

### PRESENTATION :

Class S type steam sterilizer made by Sturdy is a safe and sustainable way to sterilize loads, both wrapped and unwrapped. All pre-programs of Super Microm sterilizers are controlled by separate buttons, which are intuitive, friendly, and easy to use. With a dry time selector tailored dry time can be significantly increased your sterilization efficiency.



### FEATURES :

- Temperature Control
- Pre & Post Vacuum
- Pressure Auto Door Lock
- Overheat & Overpressure Protection
- Digital Recorder (USB)
- Separate Cycle Program Buttons
- PRION Sterilization Program
- B.D. & PUMP Test Program
- Drying Time can be Selected
- Sterilization Process Indicator

### STANDARDS & DIRECTIVES :

- \* 93/42/EEC (MDD; European Directive for Medical Devices)
- \* 2014/68/EU (Pressure Vessel PED; Pressure Equipment Directive)
- \* EN 13060 (Small Steam Sterilizers)
- \* EN/IEC 61010-1 (Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use)

- \* EN/IEC 61010-2-040 (Safety requirements for sterilizers used to treat medical materials)
- \* EN/IEC 61326-1 (EMC; Electrical equipment for measurement, control and laboratory use)
- \* ISO 13485 (Medical Device Quality Management/Certification)
- \* RoHs (Restriction of Hazardous Substances Directive)

## CHAMBER :

Made of 304 stainless steel, the overall design is pressure-resistant, high-temperature resistant, and has the ability to remove a large amount of water, air, and condensed steam. It has an exhaust hole that allows most of the air in the chamber to be exhausted through the vacuum pump so that the steam can flow better and be distributed to every corner to achieve a maximum sterilization effect. The chamber has a thermal insulation effect to reduce heat loss and the effect of external ambient temperature.

Designed in accordance with ASME codes & standards and complies with the PED (Pressure Equipment Directive), with a service life of up to 7 years.

SUS 316 can be selected for chamber material.

### Chamber Volume –

- ☐ 16 Liter (SA-230MA-R)
- ☐ 24 Liter (SA-260MA-R)
- ☐ 40 Liter (SA-300MA-R)
- ☐ 50 Liter (SA-300VMA-R)

### Chamber Material -

- ☐ SUS 304 / 304 Stainless Steel
- ☐ SUS 316 / 316 Stainless Steel

## CHAMBER LOAD CAPACITY :

|                                | SA-230MA-R | SA-260MA-R | SA-300MA-R | SA-300VMA-R |
|--------------------------------|------------|------------|------------|-------------|
| Chamber Volume (L)             | 16         | 24         | 40         | 50          |
| Chamber Size (mm)              | 230 x 410  | 260 x 450  | 300 x 570  | 300 x 710   |
| Chamber Type                   | Horizontal | Horizontal | Horizontal | Vertical    |
| Maximum Instrument Length (mm) | 300        | 350        | 525        | 540         |
| Maximum Load (unwrapped) (g)   | 5,000      | 7,000      | 9,000      | 9,000       |
| Maximum Load (wrapped) (g)     | 1,000      | 1,300      | 1,600      | 1,600       |

## DOOR LOCK SYSTEM :

In order to maintain the safety of users, the Super Microm series adopts a double safety door lock device, equipped with a sensor, which will detect the position of the door. When the door is not properly closed, the program will not be executed.

The door can only be opened when the cycle is completed and the chamber pressure is 0. When the chamber pressure is greater than 0.2 bar, the system will automatically lock the pressure lock and the door cannot be opened. If it is under negative pressure, you can click the "Vacuum Release" button on the panel to release the pressure.

According to different models, there are two door lock systems:

1. **Door Knob** : Hold the door knob and turn it 90 degrees counterclockwise to open the door, or rotate it 90 degrees counterclockwise to close.
2. **Door Handle** : Door can be opened by pulling the handle, close the door and press down the door handle to lock.



