

spirax sarco

m-CSG

TI-P486-20
TES Issue 3

Ultra-compact Clean Steam Generation System

Description

The m-CSG series of indirect mini clean steam generators are very compact units, designed to produce up to 300/600 kg/h (at nominal operating conditions) of clean steam, using plant steam as primary medium. The units are supplied ready for installation into the application.

Versions and applications:

Size:	300	Unit for the nominal production of 300 kg/h*
	600	Unit for the nominal production of 600 kg/h*
Versions / Applications:	H	"Health": humidification (AHU), sterilization of containers, generic use of clean steam.
	F	"Food&Beverage" - EC 1935/2004 Compliant: direct steam injection in food products (e.g. cooking), other applications where it is required the compliance with the EC directive as products intended to come in contact with food.

(*) max steam production at reference operating conditions: primary steam at 9-10 bar g, production at 3 bar g, feed water at 20 °C.

Construction and main features

- System complete, functional and safe
- Ultra-compact design: space saving
- Modulating pressure and level control: pressure stability and steam quality improvement
- Tube-bundle extractable: possible replacement, easy maintenance
- Packaged system, assembled on a metal base, with on board wired control panel: easy installation
- Gaskets on clean steam and water side in PTFE, FDA compliant
- Stop valves on the inlets/outlets of the fluids: possible partial or total system isolation (e.g. for maintenance)
- Strainers upstream: to protect the control valves, steam traps and other sensitive equipment from possible damage caused by impurities that drag from the fluids
- Heating ramp: to avoid material stress during start-up from cold
- System supplied properly insulated
- Engineered, built and tested by Spirax Sarco Italy, according to the following European Union Directives:
 - 2014/68/EU (PED)
 - 2006/42/EC (Machinery)
 - 2014/35/EU (LVD)
 - 2014/30/EU (EMC)
- Unit classified as ASSEMBLY, supplied with a nameplate bearing the  mark and comes complete with EC Declaration of Conformity.
- Spirax Sarco's worldwide service.



Design conditions

Plant steam side (primary)	Design pressure (PS):	12.8 bar g
	Design temperature (TS):	194.4 °C
Clean steam side	Design pressure (PS):	8 bar g
	Design temperature (TS):	194.4 °C
	Safety valve setting:	6 bar g
Feedwater side	Design pressure (PS):	8 bar g
	Design temperature (TS):	110 °C

For a bespoke design, contact Spirax Sarco

Maximum operating conditions

Production	Clean saturated steam, up to 5 bar g at 159 °C	
Primary side	Plant steam, up to 12 bar g / 191.7 °C	
Feedwater	Unit without pump	Unit with pump
	P min ≥ P clean steam + 0.5 bar g	Net positive suction head required (refer to IM-P486-21)
	Pmax 8 bar g / Tmax 110 °C	

Minimum ambient temperature : 0 °C

Designed for indoor installation only, protect from freezing.

Utilities

	Unit without pump	Unit with pump 50 Hz	Unit with pump 60 Hz
Electrical supply (cabinets)	1 x 230 V +N 50/60 Hz 0.4 kW (instr.)	3 x 400 V +N 50 Hz 0.8 kW (instr.)	3 x 380 V +N 60 Hz 0.8 kW (instr.)
Air supply (filters)	Minimum 3 bar g to maximum 15 bar g (only for the unit with pneumatic actuators)		

Performance of the units

Max clean steam production (kg/h), with feedwater at 20 °C:

300		Clean steam production pressure (bar g)				
		5	4	3	2	1
Plant steam pressure (bar g)	12	260	300/330	320/430	N/A	N/A
	10	180	250	320/330	320/420	N/A
	8	100	160	240	320/340	290
	6	-	75	140	230	290
	4	-	-	-	120	210

Max productions refer to clean generator clean, without blowdowns.

The double flowrate (Q1/Q2) means respectively with supply water at +0.5/1.0 bar g than the pressure of the steam generated.

600		Clean steam production pressure (bar g)				
		5	4	3	2	1
Plant steam pressure (bar g)	12	490/540	500/660	500/700	N/A	N/A
	10	490	500/660	500/700	470/730	N/A
	8	270	440	500/600	470/730	510/650
	6	-	200	380	470/520	510/650
	4	-	-	-	310	430

For the units equipped with pump, consider the production Q2.

N/A = not recommended operating condition, it is necessary to reduce the primary steam pressure.