



STANDARD OPERATING PROCEDURE

SOP NUMBER FSN-003-01	SOP TITLE OPERATING PROCEDURE FOR SHANGAI SANSHEN, 24L, PORTABLE AUTOCLAVE
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PART 1

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PART 2

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PART 3

Authoriser	Date of Issue:
Dr. Axel Steuwer Director – RSSD	Date of next revision:

PART 4 (To be filled in by OOS, QSU or RSSD)

<input type="checkbox"/> This procedure has been revised and is no longer valid as from: (Write date)	<input type="checkbox"/> Date of NEXT REVISION is extended until: (Max. 4 years)	<input type="checkbox"/> SOP rendered obsolete on: (Write date)
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1. Reason for revision

- 1.1. Not applicable. New SOP

2. Purpose and scope

- 2.1. The SOP is intended to provide a guideline to the proper use of the autoclave together with any safety precautions that need to be observed during its operation and maintenance.
- 2.2. Within the scope of implementation of this SOP are all laboratory personnel authorized and trained to use the autoclave for sterilization of contaminated waste

3. Definitions

- 3.1. SOP - Standard Operating Procedure
- 3.2. HSO - Health and Safety Officer
- 3.3. LO – Lab Officer

4. Responsibilities

4.1. User's responsibilities

The user is responsible for ensuring safe and proper techniques are employed at all times whenever operating the autoclave as described in this SOP. These include namely:

- Keeping the unit clean both externally and internally on a daily basis. The autoclave should be emptied and washed using a bactericidal solution both at the beginning and at the end of each cycle.
- Reporting any major spillages to the officer in charge and subsequent notification of incidents to the HSO in such an eventuality.

4.2. Head of Lab responsibilities

The Head of Lab should be the primary point of contact to ensure that the autoclave is safe to use whenever the safety and integrity could have been potentially compromised.

