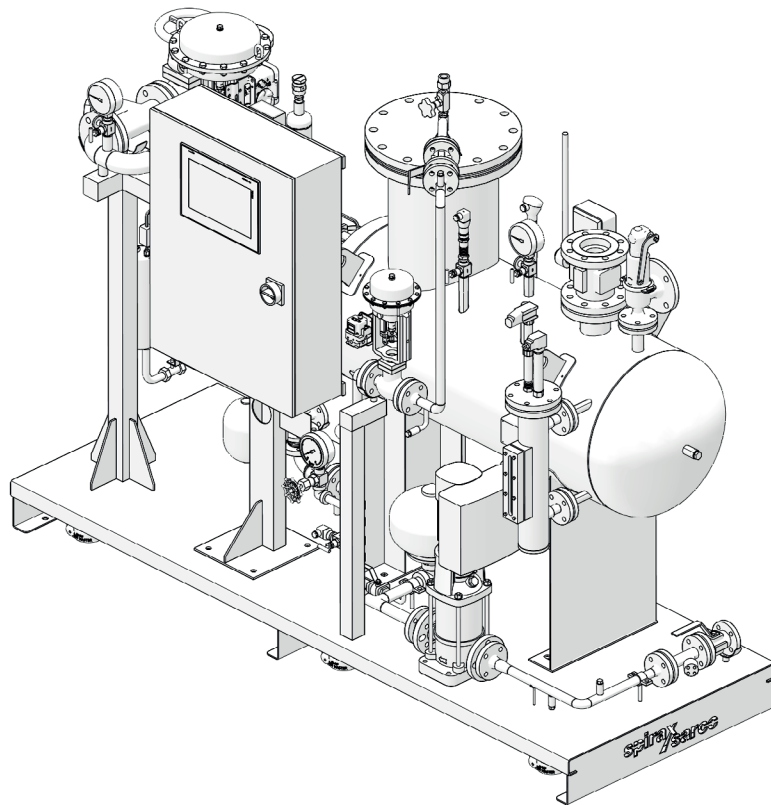


# spirax sarco

## CSG-HS

### Clean steam generation system for Healthcare



#### Description

The Spirax Sarco Clean Steam generator range has been designed for the Healthcare sector. Specifically sterilisation applications enabling the system to produce high quality steam under a wide variety of operating conditions. The system operates using plant steam as the primary heating medium. All Systems are supplied packaged and ready to install with simple commissioning.


#### Product range

Size:	<b>CSG-HS - 020</b> nominal production capacity 233 kg/h (513 lbs/hr)*
	<b>CSG-HS - 055</b> nominal production capacity 620 kg/h (1366 lbs/hr)*
	<b>CSG-HS - 125</b> nominal production capacity 1384 kg/h (3051 lbs/hr)*
	<b>CSG-HS - 180</b> nominal production capacity 2016 kg/h (4444 lbs/hr)*
Versions/Applications:	<b>HS</b> Healthcare sterilisation.

(\* ) max steam production at reference operating conditions: primary steam at 9 bar g (130.5 psi g), production at 4 bar g (58 psi g), feed water at 20 °C (68 °F).

## Construction and main features

- System complete, functional and safe
- Compact design
- Modulating pressure and level control: pressure stability and steam quality improvement
- Intelligent PLC with SIMS technology, easy maintenance
- Packaged system with on board wired control panel: easy installation
- Automated start up/commissioning sequence
- High quality dryness exceeds EN285 and ST79 on performance
- Configurable options to suit individual needs
- System diagnostics
- Preventive maintenance
- Preheater can reduce plant steam usage by a minimum of 8% at peak flow.
- Spirax Sarco's worldwide service.
- **Compliances** available but not standard in all geographies.

