# Flight Dental Systems

Clave23+ and Clave16+ Presentation R.2.6

# Flight Dental Systems

**History**

- Flight Dental Systems is a Canadian owned and managed dental equipment manufacturer and distributor with operations in over 25 countries around the world.
- Our company was founded on a commitment to deliver high quality products that provide the design, function and durability demanded by today's dental professionals at an affordable price.

**Mission**

- To provide our customers with high quality products designed and engineered in Canada at an affordable price. Along with our excellent customer service and expert knowledge of the product from the top to bottom makes for better support for our products globally.

**Motto**

- Quality and reliability meets affordability. First Class has never been so affordable.



FLIGHT
DENTAL SYSTEMS



OUR LOCATIONS:

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Tel: 604-674-0697, Ext 103

Email: info@flightdentalsystems.com

Website: www.flightdentalsystems.com

# Certifications

ISO 13485:2016

Health Canada Certification

ETL Mark

THE CANADIAN CHAMBER OF COMMERCE

LA CHAMBRE DE COMMERCE DU CANADA

# What is Class S Steam Sterilizers?

A Class S Sterilizer or also known as a positive pressure displacement autoclave uses steam to displace all of the air in the sterilization chamber before sterilization. The steam is released into a chamber using an independent steam generator which creates pulsating pressurized steam blasts, forcing the air out through the drain hole and before the sterilization process. **This results in a more accurate displacement of air than a downward displacement unit which uses a heating element that is submerged in water.**

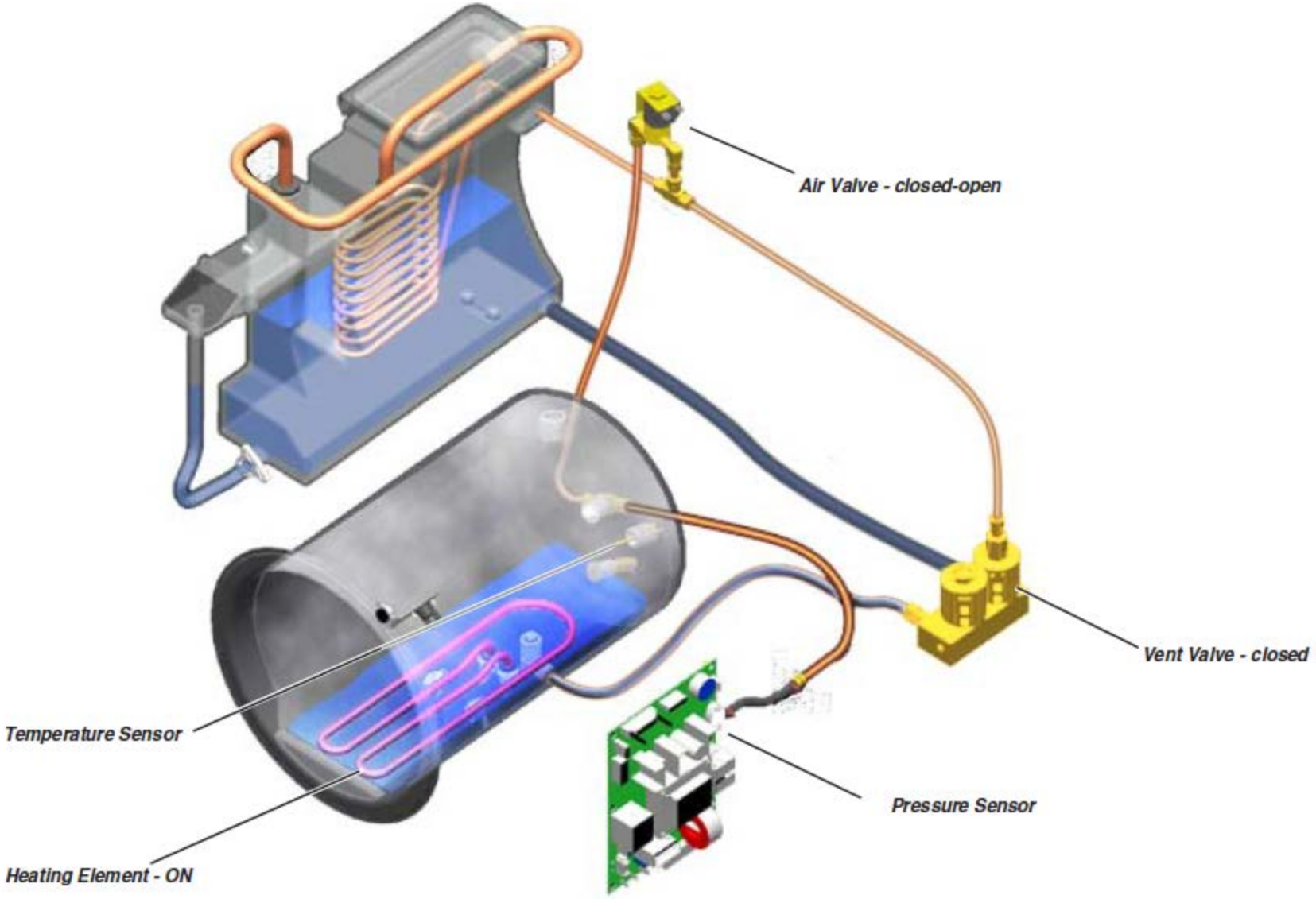


# Key Differences with Traditional Sterilizers

- Traditional Sterilizers use a Heating Element that heats up water to create the steam for a downward displacement of air
- Example – Midmark M9 and M11, Tuttanauer EZ9 and EZ11
    - Drawbacks: Not 100% accurate as air may not be completely removed
        - Results in improper sterilization
    - Additional Maintenance to clean chamber, heating elements and other parts due to mineral build-up
        - Results: Reduced heating efficiency, easily blocked or clogged pipes
        - Reuses water resulting in debris built up

