



WHB / GXC HEAT RECOVERY BOILERS



HEAT RECOVERY BOILERS

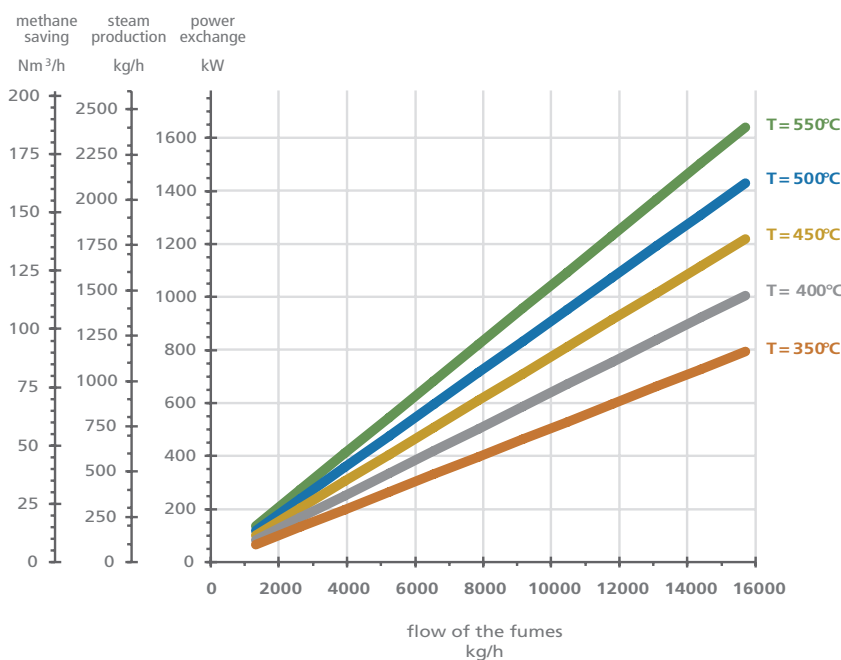
Heat recovery boilers are thermal machines that employ the heat of exhaust gases to produce hot water, superheated water or steam. Traditional recovery boilers do not have a furnace, as the water inside them is not heated up with a burner, but just with the heat of fumes conveyed in them. This process allows most of the thermal energy to be recovered that was, before, dissipated in the furnace. This places recovery boilers among the most advanced tools to increase the energy efficiency of a system.

ICI Caldaie's heat recovery boilers are made with a design called "fire-tube" boilers. In this kind of boiler, the fumes pass through a bundle of tubes immersed in a volume of water in the boiler's body. As they pass through the bundle of tubes, the fumes transfer heat to the water and have cooled down when they come out from the chimney. At the same time, thanks to the heat absorbed, the water temperature increases until it turns into steam, based on the application required.

BENEFITS

Installing recovery boilers allows for considerable benefits:

- greater energy efficiency of the plants;
- lower amount of fuel used;
- lower running costs;
- lower CO₂ emissions;
- being awarded white certificates;
- equipment quickly pays back for itself;
- high profitability of the investment.



Equivalent fuel saved as a function of temperature and flow of the fumes. NOTE: Temperatures Smoke out of the fireplace assumed 240 °C

FIELDS OF APPLICATION

The exhaust gases that can be used in recovery boilers may come from:

INDUSTRIAL PROCESSES

- furnaces;
- post-combustion chambers;
- incinerators;
- industrial processes with fumes at high temperatures.

ENERGY PRODUCTION PLANTS

- turbogas plants

COGENERATORS

- diesel engines;
- gas and biogas engines;
- vegetable oil motors.

BIOMASS PLANTS

WHB



The only thermal source of the WHB series heat recovery boilers are hot recovery fumes with no additional combustion. These are entirely automatic single-block boilers equipped with all the accessories to ensure a quick activation. The WHB series features great flexibility in terms of design and use.

The boilers are custom-made on a case-by-case basis to meet any specific requirement in terms of use. The efficiency of the WHB heat recovery boilers can be further increased by 5% if they are fitted with an economiser, an accessory available for any version of the product.

