	Model: <b>4M11G4N0/6</b>	Date: 26/10/22
	<b>PowerKit Gas Engine Datasheet</b>	

## Ratings


	1800 rpm / 60 Hz		
	COP kWm	PRP kWm	ESP kWm
<b>Gross Engine Power</b>	60	70	77
<b>Net Engine Power*</b>	56.7	66.7	73.7

\* When the engine is used with a cooling system using an electrically driven fan, net engine output data may change and quoted figures should be used for reference only

## Basic data

Engine model	.....	4M11G4N0/6
N° of Cylinders / Valves	.....	4 / 8
Cylinders arrangement	.....	In line
Bore x Stroke (mm)	.....	105 x 130
Displacement (L)	.....	4.5
Mean Piston Speed (m/s)	.....	7,8
BMEP (Bar)	.....	11,4
Fuel	.....	Pipeline Natural Gas - MN ≥ 80
Cooling System	.....	Liquid (water + 50% antifreeze)
Injection System	.....	Open Chamber
Fuel System	.....	Lean Burn Spark Ignited
Aspiration	.....	Turbocharged and Intercooled
Compression ratio	.....	11.5 : 1
Flywheel housing	.....	SAE 3
Flywheel	.....	11.5"
N° of teeth on flywheel ring gear	.....	131
Inertia of flywheel (kg/m <sup>2</sup> )	.....	0.9
Inertia of crankshaft (kg/m <sup>2</sup> )	.....	0,13
Emission	.....	N/A
Overall Dimensions with radiator (Length x Width x Height) (mm)	.....	1375 x 747 x 1038
Engine dry weight (with radiator) (kg)	.....	604
Engine wet weight (includes oil, coolant) (kg)	.....	630
Max ambient temperature restriction (°C) <sup>1</sup>	.....	45

<sup>1</sup> The indicated value is based on an ATB value of 45°C for an engine tested at 100% of the COP Power, in an open condition, without an enclosure or container, without any airflow obstruction in the front of the radiator, without air recirculation, with free exhaust gas exit and with the engine thermostatic valve in its full open condition, without a closing plate present.

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### Air intake system

Max temperature rise before turbocharger (°C) .....	≤ 15
Air intake restriction clean filter (mBar) .....	≤ 35
Air intake restriction dirty filter (mBar) .....	≤ 60
Recommended air flow Volume / Mass @ COP (m <sup>3</sup> /min) / (Kg/h) .....	4.11 / 292
Recommended air flow Volume / Mass @ PRP (m <sup>3</sup> /min) / (Kg/h).....	4.80 / 342
Recommended air flow Volume / Mass @ ESP (m <sup>3</sup> /min) / (Kg/h) .....	5.00 / 355.40

### Intercooling system

Intercooler heat dissipating capacity @ COP (KW) .....	5.32
Intercooler heat dissipating capacity @ PRP (KW) .....	6.21
Intercooler heat dissipating capacity @ ESP (KW) .....	6.36
Max. intake temperature @ 25°C ambient temperature (°C) .....	55
Max. difference between intake temperature and ambient temperature (°C) .....	5
Max. intake pressure drop of intercooler (mBar).....	120


### Cooling system

Min. inside diameter of coolant outlet pipe (mm) .....	42
Coolant capacity of radiator and pipes (L) .....	8
Coolant capacity of the engine (L) .....	5.3
Coolant alarm and shutdown temperature (°C) .....	98 / 105
Thermostat opening temperature / fully open temperature (°C) .....	76 / 90
Min. pressure in cooling system (Bar) .....	0.15
Coolant flow at engine pump at 1800 Rpm ( in m <sup>3</sup> /h) .....	4,2
Maximum additional cooling circuit restriction (mBar) .....	500

### Cooling fan

Type .....	Belt driven pusher
Air flow (m <sup>3</sup> /min) .....	186
Power consumption (KW) .....	2,2
Max allow back pressure (mBar) .....	TBD

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### Exhaust system

Max. exhaust back pressure (mBar) .....	75
Min. exhaust back pressure (mBar) .....	0
Exhaust temperature after turbocharger (°C) .....	547
Exhaust flow Volume / Mass @ COP (m³/min) / (Kg/h) .....	14 / 306
Exhaust flow Volume / Mass @ PRP (m³/min) / (Kg/h) .....	16,3 / 357
Exhaust flow Volume / Mass @ ESP (m³/min) / (Kg/h) .....	17,1 / 372
Min. diameter of exhaust pipe (mm) .....	65
Max. bending moment of exhaust gas exit flange (Nm) .....	10