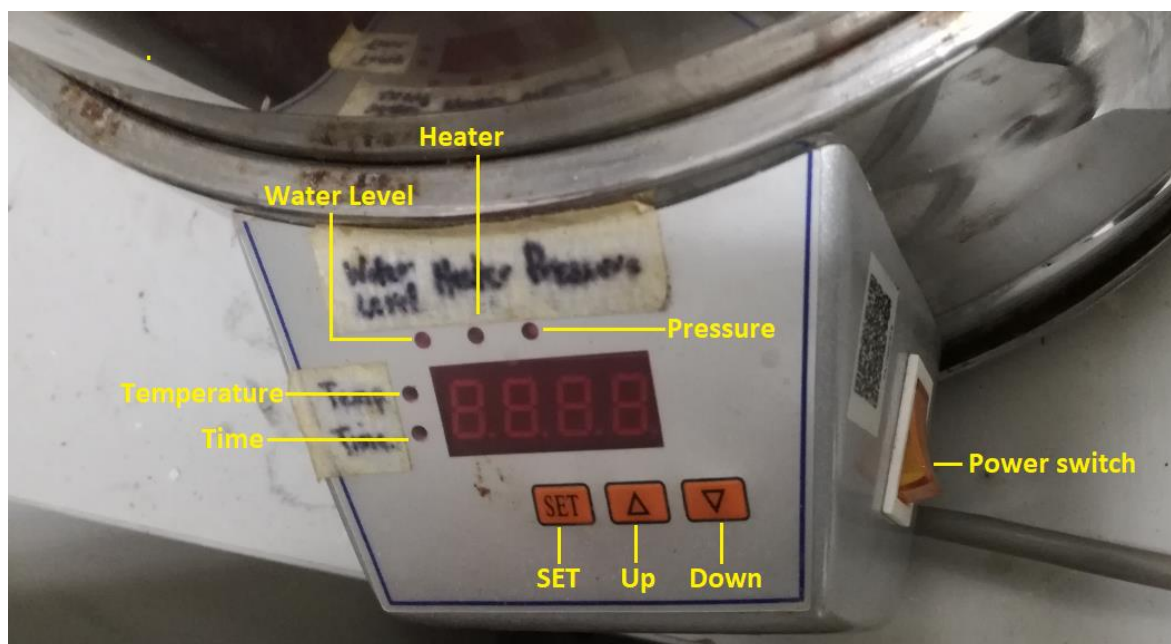
5. Health and Safety Requirements

- 5.1 Ensure that bags are free from sharp or protruding objects (e.g: pipettes coming out of the bag, cutters, syringes) as these can break through the bag and pose a danger to personnel involved with the waste sterilization procedure.
- 5.2 Fill the autoclave bags to 2/3 of the capacity and close the bag loosely to ensure adequate steam penetration.
- 5.3 Loosen caps for screw cap containers – Sealed containers in the autoclave may explode.**
- 5.4 When solid media is autoclaved, this should also have a secondary containment.

6 Procedure

6.1 Control Panel

- The sterilizer has a low water level to stop the heating function if this happens.
- The sterilizer has a buzzer alarm prompt function when the program is terminated at a low water level and the end of the heat preservation.
- The sterilizer is equipped with a running control switch (**ORANGE** indicator on the right of the control panel **Diag.1**) to prevent the heating tube from starting to work immediately after the device is switched on but this should go off when the autoclave cycle is finished.



Control Panel (Diagram 1)

- Blinking **Red** 'Water Level' indicator + audible alarm : **NO WATER**
- Fixed **Green** 'Water Level' indicator: **Water Level is GOOD**
- Blinking intermittent **Green** 'Temp' & 'Time' indicator: Autoclave on '**Stand by**' , displaying Temp and Time on main display
- Fixed **Orange** 'Temp' & 'Time' indicators : Autoclave **ON** and Heating to '**Preset**'
- Fixed **Green** 'Water Level' & **Orange** 'Heater indicators': Autoclave **ON** and **Heating**
- Fixed **Orange** 'Pressure' indicator: Pressure Ok but temperature still ramping to 121°C
- Fixed **White/BLUE** 'Pressure' indicator: Pressure and Temp - **OK**, performing cycle.
- Fixed on display, **Red**, 'END ': End of cycle.
- Blinking on display, **Red**, '120, 20' – Temperature, Time settings from '**SET**' button.

'SET', Up & Down (for temperature and time)

- The sterilization temperature can be set as required within the temperature setting range from: room temperature +5 to 126 °C

- The sterilization holding time can also be set as required within the time setting range from: 1 - 99min

6.2 Procedure for use

6.2.1 Plug in the power lead.

- Switch on the power supply from the switch located on the side of the instrument control panel.
- Ensure that the **Green** 'Temp' & 'Time' indicators are blinking (NOTE THE AUTOCLAVE DOES NOT HAVE AN ON/OFF INDICATOR. THE ORANGE BUTTON on side IS THE COMMAND TO START/STOP THE CYCLE) and that the **Green** LED "Water Level" remains **ON** when the cycle has started.

6.2.2 Remove the primary loading basket and ensure that the bottom chamber is full of clean tap water. If not, change the water or top up, until the float is completely submerged in water.

6.2.3 Make sure that both vents on the autoclave lid are closed (as described in 6.3) as in Diagram 2



Closed valve vents (Diagram 2)

6.2.4 Place the items in an autoclave bag and ensure that the lid is evenly closed from all the knobs and vents are in a closed position. (Autoclave has an internal pressure switch that will close as soon as soon as 101°C is reached)

6.2.5 Switch on the fume hood above the autoclave.

6.2.6 As soon as the desired temperature is reached, this will be maintained for the duration time the autoclave was pre-set. The Autoclave will display **END** on the 'Temperature / Time' display at the end of the cycle.

6.2.7 If 'Steam' needs to be expelled out from the chamber, extra care should be taken when opening the steam vents. Use your extended arm together with an extension to liberate the steam lock.

