

Model: 1160GQKA
Frequency: 50 Hz
Fuel Type: Natural Gas MI 61 +
Emissions Performance NOx: 500 Mg/Nm³
LT Water Inlet Temperature: 40°C (104°F)
HT Water Outlet Temp: 90°C (194°F)

Generator set data sheet
1160 kW continuous

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| | |
|---|-----------|
| Measured Sound Performance Data Sheet: | MSP-1008 |
| Prototype Test Summary Data: | PTS-258 |
| Remote Radiator Cooling Outline: | 0500-5090 |

| Fuel Consumption (ISO3046/1) | See Note | 100% of Rated Load | 90% of Rated Load | 75% of Rated Load | 50% of Rated Load |
|---|-----------------|---------------------------|--------------------------|--------------------------|--------------------------|
| Fuel Consumption (LHV) ISO3046/1, kW (MMBTU/hr) | 2,4,6,7 | 2985 (10.19) | 2718 (9.28) | 2312 (7.9) | 1662 (5.68) |
| Mechanical Efficiency ISO3046/1, percent | 2,4,7 | 40.1% | 39.6% | 38.9% | 36.5% |
| Electrical Efficiency ISO3046/1, percent | 2,4,6,7 | 38.9% | 38.4% | 37.6% | 34.9% |

Engine

| | |
|---|------------------|
| Engine Manufacturer | Cummins |
| Engine Model | QSK60G |
| Configuration | V16 |
| Displacement, L (cu.in) | 60.3 (3683) |
| Aspiration | Turbocharged (2) |
| Gross Engine Power Output, kWm (hp) | 1196 (1603) |
| BMEP, bar (psi) | 16.1 (233) |
| Bore, mm (in) | 159 (6.26) |
| Stroke, mm (in) | 190 (7.48) |
| Rated Speed, rpm | 1500 |
| Piston Speed, m/s (ft/min) | 9.5 (1870) |
| Compression Ratio | 11.4:1 |
| Lube Oil Capacity, L (qt) | 380 (401) |
| Overspeed Limit, rpm | 2070 |
| Regenerative Power, kW | N/A |
| Full Load Lubricating oil consumption, g/kWe-hr (g/hp-hr) | 0.15 (0.11) |

Fuel

| | |
|--|-------------|
| Gas supply pressure to engine inlet, bar (psi) | 0.18 (2.61) |
| Minimum Methane Index | 61 |

Starting System(s)

| | |
|---|-----|
| Electric starter voltage, volts | 24 |
| Minimum battery capacity @ 40 deg.C (104 deg.F), AH | 450 |
| Air Starter Pressure, barg (psig) | NA |
| Air Starter Flow Nm ³ /s (scfm) | NA |

Genset Dimensions (see note 1)

| | |
|-------------------------------|----------------|
| Genset Length, m (ft) | 5.00 (16.39) |
| Genset Width, m (ft) | 2.33 (7.64) |
| Genset Height, m (ft) | 2.97 (9.75) |
| Genset Weight (wet), kg (lbs) | 13924 (30,697) |

