

# Laboklav



Steriltechnik AG

## Dampfsterilisatoren Steam sterilizers



Type 55 to 195 Liter

Technical Datasheet

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## **SHP Steriltechnik AG**

Gustav-Ricker-Str. 62  
D-39120 Magdeburg

Tel: +49 (0) 391 626988-0  
Fax: +49 (0) 391 626988-1  
E-Mail: [info@shp-steriltechnik.de](mailto:info@shp-steriltechnik.de)  
Internet: [www.shp-steriltechnik.de](http://www.shp-steriltechnik.de)

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## 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 (net).....	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 ( $\phi$ x D) .....	$\phi$ 410 x 460 (+50-round.) mm
usable Volume .....	ca. 60 l
Maximum allowable pressure (PS) .....	2.8 bar
Maximum allowable temperature (TS) .....	143°C
Working pressure safety valve .....	2.8 bar
Material number for chamber and double jacket.....	1.4404 (SS 316 L)
Surface roughness.....	$\leq 0,8 \mu\text{m}$
Pressure Device Directive 97/23/EG.....	CE0036, Kat. I, Module A1
Power supply:	
Voltage .....	3N 400V~ ( $\pm 5\%$ ), 50 Hz, 16A
Working power.....	4,5 kW
Averaged power consumption per cycle .....	5 kWh
Protection class .....	I
Protection level. ....	IP24
Water supply:	
Destilled or demineralized Water (acc. to annex C EN 13060:2004)	
Averaged feed water consumption per cycle.....	ca. 3,5 l
Storing conditions:	
Temperature .....	5 ÷ 40°C
Humidity .....	max. 85%
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 programs in user level 2 (Program P11 to 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 (net).....	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 ( $\phi$ x D) .....	$\phi$ 410 x 610 (+50-round.) mm
usable Volume .....	ca. 80 l
Maximum allowable pressure (PS) .....	2.8 bar
Maximum allowable temperature (TS) .....	143°C
Working pressure safety valve .....	2.8 bar
Material number for chamber and double jacket.....	1.4404 (SS 316 L)
Surface roughness.....	$\leq 0,8 \mu\text{m}$
Pressure Device Directive 97/23/EG.....	CE 0036, Kat. II, Module A1
Power supply: Voltage .....	3N 400V~ ( $\pm 5\%$ ), 50 Hz, 16A
Working power.....	4,5 kW
Averaged power consumption per cycle .....	5 kWh
Protection class .....	<b>I</b>
Protection level. ....	IP24
Water supply:	
Distilled or demineralized Water (acc. to annex C EN 13060:2004)	
Averaged feed water consumption per cycle.....	ca. 3,5 l
Storing conditions:	
Temperature .....	5 $\div$ 40°C
Humidity .....	max. 85%
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 programs in user level 2 (Program P11 to 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 (net).....	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 ( $\phi$ x D) .....	$\phi$ 410 x 760 (+50-round.) mm
usable Volume .....	ca. 100 l
Maximum allowable pressure (PS) .....	2.8 bar
Maximum allowable temperature (TS) .....	143°C
Working pressure safety valve .....	2.8 bar
Material number for chamber and double jacket.....	1.4404 (SS 316 L)
Surface roughness.....	$\leq 0,8 \mu\text{m}$
Pressure Device Directive 97/23/EG.....	CE 0036, Kat. II, Module A1
Power supply:	
Voltage .....	3N 400V~ ( $\pm 5\%$ ), 50 Hz, 16A
Working power.....	6,5 kW
Averaged power consumption per cycle .....	6,5 kWh
Protection class .....	I
Protection level. ....	IP24
Water supply:	
Destilled or demineralized Water (acc. to annex C EN 13060:2004)	
Averaged feed water consumption per cycle.....	ca. 3,5 l
Storing conditions:	
Temperature .....	5 ÷ 40°C
Humidity .....	max. 85%
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 programs in user level 2 (Program P11 to 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 (net).....	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 ( $\phi$ x D) .....	$\phi$ 500 x 660 (+50-round.) mm
usable Volume .....	ca. 130 l
Maximum allowable pressure (PS) .....	2.8 bar
Maximum allowable temperature (TS) .....	143°C
Working pressure safety valve .....	2.8 bar
