

## BONO FIRE-TUBE STEAM BOILERS



### Cannon Bono Energia S.p.A.

Via Resistenza 12  
20068 Peschiera Borromeo (Mi) | Italy  
Phone +39 | 02 55302848

[salesbonoenergia@cannon.com](mailto:salesbonoenergia@cannon.com)

 Cannon Bono Energia | [www.cannonbonoenergia.com](http://www.cannonbonoenergia.com)

 Cannon Bono Energia

Since 1958, Cannon Bono Energia is dedicated to the design, manufacturing, installation and maintenance of industrial boilers for standard and special applications.

Fire tube steam generators are the most widespread technology for the heating of all industrial processes which require steam intensively. Cannon Bono Energia's products are characterized by a high operational reliability - even without supervision by a licensed operator - great flexibility of use and a very high energy efficiency.

Cannon Bono Energia, with over 60 years of experience in the field and more than 10.000 installations, offers four high performance series of fire tube steam generators: FT, SM, SG and HE.

The maintenance of such performances during the entire lifecycle of the boilers is also guaranteed by the efficient aftersales service provided by the company.

Cannon Bono Energia's expertise in plants construction also makes it a reliable partner for revamping interventions on existing boilers.



The steam generators are manufactured in two locations: Peschiera Borromeo (Milan) and Netro (Biella), both located in Italy, which account for more than 31.000 square meters of total surface.

Bono's steam generators are designed and manufactured in accordance with European pressure equipment directive (2014/68/EU) and are, moreover, adaptable to specific international calculation codes to allow export to countries outside of Europe.

**Cannon Bono Energia's quality and HSE management systems are certified by TÜV Süd according to ISO 9001, OHSAS 18001 and ISO 14001 standards.**



Bono Energia is part of the Cannon Group, which provides dedicated industrial solutions to the energy, water treatment, plastics, composites materials and automation industries. The Group is present worldwide with 21 venues and agents in over 40 Countries.

## Fire-tube steam boilers series FT

FT series fire-tube steam generators are an efficient, compact and reliable solution for steam production, available in different configurations, from 1 to 6 tons/h, with pressure ranging from 12 to 15 barg.

### FEATURES

- > Guaranteed efficiency up to 95%.
- > Wide combustion chamber.
- > Lower flue gas temperatures in the combustion chamber compared to reversed flame boilers.
- > Reduced emission levels.
- > Possibility to install accessories in order to improve efficiency, reduce emissions, increase the level of automation and exempt from licensed operators continuous supervision for 24/72h.



FT TECHNICAL FEATURES	Unit	FT 100	FT 200	FT 300	FT 400	FT 500	FT 600
Steam production	kg/h	1000	2000	3000	4000	5000	6000
Design Pressure	bar	12 ÷ 15					
Thermal efficiency	%	90÷95					
NOx emissions	mg/Nm <sup>3</sup>	80* - 150					
Length	mm	3900	4500	4900	5500	6100	6600
Height	mm	1950	2300	2500	2600	2800	2900
Width	mm	1850	2000	2150	2200	2300	2500

\*Lower emission levels on demand

### COMPETITIVE ADVANTAGES

- > Low investment cost.
- > Low maintenance cost.
- > Short delivery time.
- > Minimal on site installation and start-up activities.
- > Ease of access to boiler's internal parts with consequent reduced inspection, maintenance and cleaning time.



## Fire-tube steam boilers series SM/SG

SG series fire-tube steam generators represent the ideal solution for reducing electrical consumption, increase the degree of safety of the plant - also in case of unsupervised operation - and comply with new emission regulation, using simple, yet reliable electronics.

Highly customizable solution for steam production from 1 to 30 tons/h, this series of steam generators is characterized by a complete shielding of the inversion chamber with a water tube enclosure, which, compared to other types of boilers, ensures a fast access to the flue gas inversion chamber and a complete visibility of the tubes, tubesheet and combustion chamber. The advantages of this series stem from its design, with large heated surfaces and combustion chamber, as well as high turbulence of the flue gas flow, which ensure high thermal efficiency and low emissions.

### FEATURES

- > Tubes expanded and welded to the tube-sheet protecting the tubes from any aggressive delayed combustion.
- > Tubesheets with ledges to guarantee maximum quality of welding between sheet and tubes.
- > Complete absence of refractory material and connecting rods on the shielding to avoid stress on the tubesheet.
- > Wide combustion chamber guaranteeing low thermal load and reduced emissions.
- > Available design for saturated and superheated steam, as well as hot water production.

