



## Industrial Applications

### Siemens Gas Turbines (SGT)

# SGT-500 Industrial Gas Turbine

Power Generation: (ISO) 17 MW(e) / Mechanical Drive: (ISO) 23,290 bhp (17.40 MW)

The Siemens SGT-500 industrial gas turbine (formerly known as the GT35C) is a light-weight, high-efficiency, heavy duty gas turbine in the 15 MW to 20 MW power range. The special design features and the fuel flexibility for lower cost fuels of the gas turbine make it suitable for economical base-load power generation.

The SGT-500 has many applications where continuous base-load power availability, ease of maintenance and fuel flexibility are important. Not only for industries, but also for utilities and for marine and offshore applications. The unit meets the exacting requirements of the oil and gas industry.

The modular, compact design of the SGT-500 facilitates easy servicing on-site, where complete modules can be swiftly exchanged.

### Design particulars

The SGT-500 has a twin-shaft compressor, one low and one high pressure compressor. The total number of compressor stages is 18. The three-stage power turbine speed is 3,600 rpm for power generation and 3,450 rpm for mechanical drive. Seven can-type combustion chambers are located in an annular space between the inner and outer combustion chamber casing.

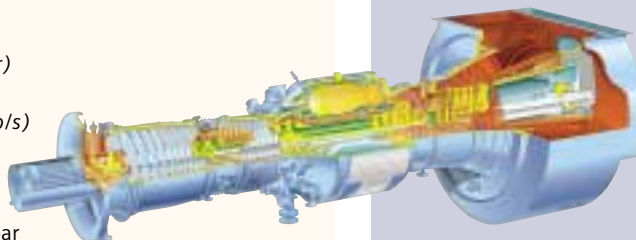
A blade tip clearance adjuster is connected between the power turbine stator and rotor in order to increase the efficiency.

All bearings are hydro-dynamic bearings of the tilting pad type. An electrical starting motor is connected to the low pressure compressor rotor.



## Performance of SGT-500 at base load (ISO rating) on natural gas

	Power Generation		Mechanical Drive
	Base load	Peak load	
Output:	17.00 MW(e)	18.60 MW(e)	17.40 MW (23,290 bhp)
Efficiency:	32.2%		32.8%
Heat rate:	11,180 kJ/kW-hr (10,597 Btu/kW-hr)		10,979 kJ/kW-hr (7,760 btu/bhp-hr)
Pressure ratio:	12:1		12:1
Exhaust mass flow:	92.3 kg/s (203.7 lb/s)		92.3 kg/s (203.7 lb/s)
Exhaust gas temperature:	375°C (709°F)		375°C (709°F)
Turbine rotor speed:	3,600 rpm		3,450 rpm
Speed range:	1,500 rpm / 1,800 rpm		0-100%
Required gas pressure:	18.0 bar(a) ± 0.5 bar (261 psi(a))		18.0 bar(a) ± 0.5 bar (261 psi(a))