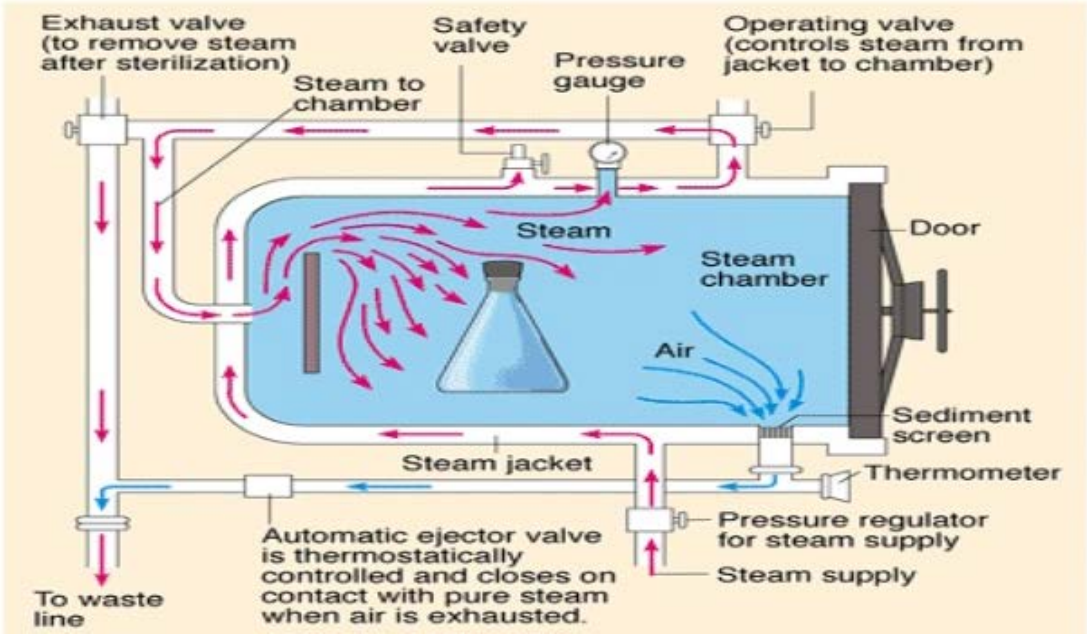


# Traditional Sterilizers



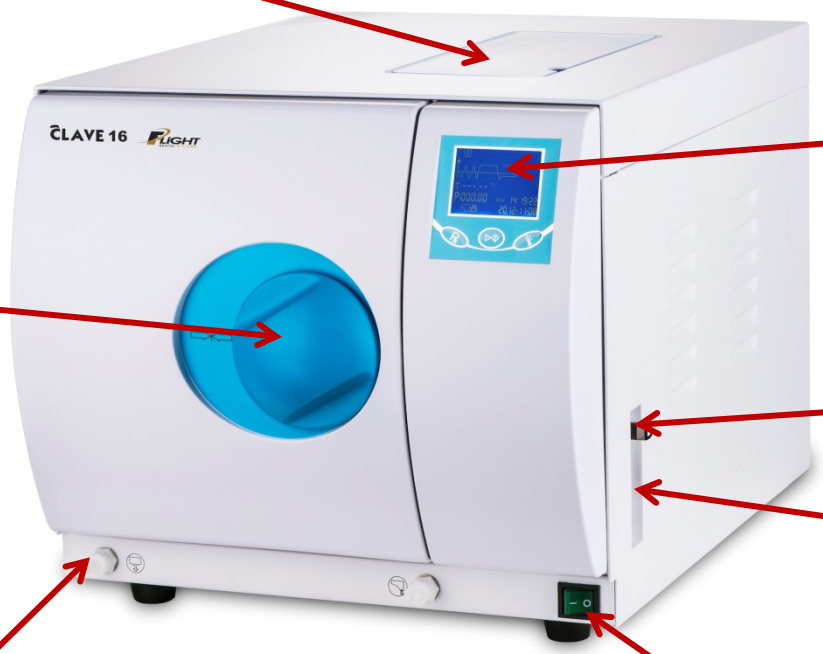
# Flight's Steam Sterilizers

- Faster Heating Time with Immediate Steam Generation
- More complete removal of air with small bursts of steam injected into chamber
- Less maintenance then sterilizers using a heating element




This is an Example Only.

# Clave16+




Distilled Water Reservoir

LCD Screen with Easy Program Selection

Manual Door with Safety Locking Switch (closed door drying)

USB Key (USB Key Included)

