

LMS100 Gas Turbine (60 Hz)

Technology

The LMS100 is an intercooled gas turbine system, developed from GE frame and aeroderivative gas turbine technologies, with simple cycle thermal efficiencies of up to 44%.

- Peaking, mid-range and baseload power capabilities of up to 106 MW
- Unrestricted daily stops and starts
- Modular design for ease of maintenance and high availability
- Fast 10-minute start-up
- High part-power efficiency
- Load following and cycling capabilities

Experience

The LMS100 is a new gas turbine based on a combination of proven technologies, derived from the CF6-80E and CF6-80C2 aircraft engines, the predominant engines for the Boeing 747 and 767 wide-body aircraft, and from the frame 6FA gas turbine.

- GE CF6-80 engines have more than 100 million operating hours in airline service
- GE F technology units have more than eight million operating hours in power generation service
- End-Users: utilities, municipalities, independent power producers
- Configurations: simple cycle, cogeneration and combined cycle

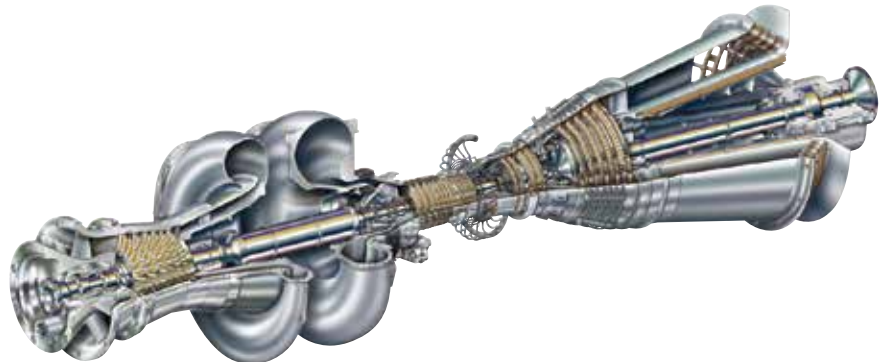
Innovation

GE Energy and GE Transportation collaborated—along with three companies from outside of GE—to develop the first modern intercooled gas turbine cycle.

- 100 MW Blocks of power
- Cycling capability
- Sustained power capability on hot days
- Fuel flexibility
- Boiler feedwater heating
- Two waste heat sources (exhaust and intercooler)

ISO performance based on natural gas

LMS100 (60 Hz)	SAC	DLE
Power Output (MW)	105.8	101.2
Heat Rate LHV (Btu/kWh)	7,877	7,816
Exhaust Flow (lbs/sec)	497	488
Exhaust Temperature (°F)	771	789
Emissions, NO _x @ 15% O ₂ (ppm)	25	25
Power Turbine Speed (rpm)	3,600	3,600
No. of Compressor Stages	20	20
No. of Turbine Stages		
Intermediate Pressure (IPT)	2	2
High Pressure (HPT)	2	2
Power (PT)	5	5



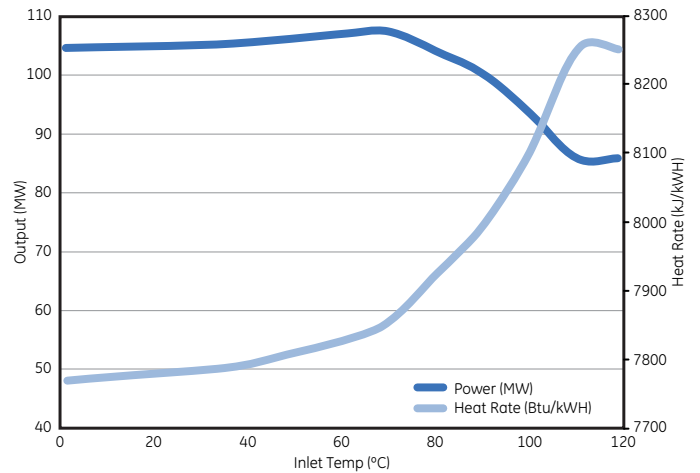
Service

GE Energy is the world's largest aeroderivative service provider, with a global network of field service offices and fully equipped service centers. A wide range of products and services are offered for the LMS100 utility and industrial operators, including:

