

PRIMUS BioPharma® – Medium Steam Sterilizers

These sterilizers are for customers who require a high quality steam pressure sterilizer whose products, operations and manufacturing facilities are regulated by the FDA. PRIMUS Sterilizers, designed and manufactured in the USA according to Quality Management Systems, are in compliance with ISO 9001:2008, ISO 13485 and FDA's Good Manufacturing Practice (GMP) for Medical Devices: General Regulation (21CFR Part 820). Medium size sterilizers are one of 21 standard sizes manufactured by PRIMUS, or we can custom manufacture a sterilizer to meet your specifications.



26"x36"x48" shown with PSS7 Controls

STERILIZER DESIGN

PRIMUS Bio→Pharma® sterilizers are designed for a wide range of sterilizing applications suitable for the laboratory or pharmaceutical industry. Quality materials and workmanship have been incorporated into the chamber, piping and controls to provide a pharmaceutical sterilizer that exceeds industry standards. Bio→Pharma® sterilizers are designed for fully automatic, computer-controlled, operations with vacuum or gravity displacement cycles for terminal sterilization to in-process sterilization of packaging components to production equipment sterilization. BioPharma® sterilizers are the choice when versatility, rigorous tolerances and validatable results are essential. The sterilizer is designed, manufactured and tested at the PRIMUSBioPharma factory in Great Bend, Kansas USA.

All medium sizes of PRIMUS sterilizers have pneumatically powered horizontal operating doors, designed to be efficient, reliable and inherently safe. To close the door, press and hold the door button, if button is released before door is fully closed the door opens. An added safety feature, the doors stop automatically if an obstacle is encountered.

STERILIZER CYCLES

Standard cycles can be configured through the use of the cycle parameters to process hard goods, wrapped goods or liquid type products. Configuration of the cycle parameters (i.e., number of PRE or POST-PULSES, EXHAUST & DRY, etc.) is unique to each cycle and depends upon the specific product being sterilized. Standard cycles can be designed for steam sterilization of various types of dry goods or liquid products. Dry good products such as filter housings and cartridges, textiles, rubber stoppers or sterilizable plastic packaging may require preconditioning for air removal from the top of flasks. A slow exhaust is used for liquid products with Jacket Off and Flow Cooling selected after exposure to reduce boil-over.

PRIMUS Pri-Matic® controls offer the user access to thirteen password-protected cycles. Cycle parameters for each cycle are baselined, validate and "locked" by validation personnel. Cycle can be custom named to assist and confirm operator selection of correct cycle.

GENERAL (*Options italicized*)

All models include Vacuum, Gravity and Liquids cycles.

VESSEL MATERIAL AND CONSTRUCTION The sterilizer features a SA240 TY316L stainless steel (SS) rectangular, horizontal completely jacketed chamber, with fully radiused longitudinal corners which are fully welded and mirror polished to provide the most hygienic, long lasting appearance and durability available. The chamber has a full-length baffle and one drain positioned in the chamber to maximize steam distribution and cross flow within the chamber.

E	26"x36"x39"	G.1	32"x36"x48"
F	26"x36"x48"	H	36"x42"x60"
G	26"x36"x60"	I	36"x42"x84"

The jacket is constructed of SA240 TY316L SS and is mounted to the chamber over channel supports designed to achieve uniform distribution of steam. The jacket enables the stabilization of temperature around the chamber thereby reducing the time required to bring the chamber up to sterilization temperature, providing superior temperature distribution, and preventing the formation of condensation on the chamber walls.

DESIGN and MANUFACTURING APPROVALS The vessel will be designed and constructed to ASME code Section VIII Division I and pressure rated for 45 PSIG and full vacuum. ASME Code Stamp and U-1 form will bear the name of the specified US manufacturer.

The sterilizer will be manufactured according to Quality Management Systems which are in compliance with ISO 13485 and 9001, will be UL listed and in conformance with CSA requirements.

DOOR CONSTRUCTION

A pneumatically operated horizontally sliding door will be operable from the touch pad push button. To close door, depress/hold door button. If door button is released while door is closing, door reverses direction and opens. In the open position, the insulated door will be secured behind a panel preventing the operator from contact with hot surfaces. An interlock will prevent cycle start unless the door is fully closed and secured.

GENERAL CONSTRUCTION

The vessel will be insulated with 1" semi-rigid high temperature fiberglass board/blanket insulation overlaid with formed aluminum paneling and mounted in a structural steel frame.

The frame will be enamel coated and fitted with adjustable legs on self-centering floor pads. The fascia and side panels will be 16-gauge, type 304 stainless-steel, removable for easy service access.

WATER CONSERVATION

To conserve water and assure effluent exhausted to drain is 140° F or below, PRIMUS provides quench water on demand for exhaust effluent.

EQUIPMENT WARRANTY

Sterilizer pressure vessels manufactured by PRIMUS are warranted against defects in workmanship and materials under normal use and operation for fifteen years where the sterilizer is continually maintained under PRIMUS service contract.

SERVICE and EQUIPMENT ACCESS

Standard service access, when facing the unit, will be from left side and top. Wiring will be laid side-by-side and mechanically secured flat against the metal insulation cover. All wiring will be clearly labeled and readily visible for visual tracing. All sterilant piping in the product contact circuit is composed of stainless steel with high quality tri-clamp, flanged, sanitary fittings. Sanitary pipe clamps are located anywhere CGMP Procedures require frequent maintenance access to process piping to allow ease of routine cleaning and maintenance. Wiring and piping components will be non-proprietary, industry grade, available through Authorized Service Agencies, local supply house, or direct from PRIMUS.

STEAM SOURCE

Steam will be from an in-house steam source in the quantity and quality specified. *Optional electric steam boiler, clean steam boiler or steam-to-steam generator may be specified. Contact PRIMUS for specific boiler information.*

CONTROLS

Three control systems are available. Pri-Matic® Control System PSS7 uses the Allen-Bradley ControlLogix PLC with an Allen-Bradley Panel View Plus 1000 Operator Interface Terminal (OIT). Pri-Matic® Control System PSS9 uses the Allen-Bradley MicroLogix 1400 PLC Control with an Allen-Bradley Panel View Plus 700. The PSS8 Trinity Control is a microcomputer system with a touch screen. All control software packages provide automatic cycle operation. The control systems hardware is mounted within a separate control cabinet. The systems feature Pulse Width Modulation (PWM) temperature control. All software meets or exceeds industry standards, is fully documented, validated and maintained under strict configuration control.