(SA-230MA-R / SA-260MA-R)



(SA-300MA-R / SA-300VMA-R)

## HEATING SYSTEM :

The heating system is divided into two parts

**Sterilization heating:** The sterilization water is heated by the electric heating tube heater (M Heater) to generate saturated steam for sterilization.

**Dry heating:** The temperature of the chamber is increased by the bend heater (B-Heater) to completely dry the chamber and the sterilized loads.

### **M-Heater**

Located at the bottom of the chamber. It is made of SUS 316 stainless steel. The steam is generated by heating the water through the heater. It is equipped with an over temperature controller to avoid overheating of the chamber and prolong the service life of the equipment.

## **Powers -**

16 Liter (SA-230MA-R) : 1,400 W

24 Liter (SA-260MA-R) : 1,800 W

40 Liter (SA-300MA-R) : 2,300 W

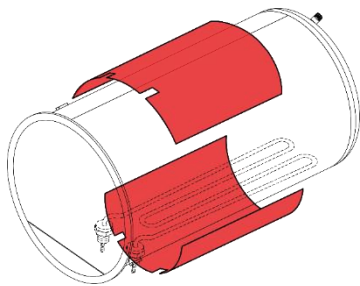
50 Liter (SA-300VMA-R) : 2,300 W

## **B-Heater**

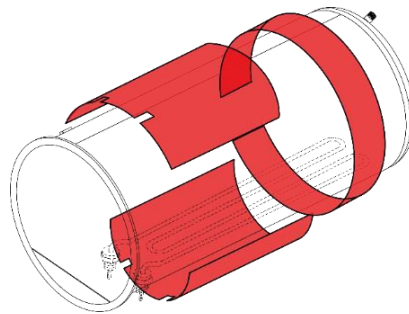
It is activated during the drying process, heats and keeps the chamber warm, and completely exhausts the steam and water in the chamber through the cooperation with the vacuum pump to keep the chamber and the sterilized loads dry.

The configuration and quantity of B-Heaters in the Super Microm Series are different according to the size of the chamber:

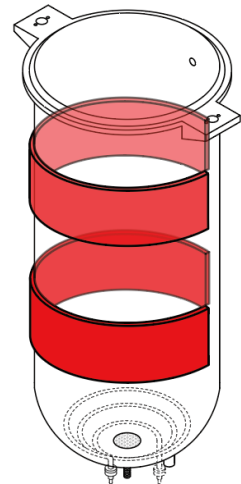
16 and 24 liters have two B-Heaters, one at the top and one at the bottom outside the chamber. 40 liter has 3 B-Heaters, adding a strip heater, and the 50 liter has two strip heaters that surround the chamber to uniformly heat the cavity of different sizes and maintain the temperature.



(SA-230MA-R / SA-260MA-R)



(SA-300MA-R)



(SA-300VMA-R)

## **Powers –**

16 Liter (SA-230MA-R) : 526 W (263 W + 263 W)

24 Liter (SA-260MA-R) : 870 W (435 W + 435 W)

40 Liter (SA-300MA-R) : 826 W (263 W + 263 W + 300 W)

50 Liter (SA-300VMA-R) : 600 W (300 W + 300 W)

## **VACUUM SYSTEM :**

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Using a diaphragm vacuum pump.

Pre Vacuum: Exhaust the air in the chamber before the sterilization starts, so that the chamber generates negative pressure and releases high-pressure and high-temperature air to allow the steam to flow better and fill the chamber and enter the slender pipe or porous instrument to ensure the sterilization effect reach the standard of complete sterilization.

Post Vacuum: To completely evaporate the steam and steam condensed water to keep the chamber and sterilized loads dry to achieve an ideal sterilization process.

### **Vacuum Pump -**

16 Liter (SA-230MA-R) : 7 L/min

24 Liter (SA-260MA-R) : 7 L/min

40 Liter (SA-300MA-R) : 16 L/min

50 Liter (SA-300VMA-R) : 16 L/min

## **HEPA AIR FILTER :**

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Using high efficiency HEPA air filter, the filtering effect of air particles below 0.3 $\mu$ m is over 99.99% to ensure that the sterilized items are not affected by the external environment and remain sterilized during the drying process.

