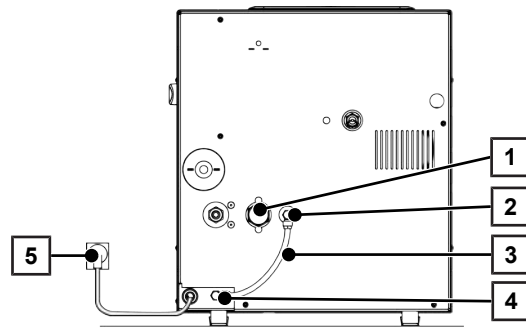
Installation examples

On the following pages, you will find examples of the recommended installation types for the feed water supply. The connection of a different water treatment unit with the same water quality is possible after consultation with MELAG.

Example 1 - Standard delivery state

Direct feed water inflow from the internal storage tank. The wastewater will be collected in the wastewater side of the storage tank. No water connection required.

The steam sterilizer is supplied with feed water directly from the internal storage tank via a hose bridge. A float switch integrated in the device notifies the absence of feed water. Programs can only be started after feed water has been filled. The used feed water (wastewater) is collected in the wastewater side of the internal storage tank and is to be emptied manually at a later point. In the wastewater side, a float switch monitors the current water level.

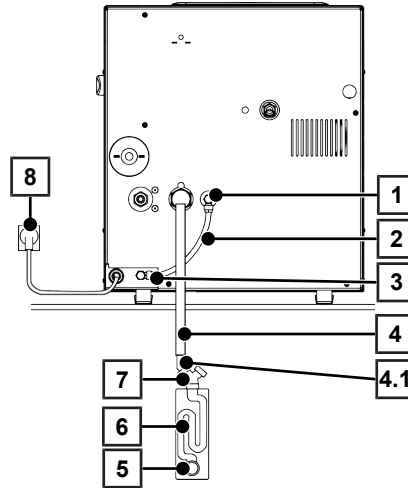


Position	Description	Art. no.
1	One-way drain connection ^{*)} with: Yellow plastic cap 3/4" and Rubber seal 3/4" for external water supply	-- ME58140 ME56950
2	Feed water connection of Euroklav/Vacuklav ^{*)}	ME25655
3	Hose PTFE 6/4 mm (5 m) ^{*)}	ME39310
4	Feed water connection of Euroklav/Vacuklav ^{*)}	ME25655
5	Mains connection ^{**)}	--
^{*)} present on the device side ^{**)} present on the building side		

Example 2 - one-way drain via siphon

Direct feed water inflow from the internal storage tank.

The steam sterilizer is supplied with feed water directly from the internal storage tank via a hose bridge. A float switch integrated in the device notifies the absence of feed water. Programs can only be started after feed water has been filled. The used feed water (wastewater) is discharged via the water outlet hose.



Position	Description	Art. no.	Contained in
1	Feed water connection of Euroklav/Vacuklav ^{*)}	ME25655	--
2	Hose PTFE 6/4 mm (5 m) ^{*)}	ME39310	--
3	Feed water connection of Euroklav/Vacuklav ^{*)}	ME25655	--
4	Water outflow hose for steam sterilizer, 2 m	ME36585	--
4.1	Wastewater nozzle for siphon with seal and clamp	ME52615	ME36585
5	Wall drain NW40 ^{**)}	--	--
6	Surface-mounted siphon (optional)	ME37410	--
7	Double support sleeve for an existing trap	ME37400	--
8	Mains connection ^{**)}	--	--