CONTROL PANELS



**PSS7 Pri-Matic®
ControlLogix
Panel with Printer**



**PSS9 Pri-Matic®
MicroLogix**



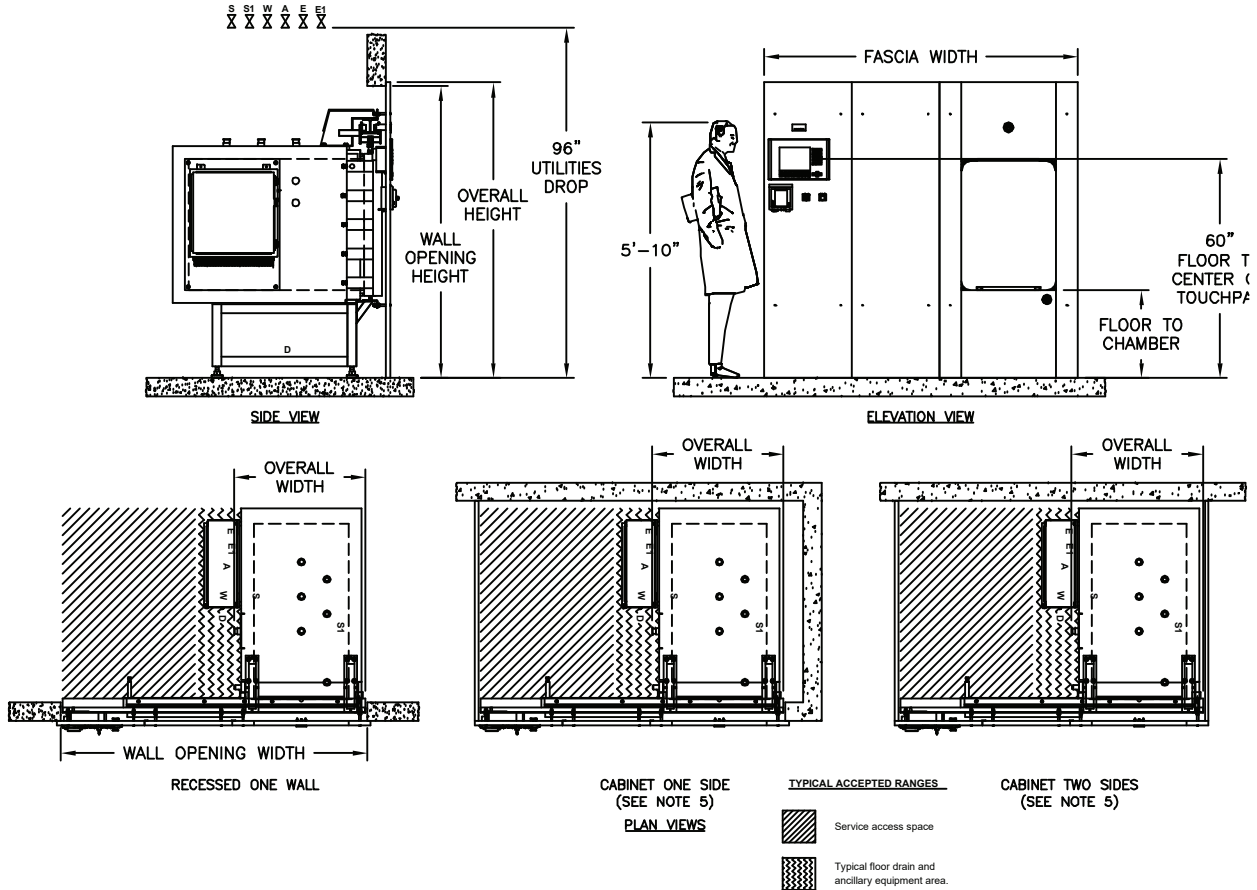
**PSS8 Trinity
Panel with
Printer**

TECHNICAL DATA SHEET



BioPharma® Medium Steam Sterilizers

SINGLE DOOR



VOLUME/DIMENSIONS CHART

*Refer to General Arrangement (GA) drawings for details and final connection point to utility services (S-Steam, W-Water, D-Drain, E-Electrical).

MODEL	E	F	G	G1	H	I
Chamber Size (w x h x l) inches/millimeters	26 x 36 x 39 660.4 x 914.4 x 990.6	26 x 36 x 48 660.4 x 914.4 x 1219.2	26 x 36 x 60 660.4 x 914.4 x 1524	32 x 36 x 48 812.8 x 914.4 x 1219.2	36 x 42 x 60 914.4 x 1066.8 x 1524	36 x 42 x 84 914.4 x 1066.8 x 2133.6
Chamber Capacity	21 ft ³ / .59 m ³	26 ft ³ / .74 m ³	33 ft ³ / .93 m ³	32 ft ³ / .91 m ³	52.5 ft ³ / 1.49 m ³	73.5 ft ³ / 2.08 m ³
Overall Width	36.00 / 914.4	36.00 / 914.4	36.00 / 914.4	44.53 / 1131.06	48.31 / 1226.8	48.31 / 1226.8
Overall Height ¹	81.00 / 2070.4	81.00 / 2070.4	81.00 / 2070.4	81.00 / 2070.4	86.00 / 2184.4	86.00 / 2184.4
Overall Length (SD) ²	53.19 / 1351.02	62.19 / 1579.62	74.19 / 1884.4	63 1/16 / 1601.8	75.13 / 1908.2	99.13 / 2517.8
Wall Opening Width ³	84.0 / 2134.0	84.0 / 2134.0	84.0 / 2134.0	96.0 / 2438.0	108.0 / 2743.0	108.0 / 2743.0
Wall Opening Height	80.00 / 2032.0	80.00 / 2032.0	80.00 / 2032.0	80.00 / 2032.0	85.00 / 2159	85.00 / 2159
Wall Opening Length	51.50 / 1308.1	60.50 / 1536.7	72.50 / 1841.5	64.25 / 1632	76.25 / 1936.75	100.25 / 2546.4
Fascia Width ⁴	86.0 / 2134.0	86.0 / 2134.0	86.0 / 2134.0	98.0 / 2489.0	110.0 / 2794.0	110.0 / 2794.0
Fascia Height	81.00 / 2070.4	81.00 / 2070.4	81.00 / 2070.4	81.00 / 2070.4	86.00 / 2184.4	86.00 / 2184.4
Floor to Chamber	24.00 / 609.6	24.00 / 609.6	24.00 / 609.6	24.00 / 609.6	24.00 / 609.6	24.00 / 609.6

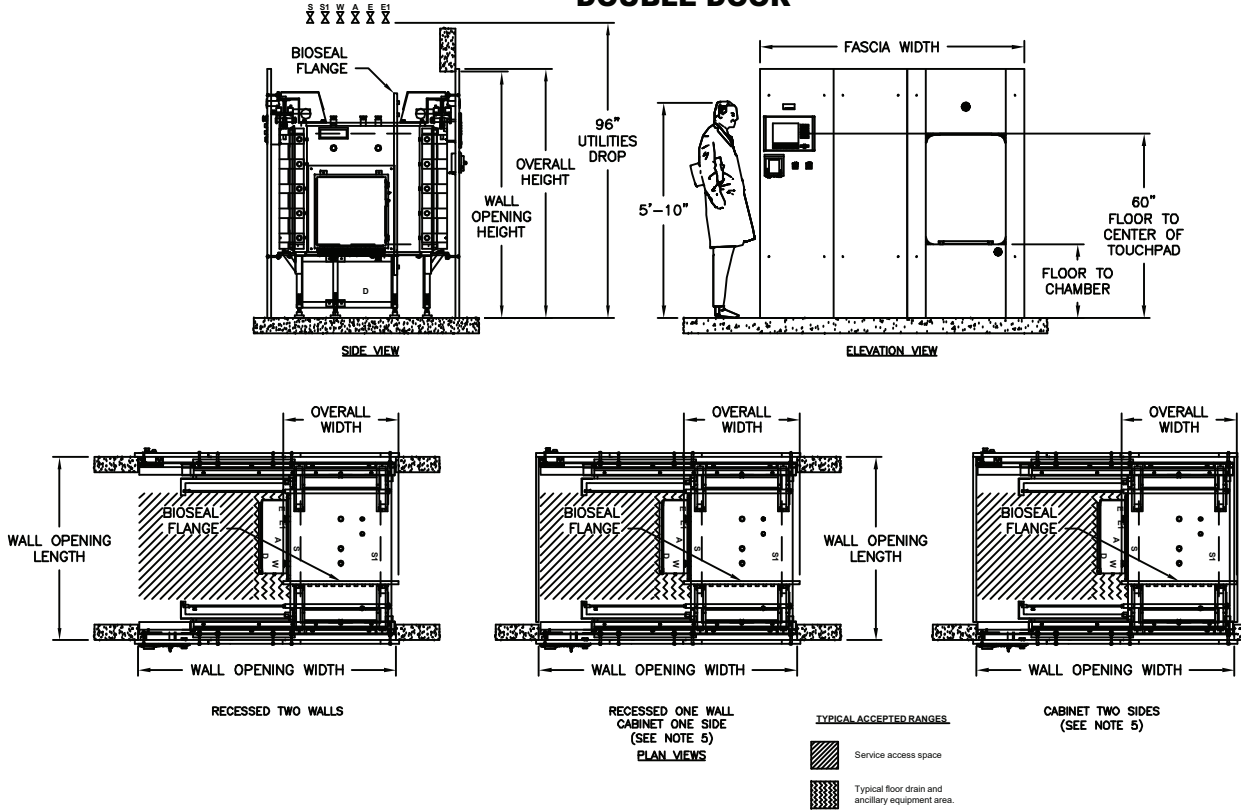
1. Fascia extends 1" beyond wall opening on each side overlapping the wall and sealing the opening.
2. Allow minimum 2" clearance at rear of recessed unit only. Cabinet side models have rear clearance built in.
3. Contact PRIMUS for alternative wall opening.
4. Standard Left Side Service/equipment access shown. Optional right side access is available.