| | See Notes | 100% of Rated Load | 90% of Rated Load | 75% of Rated Load | 50% of Rated Load |
|---|-----------|--------------------|-------------------|-------------------|-------------------|
| Energy Data | | | | | |
| Continuous Shaft Power, kWm (bhp) | 2,10 | 1196 (1603) | 1076 (1443) | 900 (1206) | 607 (813) |
| Continuous Generator Electrical Output kWe @ 1.0 pf | 10 | 1160 | 1044 | 870 | 580 |
| Heat Dissipated in Lube Oil Cooler, kW (MMBTU/h) | 5 | 171 (0.59) | 161 (0.55) | 146 (0.50) | 126 (0.43) |
| Heat Dissipated in Block, kW (MMBTU/h) | 5 | 353 (1.21) | 331 (1.13) | 295 (1.01) | 242 (0.82) |
| Total Heat Rejected in LT Circuit, kW (MMBTU/h) | 5 | 121 (0.41) | 112 (0.38) | 99 (0.34) | 77 (0.26) |
| Total Heat Rejected in HT Circuit, kW (MMBTU/h) | 5 | 677 (2.31) | 613 (2.09) | 516 (1.76) | 385 (1.31) |
| Unburnt, kW (MMBTU/h) | 13 | 69 (0.24) | 64 (0.22) | 53 (0.18) | 39 (0.13) |
| Heat Radiated to Ambient, kW (MMBTU/h) | 13 | 161 (0.55) | 152 (0.52) | 136 (0.46) | 113 (0.39) |
| Available Exhaust heat to 105C, kW (MMBTU/h) | 5 | 755 (2.57) | 698 (2.38) | 605 (2.07) | 440 (1.50) |
| Intake Air Flow | | | | | |
| Intake Air Flow Mass, kg/s (lb/hr) | 4 | 1.87 (14803) | 1.69 (13389) | 1.42 (11212) | 0.98 (7786) |
| Intake Air Flow Volume, m ³ /s @ 0°C (scfm) | 4 | 1.45 (3228) | 1.31 (2919) | 1.09 (2445) | 0.76 (1698) |
| Maximum Air Cleaner Restriction, mmHG (in H ₂ O) | | 18.68 (10.0) | 18.68 (10.0) | 18.68 (10.0) | 19 |
| Exhaust Air Flow | | | | | |
| Exhaust Gas Flow Mass, kg/s (lb/hr) | 4 | 1.94 (15329) | 1.75 (13867) | 1.47 (11618) | 1.02 (8074) |
| Exhaust Gas Flow Volume, m ³ /s (cfm) | 4 | 4.07 (8615) | 3.72 (7880) | 3.17 (6718) | 2.25 (4774) |
| Exhaust Temperature After Turbine, °C (°F) | 6 | 469 (877) | 478 (892) | 491 (915) | 508 (946) |
| Max Exhaust System Back Pressure, mmHG (in H ₂ O) | 6,14 | 37.3 (20.0) | 37.3 (20.0) | 37.3 (20.0) | 37.3 (20.0) |
| Min Exhaust System Back Pressure, mmHG (in H ₂ O) | 6,14 | NA | NA | NA | NA |
| HT Cooling Circuit | | | | | |
| HT Circuit Engine Coolant Volume, l (gal) | | 181 (48) | 181 (48) | 181 (48) | 181 (48) |
| HT Coolant Flow @ Max Ext Restriction, m ³ /h (gal/min) | | 70 (310) | 70 (310) | 70 (310) | 70 (310) |
| Maximum HT Engine Coolant Inlet Temp, °C (°F) | 8 | 80 (176) | 80 (176) | 80 (176) | 80 (176) |
| HT Coolant Outlet Temp, °C (°F) | 8 | 90 (194) | 90 (194) | 90 (194) | 90 (194) |
| Max Pressure Drop in External HT Circuit, bar (psig) | | 1.0 (15) | 1.0 (15) | 1.0 (15) | 1.0 (15) |
| HT Circuit Maximum Pressure, bar (psig) | | 2.6 (38) | 2.6 (38) | 2.6 (38) | 2.6 (38) |
| Minimum Static Head, bar (psig) | | 0.5 (7) | 0.5 (7) | 0.5 (7) | 0.5 (7) |
| LT Cooling Circuit | | | | | |
| LT Circuit Engine Coolant Volume, l (gal) | | 34 (9) | 34 (9) | 34 (9) | 34 (9) |
| LT Coolant Flow @ Max Ext Restriction, m ³ /h (gal/min) | | 22.70 (100) | 22.70 (100) | 22.70 (100) | 22.70 (100) |
| Maximum LT Engine Coolant Inlet Temp, °C (°F) | 9 | 40 (104) | 40 (104) | 40 (104) | 40 (104) |
| LT Coolant Outlet Temp, eC (°F) Reference Only | 9 | 44.0 (111) | 44.0 (111) | 44.0 (111) | 44.0 (111) |
| Max Pressure Drop in External LT Circuit, bar (psig) | | 1.0 (15) | 1.0 (15) | 1.0 (15) | 1.0 (15) |
| LT Circuit Maximum Pressure, bar (psig) | | 2.6 (38) | 2.6 (38) | 2.6 (38) | 2.6 (38) |
| Minimum Static Head, bar (psig) | | 0.5 (7) | 0.5 (7) | 0.5 (7) | 0.5 (7) |
| Emissions | | | | | |
| NO _x Emissions wet, ppm | 5 | 173 | 169 | 183 | 180 |
| NO _x Emissions, mg/Nm ³ @5% O ₂ (g/hp-h) | 5 | 489 (1.06) | 475 (1.04) | 505 (1.13) | 483 (1.15) |
| THC Emissions wet, ppm | 13 | 1201 | 1227 | 1215 | 1292 |
| THC Emissions, mg/Nm ³ @5% O ₂ (g/hp-h) | 13 | 1330 | 1352 | 1316 | 1371 |
| CH ₄ Emissions wet, ppm | 13 | NA | NA | NA | NA |
| CH ₄ Emissions, mg/Nm ³ @5% O ₂ (g/hp-h) | 13 | NA NA | NA NA | NA NA | NA NA |
| NMHC Emissions wet, ppm | 13 | NA | NA | NA | NA |
| NMHC Emissions, mg/Nm ³ @5% O ₂ (g/hp-h) | 13 | NA | NA | NA | NA |
| CO Emissions (dry), ppm | 13 | 397 | 398 | 392 | 389 |
| CO Emissions, mg/Nm ³ @5% O ₂ (g/hp-h) | 13 | 676 (1.47) | 671 (1.47) | 650 (1.45) | 633 (1.51) |
| O ₂ Emissions (dry), percent | 13 | 9.4 | 9.3 | 9.1 | 8.8 |
| Particulates PM10, g/hp-h | 13 | < 0.03 | < 0.03 | < 0.03 | < 0.03 |

