

## FEATURES AND BENEFITS

### **AFTERCOOLED FOR HIGH POWER DENSITY**

Northern Lights M1064A and H models have an aftercooler that cools the intake air. Cool air has more oxygen for better combustion. This aftercooler and electronic fuel injection increase output to give you six cylinder power from a four cylinder set.

### **SUPERIOR PMG GENERATOR ENDS**

Northern Lights generator ends achieve  $\pm 0.5\%$  voltage regulation. All have low temperature rise ratings to meet or exceed marine requirements. M1064A and H models have Permanent Magnet Generators for 300% short circuit capability required for classed vessels.

### **ELECTRONIC SYSTEM PROFILER**

The Electronic System Profiler or "ESP" is a window to your set's real-time operating condition. The ECU that controls the electronic fuel injection gives you a SAE J1939 data stream of engine information that can be shown on an optional system monitor panel.

### **COMMITTED TO PROVIDING COMPLETE SOLUTIONS**

Northern Lights generator sets are thoroughly factory tested and go through a complete quality control program to ensure your total satisfaction. Our design philosophy allows us to provide comprehensive solutions to your power production needs. Because engine room space is always at a premium, Northern Lights offers Low-Profile generator sets that save valuable inches where you need it most. Our line of options and accessories are designed to integrate into a total power system specifically built for your vessel. PTO's, sound enclosures and custom panels are among the options that make your power system as unique as your boat.

## COMPONENT SPECIFIC FEATURES

### **ENGINE BLOCK**

- Lugged four cylinder, four cycle, in-line, liquid cooled, overhead valve, marine diesels based on heavy-duty industrial engine blocks.
- Balanced, forged crankshaft with induction hardened journals and rolled fillets.
- Bimetallic valves have 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.
- Eight groove poly-vee drive belt powers the alternator and freshwater pump.
- Replaceable, wet cylinder liners for long life and low rebuild costs.

### **FUEL SYSTEM**

- Direct fuel injection systems
- Ring clamp fuel filter with air bleed and drain.
- Diaphragm-type, mechanically driven fuel transfer pump with manual priming lever.
- Flexible fuel lines routed to fuel manifold on base frame for easy installation of vessel's hard piping.

### **LUBRICATION SYSTEM**

- 500 hour oil change interval when fuel and oil requirements are met.
- Positive displacement gear-type oil pump.
- Full flow, spin-on oil filter.
- Oil spray cooling reduces piston crown temperature for longer life.
- Freshwater, plate-type, full flow oil cooler reduces heat and thermal breakdown of lube oil.
- Large capacity oil pan.
- Floating, cast aluminum, rocker cover traps valve noise and is a closed loop crankcase vent.
- Lube oil drain for easy changes.

### **COOLING SYSTEM**

- Freshwater cooling system has two thermostats for safety and quicker warm-ups.
- Heat exchanger cooling includes: Gear driven, flexible impeller seawater pump. Easy to clean, tube-type heat exchanger is cupro-nickel for long life.
- Cast iron expansion tank with brass filler neck for easy filling.
- Cast-iron exhaust manifold has double pass freshwater flow for even temperature control, fast warm-up and no hot spots.
- Zinc anode electrolysis protection.
- D, T1, T2 available in keel cooled version.

### **CLASSIFICATION STANDARDS**

- Consult factory details

### **AIR SYSTEM-TURBO AND AFTERCOOLER**

- Dry air filter silences intake noise.
- A, and H models have aftercooler with aircraft quality, 70/30 cupro-nickel, two pass element. Oval water tubes are easy to clean and stronger than round tubes. Corrugated air cooling fin design supports tubes better than plate fin type. Seawater piping is cast bronze and stainless steel. Water never touches the cast aluminum air ducts. No gaskets; all components are machined and have o-ring seals. Seawater direct from the gear driven pump, for maximum cooling. Dry bolt hole design protects engine cylinders.
- T1, T2, A, H models are turbocharged to increase output. Turbocharger turbine housings are freshwater cooled for safety.
- M1064H is US EPA Tier III certified.