The air filter not only meets the requirements of EN 13060 for air filters, but also meets the BFE and VFE filtration efficiency as high as 99.999%.

## **COMMAND AND CONTROL SYSTEM :**

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It consists of a command panel fixed on the front of the device and controlled by a microcomputer, with 5 built-in sterilization programs and 2 diagnostic test programs (Bowie & Dick and Pump test), in addition, LIQUID sterilization program or RE-DRY function can be selected according to customer needs, all programs are separate buttons for easy selection, after the program is started, the system does not allow to change the program or modify the parameters.

The drying time of the Super Microm series can be selected, and there are five times of 0 / 15 / 30 / 35 / 40 minutes, which makes the cycle more flexible and more widely used.

It has a fault indication system with visual and audible warnings. When the equipment parameters exceed the specified range enough to affect the sterilization effect or user safety, the system starts, the warning light will light up and a buzzer will sound.

All controls such as water injection, pressure, temperature, sterilization, exhaust, drying, automatic door lock (pressure lock) are automatically controlled by chamber pressure, and are equipped with over-temperature and over-pressure protection devices. When the pressure and temperature exceed the allowable safe values, the system will stop the sterilization process or release the pressure to protect the safety of the user and prolong the service life of the equipment.

### Available Programs -

- |   |  |   |
|---|--|---|
| <input checked="" type="checkbox"/> 121°C UNWRAPPED | <input checked="" type="checkbox"/> PRION  | <input checked="" type="checkbox"/> B.D. TEST |
| <input checked="" type="checkbox"/> 134°C UNWRAPPED | <input type="checkbox"/> RE-DRY (Standard) | <input checked="" type="checkbox"/> PUMP TEST |
| <input checked="" type="checkbox"/> 121°C WRAPPED   | <input type="checkbox"/> LIQUID (Optional) |   |
| <input checked="" type="checkbox"/> 134°C WRAPPED   |  |   |

| Program         | Sterilization Temperature | Sterilization Time | Dry Time                   |
|-----------------|---------------------------|--------------------|----------------------------|
| 121°C UNWRAPPED | 121°C                     | 22 mins            | 0 / 15 / 30 / 35 / 40 mins |
| 134°C UNWRAPPED | 134°C                     | 4 mins             | 0 / 15 / 30 / 35 / 40 mins |
| 121°C WRAPPED   | 121°C                     | 30 mins            | 0 / 15 / 30 / 35 / 40 mins |
| 134°C WRAPPED   | 134°C                     | 15 mins            | 0 / 15 / 30 / 35 / 40 mins |
| PRION           | 134°C                     | 18 mins            | 15 mins                    |
| RE-DRY          | -                         | -                  | 10 mins                    |
| LIQUID          | 121°C                     | 40 mins            | -                          |
| D.D. TEST       | 134°C                     |                    |                            |
| PUMP TEST       | -                         | -                  | 10 mins (Test Time)        |

### DATA RECORDER :

This paperless Recorder records the sterilization temperature, theoretical steam pressure and real time information during each cycle as an optional method of printer. It records the specified information onto an USB flash drive, in the Excel csv (Comma Separated Values) format which compatible with Microsoft® Office Excel.

### Data Recorder -

- ☐ W/ Data Recorder complies with EN 13060 Class S Type
- ☐ W/O Data Recorder

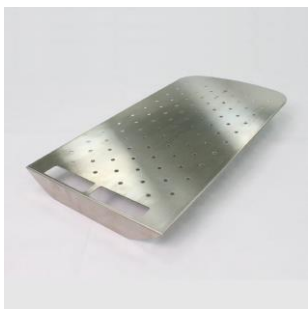




### WATER SUPPLY SYSTEM :

The water supply system of Super Microm series is divided into two parts, which are distinguished by different Types:







- 1. Water Tank :** Tabletop types are equipped with a water tank. The user manually fills the water tank with RO water/sterilized water. When the cycle is started, the system will automatically introduce water into the chamber.
- 2. Piped :** For vertical, install a local water pipe with auto-fill function to the rear interface of the equipment and make sure the water pressure is between 1~5 bar, when the cycle is started, the system will automatically introduce water into the chamber or manually fill the chamber with RO water/sterilized water.

