



# *Features and Benefits of MTU Marine Generators by Northern Lights, Inc.*

**The Benchmark for Diesel Generators.**

**MTU marine generators define quality in every area.**

- Each generator is designed and engineered for long life, easy installation & service, simplicity and most importantly durability. Elegant simplicity and ultimate reliability result from engineering away complicated excess parts.
- Only the best available materials and components are used in order to provide long life and excellent performance with low service costs.
- Quality is part of every manufacturing step, from careful hand assembly to testing every engine and generator with its wiring harness and control panel.
- **Simplicity:** extra parts are engineered out; if it isn't there it can't fail. Fewer problem areas mean fewer repairs and lower costs.
- **Serviceability:** MTU branded marine generators are engineered for low maintenance and easy service. Routine inspection and maintenance is more likely to be performed when it's easy and inexpensive.

***Each feature becomes a benefit to your customer...***

# *Engine Block*

- MTU marine generators use only heavy duty industrial engine blocks. Northern Lights in-house engineered marinization components such as intake, exhaust, cooling and DC engine wiring ensures that MTU generators can withstand the harshest of marine environments.





# Cooling

- Fresh water cooling system with single piece heat exchanger, coolant tank and exhaust manifolds allow Northern Lights to eliminate belts and hoses that are common failure points.
- Maintenance is faster and easier than conventional exchangers, corrosion is reduced, and fewer potential failure points increase reliability and reduce maintenance expenses.
- Exhaust manifolds are designed for rugged durability under the worst of conditions and are not prone to cracking or failures that are common with lighter manifolds. No aluminum is used in exhaust manifolds and no plastic is used in intake manifolds or plumbing.



## *Cooling cont'd.*

- Northern Lights has engineered away belts to eliminate potential failure points and to reduce maintenance costs with a gear driven sea water pump. Other benefits include easier, faster impeller maintenance, higher reliability and reduced costs.
- Gear driven sea water pump is located on the service side of the generator set for ease of maintenance and reliability.





# *Air Intake Design*

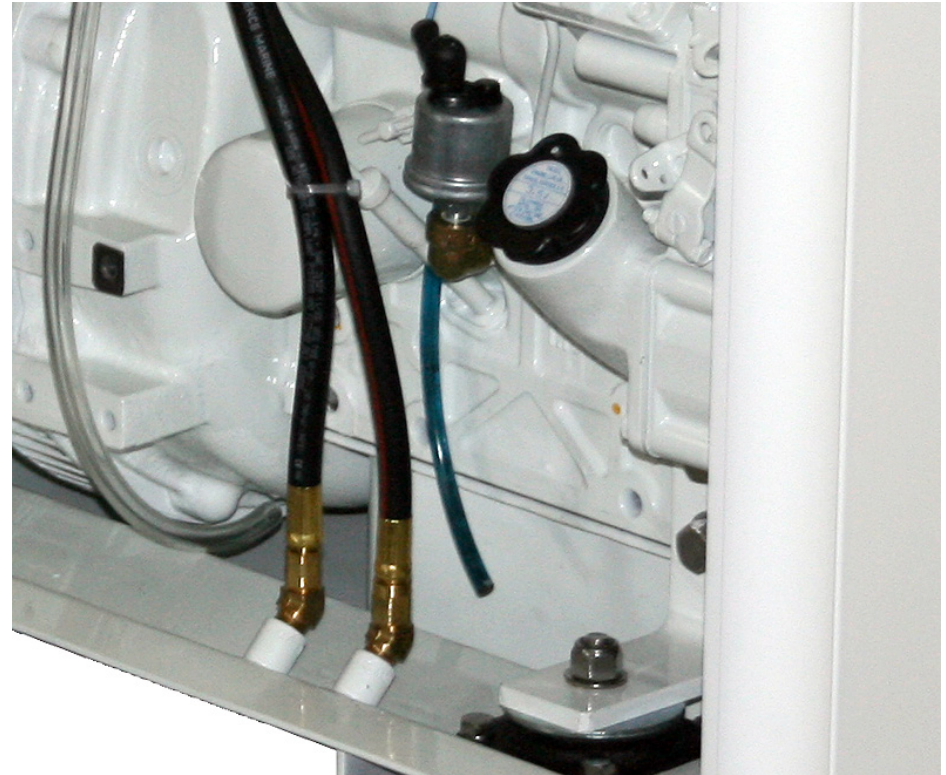
- Cast aluminum intake manifold is designed for sound deadening.
- Foam air filters are cleanable and reusable.
- Closed crankcase vents reduce oil vapor and pollution while keeping engine clean.
- Engineered and tuned intake hose for the quietest operation in the industry.\*



\*<http://www.northern-lights.com/news/soundtest.html>

# *Quick and Easy Installation & Maintenance*

- The single-side servicing feature places all regular maintenance points right at your fingertips.
- The self-venting fuel system and mechanical fuel lift pump provide ultimate reliability without depending on electrical components.
- Top and service side oil fill locations.
- Oil drain hose standard.