Printer Connection

Waste Water Drain

110Volt Power Switch

# Clave16+

**Key Features:**

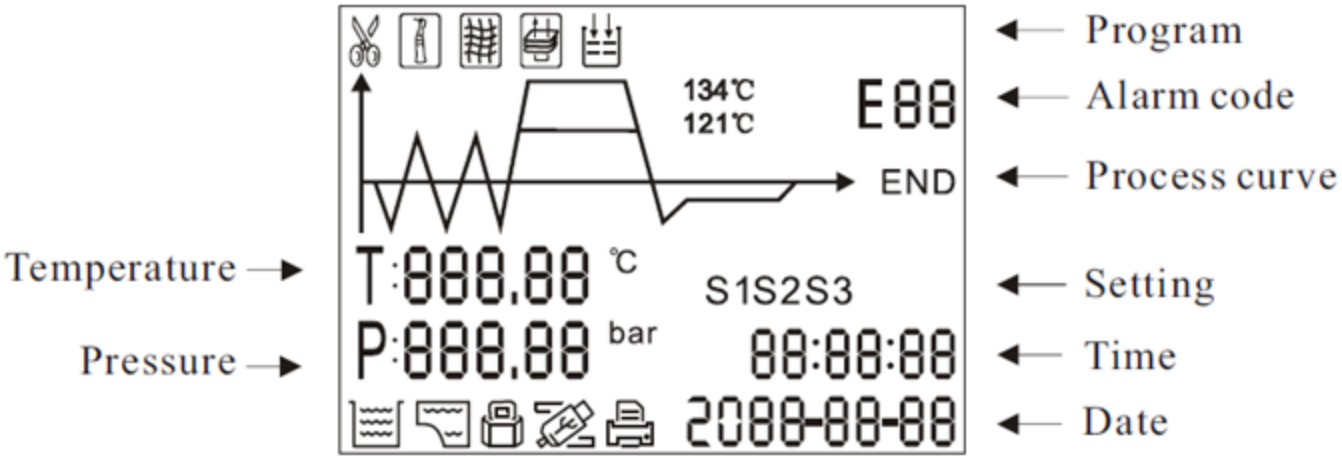
- Class S Steam Sterilizer
- 5 Programmed Sterilizations Cycles: Solid/Unwrapped, Wrapped, Liquid, Textile, Prions
- Powder Coated Solid Steel Construction
- Independent Steam Generator for positive pressure displacement dynamic pulsating steam injection
- Easy to repair – Quality Parts Made from Europe
- Optional Printer
- USB Port for Recording Cycles (USB Key included)
- Double Door Protection System – Prevents door from opening during Cycles (Provides Closed Door Drying)
- Pressure Safety valve
- HEPA Filter
- Dry-Assist Technology



| | Model: Clave16+ |
|---|---|
| **Chamber Size** | 16L (9" x 14.2") |
| **Number of Trays** | 3 |
| **Voltage** | 110v 50/60 Hz |
| **Power (W)** | 2200 |
| **Overall Dimensions (WxHxD)**<br>**Minimum Table Requirements** | 17.5" x 16.1" x 23.8"<br>19.25" x 19.75" x 21" |
| **Programmed Cycle** | **Solid/Unwrapped:** 4 Min Sterilization @ 134C, 20 min Sterilization @121C<br>**Total Time@ 134C: 44 min (Includes 30 Min Drying Time)**<br><br>**Wrapped:** 6 Min @134C, 30 min @ 121C<br>**Total Time@ 134C: 55 min (Includes 30 Min Drying Time)**<br><br>**Liquid/Textile/Rubbers:** 10 min @ 134C, 30 min @ 121C<br>**Total Time@ 134C: 60 min (Includes 30 Min Drying Time)** |



# Clave16+




Distilled water tank is requires water.

Distilled water tank is full

Used water tank is full.

Door locked

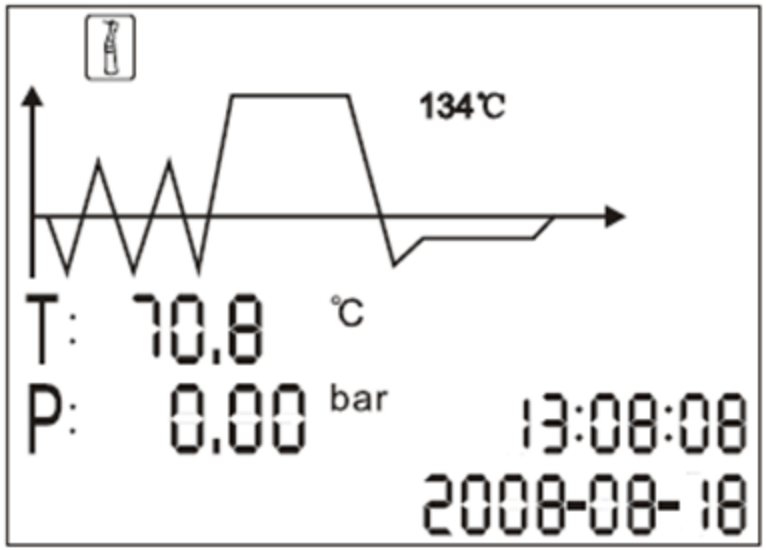
information output to USB port

Printer is connected

# Clave16+

Programmed Cycles

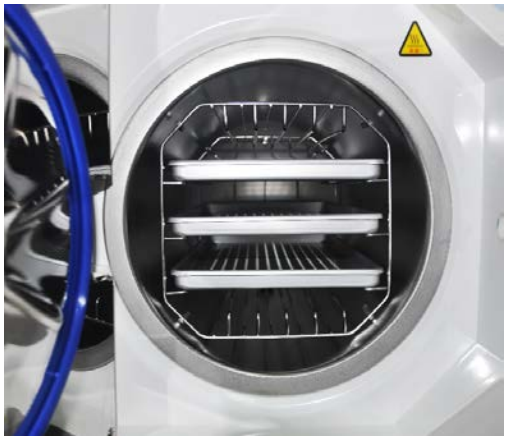
- Solid
- Wrapped
- Textile or Drying
- Prion
- Liquid



