

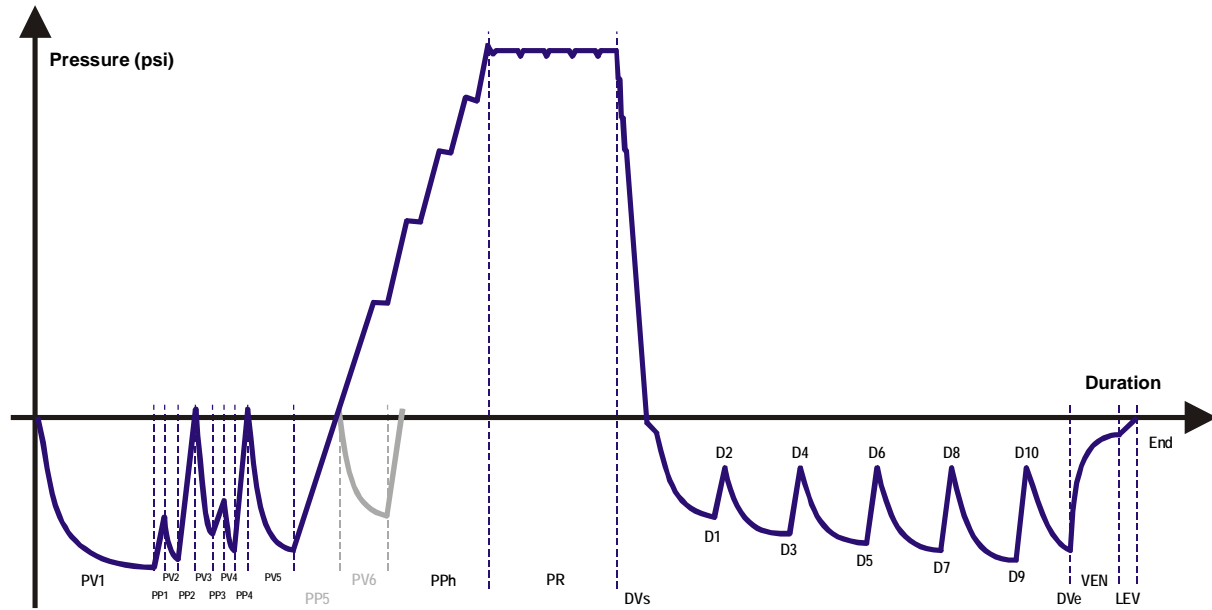
## Section 1 – About the Lisa Sterilizer

### Characteristics

- ▶ Developed, produced and tested according to the European Norm PrEN 13060 for small water steam sterilizers.
- ▶ Totally Class B cycles.
- ▶ Compact sterilizer, without any external tank or connections.
- ▶ Patented «2CS » pneumatic system :
  - Low water consumption: 7 to 12 oz/cycle (.2 to .35 liters/cycle).
  - 8 to 12 cycles without refilling or draining.
  - Quick cycles: 30 minutes (276°F/135.5°C-4 minutes).
  - 5 fractionated pre-vacuum.
  - Pulsed vacuum drying.
- ▶ Independent steam generator.
- ▶ Optimized energy management (0.5 kwh/cycle).  
Maximum absorbed power: 2100 W.
- ▶ Interactive user-friendly touchscreen.
- ▶ Simple to use and safe.
- ▶ Entirely controlled by microprocessor.  
Evolutionary software.
- ▶ Single piece stamped stainless-steel chamber.
- ▶ Reversible tray support: 5 trays horizontal or 3 cassettes horizontal or vertical.
- ▶ Optional printers.
- ▶ Refilling and draining possible during the cycle.
- ▶ Electric double door locking system and parallel positioning of the door gasket.
- ▶ Easy accessibility for service. Test functions available on the touchscreen.
- ▶ Warranty: Up to 2 years or 2000 cycles whichever comes first.

## Cycle Performance

<b>Power</b>	Design Type: Microprocessor-controlled steam sterilizer, (3) Class B cycles MB17 Power Requirements: Single Phase 230 VAC +/- 10% / 50-60 Hz / 10A Power Consumption: Maximum 2100 W Rated Current: 9.2A
<b>External Dimensions</b>	17.5 (W) x 16.1 (H) x 20.5 (D) (inches) 445 (W) x 410 (H) x 520(D) (mm)
Weight Empty	105.8 lb. / 48 kg
Operational Weight	108.0 lb. / 49 kg
<b>Noise Level</b>	
Average	38 dB
Maximum	53 dB
<b>Pressure Chamber</b>	
Capacity	18.0 quarts / 17 liters
Diameter	9.84 in. / 250 mm
Depth	13.77 in. / 350 mm
Maximum Pressure	34.8 psi / 2.4 bar
Maximum Temperature	280 °F / 138 °C
<b>Usable Chamber Space</b>	
Capacity	12.7 quarts / 12 liters
Dimensions	7.67 (W) x 8.07 (H) x 11.81 (D) (inches) 195 (W) x 205 (H) x 300 (D) (mm)
<b>Water Tanks</b>	
Main Capacity	3.7 quarts / 3.5 liters
Used Water Capacity	4.2 quarts / 4.0 liters
<b>Air Vent Filter</b>	0.3 µm
<b>External Connections</b>	The MB17 used water tank can be plumbed to automatically drain with on optional kit.
<b>Data Capture Devices</b>	Custom DP40 dot matrix printer



Fractionated pre-vacuum

Plateau time

Pulsed vacuum drying

**Legend:**

PV1..6 : Vacuum pulse

PP1..5 : Pressure pulse

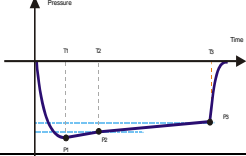
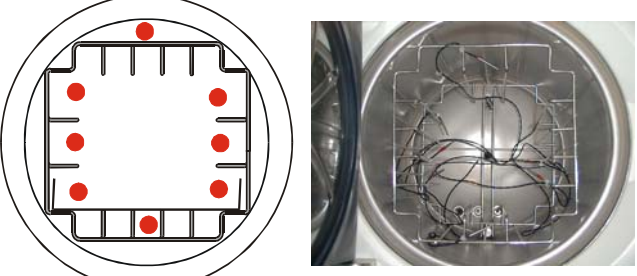
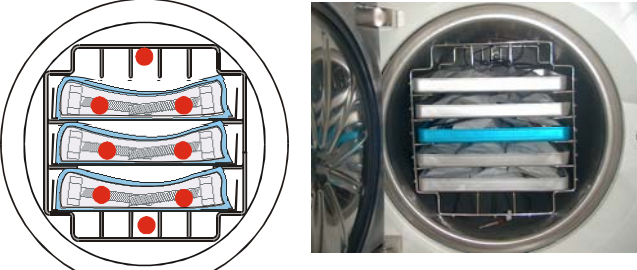
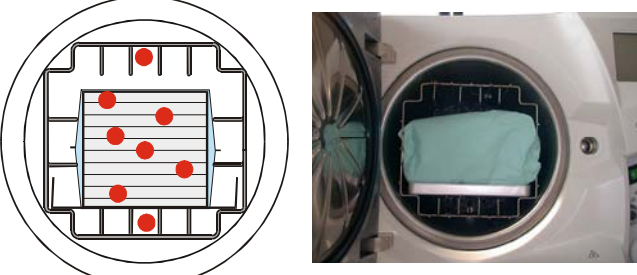
PPh : Pressure pulse and heating

PR : Process

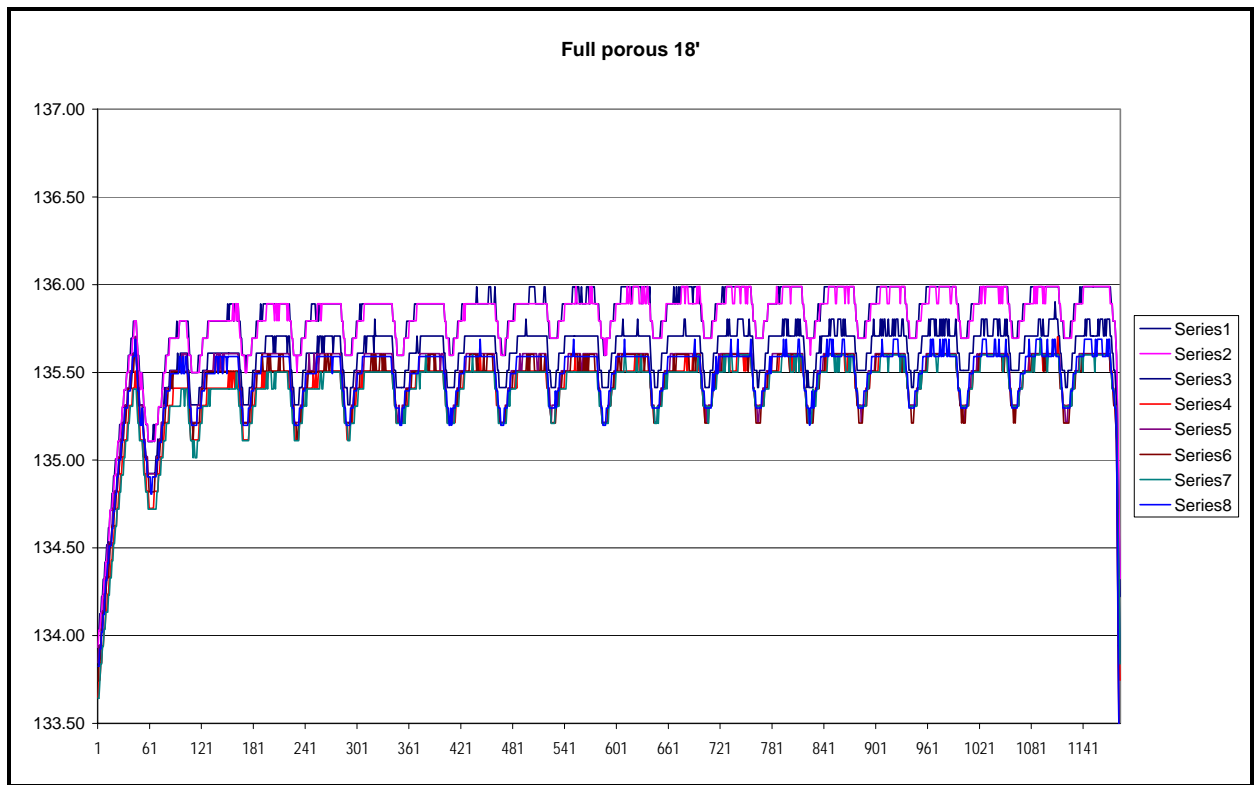
DV : Vacuum drying

VEN : Ventilation    LEV : Leveling

**Class B Test**

<p>Vacuum test (air leakage)</p>	<p><b>P3-P2 &lt; 0.019psi/min</b> <b>10 min</b> (p3 : pressure end/ p2 : pressure start )</p>	
<p>Dynamic Pressure Test</p>	<p>Pressure variation &lt; 145psi/ min (2.42psi/sec.)</p>	
<p>Empty chamber</p>		<p>Control of the saturated steam T°/Pressure correlation and in process bands</p>
<p>Full solid products Wrapped</p>		<p>Screw M12 x 100 wrapped = 9.9 lbs (4.5 kg) (Max mass declared)</p>
<p>Full porous load (textile) Wrapped</p>		<p>80% Usable space = 3.3 lbs (1.5 kg) (Max mass declared)</p>
<p>Dryness test Wrapped loads</p>	<p><b>Solid: <math>\frac{m2-m1}{m1} \times 100 &lt; 0,2\%</math></b> <b>Porous: <math>\frac{m2-m1}{m1} \times 100 &lt; 1\%</math></b> <b>m1</b> (m1 : mass start m2 : mass end )</p>	

