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OPTIMA® ORANGETOP™

User Manual



OPTIMA® ORANGETOP™ LITHIUM IRON PHOSPHATE BATTERY

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www.optimabatteries.com/contact-us

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This User Manual contains important information on safety, installation, charging, operation, troubleshooting and maintenance. You should read the entire manual before installing your battery and save it for future reference.

Say Hello to The Ultimate Power Source®!

Congratulations on your purchase of an OPTIMA® Batteries ORANGETOP™ with HYPERCORE LITHIUM™ TECHNOLOGY, one of the world's most sophisticated lithium powersports batteries. OPTIMA is a division of Charios, one of the world's largest suppliers of OE 12V lithium battery systems. Our industry-leading team has Engineered the Quit Out of Your Battery, so you can be confident it'll start when you need it.

Your new battery includes many innovative features such as a sophisticated battery management system (BMS) that continuously monitors battery charging and discharging, short circuit protection and current management to provide better performance and safety for you. The proprietary POWERLINK™ display provides real-time battery mode and charge information. If you are interested in learning more about the technology of your new battery, please visit our website at www.optimabatteries.com.

In order for you to benefit from these performance and safety features it is necessary that you familiarize yourself with the proper way to install, charge, operate, care for and store your battery as described in this manual. It is important that you read and understand everything in this manual. Your safety and satisfaction depend on it!

If you have questions or are uncertain about anything having to do with your new battery please contact

our customer service department by phone at (888) 8-OPTIMA / (888) 867-8462, by email at info@optimabatteries.com or on the web at www.optimabatteries.com/contact-us.

Sincerely,
The OPTIMA® Team

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Important Safety Information

Safe and effective use of your new OPTIMA® Battery requires that you make yourself aware of your responsibilities for selecting the right battery for your application, preparing for and installing your battery and the proper charging, use and care of your battery. The OPTIMA® Battery has been designed to minimize the risk of personal injury and equipment damage arising from the intended use or foreseeable misuse of this battery. However, this is a battery and therefore it is a source of energy that, if not used properly, could lead to personal injury or vehicle damage.

Throughout this User Manual the following signal words and/or symbols will be used to call your attention to specific information as described below.



WARNING

WARNING

indicates a hazardous situation which, if not avoided, could result in death or serious injury.



CAUTION

CAUTION

indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE

NOTICE

indicates information considered important, but not hazard-related.

The following symbols are used to call your attention to specific safety measures you should follow.



Read User Manual. This message refers not only to this User Manual, but also your vehicle and battery charger User Manuals.



No sparks, fire or smoking. It is important that you minimize the presence of ignition sources and extreme heat near your battery and your internal combustion engine.



Use protective eyewear. You should always wear goggles or safety glasses as well as gloves when working on or near batteries and any automotive equipment.

Selecting the Right Battery

This battery is intended to be a starter battery for a variety of powersports vehicles. It is not intended to be used in deep cycling, as a power source of propulsion of electric vehicles (such as electric bikes, go-karts, forklifts, golf carts, ride-on toys), or “total loss” systems.

Before proceeding with the installation and use of this battery you need to make sure that this battery is appropriate for your intended use.

See section “Technical Specifications” in this manual or on our website at www.optimabatteries.com.

Important Features of Your OPTIMA® Battery

- Microprocessor-controlled battery management system (BMS) monitors
 - Over Discharge/Under Voltage
 - Overcharge/Over Voltage
 - Short Circuit Protection
 - Over/Under Temperature
 - Over Current
 - Charging/Balancing
- POWERLINK™
 - Communicate battery charge status and fault/error conditions
 - Connect your OPTIMA lithium-enabled charger
 - Control Sleep/Storage, Active and OPTIMA CPR™ modes
- High cranking performance, your battery will crank at least three (3) times for five (5) seconds at rated cranking power
- Exceptional cold-weather performance – Meets cranking specification at temps as low as 32°F (0°C) and performs as low as 0°F (-18°C)
- Quad terminals – Allow for easier connections
- Fitment for over 95% of powersports vehicles on the market
- Advantages compared to lead acid batteries
 - Lighter weight
 - More cycle life
 - Longer storage life
 - More starting power
 - Non-spillable
 - Stable voltage delivery throughout usable range

