

Laboklav

**Dampfsterilisatoren
Steam sterilizers**



Typen 55 bis 195 Liter

Technical Datasheet

Ausgabe 01/2020

SHP Steriltechnik AG

Schloss Detzel 1
D-39345 Detzel Schloss / Satuelle

Tel: +49 (0) 39058 97 62- 0
Fax: +49 (0) 39058 97 62- 22
E-Mail: info@shp-steriltechnik.de
Internet: www.shp-steriltechnik.de

Content**Page**

I. Technical Data Laboklav 55 - 195.....	4
II. Product characteristics Laboklav 55 – 195.....	10
III. Ambient conditions for Laboklav 55 – 195	11
IV. Consumption data Laboklav 55 – 195	11
V. Media supply Laboklav 55 – 195	12
VI. Definition of feed water quality Laboklav 55 – 195 (gem. EN 285, Appendix B)	12
VII. Installation dimensions.....	13
VIII. Connections	14

I. Technical Data Laboklav 55 - 195

Laboklav 55

Overall dimension (free standing unit) (W x H x D)....	740 x 765 x 600 mm
Footprint (Bench top unit) (W x D).....	740 x 670 mm
Weight (netto).....	ca. 125 kg
Volume Feed Water tank.....	ca. 16 l
Maximum Load:	
- Instruments	20 kg
- Textiles	10 kg
- Liquids.....	15 Liter Total volume
Sterilizer chamber:	
Total volume	ca. 62 l
Chamber dimension (ϕ x D).....	ϕ 410 x 460 (+50-round.) mm
Usable Volume.....	ca. 60 l
Maximum allowable pressure (PS).....	2.8 bar
Maximum allowable temperature (TS).....	138°C
Working pressure safety valve.....	2.8 bar
Material of chamber and double jacket.....	1.4404 (SS 316 L)
Surface roughness	$\leq 0,8 \mu\text{m}$
Pressure Device Directive 2014/68/EU.....	CE0036, Kat. II, Modul B+C2
Power supply:	
Voltage	3N 400V~ ($\pm 5\%$), 50 Hz, 16A
Power cord.....	CEE-plug 16 A
Working power	4,5 kW
Averaged power consumption per cycle.....	5 kWh
Protection class	I
Protection.....	IP24
Electromagnetic compatibility	DIN EN 61326
Water supply:	
Destilled or demineralized Water (acc. to annex C EN 13060)	
Averaged feed water consumption per cycle..... (depending on initial state, program and load)	ca. 3,5 l - 8 l
Storing conditions:	
Temperature.....	5 ÷ 40°C
Humidity	max. 85%
Heat emission to the environment.....	ca. 12% of rated capacity
Programs:	
10 predefined programs in user level 1:	
The program definition depends on the available options included in the model. The programs can be individually changed.	
10 further programs in user level 2 (program P11 - P20) code protected, Predefinition is like P1.	
2 test programs (Bowie & Dick-Test, P11, vacuum test, P12) - in vacuum versions only	
Computer interface:	
- serial interface RS 485	
Printer (optional)	

