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1

## **INSTRUCTION MANUAL**

### **CAT. 87032-03, 87032-04** **EMS BioClave™ Mini Autoclave**



## *Contents*

General.....	3
Technical specifications.....	3
Packing content.....	4
Installation.....	4
Control panel.....	5
Cycle state.....	5
Operation.....	6
Getting started.....	6
Filling the water tank.....	6
Sample preparation.....	6
Selecting the sterilization temperature.....	7
Running the sterilization program.....	7
Start the sterilization program.....	7
Sterilization cycle completion.....	8
Maintenance.....	9
Cleaning the door seal.....	9
Cleaning the water tank.....	9
Cleaning the inner-chamber.....	9
Door adjustment.....	10
Replacement of the door seal.....	10
Replacement of the power fuse.....	11
Transport and storage.....	11
Error codes.....	12
Service and contact.....	12

## *Appendix*

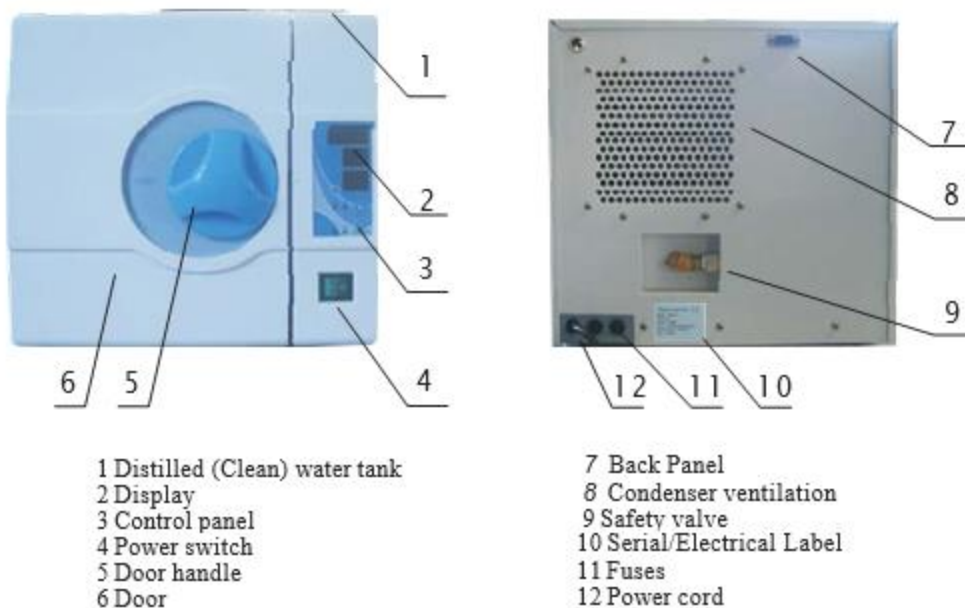
Water properties/characteristics.....	13
Diagrams of the sterilization programs.....	13
Electrical drawing.....	14
Hydraulic drawing.....	15

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## General

The sterilizer described in this manual is intended for the sterilization of research tools. It operates automatically with 134°C and 121°C sterilization temperatures. This sterilizer is in compliance with the European Directive 93/42/CEE and it has been produced in accordance with the EN 13060. In addition the chamber has been ASME certified.



NOTE: For safe operation, please pay close attention to the alert symbols below, which can be found throughout this manual. Please carefully read and understand the contents of this manual prior to operating this instrument.



This symbol represents an electrical caution – ground protection.



HOT SURFACE. This symbol represents a hot surface.



This symbol is used to draw the attention of the reader to particularly important notions for operator safety.

## Technical specifications

1. Chamber dimensions: 6.7 in. x 12.6 in. / 170 mm x 320 mm
2. Rated voltage: AC 110V–120V or 220V–240V, 50-60Hz
3. Nominal power: 1300W (120V) 950W (220V)

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4. Sterilization temperature: 121°C/134°C
5. Main fuses: T20A, T12A/250V
6. Capacity of the distilled water tank: Approx. 2.5L (water at maximum level)
7. Operating environment: 5-40°C
8. External dimensions:  
13.5 in. (width) x 13.4 in. (height) x 20.1 in. (depth)  
345 mm (width) x 340 mm (height) x 530 mm (depth)
9. Net weight: 64 lbs./29kg
10. Noise level: <60dB
11. Relative humidity: Max. 80%, non-condensing
12. Atmospheric pressure: 76kPa-106kPa