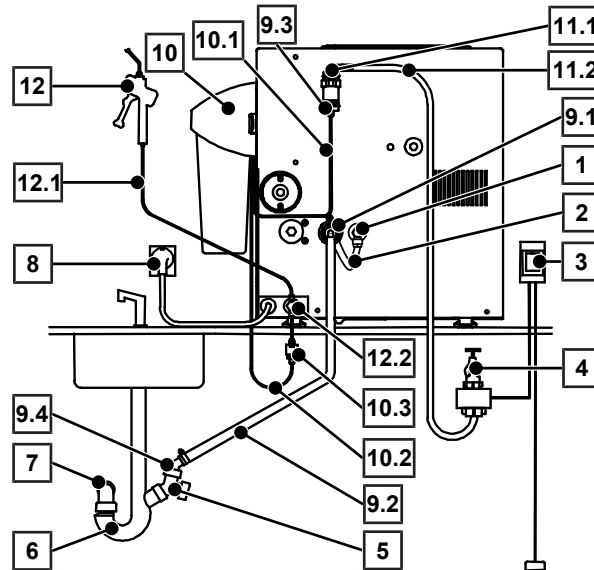
^{*)} present on the device side

^{**)} present on the building side

Example 3 - MELAdem 40

Feed water inflow from the MELAdem 40 ion exchanger.

Connection of the MELAdem 40 ion exchanger with MELAjet. The MELAdem 40 can be connected directly to the steam sterilizer feed water inflow; this generates demineralized water from normal tap water.



Position	Description	Art. no.	Contained in
1	Feed water connection of Euroklav/Vacuklav ^{*)}	ME25655	--
2	Hose PTFE 6/4 mm (5 m) ^{*)}	ME39310	--
3	Water stop (leakage water detector with cut-off valve and sensor, optional)	ME01056	--
4	Water tap with safety combination ^{**)}	--	--
5	Double support sleeve for an existing trap	ME37400	--
6	Double-chamber siphon (optional)	ME26635	--
7	Wall drain NW40 ^{**)}	--	--
8	Mains connection ^{**)}	--	--
9	Water connection set Euroklav	ME09031	--
9.1	Water branch	ME37241	ME09031
9.2	Hose for water drain of steam sterilizers, 2 m	ME36585	ME09031
9.3	Cold water adapter 3/4" to 1/4" (direct connection water hose)	ME09037	ME09031
9.4	Wastewater nozzle for siphon with seal and clamp	ME52615	ME09031/ ME36585
10	MELAdem 40	ME01049	--
10.1	MELAdem 40 feed water hose	ME28820	ME01049
10.2	Inlet hose feed water	ME28820	ME01049
10.3	Filter for MELAdem	ME48240	ME01049
11	Installation set according to EN 1717 (optional)	ME49600	--
11.1	Safety combination EN 1717 incl. holder	ME82375	ME49600
11.2	Tap water supply hose EN 1717, 2.5 m	ME24930	ME49600
12	MELAjet	ME27300	--
12.1	Hose MELAjet	ME28820	ME27300
12.2	Swivel screw connection MELAjet	ME53465	ME27300

^{*)} present on the device side

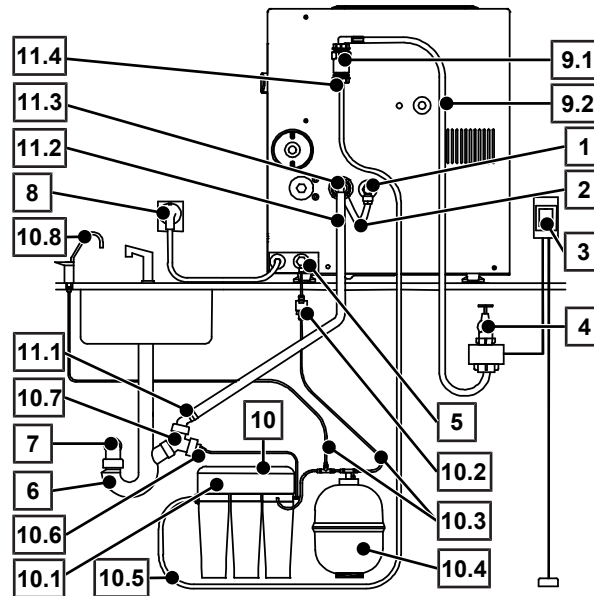
^{**)} present on the building side

Example 4 - MELAdem 47

Feed water inflow from the MELAdem 47 reverse osmosis device.

Connection of the MELAdem 47 reverse osmosis device which can be connected directly to the steam sterilizer feed water inflow. The connection of a different water treatment device with the same water quality is possible after consultation with MELAG.

The used feed water (wastewater) is discharged into the double chamber siphon via the water outlet hose.



