GAS GENERATOR SET

NATURAL GAS CONTINUOUS
(For CHP Applications)
2000 ekW 2500 kVA
50 Hz 1500 rpm

Caterpillar is leading the power generation marketplace with power solutions engineered to deliver unmatched flexibility, expandability, reliability and cost-effectiveness.

FEATURES

EMISSIONS
• Meets most worldwide emission levels down to 0.5 g/bhp-hr (250 mg/Nm³) Nox level without after treatment

FULL RANGE OF ATTACHMENT
• Wide range of bolt-on system expansion attachments, factory designed and tested.
• Flexible packaging options for easy and cost effective installation.

PROVEN SYSTEM
• Fully prototype tested.
• Field proven in a wide range of applications worldwide.
• Certified torsional vibration analysis available

WORLDWIDE PRODUCT SUPPORT
• Cat® dealers provide extensive post sales support including maintenance and repair agreements
• Cat dealers have over 1,800 dealer branch stores operating in 200 countries
• The Caterpillar S•O•S™ program cost effectively detects internal engine component conditions, even the presence of unwanted fluids and combustion by-products

Cat® G3520C GAS ENGINE
• Robust high speed diesel block design provides prolonged life and lower owning and operating costs
• Designed for maximum performance on low pressure gaseous fuel supply.
• Simple open chamber combustion system for reliability and fuel flexibility.
• Leading edge technology in ignition system and air/fuel ratio control for lower emission and engine efficiency
• One electronic control module handles all engine functions: ignition, governing, air/fuel ratio control and engine protection

CAT SR4B GENERATOR
• Designed to match performance and output characteristics of Cat gas engines
• Industry leading mechanical and electrical design
• High efficiency

CAT EMCP II+ CONTROL PANEL
• Simple user friendly interface and navigation
• Digital monitoring, metering and protection setting
• Fully-featured power metering and protection relay
• UL508A Listed
• Remote control and monitor capability options
## FACTORY INSTALLED STANDARD & OPTIONAL EQUIPMENT