### *Packing Content*

Number	Accessory	Quantity
1	8L Steam sterilizer	1
2	Loading tray	2
3	Tray rack	1
4	Tray handling tool	1
5	Door adjustment tool	1
6	Draining hose	2
7	Instructions manual	1
8	Spare fuse, main power (20A)	2
9	Spare fuse for valve (3A)	2
10	Spare fuse for mainboard (1A)	2
11	Spare door seal	1

### *Installation*

- Ensure that the sterilizer is installed with 2.5 in. (10 cm) ventilation space on all sides of the sterilizer, and 5 in. (20 cm) on top side. The clearance required to open the door is 15.5 in. (40 cm).
- The sterilizer should be placed on a level worktable.
- Do not cover or block the door, ventilation or radiation openings on the sterilizer.
- Do not install the sterilizer near a sink or in a location where it is likely to be splashed.
- Do not install the sterilizer nearby a heat source.

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### *Control panel*

**Temperature display window:** Displays the current temperature in degrees Celsius inside the chamber.

**Pressure display window:** Displays the current pressure (psi) inside in the chamber.

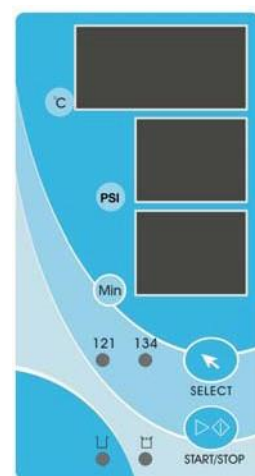
**Timer display window:** Displays the current cycle state on the remaining cycle time.

**Indication lamp:** This lamp will illuminate when the distilled water tank is low on water. In order to continue, please fill this tank with distilled water.

**Indication lamp:** This lamp will illuminate when the used water tank is full. The used water tank should then be drained in order to continue operation.

**TEMP. select button:** Use this button to choose the desired sterilization temperature according to your sample.

**START/STOP button:** Once the parameters are chosen, press this key to begin the sterilization cycle. To cancel or stop a cycle, press and hold this key for 3 seconds.



### *Cycle state*

Time display	State	State description
Ld	Preheating/loading	Machine is prepared for sample loading
Do	Door state	Door is open
Po	Vacuuming	Machine is vacuuming during a cycle
HE	Heating	Machine is in heating mode
Time (in minutes)	Sterilizing/drying	Time remaining in program
PL	Exhaust	Machine is cooling and releasing steam
Ed	End	Cycle complete – you can open door and take the sample
E1 – E7	Error state	Error – please see section “Error Codes”

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## Operation

### Getting started

1. Open the chamber door and remove all inner packing and accessories.
2. Plug the power cord into the proper electrical outlet (check that power source is in accordance to the electrical specifications of the machine, which are listed on the power label).
3. Power ON – the switch is located underneath the control panel on the front side of the machine.
4. Following power up, the control panel illuminates. The time window will display “Ld”.



### Filling the water tank

Open the top lid and fill the tank with distilled water. The water should be filled within approximately 1 inch of the black seal. If you hear a beep signal, the max water level is exceeded. Please stop filling immediately.



### Sample preparation

For the most effective sterilization and to preserve the sample, please proceed as follows:

1. Arrange the samples of different material on different trays or with at least 2 inches of space between them.
2. Always insert a sterilization paper or cloth between the tray and sample to avoid direct contact between the different materials.
3. Verify all samples are not sealed, capped or closed.
4. Do not overload the trays above the stated limit (see “Appendix 1”).
5. NOTE: Do not stack the trays one above the other or put them in direct contact with the walls of the sterilization chamber.
6. When handling the trays, always use the tray removal tool.
7. Wrap each sample separately – if samples are wrapped together, verify that they are of the same material.
8. Seal the wrap with sterilization adhesive ribbon or by a thermal sealer.
9. Never seal with metallic clips, pins, etc., as this jeopardizes the maintenance of the sterility.
10. When using sterilization paper, set the plastic part downward (tray side) and the paper side facing upward.



CAUTION! Always wrap samples

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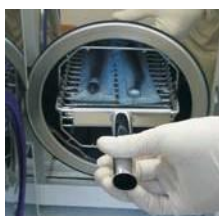
### Select the sterilization temperature

Select the sterilization temperature according to your sample. See “Appendix 2”.



### Running the sterilization program

After selecting temperature, insert the sample into the chamber using the tray handling tool.