Unpacking Your Battery

When you unpack your new battery you should inspect it to make sure that it was not damaged during shipping. Make sure the battery case is not damaged or misshapen in anyway. There should not be anything leaking from the battery. If you see signs of damage or have reason to believe the battery has been dropped, do not use it. Contact OPTIMA® customer service at 888-8-OPTIMA or info@optimabatteries.com.

When received, your battery will usually be in Sleep/Storage mode, to minimize discharge in transit and distribution. Before use, the battery must be activated by holding the POWERLINK™ button for three (3) seconds. The green LED on the POWERLINK™ will flash 3x to indicate that the battery has been activated.

Before Installing Your Battery



Wear goggles or safety glasses as well as gloves at all times when working on or near batteries and any automotive equipment.



Read User Manual. This message refers not only to this User Manual, but also your vehicle and battery charger User Manuals.

Check Your Vehicle Charging System.

A qualified technician must test your vehicle charging system before installation. Testing should be done with the engine running, both with the current battery connected and disconnected, throughout the engine's RPM range. During this test the output voltage from the vehicle charging system must never exceed 15V, with 14.4V being a typical/expected measurement. OEM-style solid state voltage regulators are strongly recommended for older vehicles (generally, pre-1995). Damage due to a defective or malfunctioning charging system is not covered by warranty.



A failed or defective charging system can cause your battery to be dangerously overcharged. Failure to check and maintain your charging system can result in damage to property.

Charging Your Battery.



OPTIMA® Chargers with lithium charging profiles were designed to function as a system with OPTIMA® Lithium Batteries to ensure maximum safety, service life, performance, functionality and convenience.



Lead acid chargers/charge profiles are not optimized for charging lithium batteries and could result in subpar performance, reduced battery life, or property damage.

Do not use:

- Lead acid battery charging profiles.
- Chargers/charge profiles for flooded/SLI batteries, AGM or gel batteries.
- Chargers/profiles with a desulfation/antisulfation/reconditioning mode or function. Although this can be useful for lead acid and AGM batteries, it may cause a lithium battery to be overcharged.

If after activating your battery the LED indicates low state of charge (red flashing), you must charge the battery before use. Use only chargers or profiles for 12V lithium iron phosphate (aka LFP or LiFePO4) batteries.

Maximum charging current:

Via POWERLINK™ - 3.5 amps

Via battery terminals - varies by model (see Technical Specifications)

Time to fully charge at 3.5A*

QUAD7	under 1 hour	QUAD12	under 1.5 hours
QUAD14	2 hours	QUAD16	under 2.5 hours
QUAD20	2.5 hours	QUAD30	under 4.5 hours

**Depending on temperature and the requirements of your vehicle, as little as 1 hour of charging time may be adequate for starting.*

Charge only between temperatures of 14°F (-10°C) and 122°F (50°C) is strongly recommended.

Charging out of this temperature range could reduce battery overall life.

Never charge a battery that is frozen.

After charging via POWERLINK™, re-insert the rubber plug in the POWERLINK™ charging port when not in use to protect from dust and water intrusion. Do not connect POWERLINK™ directly to the terminals for charging.

⚠ CAUTION

Stop charging and contact support if at any time the battery emits odors, gases or smoke, gets hot or swells/deforms.

The battery normally will automatically wake from sleep/storage mode if an OPTIMA lithium enabled charger is used, but it may be necessary to manually “wake” the battery using the POWERLINK button. Chargers from other manufacturers may also require that one manually “wake” the battery using the POWERLINK button.

