

## Generator set data sheet

### 1100 kW continuous



|                              |                            |
|------------------------------|----------------------------|
| <b>Model:</b>                | <b>C1100 N6C</b>           |
| <b>Frequency:</b>            | <b>60 Hz</b>               |
| <b>Fuel type:</b>            | <b>Natural gas MI 72 +</b> |
| <b>Emissions NOx:</b>        | <b>1.0 g/hp-h</b>          |
| <b>LT water inlet temp:</b>  | <b>40 °C (104 °F)</b>      |
| <b>HT water outlet temp:</b> | <b>90 °C (194 °F)</b>      |

|   |  |
|---|--|
| <b>Measured sound performance data sheet:</b> | MSP-1256   |
| <b>Prototype test summary data:</b>           | PTS-288  |
| <b>Generator set outline drawing:</b>         | A029E093 heavy duty air cleaner<br>A029U550 standard air cleaner |

| <b>Fuel consumption (ISO3046/1)</b>                                    | <b>100% load</b> | <b>90% load</b> | <b>75% load</b> | <b>50% load</b> |
|--|------------------|-----------------|-----------------|-----------------|
| Fuel consumption (LHV) ISO3046/1, kW (MMBTU/hr) <sup>1,2,3,4,5,7</sup> | 2597 (8.87)      | 2349 (8.02)     | 1971 (6.73)     | 1407 (4.81)     |
| Mechanical efficiency ISO3046/1, percent <sup>1,2,4,5,7</sup>          | 43.7%            | 43.4%           | 43.1%           | 40.3%           |
| Electrical efficiency ISO3046/1, percent <sup>1,2,3,4,5,7</sup>        | 42.4%            | 42.1%           | 41.9%           | 39.1%           |

### Engine

|   |                  |
|---|------------------|
| Engine manufacturer                                       | Cummins          |
| Engine model  | QSK60G           |
| Configuration   | V16              |
| Displacement, L (cu.in.)                                  | 60 (3671)        |
| Aspiration  | Turbocharged (1) |
| Gross engine power output, kWm (hp)                       | 1144 (1534)      |
| BMEP, bar (psi)   | 19 (276)         |
| Bore, mm (in.)  | 159 (6.26)       |
| Stroke, mm (in.)  | 190 (7.48)       |
| Rated speed, rpm  | 1200             |
| Piston speed, m/s (ft/min)                                | 7.6 (1496)       |
| Compression ratio   | 12.7:1           |
| Lube oil capacity, L (qt)                                 | 380 (400)        |
| Overspeed limit, rpm                                      | 1500             |
| Regenerative power, kW                                    | N/A              |
| Full load lubricating oil consumption, g/kWe-hr (g/hp-hr) | 0.18 (0.14)      |

### Fuel system

|   |           |
|---|-----------|
| Gas supply pressure to engine inlet, bar (psi) <sup>5</sup> | 0.2 (2.9) |
| Minimum methane index                                       | 72        |

## Engine electrical system(s)

|   |     |
|---|-----|
| Electric starter voltage, volts               | 24  |
| Ignition timing, deg before top dead center   | 20  |
| Minimum battery capacity @ 40 °C (104 °F), AH | 720 |

## Genset dimensions

|  |                |
|--|----------------|
| Genset length, m (ft) <sup>6</sup>         | 5.12 (16.8)    |
| Genset width, m (ft) <sup>6</sup>          | 2.23 (7.30)    |
| Genset height, m (ft) <sup>6</sup>         | 2.77 (9.08)    |
| Genset weight (wet), kg (lbs) <sup>6</sup> | 15625 (34,375) |

### Notes:

1. At ISO3046 reference conditions, altitude 1013 mbar (30 in. Hg), air inlet temperature 25 °C (77 °F).
2. Power output and efficiency include the effect of Cummins supplied coolant pumps. There is a 10 kW allowance for customer supplied coolant pumps.
3. At electrical output of 1.0 power factor, 97% alternator efficiency.
4. Based on pipeline natural gas with LHV of 33.44 mJ/Nm<sup>3</sup> (905 BTU/ft<sup>3</sup>).
5. Subtract 3 °C ambient temperature capability for each 100 mm (4 in.) H<sub>2</sub>O back pressure above the information shown on page 2.
6. Weights and dimensions represent a generator set with its standard features only. See outline drawing for other configurations.
7. According to ISO3046/1 with fuel consumption tolerance of +5% -0%.

