功率 Ratings

转速 RPM	发动机总功率 Gross Engine Output			
	数据中心功率 DCP		备用功率 ESP	
	kWm	BHP	kWm	BHP
1500	1680	2253	1800	2414

基础数据 Basic data

机型 Engine model 16M33D1800E310

缸数/气门数 N° of Cylinders / Valves 16/64

气缸分布型式 Cylinders arrangement .....V-Type V 型

缸径 x 行程 Bore x Stroke (mm) 150x185

排量 Displacement (L) 52.3

型式 Thermodynamic Cycle ..... Diesel 4 stroke 四冲程

发火次序 Firing Order ……..... A1-A7-B4-B6-A4-B8-A2-A8-B3-B5-A3-A5-B2-A6-B1-B7

增压器数量 Number of turbochargers 4

平均活塞速度 Mean Piston Speed (m/s) 9.25

平均有效压力 BMEP @ ESP (Bar) 27.53

冷却系统 Cooling System .....Liquid (water + 50% antifreeze)冷却液（水 + 50% 防冻液）

喷油系统 Injection System ..... Direct 缸内直喷

燃油系统型式 Fuel System .....High Pressure Common Rail 高压共轨

进气形式 Aspiration .....Turbocharged and Aftercooled 增压中冷

压缩比 Compression ratio ..... 15：1

飞轮壳 Flywheel housing ..... SAE 0

飞轮 Flywheel .....18"

面向飞轮端发动机旋转方向 Rotation Viewed from Flywheel …..... Counter Clockwise 逆时针

飞轮壳允许的弯矩 Allowed static bending moment of the flywheel housing (Nm) ….....TBD

飞轮齿数 N° of teeth on flywheel ring gear 194

飞轮转动惯量 Inertia of flywheel (kg•m²) 7.2

曲轴转动惯量 Inertia of crankshaft (kg•m²) 10.1

排放标准 Emission standard ..... 中国非道路 China Non-road III

整机外形尺寸 Overall Dimensions without radiator (Length x Width x Height)(mm) ...2956×1740×2025

不带散热器及管路干重 Engine dry weight without radiator and without radiator pipes (kg) 5200

带散热器及管路干重 Engine dry weight with radiator and radiator pipes (kg) ..... N/A

带散热器（包括冷却液及机油）湿重 Engine wet weight with radiator (includes oil, coolant)(kg)..... N/A

进气系统 Air intake system

清洁滤芯进气阻力 Air intake restriction clean filter (mBar) ..... ≤ 30

脏滤芯进气阻力 Air intake restriction dirty filter (mBar) ..... ≤ 62

数据中心功率进气流量 Combustion air flow @ DCP (m^3/min) 117.1

备用功率进气流量 Combustion air flow @ ESP (m^3/min) 124.5

进气管最小直径 Min. diameter of intake pipe (mm) 140

中冷系统 Aftercooling system

中冷系统型式 Aftercooler system type ..... Air to Water 水空

最大进气歧管温度 Max. intake manifold temperature(ºC) 75

进气歧管温度与环境温度之间的最大差值

Max. difference between intake manifold temperature and ambient temperature (ºC) 30

允许的中冷器最大压降 Max. intake pressure drop of aftercooler (mBar) 80

润滑系统 Lubrication system

油底壳机油最小/最大容量 Oil capacity Low / High (L) 114/171

怠速时机油压力 Oil pressure in normal condition at idle speed (Bar) ..... ≥ 2

额定转速下机油压力 Oil pressure in normal condition at rated speed (Bar) ..... 4 - 6.5

机油压力低报警（停机）值 Lowest oil pressure alarm (shutdown) (Bar) 2

机油压力高报警值 High Oil Pressure Warning (Bar) 10

最高机油温度 Max. oil temperature (ºC) 105

额定转速下机油流量 Oil flow at 1500 rpm (L/min) 533

机油燃油消耗比 Oil consumption ratio based on engine fuel consumption data (%) ..... ≤ 0.3

发动机机油总容量 Total system capacity (including filters) (L) 210

排气系统 Exhaust system

允许最大排气背压 Max. exhaust back pressure (mBar) 75

最大排气温度（涡轮前）Max. Exhaust gas temperature before turbocharger (ºC) 780

最大排气温度（涡轮后）Max. Exhaust gas temperature after turbocharger (ºC) 550

数据中心功率排气流量 Exhaust flow @ DCP (m^3/min) 395

备用功率排气流量 Exhaust flow @ ESP (m^3/min) 425.7

排气管最小直径 Min. diameter at exhaust pipe (mm) 194

涡轮增压器法兰允许最大弯矩 Max. bending moment of exhaust gas exit flange (Nm) 10

噪声 Noise

发动机噪声（声压级）Diesel engine noise (Sound pressure level) (dB(A)) 102.3

冷却系统 Cooling system (NonRad)

