Siemens SGT-400 Unit Technical Specifications (ISO Conditions)

Parameter	Specification
Power Output (Electrical)	12.9 MW
Frequency	50 Hz
Voltage	11 kV
Gross Electrical Efficiency	34.8%
Heat Rate	10,355 kJ/kWh
Turbine Speed (Shaft)	9,500 rpm
Compressor Pressure Ratio	16.8 : 1
Exhaust Mass Flow	39.4 kg/s (86.8 lb/s)
Exhaust Gas Temperature	555 °C (1,031 °F)
NO_x Emissions (with DLE)	≤ 15 ppmV (at 15% O_2)
CO Emissions (with DLE)	< 10 ppmV (at 15% O_2)

Engine Design Details

Compressor

- **Type:** Axial-flow transonic compressor
- **Number of Stages:** 11
- **Inlet Guide Vanes:** Variable inlet guide vanes (VIGVs) for robust operability and optimized performance.
- **Air Flow (ISO):** 38.9 kg/s
- **Nominal Rotational Speed:** 14,100 rpm

Combustion System

- **Combustor Type:** Reverse-flow cannular (DLE)
- **Number of Combustion Chambers:** 6
- **Emissions Concept:** Dry Low Emissions (DLE)
- **Control:** Intelligent automatic adjustment of fuel split during starting and operation to compensate for load, ambient, and fuel composition changes.
- **Ignition System:** High-energy ignitors

Turbine Section

- **Gas Generator Turbine:**
    - *Configuration:* Overhung, 2-stage
    - *Cooling:* Air-cooled blades
- **Power Turbine:**
    - *Configuration:* Free-standing, overhung, 2-stage
    - *Design:* High-efficiency with interlocking shrouds for mechanical integrity.

Bearings & Rotor Dynamics

- **Type:** Tilt-pad radial and thrust bearings.

- **Monitoring:**
    - Vibration monitoring (standard)
    - Temperature monitoring (standard)
- **Casing:** Heavy-duty casings with horizontal and vertical splits allow for on-site maintenance.

Scope of Supply & Packaging

The unit is offered as a complete, factory-tested genset package, designed for easy transport and installation.

Core Package

- **Gas Turbine Generator Set:** The core SGT-400 turbine coupled to an 11kV, 50Hz generator.
- **Base Frame:** Fabricated steel underbase with integral lube oil tank and multi-point mounting.

Auxiliary Systems (Factory-Tested Modules)

- **Lubrication System:**
    - Gearbox-driven main oil pump
    - AC motor-driven auxiliary oil pump
    - DC motor-driven emergency oil pump
    - Oil cooler and oil heater
- **Fuel System:** Gas fuel module.
- **Starting System:** Electrically driven hydraulic start system.
- **Drain System:** Auto drains module; hydrocarbon drains tank integrated into package.

Control & Instrumentation

- **Control System:** Siemens SIMATIC PLC-based control system with distributed control architecture (package-mounted).
- *Optional:* Allen-Bradley PLC or off-package control systems available upon request.
- **Monitoring:** Standard vibration monitoring (BN1701); Optional BN3500 available.
- **Safety Systems:** Integrated fire detection, gas detection, and fire suppression systems.

Air Intake & Filtration

- **Compressor Cleaning:** Provisions for both on-line and off-line washing.
- **Inlet Filtration Options:**
    - Static filter
    - Pulse-cleaning filter
    - HEPA filter

Enclosure

- **Material Options:** Painted carbon steel.
- **Acoustic Performance:** Standard sound pressure level of 85 dB(A), with additional noise attenuation options available.

Suitable Applications

- **Industrial Power Generation:** Ideal for onsite industrial power, district heating (CHP), and grid support.
- **Cogeneration (CHP):** High exhaust energy (555°C) and mass flow (39.4 kg/s) make it excellent for steam raising in combined cycle or process heat applications.
- **Oil & Gas Back-up:** While configured for power generation, its twin-shaft design allows potential adaptation for mechanical drive in refinery or pipeline applications.