Genset De-rating

Altitude and Temperature Derate Multiplication Factor

| Barometer | | Altitude | | Table A * | | | | | | | | | | | | | | | | |
|-----------|------|----------|--------|--|------|------|------|------|------|------|------|------|-----|---|---|---|---|---|---|---|
| In Hg | mbar | Feet | Meters | Derate Multiplier with Grid Parallel Operation | | | | | | | | | | | | | | | | |
| 20.7 | 701 | 9843 | 3000 | 0.79 | 0.74 | 0.69 | 0.63 | 0.58 | - | - | - | - | - | - | - | - | - | - | - | - |
| 21.4 | 723 | 9022 | 2750 | 0.83 | 0.78 | 0.73 | 0.68 | 0.63 | 0.52 | - | - | - | - | - | - | - | - | - | - | - |
| 22.1 | 747 | 8202 | 2500 | 0.88 | 0.82 | 0.77 | 0.72 | 0.67 | 0.57 | - | - | - | - | - | - | - | - | - | - | - |
| 22.8 | 771 | 7382 | 2250 | 0.92 | 0.87 | 0.82 | 0.77 | 0.71 | 0.61 | 0.51 | - | - | - | - | - | - | - | - | - | - |
| 23.5 | 795 | 6562 | 2000 | 0.96 | 0.91 | 0.86 | 0.81 | 0.76 | 0.65 | 0.55 | - | - | - | - | - | - | - | - | - | - |
| 24.3 | 820 | 5741 | 1750 | 1.00 | 0.96 | 0.90 | 0.85 | 0.80 | 0.70 | 0.59 | - | - | - | - | - | - | - | - | - | - |
| 25.0 | 846 | 4921 | 1500 | 1.00 | 1.00 | 0.95 | 0.90 | 0.85 | 0.74 | 0.64 | 0.53 | - | - | - | - | - | - | - | - | - |
| 25.8 | 872 | 4101 | 1250 | 1.00 | 1.00 | 0.99 | 0.94 | 0.89 | 0.79 | 0.68 | 0.58 | - | - | - | - | - | - | - | - | - |
| 26.6 | 899 | 3281 | 1000 | 1.00 | 1.00 | 1.00 | 0.99 | 0.93 | 0.83 | 0.73 | 0.62 | 0.52 | - | - | - | - | - | - | - | - |
| 27.4 | 926 | 2461 | 750 | 1.00 | 1.00 | 1.00 | 1.00 | 0.98 | 0.87 | 0.77 | 0.67 | 0.56 | - | - | - | - | - | - | - | - |
| 28.3 | 954 | 1640 | 500 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.92 | 0.81 | 0.71 | 0.60 | - | - | - | - | - | - | - | - |
| 29.1 | 983 | 820 | 250 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.96 | 0.86 | 0.75 | 0.65 | - | - | - | - | - | - | - | - |
| 29.5 | 995 | 492 | 150 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.98 | 0.87 | 0.77 | 0.67 | - | - | - | - | - | - | - | - |
| 30.0 | 1012 | 0 | 0 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.90 | 0.80 | 0.69 | - | - | - | - | - | - | - | - |
| | | | | °C | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | | | | | | | |
| | | | | °F | 68 | 77 | 86 | 95 | 104 | 113 | 122 | 131 | 140 | | | | | | | |
| | | | | Air Filter Inlet Temperature | | | | | | | | | | | | | | | | |