TECHNICAL DATA SHEET



BioPharma® Medium Steam Sterilizers

DOUBLE DOOR



VOLUME/DIMENSIONS CHART

*Refer to General Arrangement (GA) drawings for details and final connection point to utility services (S-Steam, W-Water, D-Drain, E-Electrical).

MODEL	E	F	G	G1	H	I
Chamber Size (w x h x l) inches/millimeters	26 x 36 x 39 660.4x 914.4 x 990.6	26 x 36 x 48 660.4 x 914.4 x 219.2	26 x 36 x 60 660.4 x 914.4 x 1524	32 x 36 x 48 812.8 x 914.4 x 1219.2	36 x 42 x 60 914.4 x 1066.8 x 1524	36 x 42 x 86 914.4 x 1066.8 x 2133.6
Chamber Capacity	21 ft ³ / .59 m ³	26 ft ³ / .74 m ³	33 ft ³ / .93 m ³	32 ft ³ / .91 m ³	52.5 ft ³ / 1.49m ³	73.5 ft ³ / 2.08 m ³
Overall Width	36.00 / 914.4	36.00 / 914.4	36.00 / 914.4	44.53 / 1131.6	48.31 / 1226.8	48.31 / 1226.8
Overall Height ¹	81.00 / 2070.4	81.00 / 2070.4	81.00 / 2070.4	81.00 / 2070.4	86.00 / 2184.4	86.00 / 2184.4
Overall Length (DD) ²	58.50 / 1485.9	67.50 / 1714.5	79.50 / 2019.3	67.22 / 1707.39	79.38 / 2016.1	103.38 / 2625.7
Wall Opening Width ³	84.0 / 2134.0	84.0 / 2134.0	84.0 / 2134.0	96.0 / 2438.0	108.0 / 2743.0	108.0 / 2743.0
Wall Opening Height	80.00 / 2032.0	80.00 / 2032.0	80.00 / 2032.0	80.00 / 2032	85.00 / 2159	85.00 / 2159
Wall Opening Length	50.90 / 1292.86	59.90 / 1521.46	71.90 / 1826.26	62.00 / 1574.8	74.19 / 1884.4	98.19 / 2494
Fascia Width ¹	86.0 / 2184.0	86.0 / 2134.0	86.0 / 2184.0	98.0 / 2489	110.0 / 2794.0	110.0 / 2794.0
Fascia Height	81.00 / 2070.4	81.00 / 2070.4	81.00 / 2070.4	81.00 / 2070.4	86.00 / 2184.4	86.00 / 2184.4
Floor to Chamber	24.00 / 609.6	24.00 / 609.6	24.00 / 609.6	24.00 / 609.6	24.00 / 609.6	24.00 / 609.6

1. Fascia extends 1" beyond wall opening on each side overlapping the wall and sealing the opening.
2. Allow minimum 2" clearance at rear of recessed unit only. Cabinet side models have rear clearance built in.
3. Contact PRIMUS for alternative wall opening.
4. Standard Left Side Service/equipment access shown. Optional right side access is available.

ARCHITECTURAL NOTES:

- Allow sufficient space for traps, shut-off's, filters and other utility supply components.
- Utility (service disconnects) shall be provided and installed "By Others".
- Building or structure modifications to accommodate the sterilizer, as well as, sterilizer shoring, rigging, cribbing and/or crane requirements into the facility shall be provided "By Others".
- Provide maximum mechanical and service access space, a minimum of 24", additional space required when boiler specified. See General Arrangement drawing for placement of ancillary equipment and service access.
- Some options affect utility services and overall dimensions.
- Water Quality - Refer to page 8.
- The Manufacturer's Equipment Warranty does not cover failure due to improper utility provisions.
- Drawings not to scale.
- Wall thickness must be provided on single and double door models recessed through 1 wall, with cabinet sides.
- Floor under sterilizer must be water tight and sloped to the drain.

UTILITY SERVICES

Provide utility services within 6'-0" of final connection to sterilizer. Optimum sterilizer performance requires the specified utilities.

MODEL	STEAM (S) Pure Steam Supply Pipe Size: 1" Sanitary*		STEAM (S1) Building Steam Supply Pipe Size: See Below Quality: Condensate free 97% to 100% saturated vapor (suitably trapped to ensure dry steam and filtered to remove particulates) Pressure: 50-80 PSIG Dynamic Note: 1.) Steam-to-steam generator requires minimum pressure 65 PSIG house steam		WATER (W) Cold Water Supply Pipe Size: See Below Temperature: < 70° F Pressure: 50-70 PSIG Dynamic		DRAIN (D) Building Drain System Minimum 2" Location: Locate floor sink directly under sterilizer Note: 1.) Exhaust discharge is cooled to < 140°F 2.) 12" x 12" x 8" floor sink is recommended by PRIMUS		Air (A) Instrument Air Connection: See Below Quality: Dry and oil free Pressure: 60-80 PSI Dynamic		ELECTRICAL (E) Building Power Supply Volts: 110 Phase: Single Amps: 10 Note: Additional circuits required for ancillary and optional equipment i.e., vacuum pump, boost pump, boiler, etc.	
	TC*	LBS/HR (KG/HR)	NPT	LBS/HR (KG/HR)	NPT	GPM (MAX) (Liter)	NPT (Discharge Pipe Size)	NPT	NPT	NPT		
E	1"	152.1 (68.99)	3/4"	169.0(76.66)	3/4"	14 (53)	1"	1/4"				
F	1"	180.0 (81.65)	3/4"	200.0 (90.72)	3/4"	14 (53)	1"	1/4"				
G	1"	234.0 (106.1)	1"	260.0 (117.94)	3/4"	14 (53)	1"	1/4"				
G1	1"	230.4 (104.5)	1"	256.0 (116.12)	3/4"	14 (53)	1"	1/4"				
H	1"	315.0 (142.9)	1"	350.0 (58.76)	1"	14 (53)	1 1/4"	1/4"				
I	1"	378.0 (171.5)	1"	420.0 (190.51)	1"	20 (75.71)	1 1/4"	1/4"				

HVAC DATA

Heat loss, at ambient of 70° F.

