We power the world with innovative gas engines

Siemens gas engine portfolio
Gas engines from 190 to 2,065 kW

The Siemens gas engine range has been designed and tailored to help meet our customers’ challenges in a dynamic market environment. Our models range from 190 to 2,065 kW, fulfilling the requirements of a wide spectrum of applications in terms of efficiency, reliability, flexibility, and environmental compatibility.

The products offer low lifecycle costs and an excellent return of investment.
Siemens best-in-class, high-efficiency, low-emission gas engines and gensets are designed for various applications such as power generation, cogeneration, and waste to energy. These engines are suitable for a broad range of commercial, industrial and municipal uses with long service intervals, easy maintenance and low fuel consumption.

Table of contents

S Series gas engines 7
H Series gas engines 21
E Series gas engines 27
Containers 32
Performance data overview 34
SL- Gas engines:
A robust, reliable and fuel flexible power generation

- Mechanical power output: from 190 to 1,150 kWb (1,200, 1,500 and 1,800 rpm)
- Powered by natural gas, landfill and sewage gas, flare and well gas, syngas
- Proven reliable and robust design
- Fast start availability
- Fuel flexibility
- Fuel blending availability
- Eco friendly
- Cost efficient implementation and service
- Load acceptance great flexibility
- Best in class global efficiency

SL- gas engines
SGE-18SL
SGE-24SL
SGE-36SL
SGE-48SL
SGE-56SL
Fuel blending system available for biogas gensets
Integrated proprietary GCS-E engine and GCS-G genset control systems
High flexibility through modularity

Applications
- Power generation (CCHP, ESP, PRP, LTP, DES)
- CHP and trigeneration
- Waste to power
- Marine applications
- Mechanical drive (for pump driving)

References
- Universities
  - Wesleyan (USA)
  - Wolverhampton (UK)
- Utilities (Landfill, sewage plants)
  - ETE (Brazil)
  - Johannesburg (South Africa)
  - Fitzpax (Mexico)
  - Storms Hog (USA)

Best-in-class global efficiencies for CHP in Natural gas S Series: 500 - 1,030 kWe

- Lean burn, turbocharged and aftercooled
- Electronically carbureted
- Fuel blending capability (natural gas/biogas) available
- Single or double circuit cooling system
- High cooling temperature option in main circuit, 120°C
- Different auxiliary cooling circuit temperatures
- Oil cooler in main circuit option available
- Drywater exhaust manifold
- Single/double stage intercooler
- Reduced oil consumption
- Emissions control
- Compliant with the U.S. emissions standards
- Fast start availability
- Supplied as a stand-alone engine, genset or in a fully containerized unit

Fuel blending system available for biogas gensets

Operating characteristics

- Power generation - CCHP
- Power output 179 to 1,028 kWe (natural gas)
- Fuel Natural gas, biogas, landfill gas, sewage gas, flare gas, well gas, syngas
- Frequency 50 and 60 Hz
- Speed 1,200 / 1,500 / 1,800 rpm
- Electric efficiency 36 - 39%
- Thermal efficiency 51 - 55%
- Total efficiency 90 - 91.5%
- NOx emissions 500 mg / Nm³

(*) Lower emission engines are available

Physical characteristics

- Approximate weight (genset) 4,000 to 10,000 kg
- Length 2.8 - 4.3 m
- Width 1.5 - 1.7 m
- Height 2.1 - 2.3 m

(*) Lower emission engines are available

** Siemens combined CHP biogas genset solution for Johannesburg Water, South Africa.**
SGE-SL Marine gas engines

The complete family of SGE-SL gensets with a variety of applications such as Auxiliary power generation and electrical propulsion - constant speed.

Applications

For a large variety of vessels: tugboats, tankers, ferries, oceanographic, special vessels and others

- Auxiliary power generation
- Electrical propulsion


Working speeds: 1,500 & 1,800 rpm

Emissions compliant IMO/500 mg/NOx

Power generation

Power output* 320 - 1,110 KVA (256-888 kWe)

Fuel: LNG. Methane number from 70

Frequency 50 and 60 Hz

Working speeds: 1,500 & 1,800 rpm

Emissions compliant IMO/500 mg/NOx

Physical dimensions

Approximate weight (genset) 2,700 to 10,000 kg

Length 2.0 - 4.6 m

Width 0.9 - 1.6 m

Height 2.1 - 2.3 m

(*) Based on existing gas engines power ratings for the ambient conditions required in the marine market.