Laboklav 80

Overall dimension (free standing unit) (W x H x D)....	740 x 915 x 600 mm
Footprint (Bench top unit) (W x D).....	740 x 820 mm
Weight (netto).....	ca. 165 kg
Volume Feed Water tank.....	ca. 30 l
Maximum Load:	
- Instruments	30 kg
- Textiles	10 kg
- Liquids.....	21 Liter Total volume
Sterilizer chamber:	
Total volume	ca. 82 l
Chamber dimension (ϕ x D).....	ϕ 410 x 610 (+50-round.) mm
Usable Volume.....	ca. 80 l
Maximum allowable pressure (PS).....	2.8 bar
Maximum allowable temperature (TS).....	138°C
Working pressure safety valve.....	2.8 bar
Material of chamber and double jacket.....	1.4404 (SS 316 L)
Surface roughness	$\leq 0,8 \mu\text{m}$
Pressure Device Directive 2014/68/EU.....	CE0036, Kat. II, Modul B+C2
Power supply:	
Voltage	3N 400V~ ($\pm 5\%$), 50 Hz, 16A
Power cord.....	CEE-plug 16 A
Working power	4,5 kW
Averaged power consumption per cycle.....	5 kWh
Protection class	I
Protection.....	IP24
Electromagnetic compatibility	DIN EN 61326
Water supply:	
Destilled or demineralized Water (acc. to annex C EN 13060)	
Averaged feed water consumption per cycle..... (depending on initial state, program and load)	ca. 3,5 l - 10 l
Storing conditions:	
Temperature.....	5 ÷ 40°C
Humidity	max. 85%
Heat emission to the environment.....	ca. 12% of rated capacity
Programs:	
10 predefined programs in user level 1:	
The program definition depends on the available options included in the model. The programs can be individually changed.	
10 further programs in user level 2 (program P11 - P20) code protected, Predefinition is like P1.	
2 test programs (Bowie & Dick-Test, P11, vacuum test, P12) - in vacuum versions only	
Computer interface:	
- serial interface RS 485	
Printer (optional)	

Laboklav 100

Overall dimension (free standing unit) (W x H x D)....	740 x 1065 x 600 mm
Footprint (Bench top unit) (W x D).....	740 x 970 mm
Weight (netto).....	ca. 195 kg
Volume Feed Water tank.....	ca. 30 l
Maximum Load:	
- Instruments	40 kg
- Textiles	25 kg
- Liquids.....	30 Liter Total volume
Sterilizer chamber:	
Total volume	ca. 102 l
Chamber dimension (ϕ x D).....	ϕ 410 x 760 (+50-round.) mm
Usable Volume.....	ca. 100 l
Maximum allowable pressure (PS).....	2.8 bar
Maximum allowable temperature (TS).....	138°C
Working pressure safety valve.....	2.8 bar
Material of chamber and double jacket.....	1.4404 (SS 316 L)
Surface roughness	$\leq 0,8 \mu\text{m}$
Pressure Device Directive 2014/68/EU.....	CE0036, Kat. II, Modul B+C2
Power supply:	
Voltage	3N 400V~ ($\pm 5\%$), 50 Hz, 16A
Power cord.....	CEE-plug 16 A
Working power	6,5 kW
Averaged power consumption per cycle.....	6,5 kWh
Protection class	I
Protection.....	IP24
Electromagnetic compatibility	DIN EN 61326
Water supply:	
Destilled or demineralized Water (acc. to annex C EN 13060)	
Averaged feed water consumption per cycle..... (depending on initial state, program and load)	ca. 4,5 l - 12 l
Storing conditions:	
Temperature.....	5 ÷ 40°C
Humidity	max. 85%
Heat emission to the environment.....	ca. 12% of rated capacity
Programs:	
10 predefined programs in user level 1:	
The program definition depends on the available options included in the model. The programs can be individually changed.	
10 further programs in user level 2 (program P11 - P20) code protected, Predefinition is like P1.	
2 test programs (Bowie & Dick-Test, P11, vacuum test, P12) - in vacuum versions only	
Computer interface:	
- serial interface RS 485	
Printer (optional)	