### **ESP AND DC ELECTRICAL SYSTEM**

- Standard, S-3B remote mount control panel with NEMA enclosure has engine hour meter, coolant temperature gauge, oil pressure gauge, DC voltmeter, start-stop and shutdown bypass switches.
- Low oil pressure and high coolant temperature safety shutdown system.
- Northern Lights ESP supplies SAE J1939 data stream through a CAN bus plug for optional engine monitor.
- Negative ground, 12 volt DC system has circuit breaker, starter motor and battery charging alternator with regulator.
- Reliable relay based DC system is easy to trouble shoot and repair. No "printed circuit board" to fail. Relays allow multiple panel installations up to 110 feet from set. Engine and panel are pre-wired with terminal strips. ....

### **AC GENERATOR**

- Direct coupled, single bearing, 12 lead, reconnectable AC generator. Maintenance free brushless design.
- Generators have class H insulation, accessible diodes, oversized ball bearings, marine grade shafts and conservative 95°/50° heat rise ratings to meet or exceed class society standards.
- Engines and generators are torsionally matched for long life.
- Automatic voltage regulator gives fast response to electrical load changes. Voltage is regulated to  $\pm 0.5\%$  (one half of one percent) over the entire range from no load to full load.
- Isochronous electronic governor for 0% AC frequency droop.
- M1064A and H have PMG (permanent magnet generator) to power AVR for 300% short circuit capability for "classed" vessels. PMG is optional on D, T1, and T2.

### **SPECIAL EQUIPMENT**

- Standard hydrolastic mounts isolate 98% of vibration from hull for owner comfort.
- Welded steel base frame with drip pan. Easy to mount and keep clean.
- Belt guard protects operator even on sets in sound enclosures.
- Sparkling white IMRON® polyurethane paint protects set and provides service visibility.
- Operator's and parts manuals.
- Optional low profile sound enclosure for industry best attenuation in a more compact design.