	EMEA		Americas		Asia Pacific	
	STD	On request	STD	On request	STD	On request
-  mark with EU declaration of conformity according to the following directives:	●					●
- 2014/68/EU (PED)	●					●
- 2014/35/EU (LVD)	●					●
- 2014/30/EU (EMC)	●					●
- ASME design with U stamp certification			●			
- Chinese GB national standard					●	

## Design conditions

<b>Primary side</b>	Design pressure	13 bar g	(188 psi g)	For a bespoke design, contact Spirax Sarco	
	Design temperature	195.1 °C	(383 °F)		
<b>Secondary side</b>	Design pressure	8 bar g	(116 psi g)		
	Design temperature	195.1 °C	(383 °F)		
	Safety valve set pressure	7 bar g	(101.5 psi g)		
<b>Feedwater</b>	Design pressure	8 bar g	(116 psi g)		
	Design temperature	without pump	110 °C		(230 °F)
		with pump	100 °C		(212 °F)

## Maximum operating conditions

	Without pump	With pump
<b>Production</b>	Clean saturated steam, up to 6 bar g/165.0 °C (Clean saturated steam, up to 97 psi g/206 °F)	
<b>Primary side</b>	Plant steam, up to 12 bar g/191.7 °C (Plant steam, up to 174 psi g/345 °F)	
<b>Feedwater</b>	P min. ≥ P clean steam + 0.5 bar g (P min. ≥ P clean steam + 7.2 psi g)	Net positive suction head required (see IM)
	P max 8 bar g/T max 110 °C (P max 116 psi g/T max 230 °F)	P max 8 bar g/T max 80 °C (P max 116 psi g/T max 176 °F)

Minimum ambient temperature: 0 °C

Designed for indoor installation only, protect from freezing.

**Note:** Feedwater is recommended to be demineralised or Reverse Osmosis quality to ensure high performance.

## Utilities

	Unit without pump	Unit with pump
<b>Electrical supply (cabinets)</b>	1 x 230 V +N 50/60 Hz 0.4 kW (instr.)	3 x 380 to 500 V +N 50/60 Hz 1 kW (sizes 020-055) (instr.) 1.5 kW (size 125) (instr.) 2 kW (size 180) (instr.)
<b>Air supply (filters)</b>	Minimum 5 bar g (72.5 psi g) to maximum 7 bar g (101.5 psi g) (only for the unit with pneumatic actuators)	

## Performance of the units without preheater option

Max clean steam production (kg/h), with feedwater at 20 °C:		Clean steam pressure/bar g		
		4.5	4.0	3.5
CSG-HS - 020	10.0	220	254	292
	9.5	200	234	271
	9.0	180	214	250
	8.5	159	192	229
	8.0	137	170	207
CSG-HS - 055	10.0	583	677	788
	9.5	531	620	727
	9.0	480	566	666
	8.5	426	511	606
	8.0	370	456	548
CSG-HS - 125	10.0	1,292	1,516	1,627
	9.5	1,171	1,385	1,490
	9.0	1,044	1,254	1,490
	8.5	930	1,126	1,350
	8.0	823	996	1,213
CSG-HS - 180	10.0	1,884	2,210	2,542
	9.5	1,692	2,016	2,361
	9.0	1,501	1,818	2,162
	8.5	1,313	1,619	1,959
	8.0	1,134	1,417	1,750

Max clean steam production (lbs/hr), with feedwater at 68 °F:		Clean steam pressure/psi g		
		65.3	58.0	50.8
CSG-HS - 020	145.0	485	559	643
	137.8	441	515	598
	130.5	396	471	551
	123.3	350	424	504
	116.0	303	376	456
CSG-HS - 055	145.0	1285	1,492	1,736
	137.8	1170	1,368	1,602
	130.5	1058	1,248	1,468
	123.3	940	1,127	1,336
	116.0	815	1,006	1,208
CSG-HS - 125	145.0	2,849	3,341	3,587
	137.8	2,581	3,052	3,285
	130.5	2,302	2,764	3,285
	123.3	2,051	2,483	2,977
	116.0	1,814	2,195	2,673
CSG-HS - 180	145.0	4,153	4,872	5,603
	137.8	3,731	4,445	5,206
	130.5	3,309	4,009	4,767
	123.3	2,894	3,569	4,319
	116.0	2,500	3,124	3,858