# *DC Electrical and Junction Box*

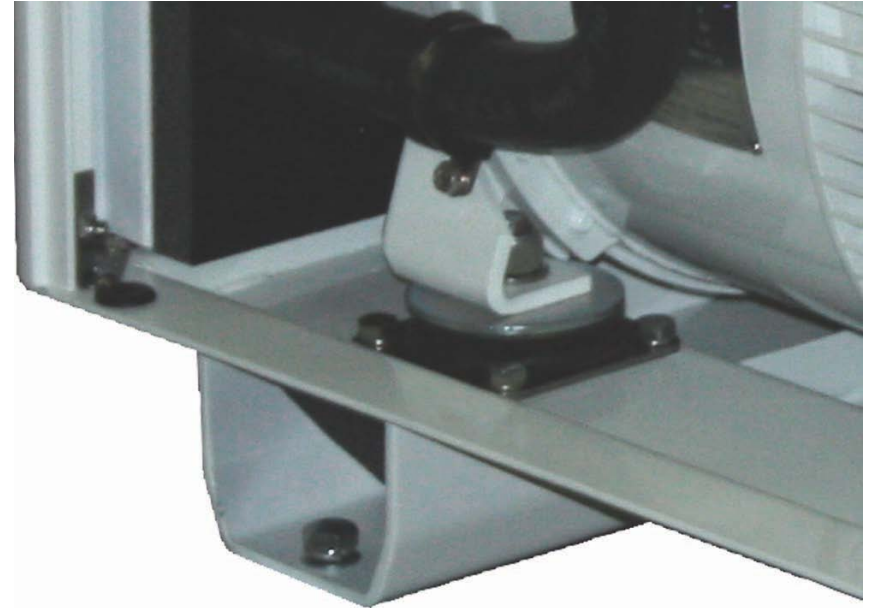
- Based on reliable, inexpensive relays, the DC Logic system makes for easy installation and even easier troubleshooting and maintenance for owners and technicians alike.
- Terminal blocks, circuit breakers, automatic voltage regulators and the DC Logic circuit fit neatly, with plenty of room to spare for access and easy wiring and high reliability.
- Contains DC relays and circuit protection. No expensive and complicated printed circuit boards.
- Automatic Voltage Regulator w/ breaker means no fuses to replace.





# *Mounting*

- MTU marine generators use anti-vibration isolation mounts to eliminate 98% of vibration. Along with intake silencers and cast valve covers, MTU marine generators are remarkably smooth and the quietest in the industry.\*
- Rigid base frame assemblies ensure solid foundation.
- Base frames serve as drip pans to contain spilled fluids keeping engine rooms remarkably clean.



\*<http://www.northern-lights.com/news/soundtest.html>





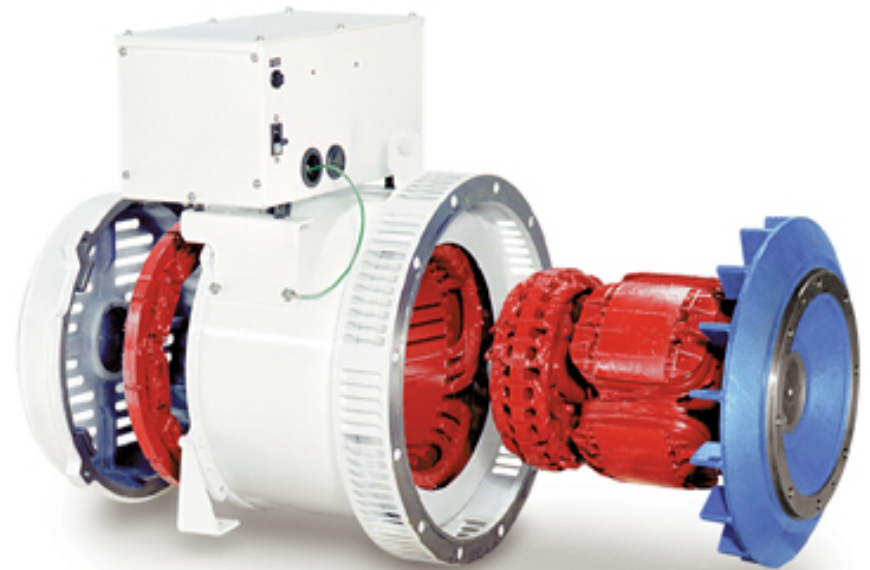
# *Sound Enclosures*

- MTU sound enclosures are designed with a simple single side access for easy serviceability. Disassembly of the enclosure is never required for routine service and maintenance.
- Boat builders will also appreciate how easy the enclosures are to install with fuel and exhaust connections outside of the enclosure.
- Internal ducting maximizes attenuation without restricting airflow. The ventilation openings in the panels have been offset eliminating line of sight, helping to keep your engine room very quiet.
- MTU sound enclosures are engineered to add very little to the already compact dimensions of the generators. An MTU generator sound enclosure ensures the boat builder can maximize the power density of every engine room.



