WHM6160C620-502 Marine propulsion engine

WEICHAI

Basic engine specifications

Rating	P1
Rated power-kW	456
Rated speed-rpm	1500
Overload power-kW	502
Overload speed-rpm	1548
Rated power tolerance-%	2
Idle speed-rpm	650
High idle speed-rpm	1620
Nº of Cylinders / Valves	6/24
Cylinders arrangement	In-line
Thermodynamic cycle	4 stroke
Bore × Stroke-mm(in)	160×200 (6.30×7.87)
Compression ratio	15:1
Displacement-L(in^3)	24.12 (1471.9)
Fuel system	Mechanical
Injection system	Direct injection
Aspiration	Turbocharged and aftercooled
Flywheel housing/Flywheel/N° of teeth on flywheel ring gear(standard)	SAE 0/18"/171
Flywheel housing/Flywheel/N° of teeth on flywheel ring gear(optional)	SAE 0/16"/171
Firing order	1-5-3-6-2-4
Rotation(from flywheel end)	Counterclockwise
Overall dimensions（L×W×H）-mm(in)	2510×1245×1815 (98.8×49.0×71.5)
Dry weight-kg(lb)	3100 (6834)
Wet weight-kg(lb)	3234 (7130)
Max. output power of front end-kW(hp)	456 (620.2)
Max. output torque of front end- N.m(ft-lbs)	3992 (2946.1)
Inertia of flywheel- kg.m^2(lb.ft^2)	13 (308.36)
Inertia of crankshaft- kg.m^2(lb.ft^2)	4.7 (111.48)
Max. bending moment @ flywheel housing- N.m(ft-lbs)	/ (/)
Location of GC-mm[in]	/ [/]
Emission compliance	IMO Tier II

Security parameters

Alarm speed-rpm	1650
Shut down speed-rpm	1800
Alarm oil pressure-MPa	0.15
Shut down oil pressure-MPa	0.1
Alarm oil temperature-°C(°F)	90(194)
Alarm coolant temperature-°C(°F)	85(185)

Noise

Diesel engine noise(Acoustic power level)- dB(A)	118.6

Rating definitions

Continuous power (P1)

The engine can run at full load continuously. The average load factor is 70% to 100%. Annual working time is more than 4000h.

Heavy duty power (P2)

The engine can run at full load for 8h every 12h. The average load factor is 40% to 80%. Annual working time is 2000h to 4000h.

Pleasure vessels in commercial operation (P3)

The engine can run at full load for 4h every 12h. The average load factor is 50% to 70%. Annual working time is 500h to 2000h.

Government vessels (P4)

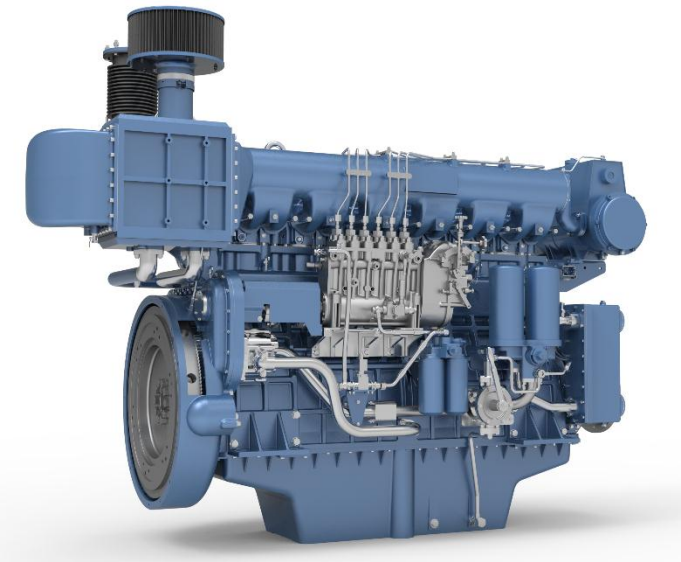
The engine can run at full load for 2h every 8h. The average load factor is 70% to 90%. Annual working time is less than 500h.

Light duty power (P5)

The engine can run at full load for 0.5h every 5h. The average load factor is 60%. Annual working time is less than 300h.

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.
- Reference document: D000185978.