**Dimensions approximate in mm and weights kg of a standard unit**

	Dimensions					Weights		
	L Length	W Width	H Height	E Clearance for tube bundle extraction	xxx Clearance height for de-aerator extraction	Empty	In operation	Maximum
<b>CSG-HS 020</b>	2000	850	1850	1250	485	730	830	980
<b>CSG-HS 055</b>	2350	850	1850	1300	520	940	1140	1340
<b>CSG-HS 125</b>	2450	1450	2060	1600	630	1300	1650	1900
<b>CSG-HS 180</b>	2950	1450	2065	2000	630	1550	2050	2450

**Dimensions approximate in mm and weights kg with preheater**

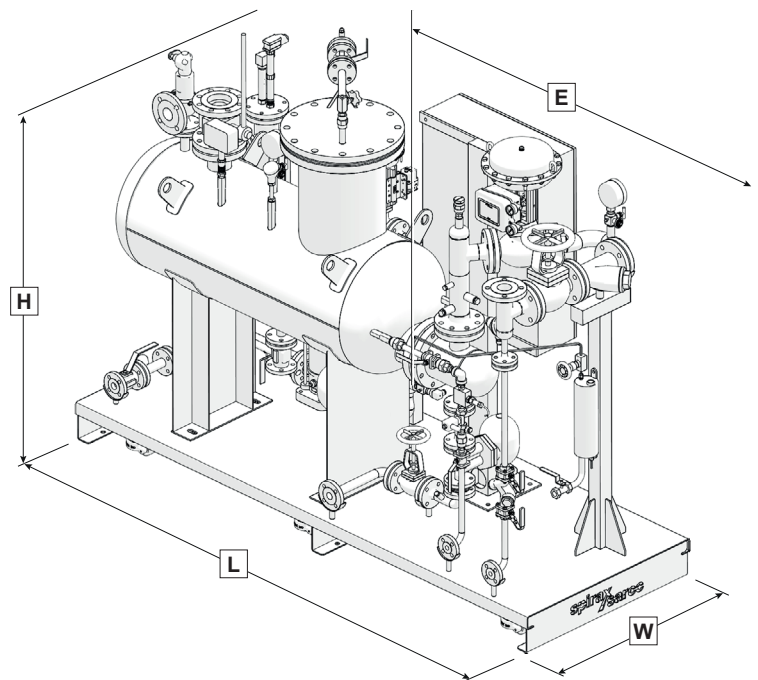
	Dimensions					Weights		
	L Length	W Width	H Height	E Clearance for tube bundle extraction	xxx Clearance height for de-aerator extraction	Empty	In operation	Maximum
<b>CSG-HS 020</b>	2300	850	1850	1250	485	780	850	1030
<b>CSG-HS 055</b>	2650	850	1850	1300	520	960	1160	1360
<b>CSG-HS 125</b>	2450	1450	2060	1600	630	1300	1650	1900
<b>CSG-HS 180</b>	2950	1450	2065	2000	630	1550	2050	2450

**Dimensions and weights of the units with EENV option - insulation 100 mm**

	Dimensions					Weights		
	L Length	W Width	H Height	E Clearance for tube bundle extraction	xxx Clearance height for de-aerator extraction	Empty	In operation	Maximum
<b>CSG-HS 020</b>	2500	950	1975	1250	485	920	1000	1200
<b>CSG-HS 055</b>	2750	1100	2050	1300	520	1090	1300	1500
<b>CSG-HS 125</b>	2550	1450	2200	1600	630	1520	1850	2100
<b>CSG-HS 180</b>	3100	1500	2240	2000	630	1700	2150	2500

Indicated dimensions are the maximum dimensions for a specific configuration of the package.

For detailed dimensions of the unit, size and position of the connections, clearance for the tube bundle extraction, weights and other constructive information, refer to the specific general arrangement drawing of the product.