Laboklav 135

Overall dimension (free standing unit) (W x H x D)....	840 x 965 x 700 mm
Footprint (Bench top unit) (W x D).....	840 x 870 mm
Weight (netto).....	ca. 205 kg
Volume Feed Water tank.....	ca. 40 l
Maximum Load:	
- Instruments	40 kg
- Textiles	25 kg
- Liquids.....	30 Liter Total volume
Sterilizer chamber:	
Total volume	ca. 135 l
Chamber dimension (ϕ x D).....	ϕ 500 x 660 (+50-round.) mm
Usable Volume.....	ca. 130 l
Maximum allowable pressure (PS).....	2.8 bar
Maximum allowable temperature (TS).....	138°C
Working pressure safety valve.....	2.8 bar
Material of chamber and double jacket.....	1.4404 (SS 316 L)
Surface roughness	$\leq 0,8 \mu\text{m}$
Pressure Device Directive 2014/68/EU.....	CE0036, Kat. II, Modul B+C2
Power supply:	
Voltage	3N 400V~ ($\pm 5\%$), 50 Hz, 16A
Power cord.....	CEE-plug 16 A
Working power	10 kW
Averaged power consumption per cycle.....	15 kWh
Protection class	I
Protection.....	IP24
Electromagnetic compatibility	DIN EN 61326
Water supply:	
Distilled or demineralized Water (acc. to annex C EN 13060)	
Averaged feed water consumption per cycle..... (depending on initial state, program and load)	ca. 5,5 l - 15 l
Storing conditions:	
Temperature.....	5 ÷ 40°C
Humidity	max. 85%
Heat emission to the environment.....	ca. 12% of rated capacity
Programs:	
10 predefined programs in user level 1:	
The program definition depends on the available options included in the model. The programs can be individually changed.	
10 further programs in user level 2 (program P11 - P20) code protected, Predefinition is like P1.	
2 test programs (Bowie & Dick-Test, P11, vacuum test, P12) - in vacuum versions only	
Computer interface:	
- serial interface RS 485	
Printer (optional)	

Laboklav 160

Overall dimension (free standing unit) (W x H x D)....	840 x 1065 x 700 mm
Footprint (Bench top unit) (W x D).....	840 x 975 mm
Weight (netto).....	ca. 220 kg
Volume Feed Water tank.....	ca. 40 l
Maximum Load:	
- Instruments	40 kg
- Textiles	25 kg
- Liquids.....	45 Liter Total volume
Sterilizer chamber:	
Total volume	ca. 165 l
Chamber dimension (ϕ x D).....	ϕ 500 x 760 (+50-round.) mm
Usable Volume.....	ca. 163 l
Maximum allowable pressure (PS).....	2.8 bar
Maximum allowable temperature (TS).....	138°C
Working pressure safety valve.....	2.8 bar
Material of chamber and double jacket.....	1.4404 (SS 316 L)
Surface roughness	$\leq 0,8 \mu\text{m}$
Pressure Device Directive 2014/68/EU.....	CE0036, Kat. II, Modul B+C2
Power supply:	
Voltage	3N 400V~ ($\pm 5\%$), 50 Hz, 16A
Power cord.....	CEE-plug 16 A
Working power	10 kW
Averaged power consumption per cycle.....	17 kWh
Protection class	I
Protection.....	IP24
Electromagnetic compatibility	DIN EN 61326
Water supply:	
Destilled or demineralized Water	
(acc. to annex C EN 13060)	
Averaged feed water consumption per cycle.....	ca. 5,5 l - 17 l
(depending on initial state, program and load)	
Storing conditions:	
Temperature.....	5 ÷ 40°C
Humidity	max. 85%
Heat emission to the environment.....	ca. 12% of rated capacity
Programs:	
10 predefined programs in user level 1:	
The program definition depends on the available options included in the model. The programs can be individually changed.	
10 further programs in user level 2 (program P11 - P20) code protected, Predefinition is like P1.	
2 test programs (Bowie & Dick-Test, P11, vacuum test, P12) - in vacuum versions only	
Computer interface:	
- serial interface RS 485	
Printer (optional)	