<table>
<thead>
<tr>
<th>System</th>
<th>Standard</th>
<th>Optional</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gas Engine Control Module (GECM)</strong></td>
<td>Fuel/air ratio control;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Start/stop logic: gas purge cycle, staged shutdown;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Engine Protection System: detonation sensitive timing,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>high exhaust temperature shutdown;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Governor: Transient richening and turbo bypass control;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ignition.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Island Mode Feature -- additional engine control module ,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>new software and engine sensors</td>
<td></td>
</tr>
<tr>
<td><strong>Air Inlet</strong></td>
<td>Two element, single-stage air cleaner with enclosure and</td>
<td>Air cleaner with precleaner;</td>
</tr>
<tr>
<td></td>
<td>service indicator</td>
<td>Mounting stand</td>
</tr>
<tr>
<td><strong>Control Panel</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Cooling</strong></td>
<td>ANSI/DN customer flange connections for JW inlet and outlet</td>
<td>Coolant level drain line with valves, fan with guard;</td>
</tr>
<tr>
<td></td>
<td>Cat flanges on SCAC circuit</td>
<td>Inlet/Outlet connections.</td>
</tr>
<tr>
<td><strong>Exhaust</strong></td>
<td>Dry exhaust manifolds, insulated and shielded;</td>
<td>Flange; Exhaust expander; Elbow: Flexible fitting;</td>
</tr>
<tr>
<td></td>
<td>Center section cooled turbocharger with Cat flanged outlet;</td>
<td>Muffler and spark-arresting muffler with companion flanges.</td>
</tr>
<tr>
<td></td>
<td>Individual exhaust port and turbocharger outlet wired to</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Integrated Temperature Sensing Module (ITSM) with GECM</td>
<td></td>
</tr>
<tr>
<td></td>
<td>providing alarms and shutdowns.</td>
<td></td>
</tr>
<tr>
<td><strong>Fuel</strong></td>
<td>Electronic fuel metering valve;</td>
<td>Fuel filter;</td>
</tr>
<tr>
<td></td>
<td>Throttle plate, 24V DC actuator, controlled by GECM;</td>
<td>Gas pressure regulator;</td>
</tr>
<tr>
<td></td>
<td>Fuel system is sized for 31.5 to 47.2 MJ/Nm³ (800 to 1200 Btu/cu ft) dry pipeline natural gas with pressure of 10.2 to 34.5 kPa (1.5 to 5 psi) to the engine fuel control valve.</td>
<td>Gas shutoff valve, 24V, ETR (Energized-To-Run)</td>
</tr>
<tr>
<td><strong>Generator</strong></td>
<td>SR4B generator, includes:</td>
<td>Medium and high voltage generators and attachments;</td>
</tr>
<tr>
<td></td>
<td>Cat Digital Voltage Regulator (Cat DVR) with 3-phase</td>
<td>Low voltage extension box; Cable access box;</td>
</tr>
<tr>
<td></td>
<td>sensing and KVAR/PF control;</td>
<td>Air filter for generator; Bearing temperature detectors;</td>
</tr>
<tr>
<td></td>
<td>Reactive droop;</td>
<td>Manual voltage control;</td>
</tr>
<tr>
<td></td>
<td>Bus bar connections;</td>
<td>European bus bar.</td>
</tr>
<tr>
<td></td>
<td>Winding temperature detectors;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Anti-condensation space heater.</td>
<td></td>
</tr>
<tr>
<td><strong>Governing</strong></td>
<td>Electronic speed governor as part of GECM;</td>
<td>Woodward load sharing module</td>
</tr>
<tr>
<td></td>
<td>Electronically-controlled 24V DC actuator connected to throttle shaft.</td>
<td></td>
</tr>
<tr>
<td><strong>Ignition</strong></td>
<td>Electronic Ignition System controlled by GECM;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Individual cylinder Detonation Sensitive Timing (DST)</td>
<td></td>
</tr>
<tr>
<td><strong>Lubrication</strong></td>
<td>Lubricating oil; Gear type lube oil pump;</td>
<td>Oil level regualtor;</td>
</tr>
<tr>
<td></td>
<td>Oil filter, filler and dipstick;</td>
<td>Prelube pump;</td>
</tr>
<tr>
<td></td>
<td>Integral lube oil cooler;</td>
<td>Positive crankcase ventilation system.</td>
</tr>
<tr>
<td><strong>Mounting</strong></td>
<td>330 mm structural steel base (for low and medium voltage units);</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Spring-type anti-vibration mounts (shipped loose)</td>
<td></td>
</tr>
<tr>
<td><strong>Starting / Charging</strong></td>
<td>24V starting motors;</td>
<td>Charging alternator;</td>
</tr>
<tr>
<td></td>
<td>Battery with cables and rack (shipped loose);</td>
<td>Battery charger;</td>
</tr>
<tr>
<td></td>
<td>Battery disconnect switch;</td>
<td>Oversized battery;</td>
</tr>
<tr>
<td></td>
<td>60A, 24V charging alternator (standard on 60Hz 1800rpm only)</td>
<td>Jacket water heater.</td>
</tr>
<tr>
<td><strong>General</strong></td>
<td>Paint -- Caterpillar Yellow except rails &amp; radiators;</td>
<td>Crankcase explosion relief valve;</td>
</tr>
<tr>
<td></td>
<td>Damper guard.</td>
<td>Engine barring group;</td>
</tr>
<tr>
<td></td>
<td>Operation and Maintenance Manuals, Parts Book.</td>
<td>EEC D.O.I and other certifications</td>
</tr>
</tbody>
</table>
CONTINUOUS 2000 ekW 2500 kVA
50 Hz 1500 RPM