## STANDARD ACCESSORIES :

### (TABLETOP TYPE)







|                          | Name              | Image   | Description  |
|--------------------------|-------------------|---|--|
| <input type="checkbox"/> | Support Plate     |    | Made of 304 stainless steel.<br>Dimensions (W x H x D)<br>16 Liter : 163 x 19 x 375 mm<br>24 Liter : 208 x 22 x 427 mm<br>40 Liter : 227 x 15 x 525 mm   |
| <input type="checkbox"/> | Sterilization Box |    | Sterilization box, there are vents on the sides and bottom that can be opened or closed, made of 304 stainless steel.<br>Container dimensions (W x H x D) :<br>16 Liter : 161 x 132 x 340 mm<br>24 Liter : 210 x 125 x 370 mm<br>40 Liter : 230 x 180 x 500 mm |
| <input type="checkbox"/> | HEPA Air Filter   |   | Consumables, filtering effect of air particles under 0.3µm is over 99.99%.<br>Replace the filter according to the ambient air quality.<br>(1 pc of standard)   |
| <input type="checkbox"/> | Cham-mate         |  | Consumables, autoclave chamber & piping cleaner<br>10 bags/ paper box.<br>(2 bags of standard)   |
| <input type="checkbox"/> | Drain Filter      |  | Filter the impurities in the sterilized waste water to avoid clogging the pipe.<br>According to the filter condition, it needs to be cleaned or renewed.   |

## (VERTICAL TYPE)

|                          | Name                 | Image   | Description  |
|--------------------------|----------------------|---|--|
| <input type="checkbox"/> | Support Plate        |    | Made of 304 stainless steel.<br>Diameter: 292 mm   |
| <input type="checkbox"/> | Sterilization Bucket |    | Sterilization bucket, made of 304 stainless steel wire with handle.<br>Dimensions:<br>Ø 270 x 270 mm   |
| <input type="checkbox"/> | Start Kit            |   | Including 2000ml water bottle x 1 pc, #304 stainless steel clip x 1 pc, exhaust hose x 2 pcs, bucket cover x 1 pc.   |
| <input type="checkbox"/> | HEPA Air Filter      |  | Consumables, filtering effect of air particles under 0.3µm is over 99.99%.<br>Replace the filter according to the ambient air quality.<br>(2pcs of standard) |
| <input type="checkbox"/> | Cham-mate            |  | Consumables, autoclave chamber & piping cleaner<br>10 bags/ paper box.<br>(2 bags of standard)   |
| <input type="checkbox"/> | Drain Filter         |  | Filter the impurities in the sterilized waste water to avoid clogging the pipe.<br>According to the filter condition, it needs to be cleaned or renewed.     |



## OPTIONAL ACCESSORIES :

|                          | Name                | Image   | Description  |
|--------------------------|---------------------|---|--|
| <input type="checkbox"/> | Tray Set<br>(Plate) |    | <p>Round tray holder, with a capacity of three stainless steel trays, made of 304 stainless steel.</p> <p>Trays dimensions (W x H x D) :</p> <p>16 Liter : 178 x 20 x 323 mm</p> <p>24 Liter : 187 x 21 x 382 mm</p> <p>40 Liter : 199 x 22 x 500 mm</p> |
| <input type="checkbox"/> | Basket              |    | <p>Sterilization basket, made of 304 stainless steel.</p> <p>Dimensions (W x H x D) :</p> <p>16 Liter : 180 x 120 x 340 mm</p> <p>24 Liter : 210 x 85 x 370 mm</p> <p>40 Liter : 200 x 160 x 500 mm</p>  |
| <input type="checkbox"/> | Spring Holder       |   | <p>Made of 304 stainless steel, which is easy to load and unload the bagged instruments, and carry out proper sterilization and drying.</p> <p>Dimensions (W x H x D) :</p> <p>97 x 122 x 148 mm</p>   |
| <input type="checkbox"/> | Sterilization Pouch |  | <p>Sterilization pouches are practical and easy to use, providing a fast and effective containment for equipment.</p>  |
| <input type="checkbox"/> | RO Water Filter     |  | <p>Filter out dirt odor, chlorine and salt; extending life usage of the sterilizer and quality.</p> <p>Quicker production &amp; supply RO water</p>  |
| <input type="checkbox"/> | Water Distiller     |  | <p>Water distiller turns water into steam to remove fluoride, arsenic, lead, viruses and other contaminants, protecting your sterilizer and instruments at a fraction of cost.</p>   |