BENEFITS

- modular versions;
 - high water content;
 - assembly and testing conducted at the manufacturer's premises;
 - simple, quick and safe installation;
 - project pressure values up to 25 bar;
 - high operating flexibility;
 - minimum running costs;
 - minimum maintenance costs;
 - easy to access for internal maintenance.
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AVAILABLE VERSIONS

EXHAUST GAS INLET

EXHAUST GAS OUTLET



**WHB single section
1 flue-gas pass**



**WHB single section
2 flue-gas passes**



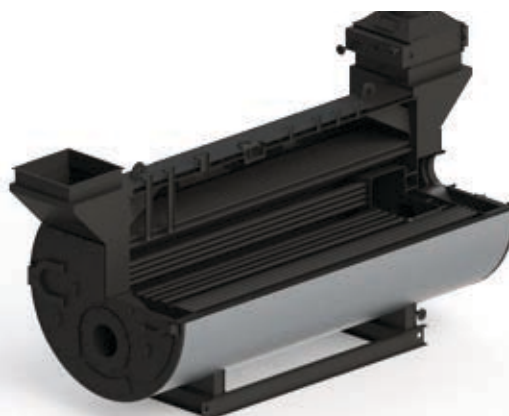
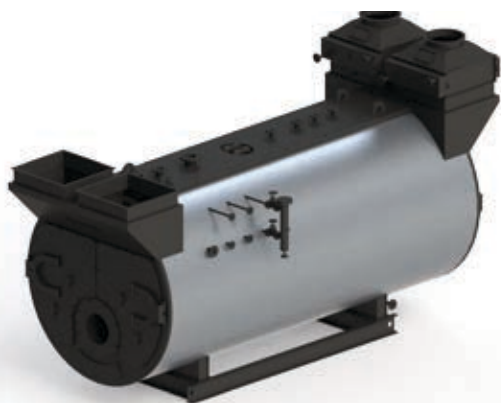
**WHB multiple section
1 flue-gas pass**

If allowed by the production cycle's technical operating parameters, the heat recovery boilers can be fitted with economisers to increase their efficiency.

Available versions:

- black steel: for water return temperatures $> 50^{\circ}\text{C}$, with gas fuel;
- AISI 316 stainless steel: for water return temperatures $< 50^{\circ}\text{C}$, with gas fuel.

GXC



The GXC series heat recovery boilers are innovative generators that combine the generation of steam by combustion with heat recovery from hot fumes from external sources. This “free” source is primary, while combustion can be used as a backup or provide the power required if the recovery fumes are not enough to meet the system’s request for steam. Combustion-based operation features three flue-gas pass with passing flame and wet bottom. The boiler’s body is made with flanged tube plates that replace the more traditional corner

welds to ensure top safety levels and reduce areas with thermal stress. The recovery section is entirely separated from the combustion section, though it is immersed in the same boiler water. The front doors are secured to the boiler’s body with double-jointed hinges, which are used to open and inspect the equipment with no need to remove the boiler. The efficiency of the GXC heat recovery boilers can be further increased by 5% if they are fitted with an economiser, an accessory available for any version of the product.

BENEFITS

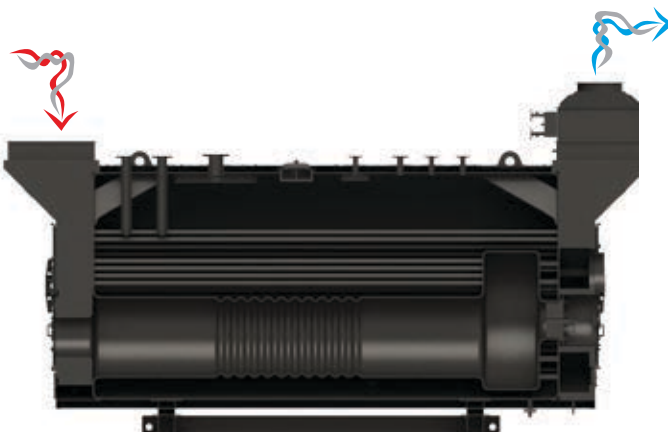
- modular versions;
- high water content;
- compact solution thanks to the integration of two operating principles in a single block;
- assembly and testing conducted at the manufacturer’s premises;
- simple, quick and safe installation;
- project pressure values up to 25 bar;
- flanged tube plates;
- high operating flexibility;
- minimum running costs;
- minimum maintenance costs;
- easy to access for internal maintenance.

AVAILABLE VERSIONS



EXHAUST GAS INLET

EXHAUST GAS OUTLET



**GXC single section
1 flue-gas pass**



**GXC single section
2 flue-gas passes**



**GXC multiple section
1 flue-gas pass**

If allowed by the production cycle's technical operating parameters, the heat-recovery boilers can be fitted with economisers to increase their efficiency.

Available versions:

- black steel: for water return temperatures $> 50^{\circ}\text{C}$, with gas fuel;
- AISI 316 stainless steel: for water return temperatures $< 50^{\circ}\text{C}$, with gas fuel.



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