NOTICE

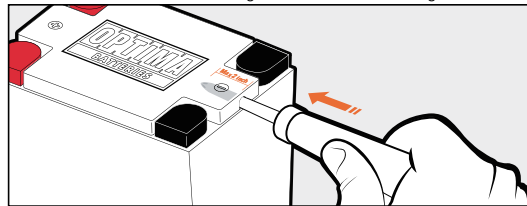
Lithium batteries do not have a “memory effect,” fully discharging before initial charging or periodically discharging is not necessary and could reduce overall life.

Installing Your Battery

POWERLINK™ must be installed to activate your battery after installation. POWERLINK™ is

critical for the battery to work properly and to take advantage of the advanced functionality this system offers.

1. **Remove old battery**, disconnecting the ground terminal first.
2. **Add fitment spacers** (included) to the bottom and sides of the battery as necessary to fit snugly in the vehicle battery box or tray. Add spacers so that when installed, the cables can reach the battery terminals without excessive tension or stretching of the cables.
3. **Remove the cover** from the top of the battery and plug the POWERLINK™ into the battery. Tighten the fasteners to firmly secure and seal the plug. The POWERLINK™ button can be used to deactivate the battery during installation. Hold the button 3 seconds to toggle between active (green LED will flash 3x) and deactivated (amber and green LEDs will flash together 3x) modes.



Use a screwdriver in the unoccupied hole on either side of the battery to pry off the cover. Do not insert the screwdriver more than two (2) inches if the cable is installed to prevent damaging the cable.

4. **Route the POWERLINK™ cable** in the groove on the top of the battery so that the cable will not be pinched or damaged when installed in the vehicle. Securely replace the cover to protect the cable and reduce dust and moisture exposure to the plug. Ensure that the battery is in sleep mode when install or remove the battery from vehicle.
5. **Install the battery**, check to make sure the height matches the old battery, that there isn't side-to-side or front-to-back movement, and that the top of the battery has adequate clearance when fully installed.
6. **Temporarily place the POWERLINK™ cable** out of the way, so that it will not interfere with the battery cable connections.
7. **Reconnect battery cables.** For negative grounded vehicles (most common), connect the positive cable first. For positive grounded vehicles (uncommon), connect the negative cable first. Do not exceed 5.6 in-lb (0.64 NM) for QUAD7 and 9.1 in-lb (1.0 NM) for QUAD12/14/16/20/30 when tightening the terminals. Do not over-torque the battery terminals; damage could result. Replace included covers on unused terminals. Anti-corrosion spray is recommended for the terminals, especially in damp or salty environments. A small piece of foam from the included fitment spacers can be cut and adhered, using the included self-adhesive, to the bottom side of the nuts to help keep them in place during installation.
8. **Reinstall the battery hold-down.** The battery must be securely mounted, add more spacers if necessary. The battery should always be secured with a proper hold-down. The battery should never be secured only by the connections at the terminals.

9. **Route the POWERLINK™ cable** on the vehicle, so that the indicator is visible and convenient for making connections to your OPTIMA® lithium-enabled charger. Ensure that the POWERLINK™ and cable are away from excessive sources of heat or water intrusion (insert the rubber plug in the charging port when not in use) and will not be pinched or damaged when the vehicle is in use and does not interfere with operation of the vehicle or controls. Ensure that the battery is in sleep mode when install or remove the battery from vehicle.

 CAUTION

The battery should be installed so that it is not exposed to excessive heat (above 140°F/60°C) such as next to an exhaust manifold

Lithium batteries weigh substantially less than the lead acid batteries they replace. Some vehicles and equipment may be designed to utilize the original battery weight to achieve the manufacturer's intended weight distribution.

 WARNING

Users and installers must understand the possible consequences of changing the weight distribution, balance or stability of the vehicle or equipment and assume all responsibility and liability for damages, injury or accidents that may result.

Do not connect more than two (2) batteries in parallel. Connecting more than two (2) batteries in parallel may cause permanent damage to the battery or reduced service life.