# Clave16+

**Chamber Size:**

Volume: 16L
*Dimensions: 9*" x 14.2"
Trays: 3 Stainless Steel Trays



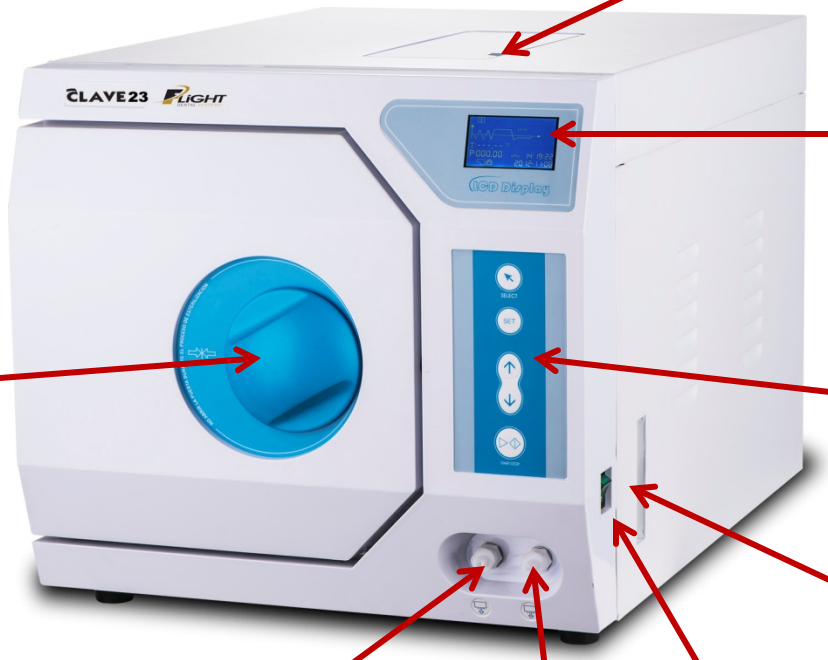




**Distilled Water Reservoir**

- Easily accessible and easy to fill
- Water Level Sensor
- Capacity to run 5-6 Cycles Before Adding water

# Clave23+




Distilled Water Reservoir

LCD Display

Manual Door with Safety Locking Switch (closed door drying)

Touchpad Control

USB Port (USB Key Included)
Optional Printer Connection

110 Volt Power Switch

Waste Water Drain

Distilled Water Drain

# Clave23+

**Key Features:**

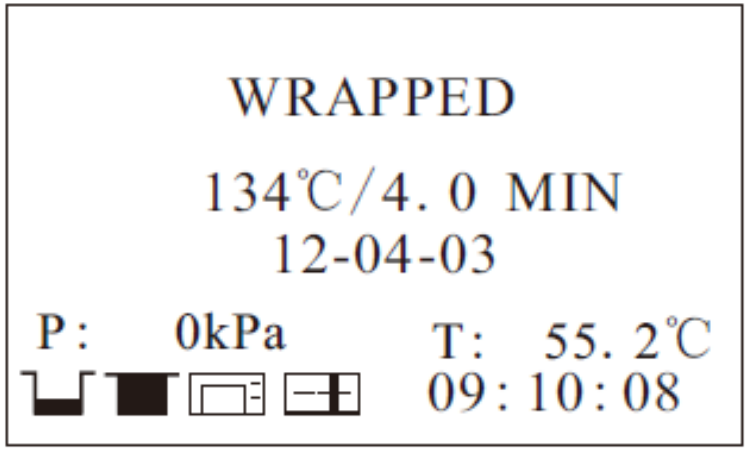
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- Powder Coated Solid Steel Construction
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- Easy to repair – Quality Parts Made from Europe
- Optional Printer
- USB Port for Recording Cycles (USB Key included)
- Double Door Protection System – Prevents door from opening during Cycles (Provides Closed Door Drying)
- Pressure Safety valve
- HEPA Filter
- Dry-Assist Technology



| | Model: Clave23+ |
|---|---|
| **Chamber Size** | 23L (9.72"x 17.7") |
| **Number of Trays** | 4 |
| **Voltage** | 110V 50/60Hz |
| **Power (W)** | 2200 |
| **Overall Dimensions (WxHxD)**<br>**Minimum Table Requirements** | 18.9" x 18.3" x 27.6"<br>20.75" x 21.63" x 25" |
| **Programmed Cycle** | **Solid/Unwrapped:** 4 Min Sterilization @ 134C, 20 min Sterilization @121C<br>**Total Time @ 134C: 54 min (Includes 30 Min Drying Time)**<br><br>**Wrapped:** 6 Min @134C<br>30 min @ 121C<br>**Total Time: 55min (Includes 30 Min Drying Time)**<br><br>**Liquid/Textile/Rubbers:** 10 min @ 134C, 30 min @ 121C<br>**Total Time: 65 min (Includes 30 Min Drying Time)** |

# Clave23+

**Symbols:**




Distilled water tank is lacking of water.

Used water tank is full.

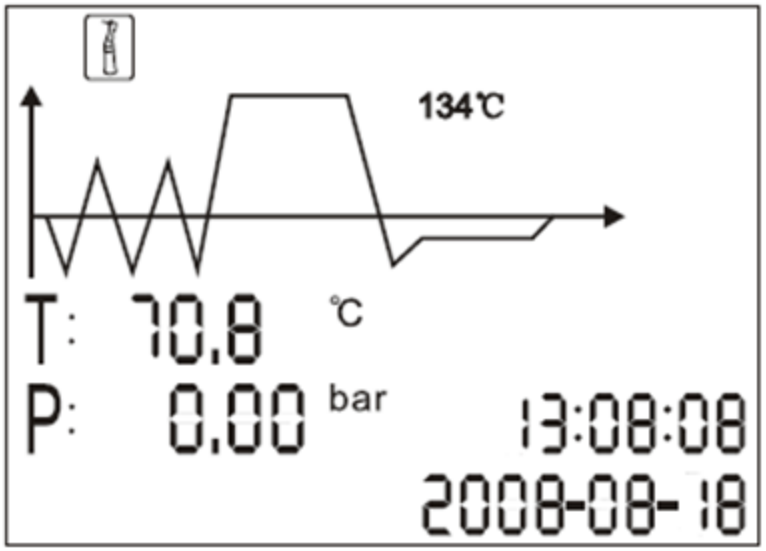
Printer is disconnected if it is blinking.

Door locked.