## OVERALL DIMENSIONS :

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16 Liter (SA-230MA-R) : 522 × 410 × 594 mm (W x H x D)  
24 Liter (SA-260MA-R) : 533 × 422 × 655 mm (W x H x D)  
40 Liter (SA-300MA-R) : 620 × 489 × 766 mm (W x H x D)  
50 Liter (SA-300VMA-R) : 600 × 980 × 450 mm (W x H x D)

## GROSS WEIGHT :

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16 Liter (SA-230MA-R) : 49 kg  
24 Liter (SA-260MA-R) : 61 kg  
40 Liter (SA-300MA-R) : 86 kg  
50 Liter (SA-300VMA-R) : 104 kg

## ALTITUDE :

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Under 1,000M

## VOLTAGE :

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AC 230V, 50/60Hz

## WATER TANK VOLUME :

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16 Liter (SA-230MA-R) : 4,200 cc  
24 Liter (SA-260MA-R) : 4,200 cc  
40 Liter (SA-300MA-R) : 8,400 cc  
50 Liter (SA-300VMA-R) : N/A

## WATER AND ENERGY CONSUMPTION :

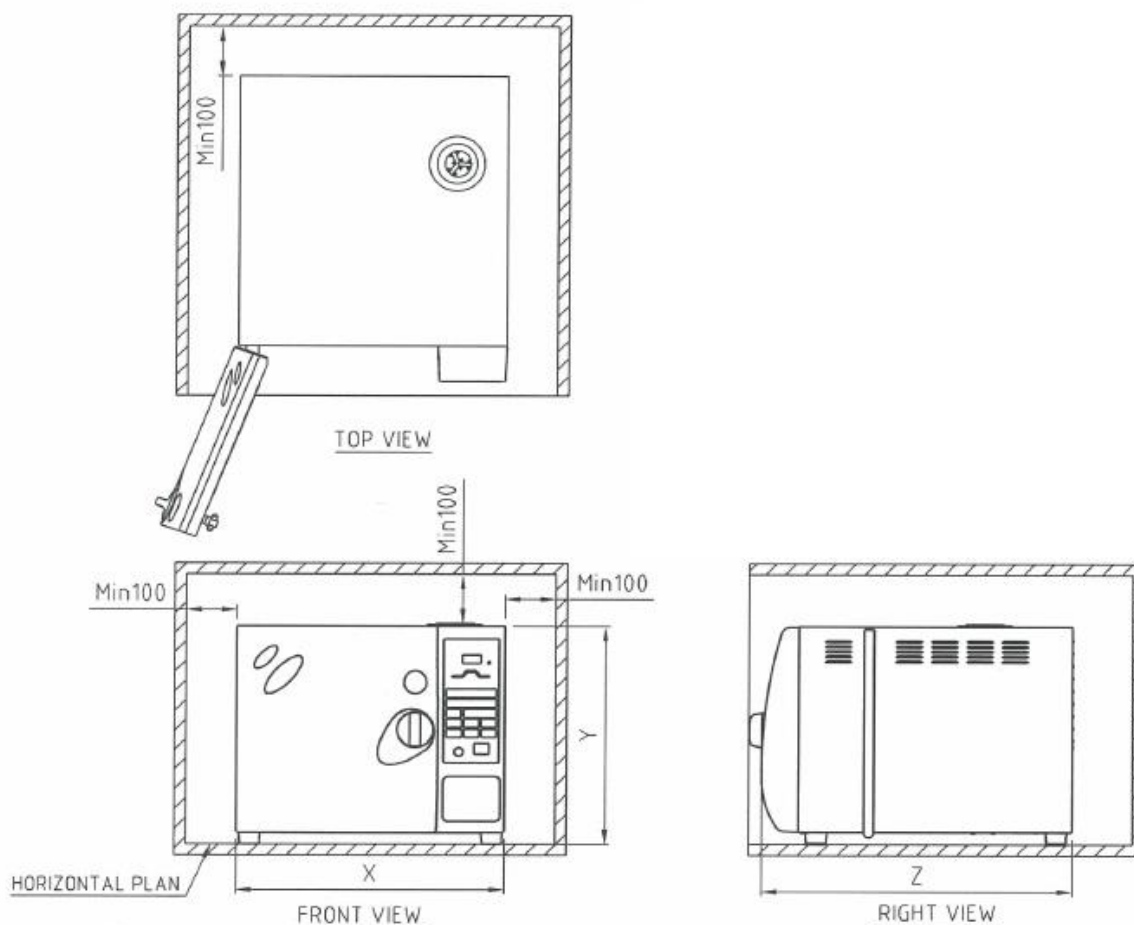
|                 | 16 Liter | 24 Liter | 40 Liter | 50 Liter |
|-----------------|----------|----------|----------|----------|
| Total Power (W) | 1,926    | 2,670    | 3,126    | 2,900    |
| Max. Water (cc) | 450      | 450      | 1,200    | 1,200    |

