

CUSTOMER: _____

REFERENCE: _____

400LS & 500LS SERIES GRAVITY & VACUUM/GRAVITY STEAM STERILIZERS FOR LIFE SCIENCE APPLICATIONS

PRODUCT SPECIFICATION

PRODUCT

Both the 400LS Series and 500LS Series Sterilizers consist of two models. The 422LS and 522LS Gravity Steam Sterilizers employ gravity/downward displacement with positive pulse conditioning and the 433LS and 533LS Vacuum/Gravity Steam Sterilizers employ both gravity/downward displacement with positive pulse conditioning and pressure/vacuum pulsing for dynamic air removal. Up to 19 cycles can be easily accessed in two easy steps. Custom cycle names can be designated for each cycle during installation. All cycle phases are sequenced and monitored by the control system, providing both audible and visual notification of deviation from certain operating parameters.

APPLICATION

For general-purpose gravity or vacuum steam sterilization and decontamination of laboratory, research and animal care supplies. The sterilizer controls are specifically designed with the flexibility needed for scientific purposes and are not to be used to sterilize medical devices for patient use in healthcare applications. The selectable temperature range is from 230°F to 275°F (110°C to 135°C) and from 219°F to 275°F (104°C to 135°C) for liquid cycles. Typical applications include wrapped and unwrapped hard goods, animal cages with bedding, textiles and linens and liquids in self-venting or unsealed containers. The liquid exhaust is microcomputer controlled for linear and consistent liquid cool down, programmable within a specified range.

KEY FEATURES: MODEL SELECTION

400LS Series 17.5" (445 mm) x 17.5" (445 mm) x 26" (660 mm), 4.6 Cu Ft (130 L)

- 422LS Gravity Steam or
- 433LS Gravity and Vacuum Steam

500LS Series 21" (532 mm) x 21" (532 mm) x 38" (965 mm), 9.7 Cu Ft (275 L)

- 522LS Gravity Steam or
- 533LS Gravity and Vacuum Steam

DOOR SELECTION

- Manual
- Power (not available for BSF or CCB)

SINGLE DOOR MOUNTING

- Recessed
- Cabinet

DOUBLE DOOR MOUNTING

- Cabinet, recessed one end
- Recessed both ends (500LS Series Only)



PRINTER LOCATION (Designation only for BSF or CCB)

- At Control End/Load End (CE)
- At Remote End/Unload End (RE)

NOTE: Printer located at control end as standard

BIOLOGIC SEALING FLANGE (BSF) (500LS Series Manual Door Only)

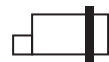
BSF/CCB at CE / Printer at CE



Unidirectional Flow



BSF/CCB at RE / Printer at CE



Unidirectional Flow



BSF/CCB at CE / Printer at RE



BSF/CCB at RE / Printer at RE



- At Control End/Load End (CE)
- At Remote End/Unload End (RE)

CROSS CONTAMINATION BARRIER (CCB) (500LS

Series Manual Door Only)

- At Control End/Load End (CE)
- At Remote End/Unload End (RE)

CONTROL PANEL LOCATION

- On Unit
- Wall Mounted Vertically, Remote from unit

STEAM SOURCE

- House steam
- 30 kW integral steam boiler with an automatic feed water pump as standard (not available with double door 400LS Series Models)
 - 208V 3Ph
 - 240V 3Ph
 - 480V 3Ph
 - 600V 3Ph
 - 380/415V 50Hz 3Ph

LANGUAGE (Select one)

- English

OPTIONS

- French
- Spanish
- Boiler Control and Safety Device (CSD-1). Satisfies state ASME requirements for secondary low water cut-off as required by local jurisdiction.
- Uninterrupted Power Supply (UPS). Provides 115V power for up to 30 minutes to complete a cycle in process.
- 304 Stainless Steel piping for clean steam Tissue Culture applications. (Requires house steam to jacket).
- Thermocouple Gland
- Load RTD for temperature control of a liquid load
- Vacuum Pump (533LS w/House steam only)
- Automatic Steam Boiler Blowdown
- Water Saver Package
 - 120V
 - 220V

*OPTIONAL SYSTEMS

- Free standing electric stainless steel boilers for clean steam
- Free standing, stainless steel steam to steam generator for clean steam
- ASME Blowdown Separator

*Refer to Optional Systems literature for further details and descriptions.

QUALITY STATEMENT

INTERIOR EQUIPMENT

- Rack with two shelves

- Extra third shelf – 400LS Series

- Extra third shelf – 500LS Series

- 500LS Series Loading Car, with interior track _____Qty.

- 500LS Series Transfer Carriage _____Qty.

STANDARDS AND CODES

Confidence in the Getinge Group is the most important quality criterion. This must be the hallmark of all our external and internal commitments, activities and products. Products and services supplied by Getinge must conform to the agreed terms and expectations to ensure recommendations for further business. The achievement of these quality goals is the basis for a continued competitive and successful enterprise.

The sterilizer shall comply with or meet the requirements of:

- ASME (Section VIII, Division 1) Code for Pressure Vessels
- Canadian Registration Number (CRN) Pressure Vessel Design
- Uniform Plumbing Code
- ETL Listed to UL 3101-1 by Intertek Testing Services

MICROCOMPUTER CONTROLS

- ETL Listed to IEC 61010-1 and IEC 61010-2-041 by Intertek Testing Services
- cETL Listed to CSA C22.2 Nos. 1010.1 and 61010.2.041 by Intertek Testing Services
- Seismic Anchoring Requirements per California Building Code

Getinge Sterilizers employ a Hitachi 20 MHz microprocessor as a dedicated controller (CPU) with 8 MB of RAM. The control panel consists of an operator interface panel (called OP30), a thermal printer, mechanical chamber and jacket pressure gauges, status indicators, active touch sensitive switches, and controls On/Off switch.

Controls are located above the door for convenience. An internal deflection barrier routes steam vapor and moisture away from the door and behind the electronic controls to maintain temperatures at or below temperature limits. If specified, the control panel can be located remotely from the sterilizer with up to 32.8 feet (10 m) of cable. An RS 232 port is provided for serial communications for central data collection or remote service analysis and is ready for T-DOC® connection. The OP30 operator interface panel is a durable 1/4 VGA 5.7 inch diagonal color screen with 320 x 240 pixels. Below the screen are five soft keys to access other screens or displays and to make changes to cycle parameters.

A screen saver extends the life of the backlit LCD. Touching any key illuminates and reactivates the display. Push-button switches, with international symbols and descriptive words, provide door seal and unseal or, if a power door is furnished, vertical movement of the door. Audible and visible operator feedback is provided when a selection is made or a fault description is displayed. Temperature can be set, controlled and displayed in degrees Celsius or Fahrenheit and pressure in psia, bar or kPa. Double door models have one printer (located at control end as standard) and a complete OP30 Operator

Interface at both ends of the sterilizer for full control capabilities at either door.

The temperature of the discharge water is controlled by a temperature device to be less than 140°F (60°C). This switch also conserves water usage. The chamber drain is continuously monitored for the presence of water during a cycle. If water is detected and cannot be automatically corrected, a high water alarm alerts the operator. An RS 232 port is provided for serial communications for central data collection or remote service analysis.

