



PRODUCT MANUAL

Marine Batteries (Gen 3)

Read and understand this manual before the use or installation of your Norsk Lithium® Battery, charger, or accessory. Refer to the **SAFETY INFORMATION** section for additional information. Save these instructions for future reference.

WARNING: The use of electricity and the installation of batteries and/or electrical equipment or electrical systems present several hazards including electrocution, fire, injury, and death. Norsk Lithium is not liable for property damage, personal injury, or death resulting from using or installing a Norsk Lithium battery or from following the actions recommended in this document. Refer to the **SAFETY INFORMATION** section for additional information.

IF YOU DO NOT FEEL SAFE, OR COMFORTABLE, OR ARE NOT QUALIFIED TO PERFORM A BATTERY INSTALLATION OR OTHER ACTION OUTLINED IN THIS MANUAL, CONSULT A QUALIFIED PROFESSIONAL ELECTRICIAN.

THANKS FOR YOUR PURCHASE!

Welcome to the Norsk Lithium family and thank you for purchasing a Norsk Lithium Battery. Our batteries are designed to provide reliable and long-lasting power for your ice fishing needs. This user guide will provide you with essential information on how to use, charge, store, and maintain your battery to ensure optimal performance. Please read this user guide in full before using your new Norsk Lithium Battery.

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For the latest news and product releases from Norsk Lithium follow us on Facebook and Instagram (**NorskLithium**).

You can also share your fishing experiences with us by tagging Norsk Lithium and using the hashtag **#NorskLithium** on your post. For the latest product videos, comparison videos, and how-to videos, subscribe to our YouTube Channel:

(www.youtube.com/@NorskLithium).

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CUSTOMER SERVICE HOURS

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9:00 am–5:00 pm

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INCLUDED EQUIPMENT

All Norsk Lithium Marine Batteries include the following:

- Qty. (1) Marine Battery with Protective Terminal Covers
- Terminal Hardware
- User manual

ATTENTION: ALL MARINE BATTERIES SHIPPED IN SHUT-DOWN MODE

Please note **ALL Norsk Lithium Batteries are shipped with a maximum 30% State of Charge (SOC) in Shut-Down Mode** to improve overall safety in transit and to ensure our customers never receive a battery that has been damaged due to over-discharge caused by the battery sitting in a warehouse or on a shelf for an extended time.

To wake your battery from Shut-Down Mode, plug a Norsk Lithium EVO-TEC™ charger with a voltage output compatible with the battery into an electrical outlet. Use the MODE button to select the battery chemistry and/or voltage of the charger bank, as is appropriate for the EVO-TEC™ charger model selected. The selected chemistry and/or voltage is indicated by the **RED** indicator light that will illuminate the current selection.

Once the compatible battery chemistry and voltage have been selected, connect the battery.

Once the battery is connected to the charger, PUSH AND HOLD the MODE button on the charger for the charger bank that is connected to the battery until the desired selection on the LED Indicator panel starts to flash. You may also hear a soft clicking sound as the LED Indicator flashes - this is normal. Your Norsk Lithium Marine Battery should wake from Shut-Down Mode within a few seconds.

NOTE: As soon as the battery wakes from Shut-Down Mode, the SOC indicator panel will illuminate 4 LED indicator lights two (2) times before the charging process begins normally. It is HIGHLY recommended that the user fully charge the battery prior to the first use. Failure to fully charge the battery prior to use will result in significantly reduced runtimes when compared to a fully charged battery.

NOTE: Norsk Lithium Marine Batteries are also fully or partially compatible with a wide range of popular chargers. For a complete list of chargers that have been tested and determined to be compatible with Norsk Lithium marine batteries, please visit our website at <https://norsklithium.com/compatible-chargers/> where you will find a Battery Charger Compatibility List for each respective marine battery model.

ALWAYS verify charger compatibility before charging.

Failure to use a Norsk Lithium EVO-TEC™ or compatible charger may result in undesirable outcomes or dangerous conditions such as, but not limited to, over-charging, incomplete charging, over-voltage warnings, BMS shutdown of the battery to protect the cells, over-heating, and fire. Norsk Lithium **IS NOT** responsible for any property damage or personal injury caused by, or undesirable performance associated with, the use of an incompatible charger.

HOW TO CONNECT TO THE BATTERY TERMINALS

Connect the positive lead to the positive terminal (+) and the negative lead to the negative terminal (-). Reverse polarity connection of leads to the battery terminals will cause a short and may cause significant and irreparable damage to the battery and the device being connected to the battery. Damage of this type is **NOT** covered by warranty.

Make sure all connections are in full contact with the terminals and a max torque force of 10ft-lbs is applied. If the max torque force of 10ft-lbs is exceeded, the terminal itself may be damaged. Loose connections will result in significant heating due to the increased resistance caused by the loose connection and can result in permanent damage to the battery.

It is recommended to put DIELECTRIC GREASE on the outer exposed surfaces of your terminals after the connection is complete. DIELECTRIC GREASE stops air and moisture from corroding exposed metal parts of your connections.

DO NOT put DIELECTRIC GREASE in between the primary contact points of your electrically conducting components.

Install protective terminal covers on all terminals prior to use.

Norsk Lithium batteries may be installed in any orientation, on the side, on end, or upside down, as long as the battery is properly secured. When mounting a Norsk Lithium Marine Battery upside down ensure that the weight of the battery is **NOT** resting on terminal connections **AND** the terminal connections **CANNOT** make contact with conductive materials.

TERMINAL HARDWARE

All Norsk Lithium Marine Batteries are shipped with a full assortment of terminal hardware that includes double-threaded bolts, standard bolts, and locknuts. All provided hardware is corrosion-resistant. If additional hardware is needed, please contact Norsk Lithium customer service to purchase replacement hardware or use the fastener size and length information below to make your purchase of corrosion-resistant (stainless steel or zinc-plated) replacement hardware from a third-party supplier.

Main 12V, 16V, 24V, and 36V Terminals

The main 12V, 16V, 24V, and 36V terminals on all Norsk Lithium Marine batteries accommodate M8 diameter fasteners. The length of the fastener that threads into the battery terminal is approximately 0.62" / 16mm.

Secondary 28V Terminals

The secondary 28V terminals found on Norsk Lithium 36V+28V Dual Voltage Marine batteries accommodate M5 diameter fasteners. The length of the fastener that threads into the battery terminal is approximately 0.70" / 18mm.

Use of non-corrosion-resistant hardware may cause significant and irreparable damage to the battery terminals and will create additional resistance that **MAY CAUSE FIRES** and undesirable performance of the devices powered by the battery. Norsk Lithium is not liable for property damage or personal injury caused by the use of non-corrosion-resistant and/or incompatible hardware.