**For dimensions and weights in inches and lbs, please go the next page**

## Dimensions approximate in inches and weights lbs of a standard unit

	Dimensions					Weights		
	L Length	W Width	H Height	E Clearance for tube bundle extraction	xxx Clearance height for de-aerator extraction	Empty	In operation	Maximum
<b>CSG-HS 020</b>	79	33	73	49	19	1610	1830	2161
<b>CSG-HS 055</b>	93	33	73	51	20	2073	2514	2955
<b>CSG-HS 125</b>	96	57	81	63	25	2867	3638	4190
<b>CSG-HS 180</b>	116	57	81	79	25	3418	4520	5402

## Dimensions approximate in inches and weights lbs with preheater

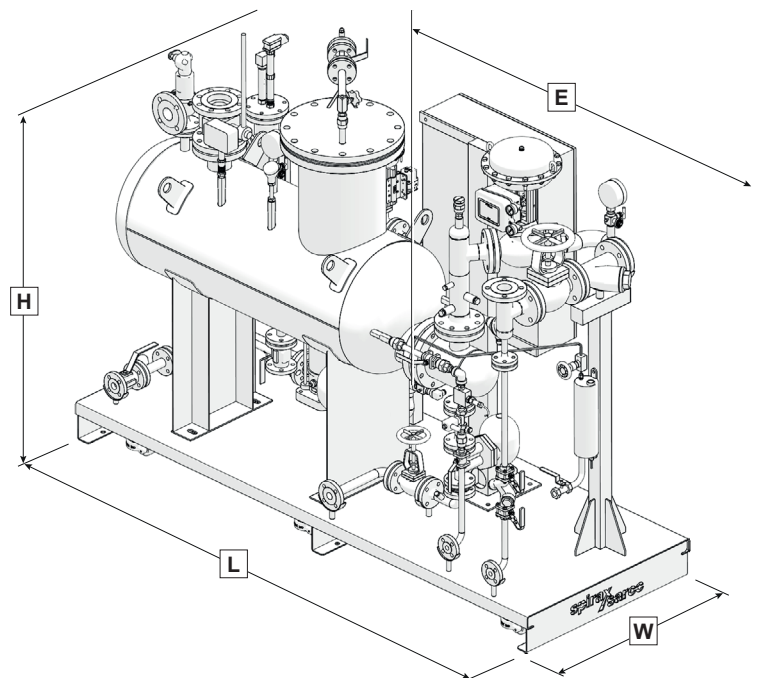
	Dimensions					Weights		
	L Length	W Width	H Height	E Clearance for tube bundle extraction	xxx Clearance height for de-aerator extraction	Empty	In operation	Maximum
<b>CSG-HS 020</b>	91	33	73	49	19	1720	1874	2271
<b>CSG-HS 055</b>	104	33	73	51	20	2117	2558	2999
<b>CSG-HS 125</b>	96	57	81	63	25	2867	3638	4190
<b>CSG-HS 180</b>	116	57	81	79	25	3418	4520	5402

## Dimensions and weights of the units with EENV option - insulation 100 mm

	Dimensions					Weights		
	L Length	W Width	H Height	E Clearance for tube bundle extraction	xxx Clearance height for de-aerator extraction	Empty	In operation	Maximum
<b>CSG-HS 020</b>	98	37	78	49	19	2029	2205	2646
<b>CSG-HS 055</b>	108	43	81	51	20	2403	2867	3308
<b>CSG-HS 125</b>	100	57	87	63	25	3352	4079	4631
<b>CSG-HS 180</b>	122	59	88	79	25	3749	4741	5513

Indicated dimensions are the maximum dimensions for a specific configuration of the package.

