

## Ratings

RPM	Gross Engine Output		
	COP kWm	PRP kWm	ESP kWm
1500	72	72	80

## Basic Data

Engine model	4M10G88/5
N° of Cylinders / Valves	4/8
Bore x Stroke (mm)	105 × 118
Displacement (L)	4.1
Fuel System	Mechanical Pump
Aspiration	Turbocharged
Compression ratio	17.5
Flywheel housing	SAE 3
Flywheel	11.5"
N° Of teeth on flywheel ring gear	128
Inertia of flywheel (kg·m <sup>2</sup> )	0.391
Inertia of crankshaft (kg·m <sup>2</sup> )	0.111
Emission standard	N/A
Overall Dimensions with radiator (Length x Width x Height) (mm)	1268 × 678 × 907
Engine dry weight (kg)	468
Engine wet weight (includes oil, coolant) (kg)	510

### Air intake system

Air intake temperature rise (°C) .....	N/A
Air intake restriction Clean filter (Bar) .....	0.03
Air intake restriction Dirty filter (Bar) .....	0.06
Recommended air flow @ PRP (m <sup>3</sup> /sec) .....	0.0681
Recommended air flow @ ESP (m <sup>3</sup> /sec) .....	0.0728
Min. diameter of intake pipe (mm) .....	60

### Inter cooling system

Intercooler heat dissipating capacity @ PRP (kJ/s) .....	N/A
Intercooler heat dissipating capacity @ ESP (kJ/s) .....	N/A
Max. intake temperature @ 25°C ambient temperature (°C) .....	N/A
Max. difference between intake temperature and ambient temperature (°C) .....	N/A
Max. intake pressure drop of intercooler (kPa) .....	N/A

### Cooling system

Min. inside diameter of coolant outlet pipe (mm) .....	36
Coolant capacity of radiator (L) .....	14
Coolant alarm temperature (°C) .....	98
Thermostat opening temp./ full open temp (°C) .....	76/89
Min. pressure in cooling system (Bar) .....	0.15
Coolant capacity of the engine (L) .....	9.4

### Exhaust system

Max. exhaust back pressure (Bar) .....	0.05
Max. exhaust temperature Before turbocharger (°C) .....	650
Max. exhaust temperature After turbocharger (°C) .....	570
Exhaust flow @ PRP (m <sup>3</sup> /sec) .....	0.262
Exhaust flow @ ESP (m <sup>3</sup> /sec) .....	0.287
Min. diameter of exhaust pipe (mm) .....	70
Max. bending moment of turbocharged flange (N-m) .....	N/A

## Lubrication system

Oil Capacity Low-High (L)	9.5-12.5
Oil pressure in normal condition Idle speed (Bar)	$\geq 1$
Oil pressure in normal condition @ PRP (Bar)	3-5
Lowest oil pressure Alarm valve (Bar)	1
Max. oil temperature (°C)	110
Oil flow (L/min)	44
Oil fuel consumption ratio based on engine fuel consumption data	$\leq 0.1\%$
Total system capacity (including filter) (L)	13

## Noise

Diesel engine noise (Acoustic power level) (dB(A))	105.6
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## Fuel system

Governor	Electronical
Max. restriction at fuel pump inlet (clean/dirty filter) (Bar)	N/A
Max. fuel return restriction (Bar)	N/A
Max. fuel inlet temperature (°C)	70
Fuel supply flow @ PRP (m <sup>3</sup> /sec)	$5.22 \times 10^{-6}$
Fuel supply flow @ ESP (m <sup>3</sup> /sec)	$5.92 \times 10^{-6}$
Min. pressure of fuel pump (Bar)	N/A
Min. diameter of inlet pipe (mm)	12
Min. diameter of return pipe (mm)	12

## Electrical system

Electrical system voltage (V)	12
Starter power (kW)	3.8
Battery charger current (A)	80
Max. electric resistance of the starting circuit ( $\Omega$ )	0.004
Min. sectional area of wire (mm <sup>2</sup> )	50
Min. cold start temperature Without auxiliary starting device (°C)	-15
Min. cold start temperature With auxiliary starting device (°C)	-25

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

Total heat dissipation @ ESP (kJ/s) ..... 215.9

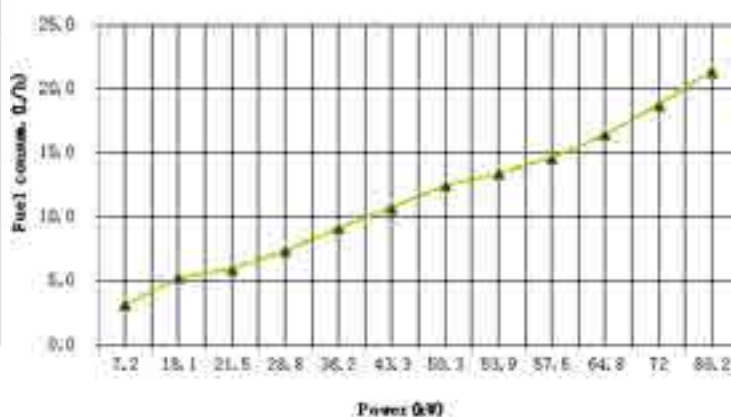
## Performance data

Mean Piston Speed (m/s) ..... 5.9

BMEP (Bar) ..... 15.6

Fan Absorbed Power (kW) ..... 2

Rating	Fuel Consumption(L/hr) @ 1500rpm
ESP	21.3
100% PRP	18.8
75% PRP	13.5
50% PRP	9.0
Fuel Consumption tolerance + 3%	

**Fuel consum.**


## Ratings Definitions

### Emergency Standby Power (ESP)

Engines of this rating provide power output with a varying load for the duration of a main power network failure. The average load factor should not exceed 70% of the engine's standby power rating. Typical operational hours of the engine is 200 hours, with a maximum expected usage of 500 hours. This includes an annual maximum of 25 hours per year at the standby power rating. No overload capability is allowed. The engine is not to be used for maintained utility paralleling applications.

### Unlimited Prime Rated Power (PRP)

Engines of this rating provide unlimited hours of usage in a variable load application. The average load factor should not exceed 70% of the engine's prime power rating; with a maximum number of 500 operational hours at 100% prime power rating. An overload capability of 10% is available, however, is limited to a period of 1 in every 12 hours.

### Continuous Power (COP)

Engines of this rating provide unlimited hours of usage per year at a constant 100% load factor. No overload capability is allowed.

1) The power ratings are in accordance with ISO 3046.

2) Test conditions: 100 kPa, 25 °C air inlet temperature, relative humidity of 30%, with fuel density 0.84 kg/L.

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.