Note 1) For a large variety of vessels as tugboats, tankers, ferries, oceanographic, special vessels.

A gas fueled vessel.

Working speeds: 1,500 and 1,800 rpm

Fuel: LNG (Liquefied Natural Gas)

Methane number from 70

Cooling configurations: With mechanical and electrical water pumps

Water circuits T°: 3040°C

Coolant in the engine.
SR- Gas engines:

- Designed for rich burn power generation
- Mechanical power output: from 281 to 870 kWb (1,800 rpm)
- Powered by natural gas
- Robust design
- Eco friendly
- Load acceptance: great flexibility

SR gas engines:
Used in the LNGo System
**SGE-SR**

**Gas engine family**

This engine is spark ignited and powered by natural gas and well gas. Robust and reliable, it has great flexibility for load acceptance and great performance for power generation and cogeneration.

### Applications

- Power Generation
- Cogeneration

---

### Power Generation - CHP

- **Fuel:** Natural gas, Well gas
- **Frequency:** 60 Hz
- **Speed:** 1,800 rpm
- **Electric efficiency:** 33 - 34% /%

### Power output

- 273 to 844 kWe

### Physical dimensions

- Approximate weight (genset): 4,000 to 10,000 kg
- Length: 2.8 - 4.3 m
- Width: 1.5 - 1.7 m
- Height: 2.1 - 2.3 m

---

**LNGo micro-scale natural gas liquefaction system**

- Mostly suitable for 60 Hz markets (USA)
- Part of the LNGo solution package
- Rich burn
- Turbocharged and aftercooled
- Wet Exhaust Manifold
- Electronically carburated
- Powered by natural gas and well gas
- Double circuit cooling system
- Different auxiliary cooling circuit temperatures
- Single/double stage intercooler
- Great flexibility for load acceptance
- Emissions control
- Compliant with the U.S. emissions standards

- Supplied as a stand-alone engine, genset or in a fully containerized unit

---

**Summary:**

- SGE-SR gas engine family
- Available for biogas gensets
- Spark ignited and powered by natural gas and well gas
- Robust and reliable, with great flexibility for load acceptance and high performance for power generation and cogeneration.

---

**LNGo Power modules (SL), Altagas Ltd. British Columbia, Canada**
SM- Gas engines:

Designed for fuel flexible power generation

- Mechanical power output: from 1,055 to 1,100 kWb when powered by natural gas, landfill, and sewage gas (1,500 and 1,800 rpm)
- Mechanical power output from 275 to 906 kWb when powered by propane LPG (1,500 and 1,800 rpm)
- Powered by natural gas, landfill, sewage gas and propane
- High efficiency
- Load acceptance great flexibility
- High quick start and operational availability
- Standard interchangeable parts

SM gas engines
SGE-18SM
SGE-24SM
SGE-36SM
SGE-48SM
SGE-56SM
Fuel blending system available for biogas gensets

The SM gas engine offers systems for a large variety of applications such as Cogeneration/trigeneration. The SM gas engine is also able to operate with other types of gases like propane and biogas.

Applications
- Power generation
- CHP and Trigeneration
- Waste-to-power

SGE-24SM
- Puerto Rico (propane), food industry
- Trigeneration

SGE-56SM
- Anaerobic digestion from POME and animal manure in Thailand and Indonesia

Great flexibility for running with fuels as propane.
Integrated propietary GCS-E engine and GCS-G genset control systems.
High flexibility through modularity.

References

Physical dimensions
- Approximate weight: 4,000 to 10,000 kg
- Length: 2.8 - 4.3 m
- Width: 1.5 - 1.7 m
- Height: 2.1 - 2.3 m

Power generation - CHP
- Power output: 303 to 873 kWe (Propane (LPG))
- Fuel: Propane
- Frequency: 50 and 60 Hz
- Speed: 1,500 / 1,800 rpm
- Electric efficiency: 36 - 36.3%
- Thermal efficiency: 53 - 54%
- Total efficiency: 91 - 93%
- NOx emissions: 500 mg / Nm3

Power generation
- Power output: 1,025 to 1,060 kWe
- Fuel: Natural gas, biogas
- Frequency: 50 and 60 Hz
- Speed: 1,500 / 1,800 rpm
- Electric efficiency: 39 - 41%
- Thermal efficiency: 51 - 52%
- Total efficiency: 92%
- NOx emissions: 500 mg / Nm3

A CHP package of SM genset.