SPECIFICATIONS

<table>
<thead>
<tr>
<th>GAS ENGINE</th>
<th>CAT EMCPPI+ CONTROL PANEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>G3520C SCAC 4-stroke-cycle, watercooled gas engine</td>
<td>• Power by 24 volts DC</td>
</tr>
<tr>
<td>Number of Cylinders</td>
<td>• NEMA 12, IP44 dust-proof enclosure</td>
</tr>
<tr>
<td>Bore --- mm (in)</td>
<td>• Lockable hinged door</td>
</tr>
<tr>
<td>Stroke --- mm (in)</td>
<td>• Single-location customer connection</td>
</tr>
<tr>
<td>Displacement --- L (cu in)</td>
<td>• Auto start/stop control switch</td>
</tr>
<tr>
<td>Compression Ratio</td>
<td>• Voltage adjustment potentiometer</td>
</tr>
<tr>
<td>Aspiration</td>
<td>• True RMS AC metering, 3 phase</td>
</tr>
<tr>
<td>Cooling Type</td>
<td>• Purge cycle and staged shutdown logic</td>
</tr>
<tr>
<td>Fuel System</td>
<td>• Digital indication for:</td>
</tr>
<tr>
<td>Governor Type</td>
<td>RPM</td>
</tr>
<tr>
<td></td>
<td>Operating hours</td>
</tr>
<tr>
<td></td>
<td>Oil pressure</td>
</tr>
<tr>
<td></td>
<td>Coolant temperature</td>
</tr>
<tr>
<td></td>
<td>DC voltage</td>
</tr>
<tr>
<td></td>
<td>L-L volts, L-N volts, phase amps, Hz, ekW, kVA, kVAR, kWhr, %kW, pf</td>
</tr>
<tr>
<td></td>
<td>System diagnostic codes</td>
</tr>
<tr>
<td></td>
<td>• Shutdown with indicating lights;</td>
</tr>
<tr>
<td></td>
<td>Low oil pressure</td>
</tr>
<tr>
<td></td>
<td>High coolant temperature</td>
</tr>
<tr>
<td></td>
<td>High oil temperature</td>
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<tr>
<td></td>
<td>Overspeed</td>
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<tr>
<td></td>
<td>Overcrank</td>
</tr>
<tr>
<td></td>
<td>Emergency stop</td>
</tr>
<tr>
<td></td>
<td>Detonation sensitive timing</td>
</tr>
<tr>
<td></td>
<td>• Programmable protective relaying functions:</td>
</tr>
<tr>
<td></td>
<td>Under / Over voltage</td>
</tr>
<tr>
<td></td>
<td>Under / Over frequency</td>
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<tr>
<td></td>
<td>Overcurrent</td>
</tr>
<tr>
<td></td>
<td>Reverse power</td>
</tr>
<tr>
<td></td>
<td>• Spare indicator LEDs</td>
</tr>
<tr>
<td></td>
<td>• Spare alarm/shutdown inputs</td>
</tr>
</tbody>
</table>

Consult your Cat dealer for all available voltages and performance
## TECHNICAL DATA

<table>
<thead>
<tr>
<th>G3520C Gas Generator Set</th>
<th>DM 5844</th>
<th>DM 5847</th>
<th>DM5849</th>
<th>DM5838</th>
<th>DM5840</th>
<th>DM5842</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emission level (NOₓ)</td>
<td>mg/Nm³</td>
<td>500</td>
<td>350</td>
<td>250</td>
<td>500</td>
<td>350</td>
</tr>
<tr>
<td>Aftercooler SCAC (Stage 2)</td>
<td>Deg C</td>
<td>32</td>
<td>32</td>
<td>32</td>
<td>54</td>
<td>54</td>
</tr>
<tr>
<td><strong>Package Performance</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power Rating @ 0.8 pf (without water pumps and without fan)</td>
<td>ekW Continuous</td>
<td>2000</td>
<td>2000</td>
<td>2000</td>
<td>2000</td>
<td>2000</td>
</tr>
<tr>
<td>Power Rating @ 0.8 pf (without water pumps and without fan)</td>
<td>kVA Continuous</td>
<td>2500</td>
<td>2500</td>
<td>2500</td>
<td>2500</td>
<td>2500</td>
</tr>
<tr>
<td>Power Rating @ 1.0 pf (without water pumps and without fan)</td>
<td>ekW Continuous</td>
<td>2020</td>
<td>2020</td>
<td>2020</td>
<td>2020</td>
<td>2020</td>
</tr>
<tr>
<td>Electric Efficiency @ 1.0 pf (ISO 3046/1)</td>
<td>%</td>
<td>40.5</td>
<td>39.8</td>
<td>39.4</td>
<td>40.5</td>
<td>39.9</td>
</tr>
<tr>
<td>Mechanical Power</td>
<td>bkW</td>
<td>2070</td>
<td>2070</td>
<td>2070</td>
<td>2070</td>
<td>2070</td>
</tr>
</tbody>
</table>

