

# SGT-700 Industrial Gas Turbine

Power Generation: (ISO) 31.21 MW(e)

The Siemens SGT-700 industrial gas turbine is a high-performance gas turbine with excellent environmental compatibility. It combines the reliability and robustness of an industrial design with the high efficiency and low emission levels of the latest turbine technology.

The SGT-700 gas turbine package represents reliable, clean and efficient power generation equipment characterized by low Life Cycle Cost, compact plant and short delivery time.

The SGT-700 is a standardized product to suit every need. It is designed for heavy-duty operation under tough conditions, both onshore and offshore, floating or fixed, in hot or cold climates, for application in simple cycle, combined-cycle, or cogeneration.

In simple cycle, the SGT-700 can be operated at base load with an in-built capacity to meet national grid code specifications.

Its rapid start-up times make it invaluable when operating in peak load application.

The compact design, small footprint and low weight are of particular benefit in offshore applications. The standard equipment design has been fully adapted for Ex-proof installation in hazardous areas and to meet offshore codes and standards.

A single-lift power generation module for floating platforms such as FPSO (Floating Production, Storage and Offloading) and semi-submersibles is available for both the SGT-600 and the SGT-700.

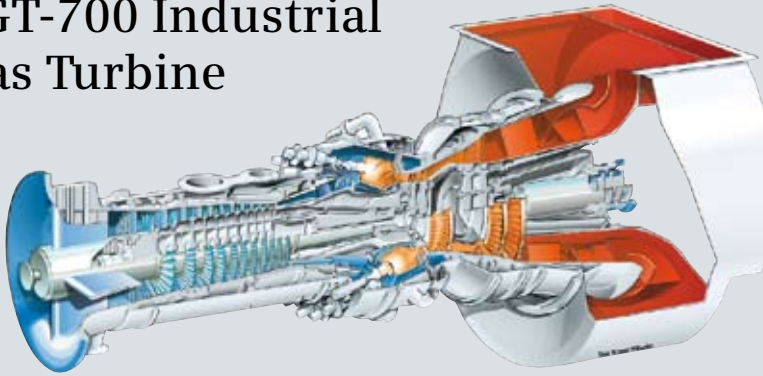


Industrial Gas Turbines

Answers for energy.

**SIEMENS**

# SGT-700 Industrial Gas Turbine



SGT-700 gas generator.

## Technical specifications

### Overview

- Power generation: 31.21MW(e)
- Frequency: 50/60 Hz
- Electrical efficiency: 36.4 %
- Heat rate: 9,882 kJ/kWh (9,367 Btu/kWh)
- Turbine speed: 6,500 rpm
- Compressor pressure ratio: 18.6:1
- Exhaust gas flow: 94 kg/s (208lb/s)
- Exhaust temperature: 528°C (983°F)
- NO<sub>x</sub> emissions (with DLE corrected to 15 % O<sub>2</sub> dry)
  - Gas fuel: ≤15 ppmV
  - Liquid fuel: ≤42 ppmV

### Generator

- Four-pole design
- Rated voltage: 10.5/11.0/13.8 kV
- 50 or 60 Hz
- Protection IP 54
- PMG for excitation power supply
- Complies with -IEC/EN 6034-1 standard

### Axial Compressor

- 11-stage axial-flow compressor
  - 2 stages variable guide vanes
- Electron-beam welded rotor

### Combustion

- 18 dual-fuel Dry Low Emissions (DLE) burners
- Welded annular sheet metal design

### Compressor Turbine

- 2-stage turbine air-cooled

### Power Turbine

- 2-stage turbine uncooled
- Interlocking shrouds

### Fuel System

- Natural gas - Liquid fuel - Dual fuel
- On load fuel-changeover capability
- Gas-supply pressure requirement: 27.0 bar(a) ±0.5 bar (395 ±7 psi(a))

### Bearings

- Tilting pad radial and thrust
- Vibration and temperature monitoring

### Lubrication

- Common lubricating oil system integrated in skid using mineral oil
- 3 x 50% AC-driven lube oil pumps with DC backup

### Gearbox

- 50 or 60 Hz

### Starting

- Electric VSD start-motor

### Control System

- Siemens Simatic S7

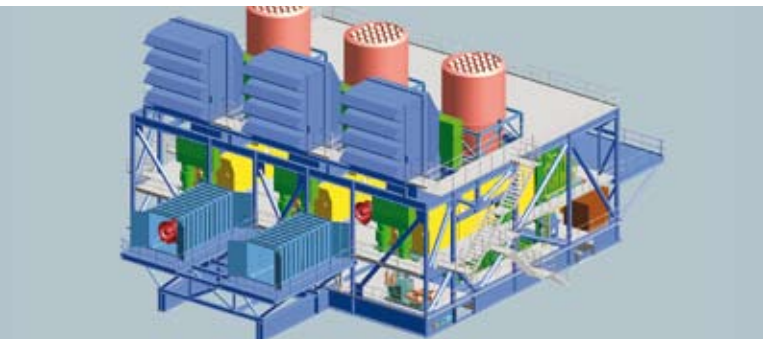
## Gas turbine

### Key features

- Robust and stable DLE performance
- Robust design – long-life components
- Low emissions – DLE ≤15 ppm NO<sub>x</sub>
- Unique dual-fuel DLE capability
- Fuel efficiency 36.4 % SC PG
- Wide range of fuel capability
- Long-term efficiency – low deterioration
- Excellent operational availability and reliability

