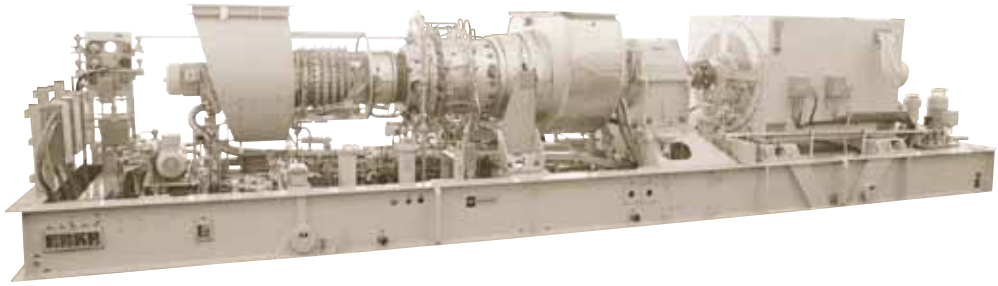
Solar® Turbines

A Caterpillar Company

MARS 100

Gas Turbine Generator Set

Power Generation



General Specifications

***Mars*® 100 Gas Turbine**

- Industrial, Two-Shaft
- 15 Stage Axial Compressor
  - Variable Inlet Guide Vanes and Stators
  - Pressure Ratio: 17.7:1
  - Inlet Airflow: 41.6 kg/sec (91.8 lb/sec)
  - Vertically Split Case
- Combustion Chamber, Annular-Type
  - 21 Conventional Fuel Injectors or 14 Lean-Premixed, Dry Low Emissions Injectors
  - Torch Ignitor System
- Power Turbine
  - 2-Stage Reaction
  - Speed, 50-Hz Generator: 8625 rpm
  - Speed, 60-Hz Generator: 8570 rpm
- Bearings
  - 4 Radial Journal: Tilt-Pad
  - 2 Thrust (GP & PT), Active: Tilt-Pad
  - 2 Thrust (GP & PT), Inactive: Fixed Tapered Land
- Coatings
  - Compressor: Inorganic Aluminum
  - Turbine and Nozzle Blades: Platinum Aluminide
- Vibration Transducer Type
  - Proximity Probes, 2 per Radial Bearing/2 per Thrust Bearing

Main Reduction Drive

- Epicyclic Type
  - 1500 or 1800 rpm

Generator

- 4 Pole, 3 Phase, 6 Wire, Wye Connected, Synchronous with Permanent Magnet Generator Exciter
- Available Construction Types:
  - Open Drip-Proof Construction
  - CACA/TEAAC (Closed Air, Cooling Air/Totally Enclosed, Air to Air Cooling)*
  - CACW/TEWAC (Closed Air, Cooling Water/Totally Enclosed, Water to Air Cooling)*
- Sleeve Bearings
- Vibration Monitoring; Velocity Transducers
- Vibration Monitoring; Displacement Transducers*
- NEMA Class F Insulation
- Class F Temperature Rise
- Class B Temperature Rise*
- Continuous Duty Rating Voltages:
  - 3300, 6600, 11 000 (50Hz)
  - 4160, 6900, 12 470, 13 200, 13 800 (60Hz)

Package

- Mechanical Construction
  - Steel Base Frame with Drip Pans
  - 316L Stainless Steel Piping
  - Compression Type Tube Fittings
- Start System
  - Direct Drive AC Motor with VFD Control
- Package Electrical Certification
  - NEC, CSA Class 1, Group D, Div.2
- Fuel System
  - Natural Gas
  - Diesel*
  - Dual (Natural Gas and Diesel)*
  - Low BTU Gas*
- Integrated Lube Oil System
  - Turbine-Driven Lube Pump
  - AC Motor Driven Pre/Post Lube Pump
  - DC Motor Driven Backup Lube Pump
  - Air to Oil Cooler
  - Water to Oil Cooler*
  - Integral Lube Oil Tank
  - Lube Oil Tank Heater*
  - Lube Oil Filter
  - Duplex Lube Oil Filter*
  - Oil Tank Vent Separator with Flame Arrestor
- Air Inlet and Exhaust Systems
  - Carbon Steel
  - Stainless Steel*
  - Barrier Type Filters
  - Self-Cleaning Filters
  - Inlet and Exhaust Silencers*
  - Inlet Evaporative Cooler*
  - Inlet Chiller Coils*
- Enclosure
  - Complete Package
  - Driver Only*
  - Fire Detection and CO_2 Suppression System
- Turbine Compressor Cleaning Systems
  - On-Crank/On-Line
  - Portable Cleaning Tank*
- Package Power
  - 120VDC Battery/Charger System*
- *Turbotronic*™ 4 On-Skid Gas Turbine and Generator Control System Features
  - Combination Generator Control Module with Load Share, Auto Synchronization, Voltage Control
  - Standard Display with Discrete Event Log, Strip Chart, Historical Trend, Maintenance Screen
  - Vibration and Temperature Monitoring
  - English Display Text and Labels
  - Spanish, Portuguese, German, French or Simplified Chinese Display Text and Labels*
  - Auxiliary and Remote Display/Control Terminals*
  - Turbine Performance Map*
  - KW Import Control*
  - KVAR/Power Factor Control
  - ControlNet Redundant Media, Ethernet, Modbus RS232C/422/485 Supervisory Interface*
  - Heat Recovery Application Interface*
  - Multi-Unit Applications: Load Shed Control, Import/Export or kW/KVAR Control Panels*
  - *InSight System*™ Equipment Health Management*
  - Printer/Logger*
- Electrical System Options
  - Neutral Grounding Resistor or Transformer*
  - Switchgear and Generator Protective Relay*
  - Motor Control Center with Automatic Transfer Switch*
- Documentation
  - Drawings
  - Quality Control Data Book
  - Inspection and Test Plan
  - Test Reports
  - O&M Manuals
- Factory Testing of Turbine
- Factory Testing of Package Systems
  - Non-Dynamic
  - Dynamic

