

FEATURE SUMMARY

- Chamber volume from 120 to 310 liters
- Working pressure meets ASME and PED requirements
- Temperature range 105 °C (221 °F) to 138 °C (280 °F)
- 18 kW / 27 kW integral steam generator or external steam source
- User friendly control system with touch screen display
- 30 Programs: 8 factory set programs, 2 test programs, 20 programmable cycle programs
- Built-in printer
- Ethernet connection port for PC access via network
- USB port to download cycle data to memory device
- Pressure gauges on front panel
- 316L stainless steel chamber and door
- Chamber has a mirror-like finish
- Stainless steel piping
- Conforms to Medical Device Directive 93/42 EEC and PED 97/23 EC, FDA Clearance
- Conforms to standards: ASME, AAMI/ANSI-ST8, EN 285, UL
- Company approved for 21 CFR 820, ISO 9001:2008 and ISO 13485:2003 (Medical Devices)
- Optional configurations available

DEVICE PICTURE



44 Compact Series with Hinged Door

PRODUCT DESCRIPTION

This autoclave series is designed to cover a large field of applications for hospitals, CSSD and medical centers.

The autoclave series has a chamber volume range from 120 liters to 310 liters.

The autoclave operates with saturated steam as the sterilizing agent with a temperature range from 105 °C (221°F) to 138 °C (280 °F) and a working pressure that meets ASME and PED requirements. The autoclave is equipped with an 18kW and 27kW integral electrical steam generator which supplies the necessary steam for the sterilization process. The sterilizer may also be steam fed from an external steam source.

APPLICATIONS

Central Sterilizing Supply Department (CSSD)
Operating Theater
Out Patient Clinic

Information furnished by Tuttnauer is believed to be accurate and reliable. However, no responsibility is assumed by Tuttnauer for its use.

This specification is subject to change without notice.



44 Compact Series with Vertical Sliding Door

TECHNICAL SPECIFICATION

44 and 55 Compact Sterilizer Series

PRODUCT SPECIFICATION

CHAMBER VOLUME & SIZE

MODEL	CHAMBER DIMENSIONS (mm)			VOLUME (liter)
	Width	Height	Depth	
4472	408	408	730	120
4480			845	140
4496			970	160
5596	508	508	970	250
55120			1210	310

DOOR SELECTION

- Single door
- Double door (pass through)

- Manual right hinged
- Manual left hinged

- Automatic vertical sliding (door on left, control on right)
- Automatic vertical sliding (door on right, control on left)

All automatic doors have a robust hydraulic mechanism for operating doors.

SERVICE ACCESS

From loading side and left or right side.

INSTALLATION SELECTIONS

- Installed in a wall [Single Door]
- Cabinet enclosure [Single Door]
- Cabinet enclosure through one wall [Double Door]
- Installed through two walls [Double Door]

ELECTRICAL COMPONENTS

The following parts are located in the electric boxes:

- The Solid State Relays for the command of the vacuum pump, and the water pump.
- The Circuit Breakers for protection of all power circuits.
- The power supplies for powering of electronic circuitry and solenoid valves.
- An overload switch is used to protect the device from high overload currents.
- The connection elements (sockets, plugs, etc) and components have a degree of protection conforming to the IPX4 protection level and conform to the IEC60529 standard.

VOLTAGE SUPPLY

Three phase or one phase electricity supply is available.

Voltage:

- 415V 3-Phase with Neutral
- 380V / 400V 3-Phase with Neutral
- 230V 3-Phase with Neutral
- 208V 3-Phase with or without Neutral
- 220V / 230V 1-Phase (not 55120 model)
- 110V / 115V 1-Phase *

* For 18kW with building steam supply (optional vacuum by ejector)

Frequency: 50 Hz or 60 Hz

MODEL	STEAM GENERATOR POWER (kW)
4472	18
4480	
4496	
5596	27
55120	

Customized electrical specifications are available (additional cost).

LANGUAGE

The operator display is available in 26 languages including: English, Spanish, German, Dutch, Russian, Chinese, Arabic.