Laboklav 195

Overall dimension (free standing unit) (W x H x D)....	840 x 1215 x 700 mm
Footprint (Bench top unit) (W x D).....	840 x 1085 mm
Weight (netto).....	ca. 255 kg
Volume Feed Water tank.....	ca. 40 l
Maximum Load:	
- Instruments	40 kg
- Textiles	25 kg
- Liquids.....	45 Liter Total volume
Sterilizer chamber:	
Total volume	ca. 195 l
Chamber dimension (ϕ x D).....	ϕ 500 x 990 (+50-round.) mm
Usable Volume.....	ca. 182 l
Maximum allowable pressure (PS).....	2.8 bar
Maximum allowable temperature (TS).....	138°C
Working pressure safety valve.....	2.8 bar
Material of chamber and double jacket.....	1.4404 (SS 316 L)
Surface roughness	$\leq 0,8 \mu\text{m}$
Pressure Device Directive 2014/68/EU.....	CE0036, Kat. II, Modul B+C2
Power supply:	
Voltage	3N 400V~ ($\pm 5\%$), 50 Hz, 16A
Power cord.....	CEE-plug 16 A
Working power	10 kW
Averaged power consumption per cycle.....	18 kWh
Protection class	I
Protection.....	IP24
Electromagnetic compatibility	DIN EN 61326
Water supply:	
Destilled or demineralized Water (acc. to annex C EN 13060)	
Averaged feed water consumption per cycle..... (depending on initial state, program and load)	ca. 8,5 l - 18 l
Storing conditions:	
Temperature.....	5 ÷ 40°C
Humidity	max. 85%
Heat emission to the environment.....	ca. 12% of rated capacity
Programs:	
10 predefined programs in user level 1:	
The program definition depends on the available options included in the model. The programs can be individually changed.	
10 further programs in user level 2 (program P11 - P20) code protected, Predefinition is like P1.	
2 test programs (Bowie & Dick-Test, P11, vacuum test, P12) - in vacuum versions only	
Computer interface:	
- serial interface RS 485	
Printer (optional)	

II. Product characteristics Laboklav 55 – 195

Product characteristics	Special features
Sterilizer chamber	Directly steam heated by integrated steam generator, indirectly steam heated by heating jacket while preheating and drying
Lid and locking mechanism	Hinged lid with motorized locking mechanism, safety lock
Lid seal	T- profile seal, silicon
Temperature measurement	Independent temperature sensors PT100 T _{0,9} = 3 s, 2 - wire connection, internal resolution 0,01K, display resolution 0,1K can be calibrated continuous monitoring of break and short cut
Reference sensor for liquids	Sensor like temperature measurement defined but with flexible connecting cable
Calibration certificate acc. to ISO	Option
Pressure measurement	Electronic pressure sensor 0 to 6 bar, absolute pressure or relative pressure, programmable, resolution and display 0.1kPa, continuous monitoring of sensor break
Calibration certificate acc. to ISO	Option
Feed water supply	Internal feed water tank with integrated degassing of feed water, automatic fill and refill, hand filling possible while lid is open
Feed water pump	35 L/h, automatic supply from feed water tank
Feed water level regulation	Level sensors for low level and max level
Over temperature protection for heaters	2 independent systems: temperature control of heaters by PT100, 2 over temperature protection switches with auto reset 1/2, 1x reset by service only
Vacuum pump (option)	Water ring vacuum pump Housing from brass, compression wheel from bronze Single phase electro motor, no 3 phase system necessary
Single and fractionated prevacuum	Parameter programmable (option)
Sterile venting system	Membrane filter, $\mu \leq 0,2 \mu\text{m}$, in all models
Display for filter change	Yes
Validation duct	1 Vacuum test (PT) G1/2" 1 Temperature test (TT) G1"
Microprocessor control	Control of all functions, messaging by

	graphic display
Safety line	For heaters and chamber pressure
Timer	Program start depending on date and time programmable
Acoustic signal	Can be switched off
Interfaces	Internal RS232 for printer External RS485 for printer, network, computer connection (only touch-option)
Batch printer (Option)	Needle printer, 50mm writing width normal paper role
Fast cooling (Option)	Circulation systems with energy recovery, energy remove by normal tap water

III. Ambient conditions for Laboklav 55 – 195

Operation: Ambient temperature Air pressure Humidity	+10°C bis +40°C 70 kPa bis 106 kPa Max. 85 % rel. Hum.
Storage: Temperature Air pressure Humidity	+5°C bis +40°C 50 kPa bis 106 kPa Max 85 % rel. Feuchte

