16M33D1680E311 Engine Data Sheet

Model Name (rpm)	Gross Engine Output (kWm / PS)	
	PRP	ESP
16M33D1680E311 (1800)	1530 (2081)	1680 (2285)

Ratings Definitions

Rating	Prime Power (PRP)	Standby Power (ESP)
Annual Working Time	Unlimited	≤200 h
Mean Engine Load Factor	≤70% per 24 h	≤70% per 24 h
Time at Full Load	≤500 h per year	≤25 h per year
Overload Capacity	1 h per 12 h (10% overload) ≤25 h 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 1000 m 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; notincluded are battery charging alternator, fan and optional equipment.

Basic Data

Engine Model	16M33D1680E311	Cylinder / Valve No.	16 / 64
Bore / Stroke (mm)	150 × 185	Displacement (L)	52.3
Fuel System	Common Rail & ECU	Aspiration	Turbocharged / Intercoolec
Compression Ratio	15.1 : 1	Emission Standard	EU Stage III
Overall Dimension (L × W × H) (mm)	2,280 × 1,740 × 2,030	Engine Net Weight (kg)	5,500
Flywheel Size	SAE NO. 0 / 18	Tooth No.	194
Max. Permitted Installing Angle (°)	Longitudinal Inclination	Front / Rear	5 / 5
	Cross Inclination	Left / Right	15 / 15
Permitted Ambient Temperature (℃)	-25 ~ 50	Permitted Altitude Limit (m)	2,000

Performance Data

	60HZ	60HZ	60HZ
Idle Speed (rpm)	700 - 750	Max. Speed Limit (rpm)	2,070
Mean Piston Speed (m/s)	11.1	BMEP (MPa)	2.25
Friction Power (kW)		Fan Power (kW)	54
Load Factor	**Power (kW)**	**SFC (g/kW.h)**	**Fuel Consumption (L/h)**
110%	1,680	201.0	402.1
100%	1,530	197.3	359.5
90%	1,377	193.6	317.5
80%	1,220	194.5	282.4
70%	1,069	194.1	247.0
60%	918	197.3	215.7
50%	765	201.3	183.4
40%	612	208.0	151.6
30%	459	220.8	120.7
20%	305	230.8	83.8
10%	153	329.6	60.1

* BMEP : Brake Mean Effective Pressure
* SFC : Specific Fuel Consumption

Air Intake System

		60HZ
Intake Air Temperature Rise (℃)	Permitted difference between turbocharger inlet temperatureand ambient temperature (this parameter impacts emission, LAT and	≤5
Intake Air Resistance (kPa)	Clean filter	≤3
	Dirty filter	≤5
Combustion Air Flow (kg/h)	Rated Power	8,869
	Standby Power	9,651
Air Filter Clear Efficiency (%)		≥99.5%
Recommended Min. Diameter of Intake Pipe (mm)		153

Intercooler System

Intercooler Heat Dissipating Capacity (kJ/s)	Rated Power	321.0
	Standby Power	404.9
Intercooler Efficiency	Rated Power	/
	Standby Power	/
Max. Intake Temperature at Amb. Temp. 25 ℃ (℃)		60
Permited Temperature Difference between Intake Temperature and Ambient Temperature (℃)		21
Permitted Max. Intake Pres. Drop of Intercooler (kPa)		8
Recommended Intercooler Radiator Cooling Area (m2)		/

Exhaust System

Permitted Max. Exhaust Back Pressure (kPa)		7.5
Max. Exhaust Temperature (℃)	Before turbocharger	630 (rated power)
	After turbocharger	550 (rated power)
Exhaust Gas Mass Flow (kg/h)	Rated Power	9169
	Standby Power	9987
Recommended Min. Diameter of Exhaust Pipe (mm)		194
Max. Bending Moment of Turbocharger Flange (N•m)		10

Lubrication System

Quantity of Oil (L)	Oil Pan Full Level	171
	Oil Pan Low Level	114
	Others (Filter etc.)	32
Oil Pressure in Normal Condition (kPa)	Idle Speed	≥200
	Rated Power	400 - 650
Lowest Oil Pressure Alarm / Highest Alarm (kPa)		200 / 1,000
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 (kPa)		500 - 550
Oil Flow (L/min)		≥640
Oil Fuel Consumption Ratio		≤0.3%