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Air intake system

Intake air flow-m³/min(cfm)	42.72 (1525.61)
Max. allowable intake air restriction(include pipe and air filter)- kPa(in H_2O)	5 (20.08)
Intake air temperature up to-°C(°F)	55 (131)
Heat rejection to atmosphere-kW(BTU/min)	26 (1478.6)

Cooling system

Coolant capacity of the engine-L(gal)	80 (17.60)
Max. sea water strainer mesh hole diameter- mm(in)	2 (0.08)
Sea water pump power-kW(hp)	4 (5.4)
Expansion tank pressure cap- kPa(in H_2O)	50 (7.3)
Heat dissipating to heat exchanger- kW(BTU/min)	260 (14786.2)
Coolant flow-m³/h(gal/h)	/ (/)
Recommended outlet water temperature-°C(°F)	≤80 (≤176)

Exhaust system

Exhaust flow-m³/min(cfm)	117.65 (4201.90)
Max. exhaust back pressure-kPa(in H_2O)	6 (24.1)
Max. exhaust temperature before turbocharger-°C(°F)	620 (1148)
Max. exhaust temperature after turbocharger-°C(°F)	/ (/)
Max. bending moment of turbocharger flange- N.m(ft-lbs)	/ (/)
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)	43/55 (9.5/12.1)
Oil fuel consumption ratio based on engine fuel consumption data-%	≤0.8
Oil flow- L/min(gal/min)	270 (59.4)

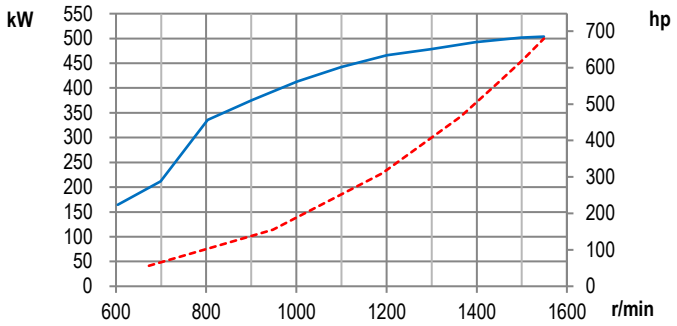
Fuel system

Fuel flow supply line- L/h(gal/h)	115.89 (25.50)
Fuel flow return line- L/h(gal/h)	/ (/)
Max. Allowable fuel supply restriction -kPa(in H_2O)	13 (52.2)
Fuel supply restriction on engine-kPa(in H_2O)	0 (0)
Allowable fuel restriction of shipyard supplied components-kPa(in H_2O)	13 (52.2)
Max. fuel return restriction-kPa(in H_2O)	15 (60.2)
Max. self-priming height of fuel delivery pump-m(ft)	/ (/)
Max. fuel inlet temperature-°C(°F)	45 (113)

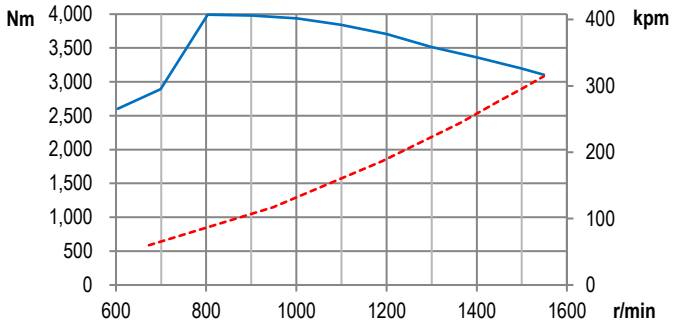
Electric system

Electrical system voltage(2-pole)-V	24
Starter power-kW(hp)	11 (15)
Recommended battery capacity(5°C and above)- A.h	443
Recommended battery capacity(-5°C and above) - A.h	503
Alternator working current-A	80

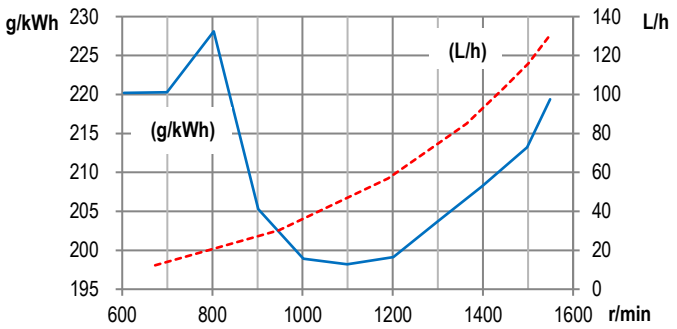
Power



Torque



Fuel consumption



Full load speed characteristics

Propeller characteristics

Materials and specifications are subject to change without notice.