### Recording Examples



### Drying

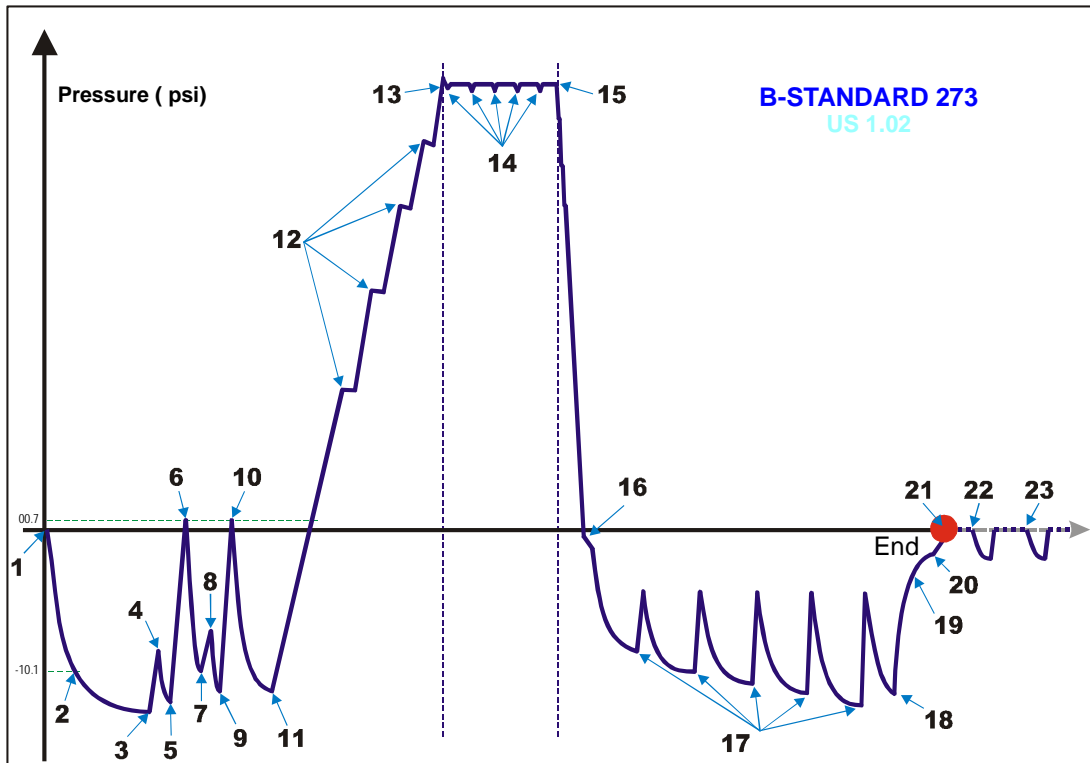
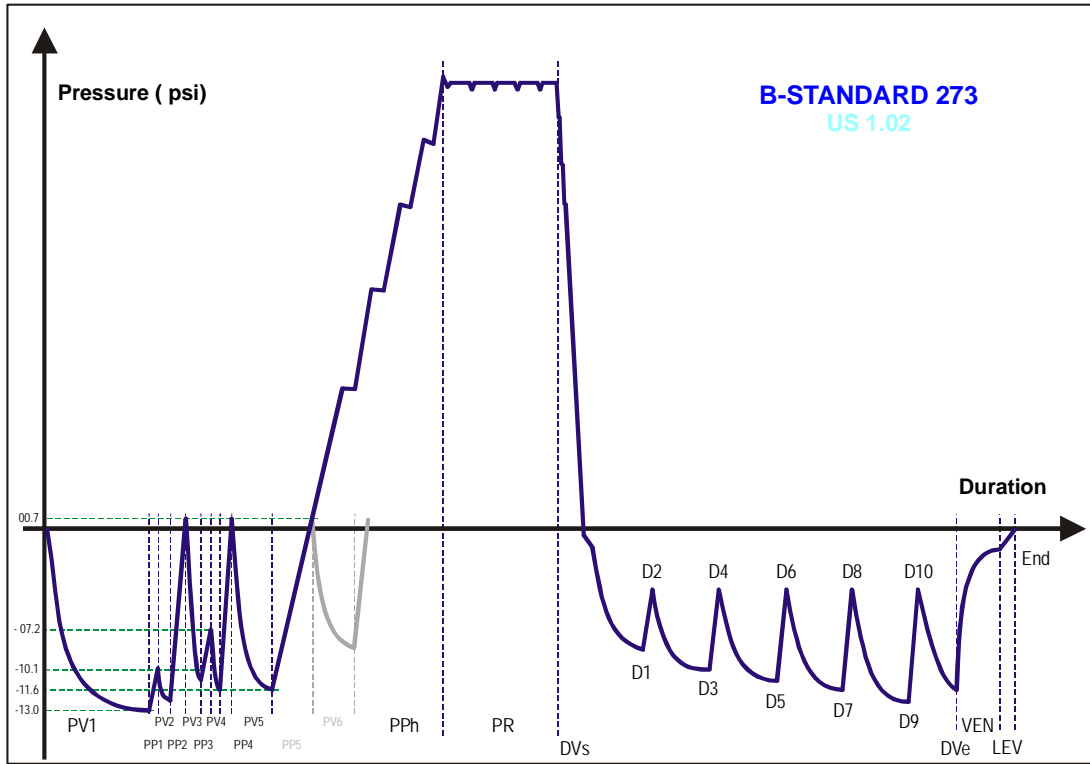


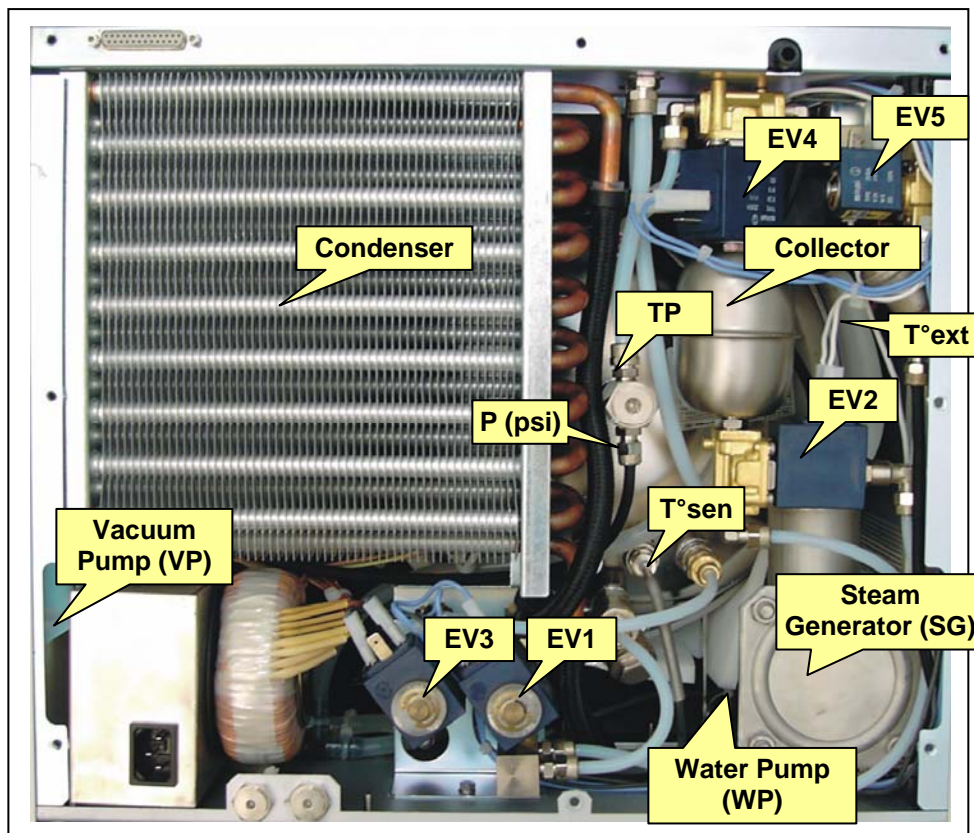
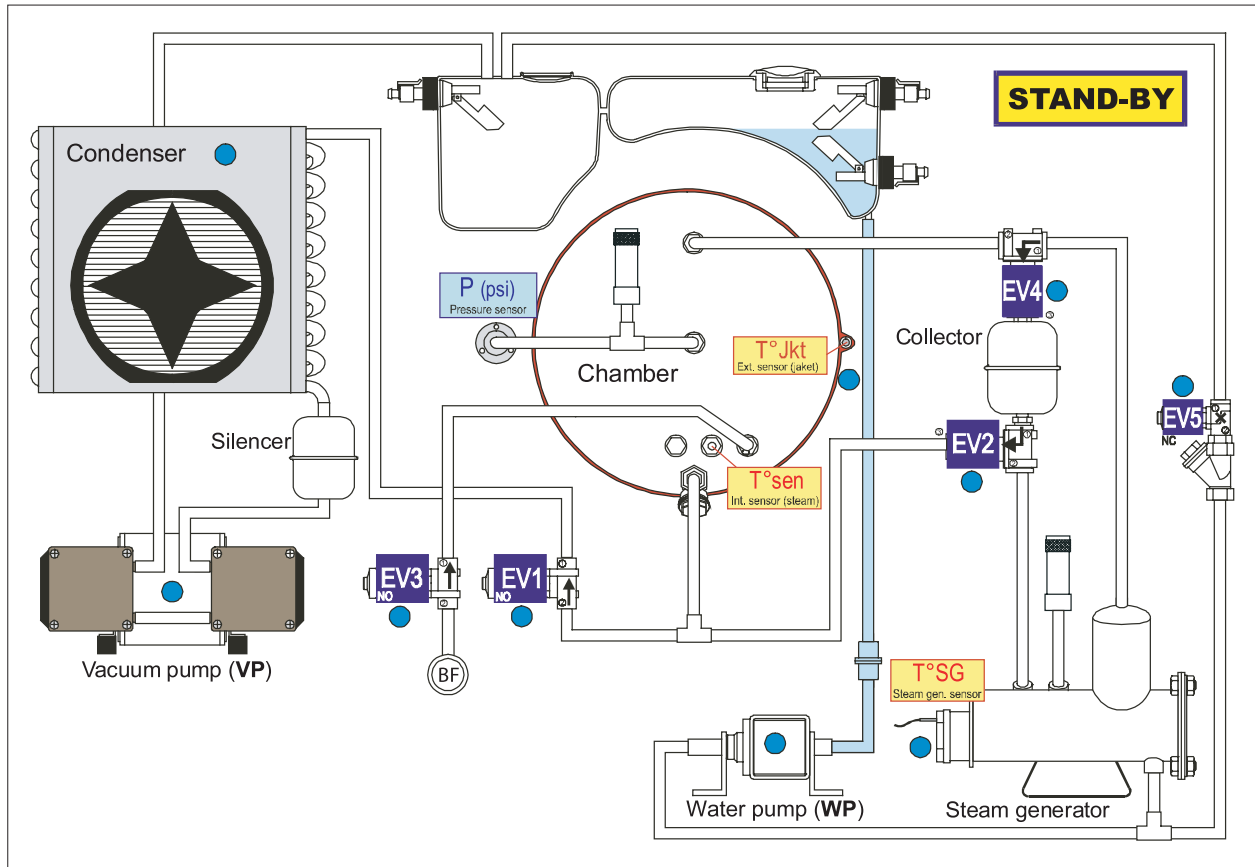
Weight Before Sterilization

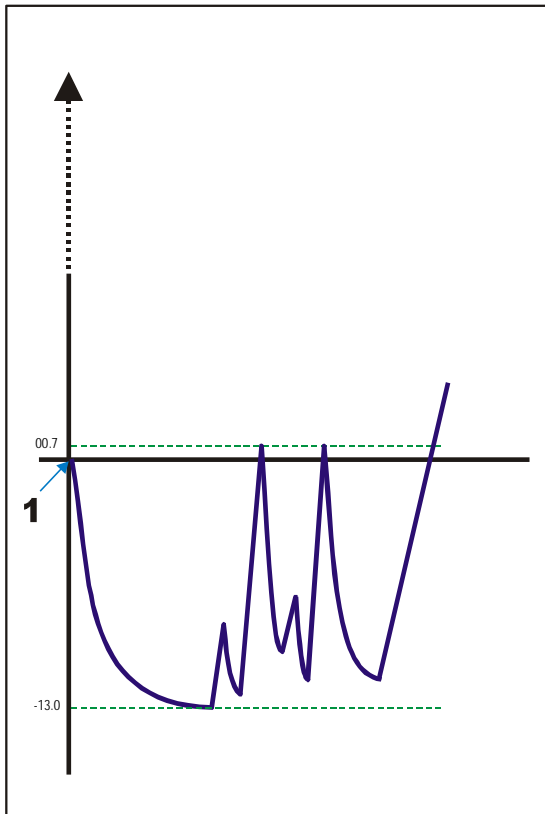
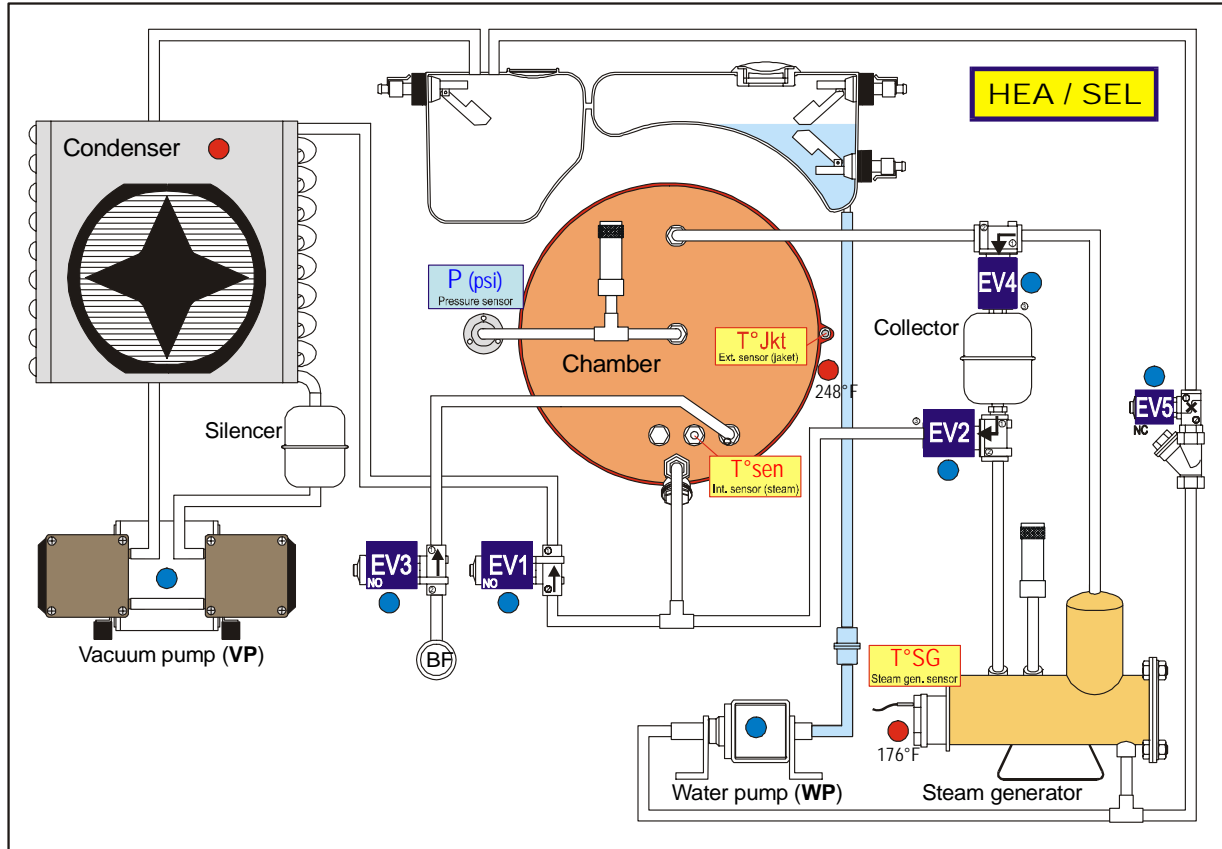