| **Fuel Consumption** |         |         |        |        |        |        |
| 100% load w/o fan | Nm³/hr | 505 | 513 | 518 | 504 | 512 | 516 |
| 75% load w/o fan | Nm³/hr | 389 | 396 | 400 | 387 | 393 | 396 |
| 50% load w/o fan | Nm³/hr | 271 | 276 | 279 | 269 | 273 | 276 |

| **Altitude Capability** |         |        |        |        |        |        |
| At 25° C (77° F) ambient, above sea level | m | 390 | 298 | 238 | 250 | 250 | 250 |

| **Cooling System** |         |         |        |        |        |        |
| Ambient air temperature | Deg C | 25 | 25 | 25 | 25 | 25 | 25 |
| Jacket water temperature (Maximum outlet) | Deg C | 90 | 90 | 90 | 90 | 90 | 90 |

| **Exhaust System** |         |         |        |        |        |        |
| Combustion air inlet flow rate | Nm³/min | 145 | 149 | 151 | 147 | 150 | 152 |
| Exhaust stack gas temperature | Deg C | 449 | 449 | 457 | 453 | 456 | 458 |
| Exhaust gas flow rate | Nm³/min | 154 | 154 | 160 | 156 | 159 | 161 |
| Exhaust flange size (internal diameter) | mm | 328 | 328 | 328 | 328 | 328 | 328 |

| **Heat Rejection** |         |         |        |        |        |        |
| Heat rejection to JW, oil cooler and AC - Stage 1 | kW | 1040 | 1050 | 1055 | 1074 | 1094 | 1108 |
| Heat rejection to AC - Stage 2 | kW | 197 | 200 | 202 | 126 | 131 | 134 |
| Heat rejection to exhaust (LHV to 25° C) | kW | 1679 | 1750 | 1797 | 1712 | 1762 | 1793 |
| Heat rejection to exhaust (LHV to 120° C) | kW | 1190 | 1239 | 1270 | 1219 | 1254 | 1274 |
| Heat rejection to atmosphere from engine | kW | 125 | 125 | 125 | 125 | 125 | 125 |
| Heat rejection to atmosphere from generator (Typical) | kW | 64 | 64 | 64 | 64 | 64 | 64 |

| **Lubrication System** |         |         |        |        |        |        |
| Standard sump refill with filter change | L | 541 | 541 | 541 | 541 | 541 | 541 |

| **Emissions** |         |         |        |        |        |        |
| NOₓ @ 5% O₂ (dry) | mg/Nm³ | 500 | 350 | 250 | 500 | 350 | 250 |
| CO @ 5% O₂ (dry) | mg/Nm³ | 971 | 962 | 957 | 1043 | 998 | 968 |
| THC @ 5% O₂ (dry) | mg/Nm³ | 2675 | 2899 | 3048 | 2643 | 2768 | 2851 |
| NMHC @ 5% O₂ (dry) | mg/Nm³ | 402 | 435 | 458 | 397 | 416 | 428 |
| Exhaust O₂ (dry) | % | 9.3 | 9.6 | 9.7 | 9.4 | 9.5 | 9.5 |
### TECHNICAL DATA