STANDARDS AND CODES

Tuttnauer products meet the following provisions and standards:

Europe:

EN285: 2006+A2:2010 for Large Autoclaves

USA:

ANSI/AAMI - ST 8: 2008 – Hospital Sterilizers

Directives & Guidelines:

97/23/EC - Pressure Equipment Directive
 2002/95/EC - RoHS Directives
 2004/108/EC - Electromagnetic compatibility
 2006/95/EC - Electrical equipment
 2006/42/EC - Machinery Directive

Safety and EMC Standards:

EN 61010-1: 2001
 EN 61010-2-040: 2005
 EN 61326-1: 2006
 EMC Directive 89/336
 EN 60529:1991 - Degrees of Enclosure Protection (IPX4)

Pressure Vessel and Steam Generator Construction Standards:

ASME Code, Section VIII, Division 1, unfired pressure vessels
 ASME Code, Section I, for boilers

Good Practice Standards:

ISO 17665-1: 2006
 ANSI/AAMI – ST 8: 2008

Quality System Standards:

ISO 9001:2008 (Quality Systems)
 ISO 13485:2003 (Quality Systems for Medical Devices)
 Compliance with 21 CFR 820

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CHAMBER CONSTRUCTION

Materials

The sterilizer chamber is constructed from solid, high quality materials. Chamber and door thickness is no less than 5 mm.

Standard Configuration Materials:

Chamber + Door: 316L stainless steel
Jacket: 304L stainless steel

Optional Materials (Stainless Steel):

Chamber + Door: 316Ti
Jacket: 316L or 316Ti

Chamber Design

The chamber is **fully jacketed**. A stainless steel mesh strainer protects the drain port from blockage by debris. The chamber is mounted on a steel framework which is height adjustable.

Door Gasket

Manual hinged door gasket: a silicone gasket is permanently fixed in the door.

Automatic sliding door gasket: a silicone gasket is fixed in a groove in the door frame and the gasket is sealed against the door by means of steam pressure.

Surface Treatment

A passivation layer is applied to the internal surface through an electro-chemical treatment which results in a smooth and shiny stainless steel. The resultant surface is polished to less than 0.8 µm which is highly protected against corrosion. The internal corners are rounded to aid cleaning.

Chamber Heating

The fully jacketed chamber is pre-heated by steam in the jacket.

Insulation

The sterilizer jacket and door are completely insulated with a 1" chloride free glass wool thereby keeping the autoclave cool on the outside. Customized thicker insulation is optional. The insulation is completely enclosed within a stainless steel cover.

The insulation reduces the energy consumption by keeping the heat inside the jacket and chamber.

SAFETY FEATURES

Door Safety Systems:

- A pneumatic safety component (pressure switch) is installed in the autoclave which prevents opening of the doors until pressure in the chamber reaches room pressure.
- Door chamber cannot be opened when chamber is pressurized
- Steam is not allowed into the chamber when the door is open
- A cycle cannot start if the door is open or not properly locked
- The sliding door movement will stop immediately if an object is detected in front of the closing door
- Double door safety is implemented through interlocks which prevent both doors from being opened simultaneously

Safety Valves: Both chamber and jacket are equipped with pressure relief safety valves. If the pressure exceeds the allowed limit then the safety valves will discharge.

Built-in Steam Generator Safety: A water level control system maintains a constant water level that ensures safe operation of the heaters. Furthermore, a sensor ensures that the heater does not operate without a minimum water intake.

Emergency Shut-Off: Easily accessible emergency switches for immediate cycle shut-off.

Double Independent Monitoring: The combined digital and mechanical monitoring systems provide a cross-reference and guarantee accurate results. The operator has two means of monitoring temperature and pressure.

WATER RING VACUUM PUMP

The vacuum pump effectively removes more than 99% air from the chamber. The pump is mounted on a damping mechanism to minimize vibration.

During vacuum action the flow path of the fluids is through the condenser (heat exchanger) and the vacuum pump/ejector to drain. This protects the vacuum system from excessive temperatures.

PIPES & COMPONENTS

The piping system of the autoclave consists of air-operated ball valves, which control the condensate and steam flow in and out of the chamber, operates the vacuum, and the air inlet valve.

Standard configuration:

Piping and fittings: 304 threaded stainless steel
Components*: Brass

Optional configuration (stainless steel):

Primary piping & fittings **: 316 + triclamp fittings
Primary components: 316 triclamps or 316 threaded

* Components – Manual valve, non-return valve, pressure regulator, pneumatic valves, steam trap, etc.