系统允许使用最高环境温度 System designed for ambient temperature up to (ºC) 50
允许的外部出水管内径 Min. inside diameter of coolant outlet pipe (mm) HT:79;LT:58
发动机高温冷却液容量 Coolant capacity of engine HT (L) 100
发动机低温冷却液容量 Coolant capacity of engine LT (L) 30
发动机报警（停机）温度 Coolant alarm (shutdown) temperature (ºC) 108
节温器初开/全开温度 Thermostat opening temperature / full open temperature (ºC) 80/92
冷却循环允许外部阻力高/低温
Max. additional restriction for external cooling circuit HT/LT(Bar) 0.5/0.5
风扇风量 Cooling fan air flow assumes the presence of the standard radiator provided (m^3/min) ..1680
风扇功耗 Fan absorbed power (kW) 57.27

燃油系统 Fuel system

调速器 Governor ..... ECU 电控调速
进油口最大阻力 Max. restriction at fuel inlet (Bar) 0.5
进油口最大压力 Max. pressure at fuel inlet (Bar) 0.5
最大回油阻力 Max. fuel return restriction (Bar) 0.2
最大进油温度 Max. fuel inlet temperature (ºC) 70
发动机供油流量 Fuel supply flow of engine inlet(L/hr) 648.4
进油管最小内径 Min. internal diameter of inlet pipe (mm) 19
回油管最小内径 Min. internal diameter of return pipe (mm) 19

电器系统 Electrical system

电器系统电压 Electrical system voltage (negative to ground) (Vdc) 24
起动机数量×功率 Starter motor quantity×power (kW) ..... 2×8.5
推荐最低电池容量-冷启动电流 @-18℃
Minimum recommended battery capacity CCA @-18ºC (A) .....750~1200
充电电流/充电电压 Battery charging alternator output (A) / (Vdc) 55/28
充电发电机功率 Battery charging alternator output power (kW) 1.5
启动回路最大电阻 Max. electric resistance of starting circuit (Ω) 0.008
启动回路线路最小截面积 Min. cross-sectional area of wire (mm^2) 95

热平衡测试数据 **Heat balance test data (环境温度with ambient temperature 32 ℃)**

名称 Designation	数据中心功率 DCP		备用功率 ESP	
冷却液进出压力 Coolant inlet / output pressure (kPa)	HT	LT	HT	LT
	L:-11.2/25.1 R:3.2/51.5	-3.7/25.12	L:-11.1/26.4 R:7.2/52.8	-2.8/25.86
冷却液进出温度 Coolant inlet / output temperature (ºC)	HT	LT	HT	LT
	L:88.6/93.6 R:88.8/93.0	50.3/57.3	L:90.2/95.7 R:91.7/96.2	51.0/59.1
冷却液流量 Coolant flow (m^3/h)	HT	LT	HT	LT
	L:55.2 R:59.4	47.2	L:54.9 R:58.7	47.3
中冷器进出温度 Intercooler inlet / output temperature (ºC)	L:207.5/54.5 R:206.6/54.9		L:222.3/55.9 R:221.7/56.4	
中冷器进出压力 Intercooler inlet / output pressure (kPa)	L:252.3/248.6 R:252.2/249.2		L:277.5/273.6 R:277.4/273.7	
发动机总散热量 Engine total dissipation heat (kJ/s)	2410.7		2645.2	
高温循环散热量 The heat taken by the HT circuit (kJ/s)	565.1		608.8	
中冷散热量 The heat taken by the LT circuit 低温水 (kJ/s)	345.8		400.2	
排气散热量 The heat taken by the exhaust (kJ/s)	1366.6		1483.0	
发动机辐射散热量 Radiation heat of the engine surface (kJ/s)	133.2		153.2	
涡后排气温度 Exhaust gas temperature after turbo. (ºC)	558		568.5	

注意Note: HT: 高温回路Jacket Water Circuit；LT: 低温回路Low Temperature Circuit

功率定义 Ratings definitions

数据中心功率 Data Centre Power (DCP)

在无限制运行时间的条件下，发电机组能为可变或连续电力负载提供的最大功率。Data Centre Power (DCP) is the maximum power that can be delivered while supplying a variable or continuous electrical load. A DCP-rated engine may operate for an unlimited number of hours per year.

备用功率 Emergency Standby Power (ESP)

在商定的运行条件下并按制造商规定的维修间隔和方法实施维护保养，当公共电网出现故障或在试验条件下，发电机组每年运行达 200 小时的某一可变功率系列中的最大功率，在 24 小时的运行周期内允许的平均输出功率应不大于 ESP 的 70%。Emergency Standby Power (ESP) is the maximum power that can be delivered in the event of a utility power outage while supplying a variable electrical load. An ESP-rated engine may operate for up to 200 hours per year. The permissible average power output over 24 hours of operation shall not exceed 70% of the ESP.No overload capability is allowed. The engine is not to be used for sustained utility paralleling applications.

1) 所有功率符合ISO 8528-1, ISO 3046和DIN 6271标准中规定的使用环境条件。 All ratings are determined in accordance with operating conditions specified in ISO 8528-1, ISO 3046, and DIN 6271 standards.
2) 此发动机数据单包含了标准配置的发动机信息，仅供参考。如性能参数需求超出该数据单包含内容，请联系应用工程部门获取信息。This Engine datasheet contains information applicable to standard engine configurations and is intended for reference only. For performance specifications beyond the parameters indicated, please submit technical inquiries to the Applications Engineering Department.