WATERPROOF RATING

All Norsk Lithium Marine Batteries are constructed from polycarbonate and have an IP67 rating which indicates the battery is protected against damage caused by water intrusion into the battery case to a depth of 1.5m / 4.9' for 30 minutes. Despite the IP67 rating and the protection it provides, a Norsk Lithium Marine Battery should **NEVER** be intentionally submerged in water. If a battery is accidentally submerged in water the battery should be removed from the water as soon as it is safe to do so and carefully inspected for signs of damage caused by water intrusion or unusual behavior before the battery is put back into service. If the battery shows signs of damage caused by water intrusion, discontinue use of the battery immediately, including both charge or discharge use, and contact Norsk Lithium customer service for further instructions.

INTERNAL BATTERY MANAGEMENT SYSTEM (BMS)

At the heart of every Norsk Lithium Battery, you'll find an internal Battery Management System (BMS). A BMS is an integrated electronics board dedicated to the oversight of a battery pack that helps ensure a long and productive life of your battery while maximizing safety and performance. The oversight provided by the BMS includes, but may not be limited to, the following protections:

Overcharging Protection, Over-Discharging Protection, Charging Overcurrent Protection, Discharging Overcurrent Protection, Short-Circuit Protection, Charging Temperature Protection (high and low), and Discharging Temperature Protection (high and low).

If your battery stops working or is acting erratically, the BMS in all Norsk Lithium Marine Batteries can be reset. Resetting the BMS will return the battery to factory default settings and will often return the battery to normal operation. For instructions on how to reset the BMS, please see the **POWER MANAGEMENT BUTTON AND STATE OF CHARGE (SOC) INDICATOR** section included in this document.

SELECTING AN ONBOARD CHARGER

One of the most critical decisions the owner of Norsk Lithium batteries will make is the charger they will use to charge their batteries.

Norsk Lithium recommends the use of a Norsk Lithium EVO-TEC™ Charger. While other chargers may be fully or partially compatible with Norsk Lithium Marine Batteries, EVO-TEC™ Chargers have been engineered to optimize the performance and lifespan of Norsk Lithium Batteries while fully supporting advanced features such as cold-temperature heating, which is standard on all Starting Batteries and optional on all Deep Cycle models, wake from Shut-Down Mode, charge while in Deep Sleep™ mode, and the ability to reach 100% State of Charge due to the optimized charger output voltage profile found in all EVO-TEC™™ Chargers.

For a complete list of chargers that have been tested and determined to be compatible with Norsk Lithium Marine Batteries, please visit our website at <https://norsklithium.com/compatible-chargers/> where you will find a Battery Charger compatibility list for each respective marine battery model.

ALWAYS verify charger compatibility before charging.

NOTE: Norsk Lithium **DOES NOT** recommend the use of a lead-acid battery charger. Norsk Lithium Marine Batteries require a higher voltage than lead acid batteries to reach the full State of Charge and

perform best when charged with a lithium-specific battery charger at 14.2 Volts. If a lead acid battery charger is used, a Norsk Lithium Marine Battery will not reach a full state of charge (60-70% SOC), the Norsk Lithium Marine Battery may be significantly and irreparably damaged, and the charger will not support the advanced features found in all Norsk Lithium Marine Batteries. Damage caused by the use of a lead acid or other incompatible charger is **NOT COVERED** by the warranty.

Norsk Lithium recommends unplugging the onboard battery charger from AC power after the completion of every charge cycle.

WARNING: NEVER charge the battery unattended. **DO NOT** use a damaged, broken, or incompatible charger. Failure to use a Norsk Lithium EVO-TEC™ or compatible charger may result in undesirable outcomes or dangerous conditions such as, but not limited to; over-charging, incomplete charging, over-voltage warnings, BMS shutdown of the battery to protect the cells, over-heating, and fire. Norsk Lithium **IS NOT** responsible for any property damage or personal injury caused by, or undesirable performance associated with, the use of an incompatible charger.

USE OF A BATTERY MAINTAINER

The use of a battery charge maintainer, often referred to as a “float charger”, is **NOT RECOMMENDED** by Norsk Lithium for use with lithium batteries. Using a maintainer that constantly tops off a battery’s SOC can cause metal plating within the cells that will significantly reduce the lifespan of the lithium battery. Because Norsk Lithium Marine Batteries have an incredibly low passive-discharge rate (<3%/month in normal operation mode) a battery maintainer for long-term storage is unnecessary and any damage caused by the use of a battery charge maintainer **IS NOT** covered by warranty.

ALTERNATOR/STATOR CHARGING

Only Norsk Lithium **Starting Batteries** should be charged by an alternator or stator found on an outboard engine. Connecting a Norsk Lithium **Non-Starting** Marine Battery (Deep Cycle Batteries) directly to an alternator or stator to charge the battery may result in serious and irreversible damage to the outboard engine’s charging system, the Non-Starting Battery being charged, and devices attached to the battery via wiring. Damage caused by the charging of Non-Starting Batteries when connected to an alternator or stator is **NOT COVERED** by warranty.

If the owner of a Norsk Lithium **Non-Starting Battery** intends to utilize charge current from an outboard’s alternator or stator to **INDIRECTLY** charge their battery, an EVO-TEC™ DC-to-DC Charger should be used to protect both the charging system and the Non-Starting battery being charged. For additional information on EVO-TEC™ DC-to-DC chargers, contact Norsk Lithium customer service or visit our website at www.norsklithium.com for more information.

RECOMMENDED CHARGE VOLTAGE AND RATE OF CHARGE

BATTERY VOLTAGE	CHARGING VOLTAGE	RECOMMENDED / MAX CHARGE (C)
12 Volts	14.2V	0.2C / 0.5C
16 Volts	17.75V	0.2C / 0.5C
24 Volts	28.4V	0.2C / 0.5C
36 Volts	42.6V	0.2C / 0.5C

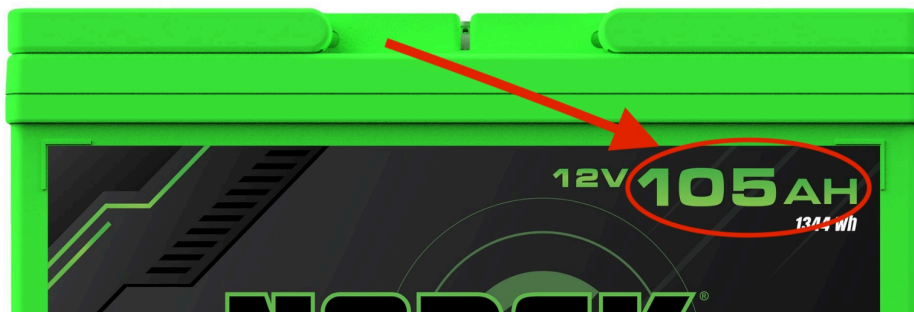
The use of a charger that outputs a voltage different than the charge voltage shown for each battery voltage above may result in undesirable outcomes or dangerous conditions such as, but not limited to, over-charging, incomplete charging, over-voltage warnings, BMS shutdown of the battery to protect the cells, over-heating, and fire. Norsk Lithium **IS NOT** responsible for any property damage or personal injury caused by, or undesirable performance associated with, the use of a charger that doesn't precisely output the charging voltage shown above.