Material number for chamber and double jacket.....	1.4404 (SS 316 L)
Surface roughness.....	$\leq 0,8 \mu\text{m}$
Pressure Device Directive 97/23/EG.....	CE 0036, Kat. II, Module A1
Power supply:	
Voltage .....	3N 400V~ ( $\pm 5\%$ ), 50 Hz, 16A
Working power.....	6,5 kW
Averaged power consumption per cycle .....	6,5 kWh
Protection class .....	<b>I</b>
Protection level. ....	IP24
Water supply:	
Distilled or demineralised Water (acc. to annex C EN 13060:2004)	
Averaged feed water consumption per cycle.....	ca. 5,5 l
Storing conditions:	
Temperature .....	5 ÷ 40°C
Humidity .....	max. 85%
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 programs in user level 2 (Program P11 to 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 (net).....	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 ( $\phi$ x D) .....	$\phi$ 500 x 760 (+50-round.) mm
usable Volume .....	ca. 163 l
Maximum allowable pressure (PS) .....	2.8 bar
Maximum allowable temperature (TS) .....	143°C
Working pressure safety valve .....	2.8 bar
Material number for chamber and double jacket.....	1.4404 (SS 316 L)
Surface roughness.....	$\leq 0,8 \mu\text{m}$
Pressure Device Directive 97/23/EG.....	CE 0036, Kat. II, Module A1
Power supply:	
Voltage .....	3N 400V~ ( $\pm 5\%$ ), 50 Hz, 16A
Working power.....	6,5 kW
Averaged power consumption per cycle .....	6,5 kWh
Protection class .....	I
Protection level. ....	IP24
Water supply:	
Destilled or demineralized Water (acc. to annex C EN 13060:2004)	
Averaged feed water consumption per cycle.....	ca. 5,5 l
Storing conditions:	
Temperature .....	5 ÷ 40°C
Humidity .....	max. 85%
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 programs in user level 2 (Program P11 to 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 (net).....	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 ( $\phi$ x D) .....	$\phi$ 500 x 990 (+50-round.) mm
usable Volume .....	ca. 193 l
Maximum allowable pressure (PS) .....	2.8 bar
Maximum allowable temperature (TS) .....	143°C
Working pressure safety valve .....	2.8 bar
Material number for chamber and double jacket.....	1.4404 (SS 316 L)
Surface roughness.....	$\leq 0,8 \mu\text{m}$
Pressure Device Directive 97/23/EG.....	CE 0036, Kat. II, Module A1
Power supply:	
Voltage .....	3N 400V~ ( $\pm 5\%$ ), 50 Hz, 16A
Working power.....	6,5 kW
Averaged power consumption per cycle .....	6,5 kWh
Protection class .....	<b>I</b>
Protection level. ....	IP24
Water supply:	
Distilled or demineralised Water (acc. to annex C EN 13060:2004)	
Averaged feed water consumption per cycle.....	ca. 5,5 l
Storing conditions:	
Temperature .....	5 ÷ 40°C
Humidity .....	max. 85%
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 programs in user level 2 (Program P11 to 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 seam 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 $T_{0,9} = 3 \text{ s}$ , 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 in 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 0.1 kPa, 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 PT 100, 2 over temperature protection switches for 220°C and 250°C, 1x with auto reset, 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
Display for maintenance cycle	Automatic message generation if maintenance is needed
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 of date and time programmable
Acoustic Signal	Can be switched off
Interfaces	Internal RS232 for printer External RS485 for printer, network, computer connection
batch printer (Option)	Needle printer, 50 mm writing width normal paper role
Fast cooling (Option)	Circulation system with energy recovery, energy remove by normal tap water

### III. Ambient conditions for Laboklav 55 – 195

Operation: Ambient temperature Air pressure Humidity	+10°C to +40°C 700 hPa to 1060 hPa Max. 70 % rel. Hum.
Storing: Ambient temperature Air pressure Humidity	+1°C to +60°C 500 hPa to 1060 hPa Max 95 % rel. Hum.

