



# 8WH20LC2400-1 Marine propulsion engine



## Basic engine specifications

|   |                              |
|---|------------------------------|
| Rating .....                                      | P1                           |
| Rated power-kW .....                              | 1765                         |
| Rated speed-rpm .....                             | 1000                         |
| Overload power-kW .....                           | 1942                         |
| Overload speed-rpm .....                          | 1032                         |
| Rated power tolerance-% .....                     | 3                            |
| Low idle speed-rpm .....                          | 400                          |
| High idle speed-rpm .....                         | 1050                         |
| N° of Cylinders / Valves .....                    | 8/32                         |
| Cylinders arrangement .....                       | In-line                      |
| Thermodynamic cycle .....                         | 4 stroke                     |
| Bore × Stroke-mm(in) .....                        | 200×300 (7.87×11.81)         |
| Compression ratio .....                           | 15:1                         |
| Displacement-L(in <sup>3</sup> ) .....            | 74.39 (4539.56)              |
| Fuel system .....                                 | Mechanical monomer pump      |
| Injection system .....                            | Direct injection             |
| Aspiration .....                                  | Turbocharged and aftercooled |
| N° of teeth on flywheel ring gear .....           | 224                          |
| Firing order .....                                | 1-3-7-4-8-6-2-5              |
| Rotation(from flywheel end) .....                 | Clockwise                    |
| Overall dimensions(L×W×H)-mm(in) .....            | 4132×1365×2642 (163×54×104)  |
| Dry weight-kg(lb) .....                           | 11800 (26015)                |
| Max. output power of front end-kW(Ps) .....       | 300 (408)                    |
| Max. output torque of front end-N·m(ft-lbs) ..... | 2865 (2114)                  |
| Emission compliance .....                         | IMO Tier II                  |

## 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

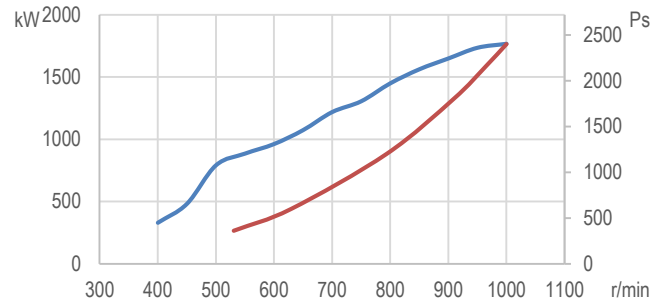
### Light Duty (P4)

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.

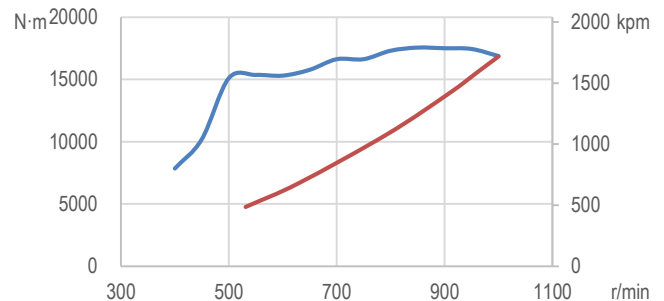
### High Performance Duty (P5)

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.