6.2.8 Wait for the pressure to drop to zero before opening the autoclave (Diagram 3).



Zero pressure (Diagram 3)

6.2.9 Empty the chamber according to the type of product autoclaved. The bottom of the sterilizer is provided with a seat ring and a water discharge faucet. Ensure the autoclave is placed in a stable and convenient position for discharging concentrated water.

6.2.10 Additional OPERATING PROCEDURES

Dispose of the following accordingly:

- the waste bag: in the YELLOW bag
- glassware: in the washing machine
- any autoclaved liquid media: to be disposed of in the sewer discharge with further dilution.

SOLID MEDIA THAT IS IN LIQUID FORM DUE TO HIGH TEMPERATURES SHOULD NEVER BE DISPOSED OF IN THE LABORATORY SINK

DO NOT LEAVE THE FUMEHOOD RUNNING OVERNIGHT

DO NOT LEAVE THE AUTOCLAVE POWERED on 'END' for a prolonged period of time once the cycle is complete - the autoclave has an in-built function to re-start automatically even if there is a short power interruption lasting more than 1 second (eg : voltage dip).

6.2.11 It is important to keep a record on the Equipment Log Book as per SOP: ZRH-OP-002 each time the autoclave is used or any maintenance is carried out on the sterilizer.

6.3 Open and Closed Vents

There are 2 safety valves (double safety protection) on the sterilizer cover, which can effectively prevent the potential danger caused by overpressure. The sterilizer cover is provided with a cold air automatic discharge valve (discharge valve), which can automatically cool the air inside the discharger at the beginning of the heating cycle.



CLOSED VENTS (Diagram 4)



OPEN VENTS (Diagram 5)

6.4 Decontamination & Cleaning procedure

- **Disposable gloves should be worn for this task.**

Decontamination is necessary as follows:

- (i) After each sterilization cycle.
- (ii) Before each 'Clean' Sterilization procedure (ie: when the autoclave is not used for **waste** sterilization)
- (iii) Before carrying out any maintenance work.
- (iv) Before moving, relocating or in any way using the autoclave.
- (v) After any gross spillage of contaminated waste.

- 6.4.1 It is important that the autoclave be kept clean and free from contamination.
- 6.4.2 Remove liquids by the use of the emptying tap on the side of the autoclave.
- 6.4.3 Any solid deposits should be cleaned from both chambers (water and loading).
- 6.4.4 Re-fill the bottom heating chamber with clean tap water. Re-insert loading chamber together with the heating plate (that is used to collect overflows).

6.5 Maintenance

To ensure an efficient service and to keep corrective maintenance to a minimum the autoclave must be regularly cleaned and checked. Caring for your autoclave is very important and can be easily overlooked resulting in high and frequent repair costs. A lack of maintenance will also lead to deterioration and excessive wear of the contents being sterilized.

6.5.1 Daily / Frequently

- (i) It is very important that the contents being sterilized are clean and free from debris, blood and organic tissue. Otherwise the instruments or sterilization process may become damaged or malfunction.
- (ii) Ensure that the all indicators are functioning before starting a cycle. Any faults should be corrected before the autoclave is used.

6.5.2 Weekly

- (i) Visually check for damage to the seals on the top of the autoclave which are compressed by the lid and tightening screws
- (ii) Inspect the mains cable of the autoclave as well as that of the hood extractor for damage or wear. In the event of any fault being discovered, contact Laboratory Officer.
- (iii) Clean the water chamber and run a sterilization cycle using a mild bactericidal solution

6.5.3 Annual Maintenance

On a yearly basis it is recommended to have the autoclave inspected, cleaned thoroughly, tested and calibrated. This is typically referred to as the Preventative Maintenance Service.

7 References

- 7.1 SOP: ZRH-OP-002 : Equipment Log Book

8 List of Appendices/Worksheets

N/A