NOTE: To calculate the recommended and max charge current for a particular Norsk Lithium Marine Battery, use the following formulas:

Recommended Charge Current: (Battery Amp Hours) x 0.2

Max Charge Current: (Battery Amp Hours) x 0.5

Battery Amp Hours for each model can be found on the front label of your battery. See the image below for an example of where to find Amp Hours on your battery.



For example: to calculate the Recommended Charge Current for a 105Ah battery, multiply the battery's stated amp hours x 0.2.

Recommended Charge Current: $105 \times 0.2 = 21A$

For example: to calculate the Max Charge Current for a 105Ah battery, multiply the battery's stated amp hours x 0.5

Max Charge Current: $105 \times 0.5 = 52.5A$

COLD TEMPERATURE CHARGING: HEATED BATTERIES

Norsk Lithium's Thermal Core Heating Technology™ uses the charge current from an AC charger, or from an outboard's alternator/stator, to warm internal heat pads within the battery case that quickly and efficiently warm the cells of the battery to a temperature that will allow the battery to safely accept the charge current.

All Norsk Lithium **Starting Batteries** come equipped with Thermal Core Heating Technology built into the battery.

All Norsk Lithium **Non-Starting** Marine Batteries are available with optional Thermal Core Heating Technology built into the battery.

Thermal Core Heating Technology is fully automated and does not require the user to do anything more than provide a charge current $\geq 6.5A$ from a compatible charger. If the cell temperature is too low to safely accept a charge, the BMS will route the incoming charge current to the Thermal Core Heating Technology pads until the cells have been warmed to a temperature of 55.4° F / 13° C. Once the safe-to-charge temperature of 55.4° F / 13° C has been reached, the BMS will then route the incoming charge current to the cells.

NOTE: A charge current $\geq 6.5A$ is required for Thermal Core Heating Technology to operate at peak efficiency. If the charge current is $< 6.5A$ Thermal Core Heating Technology will still function but the heating time needed to warm the cells from a given temperature will increase.

- The heating progress of the Thermal Core Heating Technology process can be monitored within the Norsk Guardian® App.

WARNING: DO NOT attempt to further speed up the warming process by exposing the battery to a source of significant heat as the accelerated warming process may cause a fire or cause significant and irreparable damage to the battery.

COLD TEMPERATURE CHARGING: UNHEATED BATTERIES

All Norsk Lithium Marine Batteries **NOT EQUIPPED** with optional Thermal Core Heating Technology are protected from accepting a charge when the temperature of the cell pack inside the battery case is below 32° F / 0° C.

When a compatible charger is plugged into a household electrical outlet and a Norsk Lithium Marine Battery with a cell pack temperature below 32° F / 0° C is connected to the charger, the battery's BMS will prevent the charge cycle from starting until the cell pack temperature inside the battery case has warmed to a temperature safe for the charge to take place. The user does not need to unplug the charger during the warming process. When the cell pack warms to the protection release temperature of approximately 55.4° F / 13° C, the battery's BMS will allow the charge cycle to take place normally.

- To warm the battery's internal cell pack to a temperature safe for charging, move the boat with the installed batteries to a warm, dry location (heated garage, heated storage unit) and allow the battery to warm naturally.

- If a warm, dry location large enough to accommodate your boat is unavailable, the batteries can be removed from the boat, warmed indoors, and returned to the boat once the battery(s) are warm enough to be charged.

WARNING: DO NOT attempt to speed up the warming process by exposing the battery to a source of significant heat as the accelerated warming process may cause a fire or cause significant and irreparable damage to the battery.

POWER MANAGEMENT BUTTON AND STATE OF CHARGE (SOC) INDICATOR



NOTE: The Power Management Button and SOC Indicator Panel are found on top of all GEN 3 Norsk Lithium Marine Batteries.

The Power Management Button and State of Charge Indicator Panel found on all GEN 3 Marine Battery models work together to allow the user to receive vital information about the status of their battery and to activate advanced features such as Deep Sleep.

HOW TO USE THE POWER MANAGEMENT BUTTON

QUICK PRESS - Check Status (State of Charge) / Disable Deep Sleep

LONG PRESS - 2 Lights: Access Emergency Starter Reserve (ESR) - Starting Battery Models ONLY

LONG PRESS - 3 Lights: Enable Deep Sleep

LONG PRESS - 4 Lights: Reset BMS

QUICK PRESS

QUICK PRESS is defined as a press of the Power Management Button with an immediate release. QUICK PRESS will trigger the State of Charge Indicator Panel to display the current State of Charge status of the battery by illuminating lights in the indicator panel for 5 seconds.

1 LED Light = 0% - 25% SOC

2 LED Light = 26% - 50% SOC

3 LED Light = 51% - 75% SOC

4 LED Light = 76% - 100% SOC

QUICK PRESS will wake a battery that has been placed into Deep Sleep. Once the battery wakes from Deep Sleep, the State of Charge panel will display the current State of Charge status of the battery by illuminating lights in the indicator panel for 5 seconds.

LONG PRESS - 2 LIGHTS: ACCESS EMERGENCY START RESERVE (ESR)

Emergency Start Reserve is a safety feature, found on Starting Battery models only, that allows the user to access 25% of the battery capacity that has been reserved to start the attached outboard in the event the user has overly discharged their starting battery. Think of ESR as a battery jump pack built into your battery that is always charged and ready to go when needed!

If the starting battery has been discharged to approximately 25% SOC, the battery will no longer output power until the user activates ESR using one of the methods described below:

- LONG PRESS - 2 Lights is defined as a press of the Power Management Button that is held until 2 LED Lights illuminate on the State of Charge Indicator Panel followed by an immediate release.
- The user can also activate Emergency Start Reserve in the Norsk Guardian App.

NOTE: Once ESR has been activated, Norsk Lithium **STRONGLY** advises the user to charge their battery by driving their boat for a period of time to allow the charging system to recharge the battery to a SOC >25%.

Once the battery has been recharged to a SOC > 25%, ESR will automatically reset and again be available to the user.

LONG PRESS - 3 LIGHTS: ENABLE DEEP SLEEP

Deep Sleep is a very powerful feature that allows a user to place a battery into a protective state ideal for use when the battery is to be placed into storage. When the battery is placed into Deep Sleep, there is no voltage at the terminals which means an attached device cannot discharge the battery when not in use for extended periods. Norsk Lithium strongly advises that all Norsk Lithium batteries be placed into Deep Sleep when the battery will not be used for long periods.

LONG PRESS - 3 Lights is defined as a press of the Power Management Button that is held until 3 LED Lights illuminate on the State of Charge Indicator Panel followed by an immediate release.

