

# SGT-400 Industrial Gas Turbine

Mechanical Drive: (ISO) 13.40 MW (18,000 bhp)

The ideal choice for a wide variety of mechanical drive applications, the SGT-400 combines very high efficiency (nominal 36.2 %) with excellent emissions performance in a rugged industrial design.

The Siemens twin-shaft industrial gas turbine SGT-400 features a compact gas generator and a two-stage power turbine, incorporating the latest aerodynamic and combustion technologies. The turbine has a simple-cycle shaft efficiency of 36.2 %.

The mechanical drive package is very compact, providing a small footprint and a high power-to-weight ratio. The twin-shaft configuration provides excellent speed and load turndown characteristics to allow maximum flexibility of operation.

With its reliable, proven gas turbine technology, the SGT-400 offers cost-effective power for mechanical drive applications.

## Compressor applications

- Gas injection, gas processing and refrigeration projects utilizing Siemens bespoke centrifugal compressors (or other proprietary manufacturer's compressors)
- Gas boost and gas transmission projects utilizing Siemens standard pre-engineered centrifugal pipeline compressors

## Pump applications

- Utilizing proprietary manufacturer's driven unit pumps of Siemens or client choice, ideally suited to water injection and fluid transmission projects

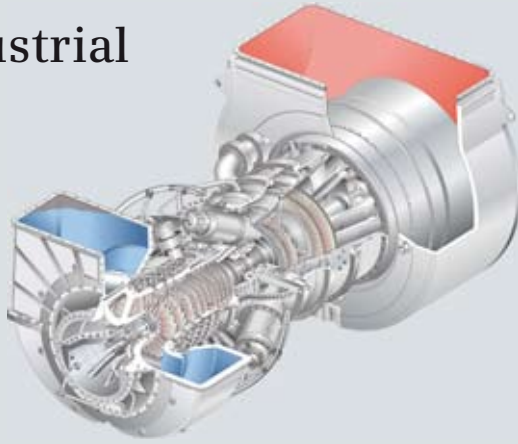


Industrial Gas Turbines

Answers for energy.

**SIEMENS**

# SGT-400 Industrial Gas Turbine



## Technical specifications

### Overview

- Twin-shaft, industrial
- Mechanical drive: 13.40 MW
- Shaft efficiency: 36.2%
- Heat rate: 9,943 kJ/kWh (7,028 Btu/bhph)
- Full load power turbine speed: 8,000 – 10,000 rpm
- Compressor pressure ratio: 16.8:1
- Exhaust gas flow: 39.4 kg/s (86.8 lb/s)
- Exhaust temperature: 555°C (1,031°F)
- Typical emissions: NO<sub>x</sub>: < 15 ppmV and CO: < 10 ppmV (corrected to 15% O<sub>2</sub> dry)
- Medium-calorific value fuels capability (> 25 MJ/Nm<sup>3</sup> Wobbe index)

### Axial compressor

- 11-stage with variable inlet guide vanes
- Air flow: (ISO) 38.9 kg/s
- Nominal speed: 14,100 rpm

### Combustion

- 6 reverse-flow cannular combustion chambers
- Dry Low Emissions (DLE) system
- High-energy ignitor system

### Turbine

- 2-stage overhung compressor turbine
  - Both stages are air-cooled
- 2-stage high-efficiency power turbine
  - Rotor blades have interlocking shrouds for mechanical integrity

### Bearings

- Tilt-pad radial and thrust
- Vibration- and temperature-monitoring as standard

### Mechanical drive

- Direct drive of compressors
- Gearbox options are available for other mechanical drive applications

### Package

- Fabricated steel underbase
  - Integral oil tank
  - Multi-point mounting
  - Optional 3-point mounting
- Modular fluid systems incorporating:
  - Lubricating oil system
  - Auxiliary gearbox-driven main pump
  - AC motor-driven auxiliary pump
  - DC motor-driven emergency pump
- Oil cooler and oil heater
- Electrically driven hydraulic start system
- Hydrocarbon drains tank on package
- Control system
  - Siemens SIMATIC PLC-based with distributed control and processing capability installed on package
  - Optional Allen-Bradley system
  - Optional off-package systems
- Vibration monitoring system
  - BN1701: Standard
  - BN3500: Optional
- Fire and gas detection equipment
- Fire suppression equipment
- On- and off-line compressor cleaning options available
- Combustion air inlet filtration options:
  - Simple static
  - Pulse cleaning
  - HEPA
- Enclosure
  - Painted carbon steel or stainless steel
  - Noise level options (85dB(A) standard)



SGT-400 core engine test facility.