	MODEL	KBTU'S/HR
SINGLE DOOR: Through one wall, at fascia	E	5
	F	5
	G	5
	G.1	5.2
	H	6.8
	I	6.8
SINGLE DOOR: Through one wall, service area	E	7.5
	F	9
	G	11.8
	G.1	12.2
	H	10.5
	I	12.3
SINGLE DOOR: Free standing, cabinet total	E	13.3
	F	14
	G	16
	G.1	16
	H	16.1
	I	16.3

	MODEL	KBTU'S/HR
DOUBLE DOOR: Through one wall, at fascia	E	5
	H	5
	G	5
	G.1	5.2
	H	6.8
	I	6.8
DOUBLE DOOR: Through one wall, service area	E	12.3
	H	13
	G	16
	G.1	13.8
	H	15
	I	16.3
DOUBLE DOOR: Through two walls, at each fascia	E	5
	H	5
	G	5
	G.1	5.2
	H	6.8
	I	6.8
DOUBLE DOOR: Through two walls, service area	E	6.9
	H	8
	G	10
	G.1	9.2
	H	7.9
	I	10.2

ELECTRIC BOILERS

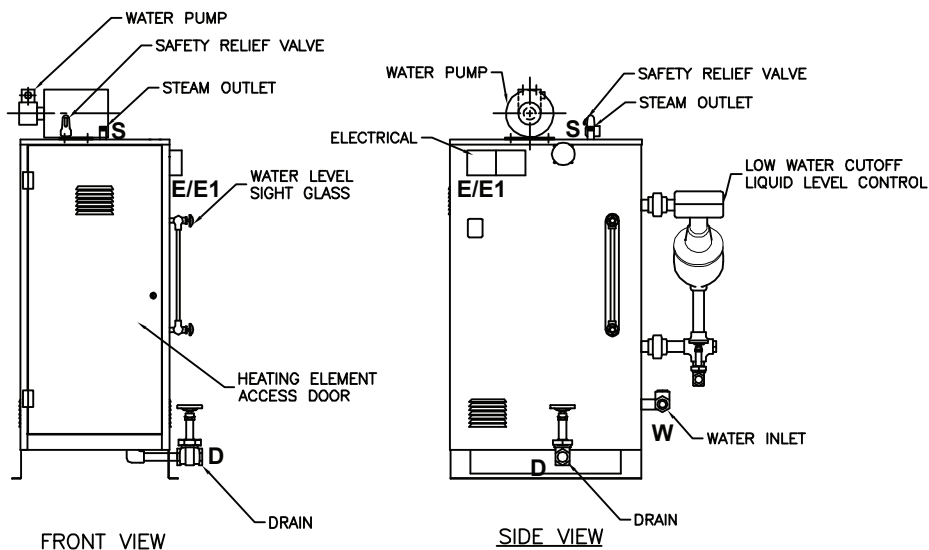
BEBC Electric Heated Boiler - Stainless steel construction for clean steam generation. Includes tainless steel feedwater boost pump.

NOTE: Stainless Steel Boilers shall be operated using only deionized water, having a maximum conductance of 1 microSeimen per cm (1S/cm) [minimum specific resitivity of 1 megohm per cm (1MW/cm)].

MODEL		E	F	G
Chamber Size (w x h x l) inches/millimeters		26 x 36 x 39 660.4 x 1600 x 1219	26 x 36 x 48 660.4 x 1600 x 1930	26 x 36 x 60 889 x 1148 x 1219
Boiler Size	kW/Hr.	60.0	72.0	108.0
Boiler Steam Output	lbs./Hr	181	217	325
Stand Alone	Model	EB-E	EB-F	EB-G
V.A.C. 208, 3 Ph	Amperes	167	200	300
V.A.C. 240, 3 Ph	Amperes	145	174	260
V.A.C. 480, 3 Ph	Amperes	73	87	130
V.A.C. 110, 60 Hz. ¹	Amperes	10	10	10
MODEL		G1	H	I
Chamber Size (w x h x l) inches/millimeters		32 x 36 x 48 660.4 x 1600 x 1219	36 x 42x 60 660.4 x 1600 x 1930	36 x 42 x 84 889 x 1148 x 1219
Boiler Size	kW/Hr.	108	144	158
Boiler Steam Output	lbs./Hr	325	433	475
Stand Alone	Model	EB-G1	EB-H	EB-I
V.A.C. 208, 3 Ph	Amperes	300	400	N/A
V.A.C. 240, 3 Ph	Amperes	260	347	379
V.A.C. 480, 3 Ph	Amperes	130	173	190
V.A.C. 110, 60 Hz. ¹	Amperes	10	10	10

1. Controls Current

N/A - Not Available



STEAM TO STEAM GENERATOR (SCS1 & SCS2)

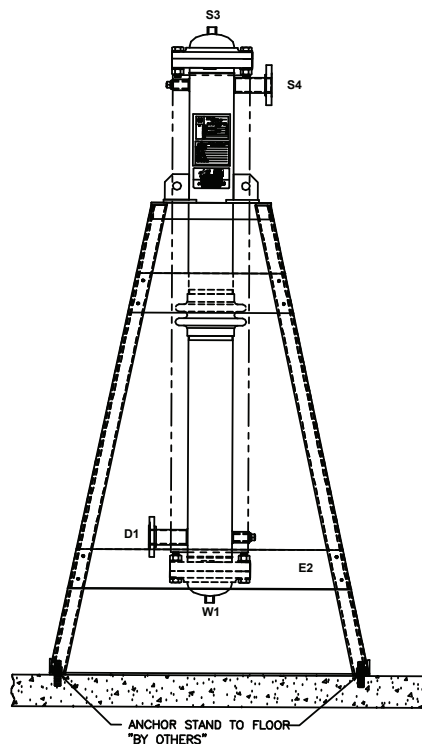
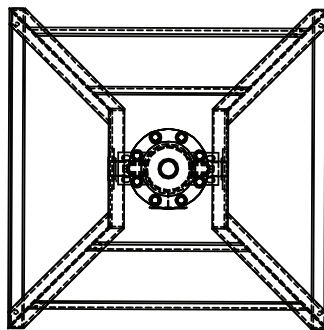
Steam to Steam Generator used to generate either clean or pure steam. The preferred method of generating Clean or Pure steam, when house steam is available to drive the generator. Converts to steam, whatever quality water is delivered.

BSCS1 Pure Steam - stainless steel steam to steam generator with sanitary fittings, double tube sheet construction. Generated from WFI quality depyronegated water. The water source to the Pure Steam Generator is either house generated or "By Others".

BSCS2 Clean Steam - stainless steel steam to steam generator with threaded fittings, threaded connections and single tube construction. Generated from distilled or reverse osmosis water. Clean Steam sterilizers normally include stainless steel piping for all wetted surfaces in the product loop.

NOTE: Refer to Page 8 for information on Water Quality.

Refer to the boiler/steam to steam generator maintenance manual provided with the sterilizer prior to using any boiler treatment chemicals. Contact PRIMUS for further recommendations.



Use the following pages to custom design your sterilizer by checking the boxes of the configuration and options required for your project. Transfer all items checked to the Technical Worksheet (Pages 15 & 16) and fax to PRIMUS Sales Department or to your local Sales Representative for a quotation. If you do not find an option or size listed to meet your requirements, please contact our Project Manager for additional information and assistance.