NOTE: The best method for verifying Deep Sleep has been enabled is the following:

- Attempt to power up any device attached to the battery. If Deep Sleep is successfully enabled, the device will not power on.
- Using a multimeter, verify there's no longer voltage at the battery terminals.
- Verify that Deep Sleep has been enabled in the Norsk Guardian App.

LONG PRESS - 4 LIGHTS: RESET THE BMS

Should you need to reset your battery's BMS to return the battery to factory default settings or to clear out a Personal Identification Number (PIN) selected to secure the battery, LONG PRESS - 4 Lights is defined as a press of the Power Management Button that is held until 4 LED Lights illuminate on the State of Charge Indicator Panel followed by an immediate release.

If the BMS Reset is successful, the State of Charge Indicator Panel will illuminate LED Lights 1-4 in sequence TWO TIMES before displaying the battery's current State of Charge.

WARNING / FAULT LIGHTS

In the event of a short circuit or other serious fault, when the Power Management Button is QUICK PRESSED, all 4 LED lights will flash repeatedly for 5 seconds indicating a fault has been detected by the battery and the BMS has triggered a safety protection.

The user should immediately attempt to determine the cause of the fault. If the user is not qualified to identify the cause of the fault, please consult a certified electrician or boat rigging professional for assistance.

Once the issue causing the fault has been remedied, the BMS will return the battery to normal operation status within 1-2 minutes.

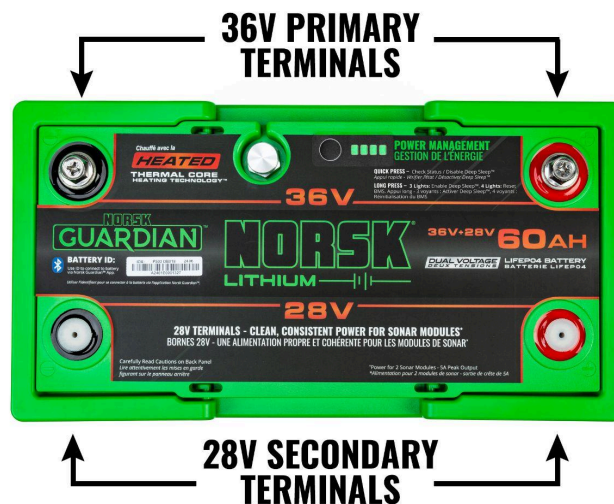
The user can verify the battery is ready to be returned to service after the cause of the fault has been identified and successfully remedied with a Quick Press of the Battery Management Button. If the State of Charge Indicator Panel displays 1-4 lights that stay lit for 5 seconds, versus all 4 LED lights flashing repeatedly for 5 seconds indicating a fault, the battery is ready to return to service.

If the user is not able to identify the cause of the fault and the State of Charge Indicator Panel continues to display 4 LED lights that flash repeatedly for 5 seconds, the user should not attempt to return the battery to service and contact Norsk Lithium customer service for assistance.

NOTE: Owners of Norsk Lithium Marine Batteries can download the Norsk Guardian App and connect to their battery using the provided battery ID that is found on top of each battery to access additional information about the cause of the warning or fault.

DUAL VOLTAGE BATTERY MODELS

Norks Lithium offers Dual Voltage output capability on select Deep Cycle Marine Battery models, such as the 36V+28V Dual Voltage Marine Deep Cycle.



Dual Voltage Batteries offer two sets of terminals that are clearly marked to show the output voltage of each set of terminals. **ALWAYS** verify the operating voltage range of the device to be connected to either set of terminals on a dual voltage battery is compatible with the output voltage provided by the set of terminals to be connected to the device.

The primary set of terminals require M8 fasteners and are intended to power your 36V trolling motor.

The secondary set of terminals requires smaller M5 fasteners and is intended to provide power to your sonar module(s).

NOTE: The output from the secondary terminals is regulated to 28V with a max output current of 5A.

The **ON / OFF** status of both sets of terminals can be monitored via the Norsk Guardian® App. See below for an example.



The secondary set of terminals on a Norsk Lithium Dual Voltage Battery is intelligently controlled to limit energy consumption when not in use.

- When the battery is idle, defined as not outputting current through either set of terminals, for 60 minutes, the secondary set of terminals will be turned off to limit energy consumption.
- When power is output by the primary set of terminals, the secondary set of terminals will be turned on automatically.
- The secondary set of terminals will turn on when a sonar module is powered on - the secondary set of terminals can provide power to an attached sonar module even when the primary set of terminals is not in use.

WARNING: **ALWAYS** charge a Norsk Lithium Dual Voltage Battery through the primary terminals using a compatible 36V charger. **NEVER** attempt to charge your Dual Voltage Battery through the secondary 28V terminals.

APPROVED BATTERY CONNECTION CONFIGURATIONS

The following battery connection configurations are approved by Norsk Lithium for GEN 3 Marine Batteries. **DO NOT** exceed the number of parallel or series connections defined in the chart below as doing so may result in significant and irreparable damage to the battery and attached devices, as well as cause significant damage to surroundings that may result in significant bodily harm.

NOTE: Property damage or bodily injury caused by exceeding the Norsk Lithium approved connection configurations for each model are **NOT** covered by warranty and Norsk Lithium is not responsible for related damages.

MARINE BATTERY MODEL	BATTERIES IN SERIES	BATTERIES IN PARALLEL
Starting 75Ah, 120Ah, 180Ah	4	4
12V Deep Cycle 105Ah, 120Ah	4	4
16V Deep Cycle 75Ah, 105Ah, 135Ah	0	4
24V Deep Cycle 60Ah, 90Ah	2	4
36V+28V Dual Voltage 60Ah	0	4

CHOOSING THE PROPER GAUGE WIRE

Choosing the proper gauge wire for all connections is a critical step in the installation of your Norsk Lithium battery. Using a wire gauge that is too small for the current and length of the wire required will create additional resistance that **MAY CAUSE FIRES** and undesirable performance of the devices powered by the battery.

Please refer to the chart below when selecting a wire gauge. The chart below is **NOT fully comprehensive** of all wiring scenarios. It is intended as a quick reference, only. If you are not qualified to select the proper gauge wire for your particular installation, please contact a qualified electrician or boat rigging professional for guidance.

