	Model : <b>12M33G1650/5</b>	Date : 20/12/19
	<b>PowerKit Engine Datasheet</b>	


## Ratings

RPM	Gross Engine Output	
	PRP kWm	ESP kWm
1500	1318 *	1450

## Basic data

Engine model	12M33G1650/5
N° of Cylinders / Valves	12 / 48
Cylinders arrangement	At Vee
Bore x Stroke (mm)	150 x 185
Displacement (L)	39.2
Thermodynamic Cycle	Diesel 4 stroke
Cooling System	Liquid (water + 50% antifreeze)
Injection System	Direct
Fuel System	High Pressure Common Rail
Aspiration	Turbocharged and Aftercooled
Compression ratio	15 : 1
Flywheel housing	SAE 0
Flywheel	18"
N° of teeth on flywheel ring gear	194
Inertia of flywheel (kg/m <sup>2</sup> )	7.14
Inertia of crankshaft (kg/m <sup>2</sup> )	3.34
Emission standard	N/A
Overall Dimensions with radiator (Length x Width x Height) (mm)	3482 x 2192 x 2246
Engine dry weight without radiator and without radiator pipes (kg)	3420
Engine dry weight with radiator and radiator pipes (kg)	4405
Engine wet weight with radiator (includes oil, coolant) (kg)	4865

\* The indicated PRP Power is for reference only. This engine is designed for emergency standby power (ESP) applications only.

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### Air intake system

Air intake temperature rise (°C) .....	≤ 5
Air intake restriction clean filter (mBar) .....	≤ 30
Air intake restriction dirty filter (mBar) .....	≤ 62
Recommended air flow @ PRP (m <sup>3</sup> /min) .....	N/A
Recommended air flow @ ESP (m <sup>3</sup> /min) .....	101.1
Min. diameter of intake pipe (mm) .....	160

### Aftercooling system

Aftercooler system type .....	Air to Air
Aftercooler heat dissipating capacity @ PRP (kJ/s) .....	N/A
Aftercooler heat dissipating capacity @ ESP (kJ/s) .....	326.7
Max. intake temperature @ 25°C ambient temperature (°C) .....	55
Max. difference between intake temperature and ambient temperature (°C) .....	≤ 30
Max. intake pressure drop of aftercooler (mBar).....	120

### Lubrication system


Oil capacity Low / High (L) .....	117 / 155
Oil pressure in normal condition idle speed (Bar) .....	≥ 2
Oil pressure in normal condition at 1500 Rpm @ PRP (Bar) .....	4 - 6.5
Lowest oil pressure alarm (shutdown) (Bar) .....	2
Max. oil temperature (°C) .....	105
Oil flow (L/min) .....	≥ 392
Oil fuel consumption ratio based on engine fuel consumption data .....	≤ 0.3 %
Total system capacity (including filters) (L) .....	160

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

Total heat dissipation @ ESP (kJ/s) .....	2242.1
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### Exhaust system

Max. exhaust back pressure (mBar) .....	75
Max. exhaust temperature before turbocharger (°C) .....	≤ 700
Max. exhaust temperature after turbocharger (°C) .....	≤ 550
Exhaust flow @ PRP (m <sup>3</sup> /min) .....	N/A
Exhaust flow @ ESP (m <sup>3</sup> /min) .....	334.9
Min. diameter of exhaust pipe (mm) .....	220
Max. bending moment of exhaust gas exit flange (Nm) .....	10

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## Cooling system with standard radiator version 2020

System designed for ambient temperature up to (°C) <sup>1</sup> .....	50
Radiator type .....	Mechanical
Fan type .....	Belt driven pusher
Min. inside diameter of coolant outlet pipe (mm) .....	84
Coolant capacity of radiator and pipes (L) .....	220
Coolant alarm (shutdown) temperature (°C) .....	103
Thermostat opening temperature / full open temperature (°C) .....	76 / 88
Min. pressure in cooling system (Bar) .....	0.5
Coolant capacity of the engine (L) .....	83
Cooling fan airflow (m <sup>3</sup> /min) .....	2100
Max additional restriction - Duct allowance (Pa) .....	175

## Fuel system


Governor .....	ECU
Max. restriction at fuel pump inlet (Bar) .....	0.5
Max. fuel return restriction (Bar) .....	0.2
Max. fuel inlet temperature (°C) .....	70
Fuel supply flow (L/hr) .....	1900
Min. pressure of fuel pump (Bar) .....	0.5
Min. diameter of inlet pipe (mm) .....	19
Min. diameter of return pipe (mm) .....	19

## Electrical system

Electrical system voltage (negative to ground) (Vdc) .....	24
Starter power (kW) .....	10
Battery charger current (A) .....	55
Battery charger absorbed power (kW) .....	1.6
Max. electric resistance of starting circuit (Ω) .....	0.008
Min. sectional area of wire (mm <sup>2</sup> ) .....	95
Min. cold start temperature without auxiliary starting device (°C) <sup>2</sup> .....	- 5
Min. cold start temperature with auxiliary starting device (°C) <sup>2</sup> .....	- 10

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

<sup>2</sup> Engines used in emergency standby application or application that require immediate start under load, must be equipped with coolant heaters. Baudouin recommend heaters installation to be executed by providing constant coolant circulation across all the engine components. Two heaters are required for V-type engines, one per each side.

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### Performance data

Mean Piston Speed (m/s)	.....	9.25
BMEP (Bar)	.....	29.59
Fan absorbed power (kW)	.....	55

### Noise

Diesel engine noise (Acoustic power level) (dB(A))	.....	121.2
Noise - upper side (dB(A))	.....	102.9
Noise - right side (view from flywheel) (dB(A))	.....	104.8
Noise - left side (view from flywheel) (dB(A))	.....	103.6
Noise – front (radiator) side (dB(A))	.....	103.5
Noise – rear (flywheel) side (dB(A))	.....	106

#### Notes :

- Noise test made at 100% of the ESP power, 1 mt. distance, on engine without radiator, without cooling fan and without silencer.
- Noise test refers to GB/T 1859 norm : Reciprocating internal combustion engines. Measurement of emitted airborne noise. Engineering method and survey method

### Fuel consumption

Rating	gr/kWh	L/hr
100% ESP	204.9	353.7
100% PRP	N/A	N/A
75% PRP	N/A	N/A
50% PRP	N/A	N/A
25% PRP	N/A	N/A
Fuel consumption tolerance + 3 %		

### 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.

- All ratings are based on operating conditions under ISO 8528-1, ISO 3046, DIN6271. Performance tolerance of  $\pm 5\%$ .
- Test conditions : 100 kPa, 25°C air inlet temperature, relative humidity of 30%, with fuel density 0.84 kg/L. Derating may be required for conditions outside these; please contact the factory for details.
- 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.