Model Number Notation

SD = Single Door
DD = Double Door
↓

PSS _ - _ -M _ _ _

↑ ↑ ↑

ControlLogix = 7 E S = House Steam
Trinity = 8 F E = Electric Boiler
MicroLogix = 9 G P = Steam to Steam
G.1
H
I

Five models are offered:
E - 26" x 36" x 39"
F - 26" x 36" x 48"
G - 26" x 36" x 60"
G.1 - 32" x 36" x 48"
H - 36" x 42" x 60"
I - 36" x 42" x 84"

A detailed formatted specification, suitable for inclusion in formal contract documents, is available on request.

Note: Use the above format to determine PRIMUS Model number and insert below and on Page 15, Technical Worksheet.

PRIMUS General Purpose Steam Pressure Sterilizer, Model Number PSS_____.

SELECT CONFIGURATION

Door

- GDA - Single Door
- DB - Double Door

Cabinet

- CD - Panels Both sides
- CCL - Left Side Panel
- CCR - Right Side Panel

Recessed

- CA - One wall
- CB - Two walls

Service and Equipment Access

- Left Side (Standard)
- Right Side

Steam Source

- House Supply
- Clean Steam²
 - EBC1 - 208/3 phase³
 - EBC2 - 240/3 phase³
 - EBC3 - 480/3 phase³
 - Other _____
 - EB0⁵ - Auto Blowdown
- Steam to Steam²
 - SCS1 - Pure Steam Dbl Tube
 - SCS2 - Clean Steam Sgl Tube
 - SCS⁴ - Clean Steam Sgl Tube Sanitary
 - Other _____

1. Electric boilers are available in Carbon Steel or Stainless Steel.
2. Contact PRIMUS for overall dimensions and utility connections.
3. All models are stand-alone.
4. GMP Validatable Option Only, sanitary piping required.
5. Low Water Cutoff is standard and the "automatic reset" feature is disabled with this option. The boiler will need to be manually rest.
6. Water Quality - For best results, feed water supply should be evaluated prior to initial startup to ensure it is of the quality necessary for the application, various external treatment processes (water softener, water conditioning, etc.) may be used. Contact PRIMUS for further recommendations.

PHARMACEUTICAL CONFIGURATIONS

Clean Steam Sterilizers P9

For cell/tissue culture applications. This option provides direct connection to a house-source of clean steam. Includes threaded stainless piping and components to chamber. If clean steam is only steam source, specify option BP9.1 for stainless piping to jacket. For alternate sources to generate clean steam, specify electric clean steam boilers (stainless steel), or when house steam is available, specify steam-to-steam generators. (Stainless steel heat exchanger).

P9	Stainless piping to chamber - threaded
P9.1	Stainless piping to jacket - threaded
EBC	Clean Steam Stainless Electric Boiler (specify voltage)
SCS1*	Pure Steam Double Tube Sheet, Sanitary Connections
SCS2*	Clean Steam Single Tube Sheet with threaded connections
SCS3*	Clean Steam Single Tube, Sanitary Connections

*Contact PRIMUS for alternate steam generator options.

CONTROLS AND RELATED OPTIONS

(Contact PRIMUS for details and performance specifications)

PSS7 Control System C7

PSS7 uses the Allen-Bradley ControlLogix PLC with Ethernet connectivity and PanelView Plus OIT in place of the SLC500 PLC and standard PanelView. ControlLogix provides graphical color touch screen capability, real time process graph, active Plumbing & Instrumentation Diagram (P&ID) screens and the ability to standardize control systems throughout a facility.

PSS7 offers a total of fifteen (15) cycles with thirteen (13) standard cycles available for product sterilization. Standard cycles are configurable by modifying the cycle parameters for each. Two dedicated cycles are available for performing vacuum leak test and sterilizer filter.

PSS8 Trinity Control System C8

PSS8 microcomputer with a selection of twenty-five (25) separate programs for sterilization of wrapped goods, hard-goods, liquids and test cycles.

Trinity Controller has a color touch sensitive screen with 30 line x 40 character display mounted on the front fascia with a thermal printer. Help screens for programming and trouble shooting alarm conditions. Cycle data can be printed, captured to a remote personal computer or logged to memory.

Air-over Cooling P11

Provides a means of rapidly cooling sterilized load. Effective to decrease cycle times with liquid loads. Filtered ambient air displaces steam during exhaust cycle to rapidly cool load and prevent boil-over.

CLEAN-IN Place Piping P15

CLEAN-IN Place (CIP) piping is standard for all piping in the product contact circuit. CIP piping has an interior finish <25 μ Ra.

Control Cycle on Load Temperature C24 Use to establish the most beneficial cycle temperature and exhaust rate parameters. Monitors and controls the load temperature. Use to establish best parameters for liquid loads and for loads with complex geometries and a tortuous path for steam penetration.

Note: See additional Bio-Containment Options

PSS9 Control System C9

PSS9 uses the Allen-Bradley MicroLogix™ 1400 PLC control and PanelView Plus™ 600 display monitor which provide a touch sensitive screen featuring color active matrix (TFT) 18 bit color graphics display and real time graph. Twenty-seven cycles, with 25 standard cycles available for product sterilization and two dedicated cycles for performing vacuum leak test and sterilizer filter. Help screens for programming and trouble-shooting alarms. Messages displayed in complete phrases with no cross-referenced codes required.

Cycle data printed, captured to a remote personal computer, or logged to memory. Security Access for Operator, Supervisor, Calibrator, Service and Administrator. Calibration provided through the operator end touch screen

Sterilization Based on Accumulated F C2 When sterilization based on accumulated heat lethality F is selected, exposure length is based on a settable value for the total accumulation of F during the charge and exposure phases. The accumulated F value must be reached before the sterilization phase is completed.

CONTROLS AND RELATED OPTIONS (CONT'D)

Supervisory Control and Data Acquisition (SCADA) System C23

The optional SCADA Interface provides the end user with a structured data format which can be easily interfaced with control room processes.

Remote Record of Run Data C11 Supervisory use to capture electronic record of each sterilization cycle. Cycle hard copy and display data is transmitted via RS232 in real time to remote computer, up to 100 feet away, for display and recording. Hard copy records may be printed from the computer. Available on both control systems.

Sterilize Filter Cycle C13

Sterilize filter is a stand-alone cycle used to sterilize the 0.2 micron sterile air filter, filter housing and related piping.

Authorized Operator Access C32

Restricts operation of sterilizer to authorized personnel and provides supervisor with PIN number of person running the cycle. Access levels are available for administrator, supervisor and operator level groups.

Remote Mount Control Panel C10

Mount control panel in separate housing adjacent to or up to 100 feet away from the sterilizer. Available on both control systems.

Thermal Printer R7

Thermal dot-matrix printer with take-up reel and 32 characters per line printing is standard. Second sterilization cycle report available at the end of the run.

BIO-CONTAINMENT OPTIONS

BioSeal Flange V6

Provides a means of isolating load from the unload ends of the sterilizer. A vapor-proof flange is welded to the vessel on both sides of the flange and around its full circumference. Penetrations through the flange for electrical and piping components are secured with vapor proof fittings. Optional on single door units, standard on double door units.

Air Differential/Vermin Seal Extension Panels V7

Aluminum panels for attachment to, and extending from, the BioSeal Flange to adjacent building surfaces to complete the barrier between either end of the sterilizer.