IV. Consumption data Laboklav 55 – 195

Feed water consumption per batch	3,5 bis 18 Liter deionised water
Cooling water consumption for condensate cooling	5 bis 12 Liter normal tap water
Energy consumption per batch	5 bis 18 kWh
Heat emission into the room	0,5 bis 2,2 kWh
Power safe function	Heat recovery and degassing when cooling
Cooling water consumption for vacuum pump	About 2L/min when pump is running (averaged about 20 to 50 Liter)
Cooling water for fast cooling option	No deionised water (feed water is running circular) The additional normal tap water depends on the load and removing temperature

V. Media supply Laboklav 55 – 195

Electrical power supply	230 V~, single phase 16 A, 50 Hz (special option for devices with 4kW)	3N~ 400VAC, 16A, 50 Hz CEE-Steckdose 3x16A. Each phase needs to be possible to switch off by main switch/ main breaker (not delivered)
Tap water for steam/ condensate cooling And feed water cooling if fast cooling function is included Temperature Water hardness	Cold tap water pressure under flow $\geq 0,5$ bar Water tap and waste protecting filter/ sieve need to be installed in supply pipe $\leq 20^{\circ}\text{C}$ <u>0,7 bis 2,7 mmol/l entspr. 4°dH bis 15°dH</u> If this is not observed, the maintenance intervals may be shortened!	
Feed water for steam generation Betriebsmitteltemperatur	EN 285 Anhang B, Pressure under flow $\geq 0,5$ bar Water tap and waste protecting filter/ sieve need to be installed in supply pipe $\leq 20^{\circ}\text{C}$	
Compressed air (Option fast cooling support)	4 to 6 bar pressure controlled, free of oil, degassed <u>min. 200 l/min, max. 500 l/min</u>	
Drainage	Free drainage with tap in drain pipe	

VI. Definition of feed water quality Laboklav 55 – 195 (gem. EN 285, Appendix B)

Acc. to EN 285 - "Steam sterilizers", app. B / EN 13060- small size steam sterilizers App. C