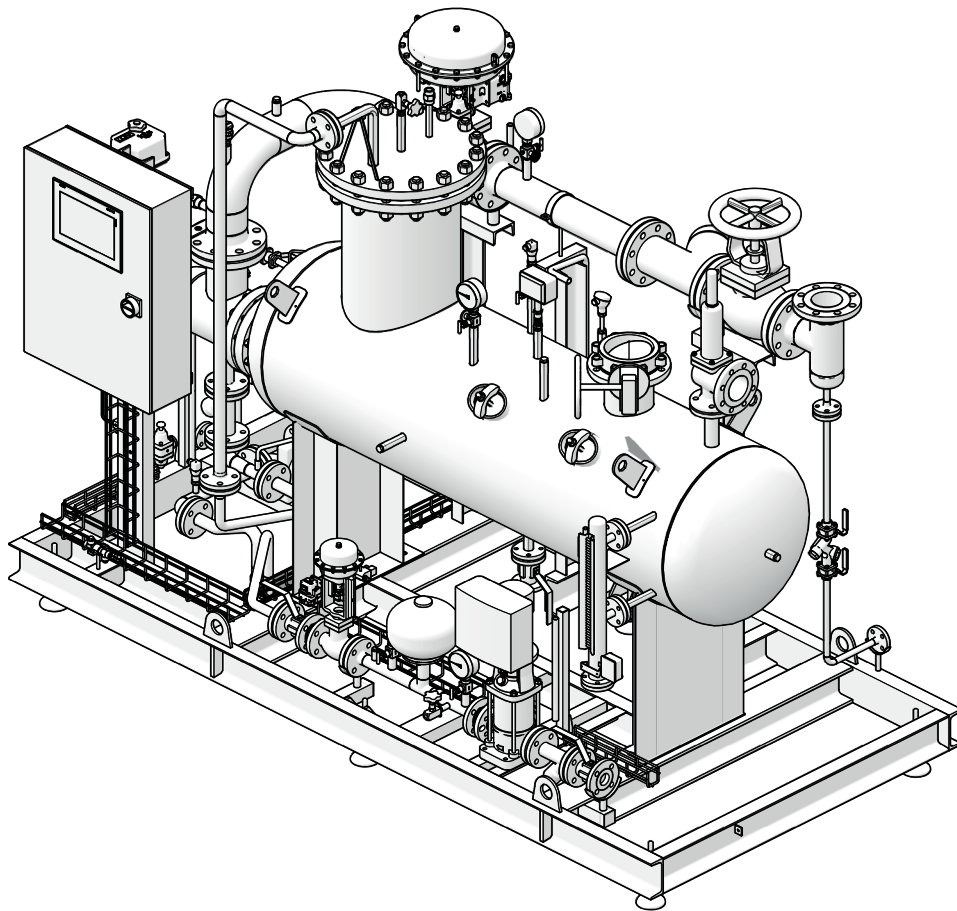
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**For dimensions and weights  
in mm and kg,  
please go the previous page**

## Connections

	Metric				Imperial			
	020	055	125	180	020	055	125	180
Plant steam inlet connection	DN32 PN25	DN50 PN25	DN80 PN25	DN100 PN25	1¼" ANSI 150	2" ANSI 150	3" ANSI 150	4" ANSI 150
Condensate outlet connection	DN25 PN40	DN25 PN40	DN40 PN40	DN40 PN40	1" ANSI 300	1" ANSI 300	1½" ANSI 300	1½" ANSI 300
Clean steam outlet connection	DN50 PN40	DN80 PN40	DN125 PN16	DN150 PN16	2" ANSI 300	3" ANSI 300	5" ANSI 300	6" ANSI 300
Feedwater inlet connection	DN15 PN40	DN20 PN40	DN25 PN40	DN32 PN40	½" ANSI 300	¾" ANSI 300	1" ANSI 300	1¼" ANSI 300
Safety valve discharge	1" G-f	DN50 PN16	DN80 PN16	DN80 PN16	1" NPT	1¼" NPT*	3" NPT	3" NPT
Not condensable vent connection	¼" G-f	¼" G-f	¼" G-f	¼" G-f	¼" NPT	½" NPT	¾" NPT	1" NPT
Drain connection	DN25 PN40	DN25 PN40	DN25 PN40	DN25 PN40	1" ANSI 300	¾" ANSI 300	1" ANSI 300	1" ANSI 300
Plant steam condensate drain connection	DN15 PN40	DN15 PN40	DN15 PN40	DN15 PN40	½" ANSI 150	½" ANSI 150	½" ANSI 150	½" ANSI 150
TDS Blowdown connection	DN15 PN40	DN15 PN40	DN15 PN40	DN15 PN40	½" ANSI 150	½" ANSI 150	½" ANSI 150	½" ANSI 150
Sampling system (cooling water in/ out - sample out)	½" BSP - 6 mm	½" BSP - 6 mm	½" BSP - 6 mm	½" BSP - 6 mm	½" BSP	½" BSP	½" BSP	½" BSP
<b>Options</b>								