	BV10	Stainless steel in lieu of aluminum
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BioSeal Fully Welded Box V11

Provides a fully welded stainless box, welded to the BioSeal flange forming the complete BioSeal. Check proposed installation site. Install into wall opening with end-opposite box BioSeal, first. For double-door pass-through model B requiring a Box BioSeal and a boiler, specify a stand-alone boiler.

Conax Adapter C5

Provides two (2) 316L SS sanitary chamber penetration, for validation purposes. Conax Adapter provides a compression gland inside the port, through which 1-24 thermocouple leads are fed to the chamber interior.

Remote Signaling of Sterilizer Status C23

Control relay connection enabling operation of a remote signaling device for an alarm condition. Alarm conditions many include Door Open, Door Closed and Cycle complete. Signal may be used to activate a buzzer, light or any other On-Off device.

Compress Air to Gasket P10

Compressed air is used to seal gasket against door interior during cycles on Bio→Pharma® sterilizers. Prolongs gasket life. Requires compressed air utility service, or option BEAC air-compressor. Optional steam to gasket is available.

GENERAL OPTIONS

Validation Port, 1.5 inch V4

Provides chamber penetration to accommodate various monitoring/control probes. Standard on all models.

Seismic Restraints V8

Required in areas prone to seismic hazards. Secures sterilizer to building but allows for leveling. Designed to current California Code.

Electric Vacuum Pump P4

A water-sealed electric vacuum pump is standard on sanitary sterilizers providing a vacuum, in lieu of the standard water ejector on non-sanitary sterilizers. Check PRIMUS' General Arrangement drawing to assure the required ancillary equipment space is provided.

Drain Line Strainer/Valve P25

Provides a means to trap and expel debris from the chamber drain line to protect heat exchanger from damage.

GENERAL OPTIONS (CONT'D)

Air Compressor EAC

For small size sterilizers, (less than 75 cu. ft.), air compressor mounted on sterilizer frame, for use when house supplied air is required but not avail-able. Not available if Air-Over Option BP11 is specified.

UTILITY - STANDARD FEATURES

Quench Effluent on Demand to Drain P6 Assures effluent exhausted to drain is 140°F or below, provides quench water for exhaust effluent only on demand, to conserve water. Standard on all units.

Stepping Transformers E1

Reduces line voltage to required 110 VAC for operation of sterilizer controls.

E1A	220 vac to 110 vac
E1B	480 vac to 110 vac
E1C	480/240/240/120, 1 phase, 0.5 KVA

Uninterruptible Power Supply E2

In the event of electrical power loss and no emergency electrical power to sterilizer, this option provides electrical power to operate control system for up to 30 minutes, to complete the cycle. This option is dedicated power source for the electronic controls only and will not supply any power requirements for heavy power load components (boiler, pumps, compressors, etc.).

PRI-Saver Water Conservation System P24 Decreases water usage up to 97% on steam sterilization cycles. PRI-Saver recirculates water through the reserve tank. This dramatically increases efficiency by reusing the water.

SHIPPING DIMENSIONS, CUBAGE & WEIGHTS

Model Sterilizer Size inches/millimeters	E 26" x 36" x 39" 660.4 x 914.4 x 990.6	F 26" x 36" x 48" 660.4 x 914.4 x 1219.2	G 26" x 36" x 60" 660.4 x 914.4 x 1524	G1 32" x 36" x 48" 660.4 x 660.4 x 1244.6	H 36" x 42" x 60" 914.4 x 1066.8 x 1524	I 36" x 42" x 84" 914.4 x 1066.8 x 2133.6
Shipping Dimensions, Single Door ¹	75 x 70.25 x 48.5 1905 x 1784.4 x 1231.9	70 x 70.25 x 57.5 1905 x 1784.4 x 1460.5	75 x 70.25 x 69.5 1905 x 1784.4 x 1765.3	87 x 70.25 x 58.252209. x 1784.4 x 1479.6	65.5 x 77.88 x 71.5 1663.7 x 1978 x 1816.1	65.5 x 77.88 x 95.5 1663.7 x 1978 x 2426
Shipping Dimensions, Double Door ²	75 x 70.25 x 49 1905 x 1784.4 x 1244.6	75 x 70.25 x 58 1905 x 1784.4 x 1473.2	75 x 70.25 x 70 1905 x 1784.4 x 1778	87 x 70.25 x 60 2209.8 x 1784.4 x 1524	65.5 x 77.88 x 72.38 1663.7 x 1978 x 1838.3	65.5 x 77.88 x 96.38 1663.7 x 1978 x 2448
Overall Width Dimensions	75 / 1905	75 / 1905	75 / 1905	87 / 2209.8	97 / 2463.8	97 / 2463.8
Knockdown Width Dimensions ¹	37.75 / 958.9	37.75 / 958.9	37.75 / 958.9	43.75 / 1111.3	49.13 / 1247.9	49.13 / 1247.9
Weight, Single Door (with plumbing)	CONTACT PRIMUS FOR WEIGHTS					
Weight, Double Door (with plumbing)	CONTACT PRIMUS FOR WEIGHTS					
Crated Weight (Additional)	Contact PRIMUS for Export Crating Weights					
Crated Dimensions	37 x 75 x 60 939.8 x 1905 x 1524	37 x 75 x 69 939.8 x 1905 x 1752.6	37 x 75 x 81 939.8 x 1905 x 2057.4	90 x 80 x 69 2057.4 x 2032	81 x 83 x 86 2057.4 x 2108.2 x 2184.4	81 x 83 x 110 2057.4 x 2108.2 x 2794
Crated Cube	97 cu ft/ 3 m ³	111 cu ft/ 3m ³	130 cu ft/ 4 m ³	113 cu ft/ 3 m ³	204 cu ft/ 6 m ³	265 cu ft/ 8 m ³
OPTIONAL ACCESSORIES						
Loading Equipment	146 lbs/ 66. kg	152 lbs/ 69 kg	205 lbs/ 92.99 kg	166 lbs/ 76 kg	282 lbs/ 128 kg	370 lbs/ 168 kg
Boiler	380 lbs/ 172.kg	390 lbs/ 177 kg	625 lbs/ 283.5 kg	625 lbs/ 284 kg	785 lbs/ 356 kg	790 lbs/ 359 kg

- Units have Split Beams and may be split for shipping purpose. All other units do not have split beam.
- Shipping dimensions are measured to the edge of the heat exchanger and include plumbing on, split beams removed, where applicable, front stainless steel panel and printer removed.
- Knockdown is vessel dimension only, dimension does not include plumbing, electrical or heat exchanger. Special Order Only, must be indicated when ordering.

LOADING EQUIPMENT

Standard chamber shelving includes a fixed removable, wire mesh bottom shelf. As an option extendable bottom shelf, is available. Adjustable shelf supports are provided in 4-inch (100mm) increments. Optional additional chamber shelf(ves) may be specified.

Loading cart includes one bottom and one intermediate shelf with four adjustable levels. Additional shelves are available. Cart frames and shelves are 316L stainless steel welded, ground and polished. Shelf surfaces are stainless steel wire mesh. Transfer carriages include swivel casters with swivel locks and 5" wheels with wheel brakes.

L1	Removable Bottom Shelf
L2	Extendable Bottom Shelf
L3	Additional Chamber Shelf
L4	Loading Cart
L5	Additional Cart Shelf
L6	Transfer Carriage

NOTE: Loading cart and transfer carriages are recommended for chamber lengths 48 inches or longer.