Weight After Sterilization

### Cycle Description







Stages	Actions	Comments
0	STERILIZER POWERED Condenser FAN ON Chamber ↗248°F Generator ↗176°F	PLEASE SELECT A CYCLE
Maxi. phase duration	After x minutes → automatic shut-off x : setting in "STAND-BY" menu to 30min. 2-4-6 hours or Off (disabled)	

Notes :

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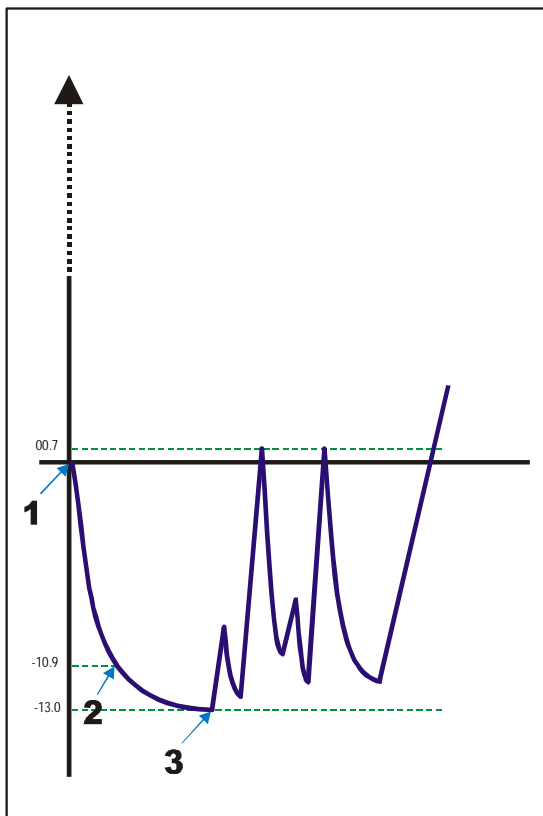
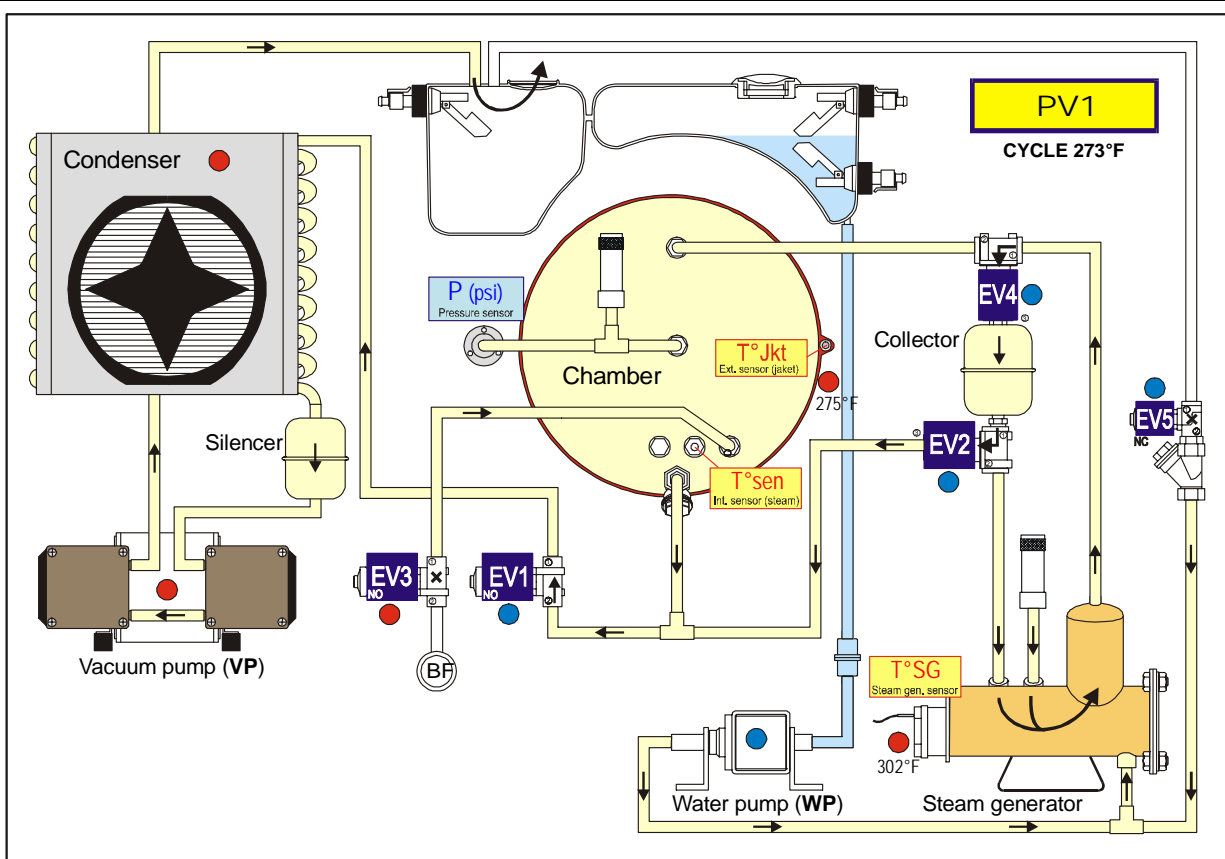
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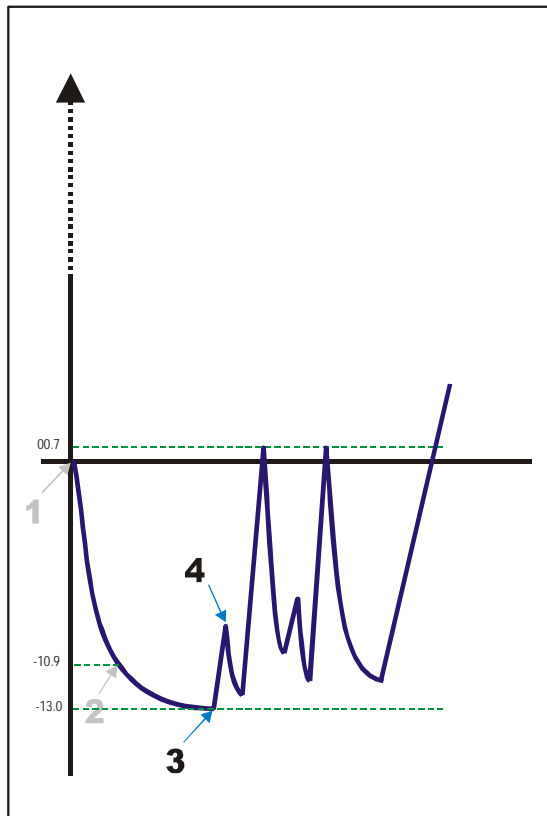
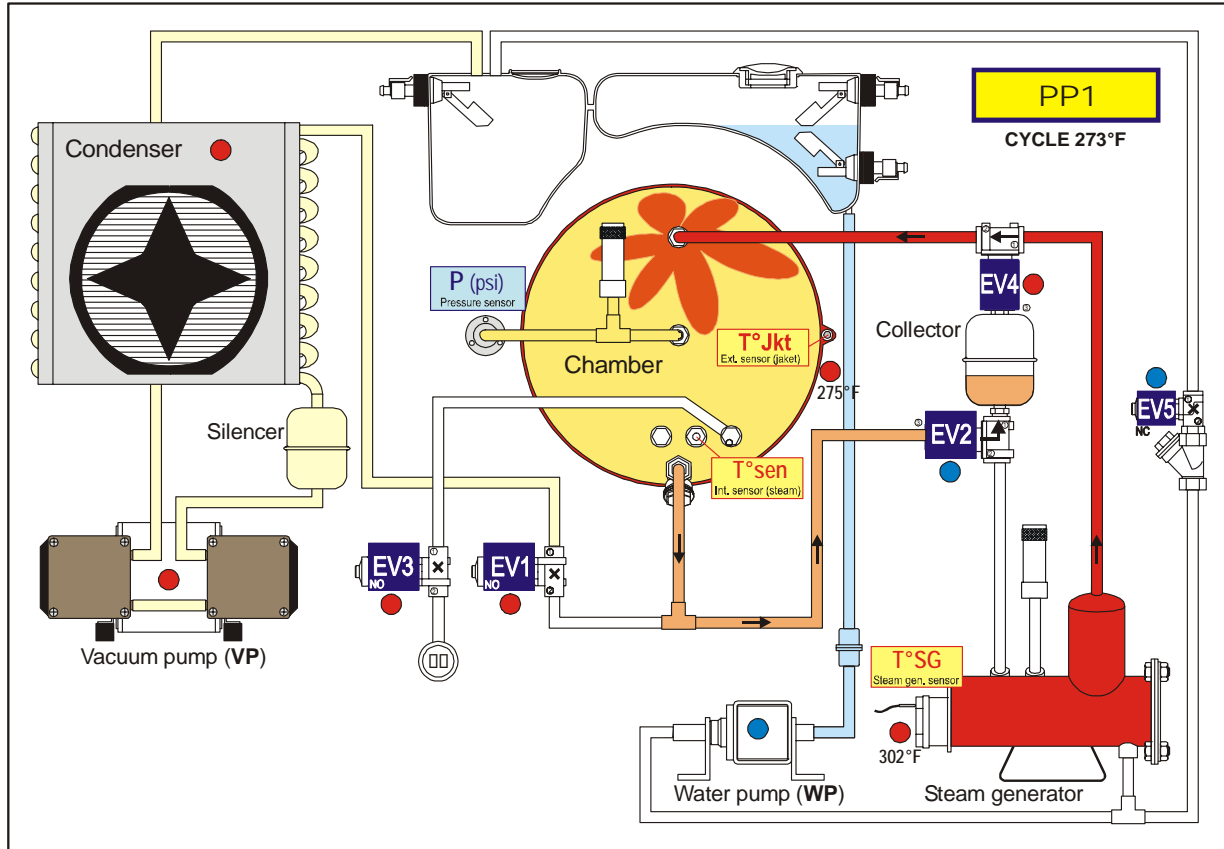


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Stages	Actions	Comments
1 Start	VP ON EV3 ON	Beginning of the fractionated pre-vacuum
2 P = -10.8 psi	EV2 ON WP ON → 34"	Water injection into steam generator
3 P = -12.3 psi AND Steam Gen. Temp. ≥ 280.4°F	EV1 ON EV4 ON EV2 OFF	↘ End of PV1 ↗ Start of PP1
Maxi. phase duration	Time out : 6'	

Notes : \_\_\_\_\_  
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Stages	Actions	Comments	
3	P = -12.3 psi <b>AND</b> Steam Gen. Temp. > 280.4°F	EV1 ON EV4 ON EV2 OFF	↘ End of PV1 ↗ Start of PP1
4	P = -10.1 psi	EV1 OFF EV4 OFF EV2 ON	↘ End of PP1 ↗ Start of PV2
<b>Maxi. phase duration</b>		Time out : 3'	

**Notes :**

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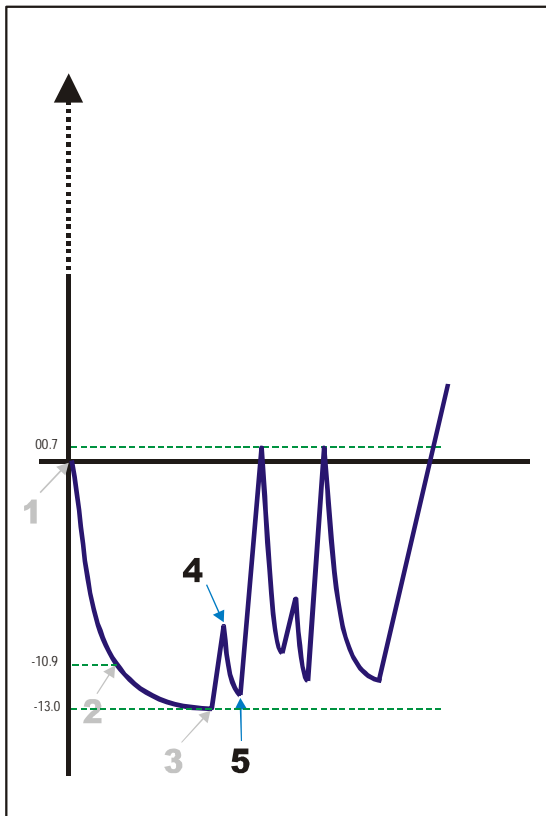
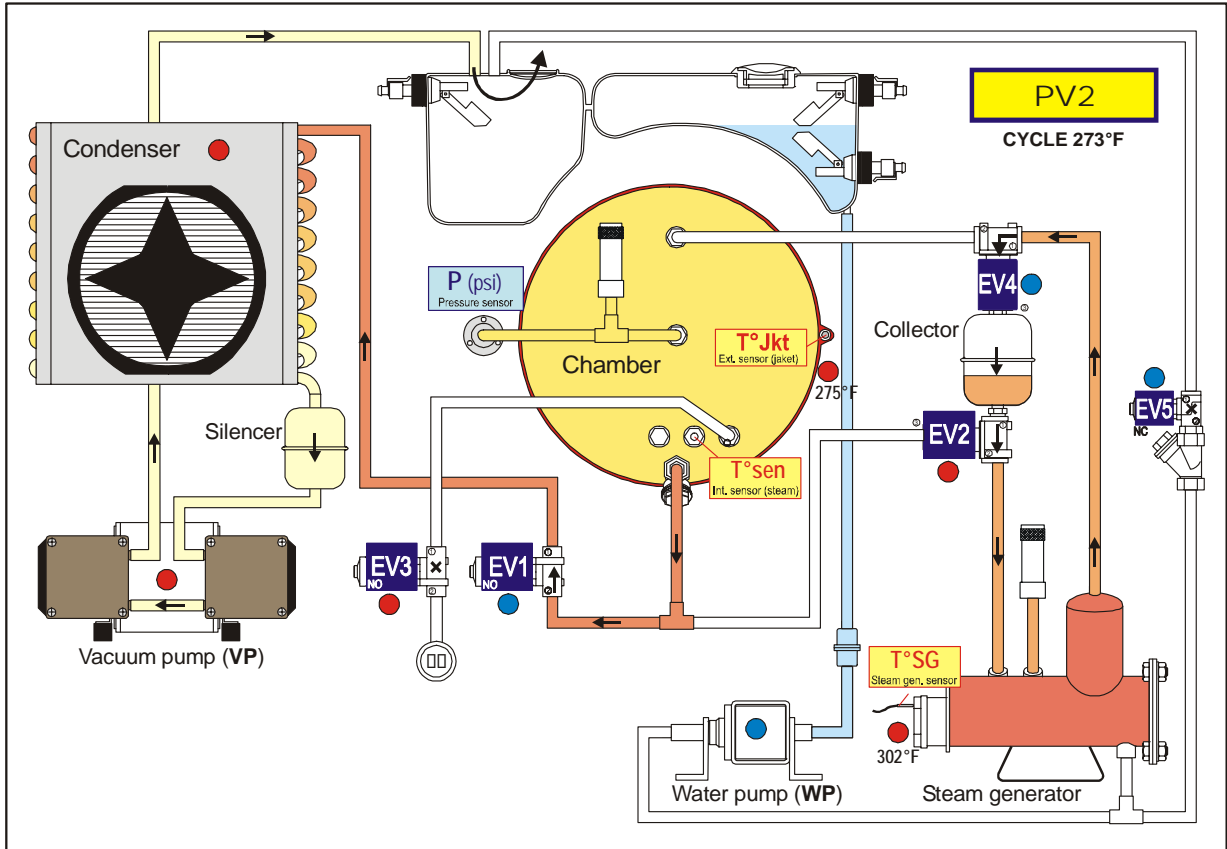
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Stages	Actions	Comments
4	P = -10.1 psi EV1 OFF EV4 OFF EV2 ON	↘ End of PP1 ↗ Start of PV2
5	P = -12.3 psi EV1 ON EV4 ON EV2 OFF	↘ End of PV2 ↗ Start of PP2
<b>Maxi. phase duration</b>		Time out : 6'