# Clave23+

Programmed Cycles

- Solid
- Wrapped
- Textile or Drying
- Prion
- Liquid



# Flight Dental System's Autoclaves

**Key Selling Points:**

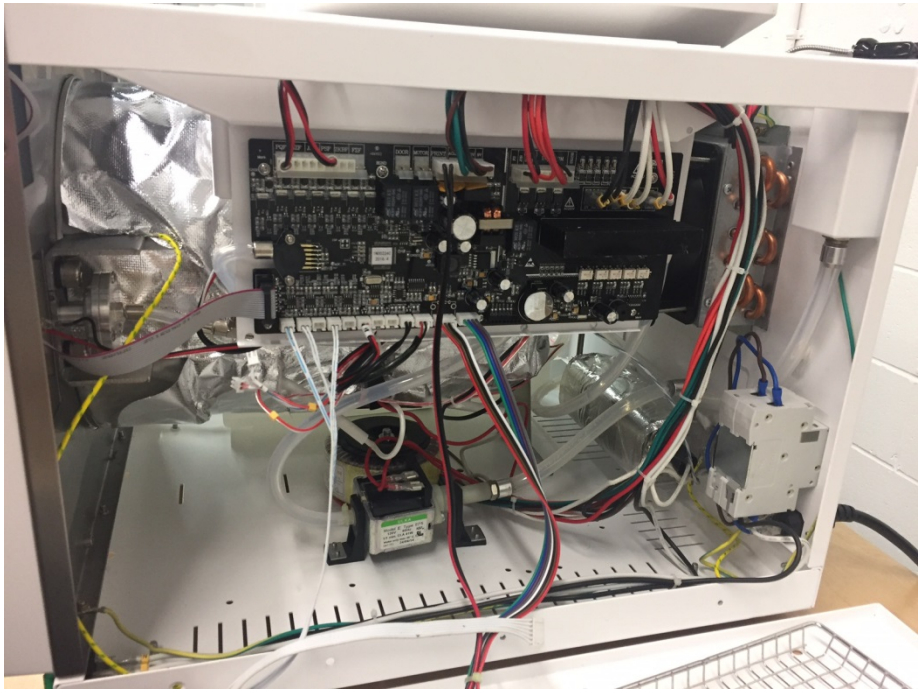
- **Fast Sterilization Cycles** Unwrapped: 4min, Wrapped: 10 min, Rubber/Textiles: 10min
- **Local** Inventory, Technical Support, and Spare Parts Inventory
- **Larger** Chamber compared to Statim with Similar Sterilization Time
- Data Logger with USB and External Printer
- **2 Year** Parts Warranty



# Technical Info

**Compact Class S Steam Sterilizer**

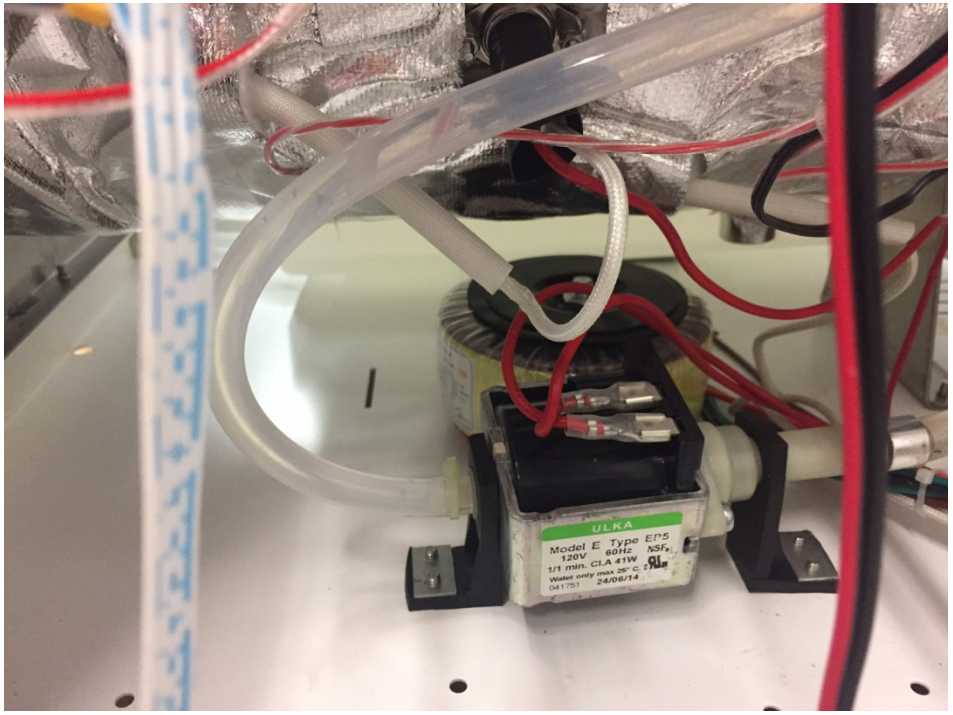
- Removable panels for easy servicing
- Independent water pump, circuit board, steam generator, Heat Exchanger, Solenoid Valves
- Chamber made with 300 Series High Quality Stainless Steel