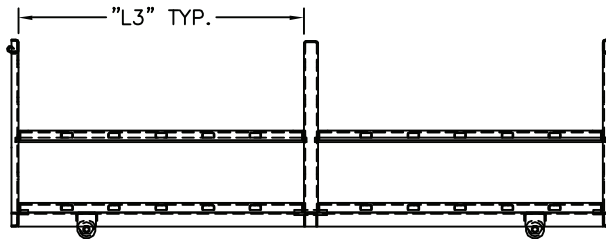
Contact PRIMUS for special loading equipment requirements. Existing loading equipment may be able to be retained, contact PRIMUS for more information.

LOADING EQUIPMENT (Cont'd)

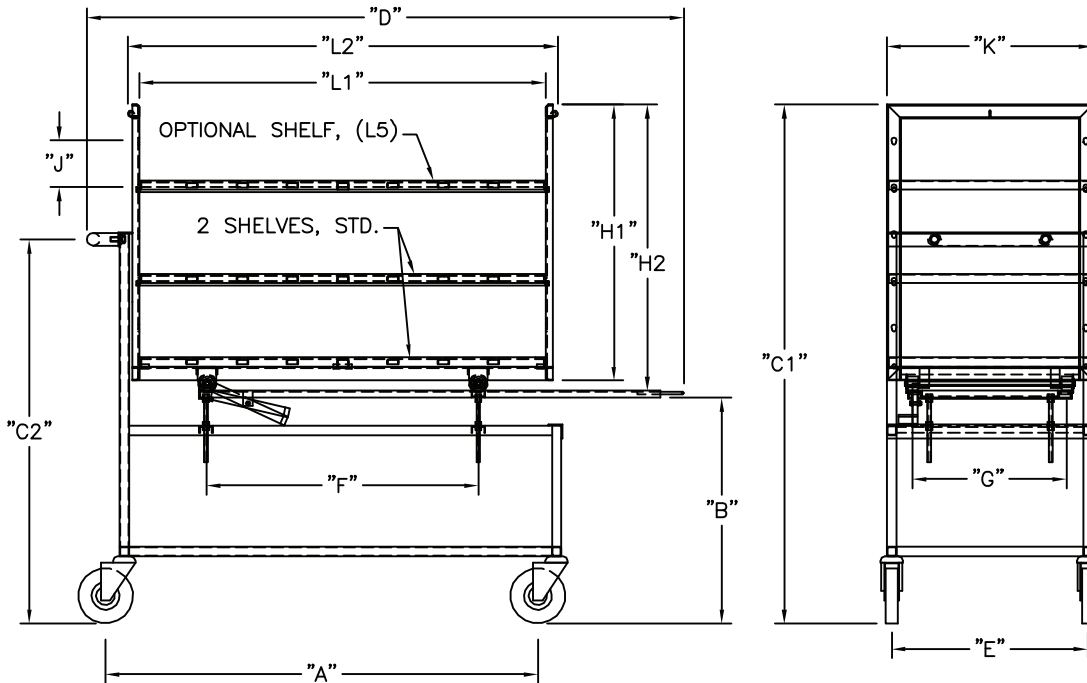
Transfer Carriage and Loading Cart Dimensions

CHAMBER SIZE	CARRIAGE QTY	CART QTY	A	B	C1	C2	D	E	F
E - 26"x36"x39"	1-L6	1-L4	40.25"	24"	57.19"	41.06"	57.00"	21"	35.50"
F - 26"x36"x48"	1-L6	1-L4	48.25"	24"	55.44"	41.06"	63.88"	21"	29.06"
G - 26"x36"x60"	1-L6	1-L4	60.25"	24"	55.44"	41.06"	75.88"	21"	41.13"
G.1 - 32"x 36"x48"	1-L6	1-L4	46.25"	24"	55.44"	41.06"	63.88"	27"	29.00"
H - 36"x42"x60"	1-L6	1-L4	58.25"	24"	61.38"	41.06"	78.88"	31"	41.00"
I - 36"x42"x84"	1-L6	1-I4	43.25"	24"	61.38"	41.06"	58.88"	31"	23.75"

CHAMBER SIZE	CARRIAGE QTY	CART QTY	G	H1	H2	J	K	L1	L2	L3
E - 26"x36"x39"	1-L6	1-L4	16.50"	31"	32.38"	5"	24"	34"	37"	N/A
F - 26"x36"x48"	1-L6	1-L4	16.50"	29.50"	30.56"	5"	22"	43.50"	46"	N/A
G - 26"x36"x60"	1-L6	1-L4	16.50"	29.50"	30.56"	5"	22"	55.50"	58"	27"
G.1-32"x36"x48"	1-L6	1-L4	22.50"	29.50"	30"	5'	28"	43.50"	46"	N/A
H - 36"x42"x60"	1-L6	1-L4	26.50"	35.50"	36.56"	5"	32"	55.50"	58"	27"
I - 36"x42"x84	2-L6	2-L4	26.50"	35.50"	36.56"	5"	32"	37.50"	40"	N/A



SIDE VIEW (60" CHAMBER OR LONGER)



SIDE VIEW

END VIEW

The PRIMUS Difference:

- Quality and Innovation – Dedicated to sterilizers for over 25 years.
- Steam Sterilizers are Our Only Business – Proud to be the only major steam sterilizer manufacturer specializing in Steam Sterilizers
- ASME Certified Pressure Vessel Factory – Being the owner of our ASME shop ensures highest of quality and faster deliver times
- USA Designed and Manufactured
- 19 Standard Sizes, Custom Sizes Available
- Steam Sterilizer for Every Need – From Basic Sterilization to Hazardous Waste, to Validatable Pharmaceutical and Bio-Critical Applications
- Engineered the Service Out of Sterilizers – “Making it one of the easiest in the industry to service” per our Authorized Service Agents and Customers
- Simplicity of Design – less parts to fail
- Non-Proprietary Components – Lowers the cost of ownership, minimizes down time and provides a more efficient meantime repair
- 316L Stainless Steel Fully Jacketed Vessel (no laminates) – reduces heat-up time and loss of temperature, providing greater uniformity of chamber temperature
- Rectangular Chamber - eliminating wasted space and high utility cost
- Sliding Doors: Inherently safe doors – seal integrity. Not a burn hazard
- PRIMUS Controls with “Evergreen Migration” meaning the hardware and software is continually supported lowering total costs of ownership – All controls offer multiple options on 4 different control platforms. Through constant improvements and development PRIMUS Controls remain a leader in the industry. Simple to operate, reliable and versatile.
- Vacuum, Gravity, Liquid and Test Cycles - Standard on all Sterilizers
- Pri-Mirror® Chamber Finish – Most sanitary in the industry. Providing a mirror finish of <10 Micro Inches Ra, the result is a non-porous surface easy to clean and hostile to microorganism
- Independent Dealers, Sales Representatives and Authorized Service Agents Worldwide – offering the most coverage and flexibility
- Customer Service - Important part of PRIMUS offered through our Authorized Service Agents or directly from PRIMUS’ Service Department
- Turn Key Operation – from planning to installation to start-up and training
- FDA, ISO 9001:2000, ISO13485-2003; UL Listed, ASME Section VIII Division I, Health Canada License

PRIMUS sterilizers represent state-of-the-art technology, built to the highest standards thanks to employees who have a strong work ethic and dedication to craftsmanship. Quality products and personal service is first and foremost with PRIMUS.

