

Generator set data sheet

1000 kW continuous



Model:	C1000 N6C
Frequency:	60 Hz
Fuel type:	Natural gas MI 60 +
Emissions NOx:	0.5 g/hp-h
LT water inlet temp:	40 °C (104 °F)
HT water outlet temp:	90 °C (194 °F)

Measured sound performance data sheet:	MSP-1257
Prototype test summary data:	PTS-288
Generator set outline drawing:	A029E093 heavy duty air cleaner A029U550 standard air cleaner

Fuel consumption (ISO3046/1)	100% load	90% load	75% load	50% load
Fuel consumption (LHV) ISO3046/1, kW (MMBTU/hr) ^{1,2,3,4,5,7}	2438 (8.33)	2210 (7.55)	1867 (6.38)	1316 (4.49)
Mechanical efficiency ISO3046/1, percent ^{1,2,4,5,7}	42.3%	42.0%	41.4%	39.2%
Electrical efficiency ISO3046/1, percent ^{1,2,3,4,5,7}	41.0%	40.7%	40.2%	38.0%

Engine

Engine manufacturer	Cummins
Engine model	QSK60G
Configuration	V16
Displacement, L (cu.in.)	60 (3671)
Aspiration	Turbocharged (1)
Gross engine power output, kWm (hp)	1031 (1382)
BMEP, bar (psi)	17.2 (249)
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) ⁸	0.2 (2.9)
Minimum methane index	60

Engine electrical system(s)

Electric starter voltage, volts	24
Ignition timing, deg before top dead center	18
Minimum battery capacity @ 40 °C (104 °F), AH	720

Genset dimensions

Genset length, m (ft) ⁶	5.12 (16.8)
Genset width, m (ft) ⁶	2.23 (7.30)
Genset height, m (ft) ⁶	2.77 (9.08)
Genset weight (wet), kg (lbs) ⁶	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 engine driven LT coolant pump.
3. At electrical output of 1.0 power factor, 97% alternator efficiency.
4. Based on pipeline natural gas with LHV of 33.44 MJ/Nm³ (905 BTU/ft³).
5. Subtract 3 °C ambient temperature capability for each 100 mm (4 in.) H₂O 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%.
8. Minimum gas supply pressure dependant on LHV of fuel.

	100% load	90% load	75% load	50% load
Energy data				
Continuous generator electrical output kW _e ^{1,5,6,7}	1000	900	750	500
Continuous shaft power, kW _m (bhp) ^{1,5,6,7}	1031 (1382)	928 (1244)	773 (1036)	515 (690)
Total heat rejected in LT circuit, kW (MMBTU/h) ²	82 (0.28)	75 (0.26)	63 (0.21)	46 (0.16)
Total heat rejected in HT circuit, kW (MMBTU/h) ²	545 (1.86)	484 (1.65)	398 (1.36)	350 (1.19)
Unburnt, kW (MMBTU/h) ²	52 (0.18)	47 (0.16)	40 (0.14)	27 (0.09)
Heat radiated to ambient, kW (MMBTU/h) ²	158 (0.54)	143 (0.49)	120 (0.41)	83 (0.28)
Available exhaust heat to 105 °C, kW (MMBTU/h) ²	546 (1.86)	505 (1.72)	444 (1.51)	330 (1.13)
Intake air flow				
Intake air flow mass, kg/s (lb/hr) ²	1.57 (12430)	1.41 (11170)	1.2 (9500)	0.83 (6570)
Intake air flow volume, m ³ /s @ 0 °C (scfm) ²	1.22 (2720)	1.09 (2430)	0.93 (2080)	0.64 (1430)
Max inlet restriction (after filter, limit for changing filters), below 35 °C ambient temp, mm HG, (in H ₂ 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 ₂ O)	18.7 (10)	15.2 (8.1)	10.5 (5.6)	0 (2.5)
Exhaust air flow				
Exhaust gas flow mass, kg/s (lb/hr) ²	1.62 (12830)	1.46 (11560)	1.24 (9820)	0.87 (6890)
Exhaust gas flow volume, m ³ /s (cfm) ^{2,9}	3.18 (6730)	2.9 (6140)	2.5 (5290)	1.8 (3810)
Exhaust temp after turbine, °C (°F) ¹	420 (788)	428 (802)	440 (824)	459 (858)
Max exhaust system back pressure, mm HG (in H ₂ O) ⁸	38 (20)	31 (17)	21 (11)	10 (5)
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)	63 (277)	63 (277)	63 (277)	63 (277)
Max HT engine coolant inlet temp, °C (°F) reference ³	82 (180)	83 (181)	84 (183)	85 (185)
HT coolant outlet temp, °C (°F) ³	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)
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)	17 (75)	17 (75)	17 (75)	17 (75)
LT coolant inlet temp, thermostat controlled °C (°F) ⁴	40 (104)	40 (104)	40 (104)	40 (104)
LT coolant inlet temp max ⁴	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 engine driven LT coolant pump.
6. At electrical output of 1.0 power factor, 97% alternator efficiency.
7. Based on pipeline natural gas with LHV of 33.44 MJ/Nm³ (905 BTU/ft³).
8. Subtract 3 °C ambient temperature capability for each 100 mm (4 in.) H₂O back pressure above the information shown on page 2.
9. At exhaust temperature and standard atmospheric pressure.