|  | 100% load     | 90% load      | 75% load      | 50% load      |
|--|---------------|---------------|---------------|---------------|
| <b>Energy data</b>   |               |               |               |               |
| Continuous generator electrical output kWe <sup>1,5,6,7</sup>  | 1100          | 990           | 825           | 550           |
| Continuous shaft power, kWm (bhp) <sup>1,5,6,7</sup>   | 1144 (1534)   | 1031 (1382)   | 861 (1154)    | 577 (773)     |
| Total heat rejected in LT circuit, kW (MMBTU/h) <sup>2</sup>   | 94 (0.32)     | 90 (0.31)     | 66 (0.23)     | 42 (0.14)     |
| Total heat rejected in HT circuit, kW (MMBTU/h) <sup>2</sup>   | 594 (2.03)    | 540 (1.84)    | 452 (1.54)    | 339 (1.16)    |
| Unburnt, kW (MMBTU/h) <sup>2</sup>   | 54 (0.18)     | 50 (0.17)     | 42 (0.14)     | 29 (0.1)      |
| Heat radiated to ambient, kW (MMBTU/h) <sup>2</sup>  | 179 (0.61)    | 163 (0.56)    | 138 (0.47)    | 100 (0.34)    |
| Available exhaust heat to 105 °C, kW (MMBTU/h) <sup>2</sup>  | 581 (1.98)    | 538 (1.84)    | 480 (1.64)    | 359 (1.22)    |
| <b>Intake air flow</b>   |               |               |               |               |
| Intake air flow mass, kg/s (lb/hr) <sup>2</sup>  | 1.64 (12990)  | 1.48 (11720)  | 1.24 (9820)   | 0.86 (6810)   |
| Intake air flow volume, m <sup>3</sup> /s @ 0 °C (scfm) <sup>2</sup>   | 1.27 (2840)   | 1.15 (2570)   | 0.96 (2140)   | 0.67 (1500)   |
| Max inlet restriction (after filter, limit for changing filters), below 35 °C ambient temp, mm HG, (in H <sub>2</sub> O) | 28 (15)       | 22.7 (12.1)   | 15.7 (8.4)    | 7 (3.7)       |
| Max inlet restriction (after filter, limit for changing filters), above 35 °C ambient temp, mm HG, (in H <sub>2</sub> O) | 18.7 (10)     | 15.2 (8.1)    | 10.5 (5.6)    | 0 (2.5)       |
| <b>Exhaust air flow</b>  |               |               |               |               |
| Exhaust gas flow mass, kg/s (lb/hr) <sup>2</sup>   | 1.7 (13460)   | 1.53 (12120)  | 1.29 (10220)  | 0.89 (7050)   |
| Exhaust gas flow volume, m <sup>3</sup> /s (cfm) <sup>2,9</sup>  | 3.27 (6920)   | 2.98 (6310)   | 2.58 (5460)   | 1.85 (3920)   |
| Exhaust temp after turbine, °C (°F) <sup>1</sup>   | 407 (765)     | 415 (779)     | 433 (811)     | 459 (858)     |
| Max exhaust system back pressure, mm HG (in H <sub>2</sub> O) <sup>8</sup>   | 38 (20)       | 31 (17)       | 21 (11)       | 10 (5)        |
| <b>HT cooling circuit</b>  |               |               |               |               |
| HT circuit engine coolant volume, l (gal)  | 181 (48)      | 181 (48)      | 181 (48)      | 181 (48)      |
| HT coolant flow @ max ext restriction, m <sup>3</sup> /h (gal/min)   | 63 (277)      | 63 (277)      | 63 (277)      | 63 (277)      |
| Max HT engine coolant inlet temp, °C (°F) reference <sup>3</sup>   | 81 (178)      | 82 (180)      | 83 (181)      | 85 (185)      |
| HT coolant outlet temp, °C (°F) <sup>3</sup>   | 90 (194)      | 90 (194)      | 90 (194)      | 90 (194)      |
| Max pressure drop in external HT circuit, bar (psig)   | 1.4 (20)      | 1.4 (20)      | 1.4 (20)      | 1.4 (20)      |
| HT circuit max pressure, bar (psig)  | 5 (73)        | 5 (73)        | 5 (73)        | 5 (73)        |
| Static head pump inlet, bar (psig)   | .5-1.5 (7-20) | .5-1.5 (7-20) | .5-1.5 (7-20) | .5-1.5 (7-20) |
| <b>LT cooling circuit</b>  |               |               |               |               |
| LT circuit engine coolant volume, l (gal)  | 34 (9)        | 34 (9)        | 34 (9)        | 34 (9)        |
| LT coolant flow @ max ext restriction, m <sup>3</sup> /h (gal/min)   | 17 (75)       | 17 (75)       | 17 (75)       | 17 (75)       |
| LT coolant inlet temp, thermostat controlled °C (°F) <sup>4</sup>  | 40 (104)      | 40 (104)      | 40 (104)      | 40 (104)      |
| LT coolant inlet temp max <sup>4</sup>   | 50 (122)      | 50 (122)      | 50 (122)      | 50 (122)      |
| Max pressure drop in external LT circuit, bar (psig)   | 1 (15)        | 1 (15)        | 1 (15)        | 1 (15)        |
| LT circuit max pressure, bar (psig)  | 5 (73)        | 5 (73)        | 5 (73)        | 5 (73)        |
| Static head pump inlet, bar (psig)   | .5-1.5 (7-20) | .5-1.5 (7-20) | .5-1.5 (7-20) | .5-1.5 (7-20) |

