12M33G1400/5e2 G-Drive Engine Datasheet

Speed	Gross Engine Output		
	COP	PRP	ESP
rpm	kWm	kWm	kWm
1500	880	1100	1210

Ratings definitions

	Continuous Power (COP)	Prime Power (PRP)	Standby Power (ESP)
Annual working time	Unlimited	Unlimited	≤200 h
Mean engine load factor	100%	≤70% per 250 h	≤80% per 24 h
Time at full load	Unlimited	≤500 h per year	≤25 h per year
Overload capacity	No	1 h per 12 h(10% overload) ≤25h per year	No

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) The engine maybe operated at : up to 1000m and 30°C without power deration. For sustained operation above these conditions, derate by 3% per 300m, and 2% per 11°C.
4) 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.

Basic data

Engine model	12M33G1400/5e2	No. of Cylinders/Valves	12/48
Bore×Stroke (mm)	150×185	Displacement (L)	39.2
Fuel system	Mechanical pump	Aspiration	Turbocharged and Intercooled
Compression ratio	15.1:1	Emission standard	EU Stage II
Overall Dimension （Length×Width×Height）(mm)	2524×1312×1731	Engine net weight (kg)	3390
Fuel supply advance angle （°）	21-22		
Flywheel housing	SAE 0	Flywheel	18"
Max. permited installing angle （°）	Longitudinal inclination	Front /Rear	10/10
	Cross inclination	Left/Right	22.5/22.5
Permitted temperature ambient (℃)	-10-50	Permitted altitude limit (m)	2000
Valve lash/clearance at cold (mm)	（intake valve:0.3±0.03）/(exhaust valve:0.4±0.03)		

Performance data

Idle Speed (rpm)	700-750	Max. Speed Limit (rpm)	1545
Mean Piston Speed (m/s)	9.25	BMEP (MPa)	2.245
Friction Power (kW)	/	Fan Power (kW)	31
Load factor	Power (kW)	Fuel consum. g/(kW.h)	Fuel consum. (L/h)
110%	1209.9	200.5	288.8
100%	1101.8	197.5	259.1
90%	992.7	195.2	230.7
75%	826.0	194.2	191.0
60%	660.0	195.6	153.7
50%	551.4	197.3	129.5
40%	440.7	201.5	105.7
30%	329.8	210.8	82.8
25%	275.5	217.4	71.3
10%	108.9	288.7	37.4

Air intake system

Air intake temperature rise （℃）	Permitted difference between turbocharger inlet temperature and ambient temperature(this parameter impacts emission ,LAT and altitude capability)	≤5
Air intake resistance (kPa)	Clean filter	≤3
	Dirty filter	≤5
Needed air flow (kg/h)	Rated Power	5520
	Standby Power	5938
Air filter efficiency		≥99.5%
Recommended Min. diameter of intake pipe (mm)		160

Intercooler system

Intercooler heat dissipating capacity（kJ/s）	Rated Power	248.3
	Standby Power	278.5
Intercooler efficiency	Rated Power	≥85%
	Standby Power	/
Max. intake temperature when the ambient temperature is 25℃ （℃）		55
Permited temperature difference between intake temperature and ambient temperature (℃)		30
Permitted max. intake pressure drop of intercooler (kPa)		12
Recommended intercooler radiator cooling area (m^2)		170

Exhaust system

Permited Max. exhaust back pressure (kPa)		7.5
Max. exhaust temperature (℃)	Before turbocharger	700
	After turbocharger	550（rated power）
Exhaust flow （kg/h）	Rated Power	5739
	Standby Power	6181
Recommended Min. diameter of exhaust pipe (mm)		220
Max.bending moment at the turbocharger flange（N•m）		10

Lubrication system

Volume of oil pan (L)		146
Oil pressure in normal condition (kPa)	Idle speed	≥200
	Rated Power	400~650
Lowest oil pressure alarm valve/highest alarm valve （kPa）		200/1000
Temperature range in main oil passage under rated working condition (℃)		85~105
Max. oil pressure while engine starts（kPa）		1000
Opening pressure of main oil passage pressure limiting valve		500-550
Oil flow （L/min）		≥392
Oil fuel consumption ratio		≤0.3%

Noise and Emission

Exhaust smoke (FSN)	Rated working station	≤1.5
	Max. torque working conditon	/
Diesel engine noise （Acoustic power level）(dB(A))		121.6

Fuel system

Governor	Electric governor
Steady speed droop	≤3%

Max. fuel supply resistance of the fuel pump inlet at rated working conditon（kPa）		13
Max. fuel return resistance（kPa）		15
Permited Max. fuel inlet temperature （℃）		45
Fuel suply flow（kg/h）	Rated Power	219.5
	Standby Power	243.3
Min. pressure of fuel pump（kPa）		35
Recommended min. diameter of inlet pipe （mm）		12
Recommended min. diameter of return pipe （mm）		12

Electric system

Electric system voltage(V)		24
Starter power/voltage （kW/V）		10/24
Alternator power/voltage （kW/V）		1.54/28
Permited Max. electric resistance of the starting circuit（Ω）		0.002
Recommended Min. sectional area of wire（mm²）		70
The lowest cold starting temperature（℃）	Without auxiliary starting device	-5
	With auxiliary starting device	-10

Cooling system

Water pump Transmission speed ratio	1.9
Permited Min. coolant temperature when engine working（℃）	50
Coolant fill rate (L/min)	17.4
Max. time to fill (min)	9
Recommended Min. inside diameter of outlet water pipe(mm)	45
Min. pressure at water pump inlet without degassing device or with some degassing device（kPa）	50
Min. pressure at water pump inlet with full degassing device（kPa）	0
Max. degassing time(min)	15
Coolant capacity of engine（L）	75.94
Coolant capacity of radiator（L）	157
Water alarm temperature （℃）	95
Thermostat opening temp./ full open temp.（℃）	77(1/-2)/87
Permitted Min. pressure in cooling system	50
Permitted Max. external resistance（at rated speed）	50

Heat balance test data (with ambient temperature 40.3℃)

Pressure of water in/ water out （kPa / kPa）	Rated Power	left：-18.8/65.6；right：-31.0/84.6
	Standby Power	left：-12.4/50.7；right：-28.4/67.2
Coolant flow （m^3/h）	Rated Power	left：41.5；right：38.8
	Standby Power	left：38.5；right：35.3
Temperature of water in/ water out （℃/℃）	Rated Power	left：85.4/89.7；right：85.4/89.9
	Standby Power	left：84.4/89.9；right：84.4/89.8
Temperature before/after intercooler（℃/℃）	Rated Power	left：208.0/58.2；right：202.0/58.6
	Standby Power	left：213.0/57.4；right：212.0/58.6
Pressure before /after intercooler （kPa / kPa）	Rated Power	left：209.0/195.9；right：212.6/193.8
	Standby Power	left：239.6/223.8；right：232.9/214.2
Heat taken away by Coolant	Rated Power	411.5

（kJ/s）	Standby Power	450.6
Heat taken away by intercooler （kJ/s）	Rated Power	248.2
	Standby Power	280.6
Heat taken away by exhaust gas （kJ/s）	Rated Power	840.6
	Standby Power	927.7
Total heat dissipation（kJ/s）		2308.9/2563.3

Mounting system

Inertia of flywheel（kg•m^2）	7.18
Inertia of crankshaft（kg•m^2）	4.52

Fuel consum. Curve

Fuel consumption curve versus engine power