### Lubrication system

Oil capacity Low / High (L) .....	9 / 11
Oil pressure in normal condition idle speed (Bar) .....	≥ 1.2
Oil pressure in normal condition at 1800 Rpm @ PRP (Bar) .....	3 - 6
Lowest oil pressure alarm (shutdown) (Bar) .....	1
Highest oil pressure alarm (shutdown) (Bar) .....	10
Max. oil temperature (°C) .....	105
Oil flow (L/min) .....	46
Oil consumption at full load (g/kW-hr) .....	≤ 0.5
Total system capacity / including filters (L) .....	11

### Noise

Engine sound pressure level (dB(A))@1m .....	94,1
Engine acoustic power level (dB(A)) .....	110,8

### Fuel system

Governor .....	ECU
Pressure loss from gas mixer (mBar) .....	5
Suction pressure max (mBar) .....	30
Max. Gas inlet temperature (°C) .....	35
Min / Max customer supply pressure before gas regulator (Bar) .....	0,02 / 0,04
Min / Max supply pressure at engine inlet (mBar) .....	15 / 35
Min. diameter of gas inlet pipe (mm) .....	24

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### Electrical system

Electrical system voltage (negative to ground) (Vdc) .....	24
Starter power (kW) .....	6
Battery charger current (A) .....	80
Max. electric resistance of starting circuit (mΩ) .....	4
Min. sectional area of wire (mm <sup>2</sup> ) .....	50
Min. cold start temperature without auxiliary starting device (°C) .....	-10
Alternator battery charger consumption (KW).....	2,3

### Heat balance test data (with ambient temperature 28 °C)

Load	COP			PRP		
	100%	75%	50%	100%	75%	50%
Total heat dissipation (KW)	135,6	107,46	86,07	154,82	120,35	92,45
Heat taken away by the coolant (KW)	51,14	40,53	32,46	58,39	45,39	34,86
Intercooler heat dissipating capacity (KW)	5,12	4,06	3,25	5,85	4,54	3,49
Available exhaust heat to 120 °C – (KW)	49,03	38,85	31,12	55,98	43,51	33,43
Radiated heat to ambient (KW)	30,31	24,02	19,24	34,61	26,9	20,67

### Fuel consumption / Mechanical efficiency ISO3046/1

	COP			PRP	ESP
	100%	75%	50%	100%	100%
Fuel consumption LHV - (KW)	195,6	152,46	116,07	224,82	245,26
Engine mechanical efficiency (%)	30,67	29,52	25,85	31,14	31,4
Engine thermal efficiency (%)	51,21	52,07	54,78	50,87	N/A
Fuel consumption tolerance + 5 %					

### Ratings definitions

#### Emergency Standby Power (ESP)

Emergency Standby Power is the maximum power available for a varying load for the duration of a main power network failure. The average load factor over 24 hours of operation should not exceed 70% of the engine's ESP power rating. Typical operational hours of the engine is 200 hours per year, with a maximum usage of 500 hours per year. This includes an annual maximum of 25 hours per year at the ESP power rating. No overload capability is allowed. The engine is not to be used for sustained utility paralleling applications.

#### Prime Power (PRP)

Prime Power is the maximum power available for unlimited hours of usage in a variable load application. The average load factor should not exceed 70% of the engine's PRP power rating during any 24 hour period. An overload capability of 10% is available, however, this is limited to 1 hour within every 12 hour period.

#### Continuous Power (COP)

Continuous Power is the maximum power available for an unlimited period of use at a constant load factor. No overload capability is allowed.

- 1) All ratings are based on operating conditions under ISO 8528-1, ISO 3046, DIN6271. Performance tolerance of ±5%.
- 2) Test conditions : 100 kPa, 25°C air inlet temperature, relative humidity of 30%. Derating may be required for conditions outside these; please contact the factory for details.
- 3) Power output curves are based on the engine operating with fuel system, water pump and lubricating oil pump; not included are battery charging alternator, fan and optional equipment
- 4) The values given in this data sheet are for information purposes only and not binding