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Ratings

转速Speed r/min	1500 rpm / 50 Hz		
	持续功率 kW COP kW	常用功率 kW PRP kW	备用功率 kW ESP kW
发动机总功率 Gross Engine Power	1280	N/A	N/A
发动机净功率 Net Engine Power	TBD	N/A	N/A

功率定义解释 Ratings definitions :

功率分类 Ratings Definitions	运行条件 Operating condition
持续功率 COP	1、 每年运行时间不限； Unlimited using time per year; 2、 在恒定的 100%负荷下运行； Continuous power is the maximum power available at a constant load factor; 3、 不具备超负荷能力。 No overload capability is allowed.
常用功率 PRP	1、 每年运行时间不限； Unlimited using time per year; 2、 运行24h上平均负荷率不能超过70%； The average load rate is no more than 70% over 24 hours; 3、 每 12h 内，可超负荷 10%运行 1h。 Overloading 10% for 1h within 12 hours of operation is allowed.
备用功率 ESP	1、 每年运行时间不超过200h; The annual operating time shall not exceed 200h; 2、 运行24h以上，平均负荷率不超过70%； The average load rate shall not exceed 70% over24h operation cycle; 3、 不具备超负荷能力; No overload capability is allowed; 4、 发动机启动加速按照 Q/WCG136.13 进行，没有热机过程，由启动加速到标定转速需在 10s 内完成。自然吸气发动机，环境温度在 5℃以下时，需增加预热设施保证发动机出水温度在 30℃以上；环境温度 5℃以上时，无需预热设施。增压发动机环境温度 10℃以下时，需增加预热设施保证发动机出水温度在 30℃以上；环境温度 10℃以上时，无预热设施。 The acceleration of starting of engines are carried out in accordance with Q/WCG136.13, and there's no engine process. From acceleration of starting to calibration speed shall be completed within 10s. Natural aspirated engine, when the environment temperature is below 5℃ , need to increase preheat

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	facilities to ensure that engine water temperature above 30°C. When environment temperature over 5°C, no preheating facilities are required. Supercharged engine, when the environment temperature is below 10°C, need to increase preheat facilities to ensure that engine water temperature above 30°C. When environment temperature over 10°C, no preheating facilities are required.
限时使用功率 LTP	1、不具备超负荷功率； No ability to overload; 2、恒定负荷条件下，运行时间每年不超过 500h。 The annual operating time shall not exceed 500h while supplying a variable electrical load.
数据中心功率 DCP	1、具有 10%超负荷能力； It has 10% overload capacity; 2、每年运行时间不限； Annual run time is unlimited; 3、在≤100%的可变或持续负荷下工作； Working under variable or continuous load of less than 100%; 4、当设备持续运行时，功率负荷不大于标定功率的 70%。 The power load shall not exceed 70% of the calibration power when the device is running continuously.
备注 Descriptions	1) 所有功率基于标准 ISO 8528-1, ISO 3046, DIN6271，误差范围 ±5%。 All ratings are based on operating conditions under ISO 8528-1, ISO 3046, DIN6271. Performance tolerance of ±5%. 2) 测试条件：大气压力 100kPa，25°C，相对湿度 30%；其他环境条件下可能需要进行功率修正，详情请与厂家联系。 Test conditions : 100 kPa, 25 °C air inlet temperature, relative humidity of 30%. Derating may be required for conditions outside these; please contact the factory for details. 3) 所有的数据均基于发动机带燃气系统、水泵、机油泵时获得的，而不带有交流发电机、风扇、其它选用设备和被驱动的附件。 Power output curves are based on the engine operating with gas system, water pump and lubricating oil pump, without battery charging alternator, fan and optional equipment.