CYCLE DOCUMENTATION

The printer documents cycle performance using special thermal paper for a permanent record. Thermal printing allows for quiet operation. At cycle completion, a cycle performance record is printed. Paper is replaced by a “drop in and quick feed” method and the printed strips can be either accumulated on an automatic take-up reel, or torn off for individual cycle storage. A last cycle duplicate print and paper feed switch is provided. The printer is located on the control panel as a standard and documents the following on a 200-dpi dot matrix printer (1.88" [47.6 mm] wide print width):

- Process start time and date, sterilizer name and number, daily cycle number and total cycle count
- Cycle selected with time and temperature, with other adjustable parameters identified
- Cycle phase transition points, temperature, pressure and total cycle time
- Process fault information messages with time of occurrence
- Summary verification of time at selected temperature (min/max exposure values)
- Cycle verification signature line

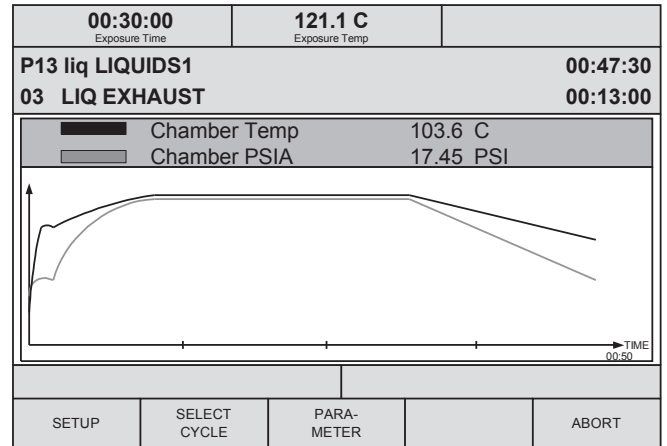
OP30 Operator Interface Features

The OP30 color screen is divided into specific sections to

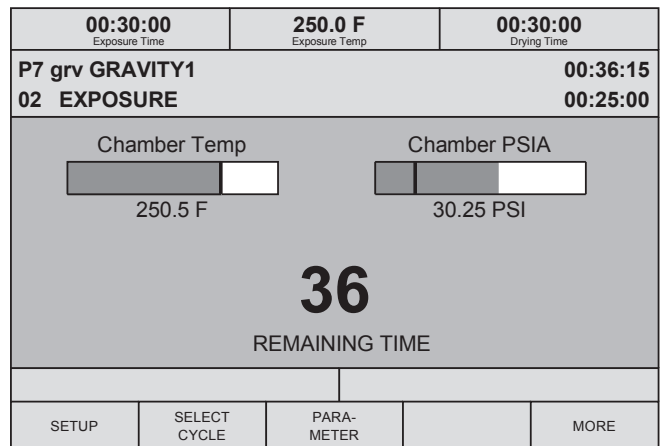
- **Detail.** Displays real time process information in text form.

00:03:00 Exposure Time	135.0 C Exposure Temp	00:20:00 Drying Time
P1 vac PREVAC1		00:00:00
01 STANDBY		01:12:44
Chamber Temp	29.1 C	
Cham Press/PSIG	0.00 PSI	
Jacket Temp	129.9 C	
Atmosphere PSIA	14.25 PSI	
Chamber PSIA	14.25 PSI	
Steam Table Diff	-13.82 PSI	
Exp. Temp Max	135.6 C	
SETUP	SELECT CYCLE	PARA-METER
		UNSEAL

- **Plot Graph.** Displays cycle temperature and pressure in colored graph during a cycle.



- **Bar Graph.** Displays temperature and pressure in a bar graph, with a large, easy to read, time remaining to the end of the cycle (averages the last three cycles for each cycle type).



display selection and performance information in a consistent manner. The top section identifies the time and temperature selected for the cycle. Below that is the type of cycle selected. The middle portion provides a choice of three screens to view actual, real time cycle information. “Pop-up” dialog boxes to change values appear within parameter selection screens to implement changes. Parameters are password protected.

The three screens are:

The lower portion of the screen provides text alarm messages and non-critical system messages, both using color displays, and soft key identifications. Navigating the various screens is accomplished by use of soft keys, directional arrows to move the cursor and change values, and the Enter key. Up to 19 factory recommended cycles are available. Time and temperature can be changed using a quick edit feature. Each change prompts operator acceptance by the use of a Yes/No acknowledgement and a “Save” soft key.

For Supervisor access, an alpha-numeric display provides levels of access for individual operators and service. Using the soft key labeled "Setup" provides the ability to:

- select operating screens
- print the last cycle
- adjust system menu for setting the calendar
- establish users
- passwords for each operator
- access the "about" selection to identify the model and system software number
- choose language, date format, and temperature and pressure measurement
- adjust parameters through password access

The supervisor can also select a Utilities Control feature, which provides a seven-day timer for programmed startup and shut-down of the sterilizer. The Utilities Control System shuts off water and steam to the unit to conserve energy. Cycles running beyond the programmed shutoff time will be completed. Finally, an optional Automatic Steam Boiler Blowdown System can be programmed to blow down the steam boiler automatically once a day, while cooling hot condensate through internal piping. This is typically scheduled during off-peak time.

The factory recommended cycles available for use are:

MODELS 422LS and 522LS (12 total cycles)

- 6 Gravity cycles of 30 minutes exposure at 121°C (250°F) with 30 minutes dry time
- 6 Liquid* cycles at 121°C (250°F), with 30 minutes exposure

MODELS 433LS and 533LS (19 total cycles)

- 6 Gravity cycles of 30 minutes exposure at 121°C (250°F) with 30 minutes dry time
- 6 Pre-Vacuum cycles of 30 minutes exposure at 121°C (250°F)
- 6 Liquid* cycles at 121°C (250°F) with 30 minutes exposure
- 1 Vacuum Leak Test cycle run at 131°C (268°F)

PERFORMANCE

Note: Selection of time and temperatures other than factory recommendations require operator verification of the cycle efficacy.

*The liquid cycle, if used, is not intended for the sterilization of liquids used directly for patient contact.

When installed and connected to specified utility services, the system provides accurate and repeatable performance. During the timed exposure phase, the temperature will be controlled by the chamber sensor at 0.5°C (0.9°F) above the set point (±0.2°C). Temperature selectivity is in 0.1°C (0.1°F) increments. Timing functions are selectable in one-second increments, and

CYCLE PROGRESSION

accuracy is within 0.04%. Temperature is controlled by a time proportioning continuous algorithm, called Proportional Integral (PI). A battery with a 10 year life holds programmed cycle values

in memory. In the event of a power interruption, current cycle status is stored for up to 1 minute.

- **Gravity/Wrapped Goods (pressure pulse pre-conditioning)**
 - a. **Conditioning** — steam flows into the chamber for a timed period, followed by a series of positive pressure pulses to remove chamber air.
 - b. **Heat-Up** — to selected temperature.
 - c. **Exposure** — selected chamber temperature is attained and timed.
 - d. **Exhaust** — chamber vented to atmospheric pressure.
 - e. **Dry** — filtered air is drawn through chamber for the duration of time selected. (Either Gravity or Vacuum Dry is selectable; Vacuum Dry is recommended.)
 - f. **Cycle Complete** — signaled by a tone, display message and light.
- **Prevac/Wrapped Goods (vacuum/pressure pulsing pre-conditioning)**
 - a. **Conditioning** — steam flows into the chamber for a timed period, followed by a series of pressure/vacuum pulses to remove chamber air.
 - b. **Heat-Up** — to selected temperature.
 - c. **Exposure** — selected chamber temperature is attained and timed.
 - d. **Exhaust** — chamber vented to atmospheric pressure.
 - e. **Dry** — a vacuum is created for the duration of the time selected. Filtered air is admitted at the end of the drying time, chamber to atmospheric pressure.
 - f. **Cycle Complete** — signaled by a tone, light and display message.
- **Liquids** —
 - a. **Conditioning** — steam flows into chamber for a timed period to remove air.
 - b. **Heat-Up** — to selected temperature.
 - c. **Dwell** — allows liquid loads to reach drain temperature

PARAMETER ADJUSTMENTS

(when liquid RTD is not used).

- a. **Exposure** — selected chamber temperature is attained and timed.
- e. **Exhaust** — an adjustable linear exhaust.
- f. **Cycle Complete** — signaled by a tone, light and display message.

Utilizing a service software utility tool, an authorized service representative can adjust and modify the following cycle parameters:

CONSTRUCTION

- Set the number of pre-conditioning pulses.
- Set the height of positive pre-conditioning pressure pulses.
- Set the depth of negative pre-conditioning pressure pulses.

- Set over-drive.
- Adjust liquid cycle dwell time.
- Adjust liquid cycle exhaust rate.

The chamber is constructed of an inner shell reinforced by a series of “U” channels that form the outer jacket of the chamber. The gasket ring and backhead (on single door models) are formed and welded to the chamber body. Chamber material is 5 mm (0.197”) thick and door material is 6 mm (0.236”) thick, and both are constructed of Stainless Steel, Type SA240 Gr. 316Ti. The jacket material is also 316Ti. The interior chamber finish is polished to a high luster finish. All pressure vessel construction meets ASME code requirements for working pressures up to 45 psig (310 kPa). The gasket ring holds a continuous, one-piece silicone gasket, 0.63” (16 mm) in diameter. The body assembly is thermally insulated with 1.5” fiberglass insulation and is double thick between the jacket “U” channels.

A steam baffle is provided to prevent condensation from wetting

VERTI-GLIDE DOOR

the load. An extra threaded opening permits passage of thermocouple leads to monitor interior and load temperatures. Steam connection to the jacket and chamber is 316L material. A manual gasket retract valve is provided for emergency chamber access. When rack and shelves are supplied, shelf adjustments will be approximately every 2.5” (63.5 mm). Individual rack supports and shelves shall be easy to remove for cleaning.