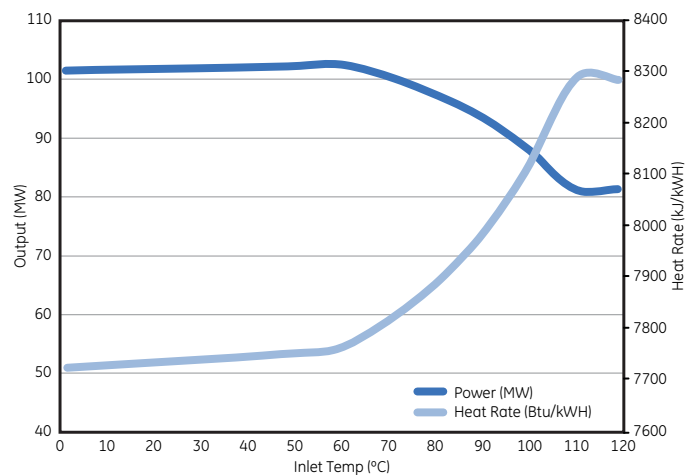
- Customer support 24/7/365
- Global field services capability
- Level IV Service Centers in Houston, Texas and Rheden, The Netherlands
- Comprehensive spare parts support
- Critical repairs available globally
- Spare or lease engine module options
- Rotatable module exchange programs
 - Gas Turbine Supercore
 - High Pressure Turbine
 - Intermediate Power Turbine
 - Combustor
 - Power Turbine
 - Low Pressure Turbine (Booster) Rotor
- CM&U – Upgrade programs
- Remote diagnostic services
- Customer training courses
- Wide variety of contractual or long-term service agreements

This comprehensive product offering, combined with our commitment to reduce service center and outage turn times, results in substantial life cycle cost savings for the plant owner/operator.

