# 康明斯发动机
## 船机性能曲线

| 发动机型号 | 曲线编号 | | |
|---|---|---|---|
| K19-DM | D(M)-485a | | |
| 特征编号 | CPL代号 | 日期 | |
| D193097MX02 | CQ416 | 2011/3/9 | |

排量： 19L [1150 in.$^3$]
缸径： 159mm [6.25 in.]
冲程： 159mm [6.25 in.]
燃油系统 PT
缸数： 6

常用功率： kW [HP] @ r/min
448 [600] @1500

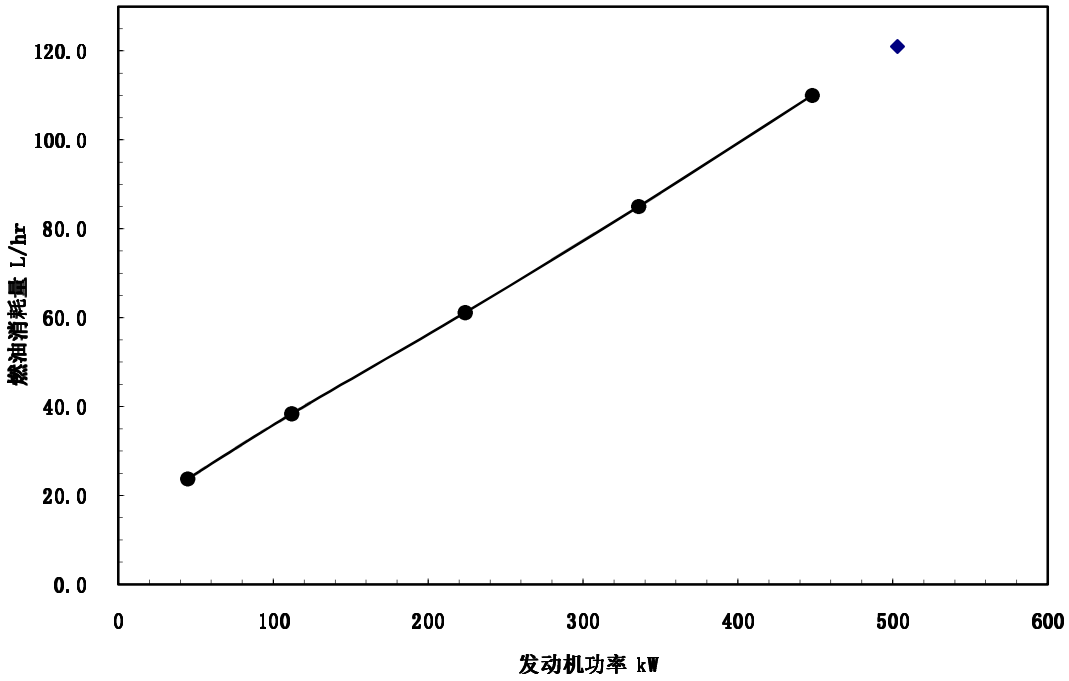
吸气方式： 增压、中冷
排气管： 干式

认证： 此船用柴油机满足以下认证：
国际海事组织（IMO）的IMO-NOx要求，MPARPOL 73/78 附则VI第13条

| 转速 | 超负荷功率 | | 常用功率 | |
|---|---|---|---|---|
| r/min | kW | bhp | kW | bhp |
| 1500 | 503 | 675 | 448 | 600 |

**1500 r/min时发动机性能数据**

| 输出功率 | | | 燃油消耗 | | | |
|---|---|---|---|---|---|---|
| % | kW | bhp | kg/kW.h | lb/bhp.h | l/hr | gal/hr |
| **超负荷功率** | | | | | | |
| 110 | 503 | 675 | 0.204 | 0.337 | 121.0 | 32.0 |
| **常用功率** | | | | | | |
| 100 | 448 | 600 | 0.209 | 0.344 | 110.0 | 29.1 |
| 75 | 336 | 450 | 0.215 | 0.354 | 85.0 | 22.5 |
| 50 | 224 | 300 | 0.232 | 0.382 | 61.1 | 16.2 |
| 25 | 112 | 150 | 0.291 | 0.479 | 38.3 | 10.1 |
| 10 | 45 | 60 | 0.450 | 0.741 | 23.7 | 6.3 |