Oil cooler in main circuit option available.
Dry/drier exhaust manifold.
Single/double stage intercooler.
Reduced oil consumption.
Emissions control.
Compliant with the US emissions standards.
Supplied as a stand-alone engine, genset or in a fully containerized unit.
HM- Gas engines:
Designed for high performance power generation

- Mechanical power output: from 520 to 1,350 kWb (1,200, 1,500 and 1,800 rpm)
- Powered by natural gas, sewage gas and landfill gas
- Fuel-flexibility and fuel blending availability
- High performance
- Low life cycle cost
- Cost efficient
- Compact solution
- Best-in-class electrical efficiencies in biogas and natural gas

HM gas engines
SGE-24HM
SGE-42HM
SGE-56HM
SGE-HM Gas engines

The proven HM engine series offers a robust design with Miller cycle. This is the first reference of the 42HM model engine recently released.

A cost efficient compact solution for power generation and cogeneration processes.

Applications
- Power generation (50 Hz and 60 Hz)
- CHP - cogeneration

References
- Sokolow Podlasie, Poland
- Supply two gensets SGE-42HM
- Power output - 2 MWe
- Customer: SOKOŁÓW SA

Best-in-class electrical efficiencies in Biogas (W2P) engines, H Series:
- 24HM: 500 kW; 42HM: 1,000 kW; 56HM: 1,300 kW

Best-in-class electrical efficiencies in Natural gas H Series:
- 24HM: 500 kW; 56HM: 1,300 kW

- Proven design
- High thermal efficiency
- Integrated proprietary GCS-C engine and GCS-G genset control systems

Condensation plant - Sokolow Podlasie - Poland
HM: Key features

Control system
- Proprietary, fully integrated, engine control system for optimized performance and diagnosis

Lubrication system
- 6x coin oil circuit
- Internal oil pump
- Centrifugal oil filter for W2P applications

Combustion system
- Two camshafts, Miller cycle
- Cylinder head designed for maximum volumetric efficiency with water-cooled exhaust valve seats
- Pre-chamber sparkplugs

Intake & exhaust systems
- One-stage, oil-cooled turbocharger, water cooled
- Dual-stage, oil engine-integrated, charge cooler
- Two intake manifolds outside the engine
- Dry intake manifolds, cooler for engine

Power train
- High swirl pistons optimized for high efficiency
- Rings designed for optimized oil consumption
EM- Gas engines:

Designed for Best-in-class power generation

- Mechanical power output: 2,065 kWb (1,200 and 1,500 rpm)
- Direct Drive in 60 Hz (1,200 rpm) option
- Powered by natural gas
- Best-in-class, excellent efficiency in small footprint
- Lowest emissions
- High operational availability
- Low life cycle cost
**Applications**

- Power generation (50 Hz and 60 Hz)
- CHP - cogeneration

**Power generation - CHP**

<table>
<thead>
<tr>
<th>Power output</th>
<th>2,012 kWe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuel</td>
<td>Natural gas</td>
</tr>
<tr>
<td>Tapped</td>
<td>1,200 / 1,500 rpm</td>
</tr>
<tr>
<td>Electric efficiency</td>
<td>45.4%</td>
</tr>
<tr>
<td>Thermal efficiency</td>
<td>41%</td>
</tr>
<tr>
<td>Total efficiency</td>
<td>86.4%</td>
</tr>
<tr>
<td>NOx emissions</td>
<td>500 mg / Nm3 N2O</td>
</tr>
</tbody>
</table>

**Physical dimensions**

- Approximate weight: 14,515 kg
- Length: 6.4 m
- Width: 2.0 m
- Height: 2.3 m

**Best-in-class electrical efficiency in Natural gas E Series: 86 EM: - 2,000 kWe**

**Key Features**

- High efficiency turbocharger
- Electronically controlled
- New piston design for best performance
- Two circuit cooling system – Main circuit
- Auxiliary cooling variable temperature main concept
- Oil cooler in main circuit
- Direct Drive for 60 Hz (1,200 rpm) option
- 90,000 hours for major overhaul
- Double stage intercooler
- Reduced oil consumption
- Emissions control

Supplied as a stand-alone engine, genset or in a fully containerized unit

---

SGE-EM Gas engines

The EM gas engines are the most compact competitive choice with the ability to deliver high power output with even 200 mg/Nm3 NOx.

