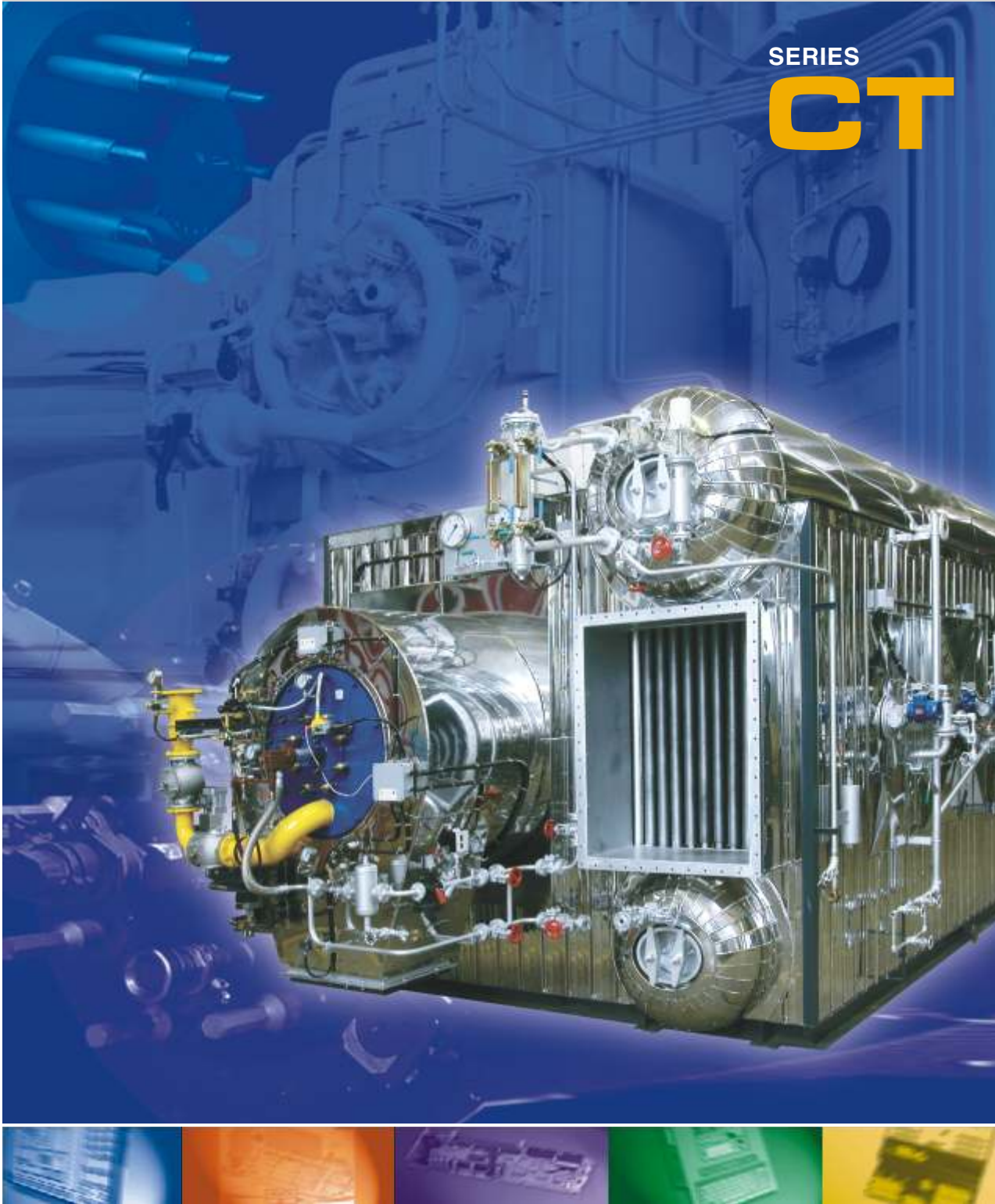


CLAJTUB

WATER TUBE STEAM GENERATORS

SERIES

CT



Cannon
BONO ENERGIA

CLAJTUB water tube type steam generators are the result of over 40 years experience of BONO ENERGIA in the industrial, petrochemical and power generation application. Engineered using the most advanced CAD systems, these generators guarantee the highest operating features thanks to the BONO experience on heat transfer, welding technology and pressure vessel calculations. The production, made in Peschiera Borromeo facilities, is based on ISO 9001-2000 quality standards with inspection plans for material, production process and final test. A certified documentation is released to the customers together with installation, operating and maintenance manuals.



CT 20 t/h in package configuration



CT Ultra Low Nox application with "reach gas" fuel from chemical process

water tube steam generators



CT 30 t/h for chemical process application

CLAJTUB		
Sizes & Models	Configuration	Fuels
From 8 t/h to 60 t/h	Package	Natural Gas Fuel Oil Refinery Gas
From 60 t/h to 150 t/h	Site Created	Lean Gas Reach Gas Coke Oven Gas Process Gas
Design pressure up to 80 bar Design superheated steam temperature up to 480° C		



CT 70 t/h for refinery application



water tube steam generators

Boiler structure

CLAJTUB series water tube steam generators represent a modern concept of "D" shaped design having two overmounted drums, expanded vertical tubes and full water walls type furnace. The water circulation inside the boiler is of the natural type.

Flue gas tightness is realized on the external walls by means of longitudinally finned tubes.

The burner is housed inside the front water wall by means of properly shaped water tubes.

External walls and drums are insulated by means of high density rock wool panels, covered by stainless steel lagging, water tight for outdoor installation, anchored to the supporting structure and easy to disassemble.