** Primary piping system that connects to the chamber up to and including the first valve.

PRESSURE GAUGES

The single door configuration has four pressure gauges that indicate the pressure in the chamber, jacket, door gasket, and the steam generator.

These pressure gauges are located on the autoclave's front panel (loading side).

The double door configuration has two additional pressure gauges on the unloading side that indicate the pressure in the chamber and the pressure in the gasket of the second door.

VALIDATION PORTS

The chamber is provided with two 1" threaded connections for optional vacuum/pressure gauges and test sensors. The Validation Ports are each found on the right and left side of the sterilizer from the control side.

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44 and 55 Compact Sterilizer Series

AIR FILTER

A disposable microbiological air filter is provided to filter all air entering the sterilizer chamber. The air is used to equalize the chamber pressure to atmospheric pressure at the end of the sterilization cycle.

The filter is rated for a particle size of 0.2 µm.

STEAM SUPPLY

The autoclave is supplied with either a steam generator or an option to connect to building steam supply. A combined option of steam generator and building steam supply is also available.

Additional specialized steam supply configurations are listed in the Special Options and Accessories section below.

Built-in Steam Generator: supplies steam for the sterilization process. The stainless steel steam generator is an electrically heated type generator equipped with immersion heaters, divided in three-phases. The electrical system of the steam generator is located in a separate electric box.

Water to the steam generator is supplied by a single-phase pump, from a water reservoir, which is connected to a source of mineral-free water.

STEAM GENERATOR WATER QUALITY

Various water systems can be used to supply mineral-free water to the steam generator such as Reverse Osmosis (RO), distilled water, etc. Water supplied to the steam generator should be in compliance with the EN 285 standard which includes the following hardness and conductivity requirements:

- Hardness < 0.1 mmol/l
- Conductivity < 50 µS/cm
- Maximum consumption: 12 liters per standard load cycle

Note: Soft water should not be used since its use may result in corrosion of the steam generator and chamber.

VACUUM SYSTEM AND DRAIN COOLING WATER QUALITY

City tap water supply:

- Hardness between 0.7 and 2 mmol/l
- The tap water pressure should be in the range of 3 – 5 bar (40 - 72 psi)
- Recommended temperature: 15°C
- Consumption: 160 liters per cycle average

CONTROL SYSTEM (ALLEN-BRADLEY)

The controls system is based on the Allen Bradley MicroLogix 1400 PLC platform, and controls and monitors the physical parameters of the sterilization process, and performs the operation sequence of the machine, according to the selected program, and features:

- Data acquisition from 10 digital inputs: four PT100 sensors, four 4-20mA analog inputs, and two 0–10V analog inputs
- Digital inputs and outputs for sterilizer control
- Analog inputs from multiple temperature and pressure
- Measures chamber pressure, jacket pressure, steam generator pressure, door gasket pressure, and reference temperature
- Communication via a serial port or an Ethernet 10/100 communication port (on some configurations)
- Analogue sensor calibration
- F₀ mode
- FLASH memory and real-time clock backup store cycle data for at least 5 years even if there is a power failure

The system includes an additional memory device which contains: the updated software, offset and gains, and in the case of software or control error will reload the software automatically.

The control system controls all system functions, monitors system operations, both visually and audibly alerts the operator of cycle malfunctions and, on demand, provides visual indication of the chamber temperature and pressure.

TEMPERATURE AND PRESSURE SENSORS

The temperature and pressure measuring circuits are both linear and designed with components having a high precision. The PT100 sensors conform to Class A of the IEC751 standard.

When the exhaust temperature increases above 40°C (measured by a PT100 sensor at the exhaust drain) then tap water is mixed with the exhaust to drain.

The control system allows for the calibration of temperature and pressure to be performed digitally.

Each sensor circuit is calibrated with individual constants to correct the deviation in manufacturing and aging.

The system uses FLASH memory in which the offset and gain data of the sensors are stored. This data may be entered into the system, through programming or through the autoclaves touch screen control panel.