TOTAL WIRE LENGTH IN FEET

MAXIMUM AMPERAGE	TOTAL WIRE LENGTH IN FEET												
	0-5'	10'	15'	20'	25'	30'	40'	50'	60'	70'	80'	90'	100'
5A	16 AWG	16 AWG	16 AWG	14 AWG	12 AWG	12 AWG	10 AWG	10 AWG	10 AWG	8 AWG	8 AWG	8 AWG	6 AWG
10A	16 AWG	14 AWG	12 AWG	10 AWG	10 AWG	10 AWG	8 AWG	6 AWG	6 AWG	6 AWG	6 AWG	4 AWG	4 AWG
15A	14 AWG	12 AWG	10 AWG	10 AWG	8 AWG	8 AWG	6 AWG	6 AWG	6 AWG	4 AWG	4 AWG	2 AWG	2 AWG
20A	14 AWG	12 AWG	10 AWG	8 AWG	6 AWG	6 AWG	6 AWG	4 AWG	4 AWG	2 AWG	2 AWG	2 AWG	2 AWG
25A	12 AWG	10 AWG	8 AWG	8 AWG	6 AWG	6 AWG	4 AWG	4 AWG	2 AWG	2 AWG	2 AWG	1 AWG	1 AWG
30A	10 AWG	10 AWG	8 AWG	6 AWG	6 AWG	4 AWG	4 AWG	2 AWG	2 AWG	1 AWG	1 AWG	0 AWG	0 AWG
40A	8 AWG	8 AWG	6 AWG	6 AWG	4 AWG	4 AWG	2 AWG	2 AWG	1 AWG	0 AWG	0 AWG	2/0 AWG	2/0 AWG
50A	6 AWG	6 AWG	6 AWG	4 AWG	4 AWG	2 AWG	6 AWG	1 AWG	0 AWG	2/0 AWG	2/0 AWG	3/0 AWG	3/0 AWG
60A	6 AWG	6 AWG	4 AWG	4 AWG	2 AWG	2 AWG	6 AWG	0 AWG	2/0 AWG	3/0 AWG	3/0 AWG	4/0 AWG	4/0 AWG
70A	6 AWG	6 AWG	4 AWG	2 AWG	2 AWG	1 AWG	0 AWG	2/0 AWG	3/0 AWG	3/0 AWG	4/0 AWG	4/0 AWG	N/A
80A	4 AWG	4 AWG	4 AWG	2 AWG	2 AWG	1 AWG	0 AWG	3/0 AWG	3/0 AWG	4/0 AWG	4/0 AWG	N/A	N/A
90A	4 AWG	4 AWG	2 AWG	2 AWG	1 AWG	0 AWG	2/0 AWG	3/0 AWG	4/0 AWG	4/0 AWG	N/A	N/A	N/A
100A	4 AWG	4 AWG	2 AWG	2 AWG	1 AWG	0 AWG	3/0 AWG	3/0 AWG	4/0 AWG	N/A	N/A	N/A	N/A
120A	2 AWG	2 AWG	2 AWG	1 AWG	0 AWG	2/0 AWG	3/0 AWG	4/0 AWG	4/0 AWG	N/A	N/A	N/A	N/A
150A	1 AWG	1 AWG	1 AWG	0 AWG	2/0 AWG	3/0 AWG	4/0 AWG	4/0 AWG	N/A	N/A	N/A	N/A	N/A
200A	2/0 AWG	2/0 AWG	2/0 AWG	2/0 AWG	3/0 AWG	4/0 AWG	N/A	N/A	N/A	N/A	N/A	N/A	N/A
250A	3/0 AWG	3/0 AWG	3/0 AWG	3/0 AWG	4/0 AWG	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300A	4/0 AWG	4/0 AWG	4/0 AWG	4/0 AWG	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

WIRING DIAGRAMS - SERIES & PARALLEL

IF YOU DO NOT FEEL SAFE, OR COMFORTABLE, OR ARE NOT QUALIFIED TO PERFORM A BATTERY INSTALLATION OR OTHER ACTION OUTLINED IN THIS MANUAL, CONSULT A QUALIFIED PROFESSIONAL ELECTRICIAN.

Batteries Wired in Series

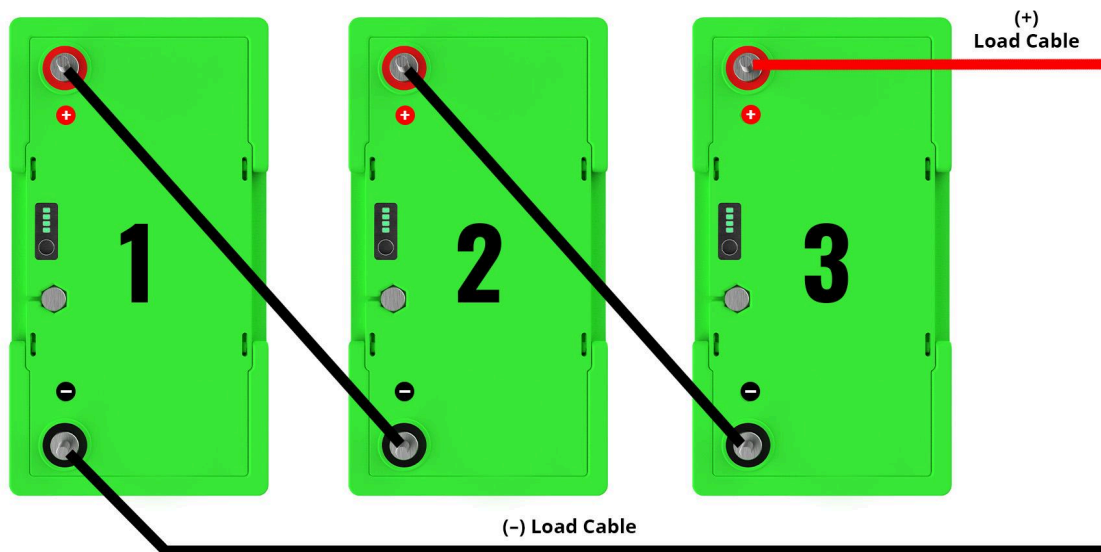
WARNING: Before wiring batteries in series, fully charge all batteries.

WARNING: Never wire batteries with different capacities or voltages together in a series. For example, do not wire a 12.8V 105Ah battery in series with a 12.8V 180Ah battery. Do not wire a 16V 105Ah battery in series with a 12.8V 105Ah battery. **ALL** batteries wired in series **MUST** have the same capacity and voltage.

NOTE: Please consult the **APPROVED BATTERY CONNECT CONFIGURATIONS** section of this document to determine the maximum number of serial or parallel connections approved by Norsk Lithium for each Marine Battery model.

Wiring multiple batteries in series is a way to increase the voltage output from the bank of connected batteries. The diagram below shows (3) Norsk Lithium Marine Deep Cycle 12.8V 105Ah batteries wired in series to create a 36V 105Ah power supply commonly used to power a 36V electric trolling motor.

SERIES CONNECTION



Step-by-Step: Wire Batteries in Series

1. Mount and properly secure the batteries in the desired location.
2. Connect the positive (+) terminal of your first battery to the negative (-) terminal of your second battery using an 18" 6-AWG jumper cable with 5/16th copper lugs on each end of the cable.
3. Connect the positive (+) terminal of your second battery to the negative (-) terminal of your third battery using an 18" 6-AWG jumper cable with 5/16th copper lugs on each end of the cable.

