



# WP2.3NC82-18E220 Marine propulsion engine



## Basic engine specifications

Rating .....	P1
Rated power-kW .....	60
Rated speed-rpm .....	1800
Overload power-kW .....	66
Overload speed-rpm .....	1858
Rated power tolerance-% .....	±3
Low idle speed -rpm .....	750
High idle speed-rpm .....	1980
N° of Cylinders / Valves .....	4/16
Cylinders arrangement .....	In-line
Thermodynamic cycle .....	4 stroke
Bore × Stroke-mm(in) .....	89×92 (3.51×3.62)
Compression ratio .....	16.8:1
Displacement-L(in <sup>3</sup> ) .....	2.3 (140.36)
Fuel system .....	Common rail
Injection system .....	Direct injection
Aspiration .....	Turbocharged and aftercooled
Flywheel housing/Flywheel/N° of teeth on flywheel ring gear(standard) .....	SAE 3/11.5°/128
Flywheel housing/Flywheel/N° of teeth on flywheel ring gear(optional) .....	/
Firing order .....	1-3-2-4
Rotation(from flywheel end) .....	Counterclockwise
Overall dimensions(L×W×H)-mm(in) .....	854×650×826 (33.6×25.6×32.5)
Dry weight-kg(lb) .....	310 (682)
Wet weight-kg(lb) .....	325 (715)
Max. output power of front end-kW(Ps) .....	/ (/)
Emission compliance .....	IMO Tier II
Lifting cylinder height- m(ft) .....	/ (/)

## 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.

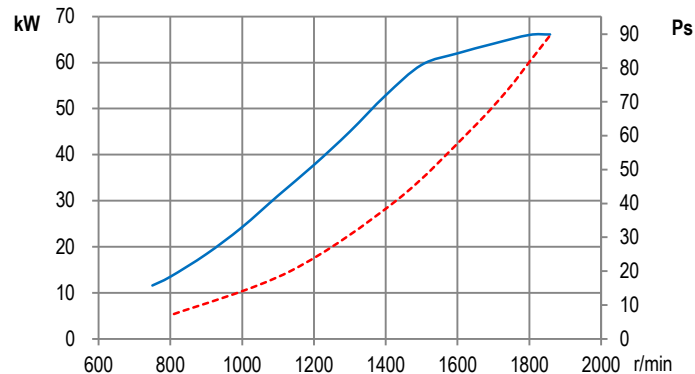
### Light Duty (P4)

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.

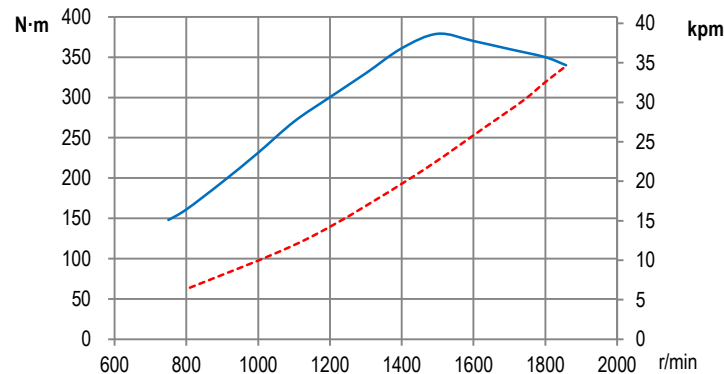
### High Performance Duty (P5)

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.

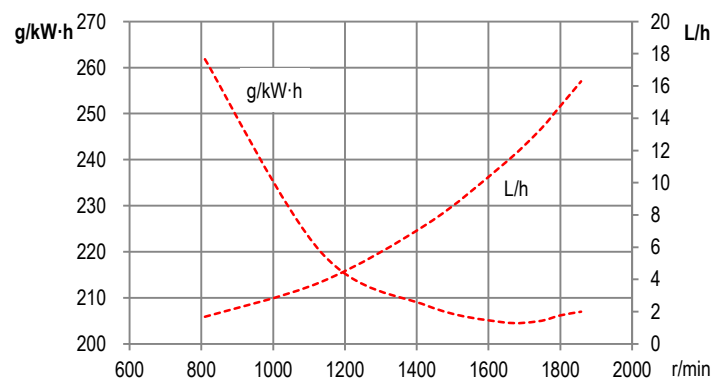
## Power



## 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)	4.2 (147.6)
Max. allowable intake air restriction- kPa(in H <sub>2</sub> O)	3.5 (14.0)
Intake air temperature up to-°C(°F)	55 (131)
Heat rejection to atmosphere-kW(BTU/min)	7.4(420.8)

## Cooling system

Coolant capacity of the engine-L(gal)	6.7(1.47)
Max. sea water strainer mesh hole diameter- mm(in)	2 (0.08)
Sea water pump flow-m <sup>3</sup> /h(gal/h)	5 (1.47)
Head of sea water pump -m(ft)	4.5(14.76)
Max. self-priming height of sea water pump- m(ft)	/(/)
Expansion tank pressure cap- kPa(psi)	90(13.1)
Heat dissipating to heat exchanger- kW(BTU/min)	/(/)
Coolant flow-m <sup>3</sup> /h(gal/h)	6.1(1342)
Temperature range of engine outlet -°C(° F)	76/88(168.8/190.4)
Temperature range of thermostat-°C(° F)	76/88(168.8/190.4)

## Exhaust system

Exhaust flow-m <sup>3</sup> /min(cfm)	7.4 (259.92)
Max. exhaust back pressure-kPa(in H <sub>2</sub> O)	6.5 (26.10)
Max. exhaust temperature before turbocharger-°C(°F)	/ (/)
Max. exhaust temperature after turbocharger-°C(°F)	550(1076)
Max. bending moment of turbocharger flange- N·m(ft·lbs)	/(/)
Exhaust smoke-FSN	≤1.0

## Lubricating system

Max. install angle(fore-aft)	10
Max. install angle(athwart ship)	15
Max. operating angle(fore-aft)	15
Max. operating angle(athwart ship)	22.5
Sump type	Wet
Oil capacity Low/High-L(gal)	3/9 (0.66/1.98)
Oil consumption -g/(kW·h)	≤0.1
Oil flow- L/min(gal/min)	50 (11)
Oil pressure of idle speed- kPa(in H <sub>2</sub> O)	100~250(401.6~1004)
Oil pressure of rated speed- kPa(in H <sub>2</sub> O)	350~550(1405.6~2208.8)

## Fuel system

Fuel flow supply line- L/h(gal/h)	14.8 (3.3)
Fuel flow return line- L/h(gal/h)	/ (/)
Max. Allowable fuel supply restriction -kPa(in H <sub>2</sub> O)	65 (261.0)
Fuel supply restriction on engine-kPa(in H <sub>2</sub> O)	/ (/)
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)	20 (80.3)
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)	/(/)

## Starting system

Electrical system voltage(2-pole)-V	24
Electric starter power-kW(Ps)	3.5 (4.76)
Recommended battery capacity- A·h	80~150
Alternator working current-A	55

## Security parameters

Alarm speed-rpm	2070
Shut down speed-rpm	2160
Alarm oil pressure-MPa	0.1
Shut down oil pressure-MPa	0.08
Alarm oil temperature-°C(°F)	115(239)
Alarm coolant temperature-°C(°F)	102(215.6)

## Noise

Noise(SPL)- dB(A)	89
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## 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.