### Maintenance

- On-site maintenance or 24-hour exchange of gas generator
- Flexible standardized concepts for maintenance planning
- Overhaul interval of 40,000 hours
- Condition-based maintenance
- The 18 burners are easily removable from the outside
- Can be balanced in-field
- Staff training in operation and maintenance
- 24/7 Siemens support
- Remote diagnostics



Standard single-lift power generation module for floating platforms.



Rooftop installation in a cultural urban environment at Wurzburg, Germany.

## Package

### Key features

- Compact layout
- Same footprint and commonality with the SGT-600
- Flexible installations based on standardized package solutions
- Major components delivered on a common base frame
- Fast and easy installation
- Skid-mounted with single-lift capacity
- Pre-commissioned at the Siemens workshop to reduce time at site
- Simple on-site works due to flexible package design
- State-of-the-art control system fulfills all requirements for control and safety
- Can easily communicate with other control systems

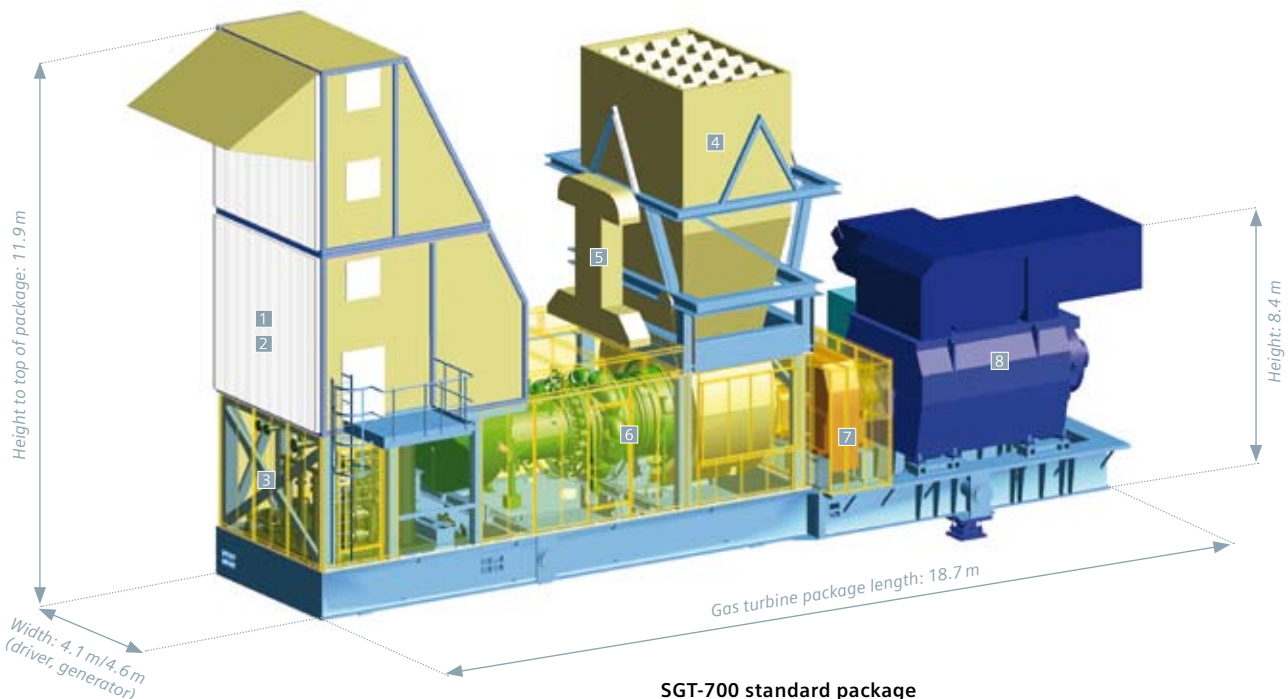
## Cogeneration and combined cycle

Due to its high exhaust heat, the SGT-700 is one of the most efficient units on the market for cogeneration and combined cycle applications.

In combined cycle application it has the economic advantage of a simple single-string concept (gas turbine, generator, steam turbine) with double-end drive of a single generator.