# Generator Construction

- MTU 5-30kW generator sets feature auxiliary stator winding. This unique innovation provides a number of benefits, including 300% short circuit capability, improved AC voltage regulator performance and classification society compliance.
- Hand wound main rotor with skewed windings for smooth sine wave required for today's most sensitive electronic equipment.



# Panels

- Remote start/ stop panel with hour meter and 20' harness is standard.
- NL gauge senders are factory installed for optional gauge panels.
- WaveNet digital control panel optional.
- Multiple panel harnesses allow the boat builder to place panels in a variety of different locations to better appeal to the end user.

\*\*\*please note that Northern Lights logos will be deleted for MTU branded marine generators



# WaveNet

- Northern Lights optional WaveNet digital monitoring and control system is certified for use on the NMEA 2000 networks.
- WaveNet provides the user with a digital window into the operation and output of the generator, including a full listing of system status safety alarms and shutdowns.
- Provides a running data log of events, and can even show the amount of electrical output being used at any given time.

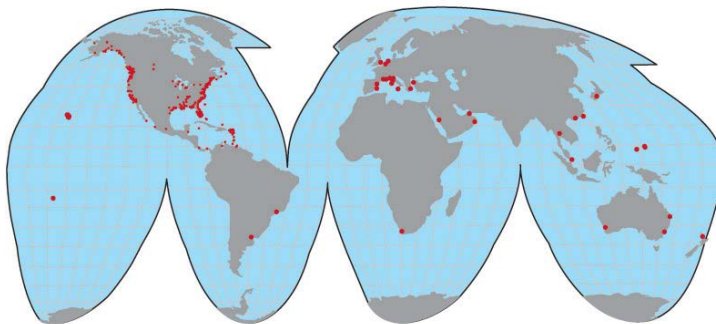






# *Client Support, Satisfaction & Quality*

- Global factory support is a major benefit that sets Northern Lights apart from the competition and gives our products more value to the end user.
- Northern Lights factory and worldwide support with over 340 dealers in 40 countries provide sales, service, technical training, parts and engineering assistance and is always available by phone, fax and internet. No other manufacturer offers the same level of product support as Northern Lights.
- Northern Lights provides excellent training programs available for owners.
- LRS Type Approval signifies NL meets the highest international quality & safety standards.
- Five-year warranty. Unlimited hours for first year, major components for all five years!



**Authorized Service Centers**



# *Bonus Features*

- Each generator is delivered with the first oil change filter.
- Owners and parts manuals with each set.
- CD and downloadable manuals in electronic format are available.
- Spare parts kits available in both standard and “World Class” configurations.





# *Victron Energy Generator Test*

- In 2007, an independently certified test (by TUV-EPS) was commissioned by Victron Energy. Marine generator sets were tested at 10kW and below (50 Hz ratings, 1500-3000 RPM).
- Of the 19 generator sets tested from the world's preeminent manufacturers, Northern Lights M773LW2 was deemed the quietest, at less than 65 dBA with no electrical load. The second quietest machine tested was also a Northern Lights - the M673LD2, at fewer than 66 dBA. Victron Energy notes in the report that "The sound levels measured should not be seen as absolute values but as relative values, for which we used the symbol fcdBA, showing how much more or less noisy one generator is compared to another."
- The only two Northern Lights tested proved to be the two quietest. This is a testament to the proven engineering and craftsmanship of Northern Lights generator sets.
- Other key contributors to Northern Lights' quiet design are platform mounts, which dramatically reduce noise resulting from the transmission of vibration, and single piece, cast iron expansion tank/exhaust manifolds which keep engine noise at a minimum.
- Sound signatures on Northern Lights can be further reduced with the use of one of our industry-leading sound enclosures. Featuring noise-dampening foam and unique latch design for easy access, Northern Lights sound enclosures are one of many options that further customize Northern Light generator sets.

For the full study, interested parties can visit <http://www.victronenergy.com/generatortest/>

# *Victron Energy Generator*

## *Test Results*