After the samples are loaded, close and lock the door by turning the door handle clockwise until it stops.



**CAUTION!** You must turn the door handle to the maximum position, otherwise, the machine will alarm and an error message will be displayed during the cycle.

### Start the sterilization program

Press the START button. The machine will start the cycle. The cycle will take 12 – 55 minutes. See “Appendix 2”.

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When you press the START button and the door handle has not been turned to the maximum position, “do” will flash on the time display window. The cycle will not begin until the door has been completely closed and the START button is pressed again.


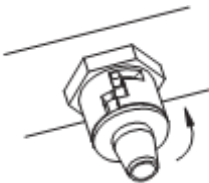

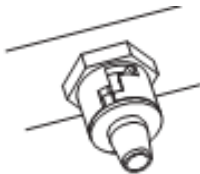
### Sterilization cycle completion

After a cycle is completed, the time display will show “Ed”. Once the pressure has reached 0 psi on the display, the door can be opened and the samples can be removed.



Always use the tray handling tool to load or unload the tray in order to avoid touching the hot surface of the trays.

### *Draining the water tanks*

 <ol style="list-style-type: none"> <li>1. Connect the supplied drain hose to the drain valve by pressing it on firmly.</li> </ol>	 <ol style="list-style-type: none"> <li>2. Set the drain valve to the open position by turning it counter clockwise.</li> </ol>
 <ol style="list-style-type: none"> <li>3. Pull the drain valve outward – the tank will begin to drain through the hose.</li> </ol>	 <ol style="list-style-type: none"> <li>4. After you have completed draining the water, push the drain valve inward and set to the closed position.</li> </ol>

The sterilizer includes two draining valves. The left valve is used for draining the used water tank. The right valve is used for draining the clean water tank. Always be sure that the hose is draining into a vessel with at least 2L capacity.

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## Maintenance

Frequency	Operation
Daily	Clean the door seal Wipe dry the inner chamber
Weekly	Clean the water tank Clean the inner-chamber
Annually	Replace the door seal

### Cleaning the door seal

Clean the door seal daily with a soft cloth saturated in distilled water.



### Cleaning the clean water tank

Clean the clean water tank every week with medical disinfectant.



### Cleaning the inner-chamber, weekly

1. Remove the trays and tray rack from the inner-chamber.
2. Wipe the inner chamber with a soft cloth saturated in distilled water. Apply the same procedure to the trays and the tray rack.



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## Door adjustment

Door adjustment should only be performed if the door is not providing proper seal or if the door seal has just been replaced. If either of the aforementioned are the case, proceed as follows:

1. Open the door and insert the door adjustment tool in the gap beneath the plastic cover (Figure 2).
2. To tighten the door seal, use this tool to adjust the door adjustment nut counter clockwise (Figure 1).
3. If the door seal is too tight, (difficult to lock/unlock), you may also adjust the door adjustment nut clockwise to loosen it.