CT typical pressure vessel design

Heat recovery units

Boiler efficiency is becoming today more and more important for the boilers operation.

BONO provides a wide and dedicated range of economizers (bare or finned tubes type) to ensure the highest boiler performance (94+95% efficiency on Low Heating Value) even with different available fuels.



CT 20 t/h auxiliary boiler for power generation



Economizer during site erection



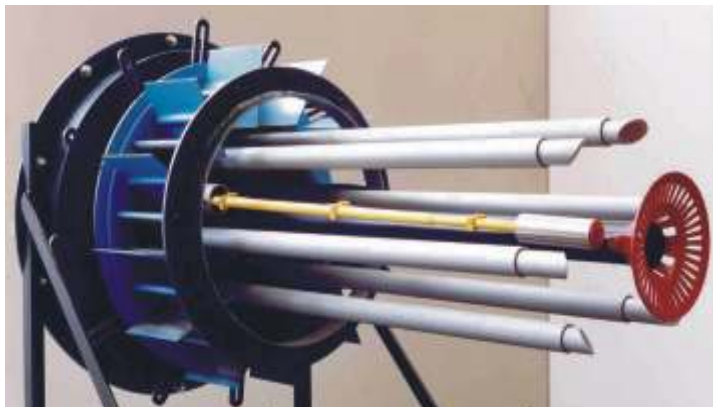
CT steam drum under machining

Combustion plant - Burner

The combustion is fully automated; boilers are fitted with Venturi type, high efficiency, axial flow type burner, able to work with low air excess.

Low NOx burners are usually mounted while ultra-low NOx burners can be installed upon request (25 ppm NOx at 3% O₂) with double or triple air register. Movable and externally adjustable gas spuds are basic features of BONO Energia's CICLONOX or primary brand burners suppliers.

Fuel oil atomisation is obtained by means of compressed air, low pressure steam (wide modulation range) or by mechanical atomisation. BONO experience in combustion includes natural gas, refinery gas (H₂ reach), coke oven gas and "lean gas" coming from the process.



Low NOx BONO CICLONOX burner

Regulation system

Combustion regulation is lead lag/measuring type where fuel flowrate and relevant air combustion are taken into account, in order to realize precise proportion between air and fuel with low air excess in the whole modulation range.

CLAJTUB boilers are managed by control panel fitted with PLC acting on air and fuels flow, O₂ continuous adjusting system and acting on characterizing curve with primary measuring elements.

Level regulation, electronic type 1-2 or 3 elements is complete with transmitters, regulators, calibrated flange and regulating valves.

Superheated steam temperature regulation (if any) is realized with 1 or 2 elements control system with mid and final regulator.

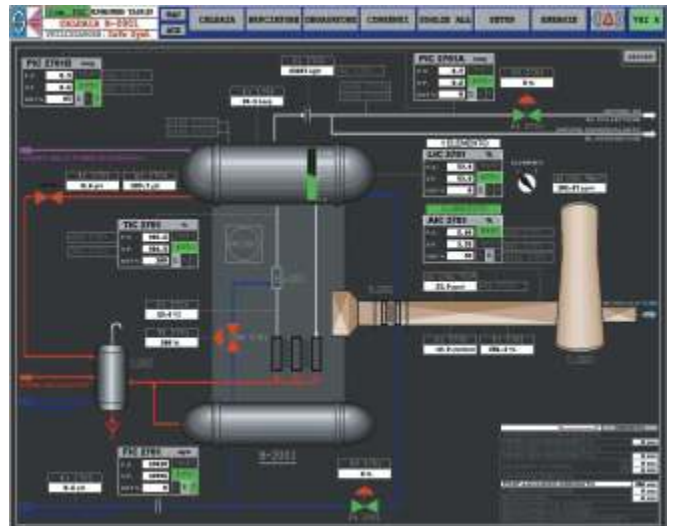
Surface desuperheaters are foreseen for specific technical needs.

The centralized control panel, including a Human Machine Interface unit (HMI) visualizing all the equipment and instrumentation, allows supervision, monitoring and control of boiler operation parameters, including other elements of the boiler room.

The centralization of the operations is obtained by PLC, acquiring signals from the field with remote set point and operation. This system detects - in real time - the generator's working conditions in power station, pressure and temperature data, type of fuel in use, flue gases analysis, thermal output, actual flowrates and totalization of various parameters.

De-aerators, dosing stations, pumps and other auxiliary equipment can be controlled and operated from the main control panel.

Different configurations are available according to specific client requirements.



Human Machine Interface (HMI) for CT boiler control



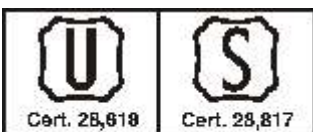
CT "turn-key" thermal power installation 140 t/h for refinery application

BONO competence : complete thermal power stations

BONO ENERGIA is able to design, plan, erect and start-up complete power stations, even having a combined production of thermal and electric power. In cooperation with the sister Companies BONO SISTEMI and BONO ARTES, all belonging to the Cannon Group, it is able to supply water treatment and conditioning plants for each type of boiler, including total demineralisation plants and physical thermal de-aerators. BONO's experience in this field is witnessed by hundreds of projects successfully completed in the last 40 years and a list of the most significant projects is available upon request. Primary power generation utilities, chemical and petrochemical companies benefit from BONO's experience for the successful completion of power plants constructions.



CT "turn-key" installation for chemical application



Company Authorized to Use the indicated ASME Symbols



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