**SGE-86EM genset**

**Internal section of the SGE-86EM engine**

- Highest efficiency in its class
- Lower emissions
- Lower footprint
- Best power-performance ratio
- Direct Drive for 60 Hz (1,200 rpm) option
- Lower OPEX

**Applications**

- Highest efficiency in its class
- Lower emissions
- Lower footprint
- Best power-performance ratio
- Direct Drive for 60 Hz (1,200 rpm) option
- Lower OPEX

**Applications**

- Highest efficiency in its class
- Lower emissions
- Lower footprint
- Best power-performance ratio
- Direct Drive for 60 Hz (1,200 rpm) option
- Lower OPEX

**Applications**

- Highest efficiency in its class
- Lower emissions
- Lower footprint
- Best power-performance ratio
- Direct Drive for 60 Hz (1,200 rpm) option
- Lower OPEX

SGE-EM genset.

SGE-EM genset.

SGE-EM genset.

SGE-EM genset.
Control system
- Proprietary, fully integrated, engine control system for optimized performance and diagnosis

Combustion system
- One single camshaft, Miller cycle
- Cylinder head designed for maximum volumetric efficiency with water-cooled exhaust valve seats
- Pre-combustion chamber with direct gas injection optimized for high efficiency and low emissions

Lubrication system
- On-engine integrated O/C (HT water circuit)
- External, accessible, oil pump
- Centrifugal oil filter

Intake & exhaust systems
- Two high efficiency turbochargers, water-cooled, with two bypass valves
- Twin-stage, on engine integrated, charge cooler
- Dry intake manifold inside the engine
- Dry exhaust manifold, outside the engine

Power train
- Forged steel piston for high peak combustion pressures
- Rings designed for optimized consumption
- Low mass and high resistance connecting rod

EM: Key features

- Control system
- Proprietary, fully integrated, engine control system for optimized performance and diagnosis

- Combustion system
- One single camshaft, Miller cycle
- Cylinder head designed for maximum volumetric efficiency with water-cooled exhaust valve seats
- Pre-combustion chamber with direct gas injection optimized for high efficiency and low emissions

- Lubrication system
- On-engine integrated O/C (HT water circuit)
- External, accessible, oil pump
- Centrifugal oil filter

- Intake & exhaust systems
- Two high efficiency turbochargers, water-cooled, with two bypass valves
- Twin-stage, on engine integrated, charge cooler
- Dry intake manifold inside the engine
- Dry exhaust manifold, outside the engine

- Power train
- Forged steel piston for high peak combustion pressures
- Rings designed for optimized consumption
- Low mass and high resistance connecting rod

22
Container models

40 feet container with embedded aircooler

40 feet container with top mounted aircooler

30 feet container with remote radiator

Soundproof canopy

- Air intake silencer
- Remote radiator
- Exhaust chimney
- Loosed supply for site assembly
- Exhaust skid
- Exhaust heat exchanger
- Exhaust distributor (optional)

Brief description

The container is comprised of following individual areas:

- Engine room - the base module containing the genset, cooling pumps, thermostatic valves and daily oil tank.
- Cabinet room - containing the electrical, control and power panels.
- Aircooler room - containing the cooling system and gas ramp. When necessary it will include the heat recovery skid.
- Top mounted area - containing the exhaust silencer, chimney and if necessary the exhaust heat recovery skid.

---

Sound pressure level

Down to 75 dB (A) in 10 m except for the 56SL T30 model with 75 dB (A) in 1 m

Ambient temperatures (*):

The container is designed for ambient temperatures of -18ºC to 35ºC with an option to reach up to 45ºC.

