



# Aalborg XS-TC7A

## Waste heat recovery economizer after auxiliary engines

### Application

To meet environmental legislation that addresses reducing ship fossil fuel emissions and to enhance product performance, Alfa Laval Aalborg offers a broad range of waste heat recovery (WHR) boilers that can easily be incorporated into the design of a new ship or retrofitted to an existing vessel. The WHR product range provides operational savings while improving the environmental profile of the ship and the shipping company.

For decades, Alfa Laval Aalborg has installed WHR systems after the ship main engines. These systems have to a large extent been able to meet the vessels' steam requirements during operation at sea and, for some installations, even been able to contribute to meeting electrical power generation requirements on board. Operating the oil-fired boiler is normally required during manoeuvring and port stays in order to sustain the ship's steam requirements. In order to complement or eliminate this requirement, Alfa Laval Aalborg has developed an energy saving concept by utilising the waste heat from the auxiliary engines.

Stricter environmental legislation and other developments to create a more sustainable shipping industry has challenged engine manufacturers to further develop technologies for reducing fuel oil consumption and improve engine efficiency by reducing exhaust gas flow and temperatures.

As a direct consequence of the reduced exhaust gas flow and lower exhaust gas temperatures, the steam production for some installations has proven insufficient in meeting steam requirements even during sea-going operation. Lowering the fuel oil consumption on the main engine, through increased efficiency therefore results in higher fuel oil consumption of the oil-fired boiler if the entire steam boiler plant remains unchanged.

The waste heat from the auxiliary engines has not been considered in the past; nevertheless it contains a large amount of energy that can be used to supplement ship steam requirements during voyage and especially during port stays.

### Aalborg XS-TC7A from Alfa Laval

Alfa Laval Aalborg XS-TC7A is a compact and efficient waste heat recovery economizer for installation after the auxiliary engines. It optimizes the use of heat from the auxiliary engine



exhaust gases during voyage and port stays. When used in combination with a waste heat recovery system installed after the main engine, the Aalborg XS-TC7A contributes to significant reductions in the oil consumption on the oil-fired boiler under most load conditions.

Unlike the continual operation of the main engine during oceangoing voyages, the operation of the auxiliary engines varies. The Aalborg XS-TC7A, therefore, has been developed as a customized solution focused on generating energy under varying load conditions. To ensure the most advantageous design, the Aalborg XS-TC7A will be specially tailored to the individual ship and engine design with due consideration to the existing uptake back pressure and other critical factors.

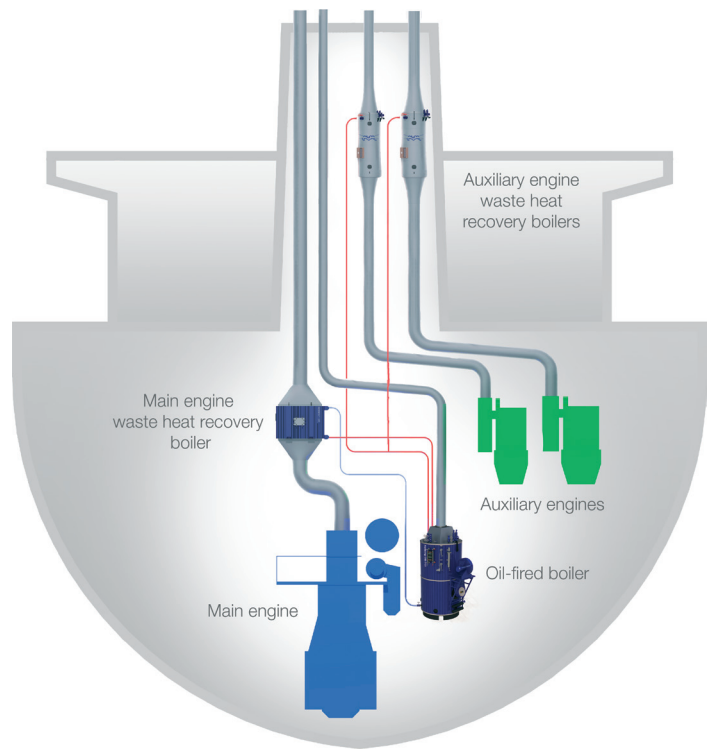
The economizer features an optimized and specialized convection part, which augments heat transfer caused by increased turbulence at the exhaust gas boundary layer. This provides the capability to increase steam production while reducing the weight and footprint of the Aalborg XS-TC7A compared to other WHR systems.

As an option, it is possible to order a version of the Aalborg XS-TC7A economizer that is designed to resist dry-running (within certain parameters) and thereby ensure the continuous operation of the generator engine – even while performing maintenance on the steam system.

Return on investment varies depending on the installation, with payback generally within 12 to 18 months. In some cases, payback can be realized within 6 to 8 months. The actual payback time depends on the number of days the produced steam can be utilized (offset against the steam requirement from the oil-fired boiler) and the redundancy requirements.

### Benefits

Alfa Laval Aalborg offers a highly efficient and reliable concept based on well-proven and innovative solutions to ensure the best operating conditions and optimal return on investment. The design of the heating surface of the WHR boiler has a small footprint and the lowest possible weight to output ratio as a result of enhancement to unique Alfa Laval Aalborg technologies.



EMMA MÆRSK equipped with the Alfa Laval Aalborg XS-TC7A waste heat recovery economizer.

- Able to supply or support the steam demand during port stays
- Enhanced environmental profile with reduced fuel oil consumption
- Cost of steam production (energy) is nearly free
- Short payback time
- Lower emission tax, when ratified
- Lower oil-fired boiler operating costs in terms of fuel
- Reduced oil-fired boiler maintenance
- Potential positive influence on vessel energy efficiency design index (EEDI)



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How to contact Alfa Laval  
 Contact details for all countries are continually updated on our website.  
 Please visit [www.alfalaval.com](http://www.alfalaval.com) access the information.