**标定条件：**功率标定的条件采用的是ISO3046标准条件；大气压100kPa[29.61 in.Hg]，环境温度25℃[77° F]，相对湿度30%。燃油燃烧数据基于GB252 0#轻柴油(No.2 美国柴油)比重为0.85kg/L(7.11b/U.S.gal)。
输出功率曲线是基于发动机只携带燃油系统、水泵、机油泵；不包含充电机、风扇、其它选用设备和被驱动的部件的情况。
在高于40℃[104° F]的高温环境下持续使用时，输出功率可近似按每11℃降低2%（每10° F降低1%）。

**常用功率标定：**常用功率是指在不同负荷下输出连续的电能。下诉常用功率的主要参数：
*在250小时的运行周期内，可变负荷的均值不能超过所标定常用功率的70%。
*一年内，100%常用功率的整个运行时间不超过500小时。
*在12小时运行周期内可超负荷10%1小时。在一年内，超负荷10%运行的总时间不超过25小时。

# 康明斯发动机有限公司

## 船用辅机性能数据

| | |
|---|---|
| **性能曲线：** | **D(M)-485a** |
| **总数据单：** | **DS-D193097** |
| **CPL：** | **CQ416** |
| **日期：** | **2011/3/9** |

**整机数据**[1]

| | | | |
|---|---|---|---|
| 发动机型号 | | K19-DM | |
| 功率标定方式 | | 常用功率 | 超负荷功率 |
| 额定功率 | kW [hp] | 448 [ 600 ] | 503 [ 675 ] |
| 额定功率转速 | rpm | 1500 | 1500 |
| 额定功率允差 | % | ±2% | |
| 额定点扭矩 | N·m [lb.·ft.] | 2852 [ 2103 ] | 3202 [ 2361 ] |
| 怠速范围 | rpm | 675-775 | |
| 平均有效压力 | kPa [psi] | 1886 [ 273 ] | |
| 压缩比 | | 13.9:1 | |
| 活塞速度 | m/sec [ft/min] | 7.95 [ 1565 ] | |
| 摩擦功率 | kW [hp] | 45 [ 60 ] | |

**发动机重量**[1]

| | | | |
|---|---|---|---|
| 干重——仅发动机 | kg [lb.] | 1814 [ 3996 ] | |
| 干重——带热交换器 | kg [lb.] | 2005 [ 4416 ] | |
| 安装图号 | | 4914569 | |
| 仪表箱接线图号、原理图号 | | 4061349、4061350 | |

**燃油系统**[1]

| | | | |
|---|---|---|---|
| ISO 8178 D2测试循环加权燃油消耗量 | l/hr [gal/hr] | 57.9 [ 15.3 ] | |
| 燃油消耗量 | l/hr [gal/hr] | 110 [ 29.1 ] | 121 [ 32 ] |
| 到燃油泵的近似燃油量 | l/hr [gal/hr] | 440 [ 116 ] | |
| 最高允许燃油泵进油温度 | °C [°F] | 71 [ 160 ] | 71 [ 160 ] |
| 燃油压力 | kPa [psi] | 737 [ 107 ] | 861 [ 125 ] |

**进气系统**[1]

| | | | |
|---|---|---|---|
| 进气歧管压力 | kPa [in. Hg] | 203 [ 60 ] | 223 [ 66 ] |
| 进气流量 | l/sec [cfm] | 498 [ 1055 ] | |
| 对环境辐射散热量 | kW [BTU/min] | 43 [ 2448 ] | 54 [ 3074 ] |

**排气系统**[1]

| | | | |
|---|---|---|---|
| 排气流量 | l/sec [cfm] | 1429 [ 3027 ] | |
| 排气温度(增压器出口) | °C [°F] | 不可用 | |
| 排气散热量 | kW [BTU/min] | 322 [ 18328 ] | 362 [ 20605 ] |