**Notes:**

1. At ISO3046 reference conditions, altitude 1013 mbar (30 in. Hg), air inlet temperature 25 °C (77 °F).
2. Production variation/tolerance ±5%.
3. Outlet temperature controlled by thermostat. Inlet temperature for reference only.
4. Inlet temperature controlled by thermostat to 40 °C but is allowed to go to 50 °C and ignition timing is retarded resulting in efficiency loss of 0.4 - 0.6%.
5. Power output and efficiency include the effect of Cummins supplied coolant pumps. There is a 10 kW allowance for customer supplied coolant pumps.
6. At electrical output of 1.0 power factor, 97% alternator efficiency.
7. Based on pipeline natural gas with LHV of 33.44 MJ/Nm<sup>3</sup> (905 BTU/ft<sup>3</sup>).
8. Subtract 3 °C ambient temperature capability for each 100 mm (4 in.) H<sub>2</sub>O back pressure above the information shown on page 2.
9. At exhaust temperature and standard atmospheric pressure.

## Altitude and temperature derate multiplication factor <sup>1.2.3</sup>

| Barometer                    |      | Altitude |        | Table A                                   |           |           |           |           |           |           |            |            |            |
|------------------------------|------|----------|--------|---|-----------|-----------|-----------|-----------|-----------|-----------|------------|------------|------------|
| In Hg                        | mbar | Feet     | Meters | Derate multiplier for all operation modes |           |           |           |           |           |           |            |            |            |
| 20.7                         | 701  | 9843     | 3000   | 0.75                                      | 0.75      | 0.75      | 0.75      | 0.71      | 0.68      | 0.61      | 0.53       | -          |            |
| 21.4                         | 723  | 9022     | 2750   | 0.79                                      | 0.79      | 0.79      | 0.78      | 0.73      | 0.70      | 0.63      | 0.54       | -          |            |
| 22.1                         | 747  | 8202     | 2500   | 0.82                                      | 0.82      | 0.82      | 0.81      | 0.76      | 0.72      | 0.64      | 0.55       | -          |            |
| 23.5                         | 795  | 6562     | 2000   | 0.89                                      | 0.89      | 0.89      | 0.88      | 0.83      | 0.78      | 0.67      | 0.56       | -          |            |
| 24.3                         | 820  | 5741     | 1750   | 0.93                                      | 0.93      | 0.93      | 0.91      | 0.86      | 0.81      | 0.68      | 0.56       | -          |            |
| 25.0                         | 846  | 4921     | 1500   | 0.96                                      | 0.96      | 0.96      | 0.94      | 0.90      | 0.85      | 0.69      | 0.57       | -          |            |
| 25.8                         | 872  | 4101     | 1250   | 1.00                                      | 1.00      | 1.00      | 0.97      | 0.93      | 0.89      | 0.71      | 0.57       | -          |            |
| 26.6                         | 899  | 3281     | 1000   | 1.00                                      | 1.00      | 1.00      | 1.00      | 0.97      | 0.93      | 0.72      | 0.58       | -          |            |
| 27.4                         | 926  | 2461     | 750    | 1.00                                      | 1.00      | 1.00      | 1.00      | 1.00      | 0.96      | 0.74      | 0.58       | -          |            |
| 28.3                         | 954  | 1640     | 500    | 1.00                                      | 1.00      | 1.00      | 1.00      | 1.00      | 1.00      | 0.75      | 0.59       | -          |            |
| 29.1                         | 983  | 820      | 250    | 1.00                                      | 1.00      | 1.00      | 1.00      | 1.00      | 1.00      | 0.75      | 0.59       | -          |            |
| 29.5                         | 995  | 492      | 150    | 1.00                                      | 1.00      | 1.00      | 1.00      | 1.00      | 1.00      | 0.75      | 0.59       | -          |            |
| 30.0                         | 1012 | 0        | 0      | 1.00                                      | 1.00      | 1.00      | 1.00      | 1.00      | 1.00      | 0.75      | 0.59       | -          |            |
| Air filter inlet temperature |      |          |        | °C  | <b>0</b>  | <b>15</b> | <b>20</b> | <b>25</b> | <b>30</b> | <b>35</b> | <b>40</b>  | <b>45</b>  | <b>50</b>  |
|                              |      |          |        | °F  | <b>32</b> | <b>59</b> | <b>68</b> | <b>77</b> | <b>86</b> | <b>95</b> | <b>104</b> | <b>113</b> | <b>122</b> |