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CONTROL PANEL

Control and Monitoring

The control system is operated via an easy to use full color touch screens (7" TFT LCD) found on both sides of the autoclave. One or both touch screens may be upgraded to 10" display.

The touch screen control panel supports multiple languages.

Twelve password access levels (0-12) are provided to control access/operation of the machine preventing unauthorized access. These access levels are customizable. Access control can be applied to the following functions operated from the control panel:

- running test cycles
- sensor calibration, service and maintenance
- cycle selection, cycle start, customizing cycle parameters
- 18 preset sterilization programs and 2 preset test programs
- door control
- testing inputs and outputs

With the standard factory configuration, calibration of the temperature circuits and calibration of the pressure circuits require an access code.



Operators Control Panel (Touch Screen)

The following information is displayed:

- Temperature, chamber pressure and jacket pressure
- Door status
- Sterilization time count down
- Autoclave status: standby, ready, pre-vacuum, heating, sterilization, exhaust, dry time, air inlet, cycle ended
- Display of inputs and outputs with other maintenance functions
- View of alarms history and general history log (2000 readings)
- door/s status
- cycle graph display with zoom
- cycle name, cycle parameters
- user messages

ALARMS

The autoclave uses both audible and visual alarm indicators. Automatic process checking and failure detection are provided by the control system. In the event of a failure during the sterilization cycle, the system enters an alarm phase which will safely end the process automatically. The range of alarms includes:

- Temperature & pressure sensor failure
- Phase time-outs
- Door(s) not properly closed
- Power failure
- No water in the water reservoir
- Optional utility alarms: no water / no steam / no air

CYCLE DOCUMENTATION - PRINTER

The autoclave is equipped with a printer which prints a detailed history of each cycle performed by the instrument. Various types of printers are listed in the Special Options and Accessories section towards the end of this document.

The printing format is 24 characters per line. The following information and set parameters are printed when the sterilization cycle begins:

- Autoclave serial number, load no., name
- Software version
- Real time
- Selected program
- Sterilization temperature, pressure, and time
- Dry time
- Alarms

Thereafter, the autoclave starts performing the sequence of operations of the cycle. The measured values of temperature and pressure are printed at fixed time intervals, according to various phases of the sterilization process: 4 minute time interval for vacuum, 1 minute time interval for sterilization, and the start and end time of the drying phase. All interval times can be user defined. Furthermore, the customer may request customized time intervals prior to order delivery.

The data is printed from the bottom up, beginning with the date and ending with "O.K." for a complete cycle or "FAIL" for an aborted cycle.

OPTIONAL LOADING EQUIPMENT

Two Pull Out Trays

Stainless steel trays equipped with tracks for easy loading and unloading. The tracks are designed to prevent the trays from rolling over.

Loading Cart and Transfer Carriage

The loading cart rolls off the transfer carriage onto the chamber rails for easy handling of heavy loads.

The transfer carriage uses heavy duty revolving wheels (castors) to maximize mobility in limited space, and wheel brakes to prevent rolling. There is a lock to prevent the loading cart from sliding. The legs of the transfer carriage are adjustable to match the height of the loading cart with the tracks in the sterilizer chamber.

Both the loading cart and transfer carriage are made of durable AISI 304 or AISI 316 stainless steel.

See Special Options and Accessories section for more options.

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STERILIZER DOCUMENTATION

A number of copies of the manuals are provided. Operator and service manuals are in selected language. Other manuals are in English. Manuals include electrical and piping diagram.

Furthermore, a CD is provided containing the following:

- Operators manual
- Technical manual
- Serial number for specific autoclave
- Factory test report prior to shipping
- Optional - technical specifications for component, etc.

MAINTENANCE / SERVICE PLAN

A global network of skilled service specialists can provide periodic inspections and adjustments to help assure low-cost peak performance. A detailed service and maintenance plan is included in the operator manual.

PACKAGING FOR SHIPMENT

The sterilizer is packed in a wooden crate for shipping/transportation.

WARRANTY

Tuttnauer warrants that each device is carefully tested, inspected and that it leaves the factory in proper working condition.

Tuttnauer certifies that the device is guaranteed to be free from defects in material and workmanship, for one year from installation date but not more than 18 months from shipping date, against faulty components and assembly. Extended warranty periods are optional.