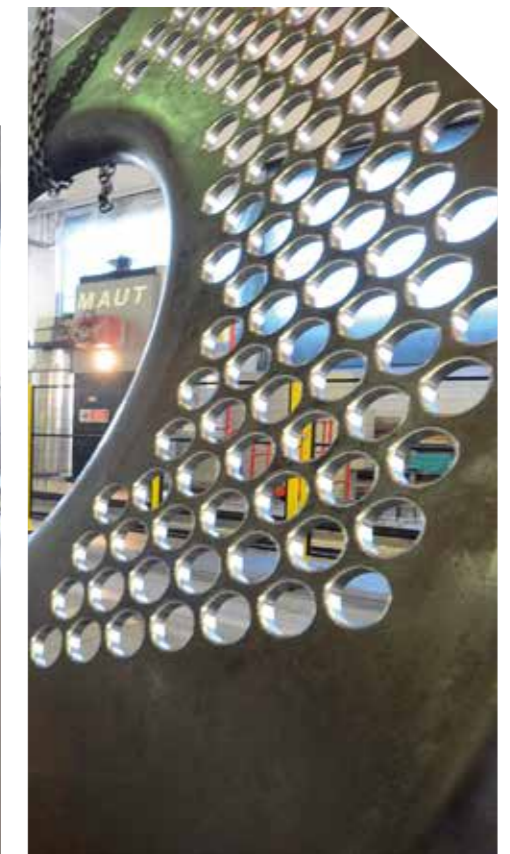


SM/SG TECHNICAL FEATURES	Unità	SM 100	SM 200	SM 300	SM 400	SM 500	SG 600	SG 800	SG 1000	SG 1200	SG 1500	SG 2000	SG 2200	SG 2500	SG 3000	
Steam production	kg/h	1000	2000	3000	4000	5000	6000	8000	10000	12000	14000/15000	20000	22000	25000	30000	
Design pressure	bar	12 ÷ 25														
Thermal efficiency	%	90 ÷ 97,5*														
NOx emissions	mg/Nm <sup>3</sup>	60** - 130														
Length	mm	4300	4800	6000	6300	6400	7400	7950	8350	8900	9400	10300	11000	12000	13000	
Width	mm	2000	2000	2350	2350	2550	3250	3250	3600	3600	3750	3750	3900	4000	4500	
Height	mm	1800	1800	2100	2100	2300	2900	2900	3250	3300	3550	3800	3800	3800	3900	

\* For HE Smart configuration \*\* Lower levels on demand

### COMPETITIVE ADVANTAGES

- > Ease of access to the internal parts of the boiler, furnace, tubesheet and flue gas inversion chamber.
- > Heat exchange optimization.
- > High thermal efficiency up to 96%.
- > Low NOx emission level, under 80 mg/Nm<sup>3</sup>, achieved through an optimized combustion and the employment of low-NOx burners specifically design for the steam generators.
- > Integrated electronic control system for dynamic management and control of the boiler, guaranteeing maximum safety and improved performances even in case of unattended operation for 24/72h.
- > Opportunity to interconnect with smart factory.
- > Possibility to exempt from supervision for 24/72h.
- > Turnkey solutions.



## HE Smart steam generators

HE Smart package is designed to minimize electrical and fuel consumption at every operating load, through the smart and flexible operation of an extensive heat recovery system as well as the electrical components. At the core of HE Smart is the OptiSpark automation system, completed with a wide array of metering devices for the optimal setting of the inverters and heat exchangers. Moreover, the HE Smart equipment allows the safe unattended operation of the boiler for 24/72h, bringing further advantage in terms of OPEX, besides the fuel and power savings.



### FEATURES

- > Thermal efficiency guaranteed up to 97,5%.
- > Smart management of process parameters thanks to OptiSpark automation system.
- > Reduced NOx and CO<sub>2</sub> emissions.
- > High efficiency for various applications, even with feed water temperatures as high as 150°C.
- > Consistent fuel and power savings.
- > Reduced OPEX costs.
- > Internet connection for remote control and monitoring.
- > Optimized combustion through the employment of burners specifically designed for BONO's boilers.
- > Available for saturated and superheated steam, as well as superheated water production.