## Product nomenclature and selection guide

The product nomenclature is based on the characteristics of the main elements and options, identified as follows:

Basic configuration	
<b>Design code</b>	E EN
	A ASME
	G GB
	J JBA
<b>Shell type</b>	F Flanged openable
<b>Unit size:</b>	020 Up to 200 kg/h (441 lbs/hr) (at the reference operating conditions ^)
	055 Up to 550 kg/h (1212 lbs/hr)
	125 Up to 1250 kg/h (2756 lbs/hr)
	180 Up to 1800 kg/h (3968 lbs/hr)
<b>Valve actuation type:</b>	PN Pneumatic (fail-safe)
	EL Electric (fail-safe)
<b>Control:</b>	P1 ABB AC500 series + 7" display
	P2 Allen-Bradley CompactLogix 1700 series + 7" display
	P3 Siemens S7.1200 series + 7" display
<b>Communication interface:</b>	C0 None
	C1 BACnet IP
	C2 Profinet
	C3 Modbus TCP/IP
	C4 BACnet MSTP
	C5 Profibus
	C6 Modbus RTU
	C7 BACnet (BTL cert.) IP
C8 BACnet (BTL cert.) MSTP	
<b>Unit frame/Electrical cabinet:</b>	0 Base and cabinet made of carbon steel, painted
	1 Open frame and cabinet made of carbon steel, painted
	2 Frame w. side panels and cabinet made of carb. steel, painted
	3 Base and cabinet made of stainless steel (304)
	4 Open frame and cabinet made of stainless steel (304)
	5 Frame with side panels and cabinet made of stainless steel (304)
<b>Control Panel location</b>	S Side
	F Front
<b>Insulation: (aluminium cladding if carbon steel frame and electrical cabinet is selected, stainless steel 304 if stainless steel 304 frame and electrical cabinet is selected)</b>	1 Steam generator body only
	2 Steam generator and hot piping
	3 Insulation to EEnv specification
	0 Not insulated
<b>Handling wheels and feet:</b>	N None (only plates with anchor holes are provided)
	F Adjustable feet
	W Pivoting wheels, lockable, with feet

Product nomenclature and selection guide continued on next page



## Product nomenclature and selection guide (continued)

<b>Plant steam inlet shut-off valve:</b>	M	Manual stop valve	
	AE	Automatic isolation valve	electrical
<b>Plant steam line trapping:</b>	N	None	
	T	Plant steam line trapping station	
<b>TDS control system:</b>	1	Timed TDS blowdown	
	2	TDS control with external probe (discontinuous metering)	
	3	TDS control system w. internal probe (continuous metering)	
<b>Sampling cooler</b>	N	None	
	S	Sample-cooler and sampling valve	
<b>Feedwater pressurisation system:</b>	N	None (water P > clean steam P + 0,5 bar g)	
	P	Pump with VFD	
<b>Independent downstream plant protection</b>	N	None	
	L	Self-monitoring low level probe LP30 (available only with LP20)	
	T	Temperature limiter	
<b>Feedwater pre-heating:</b>	N	None	
	PR	Feed water pre-heating by heat recovery from primary condensate	
<b>Intelligent diagnostics</b>	N	None	
	I1	System diagnostics	
	I3	Integrity test	
	I4	System diagnostics + Integrity test	
<b>Clean steam outlet shut-off valve:</b>	N	None	
	M	Manual stop valve	
	AE	Automatic stop valve	electrical
<b>Test and certifications:</b>	S	EU PED test and CE marking of the assembly	
	U	ASME U stamp	
	M	MOM compliance	
	K	KGS compliance	
	D	DOSH compliance	
	GC	GB standard in Chinese language	
	GE	GB standard in English language	
	SF	None (as assembly)	
<b>Level indicator:</b>	V	Viscorol (Magnetic Level Indicator)	
	L	LP20 (Capacitance Level Probe)	

### Product nomenclature example

CSG-HS E F 020 - PN P3 C1 - 1 F 2 F - AE T - 3 S P L N I7 - AE S L

Not all configurations are available in every country. Please contact your local Spirax Sarco representative for more details.