**排放(符合ISO8178的D2循环)**

| | | | |
|---|---|---|---|
| NOx (氮氧化物) | g/kW·hr [g/hp·hr] | 7.69 [ 5.74 ] | |

**冷却系统**[1]

| | | | |
|---|---|---|---|
| 海水泵规范 | MAB 0.08.17-07/16/2001 | | |
| 压力盖开启压力 | kPa [psi] | 50 [ 7 ] | |

**带低温中冷(LTA)的发动机**

**主冷却器**

| | | | |
|---|---|---|---|
| 流入热交换器/基尔冷却器的冷却水流量 | l/min | 476 [ 126 ] | |
| 标准节温器的工作温度范围(初开) | °C [°F] | 82 [ 180 ] | |
| 标准节温器的工作温度范围(全开) | °C [°F] | 95 [ 203 ] | |
| 对发动机冷却水的散热量[3] | kW [BTU/min] | 168 [ 9563 ] | |

**低温冷却器**

| | | | |
|---|---|---|---|
| 流入LTA热交换器/基尔冷却器的冷却水流量 | l/min | 84 [ 22 ] | |
| LTA节温器的工作温度范围(初开) | °C [°F] | 69 [ 156 ] | |
| LTA节温器的工作温度范围(全开) | °C [°F] | 78 [ 172 ] | |
| 对发动机冷却水的散热量[3] | kW [BTU/min] | 93 [ 5294 ] | |
| LTA冷却器最高入口水温 | °C [°F] | 63 [ 145 ] | |

1、所有数据均为额定条件下。

2、有关限制性的要求，请参阅安装指南。

3、对冷却液的传热量是基于50%的水与50%乙二醇的混和溶液且不考虑污垢的情况下得出的。若是自行配备的散热器时，应按中冷器供应商推荐的修正系数考虑。

4、有关可选的康明斯海水泵的流量规范（如适用的话），请参考选用件说明。

| CCEC CUMMINS ENGINE PERFORMANCE CURVE | Engine Model K19-DM | Curve No. D(M)-485a | |
|---|---|---|---|
| | Configuration D193097MX02 | CPL Code CQ416 | Date 9/Mar/11 |

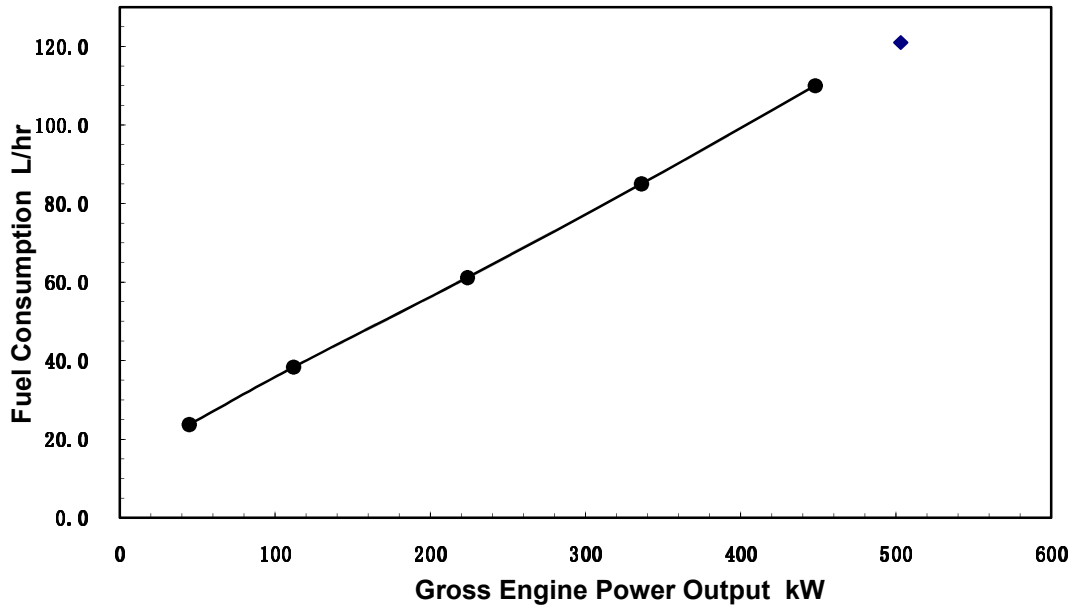
| | | | | |
|---|---|---|---|---|
| Displacement: | 19L | [1150 in.$^3$] | | kW [HP] @ r/min |
| Bore: | 159mm | [6.25 in.] | Prime Power: | 448 [600] @1500 |
| Stroke: | 159mm | [6.25 in.] | | |
| Fuel System: | PT | | Aspiration: | Turbocharged/Aftercooled |
| Cylinders: | 6 | | Exhaust: | Dry |

