TECHNIP FRANCE

Brie Comte Robert, le 21 juin 2012

N/ Réf. : PC / MG 183 / 2012

Offre : 7551 / 2512

Objet : 2 Générateurs vapeur SFO 75.1
Conditionnés en conteneur

Sir,

We are pleased to send you our best proposal for the supply of two CLAYTON Type SFO 75.1 steam generators with their options and accessories packaged in containers.

Due to its design, the CLAYTON steam generator will bring you many advantages:

❖ Reduction of energy costs:
• Quick start: less than 5 minutes from the cold state for generators <1500 KW
• Instantaneous reaction in hot operation
• High yields guaranteed on PCI ranging from 85 to 88% whatever the load of the generator (between 20 and 100%)
• Very high dynamic output thanks to the combination of low water volume and fast load variation.
❖ High quality steam:
• Priming rate less than 0.5% on average and 1% maximum during the sudden surge.

- Water and energy saving:

  Very low de-concentration rate (less than 2.5% without return of condensate and with standard water treatment without demineralization).

- Reduction in installation costs:
  Small footprint - low weight.

- Reduction of operating costs:
  Fully automatic generator including start and stop phases (optional).
  Reduced maintenance, no disassembly during regulatory inspections. No need for control or commissioning authorization. Control of 18 months by competent staff, without a notified body; PV <6000 bl - Annex 3 to Decree 99-1046 of 13/12/99 and Order of 15/03/2000 Article 5 (3).

Marc GAROSCIO
Directeur

Pièces jointes :

- **Offre commerciale**
- **Plan et schéma**

DESCRIPTION OF EQUIPMENT

SCOPE

We have the pleasure to offer 2 Clayton Steam Generators with ancillary equipment, built together in 2 adapted 20 ft. containers as described in this quotation.
Clayton equipment is designed for long life, low running costs and low maintenance. All equipment is of the highest quality, robust construction suitable for operation in an industrial environment. The main items included in this quotation are the Clayton Steam Generator, Clayton Hotwell *(an atmospheric feed water tank allowing easy integration* into a container with height limited for standard road transport), Chemical Dosing System, Water Softener, Clayton Blowdown Tank, Steam Back Pressure Regulating Valve and Automatic Start System.
The steam generators will operate at 7 to 8 bars and a sream pressure regulating valve will ensure the supply of dry saturated steam at 4 barg.

CLAYTON STEAM GENERATOR

The Clayton Steam Generator is of modular construction, pre-assembled on a baseframe. The standard unit is fitted with our high efficiency gas burner as well as gas and flame safety systems, helical water coil, high efficiency insulated steam separator, control panel and all necessary valves, and instruments.

ADVANTAGES OF THE CLAYTON STEAM GENERATOR

•Every Clayton Steam Generator is fitted with a high efficiency centrifugal steam separator. This provides almost completely dry saturated steam to the process. An additional feature of this separator is that separated water is recovered and returned to the hotwell to be re-used.

•An automatic blowdown is fitted as standard. This removes impurities in the water which would otherwise be passed down the line into the steam main and steam using equipment.

•The Clayton Steam Generator is mounted on support legs which ensures a free flow of air underneath. This avoids the possibility of heat transfer to the floor.

•The burner is bottom mounted on all Clayton Steam Generators for easy access.

•The high fuel to steam heat transfer characteristics of the Clayton Steam Generator results in lower energy costs which saves on fuel bills.

•Water level controls are not required and there is no possibility of a steam explosion from a Clayton Steam Generator.

•The Clayton Steam Generator does not require daily checks of water level controls. And a separate boiler house is not required.

•Clayton Steam Generator has a very rapid start up time and responses rapidly to changes in steam demand.

•The small size of the Clayton Steam Generator means that it can be fitted into a limited space.

CLAYTON STEAM GENERATOR SYSTEM

2 Steam generator type SF-75-1 O

Each steam generator:

Net heat output		:	735	kW
Net steam production in kg/h at 7 barg and from 98°C feed water temperature		:	1 093	kg/h
Design pressure		:	10	bar
Operating steam pressure		:	7	bar
Electrical tension		:	3 x 400 V - 50 Hz	
Electrical power	- pump	:	3,00	kW
	- blower	:	5,50	kW
Water content	- filled	:	148	l
	- in operation	:	49	l

Combustion efficiency @ feedwater of 98 °C measured at lower heating value of the fuel

	load at	100 %	50%	
-	light oil firing	: 88,0	90,0	without economizer

Fuel consumption at full load - Light oil : 83,1 l/h — LHV light oil: 42 700 kJ/kg; density L.O.: 0,847 kg/l

Burner regulation : step (0 - 50 - 100 %)

Overall dimensions of the steam generator :

light oil fired unit	- length	:	1 713	mm	
	- width	:	1 100	mm	without Clayton feed water pump (on separate
	- height	:	2 159	mm	frame for containerization)
	- shipping weight	:	1 050	kg	

- The generator's heating surface consists of a single, continuous coil tube, designed in such a way to achieve full counterflow. Velocity of water and steam is controlled through a progressive increase in the size of the coil tube. The high velocity, both on the gas and the steam/water side combined with the counterlow principle, ensures the highest possible transfer and efficiency.

The combustion chamber is water cooled to minimise radiation losses.

The heating coil, the steam/water separator, the combustion chamber, the burner and blower and the control panel are completely mounted on a frame and tested in our factory. The unit is executed for INDOOR installation.

PRICE steam generator: ***33 810 € x 2 = 67 620 €***