## INSTALLATION INSTRUCTION :

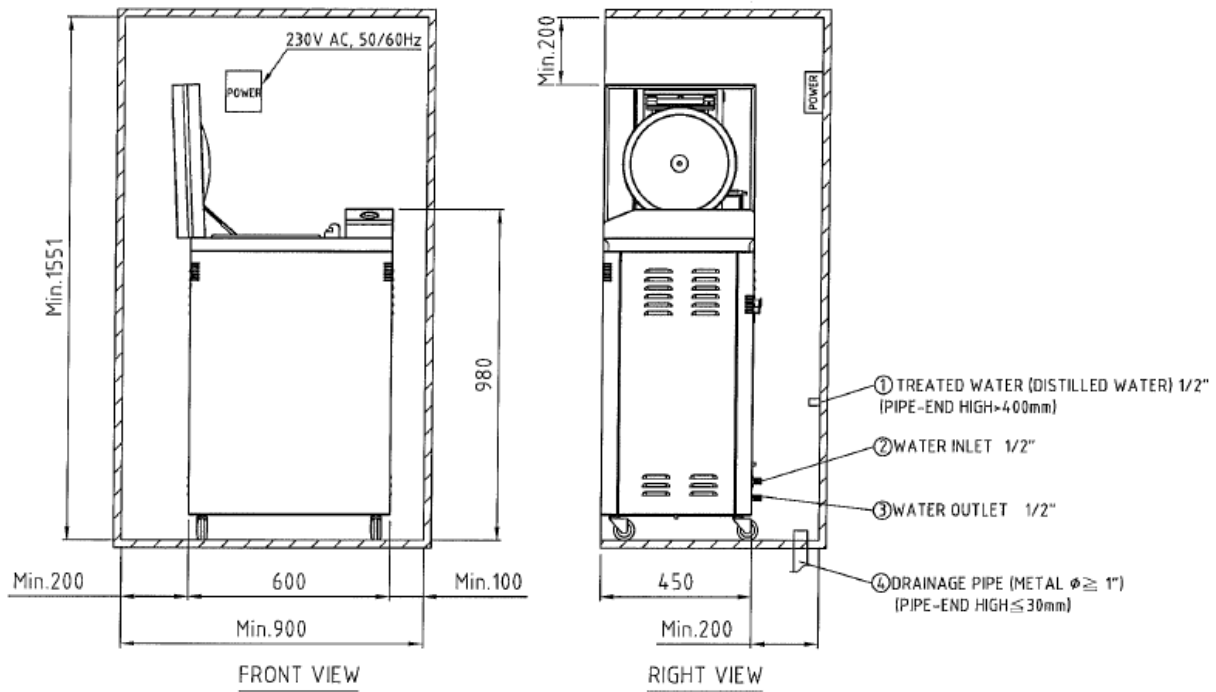
This equipment has been designed for use in accordance with the International EMC (Electromagnetic Compatibility) Standards. In view of different environments, please follow the instructions given below to eliminate interference, if necessary.

