



# WP6C163-23 Marine propulsion engine



## Basic engine specifications

|   |                                |
|---|--------------------------------|
| Rating .....  | P1                             |
| Rated power-kW .....  | 120                            |
| Rated speed-rpm .....   | 2300                           |
| Overload power-kW .....   | 132                            |
| Overload speed-rpm .....  | 2374                           |
| Rated power tolerance-% .....   | ±3                             |
| Low idle speed -rpm .....   | 650                            |
| High idle speed-rpm .....   | 2530                           |
| N° of Cylinders / Valves .....  | 6/12                           |
| Cylinders arrangement .....   | In-line                        |
| Thermodynamic cycle .....   | 4 stroke                       |
| Bore × Stroke-mm(in) .....  | 105×130 (4.13×5.12)            |
| Compression ratio .....   | 18:1                           |
| Displacement-L(in <sup>3</sup> ) .....                                      | 6.75 (411.9)                   |
| Fuel system .....   | Mechanical                     |
| Injection system .....  | Direct injection               |
| Aspiration .....  | Turbocharged and aftercooled   |
| Flywheel housing/Flywheel/N° of teeth on flywheel ring gear(standard) ..... | SAE 1/14"/145                  |
| Flywheel housing/Flywheel/N° of teeth on flywheel ring gear(optional) ..... | SAE 3/11.5"/131                |
| Firing order .....  | 1-5-3-6-2-4                    |
| Rotation(from flywheel end) .....   | Counterclockwise               |
| Overall dimensions(L×W×H)-mm(in) .....                                      | 1366×904×1061 (53.8×35.6×41.8) |
| Dry weight-kg(lb) .....   | 750±50 (1653)                  |
| Wet weight-kg(lb) .....   | 775±50 (1709)                  |
| Max. output power of front end-kW(Ps) .....                                 | 120.17 (163.4)                 |
| Emission compliance .....   | IMO Tier II                    |
| Lifting cylinder height- m(ft) .....  | 0.8 (2.62)                     |

## Rating definitions

### Continuous Duty (P1)

The engine can run at full load continuously. The average load factor is 70% to 100%. Annual working time is recommended but not limited to 5000h~8000h.

### Heavy Duty (P2)

The engine can run at full load for 8h every 12h. The average load factor is 40% to 80%. Annual working time is recommended but not limited to 5000h.

### Intermittent Duty (P3)

The engine can run at full load for 4h every 12h. The average load factor is 40% to 80%. Annual working time is recommended but not limited to 3000h.

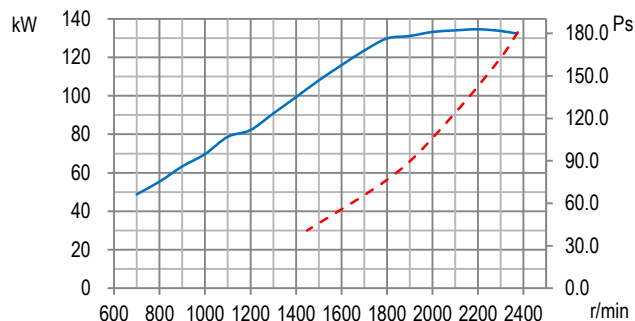
### Light Duty (P4)

The engine can run at full load for 2h every 8h. The average load factor is about 60%. Annual working time is recommended but not limited to 1000h.

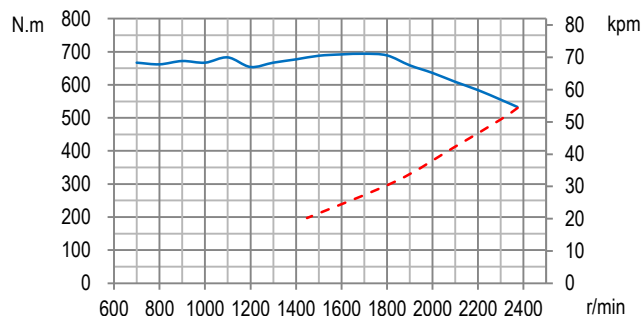
### High Performance Duty (P5)

The engine can run at full load for 0.5h every 5h. The average load factor is about 60%. Annual working time is recommended but not limited to 500h.

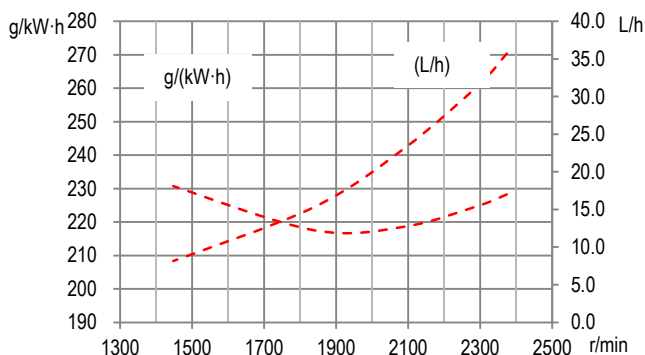
## Power



## Torque

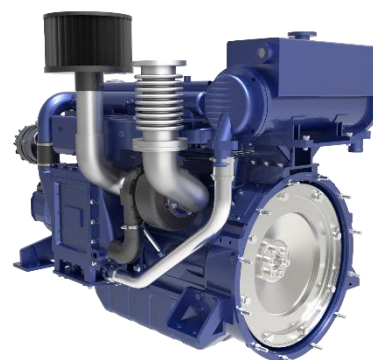


## Fuel consumption



— Full load speed characteristics

- - - Propeller characteristics





## Air intake system

|   |              |
|---|--------------|
| Intake air flow-m <sup>3</sup> /min(cfm)                        | 11.8 (421.7) |
| Max. allowable intake air restriction- kPa(in H <sub>2</sub> O) | 6 (24.1)     |
| Intake air temperature up to-°C(°F)                             | 55 (131)     |
| Heat rejection to atmosphere-kW(BTU/min)                        | 16(909.9)    |