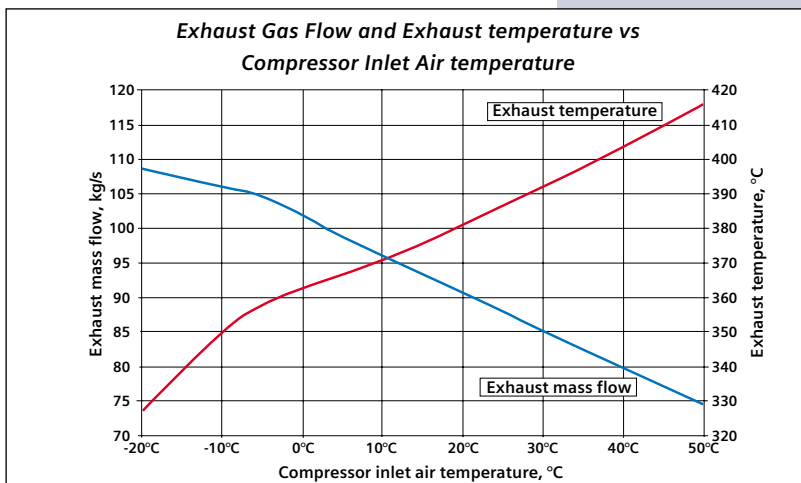
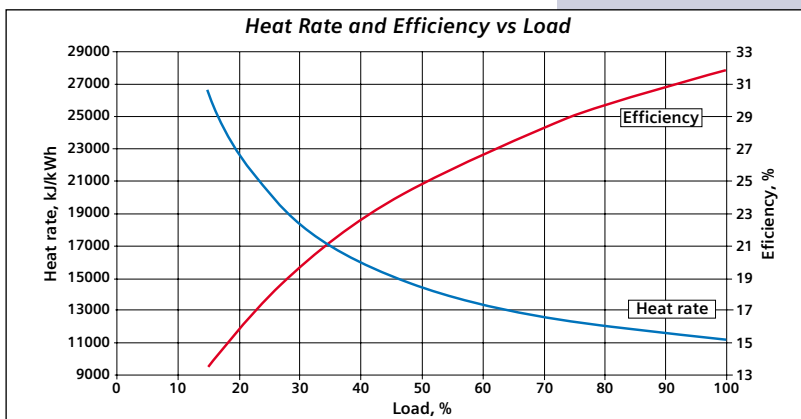
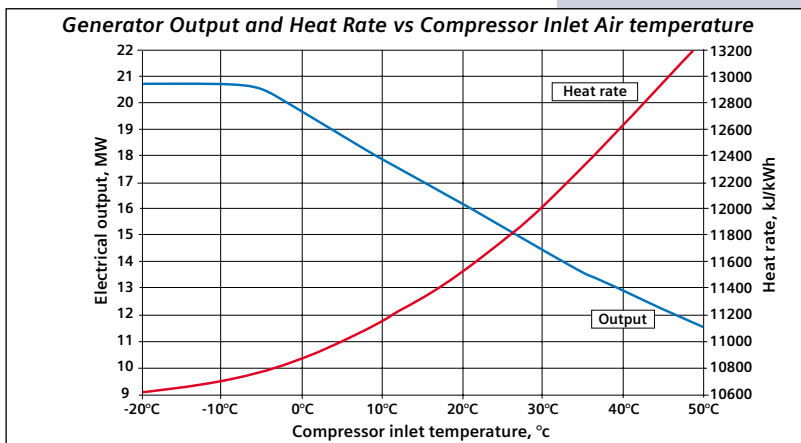
### Low environmental impact

The SGT-500 runs quietly and cleanly. Roomy and well designed combustors ensure smoke-free combustion of most types of liquid or gas fuel.

A dry low NO<sub>x</sub> combustor system maintains emissions below 42 ppmV on gas fuel. This means a NO<sub>x</sub> level ten times lower than conventional burner techniques. Water or steam is injected into the combustor section to reduce the NO<sub>x</sub> level when the gas turbine is running on liquid fuels. The SGT-500 satisfies stringent noise requirements and regulations for NO<sub>x</sub> emissions.



Robust SGT-500 combustor (right) compared with a common gas turbine combustor of similar type.



### Conversion factors:

To convert	To	Multiply by
°C	°F	(°C x 9/5) + 32
kg/s	lb/s	2.2046
kJ/kWh	Btu	0.949

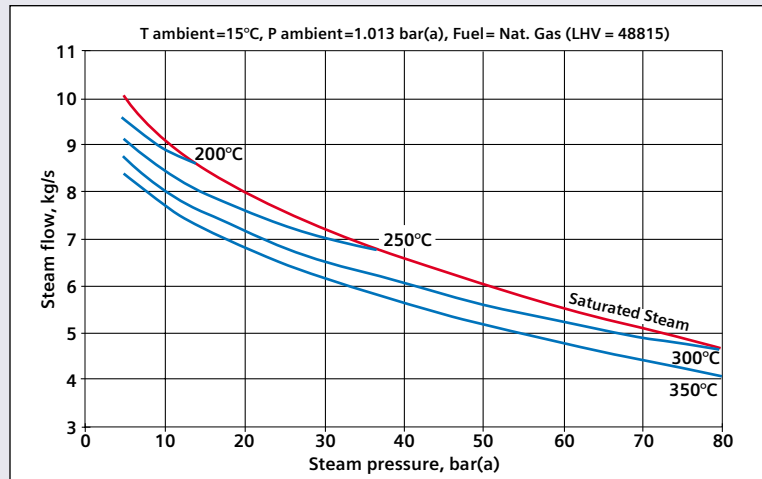
## Power Generation

### Nominal steam production capability in cogeneration and combined cycle

Intake losses: 10 mbar (4" H<sub>2</sub>O)  
 Exhaust losses: 25 mbar (10" H<sub>2</sub>O)  
 Relative humidity: 60%  
 Altitude: Sea level

#### Conversion factors:

To convert	To	Multiply by
°C	°F	(°C x 9/5) + 32
kg/s	lb/s	2.2046
kJ/kWh	Btu	0.949
bar	psi	14.5