* Based on SAE standard ambient pressure vs. altitude. Assumes LT return temperature is 10C above air filter inlet.

| Barometer | | Altitude | | Table B * | | | | | | | | | | | | | | | | | |
|-----------|------|----------|--------|---|------|------|------|------|------|------|------|------|-----|---|---|---|---|---|---|---|---|
| In Hg | mbar | Feet | Meters | Derate Multiplier Off Grid (Island or Load Share) | | | | | | | | | | | | | | | | | |
| 20.7 | 701 | 9843 | 3000 | 0.63 | 0.56 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 21.4 | 723 | 9022 | 2750 | 0.69 | 0.61 | 0.53 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 22.1 | 747 | 8202 | 2500 | 0.74 | 0.66 | 0.59 | 0.51 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 22.8 | 771 | 7382 | 2250 | 0.79 | 0.71 | 0.64 | 0.56 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 23.5 | 795 | 6562 | 2000 | 0.84 | 0.76 | 0.69 | 0.61 | 0.54 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 24.3 | 820 | 5741 | 1750 | 0.89 | 0.82 | 0.74 | 0.66 | 0.59 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 25.0 | 846 | 4921 | 1500 | 0.94 | 0.87 | 0.79 | 0.72 | 0.64 | 0.53 | - | - | - | - | - | - | - | - | - | - | - | - |
| 25.8 | 872 | 4101 | 1250 | 1.00 | 0.92 | 0.84 | 0.77 | 0.69 | 0.58 | - | - | - | - | - | - | - | - | - | - | - | - |
| 26.6 | 899 | 3281 | 1000 | 1.00 | 0.97 | 0.89 | 0.82 | 0.74 | 0.63 | 0.52 | - | - | - | - | - | - | - | - | - | - | - |
| 27.4 | 926 | 2461 | 750 | 1.00 | 1.00 | 0.95 | 0.87 | 0.79 | 0.68 | 0.57 | - | - | - | - | - | - | - | - | - | - | - |
| 28.3 | 954 | 1640 | 500 | 1.00 | 1.00 | 1.00 | 0.92 | 0.85 | 0.73 | 0.62 | 0.51 | - | - | - | - | - | - | - | - | - | - |
| 29.1 | 983 | 820 | 250 | 1.00 | 1.00 | 1.00 | 0.97 | 0.90 | 0.78 | 0.67 | 0.56 | - | - | - | - | - | - | - | - | - | - |
| 29.5 | 995 | 492 | 150 | 1.00 | 1.00 | 1.00 | 0.99 | 0.92 | 0.81 | 0.69 | 0.58 | - | - | - | - | - | - | - | - | - | - |
| 30.0 | 1012 | 0 | 0 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.84 | 0.72 | 0.61 | 0.50 | - | - | - | - | - | - | - | - | - |
| | | | | °C | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | | | | | | | | |
| | | | | °F | 68 | 77 | 86 | 95 | 104 | 113 | 122 | 131 | 140 | | | | | | | | |
| | | | | Air Filter Inlet Temperature | | | | | | | | | | | | | | | | | |

* Based on SAE standard ambient pressure vs. altitude. Assumes LT return temperature is 10C above air filter inlet.