Series: Making the Main Load Connections

4. Connect the main positive (+) load cable leading to the device to be powered to the positive (+) terminal of the third battery.
5. Connect the main negative (-) load cable leading to the device to be powered to the negative (-) terminal of the first battery.
6. To finalize the series connections, verify all fasteners have been tightened to 10 ft/lbs, apply dielectric grease to the external surfaces of all fasteners to eliminate the potential for corrosion, and install protective terminal covers prior to use.

NOTE: Consult the owner's manual provided by the manufacturer of the device(s) to be powered by the batteries wired in series for the proper wire gauge to be used for the main load cables as well as the proper fuse or breaker size to be installed on the positive (+) load cable between the battery and the powered device(s).

Wire Batteries in Parallel

WARNING: Before wiring batteries in parallel, fully charge all batteries.

WARNING: Never wire batteries with different capacities or voltages together in a series. For example, do not wire a 12.8V 105Ah battery in series with a 12.8V 180Ah battery. Do not wire a 16V 105Ah battery in series with a 12.8V 105Ah battery. All batteries wired in series **MUST** have the same capacity and voltage.

NOTE: Please consult the **APPROVED BATTERY CONNECT CONFIGURATIONS** section of this document to determine the maximum number of serial or parallel connections approved by Norsk Lithium for each Marine Battery model.

Wiring multiple batteries in parallel is a way to increase the total amp hours of the bank of connected batteries. The diagram below shows (3) Norsk Lithium Marine Deep Cycle 24V 105Ah batteries wired in parallel to create a 12.8V 315Ah power supply commonly used to power 12V accessories such as lights, pumps, sonar units, and radios.

NOTE: Norsk Lithium recommends the installation of a fuse block on the positive terminal of each battery for batteries wired in parallel to provide individual circuit protection for each battery, preventing significant damage in case of a short circuit or fault within one battery wired in the parallel configuration. A sample of the recommended fuse block and the 150A 58V fuse is shown below.



Step-by-Step: Wire Batteries in Parallel

1. Install the FUSE BLOCKS on the POSITIVE TERMINAL of the batteries to be wired in parallel connection.
2. Prior to making connections between two batteries, verify all batteries to be wired in parallel have matching voltages. If one or more batteries to be connected do not have matching voltages, charge the batteries with lower voltage to match the batteries with higher voltage prior to moving on to the next step.

Parallel: Making the Positive Connections

3. Using a RED 18" 6-AWG jumper cable with 5/16th copper lugs on each end of the cable, connect one end to the POSITIVE FUSE BLOCK on Battery 1 and the other end of the jumper wire to the POSITIVE FUSE BLOCK on Battery 2.
4. Connect a second RED 18" 6-AWG jumper cable with 5/16th copper lugs on each end of the cable to the POSITIVE FUSE BLOCK on Battery 2 and the other end of the jumper wire to the POSITIVE FUSE BLOCK on Battery 3.

Parallel: Making the Negative Connections

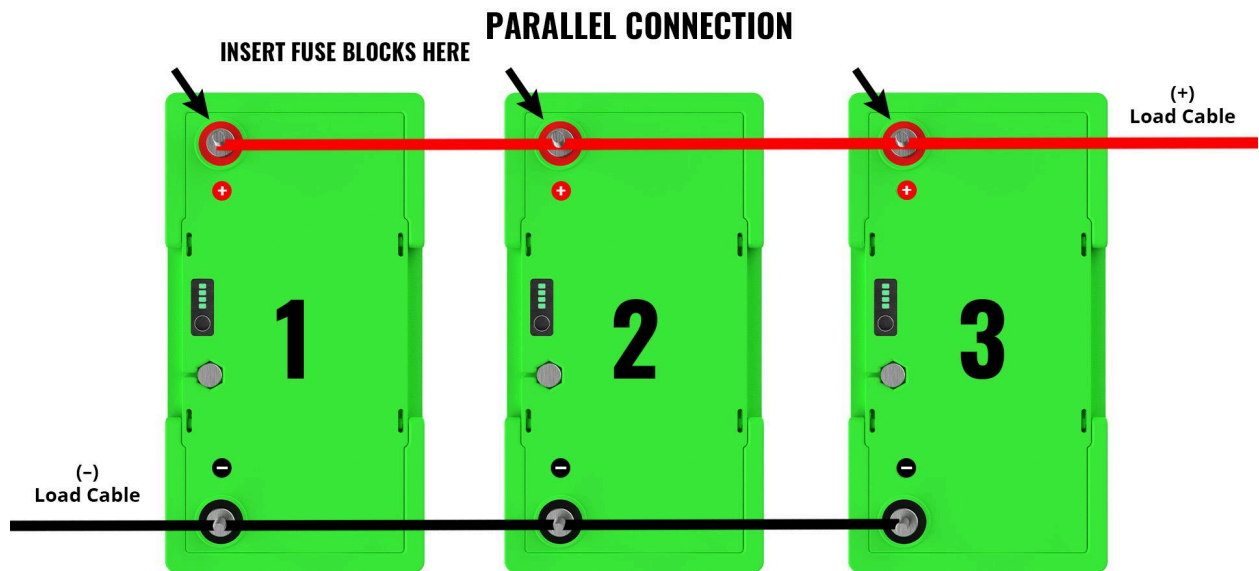
5. Using a BLACK 18" 6-AWG jumper cable with 5/16th copper lugs on each end of the cable, connect one end to the NEGATIVE TERMINAL on Battery 1 and the other end of the jumper wire to the NEGATIVE TERMINAL on Battery 2.
6. Connect a second RED 18" 6-AWG jumper cable with 5/16th copper lugs on each end of the cable to the NEGATIVE TERMINAL on Battery 2 and the other end of the jumper wire to the NEGATIVE TERMINAL on Battery 3.

Parallel: Making the Main Load Connections

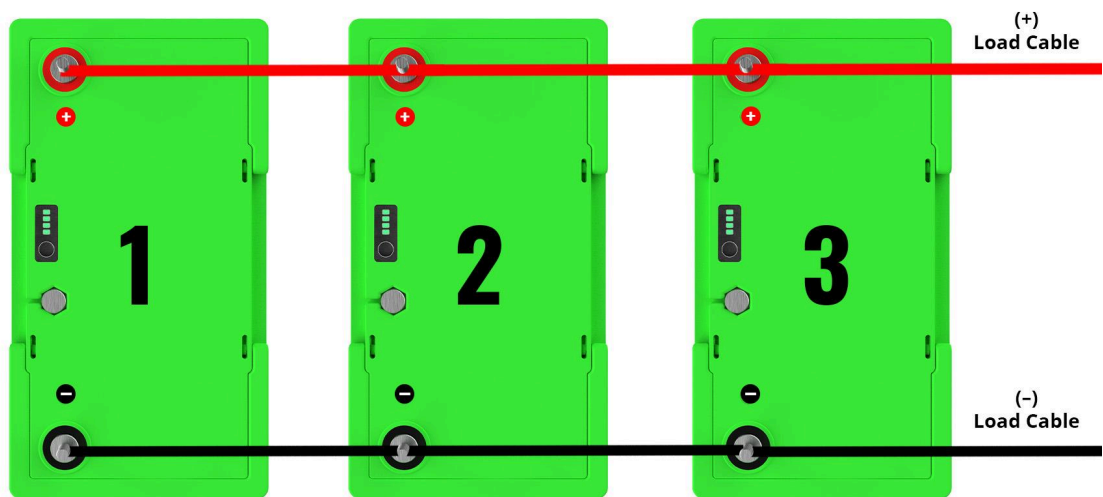
7. Connect the main positive (+) load cable leading to the device to be powered to the positive (+) terminal on Battery 3.
8. Connect the main negative (-) load cable leading to the device to be powered to the negative (-) terminal on Battery 1.