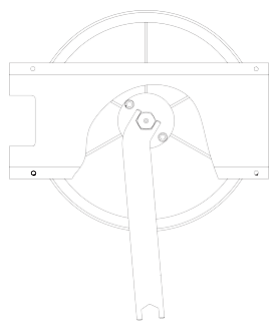


Figure 1



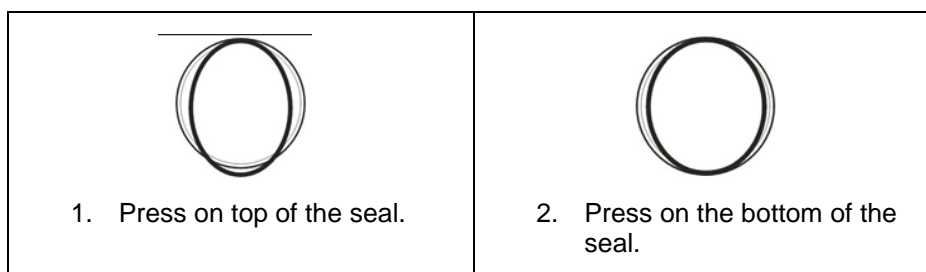
Figure 2



**CAUTION!** Never attempt to adjust the door seal when the door is in the closed position.

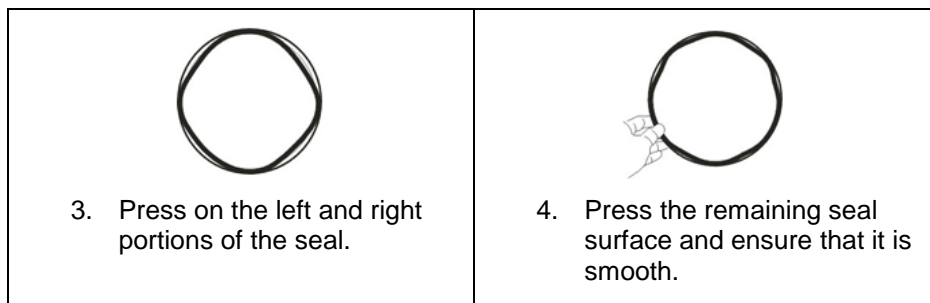
## Replacement of the door seal

1. Fully open the door.
2. Remove the door seal carefully by pulling it by hand away from the door.
3. Clean the new door seal carefully with a soft cloth saturated with distilled water.
4. Moisten the new seal with medical disinfectant.
5. Insert the new seal following the instructions below:



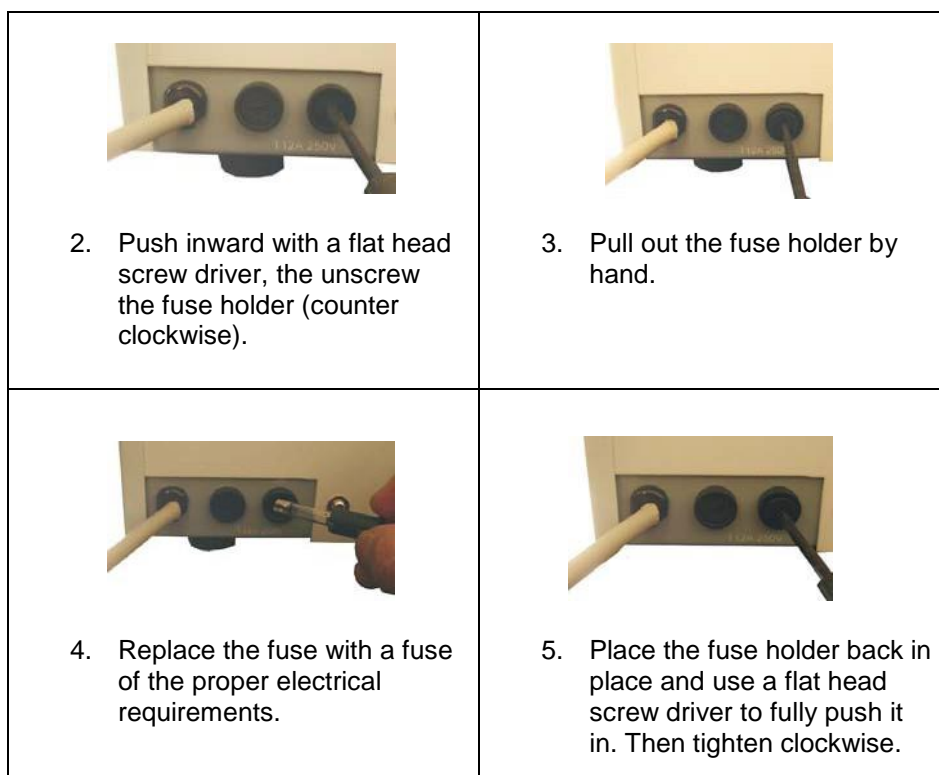
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### Replacing the power fuse

1. Switch off the power.



### *Transport and Storage*

1. Switch off the sterilizer before transportation or storage. Pull out the plug and let the machine cool down.
2. Drain both the clean and the used water tank.
3. Conditions for transportation and storage:

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Temperature: -20C/ ~+55C

Relative humidity: 85%

Atmospheric pressure: 50kPa~106kPa

### *Error Codes*

<b>Code</b>	<b>Description</b>	<b>Proposed solution</b>
<b>E1</b>	Inner temperature sensor error	Check inner temperature sensor
<b>E2</b>	Temperature sensor of chamber wall error	Check temperature sensor of chamber wall
<b>E3</b>	Failure to rise temperature	Check water pump or the door seal
<b>E4</b>	Failure to release the steam	Check the air release valve
<b>E5</b>	Door is opened during the cycle	Make sure you have turned the door handle to the max. position or check the door switch
<b>E6</b>	Program manually interrupted	Shut off the power and restart the machine
<b>E7</b>	Time Error	Check the water pump and the air release valve
<b>EF</b>	Failure to initialize	Shut off the power and restart the machine

### *Service and Contact*

For additional information on any of the error codes listed in the section above, please contact your sales representative or contact Electron Microscopy Sciences at 1-800-523-5874. Please have the unit's serial number (located on the back panel of the instrument) readily available when calling. Do not send in a unit for service without calling first to obtain a repair authorization number and a decontamination form. The unit should be properly packed to avoid damage. Any damage resulting from improper packing shall be the responsibility of the owner.