### IV. Consumption data Laboklav 55 – 195

Feed water consumption per batch	0,7 to 8,5 Liter deionised water
Cooling water consumption for condensate cooling	5 to 12 Liter Normal tap water
Energy consumption per batch	1,8 to 7,5 kWh
Heat emission into the room	0,5 to 1,9 kWh
Power safe function	Heat recovery and degassing when cooling
Cooling water consumption for vacuum pump	Ca. 2L/min when pump is running (averaged ca. 20 to 40 Liter per batch)
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 Laboklav 55)	3N~ 400VAC, 16A, 50 Hz CEE-Standard 3x16A. each phase needs to be possible to switch off by main switch /main breaker
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 $\leq 20^{\circ}\text{C}$ 0,7 bis 2,0 mmol/l	
Feed water for steam generation Temperature	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 min. 20 l/min	
Drainage	Free drainage with trap 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

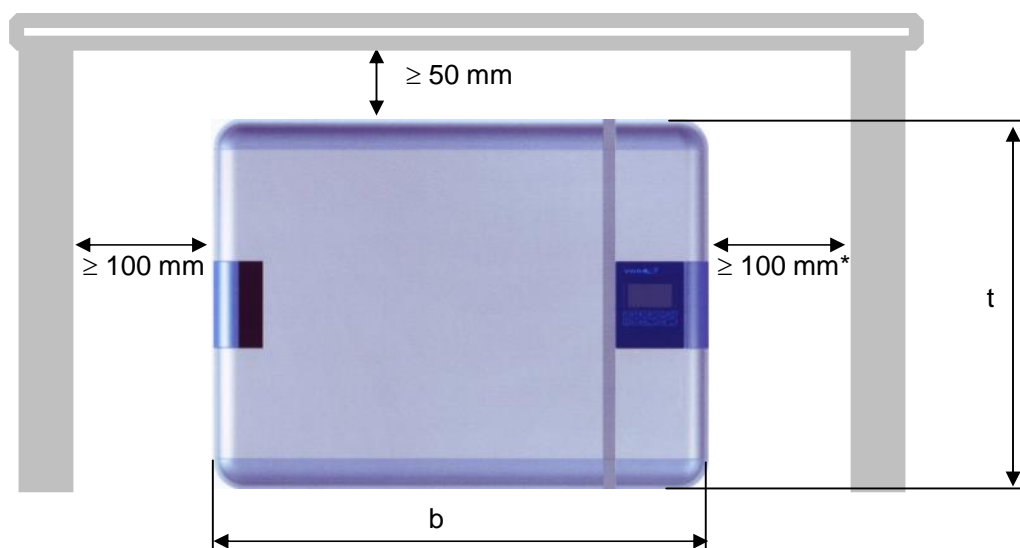
	Feed water	Condensate
Residual dry matter	$\leq 10$ mg/l	$\leq 1.0$ mg/kg
Silica oxide, SiO <sub>2</sub>	$\leq 1$ mg/l	$\leq 0.1$ mg/kg
Iron	$\leq 0.2$ mg/l	$\leq 0.1$ mg/kg
Cadmium	$\leq 0.005$ mg/l	$\leq 0.005$ mg/kg
Lead	$\leq 0.05$ mg/l	$\leq 0.05$ mg/kg
Other heavy metals, except for iron, cadmium,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

Tests for conformance are performed with commonly used analytic methods.