**PRIMUS has earned a reputation for offering
the premier sterilizer on the market!**



**26"x36"x48" with loading cart
and transfer carriage**

QUALITY AND INTEGRITY FORM THE FOUNDATION OF
SPIRE INTEGRATED SOLUTIONS.
OUR VISION FOR CONTINUAL IMPROVEMENT IS REALIZED
THROUGH THE ESTABLISHMENT OF QUALITY OBJECTIVES
ACHIEVED THROUGH TEAMWORK WITH A GOAL OF
RETURNING SIGNIFICANT VALUE TO OUR CUSTOMERS.

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PRIMUS TECHNICAL Data Worksheet

Complete the following by selecting the options or transferring the options, checked on preceding pages, required to meet your needs. Forward completed worksheet to [Spire Sales Department sales@spire-is.com](mailto:sales@spire-is.com) or your local PRIMUS Representative. If you do not find an option or size listed to meet your requirement, please contact our Sales Department for additional information and assistance with a custom design to meet your specifications.

PRIMUS MODEL NUMBER		QUANTITY	
PROJECT NAME			
PROJECT ADDRESS			
COMPANY NAME		PHONE	
CONTACT NAME		FAX	
CONTACT EMAIL			
SPECIFICATION SECTION		ITEM NO.	
SHOWN ON DRAWING NO.		ROOM NO.	
PRIMUS QUOTE NO.			

GENERAL CONFIGURATIONS		
DA	Single Door	
DB	Double Door	
DE	Door(s) Manually Operated (Std)	
CD	Cabinet, 2 sides	
CCL	Cabinet, 1 Side Left	
CCR	Cabinet, 1 Side Right	
CA	Recessed, 1 Wall	
CB	Recessed, 2 Wall	
NPN	Left Side Service (Std)	
C30	Right Side Service Access & Control	
C31	Control Panel Opposite Side of Service	
CF	Rear Panel	
CG	Hinged Access Panel thru Fascia	
STEAM SOURCE		
EB1	Boiler, 208/3ph	
EB2	Boiler, 240/3ph	
EB3	Boiler, 480/3ph	
EBC1	Clean Steam, 208/3ph	
EBC2	Clean Steam, 240/3ph	
EB3	Clean Steam, 480/3ph	
SCS1	Pure Steam Double Tube, Sanitary	
SCS2	Clean Steam Single Tube	
SCS3	Clean Steam Single Tube, Sanitary	
EBO	Automatic boiler blow-down	
LWC	Low Water Cutoff, Manual Reset	
PHARMACEUTICAL OPTIONS		
P9	Clean Steam to Chamber, Threaded Piping	
P9.1	Clean Steam to Jacket, Threaded Piping	
P11	Air-Over Cooling	
C24	Control Cycle on Load Temperature	
CONTROLS & RELATED OPTIONS		
C7	Pri-Matic® Control System, PSS7 (ControlLogix)	
C9	Pri-Matic® Control System, PSS9 (Micrologix)	
C8	Trinity Control System, PSS8	
C2	Pri-Matic F ₀ control F ₀ accumulated, 4 points	
C23	SCADA Data File	

CONTROLS & RELATED OPTIONS (con't)		
C11	Serial Data Output	
C13	Sterilize Filter Cycle	
C32	Authorized Operator Access	
C10	Remote Mount Control Panel	
R7	Thermal Printer, Take-up Reel (Std)	
R7	Thermal Printer, 32 Character (Std)	
BIO-CONTAINMENT OPTIONS		
V6	One BioSeal Flange	
V7	BioSeal Extension Panels	
P10	Compressed Air to Gasket	
C5	Conax Adapter	
C23	Remote Alarm Signal	
V11	Fully Welded BioSeal Box	
GENERAL OPTIONS		
V3.1	Validation Port, 1.0" diameter	
V8	Seismic Restraint	
P4	Electric Vacuum Pump (Std)	
P25	Drain Line Strainer/Valve	
DF	Automatically Operated Door	
EAC	Air Compressor	
UTILITY - RELATED OPTIONS		
P6	Quench Water to Drain, on Demand (Std)	
E1A	Stepping Transformer from 220V to 110V	
E1B	Stepping Transformer from 480V to 110V	
E1C	Stepping Transformer from 480/240-240/120V, 1 ph, 0.5KVA	
E2	UPS maintains sterilizer operation for 30 minutes during power outage	
E3	GFI Receptacle	

Std = Standard Component
 SS = Stainless Steel
 CIP = Clean-in-Place
 N/A = Not Available

(Continue on the next page)

Specification Data Worksheet (cont'd)

LOADING EQUIPMENT	
L1	Removable Bottom Shelf (Std)
L2	Extendable Bottom Shelf
L3	Additional Chamber Shelves
L4	Loading Cart
L5	Additional Cart Shelves
L6	Transfer Carriage
L10	Heavy Duty Loading Cart
OTHER CONTROL OPTIONS	
C3	Blind Flange Assembly, Sanitary Fitting
C4	Jacket Pressure Display, Digital
C1.2	16/24 Thermocouples Conax Adapter
C7.1	Second PanelView 1000
C14	WFI Interface
C15	Pri-Matic in NEMA 12 ¹ enclosure (Dustproof)
C15.1	Stainless Steel Enclosure for Pri-Matic Control Panel
C16	Pri-Matic mounted in NEMA 4 ² Enclosure (Waterproof)
C16.1	Pri-Matic mounted in NEMA 4X ³ SS Enclosure
C17	Remote Sterilizer "OFF" Signal
C18	Remote Sterilizer "In-Cycle" Signal
C23	Remote Alarm Signal
C26	PanelView 550, Service Area
C29	Additional Operational Manuals (2 CDs provided) Qty _____
C30	Right Side Service Access & Controls
C31	Control Panel Opposite Side of Service
R3	Strip-Chart Recorder
R4.1	Thermal Printer, Flush Mount 24 Col.
R5	Circular Chart Recorder
R6	Impact Printer, 24 Column

OTHER PIPING OPTIONS	
P2	Heated Air-In, Heat Exchanger SS
P5	Safety Valve Over Rupture Disk
P15	Sanitary Piping (Std)
P16	Air to Jacket Cooling
P18	Passivate Chamber
P19	Passivate Chamber and Piping
P20	Steam Quality Sampler
VESSEL OPTIONS	
V1	Stainless Steel Frame
V2	Jacket Type, 316 L SS
V3	Jacket Insulation Cover, SS
V6.1	Additional BioSeal Flange
V8	Seismic Restraints
V10	BioSeal Panels, Stainless
GMP DOCUMENTATION OPTIONS	
D1	GMP Validation Documentation
D4	IQ/OQ Protocol, PSS8 Trinity
D3	IQ/OQ Protocol, Pri-Matic

Std = Standard Component
 SS = Stainless Steel
 N/A = Not Available
 1 = NEMA 12 (IP55), Dustproof, Painted Steel Enclosure
 2 = NEMA 4, Waterproof, Stainless Steel Enclosure
 3 = NEMA 4X (IP66), Waterproof, Stainless Steel Enclosure
 GMP Validation Documentaion includes the following:

In-Process Inspection Traveler
 Weld Map
 Weld Procedure Specifications (WPS)
 Welder or Welder Operator Qualification Test (WPQ)
 Material Heat Code List (Code Components) Material
 Certifications and Mill Test Reports Chamber
 Mapping Test Runs and graphs
 Heat Numbers of all SS Components Manufacturer's
 Specification Datasheets and/or Instruction Manual
 for all Major Components
 Major Components on MPL Tagged

YOUR LOCAL SPIRE REPRESENTATIVE:

FOR ADDITIONAL ASSISTANCE

spire-is.com . (877) 679.7800 . sales@spire-is.com



Manufacturer reserves the right to modify materials or specification without notice.