Heat Rejection Factor (altitude and ambient) for HT and LT Circuits

| Barometer | | Altitude | | Table C | | | | | | | | | | | | | | | | | |
|-----------|------|----------|--------|--|------|------|------|------|------|------|------|------|-----|---|---|---|---|---|---|---|---|
| In Hg | mbar | Feet | Meters | Multiplier for HT & LT Heat Rejection vs Alt & Temp. | | | | | | | | | | | | | | | | | |
| 20.7 | 701 | 9843 | 3000 | 1.11 | 1.13 | 1.14 | 1.15 | 1.17 | 1.18 | 1.19 | 1.20 | 1.22 | - | - | - | - | - | - | - | - | - |
| 21.4 | 723 | 9022 | 2750 | 1.10 | 1.12 | 1.13 | 1.14 | 1.15 | 1.17 | 1.18 | 1.19 | 1.21 | - | - | - | - | - | - | - | - | - |
| 22.1 | 747 | 8202 | 2500 | 1.09 | 1.10 | 1.12 | 1.13 | 1.14 | 1.16 | 1.17 | 1.18 | 1.20 | - | - | - | - | - | - | - | - | - |
| 22.8 | 771 | 7382 | 2250 | 1.08 | 1.09 | 1.11 | 1.12 | 1.13 | 1.14 | 1.16 | 1.17 | 1.18 | - | - | - | - | - | - | - | - | - |
| 23.5 | 795 | 6562 | 2000 | 1.07 | 1.08 | 1.09 | 1.11 | 1.12 | 1.13 | 1.15 | 1.16 | 1.17 | - | - | - | - | - | - | - | - | - |
| 24.3 | 820 | 5741 | 1750 | 1.06 | 1.07 | 1.08 | 1.10 | 1.11 | 1.12 | 1.14 | 1.15 | 1.16 | - | - | - | - | - | - | - | - | - |
| 25.0 | 846 | 4921 | 1500 | 1.05 | 1.06 | 1.07 | 1.09 | 1.10 | 1.11 | 1.12 | 1.14 | 1.15 | - | - | - | - | - | - | - | - | - |
| 25.8 | 872 | 4101 | 1250 | 1.04 | 1.05 | 1.06 | 1.07 | 1.09 | 1.10 | 1.11 | 1.13 | 1.14 | - | - | - | - | - | - | - | - | - |
| 26.6 | 899 | 3281 | 1000 | 1.02 | 1.04 | 1.05 | 1.06 | 1.08 | 1.09 | 1.10 | 1.12 | 1.13 | - | - | - | - | - | - | - | - | - |
| 27.4 | 926 | 2461 | 750 | 1.01 | 1.03 | 1.04 | 1.05 | 1.07 | 1.08 | 1.09 | 1.10 | 1.12 | - | - | - | - | - | - | - | - | - |
| 28.3 | 954 | 1640 | 500 | 1.00 | 1.02 | 1.03 | 1.04 | 1.05 | 1.07 | 1.08 | 1.09 | 1.11 | - | - | - | - | - | - | - | - | - |
| 29.1 | 983 | 820 | 250 | 0.99 | 1.00 | 1.02 | 1.03 | 1.04 | 1.06 | 1.07 | 1.08 | 1.10 | - | - | - | - | - | - | - | - | - |
| 29.5 | 995 | 492 | 150 | 0.99 | 1.00 | 1.01 | 1.03 | 1.04 | 1.05 | 1.06 | 1.08 | 1.09 | - | - | - | - | - | - | - | - | - |
| 30.0 | 1012 | 0 | 0 | 0.98 | 0.99 | 1.01 | 1.02 | 1.03 | 1.05 | 1.06 | 1.07 | 1.08 | - | - | - | - | - | - | - | - | - |
| | | | | °C | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | | | | | | | | |
| | | | | °F | 68 | 77 | 86 | 95 | 104 | 113 | 122 | 131 | 140 | | | | | | | | |
| | | | | Air Filter Inlet Temperature | | | | | | | | | | | | | | | | | |

Temperature & Altitude Derate

1. Determine derate multiplier vs. temperature and altitude in Table A or B depending upon your operating condition.

2. Assumes the LT return temperature is 10 deg C above the air filter inlet with a maximum LT temperature of 50 deg C.

3. If the LT temperature exceeds 50 deg C, consult factory for recommendations.

4. Altitude is based upon SAE standard ambient pressure vs. altitude. For low barometric conditions add 150m (500 ft) to site altitude.