The vertical sliding door is counterbalanced for ease of operation. When open, it is totally out of the way, allowing safe and complete access to the chamber. Opening or closing the manual door requires only gentle upward or downward hand pressure. The optional Power Door is operated by a foot switch, and the door will stop automatically if an obstruction is encountered. If the foot switch is actuated while the door is opening or closing, the direction will be reversed. The Power Door can be opened or closed manually. At the beginning of the

BIOLOGIC SEALING FLANGE (BSF)

cycle, steam pressure behind the gasket automatically seals the door and retracts automatically at the end of the cycle. Sealing is positive and consistent. The gasket is recessed for added protection and long life. Once the cycle begins and the chamber is pressurized, the door cannot be opened. A safety switch prevents steam from entering the chamber when the door is not in the closed position. The door is insulated with fiberglass insulation and covered with a stainless steel panel.

When specified, a 1/4” thick, carbon steel, inner flange plate is seal welded around the chamber periphery. The flange plate is mated to the 3/8” thick wall frame installed in the building wall. The wall frame is shipped early as directed. Studs welded on approximately three-inch centers are located around the flange plate and the wall frame. The mating surfaces are gasketed with a 1/4” thick Buna-N rubber gasket using stainless steel clamping bars, nuts and lock washers. The completed assembly of the sealing flange and wall frame provides an airtight seal, which then prevents passage of airborne

microorganisms from a “contaminated” room to a “clean” room. Any necessary penetrations in the flange for wiring or plumbing shall be through potted fittings. Infiltration tests show no cross contamination leakage through the sealing flange with pressure differential of 0.22 psig (6” W.C.). Unidirectional door operation is standard, meaning that one door is sealed at all times, and

CROSS CONTAMINATION BARRIER (CCB)

once the designated “Control End” (CE) door is opened, the sterilizer must complete a successful cycle before the door designated Remote End (RE) can be opened. Full operator interface is provided at both doors with the printer designated at one door (CE or RE). An emergency backup system is provided to maintain the door gasket in the event of utility loss. Compressed air is used as the medium for gasket seal.

The Cross Contamination Barrier has the same inner flange

PANELING

plate as the BSF, and is used when a barrier to maintain an air differential is needed. Sheet metal paneling is supplied to span the distance from the flange plate to the wall opening and is sealed with caulking compound, creating the barrier separation. Electrical or plumbing penetrations through the flange plate shall be compression fittings. Compressed air is used as the

INTEGRAL STEAM BOILER

medium for sealing the sterilizer door gaskets. Unidirectional door operation, as described for BSF, is standard.

The front paneling is constructed of nominal 0.050” (1.27 mm) 300 series #3 brush finish stainless steel and is hinged for easy access to components, the manual gasket retract valve and, if specified, the electric steam boiler. The trim panels are

STEAM BOILER

built-in to fit within a recessed wall or optional cabinet. When specified, the cabinet model will be made of the same material.

The steam boiler will have a 30 kW capacity at standard voltages, and be integral with an automatic fill valve to ensure the correct water level at all times. The sterilizer control on/off switch controls the boiler control power (115V). The steam boiler is automatically controlled to generate and maintain a supply of steam to the sterilizer at minimum of 40 psig (3.72 bar). An automatic feedwater pump is provided as standard.

CONTROLS & FEATURES

The integral steam boiler heating system includes:

1. On-off selector switch with power light. Control power will be removed from the steam boiler when “control off” is selected.
2. An adjustable pressure control and a high-limit control.
3. Adjustable over-pressure cutoff.
4. Automatic fill valve to maintain the correct water levels at all times.

5. An ASME, UV rated 100-psi pressure relief valve.
6. Magnetic contactors for heater circuit, visible water level gauge, safety relief valve and manual drain blowdown valve.
7. A high-water cutoff safety feature prevents water from entering the sterilizer.
8. Full-size, stainless steel drip pan with leak detection and automatic system shutdown.
9. During the blowdown function for either manual or automatic operation, hot condensate flows through the lower piping and is condensed by cold water.

OPTIONS

10. Low water kit to meet ASME CSD-1 requirements per local jurisdictions.
11. An automatic blowdown that incorporates a motorized ball (shutoff) valve that automatically uses steam pressure to minimize mineral accumulation in the steam boiler. The seven-day timer allows the user to select a time each day to schedule the blowdown function.

OPTIONAL WATER SAVER PACKAGE

Features and Benefits:

- No change in cycle performance
- Operator instructions for equipment are unchanged
- Flexible mounting schemes allow installation anywhere within 15 feet of the sterilizer
- Significant water usage reduced

When the is installed and adjusted properly, the system can provide water savings of 75% or greater. The table below shows average savings for various models of Getinge Vacuum-Steam sterilizers when the equipment is programmed for a wrapped goods cycle with 3 minutes exposure time and a dry-time of 30 minutes. Even when installed on gravity displacement sterilizers that require a lengthy dry phase for processing porous loads, the Water Saver can produce significant savings.

NOTE: Requires independent electrical service

Water Consumption Per Cycle

Equipment: 400/500LS
 Standard Unit Consumption: 139 gal.
 With Water Saver package: 25 gal.
 % Savings: over 75%

ENVIRONMENTAL IMPACT

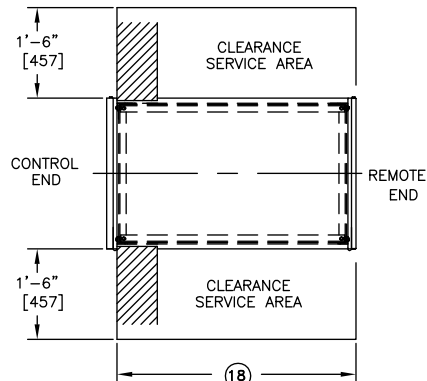
Getinge steam sterilizers are designed and constructed with our environment in mind. To aid in the conservation of natural resources, and in recognition of prevailing Environmental Policies, in particular ISO 14001, Getinge steam sterilizers are more than 90% (by weight) recyclable.

Under normal operation, Getinge steam sterilizers produce no harmful byproducts. The Getinge steam sterilization process, in and of itself, produces nothing more dangerous than hot drain.

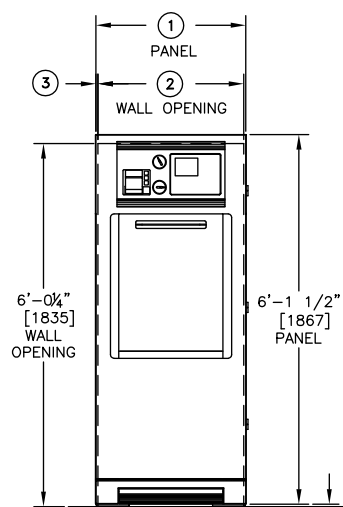
WARRANTY

Getinge USA, Inc. warrants that each sterilizer is carefully tested, inspected and leaves the factory in proper working condition, free from visible defects. Sterilizers are warranted for one year from the start of the warranty, including parts and labor (excluding expendable parts). The ASME pressure vessel is further warranted to the original owner against structural failure for a period of 15 years from the date of initial operation. See warranty pamphlet for complete details.