CERTIFIED: This marine diesel engine complies with or is certified to the:
IMO-NOx requirements of the International Maritime Organization (IMO), MARPOL 73/78 Annex VI, Reg

| Engine Speed | Overload Capacity | | Prime Power | |
|---|---|---|---|---|
| r/min | kW | bhp | kW | bhp |
| 1500 | 503 | 675 | 448 | 600 |

**Engine Performance Data @ 1500 r/min**

| OUTPUT POWER | | | FUEL CONSUMPTION | | | |
|---|---|---|---|---|---|---|
| % | kW | bhp | kg/kW.h | lb/bhp.h | l/hr | gal/hr |
| **10% Overload Capacity** | | | | | | |
| 110 | 503 | 675 | 0.204 | 0.337 | 121.0 | 32.0 |
| **Prime Power** | | | | | | |
| 100 | 448 | 600 | 0.209 | 0.344 | 110.0 | 29.1 |
| 75 | 336 | 450 | 0.215 | 0.354 | 85.0 | 22.5 |
| 50 | 224 | 300 | 0.232 | 0.382 | 61.1 | 16.2 |
| 25 | 112 | 150 | 0.291 | 0.479 | 38.3 | 10.1 |
| 10 | 45 | 60 | 0.450 | 0.741 | 23.7 | 6.3 |




**Rating Conditions:** Ratings are in accordance with ISO-3046 reference conditions; air pressure at 100 kPa (29.61.in Hg.), air temperature 25°C (77°F), and 30% relative humidity. The fuel consumption data is based on GB252 No.0 diesel fuel（No. 2 diesel fuel in U.S.） weight at 0.85 kg/litre (7.1 lb/U.S. gal). 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, optional equipment, and driven components. Operation at Elevated Temperatures for sustained operation above 40°C (104°F), derate 2% per 11°C

**Prime Power Rating** is applicable for supplying continual electrical power at varied load. The following are the Prime Rating parameters:

* Prime Power is available for an unlimited number of hours per year in a variable load application. Variable load should not exceed a 70% average of the Prime Power rating during any operating period
* The total operating time at 100% Prime Power shall not exceed 500 hours per year.
* There is a 10% overload capability for a period of 1 hour within a 12 hour period of operation. Total operating time at 10% overload shall not exceed 25 hours per year.

# CCEC Cummins Engine Co. Ltd.

## Auxiliary Marine Engine Performance Data

| | |
|---|---|
| **Curve No.:** | **D(M)-485a** |
| **DS:** | **DS-D193097** |
| **CPL:** | **CQ416** |
| **DATE:** | **9-Mar-11** |