## Gas turbine

### Key features

- High simple-cycle and cogeneration efficiencies, cutting fuel costs
- Dual-fuel Dry Low Emissions (DLE) combustion system as standard, meeting stringent legislation
- Twin-shaft arrangement for both power generation and mechanical drive, allowing commonality of parts in mixed duty installations

### Maintenance

- Site maintainability or optional rapid core exchange as required by customer
- Designed for maintenance:
  - Horizontally split compressor casing
  - Horizontally and vertically split inlet casing
  - Combustion chambers, flame tubes and ignitors easily accessible for inspection
  - Large side-doors on enclosure for equipment change-out
  - Gas generator and power turbine removal on either side of package
- Multiple boroscope-inspection ports



SGT-400 compressor package assembly.



Two SGT-400 pipeline compressor sets for Sasol Technology (Pty) Ltd, installed at the Komatipoort compressor station in South Africa.

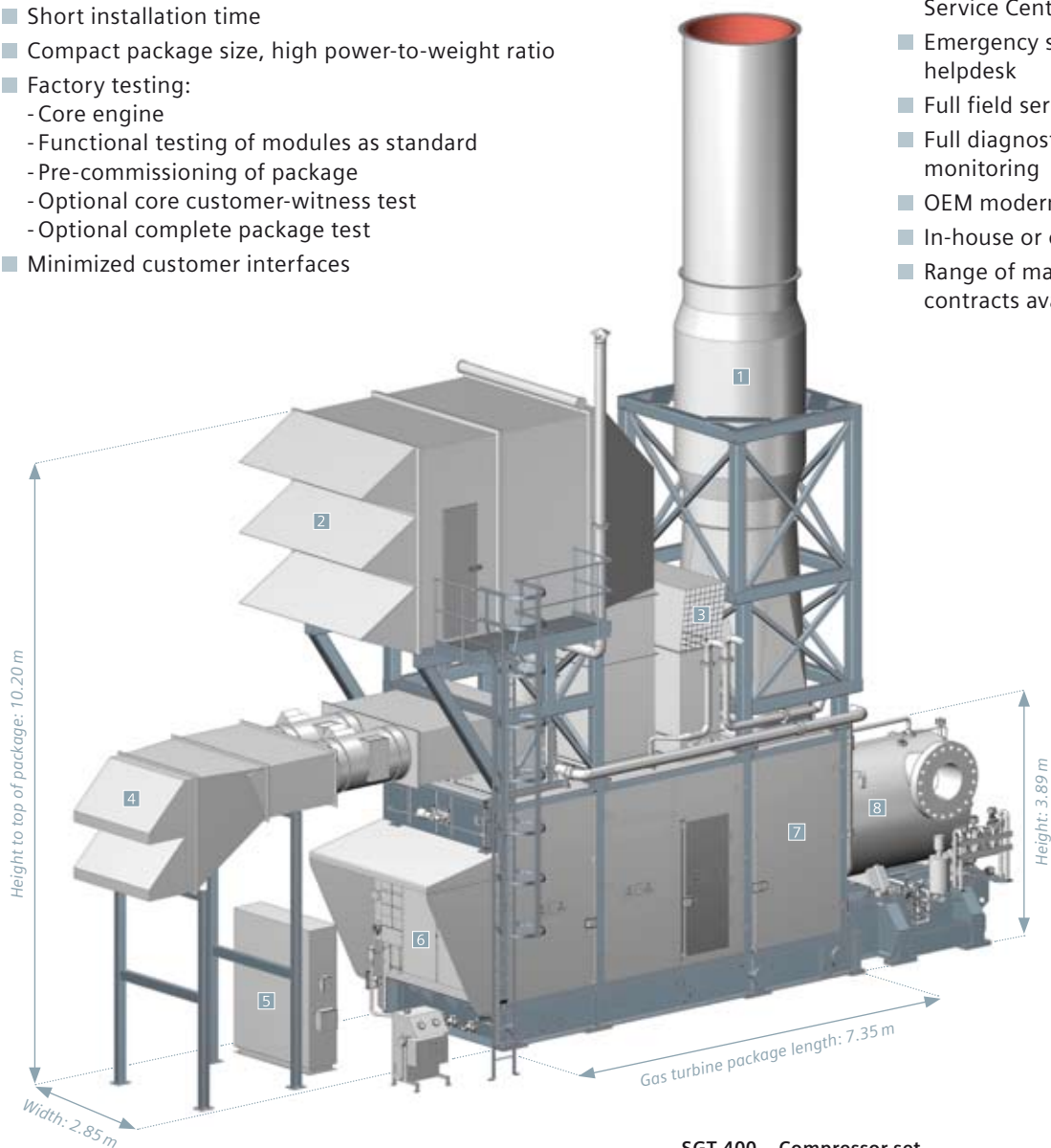
## Package

### Key features

- Short installation time
- Compact package size, high power-to-weight ratio
- Factory testing:
  - Core engine
  - Functional testing of modules as standard
  - Pre-commissioning of package
  - Optional core customer-witness test
  - Optional complete package test
- Minimized customer interfaces