NOTE: Norsk Lithium DOES NOT recommend both the positive (+) load cable leading to the device being powered and the negative (-) load cable leading to the device being powered to be connected to the same battery within the parallel configuration as the current will not be evenly distributed from all batteries in the configuration.

9. Connect the positive (+) load cable leading to the device to be powered to the positive (+) terminal of the last battery in the parallel configuration, in this example that would be Battery 3.
10. Connect the negative (-) load cable leading to the device to be powered to the negative (-) terminal of the first battery in the parallel configuration, in this example that would be Battery 1.
11. To finalize the parallel connections, verify all fasteners have been tightened to 10 ft/lbs, apply dielectric grease to the external surfaces of all fasteners to eliminate the potential for corrosion, and install protective terminal covers prior to use.



CORRECT WIRING – OPTIMAL: DISTRIBUTES CURRENT EVENLY.



INCORRECT WIRING – SUB-OPTIMAL: CURRENT NOT DISTRIBUTED EVENLY.

NOTE: Consult the owner's manual provided by the manufacturer of the device(s) to be powered by the batteries wired in parallel for the proper wire gauge to be used for the main load cables as well as the proper fuse or breaker size to be installed on the positive (+) load cable between the battery and the powered device(s).

MIXING BATTERY CHEMISTRIES

Because the resting voltage of a lithium battery is HIGHER than that of a lead acid or AGM battery, Lead Acid or AGM chemistry batteries should **NEVER** be directly wired in series or parallel with a lithium battery of any capacity or voltage. Failure to follow these instructions may result in significant and irreparable damage to both batteries and attached devices, as well as cause significant damage to surroundings that may result in significant bodily harm. Property damage or bodily injury caused by directly connecting a Norsk Lithium Marine Battery to a lead acid or AGM battery are NOT covered by warranty and Norsk Lithium is not responsible for related damages.

To safely CHARGE a lithium battery from a lead acid or AGM battery Norsk Lithium recommends the use of an EVO-TEC™ DC-to-DC charger. For additional information on EVO-TEC™ DC-to-DC Chargers, visit our website at www.norsklithium.com or contact Norsk Lithium customer service.

STORING YOUR BATTERIES

To prolong the life of your Norsk Lithium Marine Battery, it is essential to store it properly. Store your battery in a cool, dry place away from direct sunlight and heat sources. If you plan to store your battery for an extended period, we recommend charging the battery to a SOC > 50% before putting each battery into Deep Sleep mode using the Power Management Button found on the top of each battery case or via the Norsk Guardian App. Norsk Lithium recommends the user place all batteries into Deep Sleep before extended periods of inactivity to eliminate the chance that a parasitic draw can fully discharge your battery.

NOTE: Norsk Lithium recommends that the user of a Norsk Lithium Marine Battery that has been placed into Deep Sleep mode for an extended period, wake the battery from Deep Sleep every 6 - 12 months to check SOC and overall health of the battery. Recharge the battery, if needed, to a SOC > 50% before placing the battery back into Deep Sleep.

For instructions on how to place your batteries into Deep Sleep, please see the **POWER MANAGEMENT BUTTON AND STATE OF CHARGE (SOC) INDICATOR** section of this document.

BATTERY VOLTAGE - ALL MODELS

BATTERY	RATED VOLTAGE	FULLY CHARGED	RESTING	LOWER LIMIT
12V	12.8V	14.20V *	13.2 - 13.6V	10V
16V	16V	17.75V	16.4 - 16.8V	12.5V
24V	25.6V	28.40V	26.4 - 27.0V	20.0V
36V	38.4V	42.60V	39.8 - 40.4V	30.0V

NOTE: All voltage data above was collected at 70°F / 21°C and is accurate to +/- 0.2V. The measured voltage will change at temperature extremes.

- **Fully Charged** is defined as “immediately upon completion of a charge cycle when the AC charger stops outputting charge current to the battery.”
- **Resting** is defined as “a full-charged battery several hours following the completion of a charge cycle.”
- **Lower Limit** is defined as “the voltage at which the BMS will stop the additional discharge of current to protect the cells from over-discharge.”

NOTE: * **Norsk Lithium Starting Batteries** (Excludes ALL Deep Cycles Models) are designed to accommodate a BMS CHARGE VOLTAGE CUT-OFF of **14.8V** when being charged by an outboard alternator or stator. Norsk Lithium Starting Batteries meet or exceed all performance requirements for lithium starting batteries outlined in the Mercury® Marine Performance Bulletin 2022-19R1, released November 2022.

WARRANTY

Norsk Lithium offers a limited 10-year Warranty on all Marine Batteries. The warranty coverage begins on the date of purchase as shown on the original purchase receipt.

All Gen 3 Marine Batteries are eligible for 10+2 year warranty coverage that extends the 10-Year Warranty an additional 2 years for a total of 12 years of warranty coverage. To receive the additional 2 years of warranty coverage the owner must register the eligible battery for the 10+2 year warranty coverage in the Norsk Guardian App or on the Norsk Lithium website within 90 days of purchase as shown on the dated receipt submitted during warranty registration.

NOTE: Gen 3 Marine Batteries can be easily identified as having the Battery Management Button and State of Charge Indicator panel integrated into the top of each battery. If your Norsk Lithium Marine Battery DOES NOT have a Battery Management Button and State of Charge Indicator panel on the top of the battery, it is NOT a Gen 3 model and is NOT eligible for the 10+2 year warranty described above.

This warranty covers manufacturing defects and does not cover damage caused by charging with an incompatible charger, misuse, abuse, or neglect. Please visit the warranty page on our website at www.norsklithium.com/warranty/ for more information on our warranty terms and conditions.

WARRANTY REGISTRATION

Owners of a Norsk Lithium Marine Battery are encouraged to register their battery using one of the three methods described below:

- Save a copy of your receipt showing the battery model and purchase date for submission to Norsk Lithium Customer Service in the event warranty coverage is needed.
- Register the battery for warranty online at norsklithium.com by creating an account and filling out a Product Registration form found at www.norsklithium.com/product-registration/.
- Register the battery for warranty through the Norsk Guardian app by creating an account and submitting ownership information for each battery added to the app. To start this process click “YES” when asked “Do you want to be the owner of the battery XXXX” after adding a battery to a group. Complete the submission via the app by providing the requested information.
- Battery owners who registered their battery(s) online or via the app can check the status of their warranty registration online at www.norsklithium.com/product-registration/.

