# **Solar Turbines**

## A Caterpillar Company

# **TAURUS 70 Gas Turbine Generator Set**

#### **Power Generation**



# **General Specifications**

### Taurus™ 70 Gas Turbine

- · Industrial, Single-Shaft
- 14 Stage Axial Compressor
  - Variable Inlet Guide Vanes and Stators
  - Pressure Ratio: 17.6:1 Inlet Airflow: 26.6 kg/sec (58.5 lb/sec)
  - Vertically Split Case
- · Combustion Chamber, Annular-Type 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: Platium
- Aluminide (Stages 1 and 2)
- Vibration Transducer Type Proximity Probes, 2 per Radial Bearing/
  - 2 per Thrust Bearing
  - Velocity Pick-up\*

#### Main Reduction Drive

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

\* Option

- 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)

#### 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
- 4160, 6900, 12 470, 13 200, 13 800 (60Hz) *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\*

ControlNet Redundant Media, Ethernet,

Data Highway Plus or Modbus RS232C/422/485 Supervisory Interface\*

Multi-Unit Applications: Load Shed Control,

Import/Export or kW/KVAR Control Panels\*

Neutral Grounding Resistor or Transformer\*

Switchgear and Generator Protective Relay\*

Heat Recovery Application Interface\*

InSight System™ Equipment Health

Motor Control Center with Automatic

- Turbine Performance Map\*
- KW Import Control\* - KVAR/Power Factor Control\*

Management\*

Printer/Logger\*

Transfer Switch\*

Documentation

Test Reports

- Non-Dynamic

- Dynamic

**O&M Manuals** 

- Drawings

Electrical System Options

- Quality Control Data Book

- Inspection and Test Plan

Factory Testing of Turbine

Factory Testing of Package Systems

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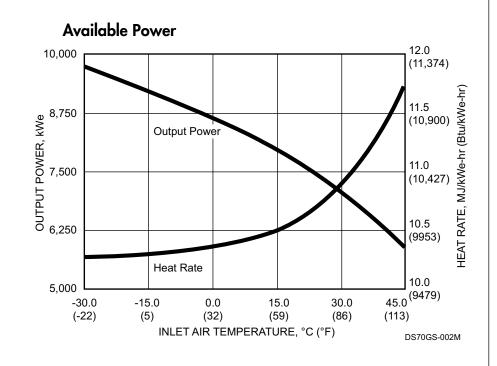
#### Power Generation

## Performance

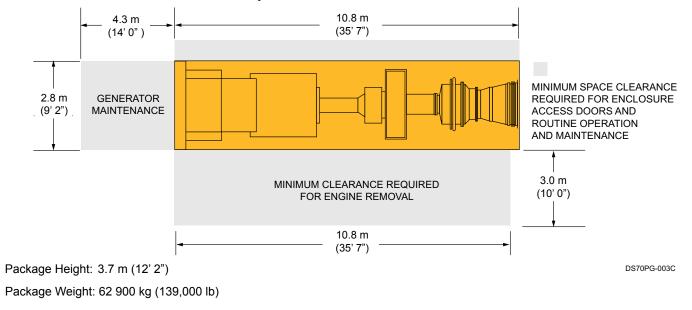
Output Power	7965 kWe
Heat Rate	10 505 kJ/kWe-hr (9955 Btu/kWe-hr)
Exhaust Flow	96 775 kg/hr (213,350 lb/hr)
Exhaust Temp.	505°C (945°F)

### **Application Performance**

Steam (Unfired)	16.5 tonnes/hr (36,370 lb/hr)
Steam (Fired) 1536°C (2800°F)	72.3 tonnes/hr (159,530 lb/hr)
Chilling (Absorp.)	14 220 kW 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/Nm <sup>3</sup> (940 Btu/scf) No accessory losses Engine efficiency: 34% (Measured at generator terminals)	



### **Enclosure Access and Maintenance Space**



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