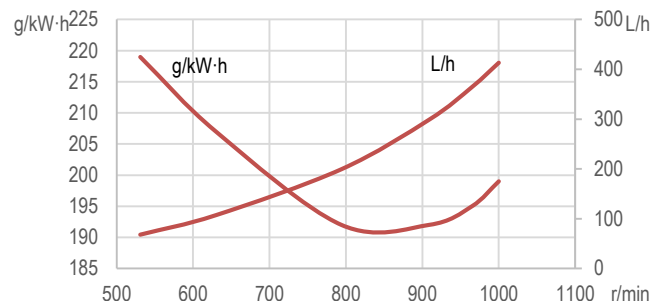
## Power



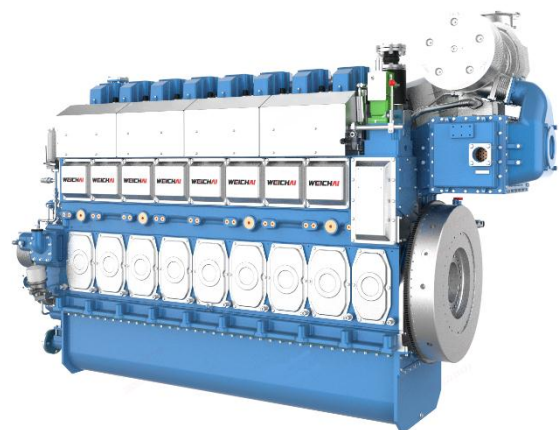
## Torque



## Fuel consumption



— Full load speed characteristics  
 — Propeller characteristics





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## Air intake system

|  |            |
|--|------------|
| Intake air flow-m <sup>3</sup> /min(cfm)                       | 225 (7946) |
| Max. allowable intake air restriction-kPa(in H <sub>2</sub> O) | 2.5 (10)   |
| Intake air temperature up to-°C(°F)                            | 60 (140)   |

## Cooling system

|  |                 |
|--|-----------------|
| Max. sea water strainer mesh hole diameter-mm(in)                | 2 (0.08)        |
| Sea water pump flow-m <sup>3</sup> /h(gal/min)                   | 57 (209)        |
| Head of sea water pump-m(ft)                                     | 36 (118)        |
| Coolant capacity of the engine-L(gal)                            | 112 (24.6)      |
| Fresh water pump flow-m <sup>3</sup> /h(gal/min)                 | 43 (158)        |
| Head of fresh water pump-m(ft)                                   | 36 (118)        |
| Min. pressure at fresh water pump inlet-kPa(in H <sub>2</sub> O) | 20 (80)         |
| Temperature range of thermostat-°C(°F)                           | 77~87 (171~189) |
| Heat dissipating of cooling system-kW(BTU/min)                   | 1147 (65230)    |

## Exhaust system

|   |               |
|---|---------------|
| Exhaust flow-kg/h(lb/h)                             | 17468 (38510) |
| Max. exhaust back pressure-kPa(in H <sub>2</sub> O) | 3 (12)        |
| Max. exhaust temperature before turbocharger-°C(°F) | 600 (1112)    |
| Exhaust smoke-FSN                                   | ≤1.0          |

## 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)       | 340/460 (74.8/101.2) |
| Oil consumption-g/kW·h             | 0.5                  |
| Oil flow-L/min(gal/min)            | 1083 (238)           |

## Fuel system

|   |            |
|---|------------|
| Fuel flow supply line-L/h(gal/h)                                      | 1400 (308) |
| Fuel flow return line-L/h(gal/h)                                      | 987 (217)  |
| Min. Allowable fuel pressure of engine inlet-kPa(in H <sub>2</sub> O) | 17 (68)    |
| Max. fuel return restriction-kPa(in H <sub>2</sub> O)                 | 34 (137)   |
| Max. fuel inlet temperature-°C(°F)                                    | 45 (113)   |

## Starting system

|  |         |
|--|---------|
| Electrical system voltage(2-pole)-V              | 24      |
| Electric starter power-kW(Ps)                    | 31 (42) |
| Recommended battery capacity(5°C and above)-A.h  | 450     |
| Recommended battery capacity(-5°C and above)-A.h | 500     |
| Air starter power-kW(Ps)                         | 40 (54) |
| Min. pressure of air starter-MPa                 | 1.0     |
| Air consumed per start-Nm <sup>3</sup>           | 500     |

## Security parameters

|                                  |         |
|----------------------------------|---------|
| Alarm speed-rpm                  | 1100    |
| Shut down speed-rpm              | 1150    |
| Alarm oil pressure-MPa           | 0.2     |
| Shut down oil pressure-MPa       | 0.15    |
| Alarm oil temperature-°C(°F)     | 78(172) |
| Alarm coolant temperature-°C(°F) | 88(190) |

## Noise

|                  |     |
|------------------|-----|
| Noise(LwA)-dB(A) | 125 |
|------------------|-----|

## 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.