**Notes :**

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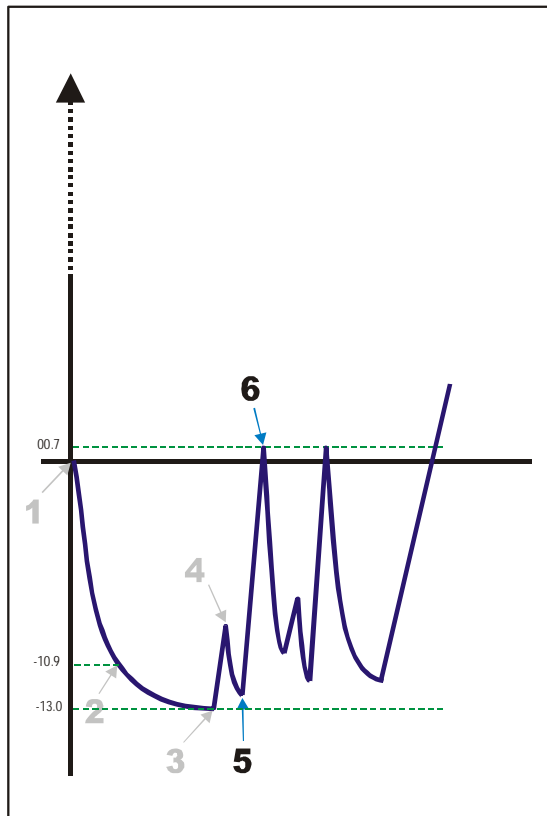
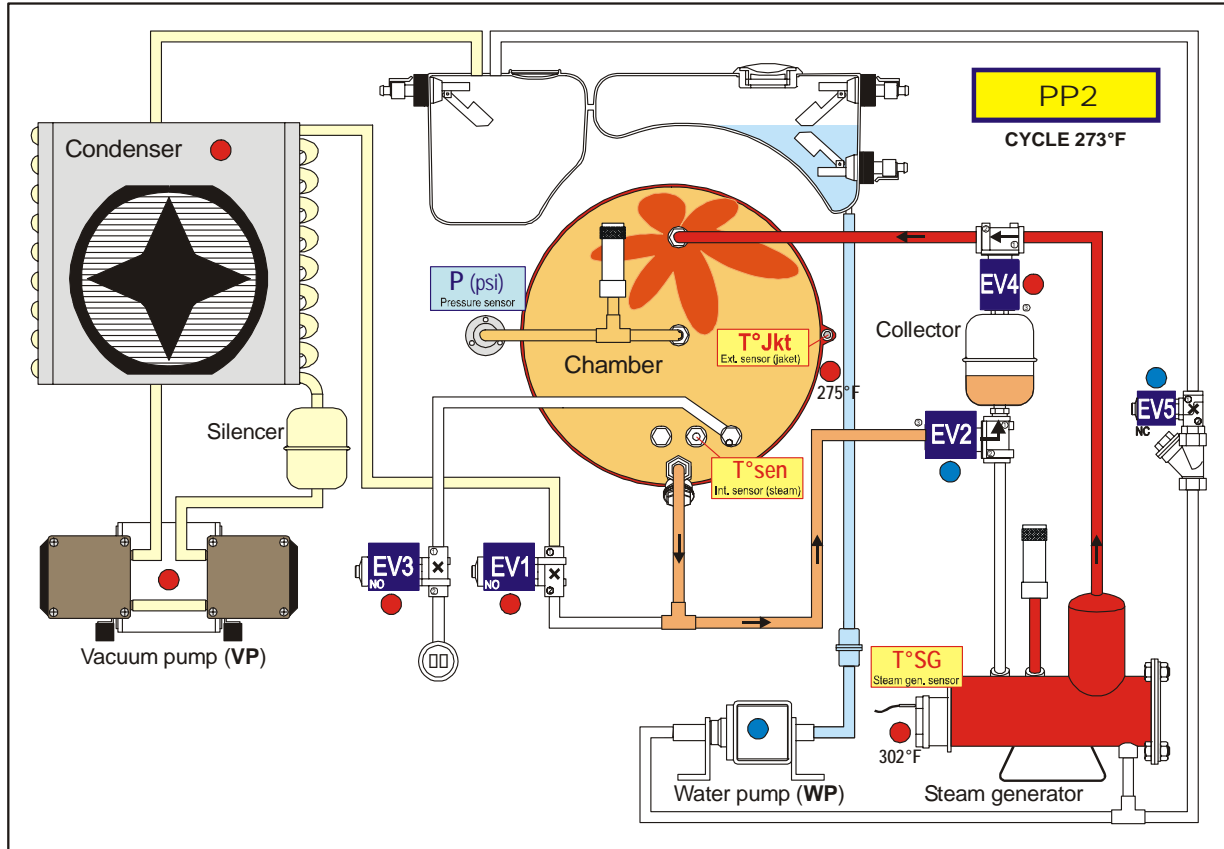
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Stages	Actions	Comments
5 P = -12.3 psi	EV1 ON EV4 ON EV2 OFF	↘ End of PV2 ↗ Start of PP2
6 P = 0.7 psi	EV1 OFF EV4 OFF EV2 ON	↘ End of PP2 ↗ Start of PV3
<b>Maxi. phase duration</b>	Time out : 6'	

**Notes :**

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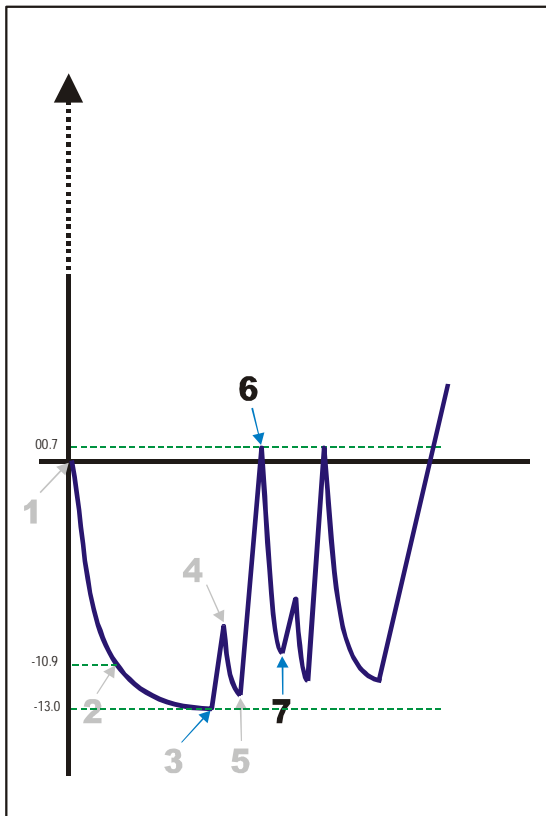
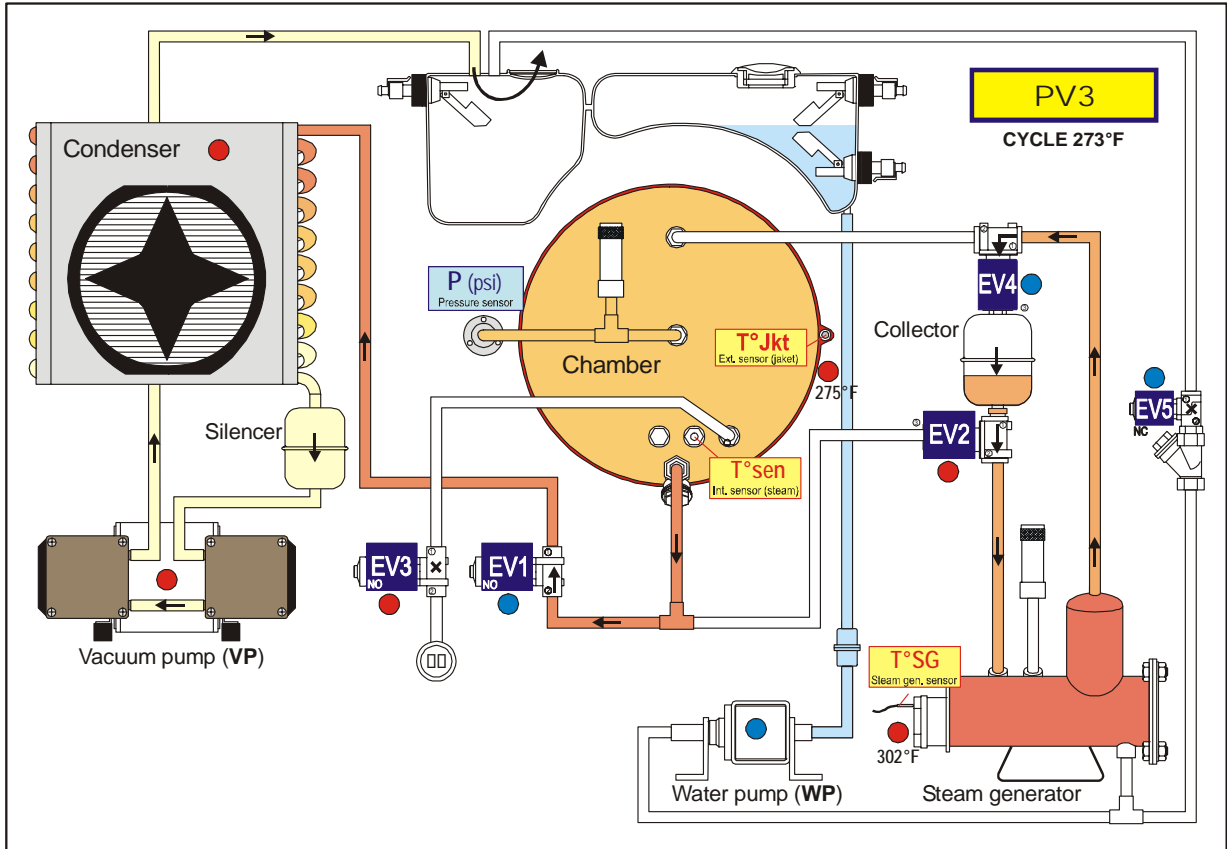
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Stages	Actions	Comments
6	P = 0.7 psi EV1 OFF EV4 OFF EV2 ON	↘ End of PP2 ↗ Start of PV3
7	P = -10.8 psi EV1 ON EV4 ON EV2 OFF	↘ End of PV3 ↗ Start of PP3
<b>Maxi. phase duration</b>		Time out : 6'

