

## FEATURES AND BENEFITS

### *THE STATE-OF-THE ART IN MARINE EQUIPMENT*

The growing demands of the marine marketplace demand a big, robust power producer. As the world's yachts grow more sophisticated, their power generation system must keep pace.

Northern Lights generator sets are based on world-class components - including industrial strength base engines and generator ends. Our exclusive marinization process ensures reliable, clean power no matter what your vessel requires.

### *LOW PROFILE FOR MAXIMUM ENGINE ROOM FLEXIBILITY*

Northern Lights' revolutionary base frame design creates the most compact, best looking power generation set on the market. Our optional sound enclosures and compound mounts save even more space and virtually eliminate vibration noise. Northern Lights provides maximize power efficiency while using minimal engine room space.

### *ELECTRONIC CONTROL SYSTEM*

For the ultimate in system management and monitoring, the M1306 series generator sets are equipped with an Electronic Control Unit (ECU). The ECU controls the electronic engine functions and provides a SAE J1939 data stream of engine information that can be displayed on an optional system monitor panel.

### *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. All M1306's have Permanent Magnet Generators for 300% short circuit capability required for classed vessels.

### *COMPLETE UNIT TESTING*

Northern Lights generator sets are thoroughly factory tested and go through a complete quality control program to ensure your satisfaction with the best built marine generator on the market today.

## COMPONENT SPECIFIC FEATURES

### ENGINE BLOCK

- Six cylinder, four cycle, in-line, liquid cooled, overhead valve, marine diesels based on heavy-duty industrial engine blocks
- Balanced alloy steel crankshaft with induction hardened journals and rolled fillets
- Replaceable valve seats and guides
- Strong three ring steel pistons for long-life reliability
- Gear-driven seawater pump
- Drive belt powers the alternator and freshwater pump
- Replaceable, strength-optimized wet cylinder liners for long life and low rebuild costs

### FUEL SYSTEM

- Electronically controlled high-pressure fuel injection system provides individual control in each cylinder for low exhaust emissions and superior fuel economy.
- High torque at low revolutions. (1800 or 1500 rpm)
- Full flow spin-on duplex elements
- Gear driven fuel transfer pump with primer
- 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
- Centrifugal oil cleaner to extend oil change intervals
- 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 with a separate closed breather system
- Lube oil drain for easy changes

### AIR SYSTEM-TURBO AND AFTERCOOLER

- Dry air filter silences intake noise
- Dry exhaust elbow available in 5 inch (127 mm) or 6 inch (152 mm)
- Aftercooler with marine quality, cupro-nickel, single pass element
- Turbocharged for increased output

### COOLING SYSTEM

- Freshwater cooling system with twin thermostats for quicker warm-ups
- Heat exchanger cooling includes: Gear driven, flexible impeller seawater pump. Easy to clean, tube-type cupro-nickel heat exchanger
- Cast aluminum expansion tank with brass filler neck. Cast-iron exhaust manifold has single pass freshwater flow for even temperature control, fast warm-up and no hot spots
- Zinc anode electrolysis protection

### DC ELECTRICAL SYSTEM

- Engine supplies SAE J1939 data stream through a CAN bus plug for optional engine monitor
- Negative ground, 24 volt DC system with circuit breaker, starter motor and battery charging alternator with regulator. Isolated ground optional
- Standard digital controller displays engine hours, coolant temperature, oil pressure, DC voltage, and includes start-stop controls. Increased ease of paralleling through controller
- Engine and panel are pre-wired with terminal strips
- Low oil pressure and high coolant temperature safety shutdown system included in controller

### AC GENERATOR

- Direct coupled, single bearing, 12 lead, reconnectable AC generator. Maintenance free brushless design
- Generators meet or exceed class society standards. All have class H insulation, accessible diodes, oversized ball bearings, marine grade shafts and conservative 90°/50° heat rise ratings
- 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
- PMG (permanent magnet generator) to power AVR for 300% short circuit capability for "classed" vessels

### SPECIAL EQUIPMENT

- Standard hydrolastic mounts isolate 98% of hull vibration
- Welded steel base pan. Easy to mount and keep clean
- Belt guard protects operator even on sets in sound enclosures
- Sparkling white IMRON<sup>®</sup> polyurethane paint for protection and visibility
- Operator's and parts manuals

### WORLD-CLASS OPTIONS

- Make your power generator system as unique as your boat. Northern Lights offers a comprehensive list of optional equipment including high power PTO's, super attenuated sound enclosures, customizable panels, and much more

### CLASSIFICATION STANDARDS

- Meets or exceeds US EPA Tier III emission standards
- IMO 2 compliant
- Available certification from all major class societies including ABS, Lloyds Register, Germanischer Lloyd, DNV, Bureau Veritas, RINA, CCS and more (consult factory for additional societies and application information)