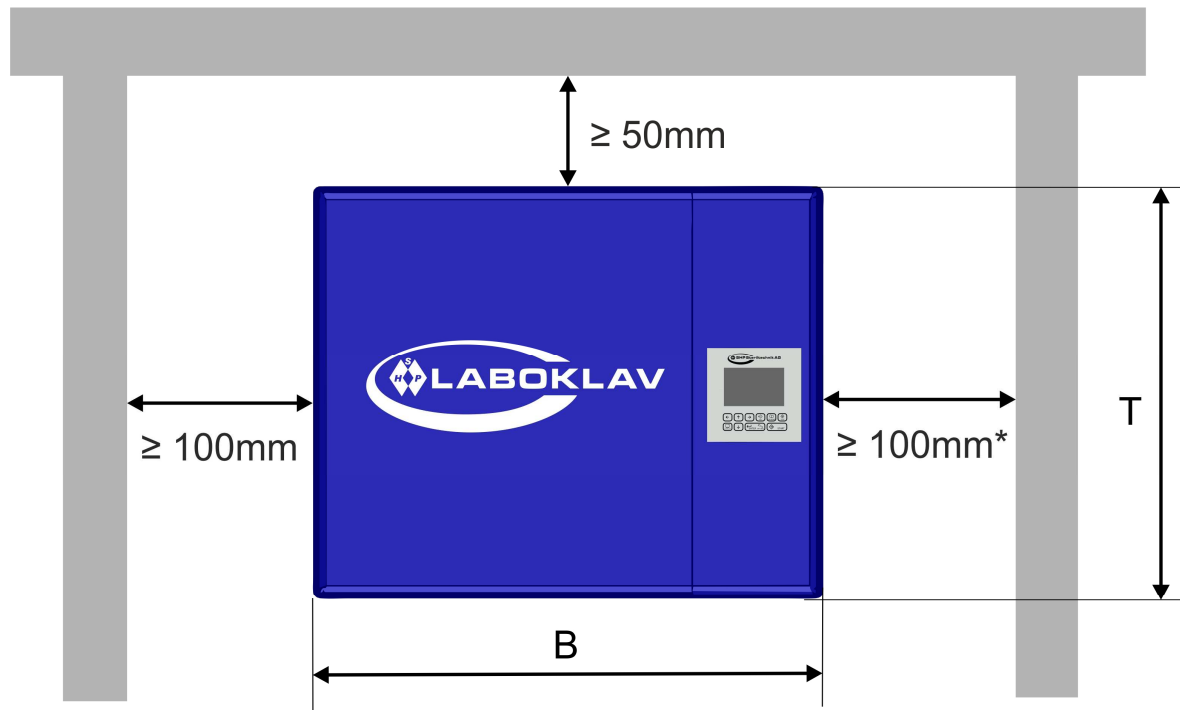
	Feed water	Condensate
Residual dry matter	≤ 10 mg/l	≤ 1.0 mg/kg
Silica oxide, SiO_2	≤ 1 mg/l	≤ 0.1 mg/kg
Iron	≤ 0.2 mg/l	≤ 0.1 mg/kg
Cadmium	≤ 0.005 mg/l	≤ 0.005 mg/kg
Lead	≤ 0.05 mg/l	≤ 0.05 mg/kg
Other heavy metals, except for iron, cadmium, lead	≤ 0.1 mg/l	≤ 0.1 mg/kg
Chlorines	≤ 2 mg/l	≤ 0.1 mg/kg
Phosphates	≤ 0.5 mg/l	≤ 0.1 mg/kg
Conductivity (at 20°C)	≤ 15 $\mu\text{S}/\text{cm}$	≤ 3 $\mu\text{S}/\text{cm}$
pH	5 to 7	5 to 7
Colour	Colourless, clean, no deposit	Colourless, clean, no deposit
Hardness	≤ 0.02 mmol/l	≤ 0.02 mmol/l

NOTE 1: Using water of contamination greater than specified above for steam generation, can considerably reduce the sterilizer life and **void the manufacturer's warranty.**

NOTE 2: The condensate should be derived out of the steam collected during sterilizing cycle with the empty chamber.

Tests for conformance are performed with commonly used analytic methods.