The warranty does not include and does not replace routine treatment and preventive maintenance to be performed according to "Preventive and Periodical Maintenance" instructions mentioned in the device's accompanying manual.

The user must ensure that all utilities used, including the water, meet all the specifications mentioned in the operator manual.

The user is subject to the full warranty statement found in the documentation delivered with the equipment.

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UTILITY DATA / REQUIREMENTS

External Steam Source

1. 97 – 100 % dry saturated steam
- 2a. Steam rate 46 kg/h for 6690, 66120, and 6671130 models
- 2b. Steam rate 80 kg/h for 6671162 Model
3. Protected by certified safety valve - max. 2.8 bar
4. Final steam pipe to the autoclave at least pipe 1" diameter
5. Install a shut-off valve at end of steam pipe

Electrical

With generator (all models)

- 3-Phase, 208 / 220 / 230 / 380 / 400 / 415 Volt, with or without neutral, 18 kW
- For autoclave model 55120: 3-Phase, 208 / 220 / 230 / 380 / 400 / 415 Volt, with or without neutral, 27 kW

Without generator (all models)

Note: must have building steam supply (optional vacuum by ejector)

- 3-Phase, 208 / 220 / 230 / 380 / 400 / 415 Volt, with or without neutral, not less than 10 A
- 1-Phase, 110 / 115 / 220 / 230 Volt, with neutral, not less than 10 A, (optional vacuum by ejector) (not for 55120 model)
- 1-Phase (only 4472 and 4480 Models), 220 / 230 Volt, with neutral, not less than 10 A, vacuum by V6 vacuum pump

Additional customizable electrical specifications are available.

Drainage (Sewage)

1. At least 2" sewage pipe.
2. The sewage shall be able to withstand continuous temperature of 80 °C and for short time periods at 100 °C.
3. Each autoclave will have a separate sewage line connected to a vertical vent pipe. Vertical pitch is 1000 mm.

Note: Local national regulations may require that the drain be tapped and vented, and not connected to other drains which

may cause back pressure or obstruct flow. An air break may also be necessary.

Mineral-Free Feed Water for Steam Generator

1. Water intended for the steam generator must have a water quality in accordance with EN 285:2006+A2:2009
2. Install 1/2" pipe with a shut-off valve at its end
3. Regulations may require a Back-Flow protection device
- 4a. Supply: 25 ℓ/h for sterilizers using 18 kW steam generators
- 4b. Supply: 37 ℓ/h for sterilizers using 27 kW steam generators

Tap Water

1. Intended for vacuum pump and cooling
2. Install 1/2" pipe with shut-off valve at its end
3. Supply pressure 2 – 5 bar at approximately 15 °C temperature.
4. Local regulations may require a Back-Flow protection device
5. Hardness (free of alkaline earth ions) should be between 0.7 mmol/ℓ and 2.0 mmol/ℓ
6. Supply: approximately 17 ℓ/min

Compressed Air

1. At least 3/8" hose to supply the compressed air
2. The compressed air supply line coming from the building must have a shut-off valve
3. Pressure: 6 to 8 bar, free from liquid water, filtered to 25 µm, free from oil droplets greater than 2 µm

Ambient Temperature

Plant room temperature should be in the range from 5 to 40 °C and 85% RH (relative humidity).

Floor

The unit mass shall be considered no less than 10000 N/m² according to the DIN 58949-7:2004 standard.

