

HOT WATER HEATERS



CTH
SERIES



Cannon
BONO ENERGIA

Hot Water Heaters

CTH Series

HIGH TEMPERATURE HOT WATER HEATERS

BONO ENERGIA new CTH Hot Water Heaters are designed for thermal capacity ranging from 5 to 60MWt with hot water outlet temperature up to 260°C and total operating pressure up to 65 bar. Up to 30MWt, thanks to its innovative design, CTH heaters are delivered as complete package solution

APPLICATIONS

Through the years, BONO ENERGIA CTH Hot water heaters have found their main application within district heating and industrial processes where hot water (less than 120°C) was required. Within these application CTH offered a complete and reliable solution for all required process needs.

In the last years, BONO ENERGIA CTH have found further applications where high process water temperature in conjunction with high pressure and flexibility are required, such as pharmaceutical and chemical process, power plant start up equipment etc.

For these applications the precise temperature control, high hot water circuit pressurisation and fast thermal response are required.

Thanks to its compact multi-tubular water tube structure, CTH achieve all the process requirements allowing for a simple installation circuit and granting heater **overall efficiency higher than 94%** based on L.H.V.



CTH EVOLUTION

Having more than 35 years of experience in manufacturing industrial thermal fluid heaters, BONO ENERGIA knowledge of hot water process is unique:

1960: Supply of the first hot oil heater based on a multi-tubular water tube structure;

1970: Supply the first hot oil package unit having more than 13 MW capacity;

1982: Installation of the first hot water heater based on multi-tubular water tube structure;

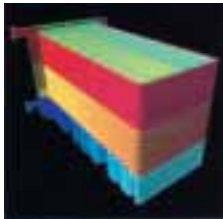
2000: Supply of a 20MW hot water boiler for one of the biggest world wide pharmaceutical company;

2002: CTH has been delivered to one of the biggest world wide electrical utilities company.

At present, BONO ENERGIA multi-tubular thermal heaters are world-wide installed (more than 2,000 units) also thanks to an efficient and distributed after sales network through the Cannon organization consisting in more than 30 locations all over the world.

World Wide Certifications

BONO ENERGIA Heaters have been technically approved from most important International certification companies (ASME, APAVE, ASIT, SOLO (Chinese) etc.). This, in conjunction with BONO ENERGIA standards for auxiliary and control system, ensures the highest now a day quality and reliability for this kind of equipments



- CTH heaters are based on a multi tubular water tube structure with direct flame heating.
- This structure allows compact heater design, easy access to internal parts, complete heater deniability.
- The innovative water circulation within tubes of combustion chamber and convection section has been studied to avoid internal steaming and circulations "dead zones" without the aid of supplementary circulation device



GENERAL SOLUTIONS

The CTH is an innovative fully screened hot water heater giving several advantages versus shell type design or steam water tube boilers with intermediate hot water condensation exchanger.

The CTH design is identical to the one used for hot oil heaters where severe conditions have to be matched. CTH are the right answer for a modern hot water plant with cost efficiency for installation from 5 to 60 MWt. CTH has a compact design also for heaters having a thermal power higher of 30 MWt where steam boilers are required; for this power requirement CTH grants a simplified plant solution with a reduced number of auxiliary components. This aspect has a benefit aspect on overall maintenance and LCC plant cost. Over 30MWt a field erection of the heater is required; the CTH pressure parts will be delivered in only two sections reducing the local assembly costs and material handling. CTH has a complete and full accessibility for cleaning and maintenance. There is no need of heavy external lifting structures for repairing due to the complete internal access through proper inspection doors and screened tube design.



CTH MAIN TECHNICAL ITEMS

Large furnace (water tube screened)

CTH furnace is suitable for high capacities up to 60 MW with high efficiency radiation heat exchange. The furnace dimensions allows easy matching of the most stringent emissions NOx level. External heater walls reach max 20-30 °C above ambient temperature.

Reduced refractory materials

Small presence of refractory reduces the thermal lag of the heaters, thus increases heater flexibility.

Convection section made of banks of horizontal counter current flow tubes

Built in air pre heater vertical tube type built into the front part of the heater

This structure is built into the heater as a package unit arrangement. Highly efficient heat exchanger between flue gas and combustion air. Reduced temperature of the flue gases at the stack outlet (higher thermal efficiency).

Low quantity of water content

High water temperature outlet response for high transient applications.

Multi tubular heater structure with welded distribution headers

High elasticity of the tube structure (structure expansions are completely absorbed); the front headers allows the free expansion of the whole tube structure. The CTH heaters design allow the full drainability of the heater.



■ Combustion chamber and convection section tubes are pre formed through automatic bending machines as warranty of quality production matching most international codes and standards



■ Complete quality control of all manufacturing phases and high-specialised personnel assure the highest operation reliability of CTH reducing overall plant maintenance costs.