VII. Installation dimensions

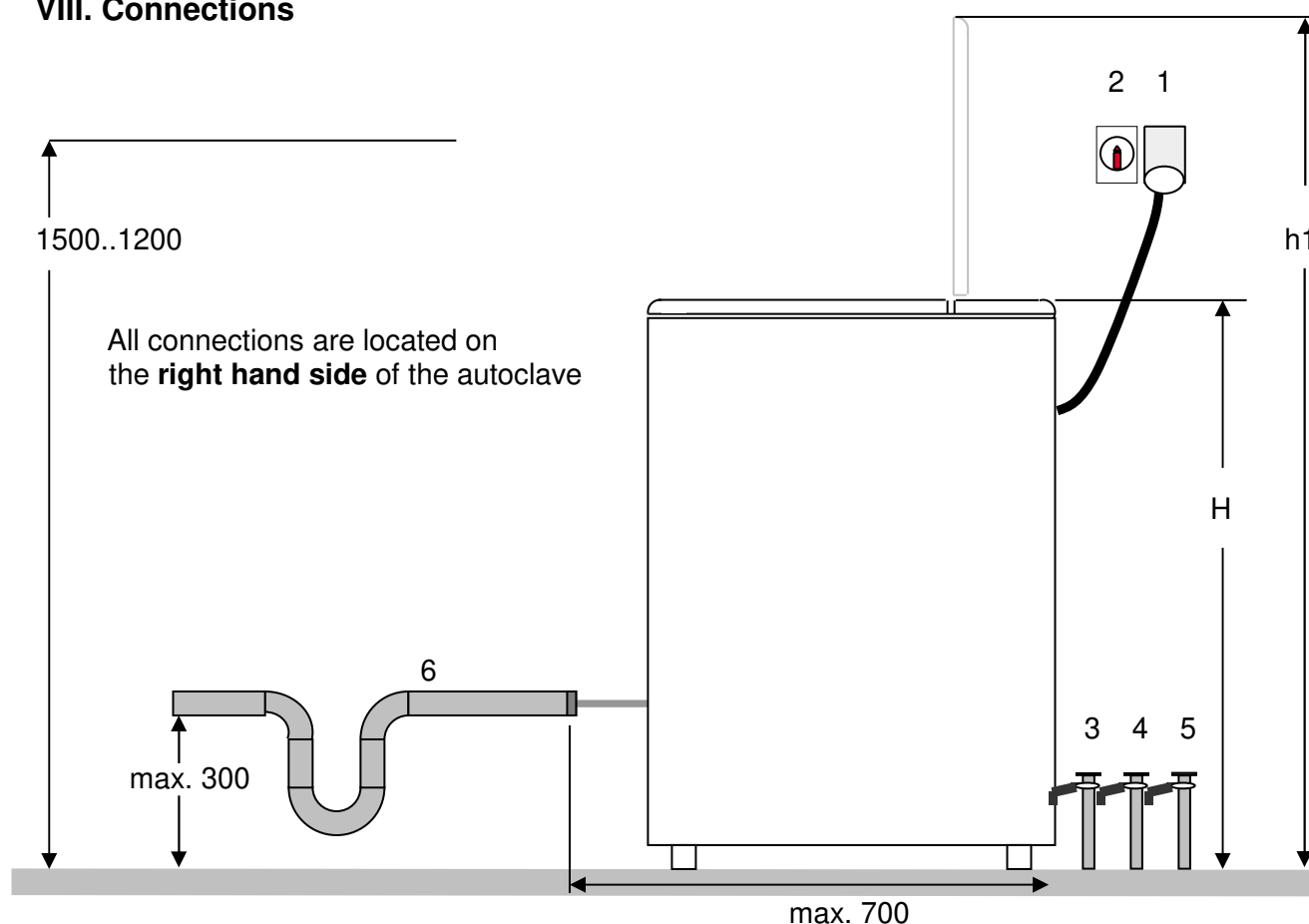


All dimensions are minimum dimensions and should not be reduced to safe the heating power emission without problems.

	B	T	H	h1
Laboklav 55	740 mm	600 mm	765 mm	1385 mm
Laboklav 80	740 mm	600 mm	915 mm	1535 mm
Laboklav 100	740 mm	600 mm	1065 mm	1685 mm
Laboklav 135	840 mm	700 mm	965 mm	1685 mm
Laboklav 160	840 mm	700 mm	1065 mm	1785 mm
Laboklav 195	840 mm	700 mm	1215 mm	1935 mm

* If using an external condensate tank (if no regular drainage is possible only) this dimension is additionally necessary.

