General Specifications

Mars® 100 Gas Turbine

• Industrial, Two-Shaft
• Axial Compressor
  – 15-Stage
  – Variable Inlet Guide Vanes
  – Pressure Ratio: 16.3:1
  – Inlet Airflow: 41.6 kg/sec (91.8 lb/sec)
  – Vertically Split Case
• Combustion Chamber
  – Standard: Annular-Type (Conventional)
  – Optional: Annular-Type, Lean-Premixed, Dry, Low Emission (SoLoNOx™)
  – 21 Fuel Injectors (Standard)
  – 14 Fuel Injectors (SoLoNOx)
• Torched Ignitor System
• Power Turbine
  – 2-Stage, Axial
  – Speed, 50-Hz Generator: 8625 rpm
  – Speed, 60-Hz Generator: 8570 rpm
• Bearings
  – Journal: Tilt-Pad
  – Thrust, Active: Tilt-Pad
  – Thrust, Inactive: Fixed Tapered Land
• Coatings
  – Compressor: Inorganic Aluminum
  – Turbine and Nozzle Blades: Platinum Aluminide
• Vibration Transducer Type
  – Proximity Probes
  – Velocity Pick-up
Main Reduction Drive
• Epicyclic Type
• 1500 or 1800 rpm Generator
• Type: 4 Pole (Salient) Solid Rotor, 6-Wire, Wye Connection, Synchronous Generator with Brushless Exciter

• Construction Options
  – ODP (Open Drip Proof)
  – WPII (Weather Protected II)
  – CACA/TEAAC (Closed Air, Cooling Air/Toally Enclosed, Air to Air Cooling)
  – CACW/TEWAC (Closed Air, Cooling Water/Toally Enclosed, Water to Air Cooling)
• Sleeve Bearings
• Voltage Regulation
  – Solid-State Regulation with Permanent Magnet Generator (PMG)
• Insulation/Temperature Rise
  – NEMA Class F w/VPI / Class B
  – NEMA Class F w/VPI / Class F
• Voltages: 3300 to 13,800 Volts
• Frequency: 50 or 60 Hz

Package
• Mechanical Construction
  – Steel Base Frame with Drip Pans
  – 316L Stainless Steel Piping
  – Compression-Type Tube Fittings
  – Suitable for 3-Point Mounting
  – FPSO Modifications (Option)
• Electrical System
  – NEC, Class 1, Group D, Div 2
  – CENELEC/ATEX Zone 2
  – Conduit/Cable Tray Wiring
  – 120VDC Battery/Charger System
• Direct-Drive AC Start System
• Fuel Systems
  – Conventional Combustion or Dry Low Emission (SoLoNOx)
• Fuel Types
  – Natural Gas or Dual (Gas/Distillate)
• Integrated Lube Oil System
  – Turbine-Driven Main Pump
  – AC Motor-Driven Pre/Post Pump
  – DC (120V) Motor-Driven Backup Pump
  – Oil Cooler and Oil Heater (Options)
  – Tank Vent Separator and Flame Trap
  – Lube Oil Filter
• On-Crank or On-Crank/On-Line Turbine Compressor Cleaning System (Options)
  – Portable Cleaning Tank (Option)
• Air Inlet and Exhaust System
  – Carbon Steel
  – Stainless Steel
  – Marine-Type Filters
• Enclosure (Driver Only or Complete)
  – Fire Detection and Suppression
• Factory Testing of Turbine and Package
• Documentation
  – Electrical Drawings
  – Mechanical Drawings
  – Quality Control Data Book
  – Inspection and Test Plan
  – Test Reports
  – Operation and Maintenance Manuals
• Digital Onskid Display Panel

Turbotronic™ Control System
• Onskid Control System
  – Optional Offskid System
  – 24 VDC Control Power (120VDC Input)
  – Serial Link Supervisory Interface
  – Field Programmable
• Vibration Monitoring
  – Turbine Bearings and Shaft
  – Gearbox
  – Generator Bearings
• Temperature Monitoring
  – Turbine Combustion Process
  – Turbine Bearings and Lube Oil
  – Generator Bearings and Windings
• Generator Control
  – Selectable Control Modes
  – Solid-State Voltage Regulation
  – Automatic Synchronization
  – Metering Panel with Manual Synchronization (Option)
  – KW Control (Option)
• TT4000 Display and Monitoring System
  – Multiple Operator Display Screens
  – Data Collection and Playback
  – Turbine Performance Map (Option)
  – Printer/Logger (Option)
  – Predictive Emissions Monitoring (Option)

Oil & Gas Applications

MARS 100
Gas Turbine Generator Set

Oil & Gas Applications

* Non-standard option
Performance

Output Power
Continuous Duty 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)

Nominal Rating – 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: 32.9%
(measured at generator terminals)

Available Power

<table>
<thead>
<tr>
<th>OUTPUT POWER, kWe</th>
<th>HEAT RATE, MJ/kWe-hr (Btu/kWe-hr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>13,000</td>
<td>12.0 (11,374)</td>
</tr>
<tr>
<td>12,000</td>
<td>11.5 (10,900)</td>
</tr>
<tr>
<td>11,000</td>
<td>11.0 (10,427)</td>
</tr>
<tr>
<td>10,000</td>
<td>10.5 (9953)</td>
</tr>
<tr>
<td>9,000</td>
<td>10.0 (9479)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OUTPUT POWER, kW e</th>
<th>HEAT RATE, MJ/kWe-hr (Btu/kWe-hr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>45.0 (113)</td>
<td>12.0 (11,374)</td>
</tr>
<tr>
<td>30.0 (86)</td>
<td>11.5 (10,900)</td>
</tr>
<tr>
<td>25.0 (73)</td>
<td>11.0 (10,427)</td>
</tr>
<tr>
<td>20.0 (59)</td>
<td>10.5 (9953)</td>
</tr>
<tr>
<td>15.0 (46)</td>
<td>10.0 (9479)</td>
</tr>
<tr>
<td>10.0 (28)</td>
<td>-30.0 (-22)</td>
</tr>
<tr>
<td>5.0 (15)</td>
<td>-15.0 (5)</td>
</tr>
<tr>
<td>0.0 (32)</td>
<td>0.0 (32)</td>
</tr>
<tr>
<td>5.0 (15)</td>
<td>15.0 (59)</td>
</tr>
<tr>
<td>10.0 (86)</td>
<td>20.0 (73)</td>
</tr>
<tr>
<td>15.0 (113)</td>
<td>30.0 (86)</td>
</tr>
<tr>
<td>20.0 (140)</td>
<td>45.0 (113)</td>
</tr>
</tbody>
</table>

Package Dimensions

Length: 14.2 m (46’ 6")
Width: 2.8 m (9’ 2")
Height: 3.8 m (12’ 6")
Typical Weight: 86 180 kg (190,000 lb)