



# 4.6 MW Marine Gas Turbine

GE's 4.6 MW aeroderivative marine gas turbine is derived from GE's CF34 turbofan engines that are currently in use in many commercial aircraft applications. This gas turbine is basically a CF34 engine without its fan and is very similar in materials and design to GE's industry-leading 25.1 MW aeroderivative marine gas turbine. The 4.6 MW marine gas turbine is a simple-cycle, two-shaft gas turbine with an aerodynamically coupled power turbine. It incorporates a variable stator compressor driven by an air-cooled, two-stage turbine. It incorporates the latest in proven design technology and corrosion-resistant materials to provide a mature design with maximum reliability and component life. Ideally suited for marine applications requiring light weight and fuel economy, this engine offers the highest efficiency of any gas turbine in its output class.

The 4.6 MW marine gas turbine's single shaft gas generator consists of a 14-stage, 14.5:1 pressure ratio high-pressure (HP) compressor with variable inlet guide vanes and variable stator vanes in the first five stages, a machined ring (annular) combustor with 18 externally mounted fuel injectors and an air-cooled two-stage HP turbine. The aerodynamically coupled power turbine on the second shaft has four stages. The output shaft to which the load is connected is on the air inlet end of the engine.

This gas turbine is designed for long life in a marine environment using corrosion-resistant materials. It has built-in borescope ports and a water wash manifold for compressor cleaning. The low-speed shaft, with no differential bearings, provides for front end drive. It is built for fast start-up, good stall margin and flexibility of control over a wide speed and power range. The two-stage, air-cooled HP turbine permits high turbine inlet temperatures for high efficiency with long hot section parts life. GE provides a lube oil, ignition, and starting system along with a digital engine control system. The 4.6 MW marine gas turbine is designed with a split casing for ease of maintenance. The gas turbine, mounted on a marine base, as shown at the right below, is 144 inches (3.66 meters) long, 65 inches (1.65 meters) high and weighs 6,173 pounds (2,779 kilograms) including the inlet air collector and the exhaust gas plenum. The inlet duct flow area is 12 square feet (1.12 square meter) and the exhaust duct flow area is 7 square feet (.65 square meter).

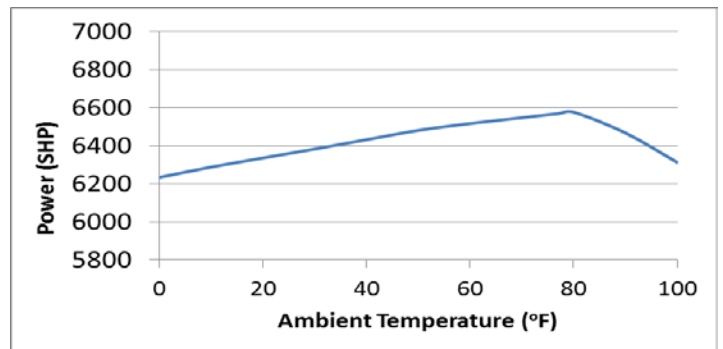
## Performance

Output	6,130 shp (4,570 kW)
SFC	.443 lb/shp-hr (270 g/kW-hr)
Heat rate	8,140 Btu/shp-hr 10,916 Btu/kW-hr 11,520 kJ/kW-hr
Exhaust gas flow	35.9 lb/sec (16.3 kg/sec)
Exhaust gas temperature	1,049°F (565°C)
Power turbine speed	7000 rpm

Average performance, 60 Hertz, 59°F (15°C), sea level, 60% relative humidity, no inlet/exhaust losses

## Max Power vs. Ambient Temperature

losses: inlet/exhaust 4/6 inches (10/15 centimeters) water



4.6 MW marine gas turbine on marine base

# 4.6 MW Marine Gas Turbine

## 4.6 MW Marine Gas Turbine Genset

The 4.6 MW marine gas turbine coupled with an electric generator, offers customers a proven performance record and high reliability in both marine and industrial applications.

### Dimensions\*

Base plate width	93 in (2.36 m)
Base plate length	281 in (7.14 m)
Enclosure height	94 in (2.39 m)
Base plate weight	60,000 lb (27,273 kg)
Duct flow areas	
Inlet	12 ft <sup>2</sup> (1.12 m <sup>2</sup> )
Exhaust	7 ft <sup>2</sup> (0.65 m <sup>2</sup> )

\* Exact dimensions, weight and performance vary with the specific generator selected.

### Performance

Output	4,200 kW
Heat rate	11,603 Btu/kW-hr

Average performance, 60 Hertz, 59°F (15°C), sea level, 60% relative humidity, 4 inches (10 centimeters) water inlet loss, 6 inches (15 centimeters) water exhaust loss

### Specific Qualifications

GE's 4.6 MW marine gas turbines power TurboJET's Foilcat fast ferries that have been operating since 1991, linking Hong Kong to Macau. This gas turbine has been granted type approval by ABS.