Altitude and temperature derate multiplication factor ^{1.2.3}

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	-	
22.8	771	7382	2250	0.86	0.86	0.86	0.84	0.80	0.74	0.65	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	0	15	20	25	30	35	40	45	50
				°F	32	59	68	77	86	95	104	113	122

Methane number capability table B

	Load (percent of rated)		
100%	90%	75%	50%
60	60	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.) H₂O 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 ⁴	Phase factor	Alternator data sheet
380-480	Wye, 3 Phase	105	C	N/A	Note 5
440-480	Wye, 3 Phase	80	C	N/A	Note 5
600	Wye, 3 Phase	80	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.

Emissions	100% load	90% load	75% load	50% load
NO _x emissions dry, ppm ⁸	83	84	84	79
NO _x emissions, mg/Nm ³ @ 5% O ₂ (g/hp-h) ⁸	200 (0.5)	200 (0.5)	200 (0.5)	200 (0.5)
THC emissions wet, ppm ²	1212	1244	1287	1352
THC emissions, mg/Nm ³ @ 5% O ₂ (g/hp-h) ²	1350 (2.6)	1380 (2.6)	1420 (2.6)	1460 (2.6)
NMHC emissions wet, ppm ^{2,3}	182	187	193	203
NMHC exhaust emissions, mg/Nm ³ @ 5% O ₂ (g/hp-h) ^{2,3}	200 (0.4)	210 (0.4)	210 (0.4)	220 (0.4)
HCHO emissions (wet), ppm ⁶	70	70	70	70
HCHO exhaust emissions, mg/Nm ³ @ 5% O ₂ , (g/hp-h) ⁶	150 (0.3)	150 (0.3)	150 (0.3)	140 (0.3)
CO emissions (dry), ppm ⁹	401	396	392	377
CO emissions rate, mg/Nm ³ @ 5% O ₂ (g/hp-h)	700 (1.4)	680 (1.4)	670 (1.4)	630 (1.4)
CO ₂ emissions (dry), percent ⁹	6.5	6.5	6.6	6.7
O ₂ emissions (dry), percent ⁹	9.5	9.4	9.3	9.0
Particulates PM10, g/hp-h ⁹	< 0.03	< 0.03	< 0.03	< 0.03

Notes:

1. Production variation/tolerance $\pm 5\%$.
2. Tolerance $\pm 15\%$.
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.
6. Tolerance $\pm 35\%$.
7. Maximum surge kVA or specific alternator data can be obtained by request if not published.
8. Tolerance $\pm 10\%$ for 1 g, $\pm 14\%$ for 0.7 g & $\pm 20\%$ for 0.5 g.
9. Tolerance $\pm 10\%$.

For more information contact your local Cummins distributor
or visit power.cummins.com

Our energy working for you.™