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基础数据 Basic data

发动机型号 Engine model	16M33D1280NG10
气缸/气门数量 N ° of Cylinders / Valves	16 / 64
气缸分布型式 Cylinders arrangement	V 形 V-engine
缸径×行程 Bore x Stroke (mm)	150 x 185
排量 Displacement (L)	52.3
活塞平均速度 Mean Piston Speed (m/s)	9.25
平均有效压力 BMEP (Bar)	19.6
燃料 Fuel	管道天然气-甲烷浓度≥88%Pipeline Natural Gas - MN ≥ 88
冷却系统 Cooling System	液体（水 + 50%冷却液）Liquid (water + 86% antifreeze)
喷射系统 Injection System	开式燃烧室 Open Chamber
燃油系统型式 Fuel System	稀薄燃烧、火花塞点火 Lean Burn Spark Ignited
进气形式 Aspiration	增压中冷 Turbocharged and Intercooled
压缩比 Compression ratio	12.5 : 1
飞轮壳 Flywheel housing	SAE 0
飞轮 Flywheel	18"
飞轮齿圈齿数 N ° of teeth on flywheel ring gear	194
飞轮转动惯量 Inertia of flywheel (kg/m ²)	7.2
曲轴转动惯量 Inertia of crankshaft (kg/m ²)	10.1
排放 Emission	N/A
发动机尺寸(长×宽×高) Overall Dimensions withoutout radiator (Length x Width x Height) (mm)	2710 x 1733 x 1770 以外形图为准 The outer chart shall prevail
发动机干重 Engine dry weight (without radiator) (kg)	5300
发动机湿重 Engine wet weight (includes oil, coolant) (kg)	/
极限环境使用温度 Max ambient temperature restriction (°C) ¹	40

¹The indicated value is based on an ATB value of 40 °C for an engine tested at 100% of the COP Power, in an open condition, without an enclosure or container, without any airflow obstruction in the front of the radiator, without air recirculation, with free exhaust gas exit and with the engine thermostatic valve in its full open condition, without a closing plate present.

¹数据单中所指极限使用环境温度40 °C为发动机在以下工况下测得：100% COP功率下进行测试，在开式环境下，无外壳及箱体，散热器前无气流堵塞及气流循环，排气口完全敞开，节温器全开。

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进气系统 Air intake system

在涡轮增压器前允许的最大的进气温升 Max temperature rise before turbocharger (°C)	≤ 2
清洁滤芯进气阻力 Air intake restriction clean filter (mBar)	≤ 15
脏滤芯进气阻力 Air intake restriction dirty filter (mBar)	≤ 25
持续工况下进气流量 Recommended air flow Volume / Mass @ COP (m ³ /min) / (Kg/h)	84.90 / 6034
额定工况下进气流量 Recommended air flow Volume / Mass @ PRP (m ³ /min) / (Kg/h)	N/A / N/A
应急备用工况下进气流量 Recommended air flow Volume / Mass @ ESP (m ³ /min) / (Kg/h)	N/A / N/A

中冷系统 Intercooling system

持续工况下中冷器散热量 Intercooler heat dissipating capacity @ COP (KW)	311.40
额定工况下中冷器散热量 Intercooler heat dissipating capacity @ PRP (KW)	N/A
备用工况下中冷器散热量 Intercooler heat dissipating capacity @ ESP (KW)	N/A
25℃环境温度下的最高进气温度 Max. intake temperature @ 25 °C ambient temperature (°C)	55
进气温度与环境温度的最大温差 Max. difference between intake temperature and ambient temperature (°C)	5
中冷器允许的最大压力降 Max. intake pressure drop of intercooler (mBar)	30

冷却系统 Cooling system

进出水外部管路的最小内径 Min. inside diameter of coolant outlet pipe HT / LT (mm)	100 / 60
散热器与管路中的冷却液容量 Coolant capacity of radiator and pipes (L)	N/A
发动机本身冷却液容量 Coolant capacity of the engine HT / LT (L)	100 / 30
出水管报警与停机温度 Coolant alarm and shutdown temperature (°C)	95 / 98
节温器初开/全开温度 Thermostat opening temperature / fully open temperature (°C)	80 / 92
冷却系统内最小保持压力 Min. pressure in cooling system (Bar)	0.5
在 1500rpm 下的水泵流量 Coolant flow at engine pump at 1500 Rpm (HT / LT in m3/h)	93 / 39
最大额外冷却阻力 Maximum additional cooling circuit restriction (mBar)	500