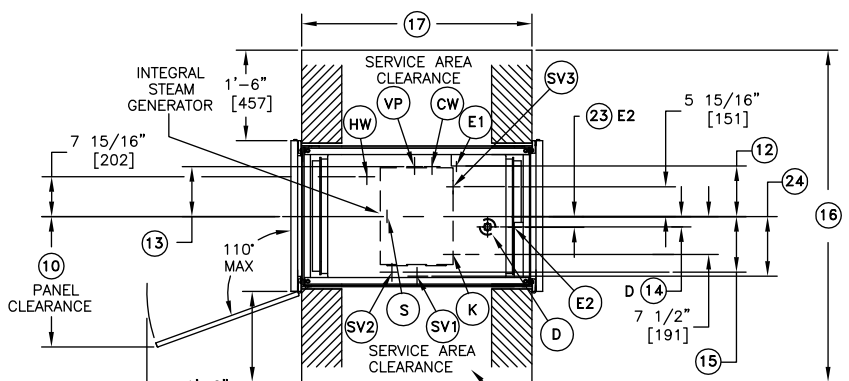
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VIEW: PLAN
(RECESSED MOUNTED CONTROL END OR REMOTE END, CABINET OPPOSITE END)

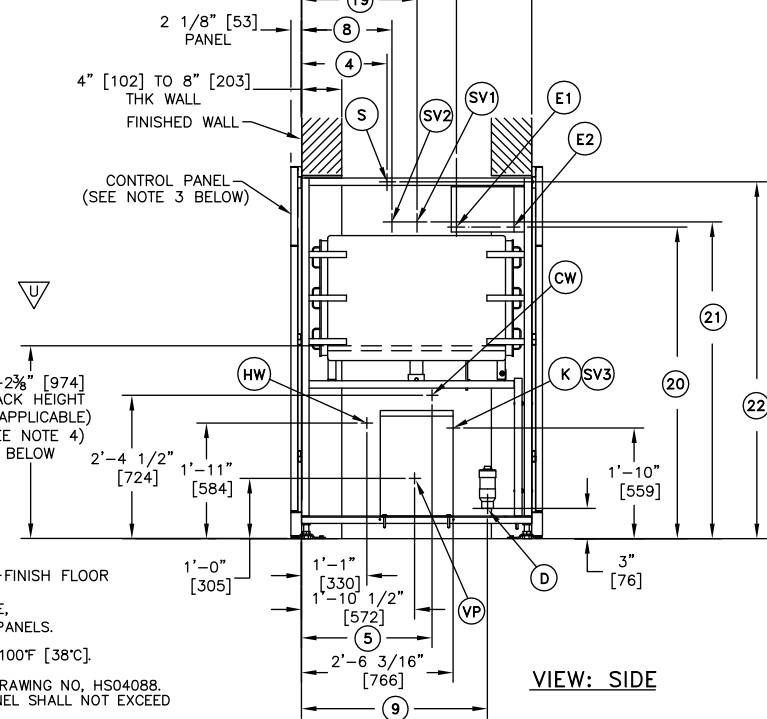


VIEW: FRONT



VIEW: PLAN
(RECESSED)
(SEE NOTES 1 & 2 BELOW)

ACCESS TO THESE SERVICE AREA (BOTH SIDES) TO BE SUPPLIED BY CUSTOMER. ACCESS DOOR MUST NOT BE LESS THAN 1'-6" WIDE BY 6'-8" HIGH. [457] [2032]



VIEW: SIDE

NOTES:

- 1) IF TWO OR MORE STERILIZERS ARE INSTALLED SIDE BY SIDE, ALLOW 1'-6" [457] CLEARANCE BETWEEN SIDES OF FACE PANELS.
- 2) ROOM TEMPERATURE OF A RECESS AREA NOT TO EXCEED 100°F [38°C].
- 3) TO INSTALL A REMOTELY LOCATED CONTROL PANEL, SEE DRAWING NO. HS04088. CABLE LENGTH FROM STERILIZER TO REMOTE CONTROL PANEL SHALL NOT EXCEED 32 FEET [9754].
- 4) CHAMBER FLOOR HEIGHT SHOULD BE APPROX. 3'-1 1/4" OFF FINISHED FLOOR.

UNIT	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮	⑯	⑰	⑱	⑳	㉑	㉒	㉓	㉔	
400	2'-2 1/4" [711]	2'-1" [635]	5/8" [16]	1'-9 1/2" [546]	1'-10" [559]	1'-7" [483]	2'-10" [863]	1'-5" [432]	2'-7" [787]	2'-0" [610]	2'-4" [711]	8" [203]	8" [203]	7" [178]	6" [152]	5'-0" [1524]	2'-10" [863]	3'-0" [914]	1'-10" [559]	5'-3" [1600]	5'-2" [1575]	5'-7" [1702]	3" [76]	8" [203]
500	2'-6" [762]	2'-5" [737]	1/2" [13]	1'-5" [432]	2'-0" [610]	2'-7" [787]	3'-10" [1168]	1'-6" [457]	3'-1" [940]	2'-2" [660]	2'-6" [762]	10" [254]	10" [254]	9" [229]	7" [178]	5'-6" [1676]	3'-10" [1168]	4'-0" [1219]	1'-11" [584]	5'-2" [1575]	5'-3" [1600]	5'-11" [1803]	5" [127]	9" [229]

UNIT SIZE	HEAT LOSSES BTU/HR [kCal/HR]				
	CONTROL AREA	RECESS AREA		CABINET MODEL	
		W/O STM GEN	WITH STM GEN	W/O STM GEN	WITH STM GEN
400	1111 [280]	2583 [651]	4631 [1167]	3694 [931]	5742 [1447]
500	1534 [387]	4296 [108]	6343 [1598]	5830 [1469]	7877 [1985]

SEE SHEET 1		DRAWN BY TL	APPROVED BY-DATE 12/19/01	IF NO OTHER TOLERANCE GIVEN	DATE 4/19/01	SCALE 1=1
		PROJECTION	CLIENT	GETINGE GETINGE USA, Inc. 1777 East Henrietta Road Rochester, NY 14623-3133		
		REFERENCE DOCUMENTS	TITLE			
REVISION HISTORY		SYMBOL LIBRARY		DRAWING NUMBER HS4083		ORIGINAL SIZE C
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1

NOTICE: Work by others

Safe and efficient operation of this product is dependent upon the owner/user providing the services specified herein as well as any other normally accepted electrical, mechanical or plumbing interface between user's supply and this product. Getinge USA will not assume responsibility for problems that result from non-compliance with the above conditions. The following conditions and services are required by Getinge USA equipment and are to be provided by others.

TABLE A: PLUMBING CONNECTIONS & UTILITIES

(Refer to notes 1-6 on sheet 4)

ON UNIT CONNECTION	PIPE SIZE TO UNIT	PRESSURE RANGE DYNAMIC AT UNIT	FLOW RATE MAX
S= Steam 3/4" NPT female see note 4 and 11	3/4" NPT	40-50 psig [2.8-3.5 kg/cm ²]	96 lbs/Hr [44 kg/Hr]
CW= Cold water 3/4" NPT female see note 1	3/4" NPT	40-70 psig [2.8-4.9 kg/cm ²]	11 gpm [2.5 m ³ /Hr]
D= Drain 1 1/2" [38] ODT	See note 3	Not applicable	See note 3
HW= Hot water 3/8" NPT female see note 2	1/2" NPT	20-50 psig (min.) [1.4-3.5 kg/cm ²]	0.4 gpm [.09 m ³ /Hr]
SV1 (Chamber) SV2(Jacket) = Sterilizer vessel pressure relief valve vent 3/4" NPT female	See note 5	Not applicable	See note 5
SV3=Steam Boiler pressure relief valve vent 1" NPT female (Sussman) 3/4" NPT female (Chromalox)	See note 5	Not applicable	See note 5
AS= Compressed Air dry, filtered, oil-less (BSF/CCB only) (see sheets 5&6)	1/4" NPT	70-100 psig dynamic [4.9-7.0 kg/cm ²]	1 SCFM [1.7 cu. m/Hr]

TABLE B: ELECTRICAL CONNECTIONS & UTILITIES

(Refer to note 7 on sheet 4)

SERVICE	CONDUIT SIZE	UTILITY NOMINAL VOLTAGE	UTILITY VOLTAGE RANGE	MAX. CURRENT NOMINAL VOLTAGE	Breaker/Fusing Recommended	Consumption
E1= Power Box	1/2" [13]	115V, 50/60 Hz, 1~	104 - 126V	12 A	15 A	250 W/Hr
OPTIONAL - connections required for optional equipment listed below						
E2= Integral Transformer Box	1/2" [13]	230V, 50/60Hz, 1~	207 - 253V	5 A	15 A	N/A
K= Electric 4 WIRE WITH GROUND (for units with Integral Steam Boiler, not available on 400 Double Door)	1 1/4" [32]	208V, 50/60Hz, 3~	188 - 216V	84 A	100 A	N/A
	1" [25]	240V, 50/60Hz, 3~	217 - 250V	73 A	100 A	
	1" [25]	380V, 50Hz, 3~	374 - 432V	46 A	60 A	
	1" [25]	415V, 50Hz, 3~	374 - 432V	42 A	60 A	
	3/4" [19]	480V, 60Hz, 3~	432 - 500V	36 A	50 A	
VP= vacuum pump motor (2HP) junction box. 4 WIRE WITH GROUND (Model 533LS only, w/o steam boiler)	1/2" [13]	208V, 60Hz, 3~	188 - 216V	5.7 A	10 A	N/A
		230V, 60Hz, 3~	217 - 250V	5.4 A		
		380V, 50Hz, 3~	374 - 432V	2.8 A		
		460V, 60Hz, 3~	432 - 500V	2.7 A		