## VII. Installation dimensions

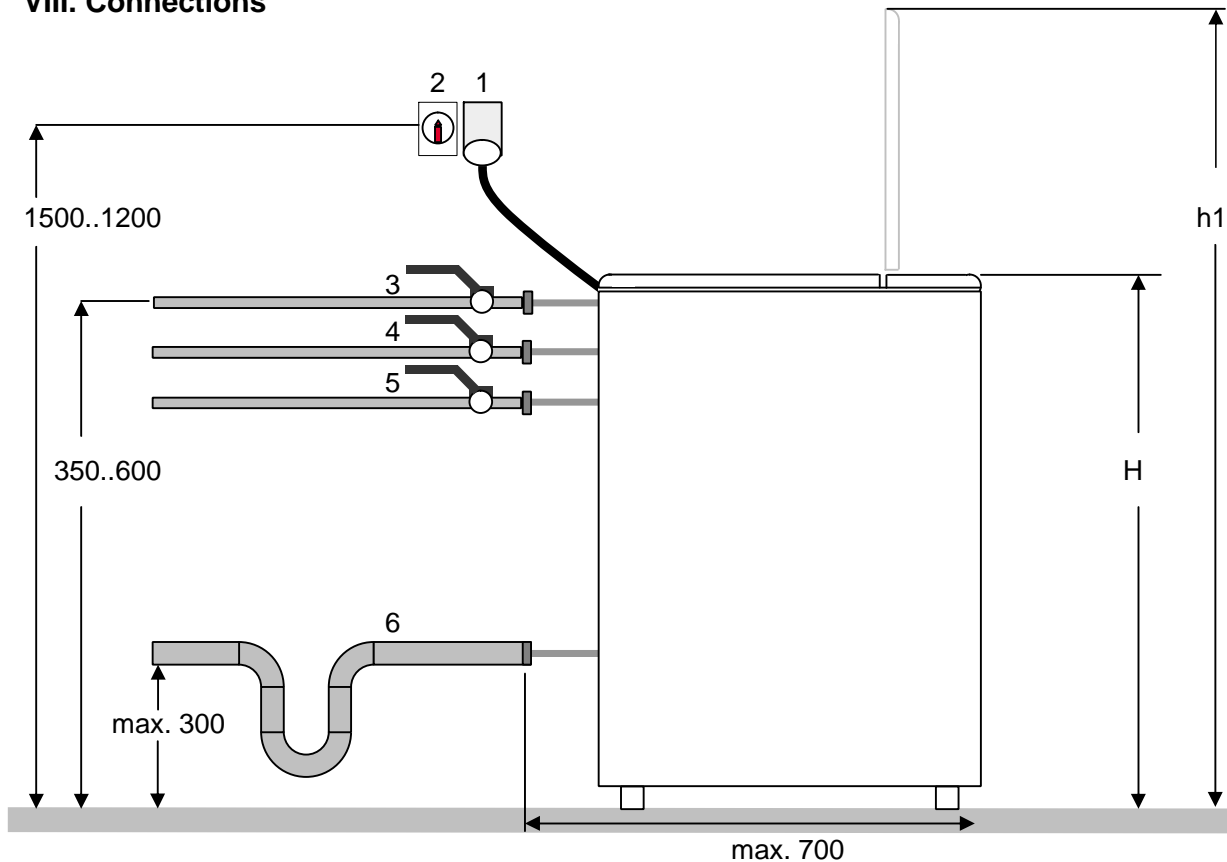


All dimensions are minimum dimensions and should not be reduced to safe the heating power emission without problems.

	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 55 a single power supply is possible 230VAC, 16A that is reducing the heating power to 3 kW!
2	Main switch	
3	Normal tap water G½"a, DN ≥ 10 mm	If not connected the cooling of feed water tank and spent steam condensation is not active! The temperature at steam / condensate outlet can rise up to 135°C!
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 (option for cooling support only) G½"a, DN ≥ 10 mm	Pressure regulation and drying 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 the 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.

For the connections at device side please see the following picture:

connector for  
deionized water

connector for  
tap water

connector for compressed air  
(for option MS, MSL, MSV, MSLV only)



Connector for drainage

All connectors 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!