Ventilation

10 air replacements per hour

OVERALL EXTERNAL DIMENSIONS

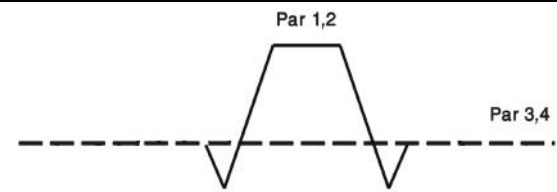
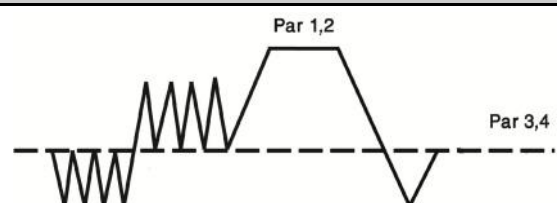
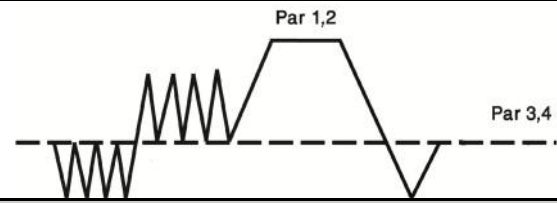
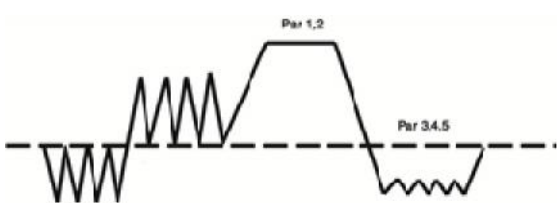
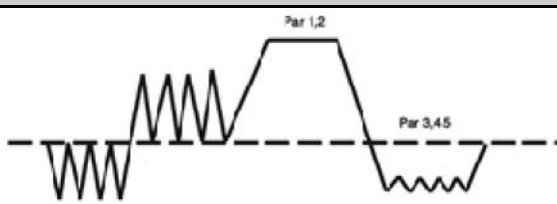
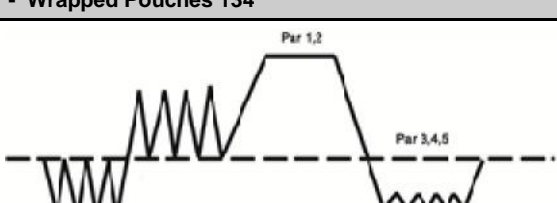
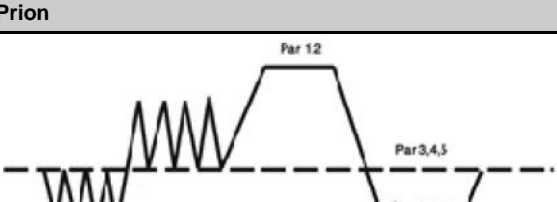
MODEL	DOOR CONFIGURATION		EXTERNAL DIMENSIONS (mm)		
	Door Type	No. of Doors	Width	Height	Depth
4472	Hinged	1	850	1630	1290
		2			1260
	Vertical Sliding	1	1150	1630	1020
		2			920
4480	Hinged	1	850	1630	1370
		2			1370
	Vertical Sliding	1	1150	1630	1120
		2			1040
4496	Hinged	1	850	1630	1530
		2			1530
	Vertical Sliding	1	1150	1630	1320
		2			1200
5596	Hinged	1	950	1680	1480
		2			1520
	Vertical Sliding	1	1250	1680	1190
		2			1160
55120	Hinged	1	950	1680	1720
		2			1760
	Vertical Sliding	1	1250	1680	1560
		2			1400

Note: Upon request Tuttnauer can provide special configurations so that the autoclaves will fit through narrow passage-ways / elevators during transportation in and out of buildings.

TECHNICAL SPECIFICATION

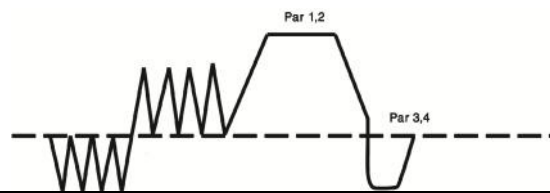
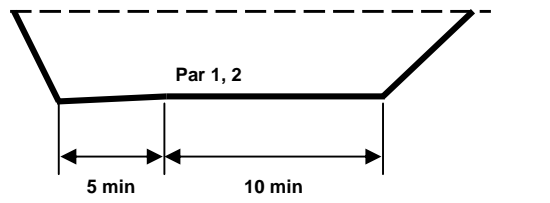
44 and 55 Compact Sterilizer Series