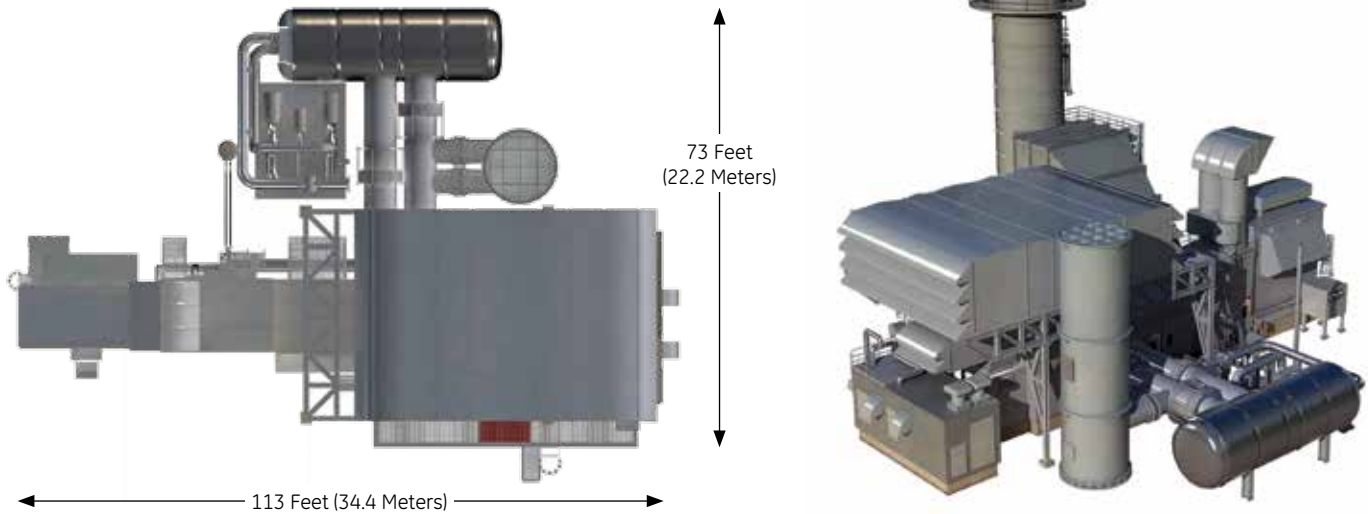
LMS100 SAC 60 Hz Output and Heat Rate



LMS100 DLE 60 Hz Output and Heat Rate



Package Layout



Standard 60 Hz LMS100 Generator Package

Gas Turbine

- 20-Stage Axial Compressor
 - 6 Low Pressure Stages and 14 High Pressure Stages
 - Off-Engine Air-to-Water Intercooler
 - Horizontal Split Casing
 - 42:1 Compression Ratio
 - 460 lb/s (209 kg/s) Nominal Inlet Mass Flow
- Annular Combustor
 - 30 Gas Fuel Nozzles, Water or Steam Injection for NO_x Control
 - 15 Gas Fuel Nozzles, Dry Low Emission Control
- 2-Stage High Pressure (HPT) and Intermediate Pressure Turbine (IPT)
- 5-Stage Aerodynamically Coupled Power Turbine (PT)

Generator

- 11.5 kV, 0.85 PF Continuous Duty
- 2 Pole, 3 Phase, Brushless Exciter
- WP11 Weather Protected
- Voltage Regulator/Neutral Side Protection CTs
- NEMA Class F Insulation and B Temperature Rise
- Integrated Protection Relay Panel

Package

- Local Control System in Weatherproof Room
- 24 V and 125 V DC Batteries
- 85 dBA Near Field Design
- Static Inlet Air Filters
- Electro-Hydraulic Start/Shutdown System
- Class 1 Div 2 Group D Class Electrical System
- Mark* V1e Duplex Digital Control System with a Human Machine Interface (HMI)
- Lube Oil System with Duplex Shell and Tube Coolers
- Turbine Factory Tested (Static)
- On and Off Line Water Wash
- 1-Year Parts/Service Warranty and Remote Monitoring and Diagnostics
- Package Familiarization Training
- Electronically Transmitted Drawings
- Start-Up Technical Assistance

Optional Equipment (Packaging)

- Water Cooled Generator (TEWAC)
- High Inertia Generator
- Power System Stabilizer (PSS)
- Synchronous Condenser
- Distillate (Liquid) Fuel System (available only for SAC)
- Dual Fuel System (available only for SAC)
- Pulse Clean Inlet Air Filter
- Online Water Wash for LPC
- Water Injection for NO_x Control - Gas or Liquid Fuel (available only for SAC)
- Dry Low Emissions (DLE)
- Combustion Inlet Air Heating Anti-Icing Coil – External-Heated
- Combustion Inlet Air Heating Anti-Icing – Compressor Bleed (available only for SAC)
- Combustion Inlet Air Heating Anti-Icing – Exhaust Heat Recovery
- Combustion Inlet Air Cooling - Evaporative Cooling
- Combustion Inlet Air Cooling – Chilling Coil
- Winterization (for colder climates)
- Duplex Shell and Tube Lube Oil Coolers
- Secondary Discharge CO₂ System
- Duplex Integrated Generator Protection System (IGPS)
- Ni-Cad Battery System
- Remote Workstation
- Alternative Generator Lineside and Neutral Cubicle Locations
- Duplex Water Injection Pumps (for NO_x Control)
- Combined Lineside and Breaker Cubicle

Optional Equipment (Balance of Plant)

- Secondary Cooling – Water to Air (Cooling Tower)
- Secondary Cooling – (Finned Tube to Air Heat Exchanger)
- Secondary Cooling Motor Control Center
- Gas Fuel Filter/Coalescing Skid
- Liquid Fuel Forwarding Pump Skid
- Liquid Fuel Filter Skid
- Fuel Gas Compressor System
- Instrument Air Compressor Skid
- Demineralized Water Filter Skid
- Simple Cycle Exhaust Stack
- Exhaust Stack Expansion Joint
- SCR and COR Catalyst Emissions Control Systems
- Continuous Emissions Monitoring System (CEMS)
- CTG Package Anchor Bolts/Fixators
- CTG Package First Fill Lubricants
- Power Control Module (PCM)
- Combustion Turbine Generator (CTG) Motor Control Center
- Intercooler Water Pump Skid Motor Control Center
- Balance of Plant (BOP) Motor Control Center
- Generator Step-Up (GSU) Transformer
- 15 kV Rated Generator Breaker
- Supervisory Control System
- Black Start Diesel Generator Package
- Black Start Generator Control System
- 240 V DC Motor Starters

