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Ingenuity for life

Siemens HL-class

The next generation of Siemens advanced air-cooled gas turbines

Siemens HL-class is paving the way to the next level of efficiency and performance. This evolutionary development step, derived from proven Siemens H-class technology, combines a series of new but already tested technologies. The result: A technology carrier to the next level with a combined cycle efficiency beyond 63% and a clear midterm goal of 65%.

New Siemens HL-class consists of three engines: SGT5-8000HL, SGT5-9000HL and SGT6-9000HL.



Key technologies

- 1 Evolutionary 3D blading for higher aero-efficiency
- 2 Advanced combustion system for higher firing temperatures and more operational flexibility
- 3 Innovative multi-layer coating for better blade robustness and less cooling-air consumption
- 4 Ultra-efficient internal cooling features for blades and vanes for less cooling air consumption
- 5 Optimized sealings for minimized leakage air
- 6 Large free-standing turbine blade 4 for higher power output



SGT5-8000HL

Performance data for simple cycle operation

| | 50 Hz |
|---------------------------|--|
| Power output | 481 MW |
| Fuel (examples) | Natural gas, LNG, distillate oil, other fuels on request |
| Frequency | 50 Hz |
| GT ramp-up | 85 MW/min |
| Efficiency | 42.6% |
| Heat rate | 8,447 kJ/kWh (8,006 Btu/kWh) |
| Turbine speed | 3,000 rpm |
| Pressure ratio | 24:1 |
| Exhaust mass flow | 850 kg/s (1,874 lb/s) |
| Exhaust temperature | 680° C (1,256° F) |
| NO _x emissions | Down to 2 ppm with SCR |
| CO emissions | 10 ppm |

Performance data for combined cycle operation

| | 50 Hz | |
|------------------------|----------------------------------|------------|
| | CC 1x1/1S | CC 2x1 |
| Net plant output | 708 MW | 1,416 MW |
| Net plant efficiency | > 63% | > 63% |
| Plant turn-down | 40% | 40% |
| Heat rate | < 5,714 kJ/kWh (< 5,416 Btu/kWh) | |
| Number of gas turbines | 1 | 2 |
| Pressure/reheat | Triple/Yes | Triple/Yes |
| Steam temperature | > 600° C (> 1,112° F) | |



SGT-9000HL series

Performance data for simple cycle operation

| | 50 Hz | | 60 Hz | |
|---------------------------|--|--|------------------------------|--|
| Power output | 567 MW | | 388 MW | |
| Fuel (examples) | Natural gas, LNG, distillate oil, other fuels on request | | | |
| Frequency | 50 Hz | | 60 Hz | |
| GT ramp-up | 85 MW/min | | 85 MW/min | |
| Efficiency | 42.6% | | 42.3% | |
| Heat rate | 8,461 kJ/kWh (8,019 Btu/kWh) | | 8,519 kJ/kWh (8,074 Btu/kWh) | |
| Turbine speed | 3,000 rpm | | 3,600 rpm | |
| Pressure ratio | 24:1 | | 24:1 | |
| Exhaust mass flow | 1,000 kg/s (2,205 lb/s) | | 700 kg/s (1,543 lb/s) | |
| Exhaust temperature | 680° C (1,256° F) | | 680° C (1,256° F) | |
| NO _x emissions | Down to 2 ppm with SCR | | Down to 2 ppm with SCR | |
| CO emissions | 10 ppm | | 10 ppm | |

Performance data for combined cycle operation

| | 50 Hz | | 60 Hz | |
|------------------------|----------------------------------|------------|----------------------------------|------------|
| | CC 1x1/1S | CC 2x1 | CC 1x1/1S | CC 2x1 |
| Net plant output | 841 MW | 1,682 MW | 577 MW | 1,154 MW |
| Net plant efficiency | > 63% | > 63% | > 63% | > 63% |
| Plant turn-down | 40% | 40% | 40% | 40% |
| Heat rate | < 5,714 kJ/kWh (< 5,416 Btu/kWh) | | < 5,714 kJ/kWh (< 5,416 Btu/kWh) | |
| Number of gas turbines | 1 | 2 | 1 | 2 |
| Pressure/reheat | Triple/Yes | Triple/Yes | Triple/Yes | Triple/Yes |
| Steam temperature | > 600° C (> 1,112° F) | | > 600° C (> 1,112° F) | |

SGT5-8000HL and SGT-9000HL series

Physical dimensions

| | 50 Hz | 60 Hz |
|------------------|---------------------------|-------------------------|
| Weight (approx.) | 497,000 kg (1,095,700 lb) | 305,000 kg (672,400 lb) |
| Length | 13.0 m (42.6 feet) | 10.8 m (35.4 feet) |
| Height | 5.3 m (17.4 feet) | 5.0 m (16.4 feet) |
| Width | 5.5 m (18.1 feet) | 4.3 m (14.1 feet) |

Simple cycle ratings are gross values at ISO ambient conditions. Combined cycle ratings are net values at ISO ambient conditions. Actual performance will vary with project-specific conditions and fuel.

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Power and Gas Division
Freyeslebenstrasse 1
91058 Erlangen, Germany

For more information, please contact
our Customer Support Center.
E-mail: support.energy@siemens.com

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