## Methane number capability table B

|      | Load (percent of rated) |     |     |
|------|-------------------------|-----|-----|
| 100% | 90%                     | 75% | 50% |
| 72   | 62                      | 60  | 60  |

## Table C altitude and ambient heat rejection factor adjustment for HT and LT circuits

### LT & HT circuit heat rejection calculation procedure

1. Determine derate multiplier vs. temp derate from table A.
2. Using the multiplier from #1 above as the percent load factor, determine the heat rejection.
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.

| Barometer                    |      | Altitude |        | Multiplier for HT & LT heat rejection vs alt & temp. |      |      |      |      |      |      |      |      |  |
|------------------------------|------|----------|--------|--|------|------|------|------|------|------|------|------|--|
| In Hg                        | mbar | Feet     | Meters |  |      |      |      |      |      |      |      |      |  |
| 20.7                         | 701  | 9843     | 3000   | 1.06   | 1.10 | 1.11 | 1.13 | 1.14 | 1.15 | 1.17 | 1.18 | 1.19 |  |
| 21.4                         | 723  | 9022     | 2750   | 1.05   | 1.09 | 1.10 | 1.12 | 1.13 | 1.14 | 1.15 | 1.17 | 1.18 |  |
| 22.1                         | 747  | 8202     | 2500   | 1.04   | 1.08 | 1.09 | 1.10 | 1.12 | 1.13 | 1.14 | 1.16 | 1.17 |  |
| 22.8                         | 771  | 7382     | 2250   | 1.03   | 1.07 | 1.08 | 1.09 | 1.11 | 1.12 | 1.13 | 1.14 | 1.16 |  |
| 23.5                         | 795  | 6562     | 2000   | 1.02   | 1.06 | 1.07 | 1.08 | 1.09 | 1.11 | 1.12 | 1.13 | 1.15 |  |
| 24.3                         | 820  | 5741     | 1750   | 1.01   | 1.04 | 1.06 | 1.07 | 1.08 | 1.10 | 1.11 | 1.12 | 1.14 |  |
| 25.0                         | 846  | 4921     | 1500   | 0.99   | 1.03 | 1.05 | 1.06 | 1.07 | 1.09 | 1.10 | 1.11 | 1.12 |  |
| 25.8                         | 872  | 4101     | 1250   | 0.98   | 1.02 | 1.04 | 1.05 | 1.06 | 1.07 | 1.09 | 1.10 | 1.11 |  |
| 26.6                         | 899  | 3281     | 1000   | 0.97   | 1.01 | 1.02 | 1.04 | 1.05 | 1.06 | 1.08 | 1.09 | 1.10 |  |
| 27.4                         | 926  | 2461     | 750    | 0.96   | 1.00 | 1.01 | 1.03 | 1.04 | 1.05 | 1.07 | 1.08 | 1.09 |  |
| 28.3                         | 954  | 1640     | 500    | 0.95   | 0.99 | 1.00 | 1.02 | 1.03 | 1.04 | 1.05 | 1.07 | 1.08 |  |
| 29.1                         | 983  | 820      | 250    | 0.94   | 0.98 | 0.99 | 1.00 | 1.02 | 1.03 | 1.04 | 1.06 | 1.07 |  |
| 29.5                         | 995  | 492      | 150    | 0.94   | 0.97 | 0.99 | 1.00 | 1.01 | 1.03 | 1.04 | 1.05 | 1.06 |  |
| 30.0                         | 1012 | 0        | 0      | 0.93   | 0.97 | 0.98 | 0.99 | 1.01 | 1.02 | 1.03 | 1.05 | 1.06 |  |
| Air filter inlet temperature |      |          | °C     | 0  | 15   | 20   | 25   | 30   | 35   | 40   | 45   | 50   |  |
|                              |      |          | °F     | 32   | 59   | 68   | 77   | 86   | 95   | 104  | 113  | 122  |  |