Do not connect batteries in series.



Parallel connections should only be done with batteries of the same size, type/technology and age or reduced service life and performance will result. Parallel connections must be made with the batteries at equal levels of charge or sparks or explosion could occur. All connections must have appropriate circuit protection via fuses, circuit breakers or similar current protection devices. Do not connect in series.

Using Your Battery

Activating the Battery

When received, your battery will usually be in “sleep/storage” mode, to minimize discharge in transit and distribution. The POWERLINK™ button is used to activate and deactivate the battery. Hold the button 3 seconds to toggle between active (green LED will flash 3x) and deactivated (amber and green LEDs will flash together 3x) modes.

OPTIMA® CPR™

If your battery is accidentally discharged, OPTIMA CPR™ will internally disconnect the battery from the vehicle and hold in reserve enough power to start the engine under normal conditions/temperatures. If you find that your vehicle is “dead” when you turn on the key and the red POWERLINK™ LED is flashing, it may be because OPTIMA CPR™ has deactivated the battery. To reactivate the battery, hold down the

POWERLINK™ button for three (3) seconds. When reactivated the green LED will flash 3x.



After the jump-start feature has been activated, it is best to connect a charger to fully charge the battery as soon as possible. The vehicle electrical charging system is not intended to be used to charge a discharged battery; using it for this purpose will usually reduce the life of your vehicle’s charging system components.

Battery Management System

In most cases, the battery management system (BMS) is “self-healing,” meaning that when the condition which caused the error to occur is resolved, the battery will automatically return to a normal functional state. There is no need to perform any reactivation or recovery procedures to use the battery again. For example, if there is an “over temperature” error, allowing the battery to cool down to an acceptable operating temperature will correct the error state and allow use without further input.

After an over-voltage or over-current you may need to press the button on the POWERLINK™ to return the battery to a normal functional state.



In the event of a short circuit, immediately uninstall the battery from the vehicle. After removal check the battery and POWERLINK™ cable for physical or heat damage or deformity, unusual smells, bowing or leakage. Finally, check POWERLINK™ LEDs. If the red LED on POWERLINK™ is illuminated solid red, the

battery has been permanently damaged and should be disposed of, do not press the POWERLINK™ button to check further. If the LED is not illuminated constant red, but the battery is unresponsive to pressing the POWERLINK™ buttons or if no LEDs illuminate after pressing the button for 3 seconds, the battery has been permanently damaged and should be disposed of.

Engine Starting and Current Rating

When fully charged, your battery is able to perform at least three (3) engine cranking events at the rated current (amps) that are a maximum of five (5) seconds long at temperatures as low as 32°F (0°C), with a “cooldown” time of three (3) seconds between each attempt. If your vehicle is unable to start after these three (3) attempts, please consider that there may be an issue other than the battery that is preventing the vehicle from starting.

Using at High Temperatures

At higher temperatures, the length of engine cranking events available may be less than five (5) seconds and the “cooldown” time needed between attempts may be longer than three (3) seconds. Charging and use of the battery is disabled if the internal temperature exceeds thresholds. Storage and use at excessive temperatures can reduce battery life, heat shield or install the battery away from excessive heat sources such as exhaust headers or components.

Using at Cold Temperatures

Please note that, as with all batteries, cold temperatures will result in reduced performance. When temperatures are below 32°F (0°C), applying a load to the battery will cause the internal temperature to increase slightly and can improve cold-weather performance. Successive starting attempts may have more power than the initial attempt for this reason. Turning on the headlights for up to five (5) minutes will often increase internal temperature enough to be beneficial. Cold-weather performance is best when the battery is fully charged. The BMS will deactivate charging below 23°F (-5°C), and will deactivate power output below 14°F (-10°C).

Energy Storage Capacity

Although OPTIMA® lithium powersports batteries usually have more power density (engine starting power) than the lead acid batteries they replace, it is important to keep in mind that the energy storage capacity is generally 1/2 to 1/3 of the original battery. This means that the runtime for accessories when your engine isn't running will be much shorter.