Combined-cycle performance:

- Output: 43.9 MW
- Top class efficiency: 51.9 %



### SGT-700 standard package

- |                        |                        |                        |
|------------------------|------------------------|------------------------|
| 1 Combustion air inlet | 4 Combustion exhaust   | 7 Speed reduction gear |
| 2 Enclosure air inlet  | 5 Enclosure air outlet | 8 AC generator         |
| 3 Lube oil system      | 6 Core engine          |                        |

# SGT-700 Performance

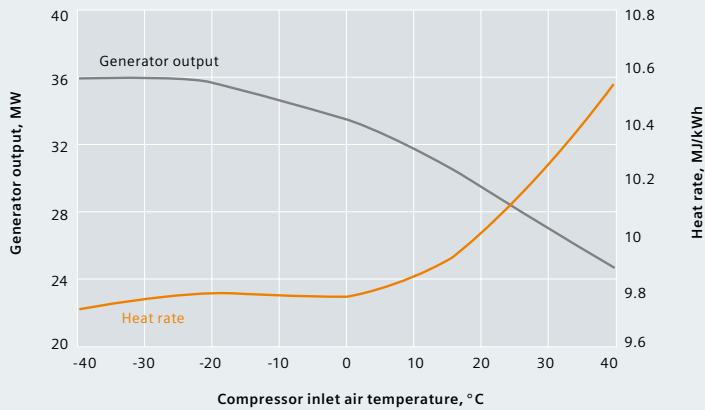
## Nominal generator output and heat rate

### Conditions/assumptions:

Fuel: Natural gas LHV, 46,798 kJ/kg (20,118 Btu/lb)  
 Altitude: Sea level  
 Ambient pressure: 1.013 bar(a) (14.7 psi(a))  
 Relative humidity: 60 %  
 Inlet pressure loss: 5 mbar (2" H<sub>2</sub>O)  
 Outlet pressure loss: 5 mbar (2" H<sub>2</sub>O)  
 Fuel temperature: 5 °C (41 °F)

### Diagram conversion factors:

| To convert | To      | Multiply by     |
|------------|---------|-----------------|
| °C         | °F      | (°C x 9/5) + 32 |
| MJ/kWh     | Btu/kWh | 949             |



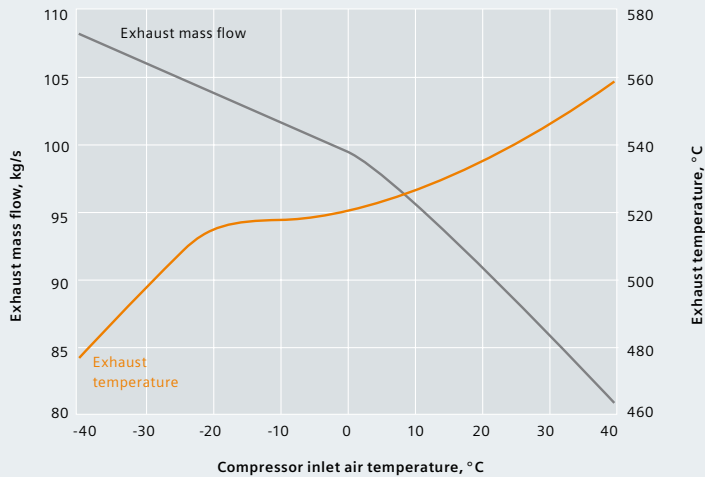
## Nominal exhaust mass flow and temperature

### Conditions/assumptions:

Fuel: Natural gas LHV, 46,798 kJ/kg (20,118 Btu/lb)  
 Altitude: Sea level  
 Ambient pressure: 1.013 bar(a) (14.7 psi(a))  
 Relative humidity: 60 %  
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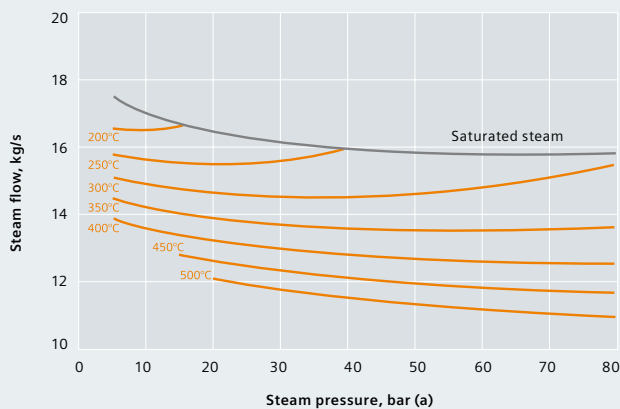
## Unfired heat-recovery steam generation

### Conditions/assumptions:

Fuel: Natural gas LHV, 46,798 kJ/kg (20,118 Btu/lb)  
 Altitude: Sea level  
 Ambient pressure: 1.013 bar(a) (14.7 psi(a))  
 Ambient temperature: 15 °C (59 °F)  
 Relative humidity: 60 %  
 Boiler pinch point: 8 K (14 F)  
 Boiler approach point: 5 K (9 F)  
 Inlet pressure loss: 5 mbar (2" H<sub>2</sub>O)  
 Outlet pressure loss: 25 mbar (10" H<sub>2</sub>O)

### Diagram conversion factors:

| To convert | To   | Multiply by     |
|------------|------|-----------------|
| °C         | F    | (°C x 9/5) + 32 |
| kg/s       | lb/s | 2.2046          |
| bar        | psi  | 14.5            |



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