Position	Description	Art. no.	Contained in
1	Feed water connection of Euroklav/Vacuklav ^{*)}	ME25655	--
2	Hose PTFE 6/4 mm (5 m) ^{*)}	ME39310	--
3	Water stop (leakage water detector with cut-off valve and sensor, optional)	ME01056	--
4	Water tap with safety combination ^{**)}	--	--
5	Feed water connection of Euroklav/Vacuklav ^{*)}	ME25655	--
6	Double-chamber siphon (optional)	ME26635	--
7	Wall drain NW40 ^{**)}	--	--
8	Mains connection ^{**)}	--	--
9	Installation set according to EN 1717 (optional)	ME49600	--
9.1	Safety combination EN 1717 incl. holder	ME82375	ME49600
9.2	Tap water supply hose EN 1717, 2.5 m	ME24930	ME49600
10	MELAdem 47	ME01047	--
10.1	MELAdem 47 reverse osmosis unit (without accessories)	ME56740	ME01047
10.2	Filter for MELAdem	ME48240	ME01047/ ME01046
10.3	Inlet hose feed water	ME28820	ME01047
10.4	Pressure tank MELAdem 47 (with shut-off valve and hose)	ME57065	ME01047
10.5	Water inflow hose (2.5 m)	ME37220	ME01047
10.6	Wastewater adapter (G1/4" internal thread)	ME56930	ME01047/ ME01046
10.7	Double support sleeve for an existing trap	ME37400	ME01047/ ME01046
10.8	External tap for demineralised water	ME91900	ME01047
11	Water connection set Euroklav	ME09031	--
11.1	Wastewater nozzle for siphon with seal and clamp	ME52615	ME09031/ ME36585

Position	Description	Art. no.	Contained in
11.2	Hose for water drain of steam sterilizers, 2 m	ME36585	ME09031
11.3	Water branch	ME37241	ME09031
11.4	Cold water adapter 3/4" to 1/4" (direct connection water hose)	ME09037	ME09031
*) present on the device side			
**) present on the building side			

Aligning the steam sterilizer

To enable fault-free operation, the steam sterilizer must be setup level using a spirit level placed on the chamber flange. Then extend the fore device feet by five (Euroklav 23 VS+) or three (Euroklav 29 VS+) revolutions to effect a slight rearwards slope of the steam sterilizer.

Test runs

Vacuum test with a cold sterilization chamber

Perform a vacuum test with an empty, cold sterilization chamber and record the outcome in accordance with record of installation and setup.

Universal-Program

If the vacuum test was successful, perform a Universal-Program with 1.5 kg load (instruments) and record the outcome in accordance with record of installation and setup.

Instructing the users

Explain all the user-typical features for the documentation and setting combinations for the operator.

Hand over the manufacturer's inspection report. The declaration of conformity regarding the pressure equipment directive and the Medical Devices Directive is included in the manufacturer's inspection report.

4 Settings and adjustment

Settings on the device

Date and time

Check the date and time and set if necessary. Consult the user manual.

Feed water inflow

The feed water supply is effected either via the internal storage tank or via a separate water treatment unit (e.g. MELAdem 40 / MELAdem 47). Setup the feed water inflow depending on the installation version to **INTERNAL** or **EXTERNAL**.

Further information is provided in the device user manual.

Additional program options

The **Autom. preheating** function heats the steam sterilizer chamber to a preheating temperature of the respective program before program start, or holds this temperature between two program runs. This will shorten the cycle times. It also reduces condensate formation on the chamber wall.

The **Additional drying** function increases the program by 50 % for difficult drying tasks.

Further information is provided in the device user manual.

Counter stands

Working in the **SETUP** menu, you can access counter stands and other technical data of the steam sterilizer.