Maintaining Your Battery

The most important maintenance for your battery is to keep it charged. Unlike some lithium chemistries, OPTIMA® HYPERCORE LITHIUM™ does not have significantly reduced life if kept fully charged. If your vehicle doesn't have excessive key-off loads and is used a few hours a month, this will usually be sufficient to keep your battery charged on its own.

To Store Your Battery

To maximize storage time and life:

- Put the battery into Sleep/Storage mode by holding the POWERLINK™ button for three (3) seconds. The amber and green LEDs will flash together 3x to indicate the battery is deactivated.
- Disconnect the battery to eliminate any vehicle system impact.
- Use an appropriate charger or maintainer, such as OPTIMA's lithium-enabled chargers.
- If none of the above are viable options, disable constantly powered devices or systems such as alarms

If stored while not connected to a charger/maintainer, check your battery at least every three (3) months to ensure the voltage is at or above 13 volts. If your battery is discharged below 6 volts, the cells will be damaged and the BMS will permanently disable the battery. Neglectful or abusive over discharge is not covered under the warranty.

Cleaning

You should inspect and clean your battery monthly or more often if necessary.

- You may use a damp cloth to clean your battery.
- Do not use harsh cleaners, solvents or corrosive liquids.
- Minimize contact with water, do not submerge or use a pressure washer.

When cleaning your battery, you should look for signs of damage. If the cover or container are cracked, melted or otherwise damaged, discontinue use and replace the battery.

Shipping the Battery

Special procedures, package labeling and documentation are required for shipping lithium batteries. These requirements vary regionally and by battery application, type and size/capacity. Please contact your carrier for complete instructions and information on the shipping requirements and documentation required.

Troubleshooting

New Battery

When received, your battery will not be fully charged and will usually be in Sleep/Storage mode, to minimize discharge in transit and distribution. Fully charge the battery before use. The battery can be activated by holding the POWERLINK™ button for three (3) seconds. A flashing LED on the POWERLINK™ means that the battery has been activated.

“Dead Battery”

If your battery becomes deeply discharged, OPTIMA® CPR™ will stop supplying power to the vehicle and hold in reserve enough power to start the engine under normal conditions/temperatures. If you find that your vehicle is “dead” when you turn on the key, it may be because the the built-in jump start feature has

been activated. TO reactivate the battery, hold down the POWERLINK™ button for three (3) seconds. When reconnected, the LED will flash 3x to indicate activation. When the the jump start feature has been activated, it is best to connect a charger to fully charge the battery as soon as possible. The vehicle electrical charging system is not intended to be used to charge a discharged battery. Using the vehicle's electrical charging system for this purpose may damage or reduce the life of your vehicle's charging system components. Please see section "Charging Your Battery" for more information.

Cold-Weather Alert

Please note that as with all batteries, cold temperatures will result in reduced performance. When temperatures are below 32°F/0°C, applying a load to the battery will cause the internal temperature to increase slightly and can improve performance. Successive starting attempts may have more power than the initial attempt for this reason. Turning on the headlights for up to five (5) minutes may increase internal temperature enough to be beneficial. Cold-weather performance is best when the battery is fully charged. The BMS will deactivate charging and all power output below 0°F (-18°C) and reactivate above 14°F (-10°C) for safety.

Battery Is Unexpectedly Discharged

Over discharge or unexpected battery discharge is the number one complaint for seasonal-use vehicles.

Depending on battery size/capacity, storage temperature and initial charge, even the smallest OPTIMA® Lithium Battery can be stored up to three (3) years if put into Sleep/Storage mode. If the battery is discharging at a high rate, it likely is due to power drawn from the vehicle even when the key is off, by things such as alarms, vehicle control modules or aftermarket accessories. Please connect and use the included POWERLINK™, which is intended to provide a convenient means to communicate if the battery needs to be charged, and to connect your OPTIMA® lithium-enabled charger to your battery.