SEE SHEET 1

DRAWN BY TL

APPROVED BY-DATE

12/19/01

IF NO OTHER TOLERANCE GIVEN

DATE 12/05/01

SCALE 1=1

PROJECTION 

CLIENT

GETINGE

REFERENCE DOCUMENTS

TITLE
400/500 SERIES ARRANGEMENT DRAWING
STEAM STERILIZERGETINGE USA, Inc.
1777 East Henrietta Road
Rochester, NY 14623-3133ORIGINAL
SIZE
C

REV	REVISION/EC NO.	DATE	REVISED BY	CHECKED BY

REVISION HISTORY

THE FILENAME IS: HS4083U1-7
THIS PLOT MADE: 11/11/08

SYMBOL LIBRARY

DRAWING NUMBER HS4083

REV U PAGE 3 of 7

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NOTES TO ARCHITECTS & CONTRACTORS


- 1) Cold water:
 - a) Cold water quality: Use potable water with a hardness of 0.5–10 grains/gal [8–170 ppm].
 - b) Maximum temperature requirement is 80°F [27°C]. Optimal vacuum efficiency is at or below 70°F [21°C], 60°F [16°C] for optional LS vacuum pump.
 - c) Back-syphonage protection is required by others. Check local plumbing code and install backflow preventer. (Examples: Vacuum breaker, dual-check or reduced pressure type).
 - d) An optional water booster pump is available:
 - * For installations where water pressure is at least 20 psig [1.4 kg/cm²] dynamic but less than 40 psig [2.8 kg/cm²].
 - * To achieve satisfactory performance with dense loads where dynamic pressure is at or below 40 psig [2.8 kg/cm²].
 - * if required backflow preventer lowers the water pressure below the minimum specified.
 - * The optional booster pump requires mechanical electrical and plumbing hook-up by customer. A separate electrical service to the water booster pump junction box is necessary. Contact your local Getinge USA representative for Utility Data.
 - e) For optional Water Saver see Getinge USA drawing HS03472.
- 2) Hot water to be supplied only when integral steam boiler is selected.
 - a) Water quality information: For optimum results, the feed water supply should be tested prior to initial startup. If the mineral content exceeds the following recommended limits, various external treatment processes (water softener, RO, etc.) may be used to correct the problem. Routine manual blow-down or automatic blow-down option lowers concentrations of impurities and maintains the pH level above 7.0.
 - b) Feedwater quality:

HARDNESS	0.5–5.0 GRAINS/GALLON [8–85 ppm]
RESISTIVITY	NOT TO EXCEED 50 KOHMS/CM
TEMPERATURE	100°F – 150°F [38°C – 65°C]
TOTAL DISSOLVED SOLIDS	150 PPM MAX.
pH	6.8–7.5
- 3) It shall be the customer's responsibility to provide a proper drainage system in accordance with applicable local codes. Temperature of drain water will not exceed 140°F [60°C] under normal operating conditions. If cold water supply is cut-off, temperature may exceed 200°F [93°C].
- 4) It shall be the customer's responsibility to provide condensate free steam between 97% and 100% saturated vapor.
- 5) Getinge USA recommends piping all vessel pressure relief valves to a vented manifold outside the equipment service area. Caution must be exercised not to reduce the discharge capacity of the relief valve. Recommended piping practices for relief valve piping can be found in ASME Boiler and Pressure Vessel Code Section VIII, Div. I, UG-135. Check local codes for special requirements.
- 6) All customer connections to sterilizer must be labeled. For safety, all shutoff valves must be reachable when standing on the floor at the equipment (i.e. water, steam, compressed air).
- 7) Electrical Supply:
 - a) It shall be the customer's responsibility to complete all electrical connections in accordance with the National Electrical Code and all applicable local codes.
 - b) A dedicated, permanently connected electrical supply with conveniently accessible disconnect switch (supplied by customer) is required for each sterilizer service indicated in Table B. Where both single phase and 3 phase supply is required, two disconnect switches can be used, yet shall be properly labeled and located as close as possible to each other and the sterilizer. Refer to the Getinge USA installation Manual for specific instructions.
 - c) For standard 115VAC units, 115VAC supply is required at "E1". For units with the optional 230V to 115V step-down transformer (integral with sterilizer), 230VAC supply is required at "E2" (and no connection at "E1").
 - d) For voltages other than 115V or 230V, a separate universal transformer is available to provide 115VAC to "E1" with input voltage configurable to 100, 200/208, 380/400/415, or 440/460/480. It shall be the customer's responsibility to install the universal transformer. Transformer box dimensions: 10" [254] L x 7 1/4" [184] W x 5 3/8" [137] D.
- 8) For 500LS units equipped with biological sealing flange or cross contamination barrier (optional), see this drawing sheet 5 & 6.
- 9) Double Door units, recessed into two walls, require partial dis-assembly of unit to allow installation into fixed walls.
- 10) Optional Wall Mounted Control Panel, see drawing no. HS04088. Cable length to sterilizer not to exceed 32 ft [9754].
- 11) Refer to Drawing HS04131 for piping with clean steam.
- 12) For Seismic Force information and loaded weights see Getinge USA drawing P/N 700337 (400 unit)/700338 (500 unit). see sheet 7 of 7.

UNIT WEIGHTS AND CRATED MEASUREMENTS TABLE

UNIT SIZE	MAX. WEIGHT UNLOADED		CRATED MEASUREMENTS			UNIT SIZE	MAX. WEIGHT UNLOADED		CRATED MEASUREMENTS		
	CRATED	UNCRADED	LENGTH	WIDTH	HEIGHT		CRATED	UNCRADED	LENGTH	WIDTH	HEIGHT
400 SINGLE DOOR	965 LBS [438 Kg]	855 LBS [387 Kg]	4'-5 1/2" [1359]	3'-4 3/4" [1035]	6'-7" [2007]	500 SINGLE DOOR	1223 LBS [554 Kg]	1103 LBS [500 Kg]	5'-2 3/4" [1594]	3'-7 3/4" [1111]	6'-7" [2007]
400 DOUBLE DOOR	1020 LBS [462 Kg]	910 LBS [412 Kg]				500 DOUBLE DOOR	1298 LBS [588 Kg]	1178 LBS [534 Kg]			

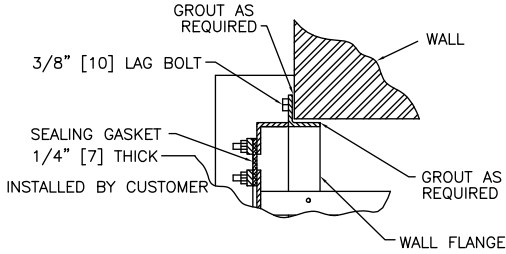
FOR INTEGRAL STEAM BOILER ADD 204LBS [93Kg] TO MAX WEIGHT.

SEE SHEET 1		DRAWN BY DL	APPROVED BY--DATE 12/19/01	IF NO OTHER TOLERANCE GIVEN	DATE 12/18/01	SCALE 1=1
		PROJECTION 	CLIENT	GETINGE		
		REFERENCE DOCUMENTS	TITLE			
			400/500 SERIES ARRANGEMENT DRAWING	GETINGE USA, Inc. 1777 East Henrietta Road Rochester, NY 14623-3133		
			STEAM STERILIZER			
REVISION HISTORY THE FILENAME IS: HS4083U1-7 THIS PLOT MADE: 11/11/08		SYMBOL LIBRARY		DRAWING NUMBER HS4083	REV U	PAGE 4 of 7