## Cooling system

|  |                |
|--|----------------|
| Coolant capacity of the engine-L(gal)              | 14(3.08)       |
| Max. sea water strainer mesh hole diameter- mm(in) | 2 (0.08)       |
| Sea water pump flow-m <sup>3</sup> /h(gal/h)       | 18 (3960)      |
| Head of sea water pump -m(ft)                      | 17(55.76)      |
| Max. self-priming height of sea water pump- m(ft)  | 2(6.56)        |
| Expansion tank pressure cap- kPa(psi)              | 50(7.3)        |
| Heat dissipating to heat exchanger- kW(BTU/min)    | 64(3639.7)     |
| Coolant flow-m <sup>3</sup> /h(gal/h)              | 7.2(1584)      |
| Temperature range of engine outlet -°C(°F)         | 70~95(158~203) |
| Temperature range of thermostat-°C(°F)             | 70~80(158~176) |

## Exhaust system

|   |                |
|---|----------------|
| Exhaust flow-m <sup>3</sup> /min(cfm)                   | 33.2 (1186.29) |
| Max. exhaust back pressure-kPa(in H <sub>2</sub> O)     | 6 (24.10)      |
| Max. exhaust temperature before turbocharger-°C(°F)     | 700 (1292)     |
| Max. exhaust temperature after turbocharger-°C(°F)      | 600(1126)      |
| Max. bending moment of turbocharger flange- N·m(ft·lbs) | 10(7.4)        |
| Exhaust smoke-FSN                                       | ≤1.5           |

## Lubricating system

|   |                    |
|---|--------------------|
| Max. install angle(fore-aft)                          | 5°                 |
| Max. install angle(athwart ship)                      | 15°                |
| Max. operating angle(fore-aft)                        | 7.5°               |
| Max. operating angle(athwart ship)                    | 22.5°              |
| Sump type   | Wet                |
| Oil capacity Low/High-L(gal)                          | 15/23 (3.3/5.06)   |
| Oil consumption -g/(kW·h)                             | ≤0.2               |
| Oil flow- L/min(gal/min)                              | 71.5 (15.7)        |
| Oil pressure of idle speed- kPa(in H <sub>2</sub> O)  | ≥120(≥482)         |
| Oil pressure of rated speed- kPa(in H <sub>2</sub> O) | 350-600(1405-2410) |

## Fuel system

|   |                |
|---|----------------|
| Fuel flow supply line- L/h(gal/h)   | 109.5 (24.1)   |
| Fuel flow return line- L/h(gal/h)   | 77.43 (351.95) |
| Max. Allowable fuel supply restriction -kPa(in H <sub>2</sub> O)                    | 9 (36.1)       |
| Fuel supply restriction on engine-kPa(in H <sub>2</sub> O)                          | 3 (12.0)       |
| Allowable fuel restriction of shipyard supplied components-kPa(in H <sub>2</sub> O) | / (/)          |
| Max. fuel return restriction-kPa(in H <sub>2</sub> O)                               | 12 (48.2)      |
| Max. self-priming height of fuel delivery pump-m(ft)                                | 1 (3.28)       |
| Max. fuel inlet temperature-°C(°F)  | 50 (122)       |
| Max. fuel inlet pressure- kPa(in H <sub>2</sub> O)                                  | 10(40)         |

## Starting system

|                                     |         |
|-------------------------------------|---------|
| Electrical system voltage(2-pole)-V | 24      |
| Electric starter power-kW(Ps)       | 6 (8.2) |
| Recommended battery capacity- A·h   | 165*2   |
| Alternator working current-A        | 35      |

## Security parameters

|                                  |          |
|----------------------------------|----------|
| Alarm speed-rpm                  | 2645     |
| Shut down speed-rpm              | 2760     |
| Alarm oil pressure-MPa           | 0.12     |
| Shut down oil pressure-MPa       | 0.08     |
| Alarm oil temperature-°C(°F)     | 105(221) |
| Alarm coolant temperature-°C(°F) | 95(203)  |

## Noise

|                   |       |
|-------------------|-------|
| Noise(SPL)- dB(A) | 111.9 |
|-------------------|-------|

## General remarks

- The origin of coordinates is at the center of the flywheel housing back end surface. X axis directs from flywheel to front, Z axis directs vertical up, Y axis direction is defined by right-hand rule.
- All ratings are based on operating conditions under ISO 8665, ISO 3046-1.
- Curves represent net engine performance in accordance with ISO 3046/1 with standard accessories such as fuel injection pump, water pump and L.O. pump under the condition of 25°C/77°F ambient temperature, 100kPa[29.612 in Hg] barometric pressure, 30% relative humidity and 25°C/77°F raw water temperature at inlet.

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Materials and specifications are subject to change without notice.