## BONO OptiSpark

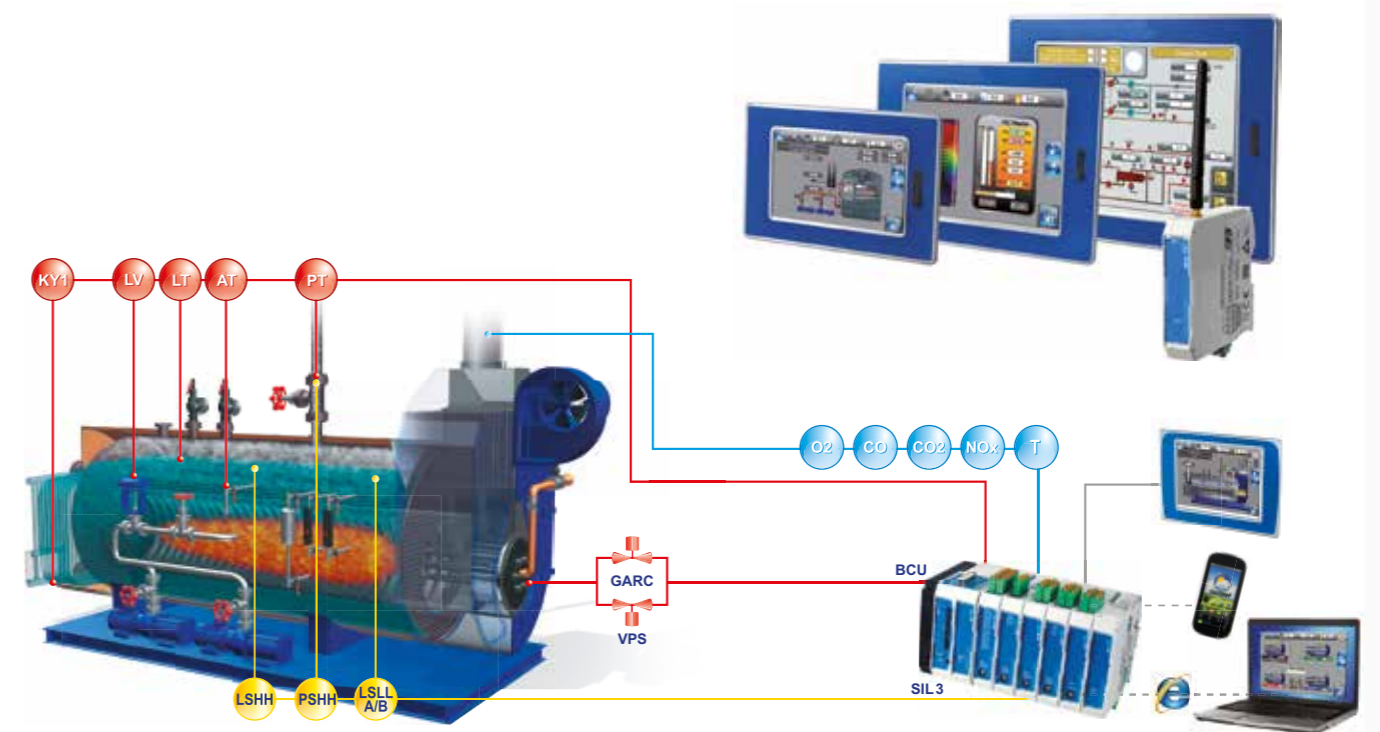
OptiSpark is a complete hardware and software package that Cannon Bono Energia offers as proprietary solution for boiler automation. Specifically studied and implemented for the fire-tube boilers, OptiSpark system has been developed integrating the features of the most various applications where Bono boilers are involved. OptiSpark's reliability and flexibility are proven by more than twenty years of installations on Bono boilers as well as on revamping of existing plants.



The adoption of OptiSpark comes with a series of advantages to the client:

- > Integration of the boiler control and burner management systems (BCS and BMS).
- > Boiler safety and efficiency during start-up, stand-by and rapid load change.
- > Load Sharing in multiple boiler systems.
- > Multiple-fuel management.
- > Graphic HMI for operator.
- > Internet and LAN communications for remote control and monitoring.

Always focusing on innovation and development, OptiSpark is an ongoing project and constantly improving. Updated to the most recent trends in the industrial sector, today's OptiSpark is at the base of interconnection between boilers and Smart Factories for Industry 4.0 implementation. The system is suitable for interconnecting with all the other machines within the factory in order to coordinate with the different applications and production processes, contributing to increase the production planning ability for continuous efficiency improvement.



## Measuring type combustion control

Cannon Bono Energia offers the possibility to choose the fully metered combustion control of fire-tube boilers, which allows a dynamic boiler management through measurement of all relevant combustion variables. The fully metered boiler performs a continuous and punctual combustion control through SIL compliant PLCs of primary brands on the market, ensuring the maximum flame quality and stability with changing ambient conditions or rapid load variations.



## Burners for non-conventional fuels

Cannon Bono Energia has always been involved in research and development of combustion heads and innovative burners implemented on the specific Bono boiler features. Cannon Bono Energia know-how in combustion, nowadays mainly focused on Low-NOx burners, also allows to offer specific solutions to employ special fuels or process residues, such as:

- > Crude oil.
- > Vegetable or animal fuel oil.
- > Flue gases from industrial processes, such as methanol, biogas, syngas and hydrogen.



## Superheated steam boilers

Cannon Bono Energia fire-tube range includes the superheated steam SG series, to be employed in plants with a wide steam distribution network or to sustain processes which require high steam temperature and dryness. The superheater is integrated in the boiler, in a package configuration, and is managed by the boiler's automation system.



## Services

Cannon Bono Energia is at the client's side during the whole boiler life cycle, offering a wide range of services aimed at ensuring the investment effectiveness and long duration of products.

Cannon Bono Energia proposes a wide range of services:

- > Installation.
- > Training.
- > Revamping to conform with current norms in term of security and emission levels to improve operational performances of the machines.
- > Commissioning and start-up.
- > Scheduled maintenance.
- > Remote online assistance.
- > Predictive maintenance.
- > Original spare parts.