**Notes :**

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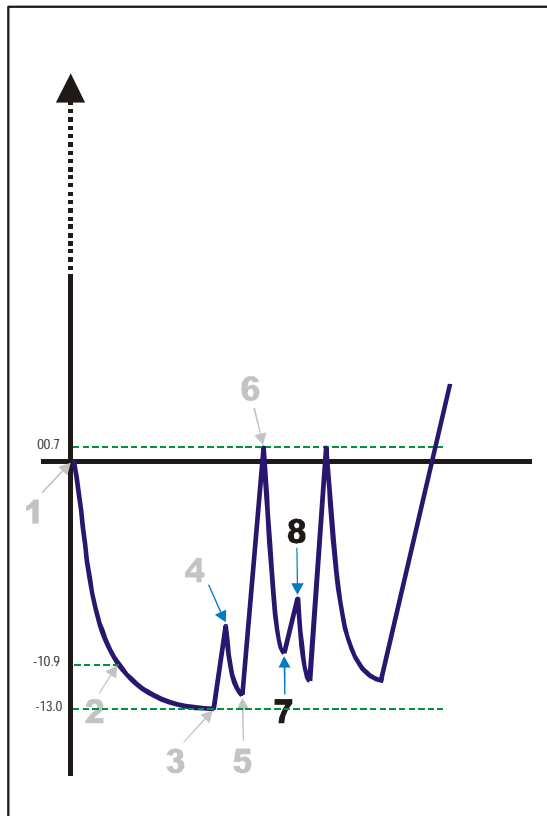
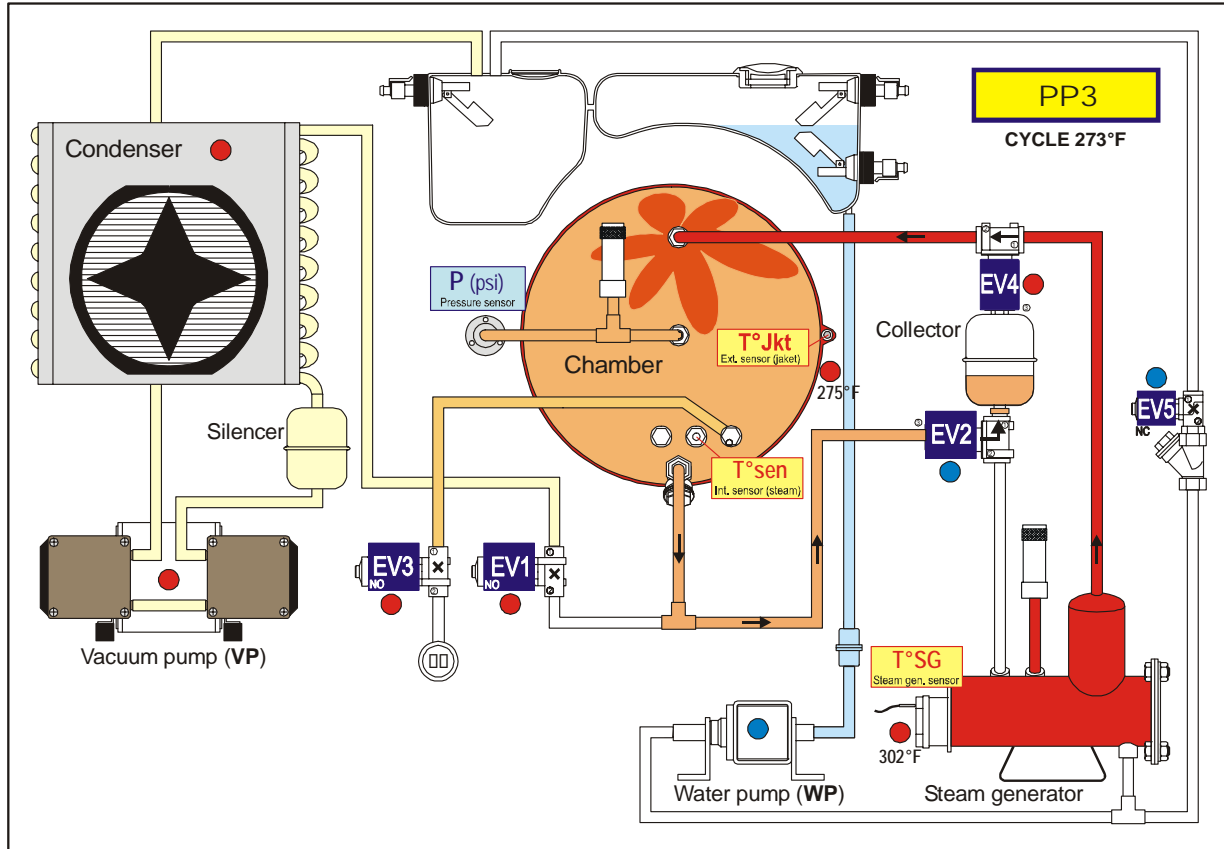
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Stages	Actions	Comments
7 P = -10.8 psi	EV1 ON EV4 ON EV2 OFF	↘ End of PV3 ↗ Start of PP3
8 P = -7.2 psi	EV1 OFF EV4 OFF EV2 ON	↘ End of PP3 ↗ Start of PV4
<b>Maxi. phase duration</b>		Time out : 6'

**Notes :**

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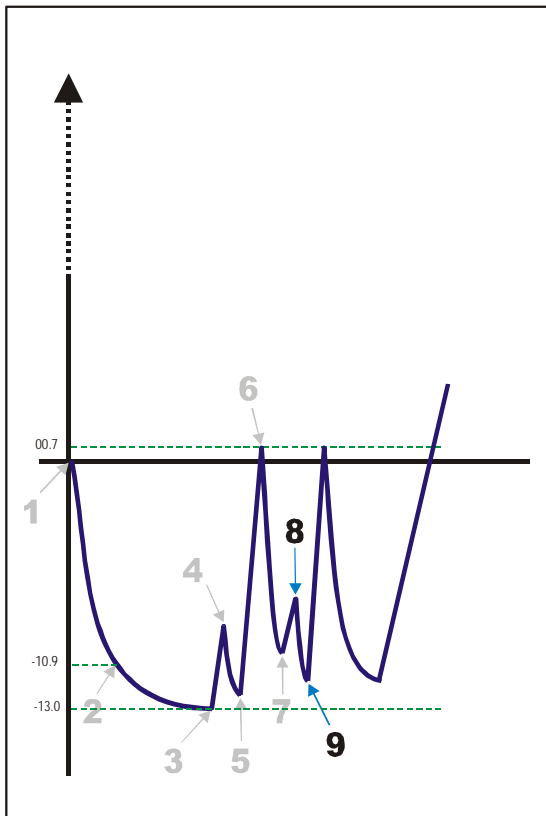
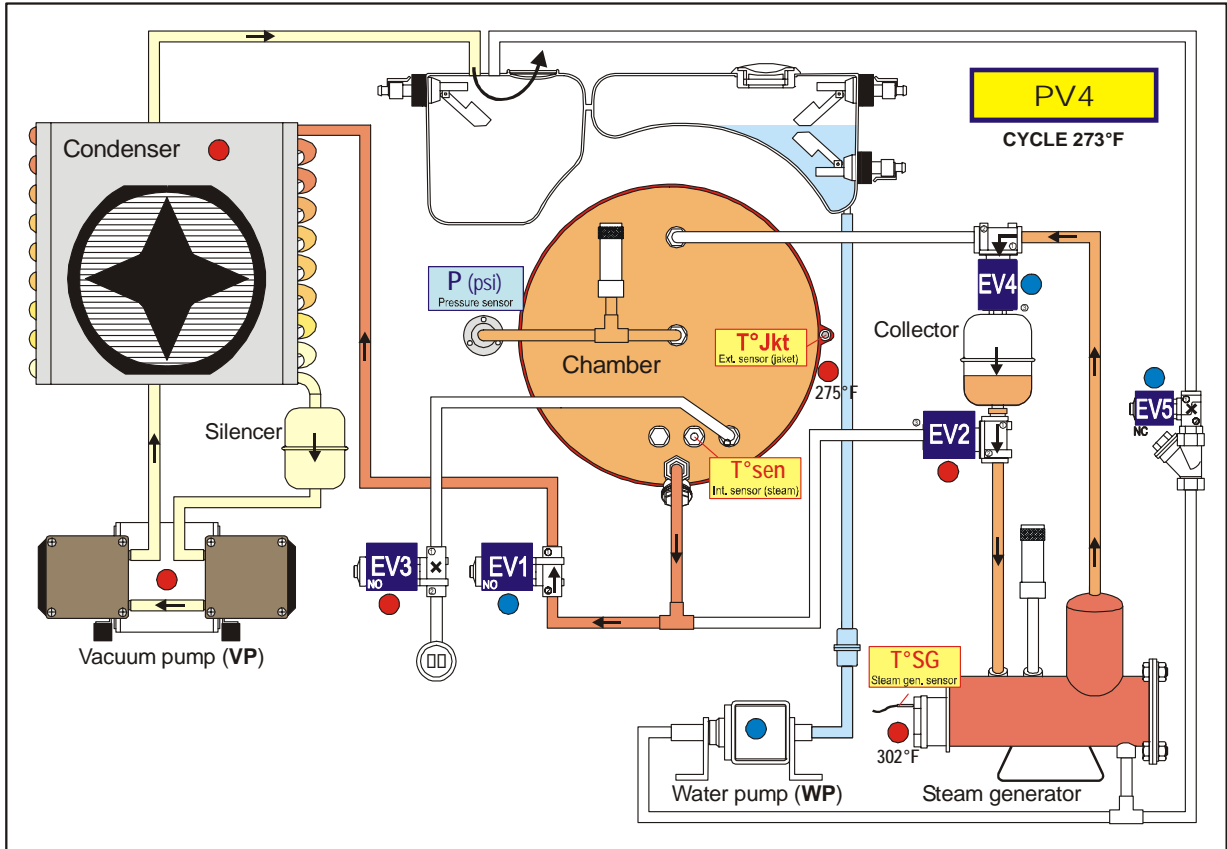
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Stages	Actions	Comments
8 P = -7.2 psi	EV1 OFF EV4 OFF EV2 ON	↘ End of PP3 ↗ Start of PV4
9 P = -11.6 psi	EV1 ON EV4 ON EV2 OFF	↘ End of PV4 ↗ Start of PP5
<b>Maxi. phase duration</b>		Time out : 6'

**Notes :**

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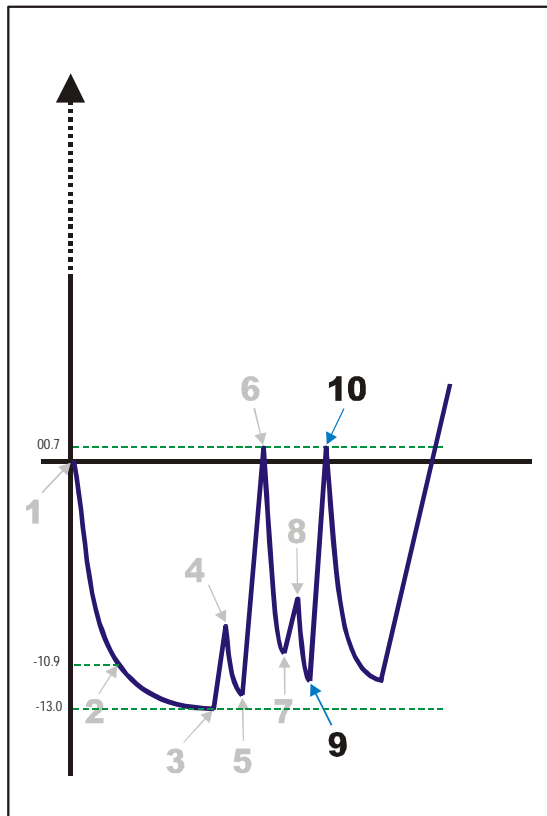
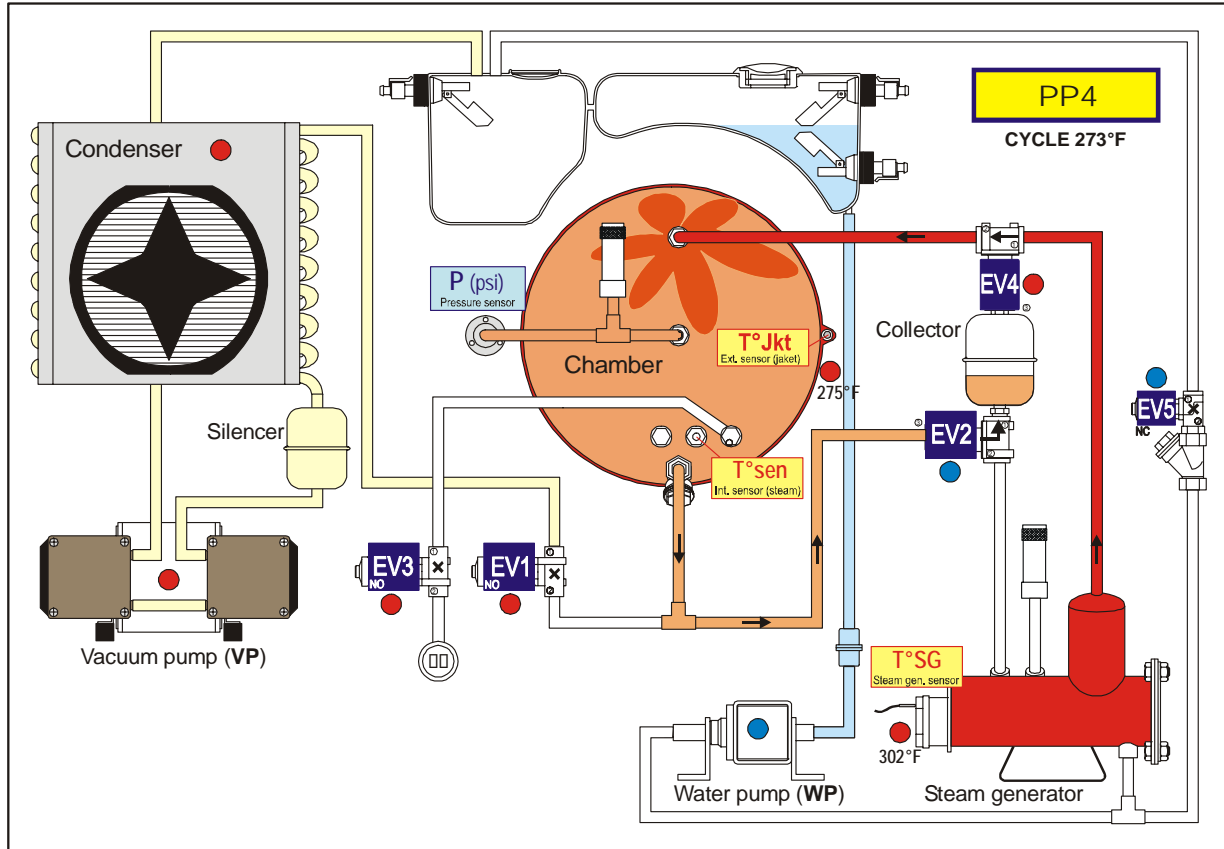
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Stages	Actions	Comments
9	P = -11.6 psi EV1 ON EV4 ON EV2 OFF	↘ End of PV4 ↗ Start of PP5
10	P = 0.7 psi EV1 OFF EV4 OFF EV2 ON	↘ End of PP5 ↗ Start of PV5
<b>Maxi. phase duration</b>		Time out : 6'

