Fact Sheet

Rolls-Royce

Bergen K gas engine projects

Dhaka, Bangladesh

Fact Sheet

Project description

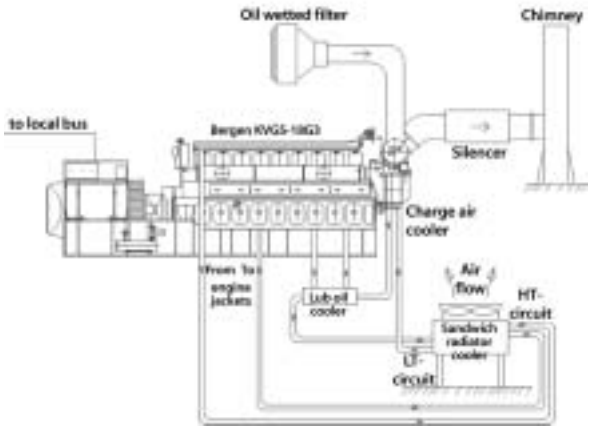
Located close to Keraniganj in the Dhaka district of Bangladesh two Bergen gas engine provides reliable energy to the power plant owned by Global Heavy Chemicals Ltd.

Global Heavy Chemicals produces sodium hydroxide 35tpd and as bi-product hydro chloric (HCl) acid. The new chemical factory produces all the HCl acid Global Capsules Ltd. need in production of hard gelatine capsules for pharmaceutical formulation products as well as fulfilling the total demand of HCl by steel industries in Bangladesh. Since electricity is one of the main inputs in the production of these chemicals, low cost of electricity will be critical to the end-product cost of GHCL.

Global Heavy Chemicals chose to invest in their own power plant since this will give more reliable power and half the electricity cost compared to buying from the grid.

The power plant is designed with two Bergen KVGS-18G3 lean-burn gas engines with an electrical output of 6.6MW. The chemical plant is fully dependent on this power supply and demands the highest reliability and availability.

The maximum load of the chemical plant is about 6MW, and not being connected to the grid, the power plant will have to take big reactive step loads when the electrolysis process is started. The engines and auxiliary systems were specially designed to handle these step loads and staying within a deviation of +/- 5 per cent on frequency and +/- 15 per cent on voltage.



Each spark-ignited engine drives an 11kV/4165 kVA alternator and operates on natural gas. The auxiliary systems includes oil wetted filters for combustion air and heavy duty radiators due to the harsh environment of this chemical plant. Bergen supply also includes exhaust silencers, start and control air systems, cooling water expansion tanks, pumps, alternator protection panels, MCC panels, synchronising panel, 24VDC panel and SCADA system for plant operation.

The lean-burn principle is unique in its combination of high power and high efficiency with low exhaust emissions. Normally these features are incompatible, but the Bergen lean-burn gas engine achieve all three by an advanced control system, which ensures controlled combustion and homogenious lean mixture of gas and air.

Technical specifications

Engine	2 x KVGS-18G3
Shaft power	2 x 3465kW
Electrical power (pf>0,8)	2 x 3330kW
Gas consumption	
(0% tolerance at 35°C)	2 x 822Nm³/h
Energy consumption	
(0% tolerance at 35°C)	2 x 8220kW
Electrical efficiency	
(0% tolerance at 35°C)	40.5%

Design criteria

Max return water temperature	
to LT circuit	50°C
Ambient temperature	40°C
Generator voltage	11kV
Step load with two gas engines	400kW to 6000kW in 30 sec
Step load, frequency deviation	max +/- 5%
Step load, voltage deviation	max +/- 15%
Lower heating value of the	
fuel gas	36 MJ/Nm³
Methane number according	
to AVL	min 70
Exhaust gas emissions, NOx	850 mg/Nm³ at 5% O2

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ER125-02/03-2M