## Customer Support

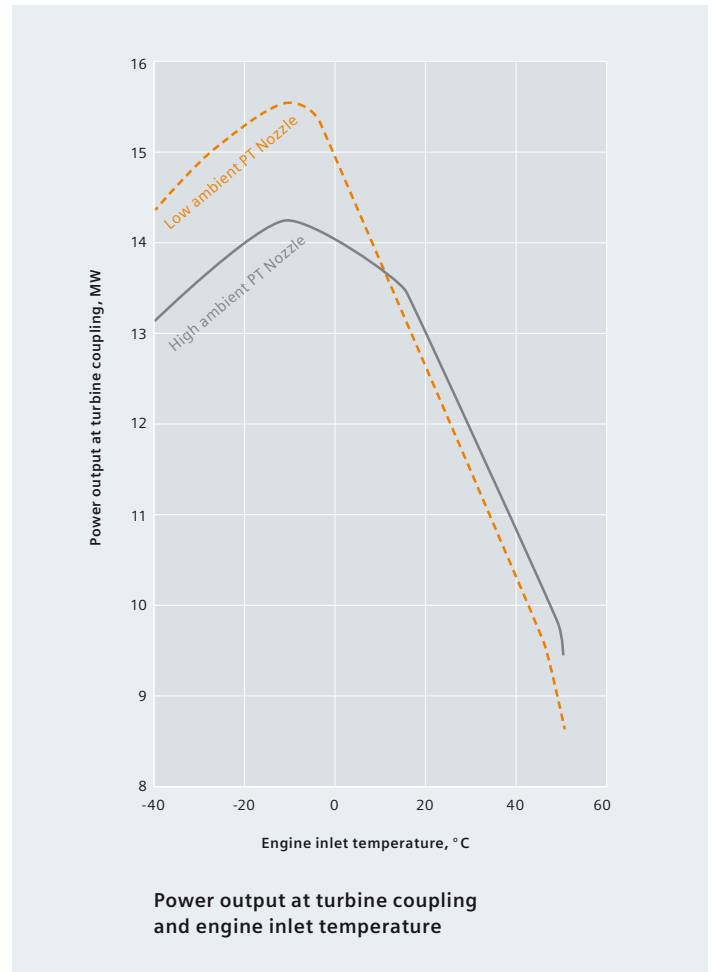
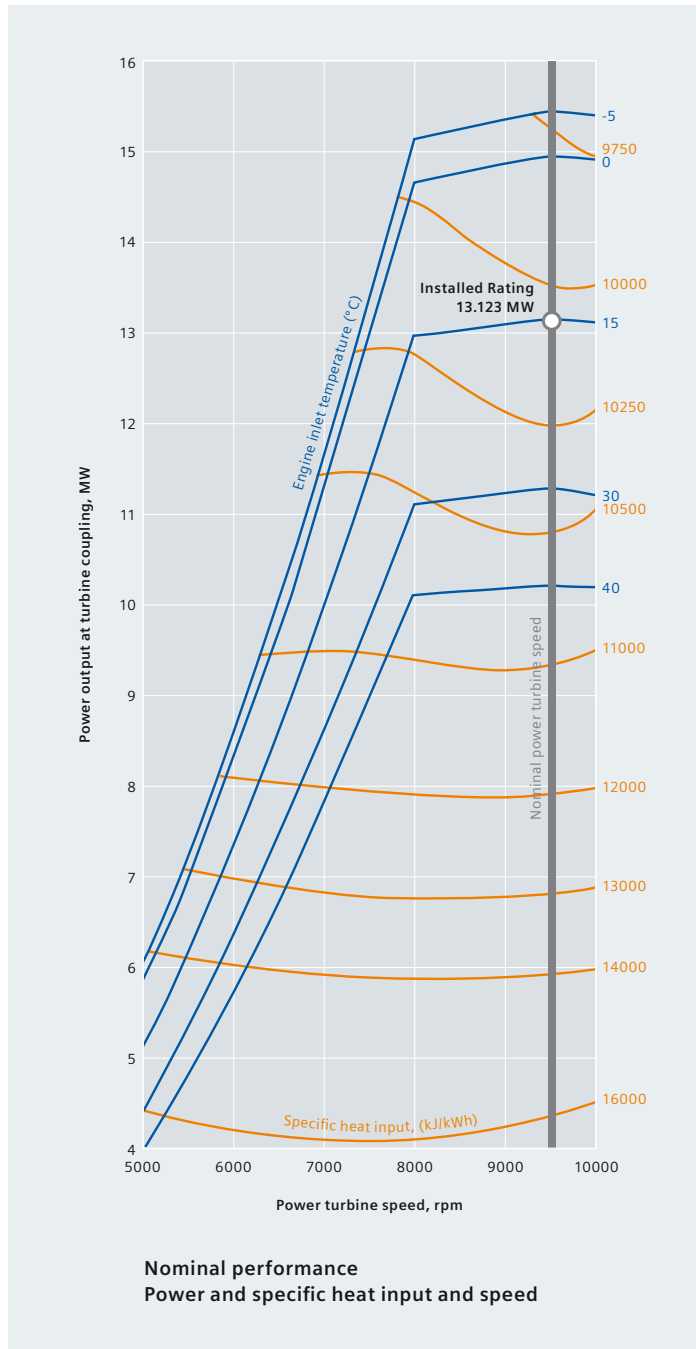
- Global support network of Authorized Service Centers
- Emergency service – 24/7 specialist helpdesk
- Full field service
- Full diagnostic support, remote monitoring
- OEM modernizations and upgrades
- In-house or on-site training programs
- Range of maintenance and service contracts available



### SGT-400 – Compressor set

- |                        |                       |                     |
|------------------------|-----------------------|---------------------|
| 1 Combustion exhaust   | 4 Enclosure air inlet | 7 Core engine       |
| 2 Combustion air inlet | 5 Fire extinguishant  | acoustic enclosure  |
| 3 Enclosure air outlet | 6 On-package controls | 8 Driven compressor |

# SGT-400 Performance



## SGT-400 Mechanical drive performance

### Conditions/assumptions:

Direct drive – no output gearbox.	Natural gas fuel.
Altitude: Sea level	Ambient pressure: 101.3 kPa
Inlet ducting loss: 1.0k Pa*	Relative humidity: 60 %
Exhaust ducting loss: 0.75 kPa*	

Specific heat input is drawn for an engine inlet temperature of 15°C but is approximately correct for other temperatures. No CO turndown in operation.

\* Duct losses are site-specific according to application. Please contact your local Siemens representative or our Customer Support Center for performance quotations.

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