1. Please install it in a stable and firm place. When installing, be sure to keep the machine body with a ventilation distance of more than 10 cm on the top, back panel, and left and right sides. Make sure that the door can be opened freely after installation.
2. While installation, please make sure that the bearing capacity of installation table is enough to carry the sterilizer.
3. Do not install or operate the sterilizer in areas where flammable items or volatile substances are used or stored. An explosion could occur, causing personal injury. An installation site with good air circulation is required.
4. Be sure to install the sterilizer on a flat surface, otherwise it may not detect the water level correctly.
5. The optional Exhaust Tank is capable of draining water; you should then drain out the water according to the local national law.

- Tabletop series installation drawing (SA-230MA-R, SA-260MA-R, SA-300MA-R)



- Vertical series installation drawing (SA-300VMA-R)



### ENVIRONMENTAL CONDITIONS IN THE STERILE AREA :

- Indoor use;
- Temperature 5°C to 40°C;
- Relative Humidity 80%RH@31°C to Relative Humidity 50%RH@40°C;
- Voltage fluctuation  $\pm 10\%$ ;
- Transient overvoltages category II;
- Pollution degree 2

## RECOMMENDED SUPPLY WATER QUALITY :

Suggested maximum limits of contaminants in and specification for water for steam sterilization.

|   | Feed water                            | Condensate                            |
|---|---------------------------------------|---------------------------------------|
| Evaporate residue   | $\leq 10 \text{ mg/l}$                | $\leq 1.0 \text{ mg/kg}$              |
| Silicium oxide, $\text{SiO}_2$  | $\leq 1 \text{ mg/l}$                 | $\leq 0.1 \text{ mg/kg}$              |
| Iron  | $\leq 0.2 \text{ mg/l}$               | $\leq 0.1 \text{ mg/kg}$              |
| Cadmium   | $\leq 0.005 \text{ mg/l}$             | $\leq 0.005 \text{ mg/kg}$            |
| Lead  | $\leq 0.05 \text{ mg/l}$              | $\leq 0.05 \text{ mg/kg}$             |
| Rest of heavy metals,<br>excluding iron, cadmium, lead  | $\leq 0.1 \text{ mg/l}$               | $\leq 0.1 \text{ mg/kg}$              |
| Chloride  | $\leq 2 \text{ mg/l}$                 | $\leq 0.1 \text{ mg/kg}$              |
| Phosphate   | $\leq 0.5 \text{ mg/l}$               | $\leq 0.1 \text{ mg/kg}$              |
| Conductivity (at $20^\circ\text{C}$ )   | $\leq 15 \text{ }\mu\text{s/cm}$      | $\leq 3 \text{ }\mu\text{s/cm}$       |
| pH value  | 5 to 7.5                              | 5 to 7                                |
| Appearance  | colourless, clean<br>without sediment | colourless, clean<br>without sediment |
| Hardness  | $\leq 0.02 \text{ mmol/l}$            | $\leq 0.02 \text{ mmol/l}$            |
| NOTE 1 - The use of water for steam generation with contaminants at levels exceeding those given in this table can greatly shorten the working life of a sterilizer and can invalidate the manufacturer's warranty guarantee. |                                       |                                       |
| NOTE 2 - The condensate is produced from steam that has been taken from the empty sterilizer chamber.   |                                       |                                       |

**Compliance should be tested in accordance with acknowledged analytical methods.**

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