CUSTOMER SERVICE

We stand behind the quality of our batteries and are committed to providing you with excellent customer service. If you purchased your product from a retail location or Amazon and have any questions or concerns please **DO NOT return it to the store**. Instead, please contact us at support@norsklithium.com and we would be happy to help you resolve any issues you may be experiencing.

HELP CENTER

If you have any questions about your Norsk Lithium product, you can also visit our Help Center on our website. There you will find FAQs, How-to-Videos and Warranty Information:

www.norsklithium.com/help-center

You can also contact our customer support team via email or phone, and we will be happy to assist you.

ADDITIONAL RESOURCES

User Manuals for Norsk Lithium products are available for download online at

www.norsklithium.com/manuals/

- Norsk Guardian App
- EVO-TEC™ Multi-Bank and Single Bank Marine Chargers
- EVO-TEC™ DC-to-DC Chargers
- 16.4V Regulator
- Portable Sonar Batteries

SAFETY INFORMATION

Lithium batteries can present a fire and explosion hazard. To minimize these hazards use and install Norsk Lithium products only as directed and, where appropriate, seek qualified, professional assistance. During installation and use:

- Consider all battery terminals and connections live
- **DO NOT** place items on the battery
- Inspect the battery and connections prior to installation and before each use. Do not use or install if the battery or battery connections are faulty or damaged.
- **DO NOT** short-circuit the battery.
- Use insulated tools
- Avoid wearing metal, metallic, or other conductive jewelry or watches when working with the battery.
- Verify the wire gauge is correct for the application and the length of the wire.
- Verify terminal connectors are tight and that wiring has an adequate surface connection on the terminals.
- **DO NOT** wire batteries with different voltages or chemistries in series or parallel.

IN THE EVENT OF A FIRE YOU MUST USE A TYPE D, FOAM, OR CO2 FIRE EXTINGUISHER. DO NOT ATTEMPT TO EXTINGUISH A LITHIUM BATTERY FIRE WITH WATER. Norsk Lithium recommends keeping a suitable fire extinguisher on hand during installation and use.

PRECAUTIONS

Norsk Lithium can't list every possible scenario or safety precaution. Use common sense. Follow manufacturer recommendations. If you are unqualified or do not feel comfortable, seek qualified professional help.

Below is a non-exhaustive list of precautions to take during the use and installation of your Norsk Lithium battery. Failure to follow these precautions may result in fire, property damage, personal injury, and/or death.

Use **ONLY** Norsk Lithium Chargers and charging components. **DO NOT** overcharge the battery. The Battery Management System (BMS) will turn the battery off in case of overcharging, but repeated overcharging may damage the battery.

DO NOT charge the battery unattended. See **Charging Procedure** section for more information.

DO NOT charge or operate a battery that is visibly damaged, dented, bulging, punctured, or otherwise in an inoperable condition.

DO NOT short-circuit lithium batteries. Doing so can damage your battery, and may cause high temperatures or current which can cause fire, personal injury, or death.

DO NOT heat over 140°F (60°C). Doing so may cause damage to the battery, housing, or charger.

DO NOT exceed max discharge specifications for the battery.

DO NOT submerge the battery in water. Keep the battery in a dry environment. Norsk Lithium recommends the use of a battery box for use in marine applications or environments where the battery may get wet.

DO NOT store batteries, chargers, or accessories near heat sources, in direct sunlight, or near high-temperature sources or gas emitters such as fire, heaters, propane tanks, generators, fuel storage, etc.... Follow all other charging and storage guidance.

DO NOT store batteries, chargers, or accessories with other metal or metallic objects, batteries, or electronic devices. Failure to follow this precaution could result in inadvertent terminal connection and fire and/or explosion.

DO NOT dispose of lithium batteries in the trash. **DO NOT** dispose of the battery by crushing, cutting, or exposing it to fire, or high temperatures, as an explosion can result. Follow all local, state, and/or federal laws and regulations related to the disposal and recycling of batteries. Seek assistance if necessary.

HAZARDS

Norsk Lithium batteries are not hazardous when used according to the manufacturer's recommendations. In cases of abuse, damage, or destruction of the battery or battery cells there are hazards of rupture, fire, heat, and leakage of internal components which may lead to exposure to hazardous chemicals. Contact us at support@norskliithium.com if you have questions about uses or applications for Norsk Lithium batteries.

Internal battery cells contain hazardous materials. **NEVER** try to open or dismantle the battery or battery cells. **DO NOT** puncture the battery case, or cells, disassemble the battery, or expose it to fire or high heat. Damage to the battery or battery cells may result in fire, explosion, and/or burns.

Exposure to internal components may result in exposure to hazardous materials including Graphite, Copper, Aluminium, Nickel, and Lithium hexafluorophosphate.

In case of rupture, avoid contact with skin, eyes, or clothing, and avoid breathing any fumes.

If EYE exposure occurs, flush your eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids.

If SKIN exposure occurs, remove contaminated clothes and rinse skin with plenty of water or shower for at least 15 minutes. Seek medical attention if necessary.

If INHALED, remove from exposure and move to fresh air immediately. Use oxygen if necessary and available.

If INGESTION occurs, **Seek medical attention if you feel unwell**. Do **NOT** induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Get medical advice/attention if you feel unwell.

In all instances, symptoms may be delayed. In case of an accident or if you feel unwell, seek medical advice immediately (show the label where possible).

Refer to Norsk Lithium Battery Safety Data Sheets for additional safety information. Safety Data Sheets can be found at: www.norsklithium.com.

FCC Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference., and (2) This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and the receiver
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help

Industry Canada Statement: CAN RSS-GEN/CNR-GEN

This device contains license-exempt transmitter(s)/receiver(s) that comply with Innovation, Science, and Economic Development Canada's license-exempt RSS(s). Operation is subject to the following two conditions: (1) this device may not cause interference. (2) This device must accept any interference, including interference that may cause undesired operation of the device.

ADDITIONAL FCC/ISED STATEMENTS FOR NORSK GUARDIAN-ENABLED DEVICES:

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.


This equipment complies with FCC/IC RSS-102 radiation exposure limits set forth for an uncontrolled environment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Industry Canada: CAN RSS-GEN/CNR-GEN

Under Industry Canada's regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p) is not more than that necessary for successful communication.

CALIFORNIA PROPOSITION 65

Norsk Lithium Marine Batteries - Lithium Iron Phosphate (LiFePO4/LFP) Chemistry:

 **WARNING:** This product can expose you to chemicals including Nickel and Acetylene Black which are known to the state of California to cause Cancer. For more information go to www.P65warnings.ca.gov.