# Technical Info

**Water Pump**

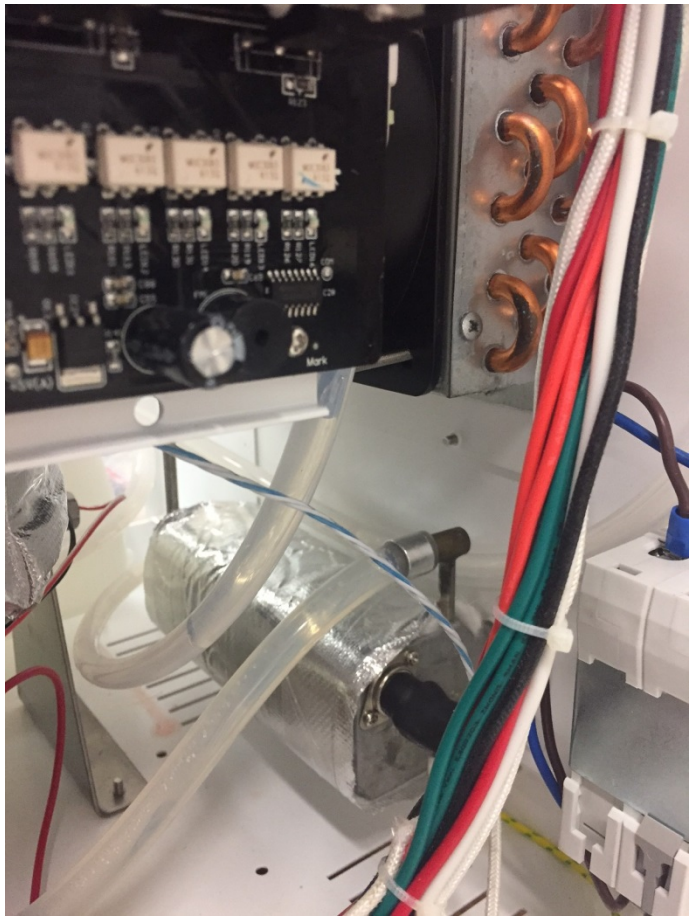
- High Quality Independent Water Pump



# Technical Info

**Steam Generator**

- Independent One Piece Steam Generator
- Safety Sensor for heat temperature
- Immediate Steam Generator uses a small amount of water
- HEPA Filtered air intake



# Technical Info

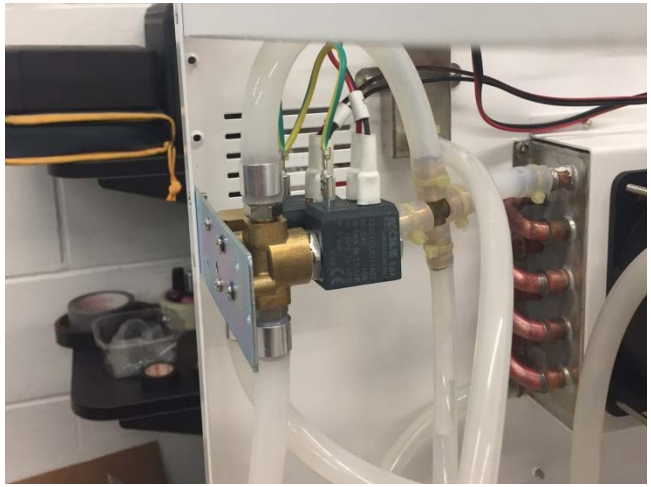
**Heat Exchanger**

- Able to rapidly cool exhausted steam for ventilation



**Solenoid Valves**

- Quality Solenoid Valves for controlling water and pressure release



# Technical Info

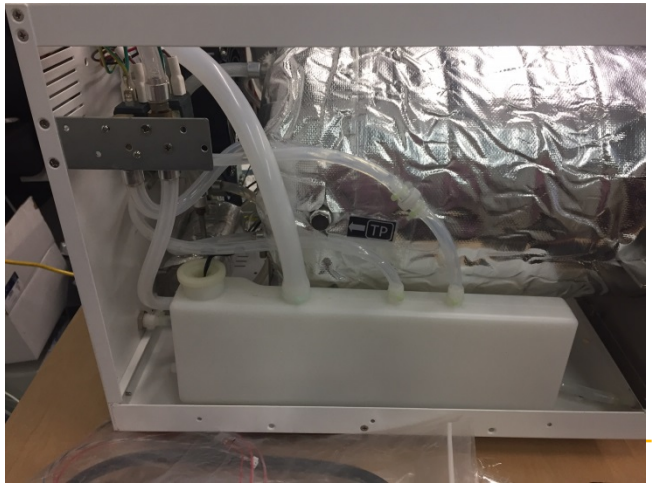
**Distilled Water Reservoir**

- Distilled water reservoir with filter
- Water Level Safety Sensor prevents running reservoir dry



**Waste Water Reservoir**

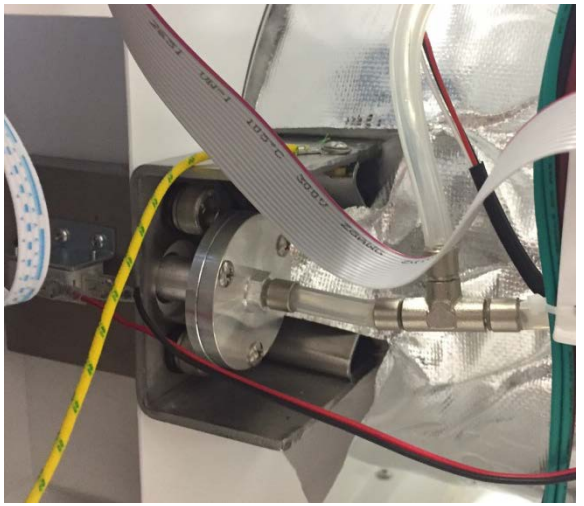
- Waste water reservoir with filter
- Water Level Safety Sensor prevents waste water overflow



# Technical Info

**Door Lock Safety Mechanism**

- Dual Safety Door Lock Sensor
- Prevents door from opening during Cycle
- Will not allow cycle to start if door is not closed