Not Charging

Normally, when using an OPTIMA® lithium-enabled charger, charging will automatically activate the battery from Sleep/Storage mode. If the battery does not automatically activate from charging, disconnect the charger and hold the POWERLINK™ button for three (3) seconds. The LED on the POWERLINK™ will flash to indicate activation.



Gassing/Smell/Bowing/Bulging. If at any time the battery emits gasses, fluids, flames, smoke, unusual smells, or the sides bulge, discontinue use or charging immediately. If this happens during charging, please confirm that an appropriate lithium charging profile and charger was used, see section "Charging Your Battery." If this happens during use of the vehicle, stop immediately and confirm that the charging system's voltage regulation is functioning properly. If the red LED on POWERLINK™ is illuminated solid red, the battery has been permanently damaged and should be disposed of, do not press the POWERLINK™ button to check further.

Interpreting POWERLINK™ Indicator

As shown in the table below, OPTIMA® Lithium Batteries are designed to automatically shut down under various excessive conditions to prevent damage to the battery and connected equipment. This will generally result in total loss of electrical power to equipment from the battery. In most applications, this will only result in not being able to start the vehicle without first holding the POWERLINK™ button.

POWERLINK Indication	MEANING	SHUTDOWN LIMIT/ CONDITION	REACTIVATION CONDITION
Green constant	Fully Charged	n/a	n/a
Green - 5 seconds repeating	>80% charge	n/a	n/a
Amber - 5 seconds repeating	35% < Charge < 80%	n/a	n/a
Red - 15 seconds repeating	10% < Charge < 35%	n/a	n/a
No LED	Over Discharged	V<7.2V	V > 10V
	Currently in Sleep/Storage Mode	n/a	Hold POWERLINK™ button 3 sec to enter Battery Active Mode or Sleep/Storage Mode
	Entering Active Mode	n/a	
Green - 3x rapidly after holding POWERLINK™ button three (3) seconds	Entering Sleep/Storage Mode	n/a	
Green/Amber/Red	Button pressed too long	Button pressed > 9 seconds	Release button
Amber/Green alternating	Charger Connected and Charging	n/a	n/a
Amber - 1 sec on/off	Charger Connected, Charging Error	n/a	See Note



CAUTION

You must take precautions to ensure that sudden loss of electrical power from the battery does not result in hazardous system behavior of your vehicle.

ADDITIONAL NOTE
Battery is fully charged via connected charger or currently active vehicle charging system.
Battery is near fully charged or vehicle charging system is charging battery.
Battery needs to be charged or vehicle charging system is not charging battery.
Charge Battery – urgent
Charge Battery. Voltage under 6V will permanently disable all functions.
Immediately after entering/communicating Active Mode, LEDs will communicate battery charge percentage as noted above.
No further LED illumination after the battery has entered Sleep/Storage Mode.
Indicates damaged POWERLINK™ button if occurs without pressing button.
Charger connected or vehicle charging system is charging battery.
Charger connected, charging error. Disconnect charger, wait 30 seconds, try again. Recurring errors indicate incompatible or defective charger.

Interpreting POWERLINK™ Indicator

As shown in the table below, OPTIMA® Lithium Batteries are designed to automatically shut down under various excessive conditions to prevent damage to the battery and connected equipment. This will generally result in total loss of electrical power to equipment from the battery. In most applications, this will only result in not being able to start the vehicle without first holding the POWERLINK™ button.