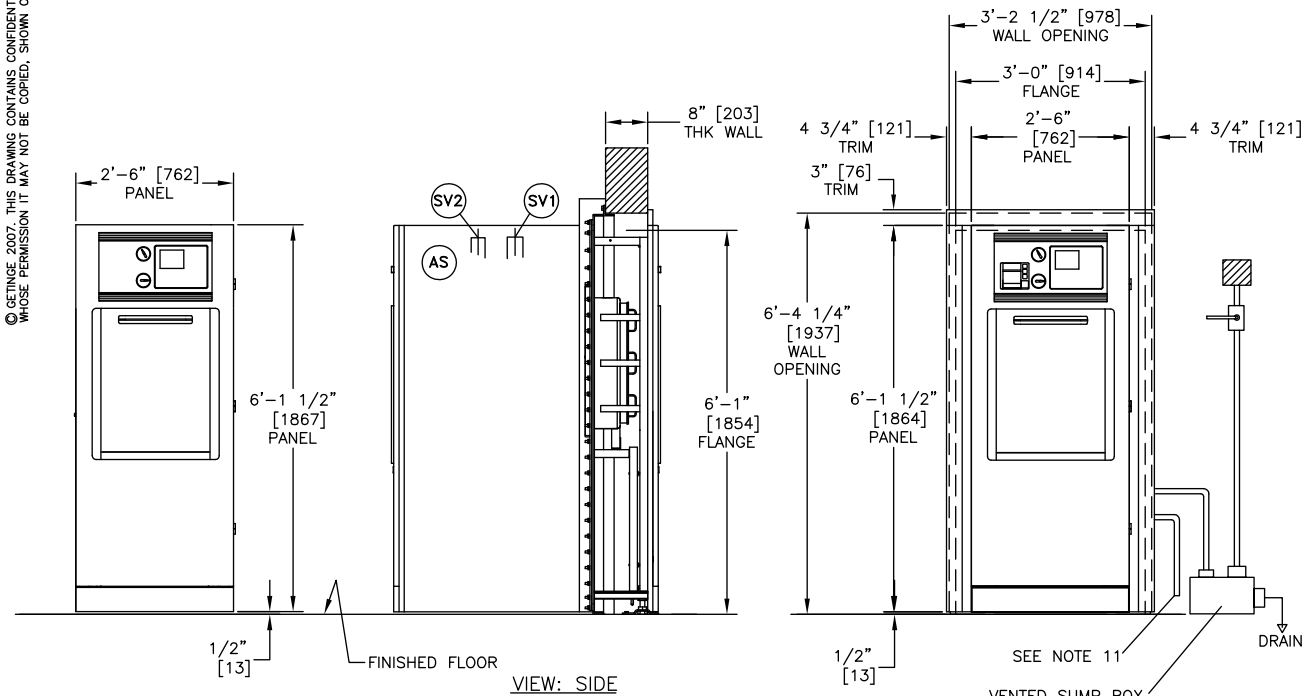
**INFORMATION ON THIS PAGE IS FOR 500 SERIES
STEAM STERILIZER WITH BIOLOGICAL FLANGE (BSF) ONLY**

NOTES:

- 1) FOR SERVICE LOCATIONS, SPECIFICATIONS, AND ARCHITECT NOTES SEE SHEET 3 & 4. BIOLOGICAL FLANGE IS 500 SERIES ONLY.
- 2) FOR BIOLOGICAL FLANGE UNITS, CONTROLS ARE SWITCHED DEPENDING ON REQUESTED END FOR BIOLOGICAL FLANGE. IF (BFCE) IS REQUESTED, CONTROLS W/PRINTER ARE ON B/F END. IF (BFRE) IS REQUESTED, CONTROLS W/PRINTER ARE ON THE END OPPOSITE OF THE B/F. SERVICE LOCATIONS REMAIN THE SAME, AS INDICATED ON SHEET 2.
- 3) WALL FLANGE (SUPPLIED BY GETINGE) CAN BE SHIPPED AHEAD OF STERILIZER. WALL SHOULD BE BUILT BY CUSTOMER TO DIMENSIONS SPECIFIED FOR TIGHT FIT. SEE TYPICAL INSTALLATION.
- 4) SEE INSTALLATION INSTRUCTIONS P/N 61301608205 FOR MORE DETAIL.
- 5) DIMENSIONS ARE FEET-INCHES [MILLIMETERS].
- 6) FOR MOUNTING OF CABINET AND TRIM PACKAGE SEE GETINGE USA DRAWING P/N 61301608483 & 61301608562.
- 7) BIOLOGICAL FLANGE UNITS INCLUDE A UNIDIRECTIONAL DOOR SEAL AIR RETENTION TANK AS SHOWN. SERVICE REQUIREMENTS FOR THE DOOR SEAL RETENTION SYSTEM ARE AS FOLLOWS:
 - (AS) A DRY, FILTERED, OIL-LESS COMPRESSED AIR SUPPLY (70-100 PSIG DYNAMIC, USAGE <1SCFM) IS REQUIRED FOR THIS SYSTEM. CONNECTION IS 1/4" NPT AT LOCATION INDICATED. A COMPRESSOR FOR THIS PURPOSE IS AVAILABLE FROM GETINGE USA (P/N 61301601462) AT EXTRA COST. AIR QUALITY WILL BE CLEAN, DRY INSTRUMENT QUALITY.
- 8) IF THE UNITS RECESSED AT THE END OPPOSITE THE BIOLOGICAL FLANGE, REFER TO SHEET 2 FOR DIMENSIONAL INFORMATION.
- 9) NOT USED
- 10) CHAMBER DRAIN PIPING WILL BE CONSIDERED TO BE CONTAMINATED AND A METHOD AND MEANS OF DECONTAMINATION FOR THIS PIPING HAS NOT BEEN PROVIDED FOR DISASSEMBLY/SERVICING.
- 11) 1/2" [13] OD TUBING (JACKET) CAN BE PIPING TO SANITARY SEWER.



TYPICAL INSTALLATION



VIEW: SIDE

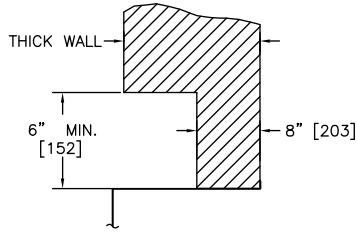
SEE NOTE 11
VENTED SUMP BOX
SEE NOTE 10

SEE SHEET 1

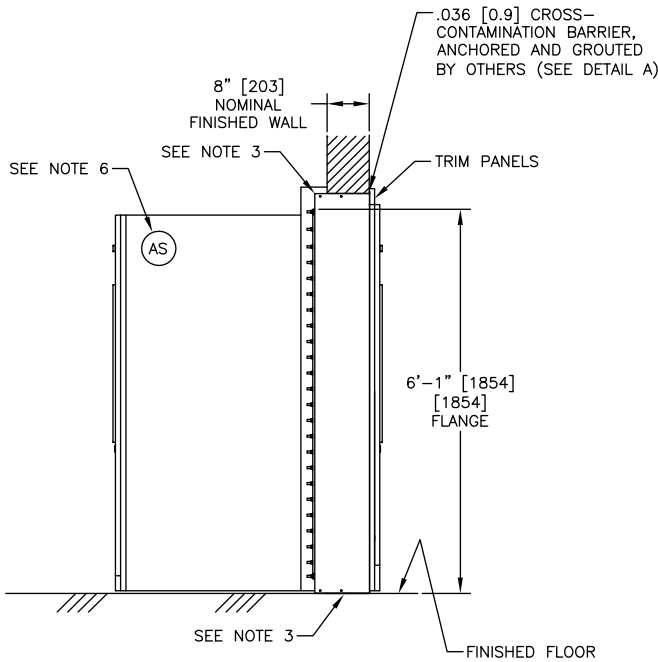
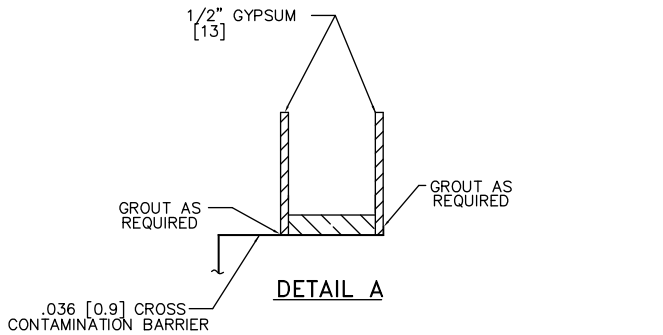
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PROJECTION 	CLIENT	GETINGE		
REFERENCE DOCUMENTS	TITLE 500 SERIES ARRANGEMENT DRAWING, STEAM STERILIZER, BIOLOGICAL FLANGE			
REVISION HISTORY THE FILENAME IS: HS4083U1-7 THIS PLOT MADE: 11/11/08	SYMBOL LIBRARY	GETINGE USA, Inc. 1777 East Henrietta Road Rochester, NY 14623-3133	ORIGINAL SIZE C	DRAWING NUMBER HS4083
			REV U	PAGE 5 of 7