| | | | |
|---|---|---|---|
| **General Engine Data** [1] | | | |
| Engine Model | | K19-DM | |
| Rating Type | | Prime Power | Overload |
| Rated Engine Power | hp [kW] | 600 [ 448 ] | 675 [ 503 ] |
| Governed Engine Speed | rpm | 1500 | 1500 |
| Rated HP Production Tolerance | % | ±2% | |
| Rated Engine Torque | lb.·ft. [N·m] | 2103 [ 2852 ] | 2361 [ 3202 ] |
| Idle Speed Range | rpm | 675-775 | |
| Brake Mean Effective Pressure | psi [kPa] | 273 [ 1886 ] | |
| Compression Ratio | | 13.9:1 | |
| Piston Speed | ft/min [m/sec] | 1565 [ 7.95 ] | |
| Friction Power | hp [kW] | 60 [ 45 ] | |
| **Weight** [1] | | | |
| Dry - Engine Only | lb. [kg] | 3996 [ 1814 ] | |
| Dry - Engine With Heatexchanger | lb. [kg] | 4416[ 2005 ] | |
| Installation Diagram No. | | 4914569 | |
| Hookup Diagram & Drawing, electrical circuit No. | | 4061349、4061350 | |
| **Fuel System**[1] | | | |
| Avg. Fuel Consumption - ISO 8178 D2 Standard Test Cycle | gal/hr [l/hr] | 15.3 [ 57.9 ] | |
| Fuel Consumption | gal/hr [l/hr] | 29.1 [ 110 ] | 32 [ 121 ] |
| Approximate Fuel Flow to Pump | gal/hr [l/hr] | 116 [ 440 ] | |
| Maximum Allowable Fuel Supply to Pump Temperature | °F [°C] | 160 [ 71 ] | 160 [ 71 ] |
| Fuel Rail Pressure | psi [kPa] | 107 [ 737 ] | 125 [ 861 ] |
| **Air System**[1] | | | |
| Intake Manifold Pressure | in. Hg [kPa] | 60 [ 203 ] | 66 [ 223 ] |
| Intake Air Flow | cfm [l/sce] | 1055 [ 498 ] | |
| Heat Rejection to Ambient | BTU/min [kW] | 2448 [ 43 ] | 3074 [ 54 ] |
| **Exhaust System**[1] | | | |
| Exhaust Gas Flow | cfm [l/sec] | 3027 [ 1429 ] | |
| Exhaust Gas Temperature (Turbine Out) | °F [°C] | N.A. | |
| Heat Rejection to Exhaust | BTU/min [kW] | 18328 [ 322 ] | 20605 [ 362 ] |
| **Emsission (in accordance with ISO 8178 Cycle D2)** | | | |
| NOx (Oxides of Nitrogen) | g/hp·hr [g/kW·hr] | 5.74 [ 7.69 ] | |
| **Cooling System**[1] | | | |
| Sea Water Pump Specifications | MAB 0.08.17-07/16/2001 | | |
| Pressure Cap Rating (With Heat Exchanger Option) | psi [kPa] | 7 [ 50 ] | |
| **Engines with Low Temperature Aftercooling (LTA)** | | | |
| **Main Cooler** | | | |
| Coolant Flow to Engine Heat Exchanger/Keel Cooler | gal/min [l/min] | 126 [ 476 ] | |
| Standard Thermostat Operating Range (Start to Open) | °F [°C] | 180 [ 82 ] | |
| Standard Thermostat Operating Range (Full Open) | °F [°C] | 203 [ 95 ] | |
| Heat Rejection to Engine Coolant[3] | BTU/min [kW] | 9563 [ 168 ] | |
| **LTA Cooler** | | | |
| Coolant Flow to LTA Heat Exchanger/Keel Cooler | gal/min [l/min] | 22 [ 84 ] | |
| LTA Thermostat Operating Range (Start to Open) | °F [°C] | 156 [ 69 ] | |
| LTA Thermostat Operating Range (Full Open) | °F [°C] | 172 [ 78 ] | |
| Heat Rejection to LTA Coolant[3] | BTU/min [kW] | 5294 [ 93 ] | |
| Maximum Coolant Inlet Temperature from LTA Cooler | °F [°C] | 145 [ 63 ] | |

TBD = To Be Determined N/A = Not Applicable N.A. = Not Avaliable

1. All Data at Rated Conditions.
2. Consult Installation Direction Booklet for Limitations.
3. Heat rejection to coolant values are based on 50% water/50% ethylene glycol mix and do NOT include fouling factors. If sourcing your own cooler, a service fouling factor should be applied according to the cooler manufacturer's recommendation.
4. Consult option notes for flow specifications of optional Cummins seawater pumps (if applicable).