5 Technical tables

Feed water quality

Minimum requirements placed on the feed water quality based on EN 13060, Appendix C

Substance / property	Feed water
Evaporation residue	≤ 10 mg/l
Silicon oxide, SiO ₂	≤ 1 mg/l
Iron	≤ 0.2 mg/l
Cadmium	≤ 0.005 mg/l
Lead	≤ 0.05 mg/l
Heavy metal traces apart from iron, cadmium, lead	≤ 0.1 mg/l
Chloride	≤ 2 mg/l
Phosphate	≤ 0.5 mg/l
pH Value	5 to 7.5
Appearance	≤ colourless, clear, without sediments
Hardness	≤ 0.02 mmol/l

Nominal value tolerances

Step	Universal-Program		Quick Pro- gr. S		Prion-Pro- gram		Gentle-Pro- gram		All values in mbar
	P	T	P	T	P	T	P	T	
Pre-vacuum	250	+50/-20	500	◀	◀	◀	◀	◀	Evacuation
	2000	-50/-30	◀	◀	◀	◀	◀	◀	Steam intake
1. Fractionation	1200	+30/-50	◀	◀	◀	◀	◀	◀	Evacuation
	2000	+50/-30	◀	◀	◀	◀	◀	◀	Steam intake
2. Fractionation	1200	+30/-50	◀	◀	◀	◀	◀	◀	Evacuation
	2000	+50/-30	◀	◀	◀	◀	◀	◀	Steam intake
3. Fractionation	1200	+30/-50	◀	◀	◀	◀	◀	◀	Evacuation
	2000	+50/-30	◀	◀	◀	◀	◀	◀	Steam intake
4. Fractionation	1200	+30/-50	◀ ^{*)} -- ^{**)}	◀ ^{*)} -- ^{**)}	◀	◀	◀	◀	Evacuation
	2000	+50/-30	◀ ^{*)} -- ^{**)}	◀ ^{*)} -- ^{**)}	◀	◀	◀	◀	Steam intake
5. Fractionation	1200	+30/-50	--	--	◀	◀	◀	◀	Evacuation
	2000	+50/-30	--	--	◀	◀	◀	◀	Steam intake
	3050	+70/-30	◀	◀	◀	◀	2060	◀	Pressure increase
	3050	+70/-30	◀	◀	◀	◀	2060	◀	Sterilization entry
	3170	+90/-90	◀	◀	◀	◀	2142 ^{*)} / 2149 ^{**)}	◀	Sterilization
	1500	+30/-50	◀	◀	◀	◀	◀	◀	Pressure release

^{*)} Euroklav 23 VS+

^{**)} Euroklav 29 VS+

Key:

P = Pressure

T = Tolerance

◀ As in Universal-Program

Pressure-time chart

Universal-Program

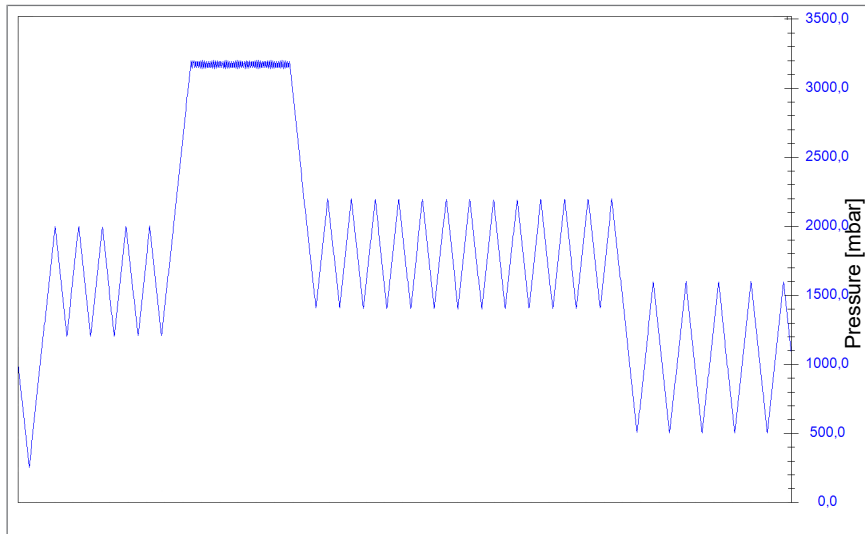


Fig. 1: Pressure-time chart for the Universal-Program, 134 °C and 2.1 bar

Quick-Program S

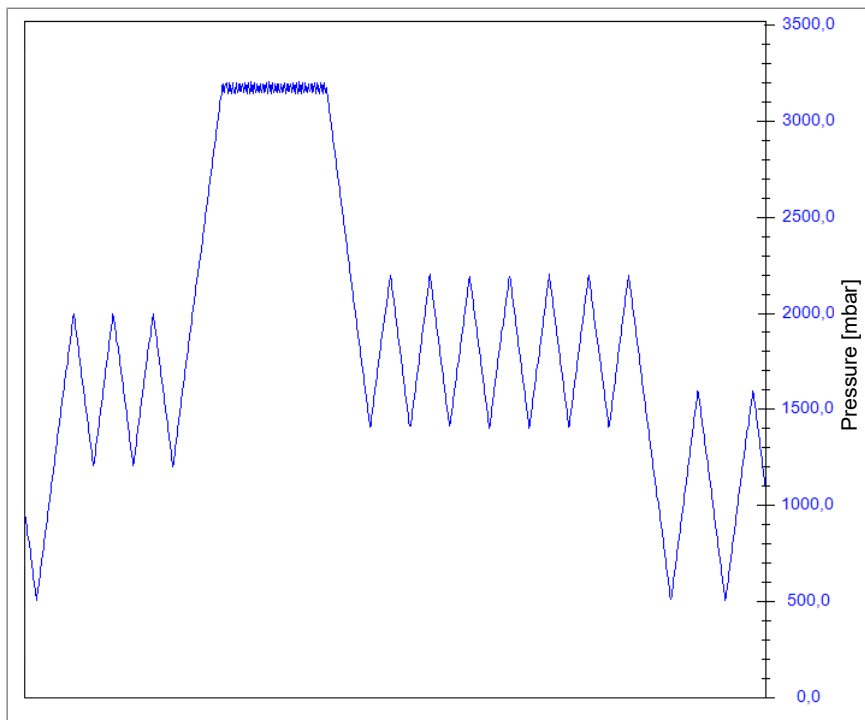


Fig. 2: Pressure-time chart for the Quick-Program S, 134 °C and 2.1 bar

Euroklav 23 VS+: Program contains an additional fractionation

Gentle-Program

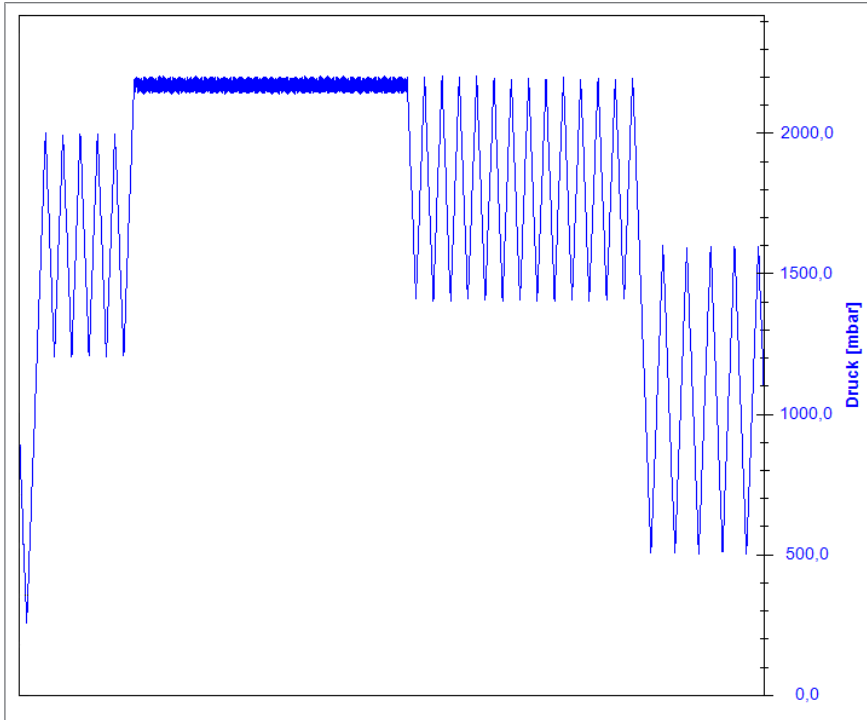


Fig. 3: Pressure-time chart for the Gentle-Program, 121 °C and 1.1 bar

Prion-Program

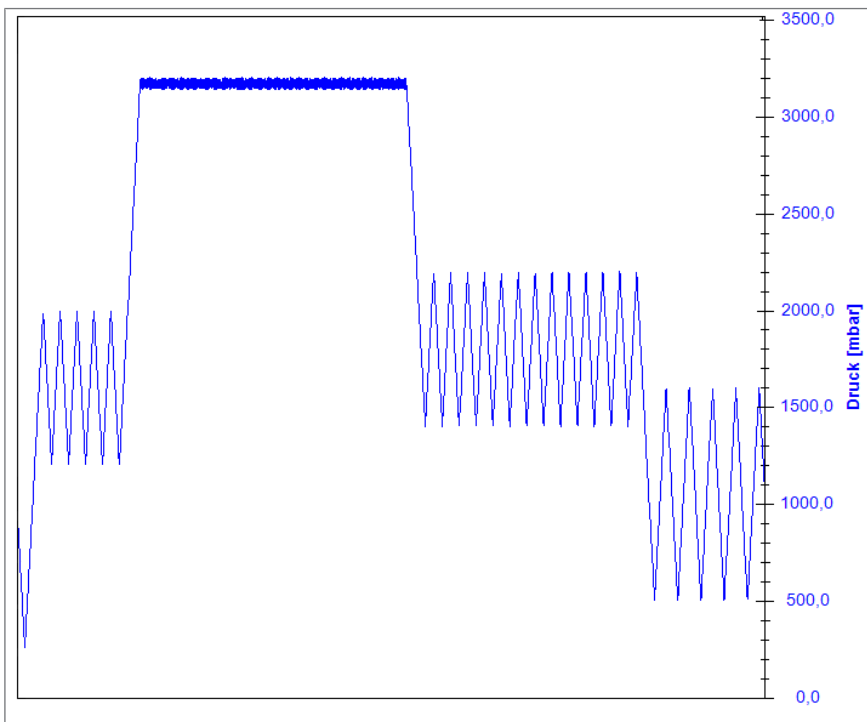
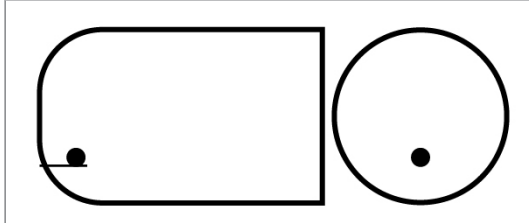


Fig. 4: Pressure-time chart for the Prion-Program, 134 °C and 2.1 bar

Empty chamber test

The coldest point in the sterilization chamber during the empty chamber test lies directly on the temperature sensor (see circular marking in the following figure). The temperature in the rest of the sterilization chamber is almost the same all over.

Schematic side and fore view of the sterilization chamber



Certificate of Suitability

According to the recommendations of the Commission for Hospital Hygiene and Infection Prevention at the Robert Koch Institute