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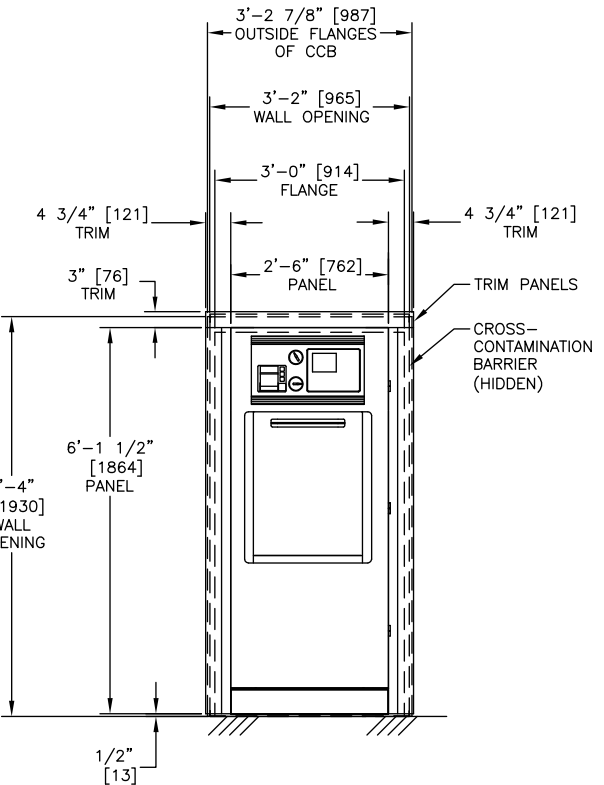
INFORMATION ON THIS PAGE IS FOR 500 SERIES STEAM STERILIZER WITH CROSS-CONTAMINATION BARRIER (CCB) ONLY



WHEN WALLS ARE GREATER THAN 8" THICK - INSTALL CCB AS SHOWN.



VIEW: SIDE
TYPICAL INSTALLATION



VIEW: RIGHT

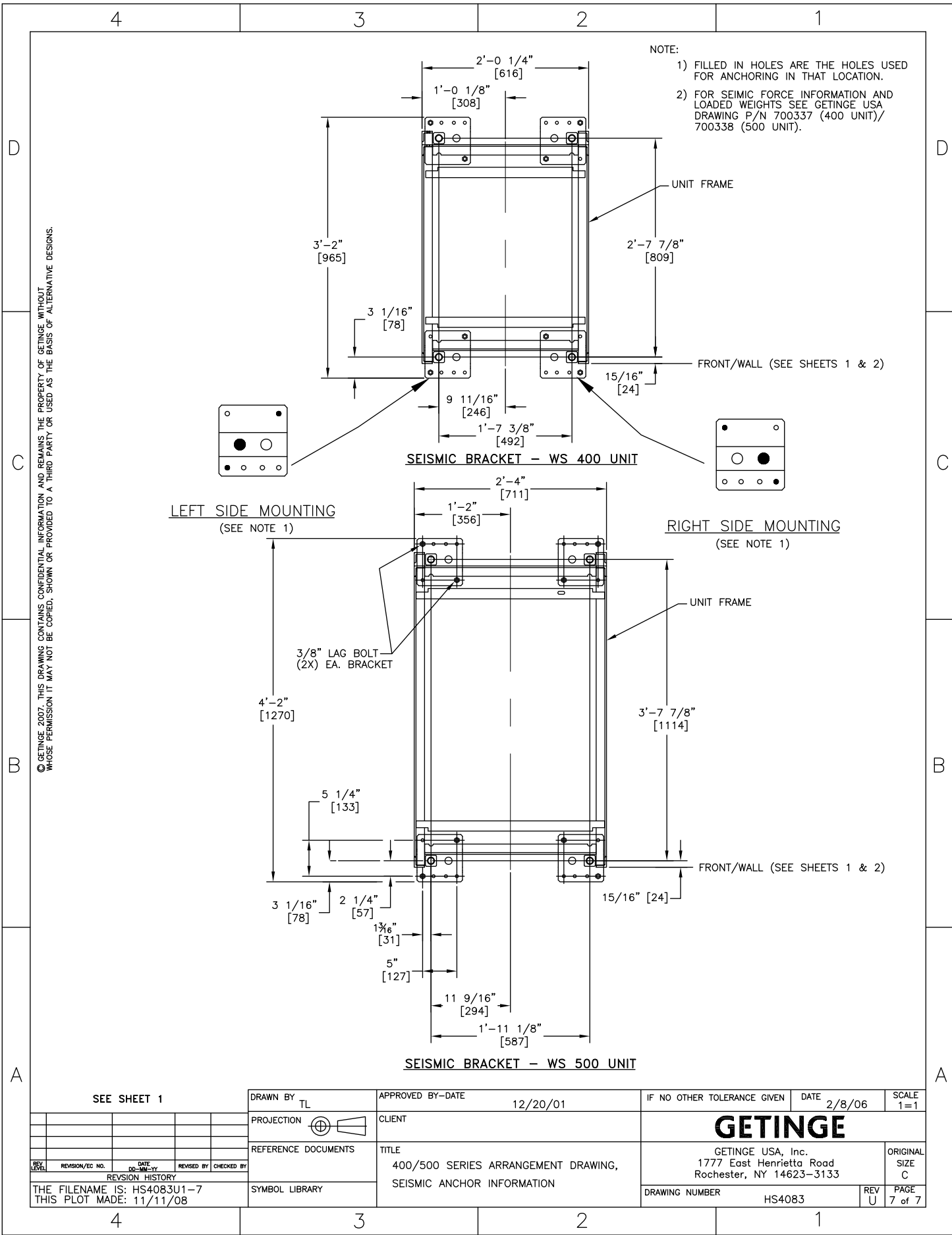
- NOTES:
- FOR SERVICE LOCATIONS, SPECIFICATIONS AND ARCHITECT NOTES, SEE SHEET 3 & 4
 - FOR CROSS-CONTAMINATION BARRIER (CCB) UNITS, CONTROLS ARE SWITCHED DEPENDING ON REQUESTED END FOR CCB. IF CCB-CE IS REQUIRED, CONTROLS WITH PRINTER ARE ON CCB END. IF CCB-RE IS REQUESTED, CONTROLS WITH PRINTER ARE ON THE END OPPOSITE THE CCB. SERVICE LOCATIONS REMAIN THE SAME, AS INDICATED ON SHEET 2 OF THIS DRAWING.
 - SEAL ALL CRACKS AND HOLES WITH GROUT OR RTV AS REQUIRED.
 - FOR MOUNTING OF TRIM PACKAGE, SEE GETINGE USA DRAWING P/N 61301608562.
 - IF THE UNIT IS RECESSED AT THE END OPPOSITE THE CCB, REFER TO SHEET 2 FOR DIMENSIONAL INFORMATION.
 - CROSS-CONTAMINATION BARRIER (CCB) UNITS INCLUDE A UNIDIRECTIONAL DOOR SEAL AIR RETENTION AS SHOWN. (EXCEPT NO AIR TANK IS PROVIDED)
- (AS) - A DRY, FILTERED, OIL-LESS COMPRESSED AIR SUPPLY (70-100 PSIG DYNAMIC, USAGE <1SCFM) IS REQUIRED FOR THIS SYSTEM, CONNECTION IS 1/4" NPT AT LOCATION INDICATED. A COMPRESSOR FOR THIS PURPOSE IS AVAILABLE FROM GETINGE USA (P/N 61301601462) AT EXTRA COST, AIR QUALITY WILL BE CLEAN, DRY INSTRUMENT QUALITY.