AC Output <sup>×</sup>	M1064D*	M1064T1*	M1064T2*	M1064A*	M1064H
60 Hz, 1800 RPM <sup>1</sup> kW	40 kW	55 kW	65 kW	92 kW	99 kW
50 Hz, 1500 RPM <sup>1</sup> kW	33 kW	50 kW	55 kW	70 kW	90 kW
Voltage regulation and PMG	±0.5% (PMG opt)	±0.5% (PMG opt)	±0.5% (PMG opt)	±0.5% (PMG Std)	±0.5% (PMG Std)
Frequency droop control	±5%	±5%	Isosynchronous 0%	Isosynchronous 0%	Isosynchronous 0%
Phase and power factor	All Models: three phase-0.8 power factor. Single phase-1.0 (unity) power factor is available on "D, T1, T2"				
Generator full load temperature rise	All Models: 95°C temperature rise at 50°C ambient				
<b>Lugger Diesel Engine Data</b>					
Inline cylinders/Aspiration/Operating cycle	I-4/Natural/4	I-4/Turbo/4	I-4/Turbo/4	I-4/Turbo Aftercooled/4	I-4/Turbo Aftercooled/4
Displacement - cid (liter)	276 (4.5)	276 (4.5)	276 (4.5)	276 (4.5)	276 (4.5)
Bore/Stroke - inches (mm)	4.19/5 (106/127)	4.19/5 (106/127)	4.19/5 (106/127)	4.19/5 (106/127)	4.19/5 (106/127)
HP @ 1800 RPM (1500 RPM) ✓	67 (59)	99 (74)	113 (84)	131 (122)	144 (131)
Max. front power take off HP @ 60 Hz (50 Hz)	60 (50)	90 (75)	102 (83)	131 (100)	144 (131)
Oil capacity with filter - quarts (ltr)	14.3 (13.5)	14.3 (13.5)	14.3 (13.5)	21.6 (20.4)	21.7 (20.5)
<b>Cooling System</b>					
Approx. heat exchanger cooling capacity - gal (ltr)	5.5 (21)	5.5 (21)	5.5 (21)	5.5 (21)	5.5 (21)
Min. seawater inlet/discharge through hull dia. - in (mm)	1.25 (32)	1.25 (32)	1.25 (32)	2 (51)	2 (51)
Sea water pump inlet hose ID - in (mm)	1.25 (32)	1.25 (32)	1.25 (32)	2 (51)	2 (51)
Heat rejection to jacket water - 60 Hz BTU min	2151	3267	4138	3983	4781
50 Hz BTU min	1911	2707	3025	3026	4303
Freshwater pump capacity - 60 Hz - gpm (lpm)	38 (144)	38 (144)	38 (144)	38 (144)	60 (227)
50 Hz - gpm (lpm)	32 (120)	32 (120)	32 (120)	32 (120)	50 (189)
Seawater pump capacity - 60 Hz - gpm (lpm)	24 (91)	24 (91)	24 (91)	42 (159)	42 (159)
50 Hz - gpm (lpm)	20 (76)	20 (76)	20 (76)	35 (133)	35 (133)
Max. seawater pump suction head - in (m)	39 (1)	39 (1)	39 (1)	39 (1)	39 (1)
Consult factory for keel and skin cooler sizing	Contact Factory	Contact Factory	Contact Factory	N/A	N/A
Keel cooler head diameter - in NPT	1.5	1.5	1.5	N/A	N/A
Keel cooler hose ID discharge and suction - in (mm)	2.25 (57)	2.25 (57)	2.25 (57)	N/A	N/A
<b>DC Electrical</b>					
DC starting voltage - standard (optional)	12 (24)	12 (24)	12 (24)	12 (24)	12 (24)
Min battery capacity - amp hr/12V CCA (24V CCA)	200/640 (570)	200/640 (570)	200/640 (570)	200/640 (570)	200/640 (570)
Starter rolling amps @ 0°C - 12VDC (24VDC)	780 (600)	780 (600)	780 (600)	780 (600)	780 (600)
12 Volt battery cable size up to 10 ft (3m)	00	00	00	00	00
<b>Air</b>					
Generator cooling air flow - 60 Hz/cfm (50 Hz/cfm)	700 (575)	700 (575)	700 (575)	700 (575)	700 (575)
Air consumption - 60 Hz - cfm (m <sup>3</sup> /m)	127 (3.6)	201 (5.7)	226 (6.4)	274 (7.8)	330 (9.4)
50 Hz - cfm (m <sup>3</sup> /m)	85 (2.4)	134 (3.8)	151	226 (6.4)	240 (6.8)
Exhaust gas volume - 60 Hz - cfm (m <sup>3</sup> /m)	357 (10.1)	512 (14.5)	618 (17.5)	724 (20.5)	869 (24.6)
50 Hz - cfm (m <sup>3</sup> /m)	251 (7.1)	339 (9.5)	508 (14.4)	600 (17)	699 (19.8)
Exhaust gas temp - 60 Hz - F° (C°)	1089° (587°)	959° (515°)	1040° (560°)	993° (534°)	979° (526°)
50 Hz - F° (C°)	999° (537°)	918° (492°)	979° (511°)	1013 (545)	1094° (590°)
Approx. heat radiated to air - 60Hz - BTU/min (50Hz - BTU/min)	328 (271)	451 (410)	533 (451)	754 (656)	861 (738)
Max. Exhaust Back Pressure - inch H <sub>2</sub> O (mm H <sub>2</sub> O)	48 (1220)	30 (762)	30 (762)	30 (762)	30 (762)