### Notes:

1. Ambient temperature is the same as air filter inlet temperature. LT inlet temperature is 40 °C, or 10 °C above ambient, whichever is higher.
2. Table refers to the capability to run at continuous power level. For short periods of time the genset can run at 5 °C higher temperature with reduced efficiency.
3. Subtract 3 °C ambient temperature capability for each 100 mm (4 in.) H<sub>2</sub>O back pressure above the information shown on page 3.
4. This generator set is capable of operating for short periods of time under with the LT temperature and/or the fuel methane number outside of the recommended limits with decreased performance. Operation in the green area will result in normal performance. Operation in the yellow area is recommended only for short periods of time and will result in reduced efficiency and shorter spark plug life. Operation in the red area is NOT recommended.

### Alternator data

| Voltage range | Connection configuration | Temp rise degrees C | Duty cycle <sup>4</sup> | Phase factor | Alternator data sheet |
|---------------|--------------------------|---------------------|-------------------------|--------------|-----------------------|
| 416-480       | Wye, 3 Phase             | 105                 | C                       | N/A          | Note 5                |
| 600           | Wye, 3 Phase             | 105                 | C                       | N/A          | Note 5                |
| 4160          | Wye, 3 Phase             | 80,105              | C                       | N/A          | Note 5                |
| 12470-13800   | Wye, 3 Phase             | 80                  | C                       | N/A          | Note 5                |

## 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.

| <b>Emissions</b>  | <b>100% load</b> | <b>90% load</b> | <b>75% load</b> | <b>50% load</b> |
|---|------------------|-----------------|-----------------|-----------------|
| NO <sub>x</sub> emissions dry, ppm <sup>7</sup>   | 182              | 183             | 174             | 180             |
| NO <sub>x</sub> emissions, mg/Nm <sup>3</sup> @ 5% O <sub>2</sub> (g/hp-h) <sup>7</sup> | 500 (1)          | 500 (1)         | 500 (1)         | 500 (1)         |
| THC emissions wet, ppm <sup>2</sup>   | 1118             | 1159            | 1192            | 1242            |
| THC emissions, mg/Nm <sup>3</sup> @ 5% O <sub>2</sub> (g/hp-h) <sup>2</sup>             | 1240 (2.4)       | 1270 (2.5)      | 1290 (2.5)      | 1300 (2.5)      |
| NMHC emissions wet, ppm <sup>2,3</sup>  | 168              | 174             | 179             | 186             |
| NMHC exhaust emissions, mg/Nm <sup>3</sup> @ 5% O <sub>2</sub> (g/hp-h) <sup>2,3</sup>  | 190 (0.37)       | 190 (0.4)       | 190 (0.4)       | 200 (0.4)       |
| HCHO emissions (wet), ppm <sup>6</sup>  | 70               | 70              | 70              | 70              |
| HCHO exhaust emissions, mg/Nm <sup>3</sup> @ 5% O <sub>2</sub> , (g/hp-h) <sup>6</sup>  | 150 (0.28)       | 150 (0.28)      | 140 (0.28)      | 140 (0.28)      |
| CO emissions (dry), ppm <sup>7</sup>  | 413              | 418             | 425             | 439             |
| CO emissions rate, mg/Nm <sup>3,7</sup> @ 5% O <sub>2</sub> (g/hp-h)                    | 710 (1.42)       | 710 (1.4)       | 710 (1.5)       | 710 (1.5)       |
| CO <sub>2</sub> emissions (dry), percent <sup>7</sup>                                   | 6.6              | 6.6             | 6.7             | 7.0             |
| O <sub>2</sub> emissions (dry), percent <sup>7</sup>                                    | 9.3              | 9.2             | 9.1             | 8.6             |
| Particulates PM10, g/hp-h <sup>7</sup>  | < 0.03           | < 0.03          | < 0.03          | < 0.03          |

### Notes:

1. Production variation/tolerance ±5%.
2. Tolerance +/- 15%.
3. NMHC emission are an estimate. Actual NMHC emissions are a function of the non-methane hydrocarbons in the fuel.
4. Standby (S), Prime (P), Continuous (C) ratings.
5. Alternator model and data sheet information available on [power.cummins.com](http://power.cummins.com).
6. Tolerance +/- 35%.
7. Tolerance +/- 10%.

For more information contact your local Cummins distributor  
or visit [power.cummins.com](http://power.cummins.com)

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