Alfa Laval Aalborg OC-TCi

Self-cleaning multi-fuel composite boiler

The Alfa Laval Aalborg OC-TCi is a composite boiler that produces steam through fuel combustion and/or exhaust gas waste heat recovery. With its high efficiency and its ability to utilize existing thermal energy, it can reduce environmental impact while providing reliable heating for marine operations. Besides operating on today's fuels, including low-sulphur fuels and LNG, it is designed for compatibility with methanol and other future emission-reducing fuels.

Application

As a steam producer, the Aalborg OC-TCi is mainly used to generate steam for following applications:

- HVAC
- Engine room consumers

In addition, the Aalborg OC-TCi can function as a steam drum for one or more exhaust gas boilers.

On vessels using LNG as fuel, the Aalborg OC-TCi can support boil-off gas (BOG) management. It can safely combust unpressurized BOG that cannot be consumed by the auxiliary engine or genset, and it can handle free flow from the LNG tank if the vessel's compression train should fail. It can even combust the mix of inert gas and methane that arises before and after tank inspection.

Benefits

- Easy operation thanks to straightforward and user-friendly design
- Easy installation and maintenance due to modular construction – fewer components and less weight
- Easy access to the boiler furnace chamber for maintenance and inspection – no dismounting the wind box
- Same steam output no matter which fuel is used
- Positive influence on the vessel's carbon footprint

Design

Compact and easy to install, the Aalborg OC-TCi is delivered with an Aalborg MF PA burner preassembled. Both components are engineered and produced in-house to ensure the highest reliability. The combined burner/boiler unit is designed with fuel flexibility in mind, which makes it a future-proof solution as marine vessels decarbonize.

- *Aalborg OC-TCi boiler*
  A fired section with helix tubes provides more heat transfer area than competing solutions, which results in fuel-saving efficiency. For waste heat recovery, the boiler has 1–3 exhaust gas sections with smoke tubes, allowing it to utilize exhaust gas heat from up to three engines.

- *Aalborg MF PA burner*
  Built with Alfa Laval's innovative MultiFlame (MF) concept, the Aalborg MF PA is a pressure-atomizing burner that supports conventional fuels, gas fuels like LNG and future fuels like methanol. By pre-mixing air and gas, it reduces the production of CO_2, NOx and other emissions.
  Flue gas from the burner is distributed uniformly through the boiler's convection part. This ensures optimal heat transfer, which lowers thermal stress inside the boiler and limits the need for boiler body repair.

Working principle

In the boiler's fired section, ignition and combustion take place in a furnace. The produced heat is transferred from the flame to the furnace shell, mainly through radiation. As they leave the furnace, the flue gases enter vertical uptakes where the heat is transferred to helix tubes, mainly through convection.

In the boiler's exhaust gas section(s), heat from the engine exhaust gas is transferred to the boiler's water side through convection.

On the water side, the transfer of heat through the furnace shell or through the walls of helix and smoke tubes evaporates the adjacent saturated water. This causes steam bubbles to form. Because the steam bubbles have a much lower specific density than the water, they rise rapidly into the steam space, where the water and steam are separated.

Alfa Laval Touch Control

The Aalborg OC-TCi is simple for crews to operate thanks to Alfa Laval Touch Control. Alfa Laval Touch Control is the modern control standard, providing the best in clarity and ease of use. It offers:

- Intuitive two-touch navigation, familiar from other Alfa Laval marine products
- Support for connectivity and remote troubleshooting
- Future-proof expansion possibilities

Robust and PLC-based, the Alfa Laval Touch Control system is produced in-house. For operation on LNG or methanol, it can be hardwired to the gas detection system.

Self-cleaning and maintenance

The Aalborg OC-TCi is built for high reliability and a long service life. It is effectively self-cleaning thanks to its TCi (Turbo Clean, intelligent) technology, which ensures consistently efficient operation. If desired, the TCi cleaning process can also be initiated manually.

Maintenance is simplified by the boiler's compact design, as well as by the following:

- Easy access to the furnace chamber
- No oil spillage from the burner during maintenance
- Easy reassembly of the burner parts after maintenance

Technical data (standard application)

Capacity, oil-fired side [kg/h]	1,200–6,500
Capacity, exhaust gas side [kg/h]	300–5,000
Weight (incl. insulation) [kg]	9,000–110,000
Diameter (incl. insulation) [mm]	1,800–4,650
Height (incl. exhaust gas boxes) [mm]	4,500–9,000
Connections	Flanged
Insulation [mm]	75
Maximum inlet temperature [°C]	450
Minimum outlet temperature [°C]	175
Pressure loss [mmWC]	200
Maximum working pressure [bar(g)]	10

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