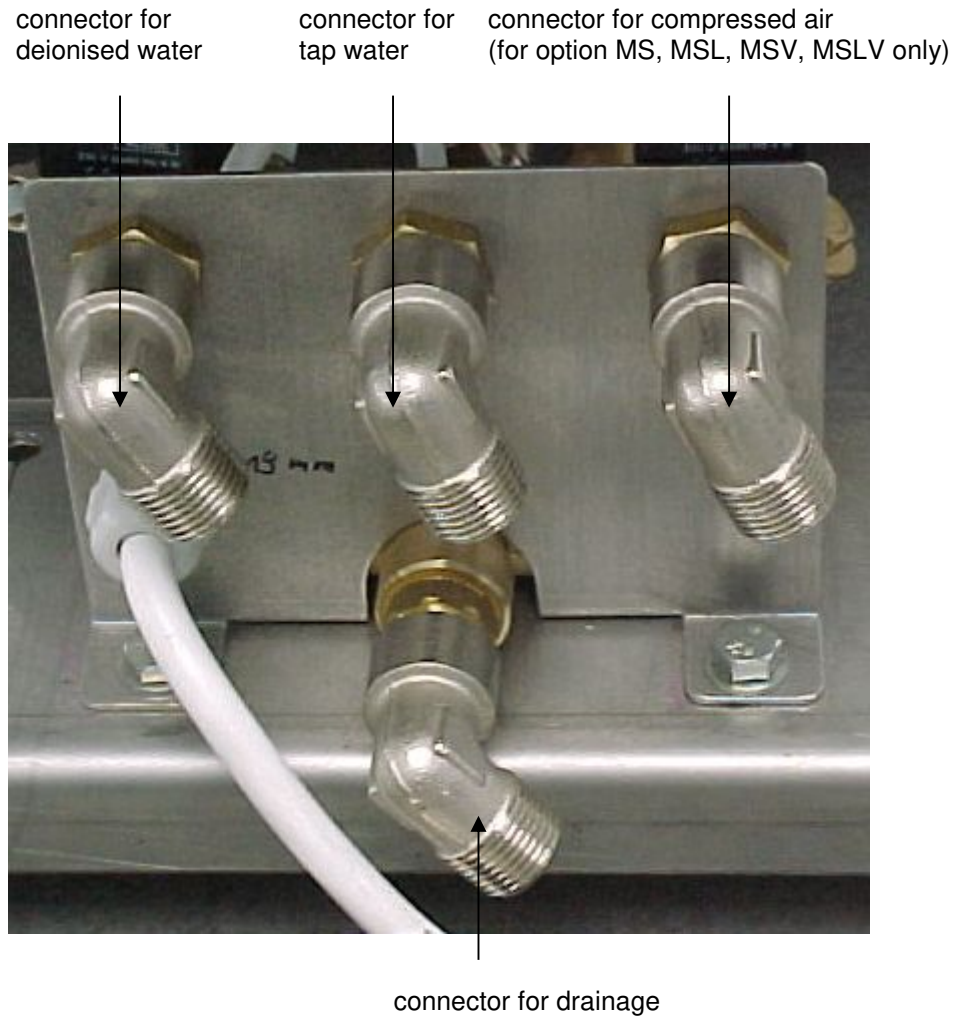
VIII. Connections



	Connection	Notes
1	CEE power plug 3x 16A Length of power cable: 1,5 m	As alternative for Laboklav with 4kW steam generator a single power supply is possible 230VAC, 16A that is reducing the heating power to 3kW.
2	Main switch	Circuit breaker on the device <u>Emergency separation/emergency stop must be installed by the customer!</u>
3	Normal tap water G½"a, DN ≥ 10 mm	If not available, there is no cooling of the feed water tank and no exhaust steam condensation! <u>Temperatures of up to 135°C</u> then occur at the condensate outlet!
4	Deionised (distillate) water G½"a, DN ≥ 10 mm	If not connected: the auto refilling function is not working. The feed water tank needs to be filled manually!
5	Compressed air (optional for S-Option) G½"a, DN ≥ 10 mm	Pressure regulation and draying the compressed air needs to be installed at supply side. It is not included in the autoclave! Safety valve is not necessary because of pressure regulation and safety valve for chamber is included in the autoclave.
6	Drainage G½"a, DN ≥ 50 mm	Max. allowed temperature of drainage pipe material need to be attended! if tap water is installed, the max temperature at the drain pipe can be programmed in the control unit.

If the unit is connected to a cooling circuit provided by the customer, the manufacturer must be informed of this connection variant before delivery of the unit. The connection of the unit to an external cooling circuit is possible, but requires the connection by a member of our factory customer service!

The connections on the device side are shown in the following picture:



All connections have G1/2" with flat seal inside. The connection should be done with temperature stable pipes (steel plated) (temperature up to 134°C), do not use PVC pipes!