## Mechanical Drive

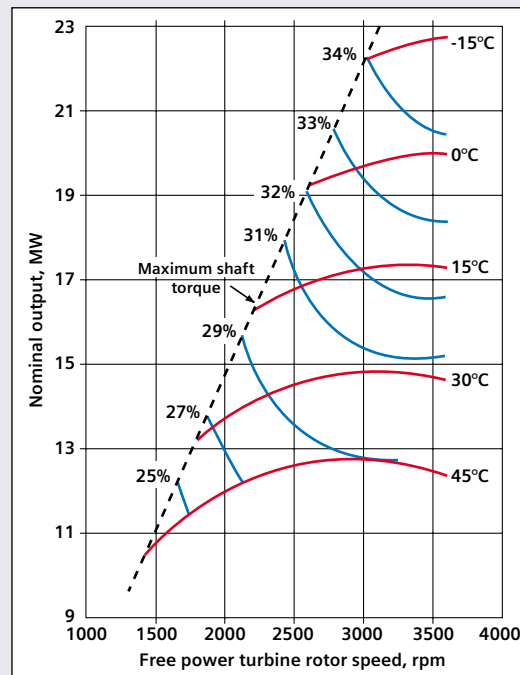
### Nominal shaft power output and efficiency at various free power turbine rotor speeds

#### Reference conditions:

Inlet/outlet pressure drop: 10 mbar (4" H<sub>2</sub>O)  
 Relative humidity: 60%  
 Altitude: Sea level  
 Gaseous fuel LHV: 46,798 kJ/kg

#### Conversion factors:

To convert	To	Multiply by
°C	°F	(°C x 9/5) + 32



## Sound emissions

### Outdoor enclosure covering gas turbine and auxiliaries (roof over AC generator)

Standard: 85 dBA @ 1m (3ft) & 1.5m (4.5ft) above grade (average value)

Option: 80 dBA @ 1m (3ft) & 1.5m (4.5ft) above grade (average value)

#### Far field

Standard: 65 dBA @ 100m (300ft)

Option: 55 dBA @ 100m (300ft)

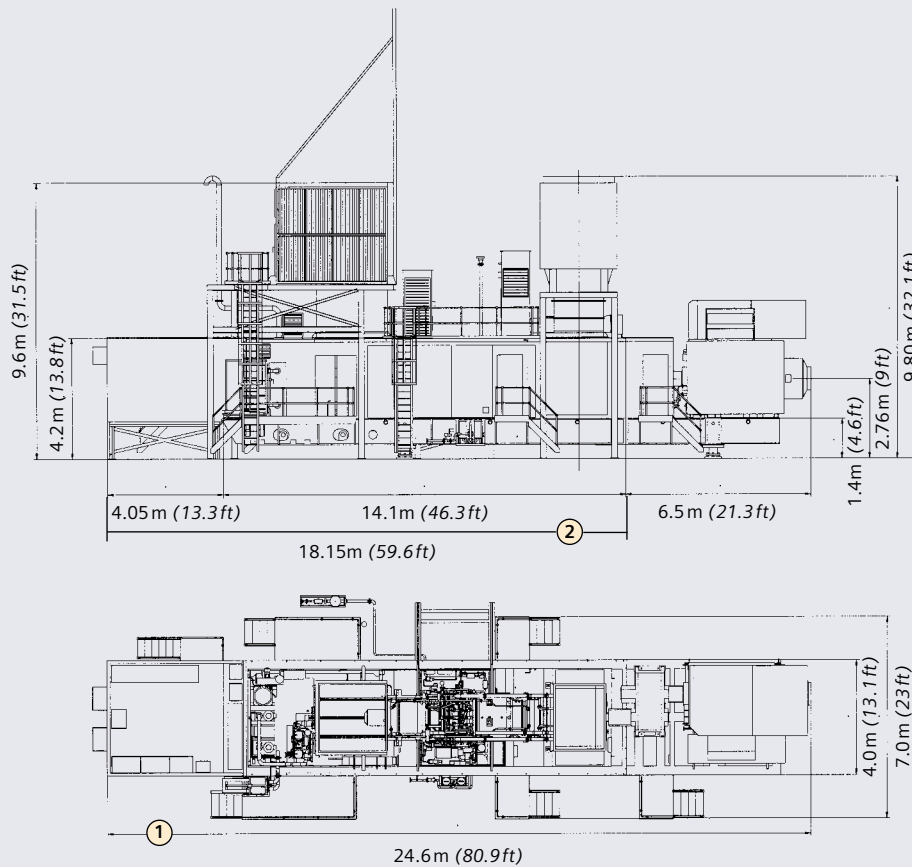




## SGT-500 Power Generation and Mechanical Drive Packages

### A compact layout

The SGT-500 has the same footprint in the power generation and mechanical drive package except for the length of the generator and gearbox.



① Total length in power generation      ② Total length in mechanical drive

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