Manufacturer:	MELAG Medizintechnik GmbH & Co. KG
Address:	Geneststraße 6-10 10829 Berlin
Country:	Germany
Product:	Euroklav® 23 VS+ / Euroklav® 29 VS+
Type of device:	Steam sterilizer
Classification:	Class IIb
Device type acc. to EN 13060:	Type S

We declare that the product specified above is suitable for the steam sterilization of

- **solid instruments (wrapped and unwrapped)**
- **porous goods (wrapped and unwrapped)**
- **simple hollow bodies (wrapped and unwrapped)**

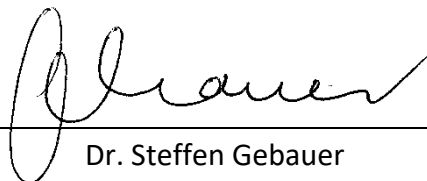
References to loading quantities and loading variations are outlined in the user manual and must be observed.

Be sure to observe the manufacturer's instructions for medical devices intended for sterilization according to EN ISO 17664.

We declare that the following test system is suited for testing the product specified above:

- **Type 5 Indicator according to EN ISO 11140-1**

Berlin, 01.07.2021



Dr. Steffen Gebauer

(Management)

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Original instructions

Responsible for content: MELAG Medizintechnik GmbH & Co. KG
We reserve the right to technical alterations

Your stockist