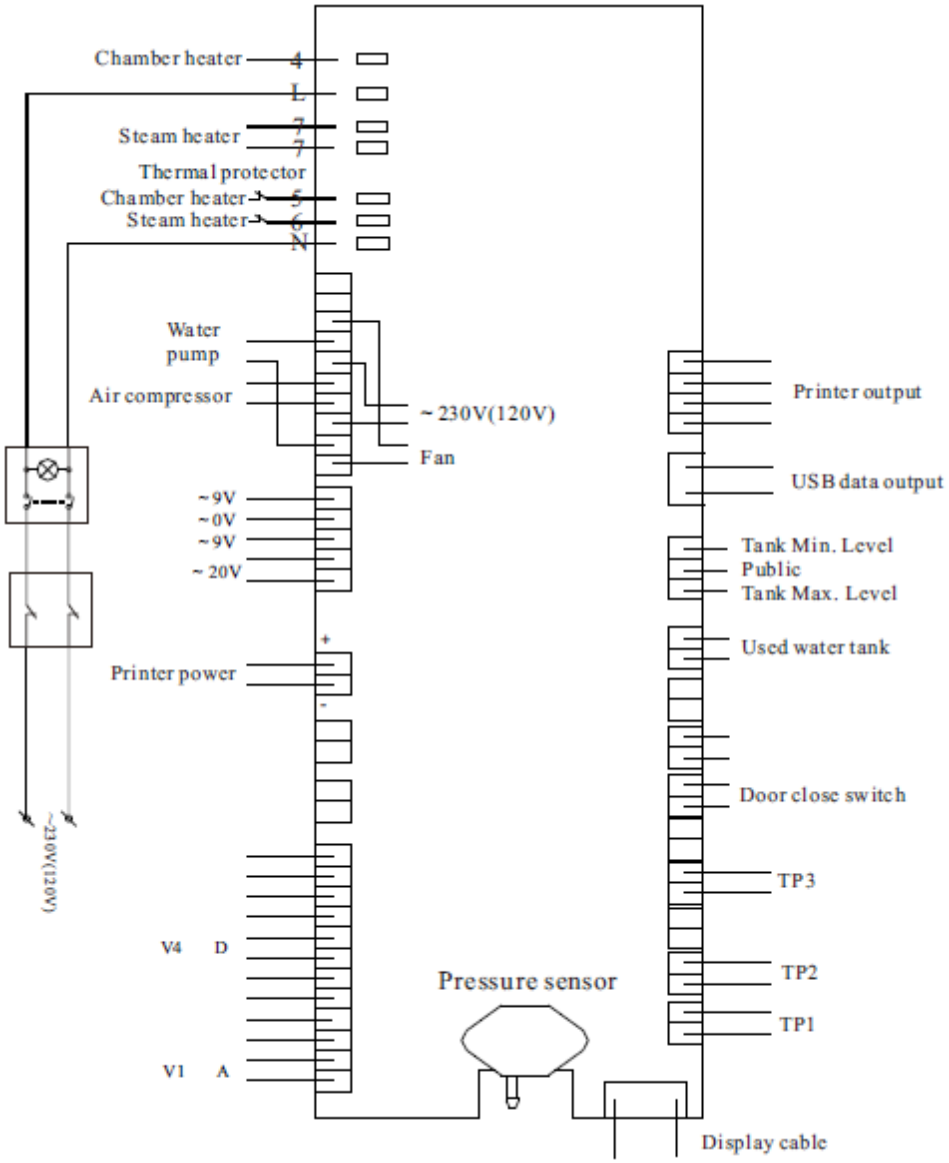


**Power Safety Prevention**

- Power shuts off automatically if there is a surge

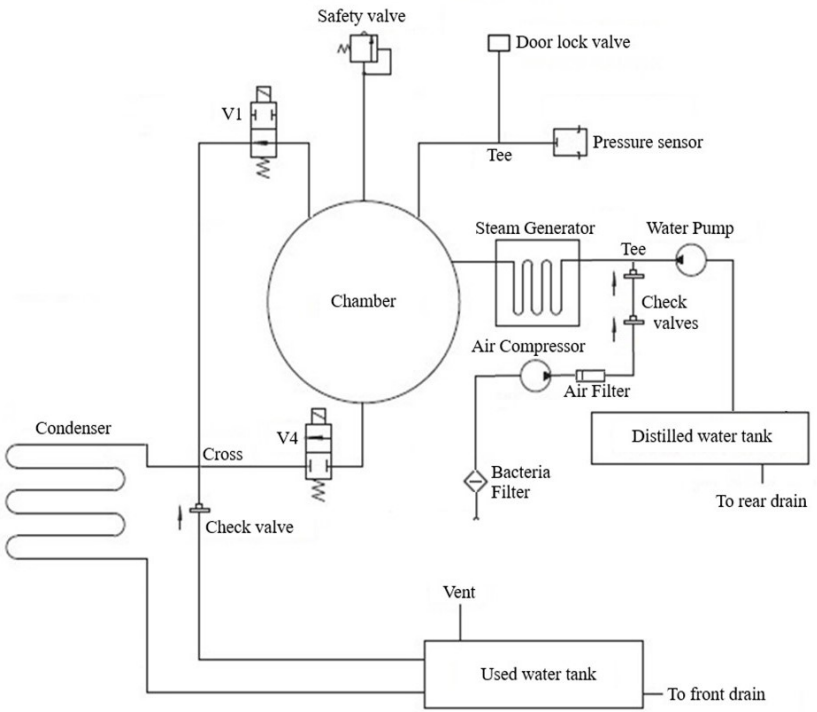


# Wiring Diagram

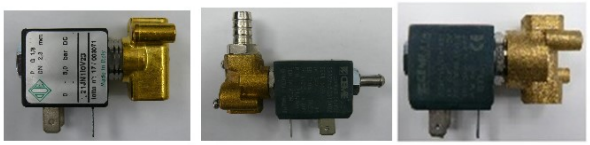



TP1: Steam generator temperature sensor
TP2: Inner temperature sensor of chamber
TP3: Temperature sensor of chamber wall
V1: Air release valve
V4: Water release valve

