



42 and 52 MW Marine Gas Turbines

The 42 MW and 52 MW marine gas turbines offer simple-cycle, two-shaft performance derived from GE's CF6-80C2 high-bypass turbofan aircraft engine. Taking advantage of the CF6-80C2 low-pressure system's normal operating speed of 3600 rpm, the 42 MW marine gas turbine couples loads directly to the low-pressure turbine shaft. This feature allows the commonality of the CF6-80C2 and the 42 MW gas turbine to be maintained. The results are low-cost, field-proven parts for the 42 MW gas turbine. The 52 MW model operates at 3930 rpm and has the advantage of much higher output. The low-pressure compressor features independently controlled variable inlet guide vanes and variable stator vanes to modulate airflow, ensuring fast, easy startup/shutdown – even under partial loads. The high-pressure compressor is mated to an efficient annular combustor for maximum fuel economy. Incorporation of advanced airflow and cooling technologies helps both models have unprecedented parts life, and provide reliable and efficient power, low fuel consumption, and low NO_x, carbon monoxide, and unburned hydrocarbon emissions, which is critical for marine applications.

These gas turbine's power comes directly from the low-pressure rotor shaft. There is no free-spinning power turbine. Eliminating the free power turbine allows for greater flexibility in ship design and better use of variable space.

These gas turbines weigh only 17,336 pounds (7,863 kilograms) which is less than half the weight of other large aeroderivative gas turbines. The entire unit is only 193.5 inches long (4.96 meters), 85 inches wide (2.16 meters) and 81 inches (2.05 meters) high so you can generate more power in less space.

The compact 42 MW and 52 MW gas turbines, with their great environmental and high thermal performance, are ideal gas turbines for consideration in ship propulsion systems' design when high power and high performance are a requirement.

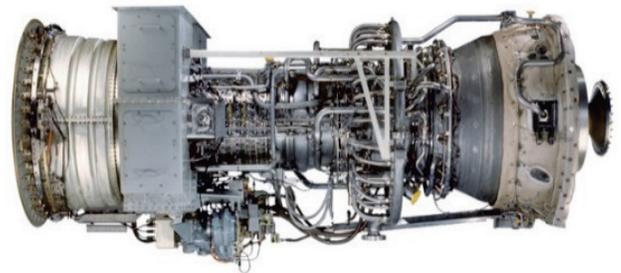
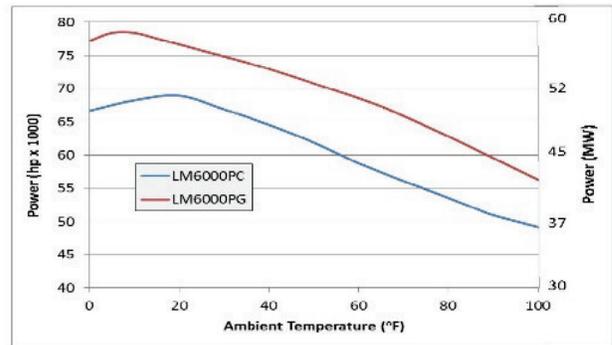
Performance

	<u>PC Model</u>	<u>PG Model</u>
Output		
shp	56,900	70,275
kWs	42,428	52,403
SFC		
lb/shp-hr	.329	.332
g/kW-hr	200.1	201.9
Heat rate		
Btu/shp-hr	6,049	6,117
Btu/kWs-hr	8,119	8,210
kJ/kWs-hr	8,564	8,660
Exhaust gas flow		
lb/sec	273	310
kg/sec	124	141
Exhaust gas temperature	853°F (456°C)	930°F (499°C)
Power turbine speed	3600 rpm	3930 rpm

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

Max Power vs. Ambient Temperature

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



42 MW Gas Turbine

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42 MW and 52 MW Marine Gas Turbine Gensets

The 42 MW or 52 MW marine gas turbine can be coupled with an electric generator making an 42 MW or 52 MW marine gas turbine-generator set. These gensets are ideal for ship applications for which electric drive is the propulsion system of choice.

Dimensions*

Base plate width	169.6 in (4.31 m)
Base plate length	650 in (16.51 m)
Enclosure height	193.3 in (4.91 m)
Base plate weight	302,000 lb (136,985 kg)
Duct flow areas	
Inlet	90 sq ft (8.36 sq m)
Exhaust	57 sq ft (5.3 sq m)

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

Performance*

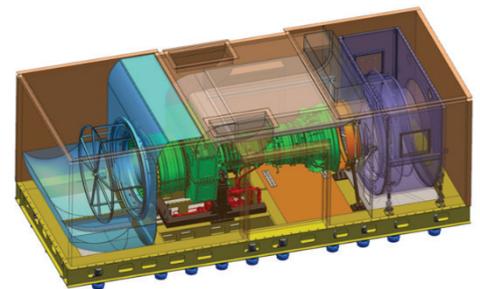
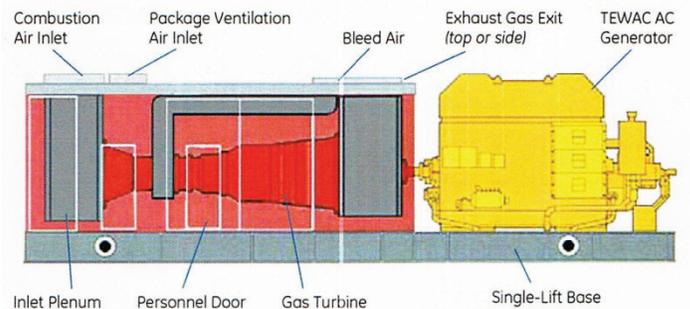
	<u>PC Model</u>	<u>PG Model</u>
Output (kW)	42,428	52,403
Heat rate (Btu/kW-hr)	8,348	8,203
Thermal efficiency	40.8%	41.6%

**Average performance, 60 Hertz, 59°F, sea level, 60% relative humidity, 4 inches water inlet loss, 6 inches water exhaust loss

Specific Qualifications

While the 42 MW and 52 MW gas turbine have not yet been used for ship propulsion, many design studies have been performed showing its viability. More than 1,100 of these units have shipped or are operating in industrial applications, driving electric generators for utility and industrial power generation. At sea, 15 units are used aboard offshore platforms, floating production storage and offloading ships, and power barges, accumulating over 700,000 operating hours. More than 8 million operating hours have been logged on the 42 MW gas turbines, experiencing a fleet-wide reliability greater than 99%.

The 42 MW and 52 MW models have received Lloyd's Register's Design Appraisal Document to the Marine Naval Vessel Rules (NVR). This powerful gas turbine is now available for additional naval marine applications.



42 MW Marine module