Wet exhaust Elbow OD - in (mm)	4 (100)	4 (100)	4 (100)	4 (100)	Contact Factory
<b>Fuel</b>					
Fuel injection pump type and control	Rotary Mechanical	Rotary Mechanical	Rotary Electronic	Rotary Electronic	HPCR Electronic
Min suction & return line - in (mm)	3/8 (9.5)	3/8 (9.5)	3/8 (9.5)	3/8 (9.5)	3/8 (9.5)
Max fuel transfer pump suction lift - in (mm)	36 (914)	36 (914)	36 (914)	36 (914)	36 (914)
Max fuel flow to transfer pump - gph 60 Hz (50 Hz)	29.9 (28.9)	29.9 (28.9)	21.5 (20.8)	22.7 (21.9)	19.6 (18.1)
Full load fuel returned to tank - gph 60 Hz (50 Hz)	26.6 (26.1)	24.7 (25.1)	15.5 (16.5)	15.8 (14.4)	9.92 (11.0)
Specific fuel consumption max load - 60 Hz/lbs.hp.hr.	0.389	0.369	0.378	0.375	0.364
50 Hz/lbs.hp.hr.	0.360	0.362	0.384	0.384	0.349
Approx. fuel rate ** at 60 Hz full load - gph (lph)	3.29 (12.45)	5.14 (19.45)	6.01 (22.74)	6.92 (26.19)	9.13 (34.58)
50 Hz full load - gph (lph) <sup>3</sup>	2.74 (10.37)	3.83 (14.49)	4.31	6.59	7.17 (27.13)
<b>Maximum Engine Operating Angle</b>					
Continuous (with separate expansion tank)	All Models - Front Down: 0-5°, (0-10°). Rear Down: 0-12°. Left/Right Down: 0-5°, (0-23°)				
Intermittent (2 minutes)	All Models - Front/Rear Down: 0-30°. Left/Right Down: 0-30°				
<b>Dimensions and Weight - Low Profile<sup>Δ</sup></b>					
Set length <sup>4</sup> - inch (mm)	75.0 (1905)	75.0 (1905)	75.0 (1905)	77.2 (1960)	77.2 (1960)
Set width <sup>4</sup> - inch (mm)	38.0 (965)	38.0 (965)	38.0 (965)	38.0 (965)	38.0 (965)
Set height <sup>4</sup> - inch (mm)	38.2 (970)	38.2 (970)	38.2 (970)	38.4 (975)	38.4 (975)
Approx. dry weight <sup>4</sup> HE cooling 3 phase - lbs (kg)	2513 (1140)	2513 (1140)	2603 (1181)	2750 (1248)	2750 (1248)
Approx. dry weight <sup>4</sup> HE cooling 1 phase - lbs (kg)	2603 (1181)	2603 (1181)	2750 (1248)	N/A	N/A
Sound enclosure length <sup>5</sup> - inch (mm)	75.0 (1905)	75.0 (1905)	75.0 (1905)	77.5 (1969)	77.5 (1969)
Sound enclosure width <sup>5</sup> - inch (mm)	38.0 (965)	38.0 (965)	38.0 (965)	38.0 (965)	38.0 (965)
Sound enclosure height <sup>5</sup> - inch (mm)	40.9 (1039)	40.9 (1039)	40.9 (1039)	40.9 (1039)	40.9 (1039)
Sound enclosure <sup>5</sup> weight - lbs (kg)	336 (152)	336 (152)	336 (152)	336 (152)	336 (152)
<b>Dimensions and Weight - Standard<sup>Δ</sup></b>					
Set length <sup>4</sup> - inch (mm)	64.2 (1630)	67.8 (1722)	67.8 (1722)	75.7 (1923)	75.7 (1923)
Set width <sup>4</sup> - inch (mm)	31.0 (787)	31.8 (807)	31.8 (807)	32.1 (815)	33.3 (845)
Set height <sup>4</sup> - inch (mm)	40.2 (1021)	40.2 (1021)	40.2 (1021)	40.6 (1031)	40.6 (1031)

\* - US EPA Tier II; Available for non-US flagged vessels only.

**NOTES:**

Contact factory = consult factory representative or www.northern-lights.com for current information

× Prime kW ratings for 3Ø at 0.8 power factor. Consult factory for deration factors.

✓ Net flywheel hp rating for fully equipped engine at rated speed under SAE J816b.

\*\* Based on prime kW rating at 1800 and 1500 RPM. Fuel rate may vary depending on operating conditions.

Δ Data for units with hydrostatic mounts, heat exchanger cooling and 3 phase generator ends. Dimensions and weight are affected by optional equipment, AC output, phase, exhaust and cooling configuration.

~ Consult factory for data on enclosures for single phase sets or sets with InSep.

**Dimensions are subject to change without notice, they are not intended for installations. Contact a factory representative for the current installation data.**



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