**G3520C Gas Generator Set**

<table>
<thead>
<tr>
<th>Emission level (NOₓ)</th>
<th>DM 5845</th>
<th>DM 5848</th>
<th>DM 5850</th>
<th>DM 5839</th>
<th>DM 5841</th>
<th>DM 5843</th>
</tr>
</thead>
<tbody>
<tr>
<td>mg/Nm³</td>
<td>500</td>
<td>350</td>
<td>250</td>
<td>500</td>
<td>350</td>
<td>250</td>
</tr>
<tr>
<td>Aftercooler SCAC (Stage 2)</td>
<td>Deg C</td>
<td>32</td>
<td>32</td>
<td>32</td>
<td>54</td>
<td>54</td>
</tr>
</tbody>
</table>

**Package Performance**

<table>
<thead>
<tr>
<th>Power Rating @ 0.8 pf (without water pumps and without fan)</th>
<th>ekW Continuous</th>
<th>2000</th>
<th>2000</th>
<th>2000</th>
<th>2000</th>
<th>2000</th>
<th>2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Rating @ 0.8 pf (without water pumps and without fan)</td>
<td>kVA Continuous</td>
<td>2500</td>
<td>2500</td>
<td>2500</td>
<td>2500</td>
<td>2500</td>
<td>2500</td>
</tr>
<tr>
<td>Power Rating @ 1.0 pf (without water pumps and without fan)</td>
<td>ekW Continuous</td>
<td>2020</td>
<td>2020</td>
<td>2020</td>
<td>2020</td>
<td>2020</td>
<td>2020</td>
</tr>
<tr>
<td>Electric Efficiency @ 1.0 pf (ISO 3046/1)</td>
<td>%</td>
<td>40.6</td>
<td>39.9</td>
<td>39.5</td>
<td>40.5</td>
<td>39.9</td>
<td>39.6</td>
</tr>
<tr>
<td>Mechanical Power (without water pumps and without fan)</td>
<td>bkW</td>
<td>2070</td>
<td>2070</td>
<td>2070</td>
<td>2070</td>
<td>2070</td>
<td>2070</td>
</tr>
</tbody>
</table>

**Fuel Consumption**

| 100% load w/o fan | Nm³/hr | 504 | 512 | 518 | 504 | 512 | 516 |
| 75% load w/o fan | Nm³/hr | 389 | 395 | 400 | 387 | 393 | 396 |
| 50% load w/o fan | Nm³/hr | 271 | 275 | 278 | 269 | 273 | 276 |

**Altitude Capability**

| At 25° C (77° F) ambient, above sea level | m | 390 | 298 | 238 | 350 | 350 | 350 |

**Cooling System**

| Ambient air temperature | Deg C | 25 | 25 | 25 | 25 | 25 | 25 |
| Jacket water temperature (Maximum outlet) | Deg C | 99 | 99 | 99 | 99 | 99 | 99 |

**Exhaust System**

| Combustion air inlet flow rate | Nm³/min | 146 | 149 | 152 | 147 | 149 | 156 |
| Exhaust stack gas temperature | Deg C | 450 | 456 | 459 | 446 | 468 | 469 |
| Exhaust gas flow rate | Nm³/min | 155 | 158 | 161 | 155 | 158 | 160 |
| Exhaust flange size (internal diameter) | mm | 328 | 328 | 328 | 328 | 328 | 328 |

**Heat Rejection**

| Heat rejection to JW, oil cooler and AC - Stage 1 | kW | 985 | 994 | 999 | 1011 | 1030 | 1042 |
| Heat rejection to AC - Stage 2 | kW | 227 | 230 | 232 | 155 | 160 | 184 |
| Heat rejection to exhaust (LHV to 25° C) | kW | 1684 | 1756 | 1802 | 1733 | 1784 | 1815 |
| Heat rejection to exhaust (LHV to 120° C) | kW | 1198 | 1247 | 1279 | 1257 | 1293 | 1314 |
| Heat rejection to atmosphere from engine | kW | 138 | 138 | 138 | 138 | 138 | 138 |
| Heat rejection to atmosphere from generator (Typical) | kW | 64 | 64 | 64 | 64 | 64 | 64 |