PROGRAM CYCLE DATA

Program 1 - Warm Up		Unwrapped rigid (instruments), etc.			
Atmospheric Pressure		Parameters	Units	Range	Factory Setting
		1. Sterilization Temperature 2. Sterilization Time 3. Exhaust Mode 4. Drying Time (Post-Vacuum)	°C min min	105 - 138 1 - 99 1-6 0 - 99	121 15 1 (fast) 1
Notes: Residual air is displaced by 4 vacuum pulses (down to 25 kPa) and 3 steam pulses up to 160 kPa. When the pressure reaches atmospheric pressure, the vacuum pump is activated until the pressure drops to 25kPa.					
Program 2 - Unwrapped 134		Unwrapped rigid (instruments), etc.			
Atmospheric Pressure		Parameters	Units	Range	Factory Setting
		1. Sterilization Temperature 2. Sterilization Time 3. Exhaust Mode 4. Drying Time (Post-Vacuum)	°C min min	105 - 138 1 - 99 1-6 0 - 99	134 3 1 (fast) 1
Notes: Residual air is displaced by 4 vacuum pulses (down to 25 kPa) and 3 steam pulses up to 160 kPa. When the pressure reaches atmospheric pressure the vacuum pump is activated until the pressure drops to 25 kPa.					
Program 3 - Unwrapped 121		Unwrapped rigid (instruments), etc.			
Atmospheric Pressure		Parameters	Units	Range	Factory Setting
		1. Sterilization Temperature 2. Sterilization Time 3. Exhaust Mode 4. Drying Time (Post-Vacuum)	°C min min	105 - 138 1 - 99 1-6 0 - 99	121 15 1 (fast) 1
Notes: Residual air is displaced by 4 vacuum pulses (down to 25 kPa) and 3 steam pulses up to 160 kPa. When the pressure reaches atmospheric pressure, the vacuum pump is activated until the pressure drops to 25kPa.					
Program 4 - Wrapped 134		Wrapped materials (instruments), porous load, etc.			
Atmospheric Pressure		Parameters	Units	Range	Factory Setting
		1. Sterilization Temperature 2. Sterilization Time 3. Exhaust Mode 4. Drying Time (Post-Vacuum)	°C min min	105 - 138 1 - 99 1-6 0 - 99	134 4 1 (fast) 15
Notes: Residual air is displaced by 4 vacuum pulses (down to 25 kPa) and 3 steam pulses up to 160 kPa. When the pressure reaches atmospheric pressure the vacuum pump is activated until the pressure drops to 25 kPa.					
Program 5 - Wrapped 121		Wrapped materials (instruments), porous load, etc.			
Atmospheric Pressure		Parameters	Units	Range	Factory Setting
		1. Sterilization Temperature 2. Sterilization Time 3. Exhaust Mode 4. Drying Time (Post-Vacuum)	°C min min	105 - 138 1 - 99 1-6 0 - 99	121 15 1 (fast) 15
Notes: Residual air is displaced by 4 vacuum pulses (down to 25 kPa) and 3 steam pulses up to 160 kPa. When the pressure reaches atmospheric pressure the vacuum pump is activated until the pressure drops to 25 kPa.					
Program 6 - 7 - Wrapped Pouches 134		Double wrapped materials (instruments), porous load, etc.			
Atmospheric Pressure		Parameters	Units	Range	Factory Setting
		1. Sterilization Temperature 2. Sterilization Time 3. Exhaust Mode 4. Drying Time (Post-Vacuum)	°C min min	105 - 137 1 - 99 1-6 0 - 99	134 7 1 (fast) 20 / 30
Notes: Residual air is displaced by 4 vacuum pulses (down to 25 kPa) and 3 steam pulses up to 160 kPa. When the pressure reaches atmospheric pressure the vacuum pump is activated until the pressure drops to 25 kPa.					
Program 8 - Prion		Prion			
Atmospheric Pressure		Parameters	Units	Range	Factory Setting
		1. Sterilization Temperature 2. Sterilization Time 3. Exhaust Mode 4. Drying Time (Post-Vacuum)	°C min min	105 - 138 1 - 99 1-6 0 - 99	134 18 1 (fast) 15
Notes: Residual air is displaced by 4 vacuum pulses (down to 25 kPa) and 3 steam pulses up to 160 kPa. When the pressure reaches atmospheric pressure the vacuum pump is activated until the pressure drops to 25 kPa.					