# GENERAL SPECIFICATIONS AND DIMENSIONS

AC Output <sup>×</sup>	M1306A12	M1306A22	M1306A32
60 Hz, 1800 RPM <sup>1</sup> kW	355 kW	400 kW	n/a
50 Hz, 1500 RPM <sup>1</sup> kW	300 kW	350 kW	400 kW
Voltage regulation and PMG	±0.5% (PMG std)	±0.5% (PMG std)	±0.5% (PMG std)
Frequency droop control	0-10%	0-10%	0-10%
Phase and power factor	3 phase, 0.8	3 phase, 0.8	3 phase, 0.8
Generator full load temperature rise - C	Max. 90°	Max. 90°	Max. 90°
<b>Diesel Engine Data</b>			
Inline cylinders/Aspiration/Operating cycle	I-6/Turbo & Aftercooled/4	I-6/Turbo & Aftercooled/4	I-6/Turbo & Aftercooled/4
Displacement - cid (liter)	775 (12.7)	775 (12.7)	775 (12.7)
Bore/Stroke - inches (mm)	5.12/6.3 (130/160)	5.12/6.3 (130/160)	5.12/6.3 (130/160)
HP @ 1800 RPM (1500 RPM) ✓	504 (433)	571 (504)	n/a (571)
Max. front power take off HP @ 60 Hz (50 Hz)	303 (253)	303 (253)	n/a (253)
Oil capacity with filter - quarts (ltr)	35.9 (34)	35.9 (34)	35.9 (34)
<b>Cooling System</b>			
Approx. heat exchanger cooling capacity - gal (ltr)	10.6 (40)	10.6 (40)	10.6 (40)
Min. seawater inlet/discharge through hull dia. - in (mm)	3 (75)	3 (75)	3 (75)
Sea water pump inlet hose ID - in (mm)	2 (51)	2 (51)	2 (51)
Heat rejection to jacket water - 60 Hz BTU min	15,534	17,241	n/a
50 Hz BTU min	12,746	14,794	16,786
Freshwater pump capacity - 60 Hz - gpm (lpm)	139 (525)	139 (525)	n/a
50 Hz - gpm (lpm)	106 (400)	106 (400)	106 (400)
Seawater pump capacity - 60 Hz - gpm (lpm)	66 (250)	66 (250)	n/a (250)
50 Hz - gpm (lpm)	57 (215)	57 (215)	57 (215)
Max. seawater pump suction head - in (m)	118 (3)	118 (3)	118 (3)
Consult factory for keel and skin cooler sizing			
<b>DC Electrical</b>			
DC starting voltage - standard	24	24	24
Min battery capacity - amp hr/24V CCA	160 (800)	160 (800)	160 (800)
Starter rolling amps @ 0°C - 24VDC	400	400	400
<b>Air</b>			
Generator cooling air flow - 60 Hz/cfm	1,550	1,550	n/a
50 Hz/cfm	1,280	1,280	1,280
Air consumption - 60 Hz - cfm (m <sup>3</sup> /m)	970 (27.5)	1,000 (28.3)	n/a
50 Hz - cfm (m <sup>3</sup> /m)	764 (21.6)	853 (24.2)	911 (25.8)
Exhaust gas volume - 60 Hz - cfm (m <sup>3</sup> /m)	2,493 (70.6)	2,740 (77.5)	n/a
50 Hz - cfm (m <sup>3</sup> /m)	2,029 (57.4)	2,295 (64.9)	2,506 (70.9)
Exhaust gas temp - 60 Hz - F° (C°)	833 (445)	882 (472)	n/a
50 Hz - F° (C°)	865 (463)	889 (476)	921 (494)
Approx. heat radiated to air - 60Hz - BTU/min	2,447	2,788	n/a
50Hz - BTU/min	2,049	2,589	2,731
Max. Exhaust Back Pressure - inch H <sub>2</sub> O (mm H <sub>2</sub> O)	30 (762)	30 (762)	30 (762)
<b>Fuel</b>			
Fuel injection pump type and control	PDE unit injectors	PDE unit injectors	PDE unit injectors
Min suction & return line - in (mm)	0.5 (13)	0.5 (13)	0.5 (13)
Max fuel transfer pump suction lift - in (mm)	79 (2000)	79 (2000)	79 (2000)
Max fuel flow to transfer pump - gph 60 Hz (50 Hz)	85.9 (71.6)	85.9 (71.6)	n/a (71.6)
Full load fuel returned to tank - gph 60 Hz (50 Hz)	62.4 (52.2)	59.7 (49.1)	n/a (45.9)
Specific fuel consumption max load - 60 Hz/lbs.hp.hr.	0.337	0.334	n/a
50 Hz/lbs.hp.hr.	0.329	0.327	0.327
Approx. fuel rate <sup>**</sup> at 60 Hz full load - gph (lph)	23.5 (88.9)	26.2 (99.2)	n/a
50 Hz full load - gph (lph) <sup>3</sup>	19.4 (73.4)	22.5 (85.2)	25.7 (97.3)
<b>Maximum Engine Operating Angle</b>			
Continuous (with separate expansion tank)	12°	12°	12°
Intermittent (2 minutes)	25° front,rear/30° lateral	25° front,rear/30° lateral	25° front,rear/30° lateral
<b>Dimensions and Weight λ ~</b>			
Set length <sup>5</sup> - inch (mm)	107.0 (2,720)	107.0 (2,720)	107.0 (2,720)
Set width <sup>5</sup> - inch (mm)	38.6 (981)	38.6 (981)	38.6 (981)
Set height <sup>5</sup> - inch (mm)	52.6 (1,340)	52.6 (1,340)	52.6 (1,340)
Approx. dry weight <sup>5</sup> HE cooling - lbs (kg)	6,350 (2,880)	6,670 (3,025)	6,700 (3,040)
Sound enclosure <sup>5</sup> - L x W x H - inch (mm)	<b>All: 119.0 (3,010) x 56.0 (1,420) x 55.0 (1,400)</b>		
Sound enclosure <sup>5</sup> weight - lbs (kg)	846 (385)	846 (385)	846 (385)
Base plate weight - lbs (kg)	650 (296)	650 (296)	650 (296)

## NOTES:

Contact factory = consult factory representative or [www.northern-lights.com](http://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.

λ 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.

~ 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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Information and dimensions subject to change without notice.

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