Hot Water Heaters CTH series



Innovative integrated control system powers new CTH series.

Optispark, the fourth generation heater control system developed by Automata (BONO ENERGIA sister Company specialized in dedicated hardware and software production) is the answer to the needs of an integrated control developed conjunctly by boilers and new technologies specialists.

Optispark is the "technological core" of the CTH heaters and is based on two separate sections:

Integrated control. The integrated controller manages all those control functions that where before separated between different controls like regulators, electro-mechanical positioner, O2 controllers and boiler alarms.

Man Machine Interface (MMI). Through an animated synoptic-video and touch screen all the information necessary to the plant operation (burner's ignition sequence, process variables status and set points) are transferred to the operator in a simple and aggregated form.

Optispark provides the control functions for both CTH heaters and process variables such as water outlet/inlet temperature, three way valves positioning, flow rates, differential pressures, which are directly displayed on the synoptic video. Alarm and shutdown are signalled by the system, by means of an ISA sequence with first-out and shutdown priority.

Moreover Optispark provides the optimisation of the heater efficiency and combustion through the most sophisticated control systems like:

- Combustion regulation through electronical positioner
- Continuous regulation of O2
- Flue gas re-circulation system control
- Forced draft fan control through variable speed electrical driver

Man machine interface offers several services like:

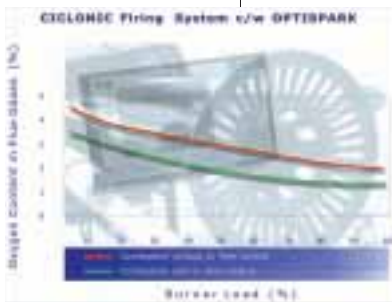
- Synoptic-video with Multilanguage text
- High resolution colour graphics
- Real time variable trends with related history
- Alarm historic acquisition

Benefit offered by OPTISPARK

- New integrated technology system.
- Due to integrated solution offers equivalent performances of normal DCS with lower costs.
- Combustion optimisation with environmental benefit.
- Reduces fuel consumption.
- Verifies and display in continuous mode the combustion parameters.
- Reduces start up and maintenance scheduling.
- Deletes hysteresis and settings of traditional combustion control systems.
- Integrates all control functions allowing an easy operation of the heater.
- Allows data transmission to remote control.
- Guarantees always-safe operation of the heater implementing availability with consequent cost saving.
- Optispark is opened to all new communication systems like SMS and email alarm transmission, Intranet and Internet, supervision with OPC server, interface with most common field bus (Modbus, Profibus, CAN).



By using a touch screen, easy calls into a library routine allows the visualisation of relevant information of the plant operation and programmed maintenance operations (alarm list, technical data of equipment, heater and Optispark operating instructions, etc.).



BONO ENERGIA TOTAL WARRANTY

The CTH hot water heaters are supplied complete with burner, regulation equipment based on an innovative integrated control system, instruments, built in pre-heater, safeties and accessories in transportable package execution up to 30MWt thanks to its original compact design.

Generally the CTH package is ready to be connected to the external network due to the fact that when possible blank tests and "fire tests" are carried out in BONO ENERGIA's workshop before shipment ensuring a very quick and efficient site commissioning and start up.

Specialised after sales service technicians, located all over the world, can easily approach and solve any kind of problem related to the operation of the BONO ENERGIA's CTH packages.

The know-how available from BONO ENERGIA is the result of more 35 years' experience in boilers and heaters engineering and construction.

BONO ENERGIA supplies integrated engineering service for complete definition of process as complement of CTH package units.

Stress analysis for fluid lines, complete and detailed information, documentation for all auxiliary equipment related to the packages will be supplied thanks to the presence of skilled specialists dedicated to this field of activity.



CTH: When hot water versatility is a must

Industrial boilers, heaters, engineering and cogeneration

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BONO ENERGIA

BONO ENERGIA is the unit in the CANNON group that designs and builds steam boilers, diathermic fluid heaters and co-generation equipment for industrial uses. A multinational group based in Italy, CANNON is the market leader in the production of Polyurethane and plastic processing machines. Since the late 1980's it has broadened its sphere of activity to include such fields as energy, ecology and industrial electronics. At the dawn of the new millennium the group's overall turnover exceeded 340 million Euro and boasted a customer base of close to 15,000 companies.

BONO ENERGIA is one of the major Italian manufacturers of industrial boilers. It has been trading for 40 years and has gained solid experience in the thermal industry. Its qualified technical staff and its three highly automated production plants are driven to provide customers with innovative and technologically advanced solutions. The synergies within the group contribute to the consistent improvement of existing technologies and the development of new ones as shown by the integration of electronic control systems and advanced combustion technologies.