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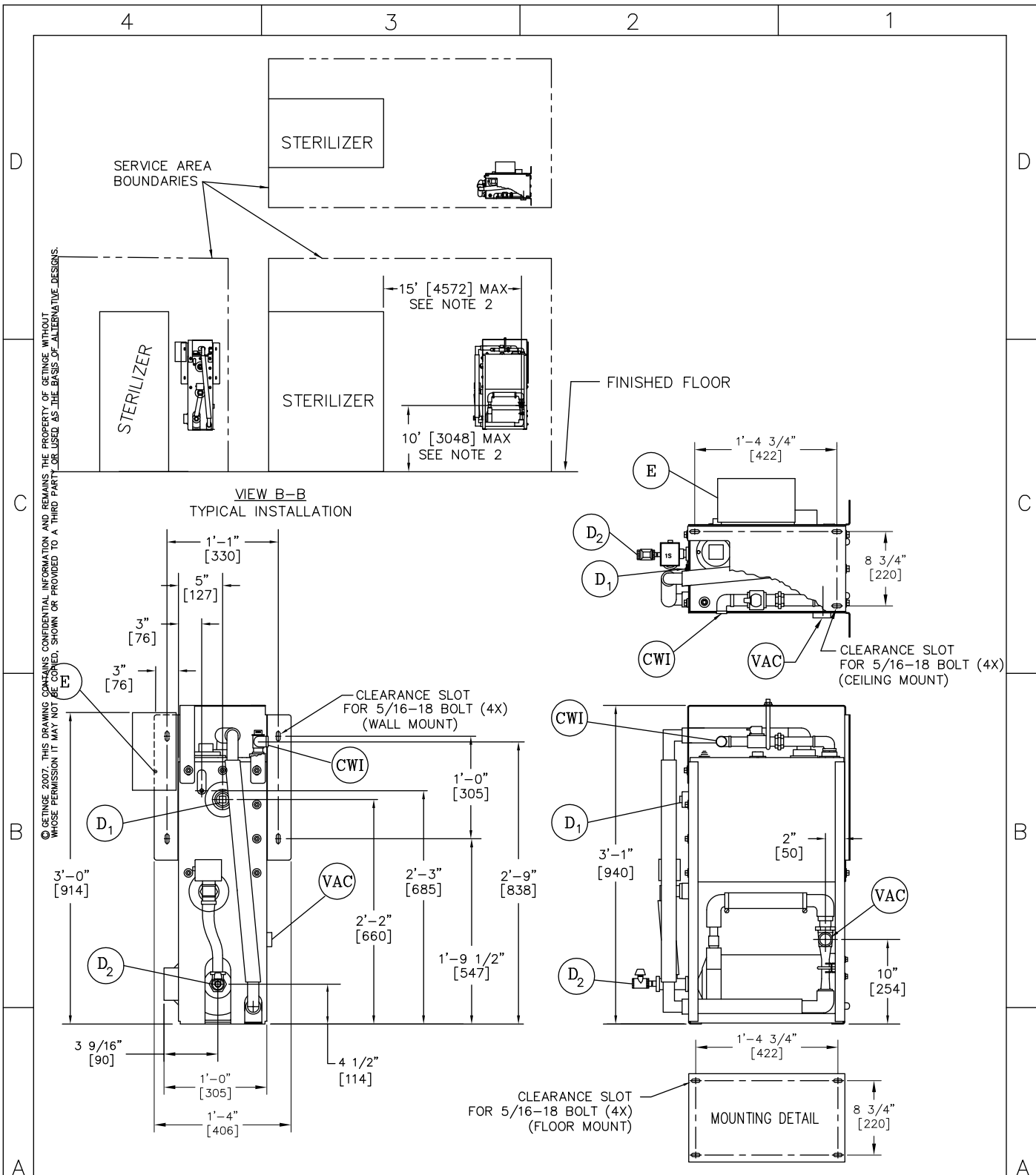
SEE SHEET 1

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PROJECTION ⊕	CLIENT	GETINGE		
REFERENCE DOCUMENTS	TITLE 500 SERIES ARRANGEMENT DRAWING, STEAM STERILIZER, CROSS-CONTAMINATION BARRIER			
SYMBOL LIBRARY		GETINGE USA, Inc. 1777 East Henrietta Road Rochester, NY 14623-3133		ORIGINAL SIZE C
REVISION HISTORY		DRAWING NUMBER HS4083	REV U	PAGE 6 of 7

THE FILENAME IS: HS4083U1-7
THIS PLOT MADE: 11/11/08



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		PROJECTION 	CLIENT	GETINGE GETINGE USA, Inc. 1777 East Henrietta Road Rochester, NY 14623-3133		ORIGINAL SIZE C
		REFERENCE DOCUMENTS	TITLE MP129 SERIES WATER SAVER SYSTEM, ROUGHING-IN DRAWING			DRAWING NUMBER HS3472
REVISION HISTORY THE FILENAME IS: HS3472F1 THIS PLOT MADE: 01-10-07		SYMBOL LIBRARY				

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NOTICE: WORK BY OTHERS

SAFE AND EFFICIENT OPERATION OF THIS PRODUCT IS DEPENDENT UPON THE OWNER/USER PROVIDING THE SERVICES SPECIFIED HEREIN AS WELL AS ANY OTHER NORMALLY ACCEPTED ELECTRICAL, MECHANICAL OR PLUMBING INTERFACE BETWEEN USER'S SUPPLY AND THIS PRODUCT. GETINGE USA WILL NOT ASSUME RESPONSIBILITY FOR PROBLEMS THAT RESULT FROM NON-COMPLIANCE WITH THE ABOVE CONDITIONS. THE FOLLOWING CONDITIONS AND SERVICES ARE REQUIRED BY GETINGE USA EQUIPMENT AND ARE TO BE PROVIDED BY OTHERS.

NOTES ARCHITECTS AND CONTRACTORS

- 1) FOR SEISMIC ANCHORING REQUIREMENTS, WORST CASE CG LOCATION & WORST CASE WEIGHT REFER TO DRAWING 531199.
2) TYPICAL INSTALLATION SHOWN IN VIEW "B". WATER SAVER VACUUM PORT SHOULD BE WITHIN 15 FEET [4572] OF STERILIZER, AND NO MORE THAN 10 FEET [3048] ABOVE THE COMMON FLOOR.
3) IT SHALL BE THE CUSTOMER'S RESPONSIBILITY TO PROVIDE A PROPER DRAINAGE SYSTEM IN ACCORDANCE WITH APPLICABLE LOCAL CODES.
4) ROUTE SERVICES TO PREVENT DAMAGE TO SERVICES AND INJURY TO PERSONNEL.
5) ALLOW 18 INCHES [457] MINIMUM CLEARANCE ON ALL SIDES FOR SERVICE ACCESS.
6) COLD WATER: A) COLD WATER QUALITY: USE PORTABLE WATER WITH A HARDNESS OF 0.5-10 GRAINS/GAL [8-170 PPM]. B) MAXIMUM TEMPERATURE REQUIREMENT IS 80F [27C].
7) ELECTRICAL SUPPLY: A) IT SHALL BE THE CUSTOMER'S RESPONSIBILITY TO COMPLETE ALL ELECTRICAL CONNECTIONS...

TABLE A: PLUMBING CONNECTIONS & UTILITIES

Table with 3 columns: ON UNIT CONNECTION, PIPE SIZE TO UNIT, PRESSURE RANGE DYNAMIC. Includes entries for CWI (Supply - Cold Water to Reservoir), VAC (Vacuum to Sterilizer), D1 (Drain, Overflow Outlet), and D2 (Drain, Tank).

TABLE B: ELECTRICAL CONNECTIONS & UTILITIES

Table with 4 columns: SERVICE, UTILITY, MAX CURRENT (AMPS), BREAKER/FUSING RECOMMENDED. Includes entry for E (Motor Starter Relay Box).

TABLE C: OPERATING ENVIRONMENTAL CONDITIONS

Table with 3 columns: TEMPERATURE, PRESSURE, RELATIVE HUMIDITY. Includes sub-tables for Voltage Fluctuations, Overvoltage Category, and Pollution Degree.

TABLE D: UNIT WEIGHTS

Table with 5 columns: MAX WEIGHT (Crated, Uncrated), CRATED DIMENSIONS (Length, Width, Height).

Revision history table with columns: REV. NO., REVISION/EC NO., DATE, REVISION, CHECKED BY, DRAWN BY, APPROVED BY-DATE, IF NO OTHER TOLERANCE GIVEN, DATE, SCALE, CLIENT, TITLE, DRAWING NUMBER, REV, PAGE.

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Additional Comments:

Getinge provides complete solutions for effective and efficient cleaning, disinfection and sterilization in the healthcare and life science sectors. Our know-how comprises everything from architectural planning, production and handling equipment, to systems for full traceability of sterile goods. Our commitment covers expert advice, training and long-term technical support.

GETINGE

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GETINGE

THE GETINGE GROUP is a leading global provider of equipment and systems that contribute to quality enhancement and cost efficiency within healthcare and life sciences. Equipment, services and technologies are supplied under the brands **ARJO** for patient hygiene, patient handling and wound care, **GETINGE** for infection control and prevention within healthcare and life science and **MAQUET** for surgical workplaces, cardiopulmonary and critical care.