

**M90C13R****90 kW (60 Hz, 1800 rpm, 3ph)**

FEATURES AND BENEFITS

ENGINE BLOCK - Four cylinder, four cycle, in-line, liquid cooled, overhead valve, marine diesels based on heavy-duty engine blocks. Balanced, forged crankshaft with induction hardened journals and rolled fillets. Replaceable, wet cylinder liners for long life and low rebuild costs. Bimetallic valves with chrome stems and rotators. Replaceable valve seats and guides. Three ring aluminum alloy pistons with Ni-Resist insert for the top ring. Keystone piston ring reduces carbon buildup under light loads. Dual gear-driven, counter-rotating balancing shafts for smooth operation. A single poly-vee drive belt powers the alternator and jacket-water pump.

FUEL SYSTEM - High pressure common rail fuel injection for smooth, clean delivery. Direct fuel injection system. Ring clamp fuel filters with air bleed and drain. Electric fuel pump integrated into primary fuel filter. Computer controlled priming for ease of operation.

LUBRICATION SYSTEM - Positive displacement gear-type oil pump. Full flow, spin-on oil filter. Oil spray cooling reduces piston crown temperature for longer life. Jacket-water, plate-type, full flow oil cooler reduces heat and prevents lube oil breakdown. Large capacity oil pan. Closed loop crankcase vent traps oil vapor to keep the engine room clean.

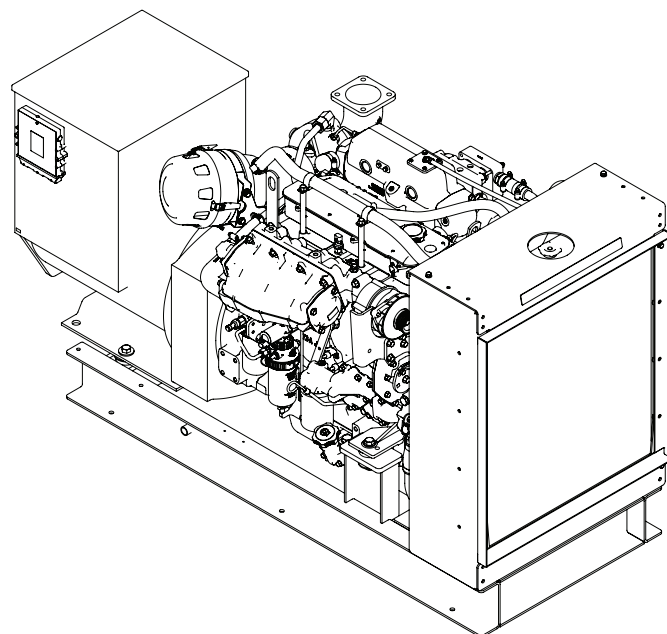
AIR SYSTEM - Dry air filter silences intake noise. Turbocharger with jacket water cooled turbine housings for safety.

COOLING SYSTEM - Two thermostats for quick warm-ups and safety. Cast-iron, water-jacketed exhaust manifold for reliable temperature control. Oversized radiator with durable shroud.

DC ELECTRICAL SYSTEM - Negative ground, 12 volt DC system includes starter motor and alternator with regulator. Low oil pressure and high coolant temperature safety shutdown system. Optional control panels help you specify the amount and type of information required. Comprehensive list of optional alarms and safety shutdowns. Optional DC logic system for simplified maintenance. Optional pre-wired engine, panel with terminal strips.

AC GENERATOR - Direct coupled, single bearing, 12 lead, reconnectable AC generator. Maintenance free brushless design. All NL generators meet or exceed class society standards with Class "H" insulation, accessible diodes, oversized ball bearings, marine grade shafts and conservative 110°/50° heat rise ratings. Engines and generators are torsionally matched for long life. Automatic voltage regulator; ±1% regulation over the entire range from no load to full load. Configured for isochronous frequency control with ECU electronic governor control.

US EPA Tier III Compliant



SPECIFICATIONS AND DIMENSIONS

AC Output*

60 Hz, 1800 RPM* kW	90 kW
Voltage regulation	1%
Frequency droop control	Isochronous 0%
Standard three phase power factor	0.8
Optional single phase power factor	1.0
Generator full load temperature rise (at 50°C ambient)	110°C
Inline cylinders/operating cycle**	I-4 / 4
Aspiration	Turbo & Aftercooled
Displacement - cid (liter)	276 (4.5)
Bore/stroke - inches (mm)	4.19/5 (106/127)
Fuel injection pump type and control	Electronic (HPCR)
Oil fill capacity - gal (ltr)	4.7 (18)

DC Electrical (12V standard, 24V optional)

DC starting voltage - standard (optional)	12 (24)
Min battery capacity - amp hr/12V CCA (24V CCA)	200/1100 (750)
Starter rolling amps @ 0°C - 12VDC (24VDC)	920 (600)
12 Volt battery cable size up to 10 ft (3m)	2/0

Air

Air consumption - 1800 rpm/cfm (m³/m)	301 (8.5)
Radiator Airflow cfm (m³/m)	6000 (170)
Generator cooling air flow 1&3Ø - 1800 rpm cfm	1,308
Exhaust gas volume - 1800 rpm/cfm (m³/m)	685 (19.4)

Air Cont'd

Exhaust gas temp - 1800 rpm/F° (C°)	813 (434)
Max. exhaust back Pressure - inch H ₂ O (mm H ₂ O)	30 (762)
Dry exhaust elbow OD- in (mm)	4 (102)

Fuel

Fuel injection pump type and control	HPCR
Min suction - in (mm)	3/8 (10)
Min return line - in (mm)	3/8 (10)
Max fuel transfer pump suction lift - in (mm)	80 (2032)
Max fuel flow to transfer pump at 1800 rpm - gph	40.0
Specific fuel consumption max load 1800 rpm - lbs.hp.hr	0.366
Approx. fuel rate ³ at 1800 RPM full load - gph (lph)****	7.6 (28.9)

Max Engine Operating Angle

Continuous (with separate expansion tank)	30°
Intermittent (2 minutes)	45°

Dimensions and Weight

Length - inches (mm)	82 (2083)
Width - inches (mm)	33.8 (858)
Height - inches (mm)	45.6 (1158)
Weight - pounds (kilograms)	2870 (1302)
See Installation Drawing # D-4976	