Noise and Emission

Exhaust Smoke (FSN)	Rated Working Station	0.075
	Max. Torque Working Condition	/
Diesel Engine Noise (Acoustic Power Level) (dB(A))		112

Fuel System

Governor		ECU
Steady Speed Drop		≤3%
Max. Fuel Supply Resistance of the Fuel Pump at Rated Working Condition (kPa)		50
Max. Fuel Return Resistance (kPa)		20
Permitted Max. Fuel Inlet Temperature (℃)		70
Fuel Supply Flow (kg/h)	Rated Power	258.5
	Standby Power	290.6
Min. Pressure of Fuel Pump (kPa)		50
Recommended Diameter of Inlet Pipe (mm)		19
Recommended Diameter of Return Pipe (mm)		19

Electric System

Electric System Voltage (V)		24
Starter Power / Voltage (kW/V)		(8.5 / 24) x 2
Alternator Power / Voltage (kW/V)		1.54 / 28
Battery Capacity		400 Ah (12V / 200 Ah x 4 EA)
Permitted Max. Electric Resistance of Starting Circuit (Ω)		0.008
Recommended Min. Sectional Area of Wire (mm^2)		95
The Lowest Cold Starting Temperature (℃)	Without Auxiliary Starting Device	-10
	With Auxiliary Starting Device	-25

Cooling System

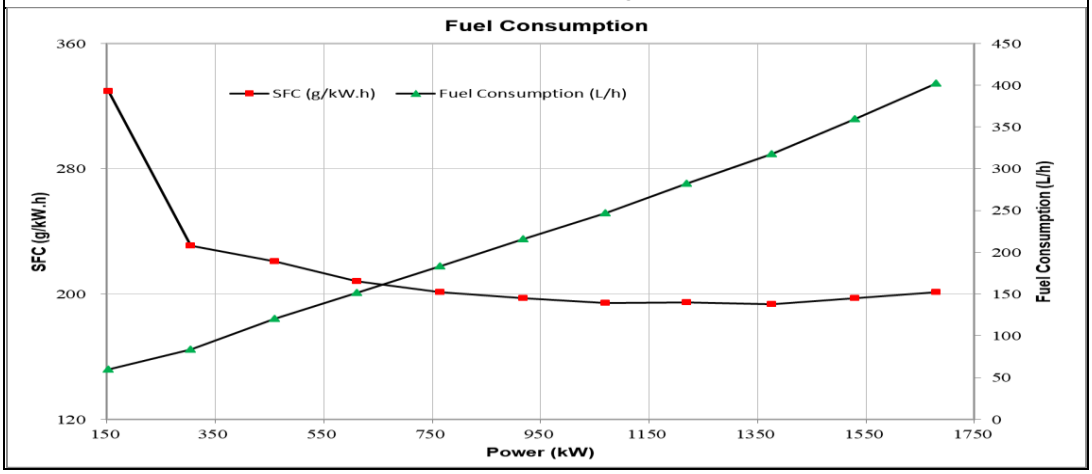
Water Pump Transmission Speed Ratio	1.93
Permited Min. Coolant Temp. When Engine Working (℃)	50
Fan Air Flow (m3/min)	2293
Water pump Flow (m3/h)	60
Recommended Min. Inside Dia of Outlet Water Pipe (mm)	Intake 100 / Outlet 79
Min. Pressure at Water Pump Inlet without Degassing Device or with Some Degassing 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)	130
Coolant Capacity of Radiator (L)	270 (with pipe 305 L)
High Alarm / Shut Down Temperature (℃)	95 / 103
Thermostat Opening / Full Open Temp. (℃)	80 / 92
Permitted Min. Pressure in Cooling System (kPa)	50
Permitted Max. External Resistance (at Rated Speed) (kPa)	50

Mounting System

Inertia of Flywheel (kg•m2)	7.2
Inertia of Crankshaft (kg•m2)	10.1

Fuel Consumption Curve

Fuel Consumption Curve versus Engine Power (60HZ)



※ Specifications are subject to change without prior notice. [End]