POWERLINK Indication	MEANING	SHUTDOWN LIMIT/ CONDITION	REACTIVATION CONDITION
Red - 1 fast, 1 slow	Multiple Errors	See Note	See Note
Red - 2 fast, 1 slow	Over Voltage	Input V > 16V or V cell > 4.1V	V<13.8V
Red - 3 fast, 1 slow	Over Current (Discharging)	I > starting current	I <=shutdown limit wait 3 seconds, hold POWERLINK™ button 3 seconds if the battery is still disconnected
	Over Current Charging,via Battery Terminals	I > charging current	
	Over Current Charging, via POWERLINK™	I > 3.5A	Hold POWERLINK button 3 seconds
		I > 3.5A	
	Short Circuit	I > 1.3X cranking rating	See caution relating to short circuit on page 15. Remove and check battery and powerlink LED. Correct electrical short circuit. Hold button 3 sec to reactivate battery
Red - 4 fast, 1 slow	Over Temperature - Discharge	T > 140°F (60°C)	T < 122°F (50°C)
	Over Temperature - Charge	T > 140°F (60°C)	T < 122°F (50°C)
Red - 5 fast, 1 slow	Under Temperature – Discharge/Charge	T < 0°F (-18°C)	T > 14°F (-10°C)
Red - Constant	Self-Test Failure	Self-Test Failure – Permanent Damage see “additional note” page 25	Do not attempt to reactivate the battery, immediately uninstall, stop using the battery, see “additional note” page 25



CAUTION

You must take precautions to ensure that sudden loss of electrical power from the battery does not result in hazardous system behavior of your vehicle.

ADDITIONAL NOTE
See over temperature and over voltage notes. If charging, may be caused by using an improper charger or a charger with unsuitable temperature compensation. If charging, confirm charger compatibility and/or allow battery to cool down (hot temperatures) or warm up (cold temperatures).
Disconnect charger or stop engine. Check charger voltage (see Section “charging”) or vehicle charging system voltage regulation (see section “Check Your Vehicle Charging System”).
Confirm battery is adequately sized for application, current/amps requirement exceeds battery rating. See section “Technical Specifications.”
Confirm battery is adequately sized for application, charging system output exceeds battery capability. See section “Technical Specifications”
Incompatible charger/charge mode, exceeds current limits for charging via POWERLINK™. Check the charger
Take care in connecting cables to battery, ensure wiring to battery is not damaged.
Excessive ambient temperature and/or multiple starting attempts have overheated battery, allow to cool down. See “Installation” section.
Excessive ambient temperature has overheated battery, allow to cool down. See “Installation” section.
Extreme cold, allow battery to warm up or move battery to warmer location.
Internal self-test error, permanent damage. Uninstall, discontinue use, contact OPTIMA support.

Technical Specifications

MODEL	QUAD7	QUAD12	QUAD14
Capacity - Nominal (Ah)	3	4.5	7
Operating/Discharge Temperature Limits	0°F to 140°F (-18°C to 60°C)		
Recommended Charging Temperature	14°F to 122°F (-10C to 50°C)		
Recommended Storage Temperature	32°F to 77°F (0°C to 25°C)		
Recommended Storage Voltage	13.6V		
Charging Voltage - Max	14.9V		
Voltage at 100% Charge	14.0V		
Charging Current - Max via POWERLINK™ (A)	3.5A		
Charging Current - Max continuous via terminals (A)	30A	45A	70A
Starting Current - Max (A)	190	380	420
Length - inch (mm)	4.45 (113)	5.24 (133)	5.91 (150)
Width - inch (mm)	2.56 (65)	2.72 (69)	2.72 (69)
Height - inch (mm)	3.41 (86.5)	3.66 (93)	5.12 (130)
Weight - lb (kg)	1.67 (0.76)	2.4 (1.1)	3.5 (1.6)