**Notes :**

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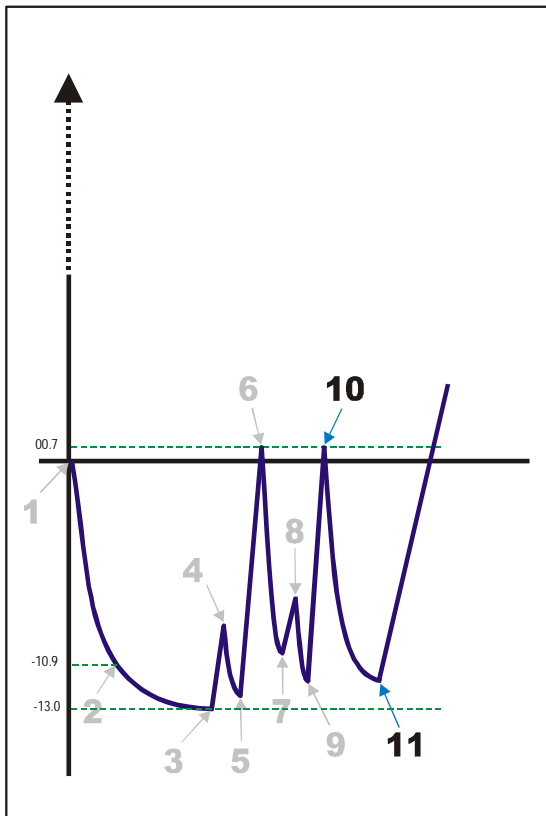
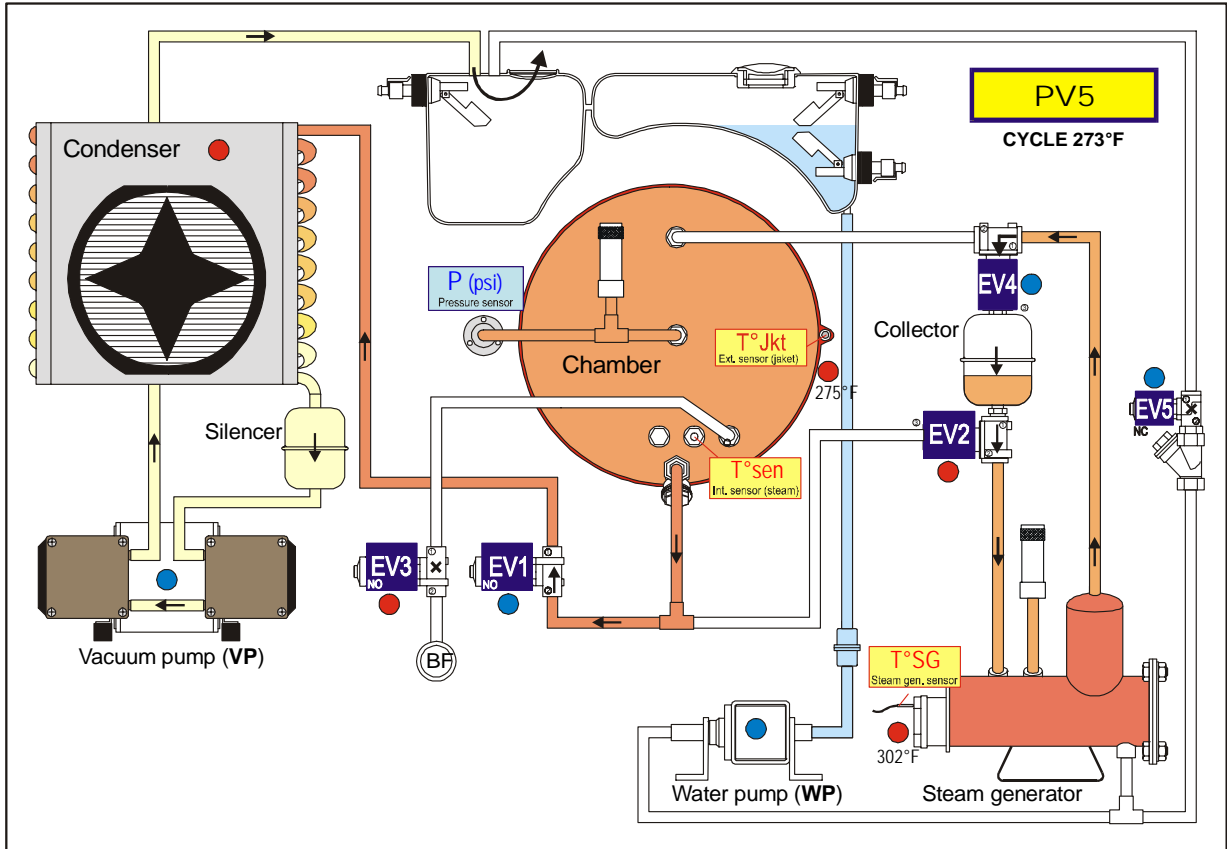
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Stages	Actions	Comments
10 P = 0.73 psi	EV1 OFF EV4 OFF EV2 ON	↘ End of PP4 ↗ Start of PV5
11 P = -11.6 psi	VP OFF EV1 ON EV4 ON EV2 OFF	↘ End of PV5 and fraction. vacuum ↗ Start of PPh
Maxi. phase duration		Time out : 6'

Notes :

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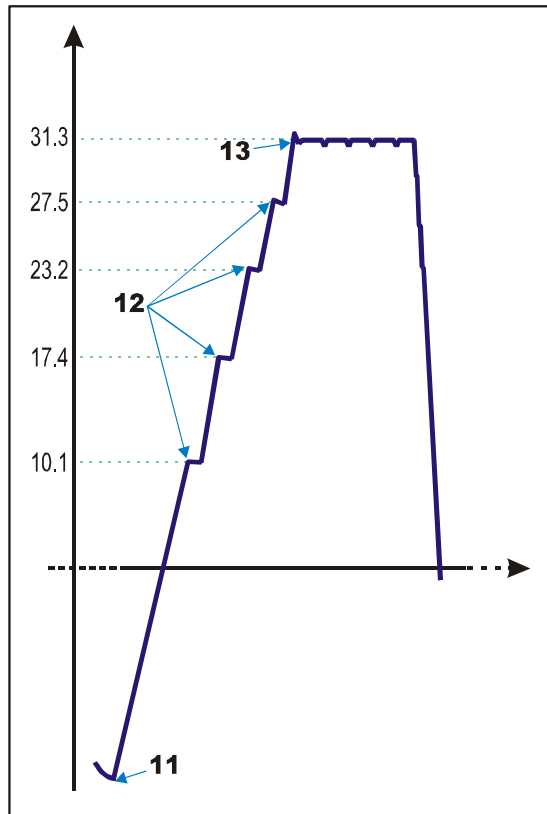
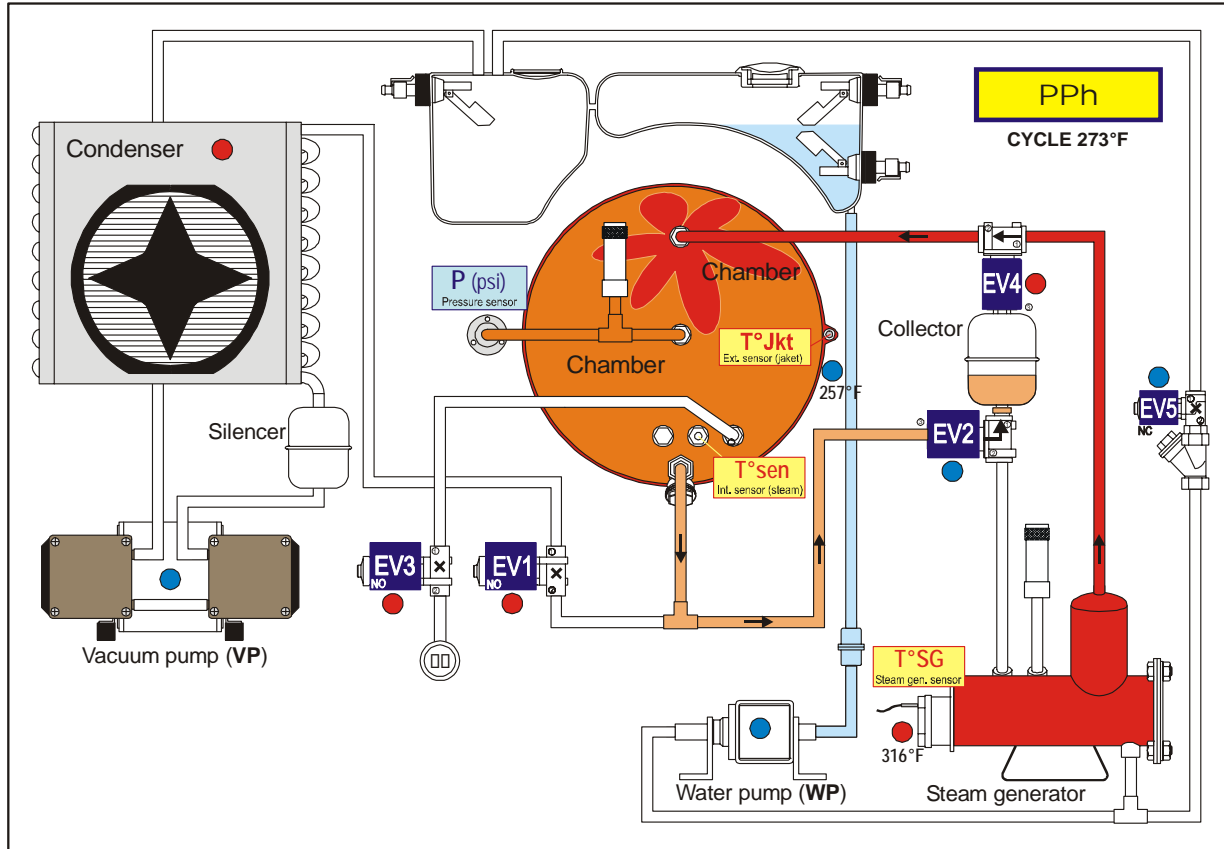
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Stages	Actions	Comments
11 P = -11.6 psi	VP OFF EV1 ON EV4 ON EV2 OFF	↘ End of PV5 and fraction. vacuum ↗ Start of PPh
12 P = 10.1 psi P = 17.4 psi P = 23.2 psi P = 27.5 psi	EV4 OFF for 15" EV2 ON for 15"	<b>2CS activated :</b> Coll. condensation discharged into the steam generator
13 P = 31.3 psi	Steam Generator powered/regulated to keep P=31.3 psi	↘ End of PPh ↗ Start of PR Holding time
<b>Maxi. phase duration</b>		20 min. (↗ Alarm A10 if more)

**Notes :**

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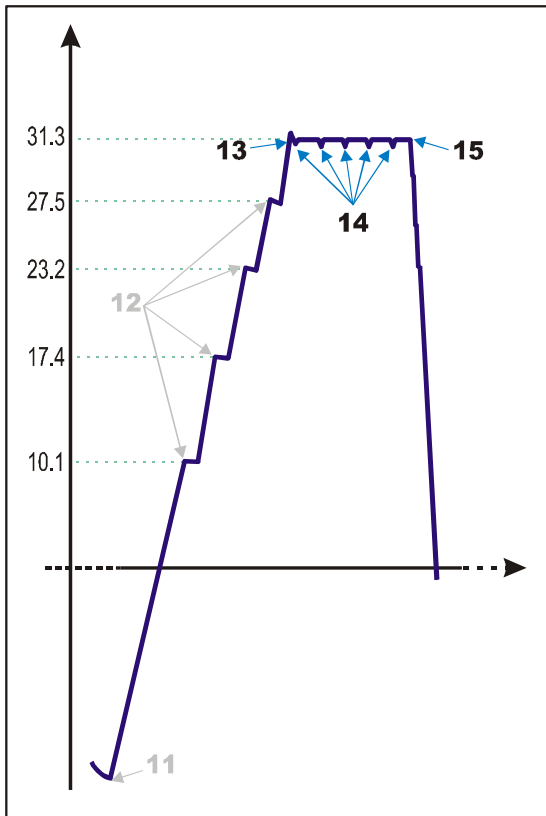
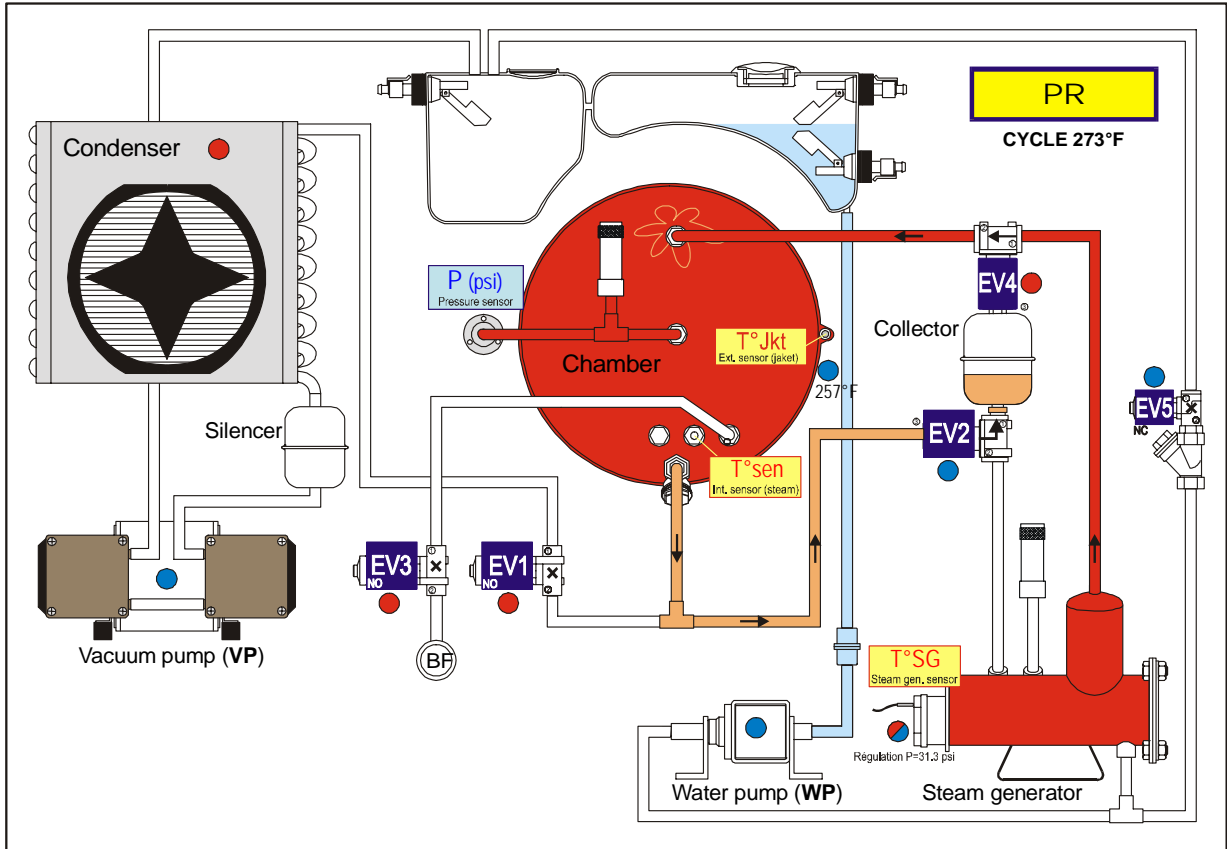
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Stages	Actions	Comments
13 P = 31.3 psi	Steam Generator powered/regulated to keep P=31.3 psi	↘ End of PPh ↗ Start of PR Holding time
14 Every 50 sec. IF P > 30.9 psi	EV4 OFF for 6" EV2 ON for 6"	2CS activated : Coll. condensation discharged into the steam generator
15 Holding time = 4 minute	VP ON EV1 OFF EV4 OFF EV2 ON	↘ End of PR ↗ Start of DV Drying phase