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Program 9 - Bowie & Dick Test		Efficiency test of air removal from within the chamber			
Atmospheric Pressure		Parameters 1. Sterilization Temperature 2. Sterilization Time 3. Exhaust Mode 4. Drying Time (Post-Vacuum)	Units °C min min	Range - - - -	Factory Setting 134 3.5 1 (fast) 2
		Notes: Residual air is displaced by 4 vacuum pulses (down to 25 kPa) and 3 steam pulses up to 160 kPa. Drying is performed during a "low-pressure" phase. When the pressure reaches atmospheric pressure the vacuum pump is activated until the pressure drops to 25 kPa. Only the number and type of vacuum pulses can be modified.			
Program 10 - Vacuum Test		Air leakage test to chamber through door and other seals			
Atmospheric Pressure		Parameters 1. Stabilizing Time 2. Test Time	Units min min	Range - -	Factory Setting 5 10
		Notes: Chamber vacuum is brought to 10 kPa. Thereafter all valves and motors are closed for 5 minutes enabling pressure stabilization. The acceptable pressure change over the following 10 minutes is 1.3 kPa.			

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SPECIAL OPTIONS AND ACCESSORIES

ADVANCED CONTROL FEATURES

10" TFT (LCD) Touch Screen

Upgrade from 7" to 10.4" touch screen.

R.P.C.R Software

Software that is installed on a network connected PC.. Allows for downloading of cycle data from an autoclave connected to the same network. Software gives access to: cycle data graph, numeric cycle data, print-outs, measured values table, parameter table, and more.

Remote Automated Cycle Data Recording

- Automatic recording of cycle information to any PC on the same Ethernet network
- Convenient access to graphs and tables
- Generate PDF reports

Supervisory Control and Data Acquisition Software (SCADA)

Complete supervisory control and data acquisition. Provides supervision control, data logger and remote control of up to 16 autoclaves. The software creates an electronic file (SNP) accessible with suitable data software such as Microsoft access and SQL to show real time data. Possibility to produce reports monthly or per cycle. The price includes a standard PC with Windows license and all the software install and tested in the factory.

Two Color Printer

Printer IDP3550 Serial dot impact, two colors black/red, high speed printing 3.6 lines/sec, 7 X 9 matrix 40 columns, 76mm roll paper, paper auto loading.

Graphic Printer - DPU 414

The DPU-414 is a silent high-quality printer that prints characters and high-density graphics. The DPU-414 prints a detailed history of each cycle performed by the instrument.

Chart Recorder (Independent Microprocessor Control)

A high-speed chart recorder, with independent microprocessor control and power supply, is suitable for independent cycle documentation. This multi-range input recorder can record 12 points at once from RTDs and DC voltage input signals, producing analog trend records and print-outs. Simple operation with an easy-to-view display allows one to key-in various items of set data. The unit operates independently of the autoclave (obligatory for meeting EN285).

ADVANCED OPERATION FEATURES

Multipurpose Valve

Compressed air operated control valve drains the water/steam and releases pressure in order to open the chamber if a cycle failure occurs due to electric power failure.

Dual Steam Source Valve

To connect central steam supply and backup steam generator.

Foot Pedal to Open Door

The foot pedal feature allows one to open the door by foot.

Automatic Restart and Shutdown

Feature enables a preprogrammed restart and/or complete shutdown of utilities at cycle end or set time, closing all utility valves, returning chamber and jacket to ambient temperature.

ADVANCED STEAM RELATED OPTIONS

Automatic Blow Down

Automatic drainage can be accomplished through the use of a programmable timer.

Separate Connection to Jacket and Chamber

Enables reaching sterilization at a faster rate and improved temperature control when working with liquids, especially with 105°C and less. This feature is vital for clean steam systems.

ACCESSORIES

Air Compressor

For operating the pneumatic valves and automatic door/s (must be ordered if there is no local source of compressed air).

Hotwell

The hotwell heats water to about 80-90°C to remove non-condensable gases prior to being pumped to the steam generator or STS generator.

Bio Shield Frame

The sterilizer is surrounded by a frame which serves as a preparation for a cross-contamination seal made of Neoprene sheet that is attached between the frame and the wall at site.

Water Recycling System

This system recycles water necessary for the heat exchanger to cool down the steam exhaust from the chamber. The water saving system recycles the water and reuses it. Tuttnauer's water saving system saves more than 50% of the tap water used.

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