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## Appendix 1

### Water properties/Characteristics

DESCRIPTION	WATER	CONDENSATE
Evaporate residue	◦ 10 mg/l	◦ 1.0 mg/kg
Silicium oxide sio <sub>2</sub>	◦ 1 mg/l	◦ 0.1 mg/kg
Iron	◦ 0.2 mg/l	◦ 0.1 mg/kg
Cadmium	◦ 0.005 mg/l	◦ 0.05 mg/kg
Lead	◦ 0.05 mg/l	◦ 0.1 mg/kg
Rest of heavy metals, excluding iron, cadmium, lead	◦ 0.1 mg/l	◦ 0.1 mg/kg
Chloride	◦ 2 mg/l	◦ 0.1 mg/l
Phosphates	◦ 0.5 mg/l	◦ 0.1 mg/l
Conductivity (at 20◦)	◦ 15 <sup>7</sup> s/cm	◦ 3 <sup>7</sup> s/cm
pH value	5-7.5	5-7
Appearance	Colorless, clean, without sediments	Colorless, clean, without sediments
Hardness	◦ 0.02 mmol/l	◦ 0.02 mmol/l

## Appendix 2

### Diagram: Sterilization programs

Temperature (C)	Pressure (PSI)	Sterilization Time (min.)	Total Cycle Time (min.)	TYPE	MAX. LOAD (k.g)
134	30	10	20-25	Unwrapped hollow material	5.00
121	16	20	30-35	Single-wrapped solid material	4.00

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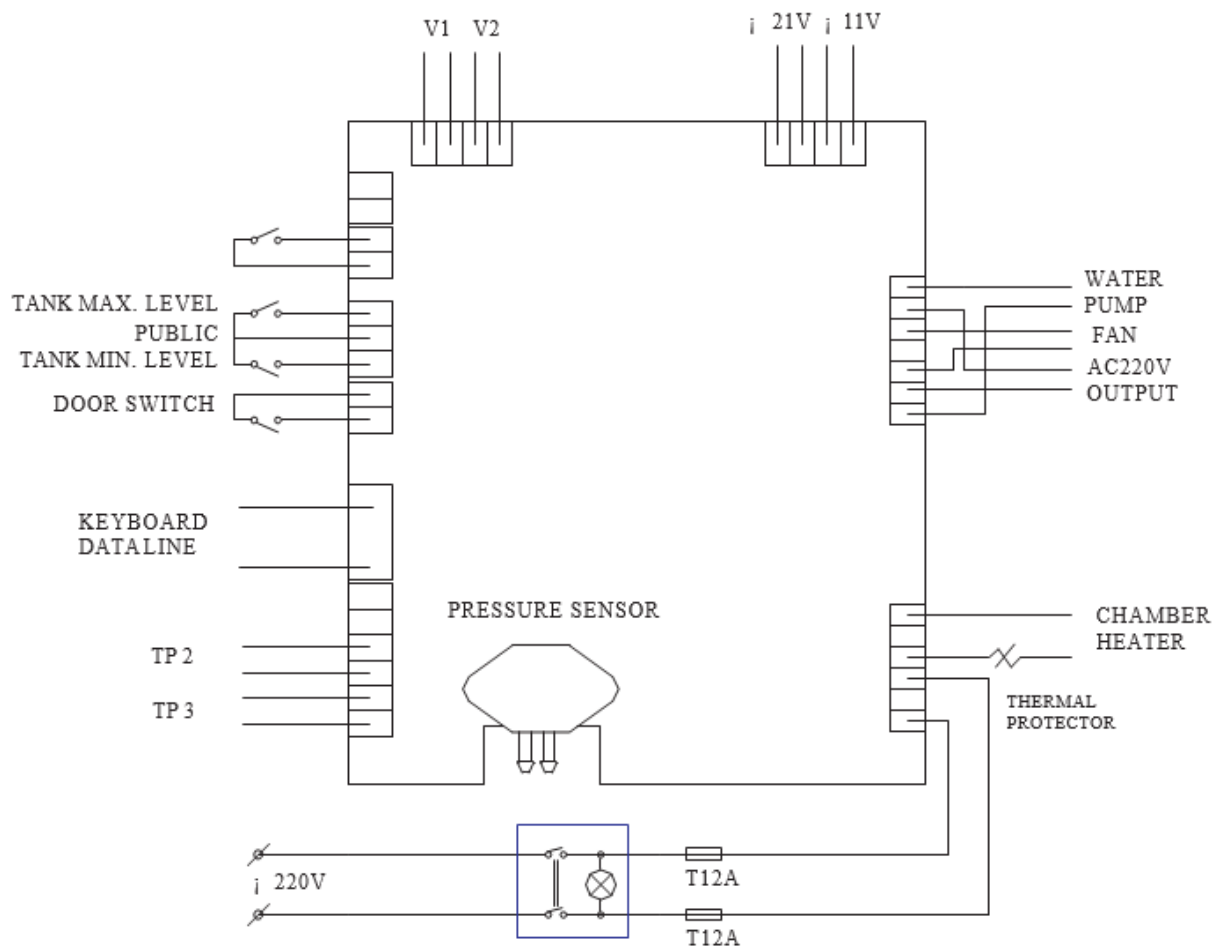
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## Appendix 3