**Lubrication System**

| Standard sump refill with filter change | L | 541 | 541 | 541 | 541 | 541 | 541 |

**Emissions**

| NOₓ @ 5% O₂ (dry) | mg/Nm³ | 500 | 350 | 250 | 500 | 350 | 250 |
| CO @ 5% O₂ (dry) | mg/Nm³ | 981 | 973 | 968 | 1035 | 990 | 960 |
| THC @ 5% O₂ (dry) | mg/Nm³ | 2633 | 2855 | 3002 | 2381 | 2493 | 2567 |
| NMHC @ 5% O₂ (dry) | mg/Nm³ | 395 | 429 | 451 | 358 | 374 | 386 |
| Exhaust O₂ (dry) | % | 9.4 | 9.7 | 9.8 | 9.2 | 9.3 | 9.4 |
CONTINUOUS 2000 ekW 2500 kVA
50 Hz 1500 RPM

RATING DEFINITIONS AND CONDITIONS

(1) **Continuous** --- Maximum output available for an unlimited time

**Ratings** are based on pipeline natural gas having a Low Heat Value (LHV) of 35.6 MJ/Nm³ (905 Btu/ft³) and 80 Cat Methane Number. For values in excess of altitude, ambient temperature, inlet/exhaust restriction, or different from the conditions listed, contact your local Cat dealer.

(2) **Efficiency** of standard generator is used. For higher efficiency generators, contact your local Cat dealer.

(3) **Ratings and fuel consumption** are based on ISO3046/1 standard reference conditions of 25°C (77°F) of ambient temperature and 100 kPa (29.61 in Hg) of total barometric pressure, 30% relative humidity with 0, +5% fuel tolerance.

(4) **Altitude** capability is based on 2.5 kPa air filter and 5.0 kPa exhaust stack restrictions.

(5) **Heat Rejection** --- Values based on nominal data with fuel tolerance of +/-2.5% and 2.5 kPa inlet and 5.0 kPa exhaust restrictions.

(6) Assume synchronous driver

(7) **Emissions data** measurements are consistent with those described in EPA CFR 40 Part 89 Subpart D & E and ISO8178-1 for measuring HC, CO, PM, NOx. Data shown is based on steady state engine operating conditions of 25°C (77°F), 96.28 kPa (28.43 in Hg) and fuel having a LHV of 35.6 MJ/Nm³ (905 Btu/cu ft) and 80 Cat Methane Number at 101.60 kPa (30.00 in Hg) absolute and 0°C (32°F). Emission data shown is subject to instrumentation, measurement, facility, and engine fuel system adjustment.
CONTINUOUS 2000 ekW 2500 kVA
50 Hz 1500 RPM

DIMENSIONS

<table>
<thead>
<tr>
<th>Package Dimensions</th>
<th>Length</th>
<th>Width</th>
<th>Height</th>
<th>Approx. Shipping Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
<td>6259.9 mm</td>
<td>1827.5 mm</td>
<td>2254.0 mm</td>
<td>18,350 kg</td>
</tr>
<tr>
<td>Width</td>
<td>246.42 in</td>
<td>71.95 in</td>
<td>88.74 in</td>
<td>40,455 lb</td>
</tr>
<tr>
<td>Height</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Weights and dimension are representative of a 400 Volt genset.
Do not use for installation design.
See general dimension drawings for details (Drawing: # 234-3560)

Performance Numbers: DM5838, DM5839
DM5840, DM5841
DM5842, DM5843
DM5844, DM5845
DM5847, DM5848
DM5849, DM5850

Feature Codes: 520GE24, 520GE25
520GE26, 520GE27
520GE47, 520GE48
520GE49, 520GE50

Source: US Sourced
LEHE2833-02 (05-11)