Methane Number Capability

| Load (Percent of Rated) | | | |
|-------------------------|-----|-----|-----|
| 100% | 90% | 75% | 50% |
| 61 | 53 | 44 | 38 |

LT & HT Circuit Heat Rejection Calculation

1. Determine derate multiplier vs. temperature derate per above.
2. Using the multiplier from #1 above as the percent load factor determine the Heat rejection from the previous page.
3. From Table C find the HT and LT circuit multiplier.
4. Multiply the result of step 2 by the result of step 3 to obtain the heat rejection at your altitude and temperature.

Alternator Data

| Voltage Range | Connection Configuration | Temp Rise Degrees C | Duty ¹¹ Cycle | Single Phase Factor | Maximum Surge kVA ¹² | Alternator Data Sheet | Feature Code |
|---------------|--------------------------|---------------------|--------------------------|---------------------|---------------------------------|-----------------------|--------------|
| 380-440 | Wye, 3 Phase | 80 | C | N/A | 4563 | 333 | B703-2 |
| 380-440 | Wye, 3 Phase | 105 | C | N/A | 3960 | 332 | B551-2 |
| 400-415 | Wye, 3 Phase | 105 | C | N/A | 3688 | 331 | D792-2 |
| 380-440 | Wye, 3 Phase | 125 | C | N/A | 3688 | 331 | B584-2 |
| 3300 | Wye, 3 Phase | 80 | C | N/A | 5398 | 324 | B592-2 |
| 3300 | Wye, 3 Phase | 105 | C | N/A | 4922 | 323 | B471-2 |
| 6300-6600 | Wye, 3 Phase | 80 | C | N/A | 5250 | 521 | B593-2 |
| 10000 | Wye, 3 Phase | 80 | C | N/A | 5145 | 521 | B794-2 |
| 10500-11000 | Wye, 3 Phase | 80 | C | N/A | 5196 | 521 | B835-2 |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

Continuous Rating Definition

Applicable for supplying power continuously to a constant load up to the full output rating for unlimited hours. No sustained overload capability is available for this rating. Consult authorized distributor for rating. (Equivalent to Continuous Power in accordance with ISO8528, ISO3046, AS2789, DIN6271, and BS5514). This rating is not applicable to all generator set models.

Notes

- Weights and set dimensions represent a generator set with its standard features only. See outline drawing for other configurations.
- At ISO3046 reference conditions, altitude 1013 mbar (30in Hg), air inlet temperature 25°C (77°F)
- Nominal performance +/- 2 1/2%
- According to ISO 3046/I with fuel consumption tolerance of +5% -0% or efficiency tolerance of +0% -5%.
- Production variation/tolerance ±5%.
- With air intake at 25°C (77°F). Tolerance ± 5°F.
- Tested using pipeline natural gas with LHV of 33.44mJ/Nm³ (980BTU/ft³)
- Outlet temperature controlled by thermostat. Inlet temperature for reference only.
- Inlet temperature controlled by thermostat, outlet temperature for reference only.
- With engine driven coolant pump.
- Standby (S), Prime (P), Continuous (C)
- Maximum rated starting kVA that results in minimum of 90% of rated sustained voltage during starting.
- Tolerance +/- 15%
- Exhaust system back pressure is a rated load and will decrease at lower loads.

Cummins Power Generation
 1400 73rd Avenue NE
 Minneapolis, MN 55432 USA
 Telephone: 763 574 5000
 Fax: 763 574 5298
 Web: www.cumminspower.com

Cummins Power Generation
 Manston Park, Columbus Avenue
 Manston, Ramsgate
 Kent CT12 5BF, UK
 Telephone: +44 (0) 1843-255000
 Fax: +44 (0) 1843-255902
 Email: cpg.uk@cummins.com
 Web: www.cumminspower.com

Cummins Power Generation
 8 Tanjong Penjuru
 Singapore 609019
 Telephone: +65 265-0155
 Fax: +65 264-0664 or 265-6909
 Email: mktg@sing.cummins.com
 Web: www.cumminspower.com