冷却风扇 Cooling fan

型式 Type	N/A
空气流量 Air flow (m3/min)	N/A
总功率 Power consumption (KW)	N/A
最大阻力 Max allow back pressure (mBar)	N/A

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排气系统 Exhaust system

最大排气背压 Max. exhaust back pressure (mBar)	50
最小排气背压 Min. exhaust back pressure (mBar)	0
涡轮增压器后排气温度 Exhaust temperature after turbocharger (°C)	459
持续工况下排气流量 Exhaust flow Volume / Mass @ COP (m ³ /min) / (Kg/h)	292 / 6264
额定工况下排气流量 Exhaust flow Volume / Mass @ PRP (m ³ /min) / (Kg/h)	N/A / N/A
应急备用工况下排气流量 Exhaust flow Volume / Mass @ ESP (m ³ /min) / (Kg/h)	N/A / N/A
推荐排气管最小直径 Min. diameter of exhaust pipe (mm)	240
涡轮增压器法兰处允许的最大弯矩 Max. bending moment of exhaust gas exit flange (Nm)	10

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 idle speed (Bar)	≥ 2
在额定转速下的机油压力 Oil pressure in normal condition at 1500 Rpm @ PRP (Bar)	4 - 6.5
机油压力低报警值 Lowest oil pressure alarm (shutdown) (Bar)	2
机油压力低停机值 Highest oil pressure alarm (shutdown) (Bar)	10
最高机油温度 Max. oil temperature (°C)	105
机油流量 Oil flow (L/min)	≥ 533
满载时机油消耗率 Oil consumption at full load (g/kWhe-hr)	≤ 0.36
整个发动机系统机油容量 (包含滤芯) Total system capacity / including filters (L)	171 / 175

噪声 Noise

1 米处声压率级噪声 Engine sound pressure level (dB(A))@1m	101
声功率 9 级噪声 Engine acoustic power level (dB(A))	118

燃气系统 Fuel system

调速方式 Governor	ECU
混合器压力损失 Pressure loss from gas mixer (mBar)	N/A
最大进气压力 Suction pressure max (mBar)	40
燃气最高进气温度 Max. Gas inlet temperature (°C)	50
燃气调节器前的最小/最大压力 Min / Max customer supply pressure before gas regulator (Bar)	0.3 / 0.5
发动机进气管最小/最大供应压力 Min / Max supply pressure at engine inlet (mBar)	40 / 70
进气管最小直径 Min. diameter of gas inlet pipe (mm)	80

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电器系统 Electrical system

电器系统电压 (负极接地) Electrical system voltage (negative to ground) (Vdc)	24
起动机功率 Starter power (kW)	8.5
充电发电机额定电流 Battery charger current (A)	55
启动回路最大电阻 Max. electric resistance of starting circuit (mΩ)	8
启动回路导线最小截面积 Min. sectional area of wire (mm ²)	95
不带辅助启动装置时最低冷启动温度 Min. cold start temperature without auxiliary starting device (°C)	0
交流充电发电机功率 Alternator battery charger consumption (KW).....	1.54

热平衡测试数据 Heat balance test data (环境温度 with ambient temperature 28 °C)

Load	COP			PRP		
	100%	75%	50%	100%	75%	50%
总散热量 Total heat dissipation (KW)	1690	1300	939	N/A	N/A	N/A
冷却液带走的热量 Heat taken away by the coolant (KW)	560	447	369	N/A	N/A	N/A
中冷器散热量 Intercooler heat dissipating capacity (KW)	311	192	92	N/A	N/A	N/A
120 °C 以上可用余热 Available exhaust heat to 120 °C – (KW)	666	543	394	N/A	N/A	N/A
表面辐射热量 Radiated heat to ambient (KW)	153	118	84	N/A	N/A	N/A

燃气消耗/机械效率 Fuel consumption / Mechanical efficiency ISO3046/1

	COP			PRP	ESP
	100%	75%	50%	100%	100%
Fuel consumption LHV - (KW) 低热值燃料消耗	3056	2387	1675	N/A	N/A
发动机机械效率 Engine mechanical efficiency (%)	41.8	40.2	38.2	N/A	N/A
燃料消耗误差 Fuel consumption tolerance + 5 %					