Solar Turbines

A Caterpillar Company

CENTAUR 50

Gas Turbine Generator Set

Power Generation



General Specifications

Centaur® 50 Gas Turbine

- · Industrial, Single-Shaft
- · 11 Stage Axial Compressor
 - Variable Inlet Guide Vanes and Stators
 - Pressure Ratio: 10.6:1
 - Inlet Airflow: 41.4 kg/sec (18.8 lb/sec)
 - Vertically Split Case
- · Combustion Chamber, Annular-Type
- 12 Conventional Fuel Injectors or 12 Lean-Premixed, Dry Low Emissions SoLoNOx Injectors
- Single Torch Ignitor System
- Power Turbine
 - 3-Stage Reaction
 - Clockwise Rotation
- Bearings
 - 3 Radial Journal: Tilt-Pad
 - 1 Thrust, Active: Tilt-Pad
 - 1 Thrust, Inactive: Fixed Tapered Land
- Coatings
- Compressor: Inorganic Aluminum
- Turbine and Nozzle Blades: Precious Metal Diffusion Aluminide
- · Vibration Transducer Type
 - Proximity Probes, 2 per Radial Bearing/ 2 per Thrust Bearing, horizontal and vertical
 - Velocity Pick-up*

Main Reduction Drive

- Epicyclic Type
 - 1500 or 1800 rpm (50 or 60 Hz)
 - Vibration monitoring: Acceleration Transducer

Generato

- 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 CO2 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, Data Highway Plus or 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

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Performance

Output Power	4600 kWe
Heat Rate	12 270 kJ/kWe-hr (11,630 Btu/kWe-hr)
Exhaust Flow	68 680 kg/hr (151,410 lb/hr)
Exhaust Temp.	510°C (950°F)

Application Performance

Steam (Unfired) 11.5 tonnes/hr (25,280 lb/hr)

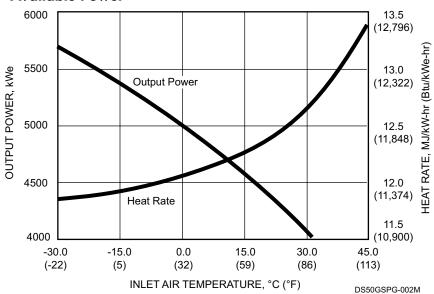
Steam (Fired) 50.4 tonnes/hr 1536°C (2800°F) (111,190 lb/hr)

Chilling (Absorp.) 9890 kW (2810 refrigeration tons)

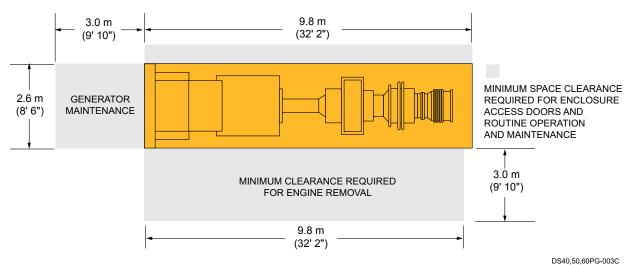
Nominal rating – per ISO At 15°C (59°F), sea level No inlet/exhaust losses Relative humidity 60% Natural gas fuel with LHV = 35 MJ/Nm³ (940 Btu/scf) No accessory losses

Engine efficiency: 29.3% (measured at generator terminals)

Available Power



Enclosure Access and Maintenance Space



Package Height: 3.2 m (10' 5")
Package Weight: 38 900 kg (85,800 lb)

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