Notes :

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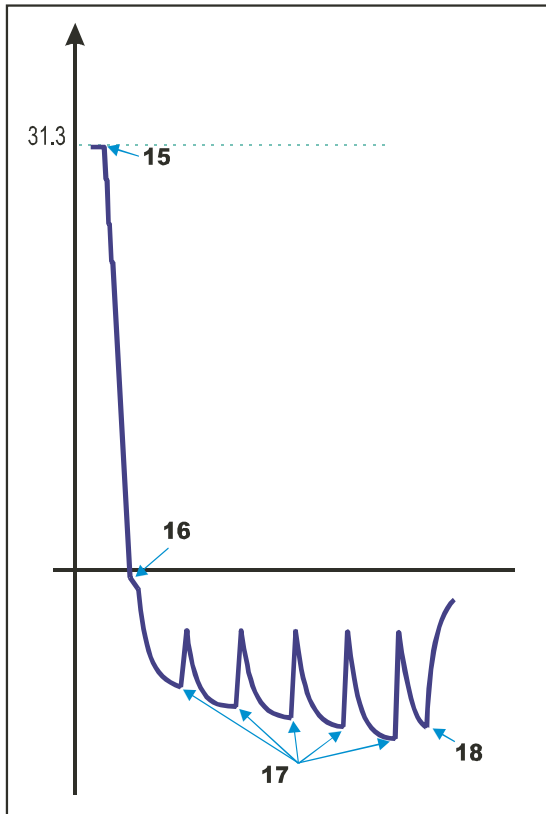
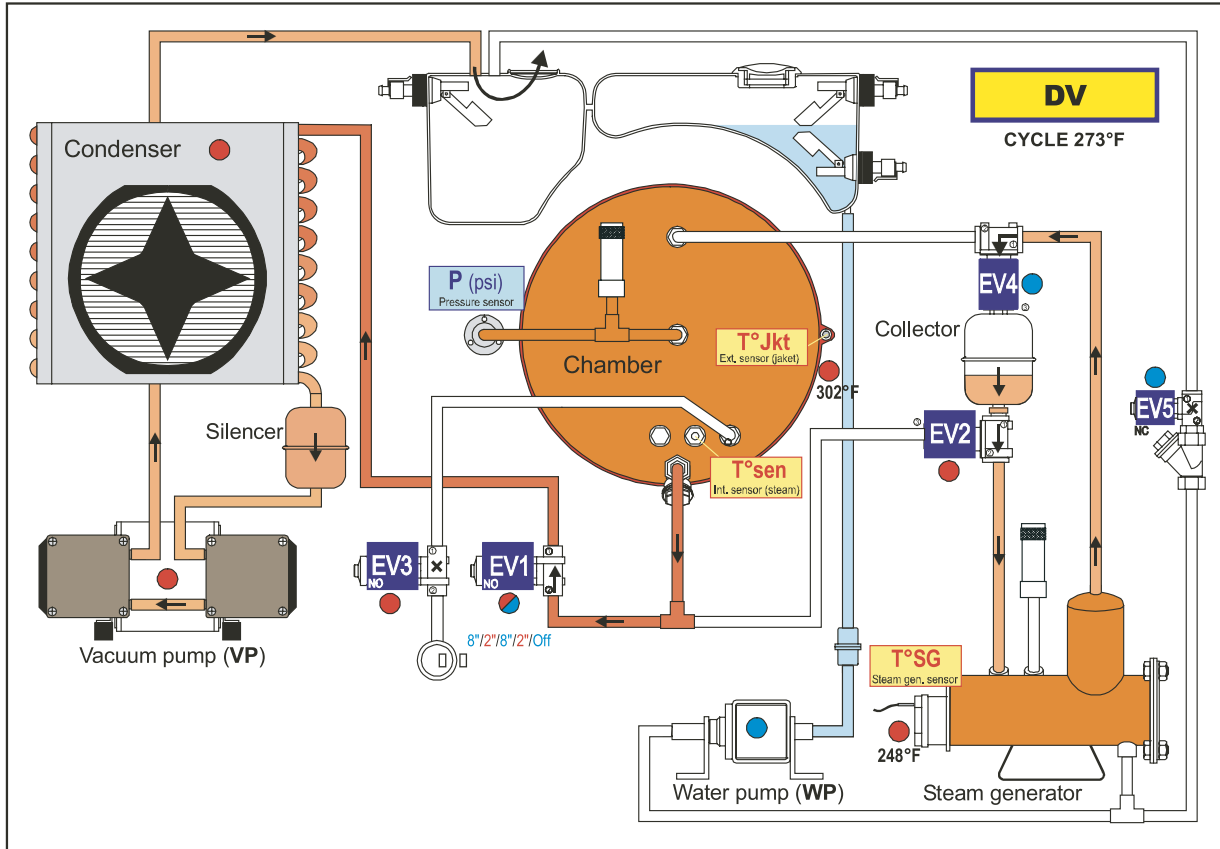
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Stages	Actions	Comments
15	VP ON EV1 OFF EV4 OFF EV2 ON	↘ End of PR ↗ Start of DV Vacuum drying
16	EV3 OFF for 20"	Condenser drained
17	Every 3min. EV3 OFF for 10"	Pulsed drying
18	EV3 OFF EV5 ON	↘ End of DV ↗ Start of VEN Ventilation

**Notes :**

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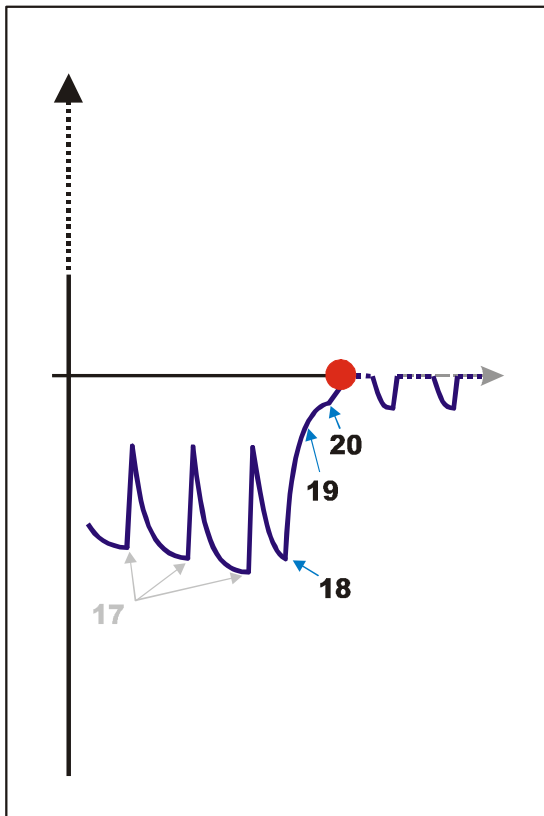
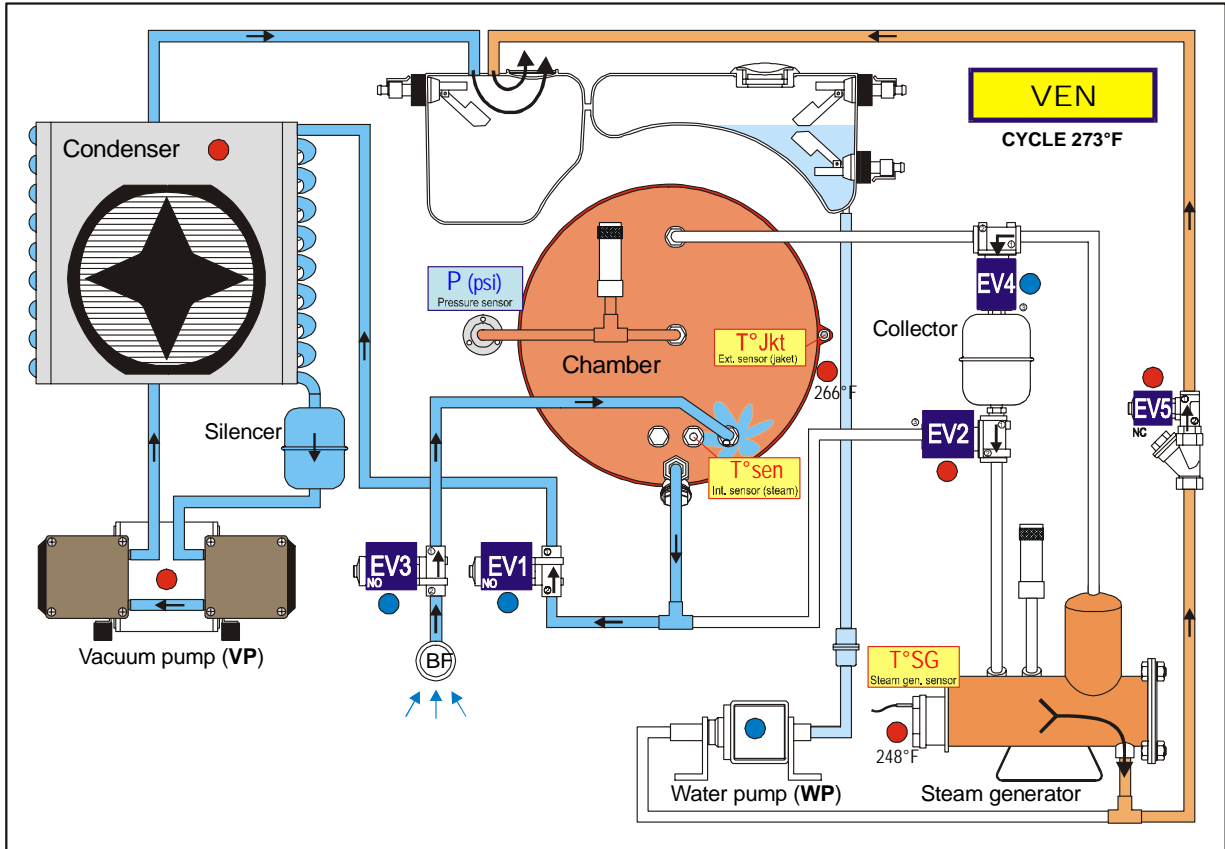
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Stages	Actions	Comments
18 DV duration = 14 minutes	EV3 OFF EV5 ON	↘ End of DV ↗ Start of VEN Ventilation
19 VEN duration = 25 sec.	EV5 OFF EV2 OFF	Vacuum in the steam generator
20 VEN duration = 40 sec.	VP OFF	↘ End of VEN ↗ Start of LEV Levelling

Notes :