MODEL	QUAD16	QUAD20	QUAD30
Capacity - Nominal (Ah)	8	9	15
Operating/Discharge Temperature Limits	0°F to 140°F (-18°C to 60°C)		
Recommended Charging Temperature	14°F to 122°F (-10C to 50°C)		
Recommended Storage Temperature	32°F to 77°F (0°C to 25°C)		
Recommended Storage Voltage	13.6V		
Charging Voltage - Max	14.9V		
Voltage at 100% Charge	14.0V		
Charging Current - Max via POWERLINK™ (A)	3.5A		
Charging Current - Max continuous via terminals (A)	80A	90A	150A
Starting Current - Max (A)	480	540	800
Length - inch (mm)	5.91 (150)	6.89 (175)	6.54 (166)
Width - inch (mm)	3.43 (87)	3.19 (81)	4.92 (125)
Height - inch (mm)	5.71 (145)	6.1 (155)	6.69 (170)
Weight - lb (kg)	4.2 (1.9)	4.6 (2.1)	8.1 (3.7)

Warranty and Warranty Restrictions

Product Registration: Please register your purchase at www.optimabatteries.com, at the “Register Battery” link.

Every OPTIMA® Lithium Battery we make has safeguards. However, please be aware that if you leave the battery in a deeply discharged state for an extended period, the battery could stop working permanently due to over-discharge. Over-discharge is not a defect covered by warranty.

OPTIMA Lithium Technical and Warranty Support

- In the event you need technical or warranty support, please contact OPTIMA Batteries customer service at 1-888-867-8462 between 9 a.m.-5 p.m. (CST) Monday through Friday, or via email at info@optimabatteries.com
- All batteries returned to OPTIMA must first be authorized by OPTIMA and receive a RMA#. Units returned without an RMA# may be misplaced or delayed.

LIMITED WARRANTY - OPTIMA (the “Manufacturer”) warrants this battery (the “product”) for five years from the date of original purchase at retail against defects in material or workmanship that may occur under normal use and care.

If the product is not free from defects in material or workmanship, the Manufacturer’s obligation under

this warranty is solely to repair or replace your product with a new or reconditioned product, at the option of the Manufacturer. It is your obligation to send the product, along with a copy of the original purchase receipt, postage prepaid to the Manufacturer, in order for repair or replacement to occur. Handwritten receipts will not be accepted. This limited warranty is not transferable to subsequent purchasers.

THIS LIMITED WARRANTY IS VOID IF THE PRODUCT OR INCLUDED ACCESSORIES ARE MISUSED, ABUSED, SUBJECTED TO CARELESS HANDLING, OPENED, REPAIRED, ALTERED, MODIFIED, OR IF THIS PRODUCT IS RESOLD THROUGH AN UNAUTHORIZED RETAILER OR THIRD PARTY. LIMITED WARRANTY DOES NOT COVER:

- Changes to internal resistance or capacity due to aging, cycling or normal wear/use
- Batteries used in deep cycling, as a power source of propulsion of electric vehicles (such as electric bikes, go-karts, forklifts, golf carts, ride-on toys), or “total loss” systems
- Incidental or other damage due to defective or inadequate vehicle/system voltage regulation, wiring errors such as arcing, short circuit, etc. or electrical issues caused by the vehicle
- Cosmetic damage
- Connecting more than 2 batteries in parallel, or any series battery connections.
- Damage occurring during shipping or mishandling. Shipping damage is the responsibility of the shipping company and should be addressed through them (UPS, FedEx, etc.)

- Physical damage arising from drop, impact, puncture, cracks or heat/melting from an external heat source
- Exceeding temperature, voltage or current specifications outlined in User Manual
- Corrosion or environmental damage such as exposure to liquids or corrosive environments, fire, chemicals, fuel, salt water, dirt or debris. This includes exposure or damage resulting from improper maintenance or cleaning of the battery.
- Batteries used with a battery charger or charging profile that does not meet specifications outlined in User Manual. Do not use battery chargers, maintainers or charging profiles for lead acid batteries.
- Improper installation such as loose, over-torqued or incorrect terminal connections; improper or inadequate cable gauge; improperly securing the battery; incorrectly installing fitment spacers; exposure to excessive heat or inadequate air flow; improper use or installation via POWERLINK™ plug or connectors.
- Leaving the battery in a deeply discharged state (below 8 volts) for an extended period, resulting in over-discharge.