* Option

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Power Generation

Performance

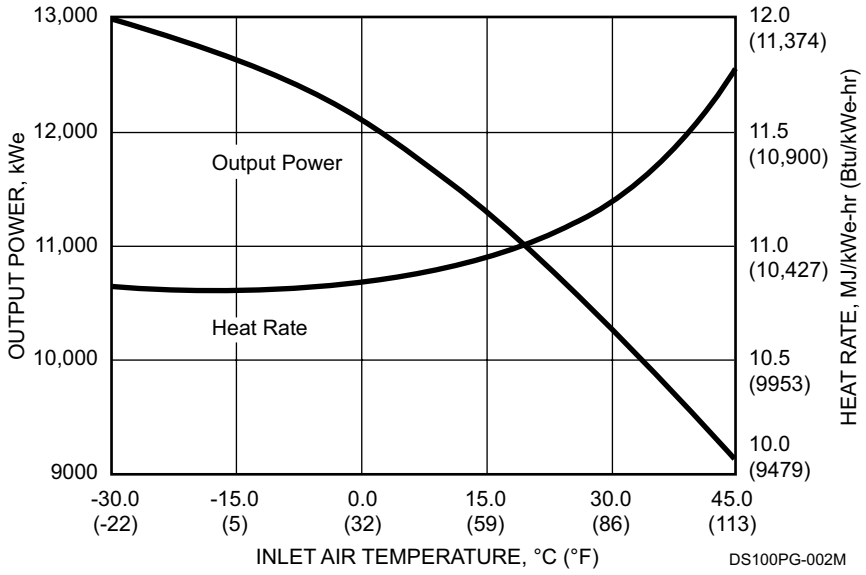
Output Power	11 350 kWe
Heat Rate	10 935 kJ/kWe-hr (10,365 Btu/kWe-hr)
Exhaust Flow	153 245 kg/hr (337,850 lb/hr)
Exhaust Temp.	485°C (905 °F)

Application Performance

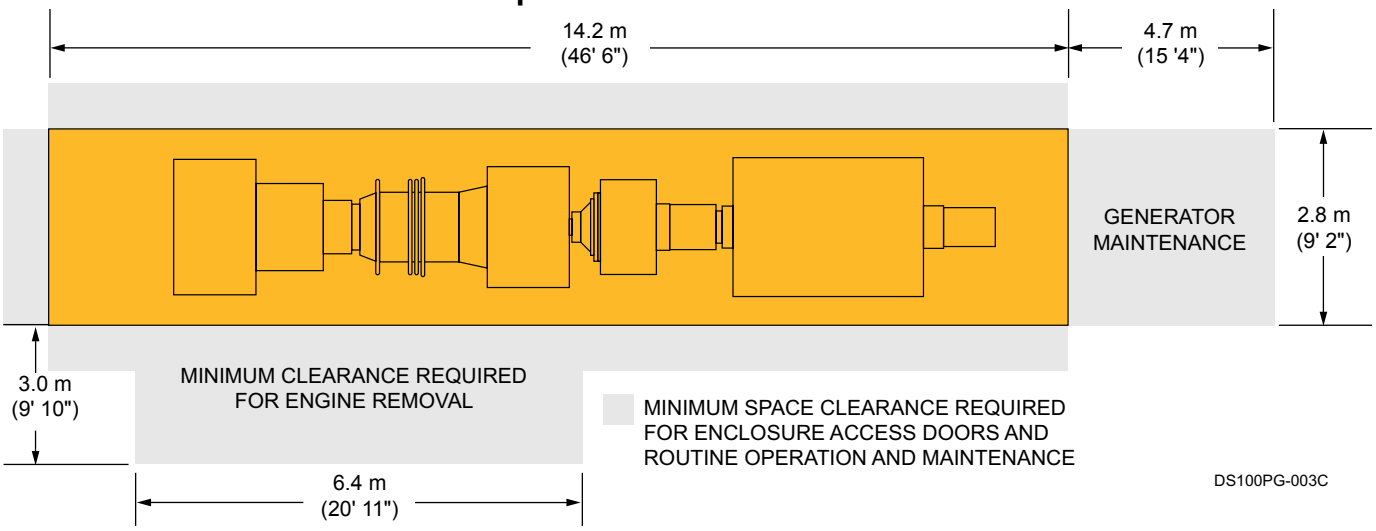
Steam (Unfired)	23.7 tonnes/hr (52,340 lb/hr)
Steam (Fired) 1536°C (2800°F)	113.8 tonnes/hr (250,880 lb/hr)
Chilling (Absorp.)	20 490 kW (5820 refrigeration tons)

Nominal rating – per ISO
At 15°C (59°F), sea level
No inlet/exhaust losses
Relative humidity 60%
Natural gas fuel with
LHV = 35 MJ/nm³ (940 Btu/scf)
No accessory losses
Engine efficiency: 32%
(Measured at generator terminals)

Available Power



Enclosure Access and Maintenance Space



Package Height: 3.8 m (12' 6")
Package Weight: 86 200 kg (190,000 lb)

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DS100PG/0113/EO

FOR MORE INFORMATION

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