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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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