Dimensions:

L:12,192 mm; W: 2,438 mm; Height: 2,896 mm

Applications by engine models

Power generation: S Series including 56SLT30, Q Series (Gas engine).
Cogeneration: All engines except for V engines of the S Series and 56 litre engines.

---

(*): For other configurations please contact the Siemens Engine Business.
### Performance data overview

#### Engine Model Speed (rpm) Fuel type Engine Power (kW) Thermal power (kW) Global Eff. (%) Dimensions (L x W x H) Weight [kg] Genset Dry [L x W x H] [kg]

<table>
<thead>
<tr>
<th>Model</th>
<th>Natural Gas</th>
<th>1,200 (6)</th>
<th>1,500 (6)</th>
<th>1,800 (6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SGE - 18 SL</td>
<td>322</td>
<td>361</td>
<td>436</td>
<td>610</td>
</tr>
<tr>
<td>SGE - 36 SL</td>
<td>404</td>
<td>484</td>
<td>564</td>
<td>720</td>
</tr>
<tr>
<td>SGE - 56 SL</td>
<td>564</td>
<td>648</td>
<td>820</td>
<td>1,030</td>
</tr>
</tbody>
</table>

#### Engine Model Speed (rpm) Fuel type Engine Power (kW) Thermal power (kW) Global Eff. (%) Dimensions (L x W x H) Weight [kg] Genset Dry [L x W x H] [kg]

<table>
<thead>
<tr>
<th>Model</th>
<th>Electrical</th>
<th>1,200 (6)</th>
<th>1,500 (6)</th>
<th>1,800 (6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SGE - 18 SL</td>
<td>322</td>
<td>361</td>
<td>436</td>
<td>610</td>
</tr>
<tr>
<td>SGE - 36 SL</td>
<td>404</td>
<td>484</td>
<td>564</td>
<td>720</td>
</tr>
<tr>
<td>SGE - 56 SL</td>
<td>564</td>
<td>648</td>
<td>820</td>
<td>1,030</td>
</tr>
</tbody>
</table>

#### Engine Model Speed (rpm) Fuel type Engine Power (kW) Thermal power (kW) Global Eff. (%) Dimensions (L x W x H) Weight [kg] Genset Dry [L x W x H] [kg]

<table>
<thead>
<tr>
<th>Model</th>
<th>Biogas</th>
<th>1,200 (6)</th>
<th>1,500 (6)</th>
<th>1,800 (6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SGE - 18 SL</td>
<td>322</td>
<td>361</td>
<td>436</td>
<td>610</td>
</tr>
<tr>
<td>SGE - 36 SL</td>
<td>404</td>
<td>484</td>
<td>564</td>
<td>720</td>
</tr>
<tr>
<td>SGE - 56 SL</td>
<td>564</td>
<td>648</td>
<td>820</td>
<td>1,030</td>
</tr>
</tbody>
</table>

### Notes:

1. For S Series: Natural Gas MN>75 and Biogas: 62.5% CH₄, 36% CO₂ and 1.5% N₂.
2. For H and E Series: Natural Gas MN>80 and Biogas 67% CH₄ and 33% CO₂ (only for H Series).
3. For S Series: Natural Gas MN>75 and Biogas: 62.5% CH₄, 36% CO₂ and 1.5% N₂.
4. Thermal efficiency of the E Series engines calculated considering the exhaust gases heat recovery until 120ºC.
5. Biogas engines engine calculated considering the exhaust gases.
6. Lower emission engines are available. Please, contact Siemens for performance data.
7. Thermodynamic power at power factor =1. 400 V (50Hz) and 480 V (60 Hz).
8. Remarks: Engine performance data is given to ISO 20451-1, 2014 and 380 (note scale one level, with a tolerance of +5%).
9. - Electrical power at power factor =1. 400 V (50Hz) and 480 V (60 Hz).
10. - Biogas engines engine calculated considering the exhaust gases.
Article-No. PGOG-B10019-00-7600

Subject to changes and errors. The information given in this document only contains general descriptions and/or performance features which may not always specifically reflect those described, or which may undergo modification in the course of further development of the products. The requested performance features are binding only when they are expressly agreed upon in the concluded contract.