# Technical Diagram

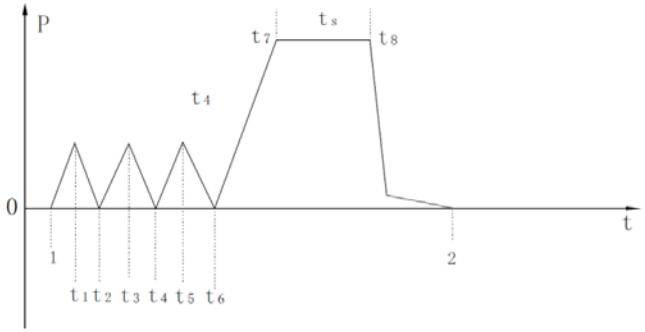


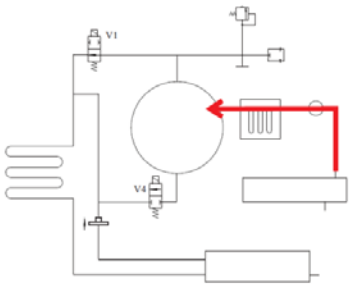
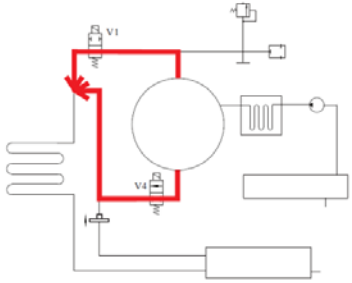
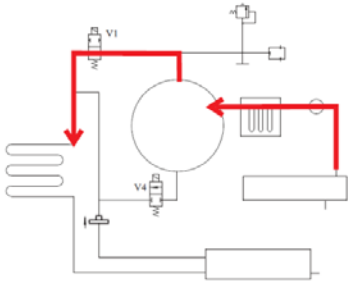

V1: Air release valve (normally open) P/N 90012024
V4: Water release valve (normally closed) P/N 90012025



New version V1 | Air release valve V1 | Water release valve V4

# Working Principle




| | |
|---|---|
| 1-t1,t2-t3,t4-t5,t6-t7<br> | t1-t2,t3-t4,t5-t6,t8-2<br><br>Drain the water by V4 until the pressure is 10kPa |
| t7-t8<br><br>Release the pressure by V1during the holding time | |

| | Flight Clave16+ | Tuttnauer EZ9Plus | Midmark M9 | Statim 2000 G4 |
|---|---|---|---|---|
| Chamber Size (Diameter x Length) | 9" x 14.2" Volume: 16L | 9" x 18" Volume: 19.8 | 9" x 15" Volume: 14.1L | 11.1"L x 7.1"W x 1.4" H Volume: 1.8L |
| Sterilization Time | Unwrapped @134C:4 min Total: 14 min<br><br>Wrapped@134C: 4 min Total: 20 min<br><br>Rubber/Plastics @134C:10 min Total: 30 min | Unwrapped @134C:3 min Total: 20 min<br><br>Wrapped@134C: 4 min Total: 17 min | Unwrapped @134C:3 min Total: 14 min<br><br>Wrapped@134C: 5 min Total: 17 min<br><br>Packs @121C:30 min Total: 40 min | Unwrapped @134C:3.5 min Total: 6 min<br><br>Wrapped@134C: 10 min Total: 14 min<br><br>Rubber/Plastics @134C:15 min Total: 20 min |
| Warranty | 2 Year | 2 Year | 1 Year | 1 Year |



| | Flight Clave23+ | Tuttnauer EZ11Plus | Midmark/Ritter M11 | Tuttnauer tvet 10Ei |
|---|---|---|---|---|
| Chamber Size (Diameter x Length) | 9.75" x 17.7"<br>Volume: 23L | 11" x 19.8"<br>Volume: 28.5L | 11" x 18"<br>Volume: 24.6L | 10" x 18.7"<br>Volume: 23L |
| Sterilization Time | Unwrapped @134C:4 min<br>Total: 14 min<br><br>Wrapped@134C: 4 min<br>Total: 20 min<br><br>Rubber/Plastics @134C:10 min<br>Total: 30 min | Unwrapped @134C:3 min<br>Total: 24 min<br><br>Wrapped@134C: 4 min<br>Total: 21 min | Unwrapped @134C:3 min<br>Total: 18 min<br><br>Wrapped@134C: 5 min<br>Total: 22 min<br><br>Rubber/Plastics @121C:30 min<br>Total: 44 min | Unwrapped @134C: 3 min<br>Total: 24 min<br><br>Wrapped@134C: 7 min<br>Total: 42 mins |
| Warranty | 2 Year | 2 Year | 1 Year | 2 Year |



# Comparison

**Competitive Advange**

- Fastest Sterilization of Large Chamber Tabletop Autoclave
- Lower Price
- Equal to or better 2 Year Warranty
- Steam Generator Technology uses less distilled water and more complete elimination of ambient air inside chamber
- Tuttnauer and Midmark/Ritter use a heating element to heat water to create the downward displacement to force air out of chamber
  - Drawbacks: Mineral Build-up and blockage, Reduced efficiency of heating element over time, resulting in higher maintenance costs
  - Greater risk of contaminated air remaining in chamber before sterilization cycle.
  - Reuse of water results in contaminant buildup from previous cycles



# Maintenance

| Frequency | Maintenance Required |
|---|---|
| Daily | Clean door seal<br>Clean the external surface<br>Drain used water tank |
| Weekly | Clean distilled water reservoir (drain tank)<br>Clean sterilization chamber |
| Monthly | Clean filter inside chamber and tank |
| Every 6-12 Months | Replace door seal |
| Every Year | Replace silicone tubing, filters and door seal |
| Every 2 Years | Replace battery on main PCB that controls timer |

