

Bergen B gas engine projects

Tørring, Denmark



Fact sheet

Located 20km west of the port of Horsens on the east coast of mainland Denmark the Tørring power station, operated by Tørring Kraftvarmeværk A.m.b.A., is the site of the first Bergen B-gas engine.



This well-established operator with nearly a decade's experience of relying on a Rolls-Royce product – the smaller bergen K-gas engine – needed more power to meet growing demand without the expense of expanding its single-engine facility. A close relationship with the management at the utility ensured they knew of Bergen's work on concepts for a big new engine that would meet its needs both in terms of power output and timescale.

Today they have 20 per cent more demand from consumers compared with when the Tørring plant opened and are now also subject to stringent requirements regarding emissions. Upgrading the older K-engine to meet these latest standards and the demand for output would have been impossible.

The 850-square-metre Tørring plant supplies enough heat and power to meet the needs of 900 separate customers. This includes commercial and domestic users and public authorities' facilities such as schools. The electrical power is fed to Vestbirk Oplands high-voltage plant for distribution while the heat recovered

from power generation through cooling water, charge air and the exhaust is used for district heating.

The Bergen B-gas B35:40-V12 AG spark ignited, lean-burn gas engine at Tørring is the result of careful development and is based on the highly successful 'B' type diesel. It was assembled early 2003, factory tested during summer and delivered to the plant in August. The new Tørring plant commenced operation in October 2003.

Operation principle

To have flexibility between the heat production and the consumption two accumulation tanks of 1100m³ in total are installed to store the heat produced during electrical production. At night the engines are stopped and

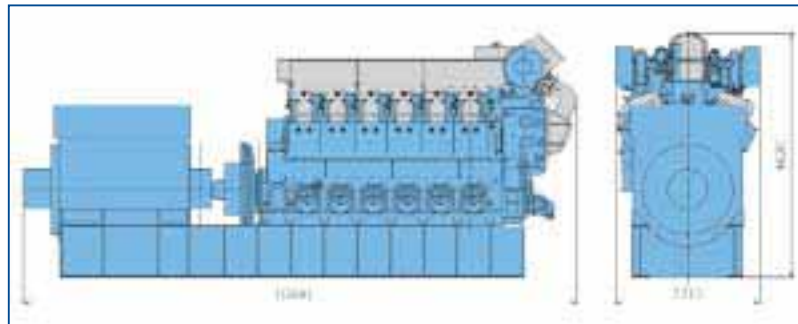
the accumulated hot water is supplied to the consumers. Gas boilers are installed and can be used during peak demand situations and as a backup for the engines.

Project description

The old engine has been removed and a new foundation block built to accommodate the height of the B-gas engine.

The exterior of the building has been extended to contain a bigger exhaust system including catalyst technology to convert not only CO but also formaldehyde (a project in cooperation with Danish environmental authorities).

The new plant is expected to operate approximately 4300 hours per year.



Technical specification

Engine type	B35:40-V12 AG
The plant is designed for the following performance (measured data without corrections)	
Electrical Output with cosphi 0,96	5100 kW*
BMEP	18,2 bar
Fuel consumption	11300 kW**
Electrical efficiency	45,1%
Recovered heat	
Lube oil	535 kW
Jacket water	700 kW
Charge air	840 kW
Exhaust	3060 kW
Generator	190 kW

Total efficiency of the plant above 90 per cent

* With ambient temperature between 5-35 °C

** With combustion parameters set to meet Danish emission regulations



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