### Electrical drawing



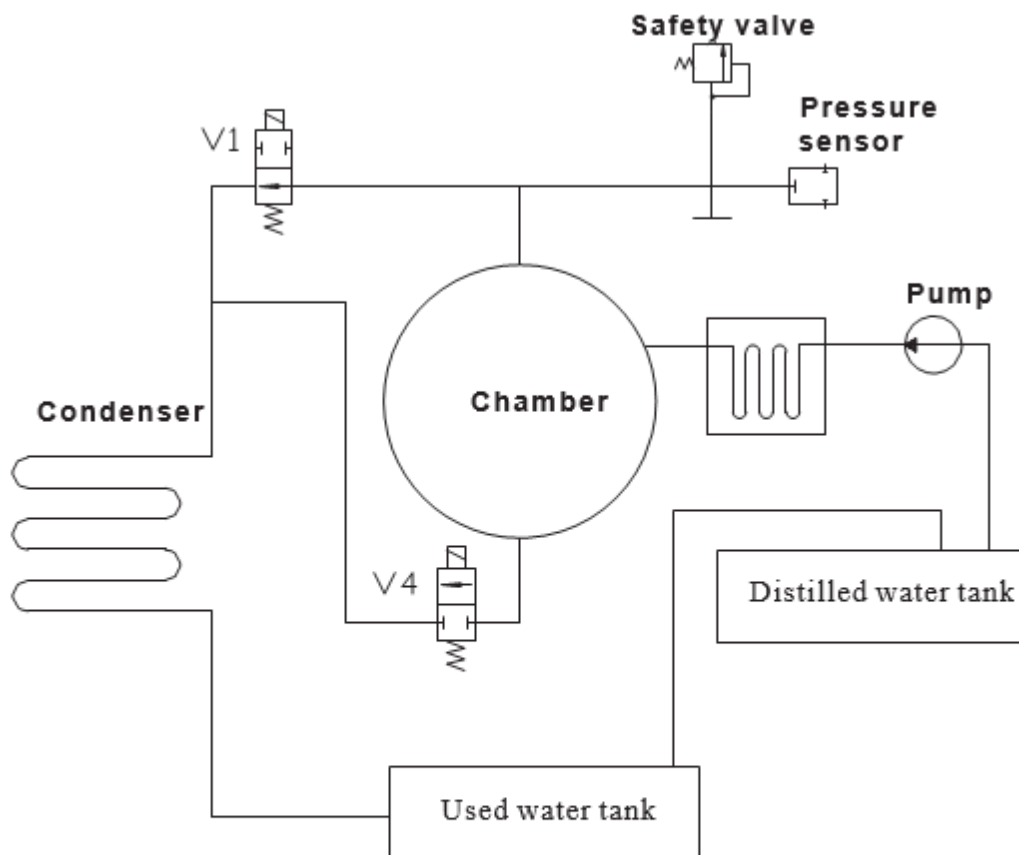
- TP2: Inner temperature sensor of chamber wall
- TP3: Temperature sensor of chamber wall
- V1: Air/Steam release valve
- V2: Water release valve

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*Appendix 4*

Diagram: Hydraulic Drawing



V1: Air/Steam release valve

V4: Water release valve

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