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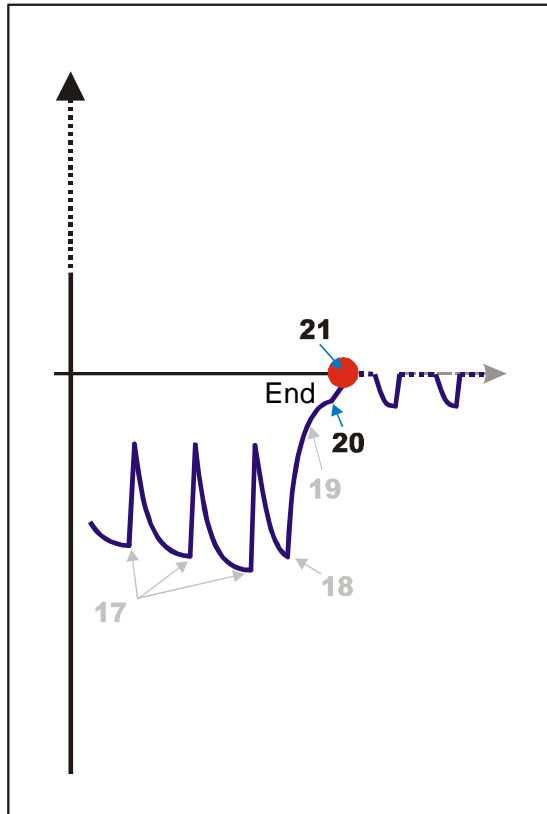
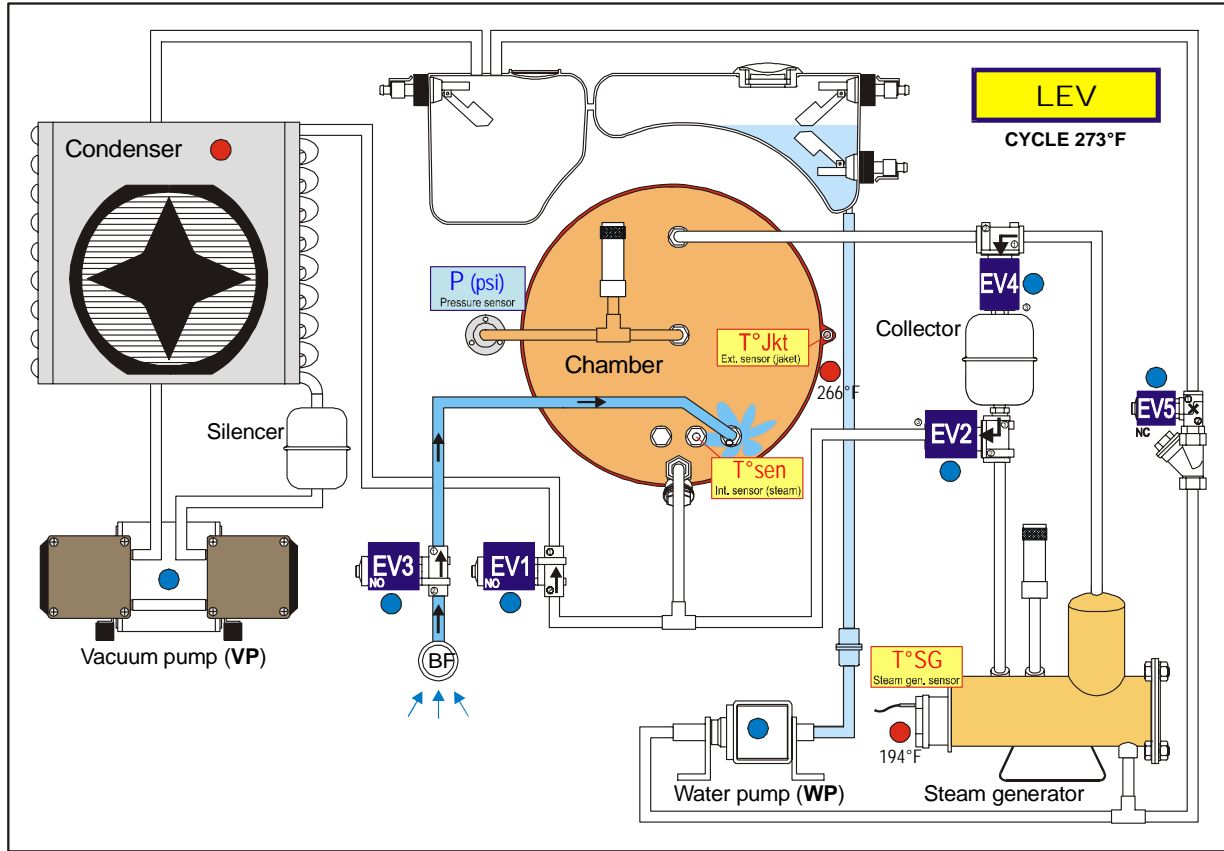
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Stages	Actions	Comments
20	VEN duration = 40 sec. VP OFF	↘ End of VEN ↗ Start of LEV Levelling
21	LEV duration = 30 sec. Acoustic signal	End of the cycle

Notes :

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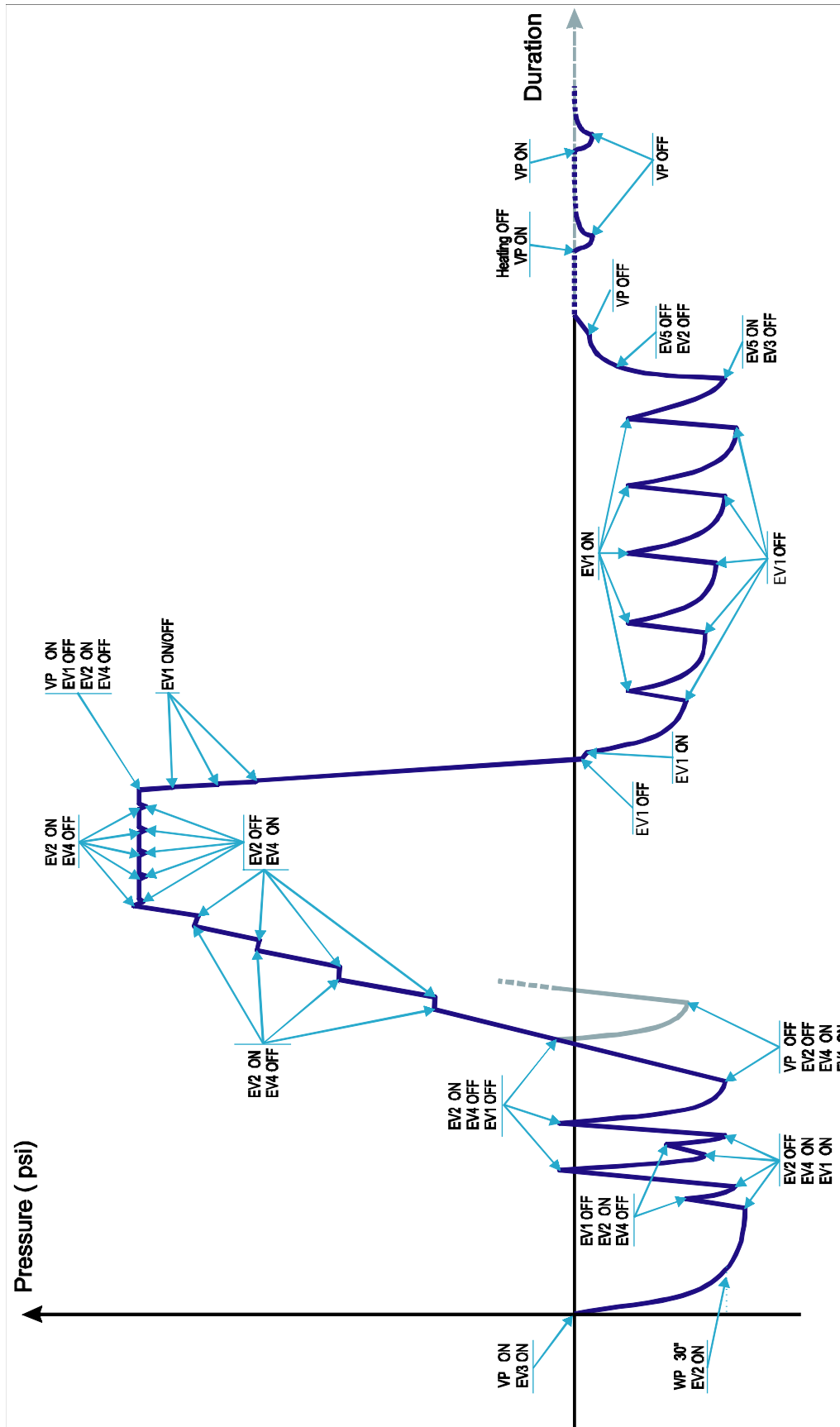
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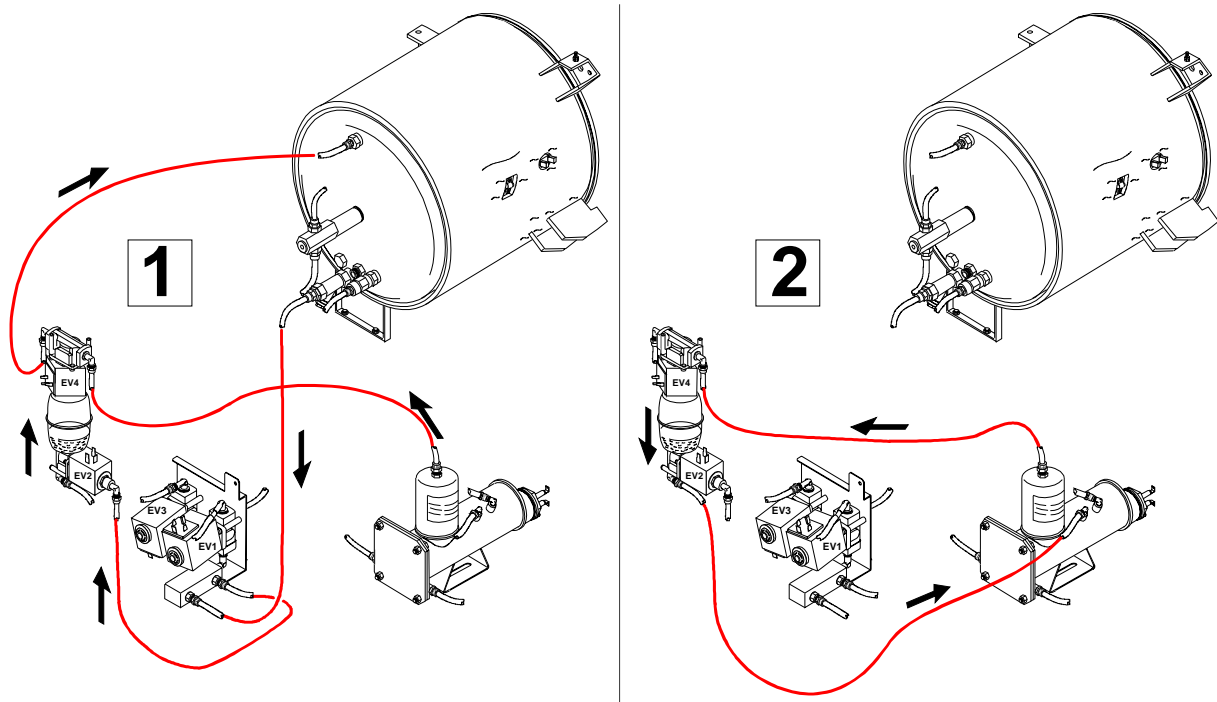
**2CS System –  
Condensation  
Collecting  
System**

This system operates during various phases of the cycle:

- ▶ At every pre-vacuum pp/pv phase change.
- ▶ During pph ( at 10.1, 17.4, 23.2 and 27.5 psi).
- ▶ During the sterilization process (every 50 seconds).

Condensed steam continuously flows from the sterilization chamber (1 below) to the condensation collector, then returns to the steam generator (2 below) at the above mentioned phases to be re-vaporized.

Check the system is operating correctly by watching the condensed steam circulate through the transparent Teflon tubing.



**Technical Specifications**

Power Requirements	Single phase 230 VAC +/- 10% - 50/60Hz - 10A
<b>Sterilizer:</b>	
- Working temperature/Humidity	50°- 104°F / 0-90% 10°- 40°C / 0-90%
- Storage temperature/Humidity (empty)	-4°- 140°F / 0-90% -20°- 60°C / 0-90%
- Minimum atmospheric pressure	7.25 psi (0.5 bar)
- Nominal voltage	230 V
- Maximum absorbed power	2100 W
- Maximum current	9.2 A
- Dimensions overall	W: 17.5 / H: 16.1 / D: 20.5 (in) W: 445 / H: 410 / D: 520 (mm)
- Maximum space required	W: 19.1 / H: 18.1 / D: 22.4 (in) W: 485 / H: 460 / D: 570 (mm)
- Clutter of the door movement	W: 14.2 / H: 15.8 / D: 14.2 (in) W: 360 / H: 400 / D: 360 (mm)
- Weight empty	106 lb. (49 kg)
- Max. mass in working condition fully loaded	140N/foot (129.4 N/m <sup>2</sup> )
- Maximum heat output	3000 KJ/hr
- Maximum noise level	< 53 dB
<b>Steam generator:</b>	
- Power/Voltage	1700 W/230 VAC
- Max. pressure/Max. temperature	58 psi/302°F (4.0 bar/150°C)
- Safety overpressure valve	72.5 psi (5.0 bar)
<b>Sterilization chamber:</b>	
- Power/Voltage	1000 W/230 VAC
- Maximum pressure/Max. temperature	34.8 psi/280°F (2.4 bar/138°C)
- Safety overpressure valve	36.3 psi (2.5 bar)
- Total volume	17 liters (18 qt.) Dia.: 9.8 in (250 mm)/Depth: 13.8 in (350 mm)
- Usable space (identical for all cycles)	12.7 quarts W: 7.67/H: 8.07/D: 11.81 (in) 12 liters W: 195/H: 205/D: 300 (mm)
- Filter	0.3 µm
<b>Distilled water (or demineralized):</b>	
- Water quality	Conform to the 13060-1 annex E
- Min./Max. consumption (full porous load)	7 to 12 oz (0.2 to 0.35 liter)
- Double tank/Autonomy	Min 8 cycles (full porous load)
Connections	Parallel printer port
Miscellaneous	Fully micro-processor driven and controlled touchscreen Mains filter/2KV over tension filter Programmable stand-by mode

## Technical Specifications (continued)

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STERILIZER CLASS B conforms with the following directives and norms :		
93/42/EEC	Medical devices	
PrEN 13060-1	(11/97)	Small steam sterilizer - General requirements. Type and work tests.
PrEN 13060-2	(11/97)	Small steam sterilizer - Particular requirements for B type.
EN 61010-1	(09/94)	Laboratory equipment - Safety requirements.
EN 61010-2-041	(08/97)	Laboratory equipment - Specific instructions for steam sterilizer.
EN 50081-2	(06/97)	Electromagnetic compatibility - Emission.
EN 50082-2	(06/97)	Electromagnetic compatibility - Immunity.
Chamber		Development and testing conform to pressure vessel regulations.
Steam generator		Development and testing conform to steam generator regulations.

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