BLUESHAPE®

Energy inside

PROFESSIONAL BROADCAST

3-STUD CAMERA BATTERIES

GRANITE TWO

All models:

BG090	**BG190HD**
BG100HD	**BG190HD SPLASH**
BG100HD SPLASH	**BG270HD**
BG150	**BG270HD SPLASH**
BG180	

USER MANUAL

Revision 1.0

www.blueshape.net

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LITHIUM-ION BATTERY PACK HANDLING PRECAUTIONS

Danger

1. Do not disassemble or modify the battery pack. The battery pack is equipped with built-in safety/protection features. Should these features be disabled, the battery pack may leak corrosive chemicals, overheat, emit smoke, burst and/or ignite.
2. Do not connect the positive (+) and negative (-) terminals to a metal object such as a wire. Do not transport or store the battery pack together with metal objects such as jewellery, hairpins, etc. In such cases, short- circuiting or over-current flow may occur causing the battery pack to leak, overheat, emit smoke, burst and/or ignite. Metal objects such as wires, jewellery or hairpins may generate heat if they come into contact with the battery.
3. Do not discard the battery pack into fire or heat since this may cause the insulation to melt down and may also damage the gas release vents and other safety features possibly leading to chemical leakage, overheating, smoke emission, bursting and/or ignition.
4. Do not use or leave the battery pack near a heat source such as a fire or a heater (> 80°C) or in a car. If the resin separators should become damaged due to overheating, short-circuiting may occur inside the battery pack, possibly leading to chemical leakage, overheating, smoke emission, bursting and/or ignition of the battery pack.
5. Do not immerse the battery pack in fluids, water or seawater and do not allow it to get wet. Otherwise, the protective features inside the battery may be damaged and abnormal chemical reactions may occur, possibly leading to leakage, overheating, smoke emission, bursting and/or ignition.
6. Do not recharge the battery pack near fire or in extremely hot environments. Otherwise, hot temperatures may trigger its built-in protective features, inhibiting recharging or damaging these built-in protective features, causing it to be charged with an excessive current. As a result, abnormal chemical reactions may occur internally, possibly leading to leakage, overheating, smoke emission, bursting and/or ignition.
7. To recharge the battery pack, use the battery charger specifically designed for the device and observe the recharging conditions specified by the maker of the charger. A recharging operation under non-conforming conditions may cause the battery pack to become overcharged, or charged with an excessive current. Abnormal chemical reactions may occur, possibly leading to electrolyte leakage, overheating, smoke emission, bursting and/or ignition.
8. Do not pierce the battery pack with pointed or other sharp objects. Do not strike it with a hammer, or step on it. Otherwise, the battery pack may become damaged and deformed internal short-circuiting may occur, possibly leading to chemical leakage, overheating, smoke emission, bursting and/or ignition.
9. Do not strike or throw the battery pack. An impact may cause leakage, overheating, smoke emission, bursting and/or ignition. Moreover, if the protective features inside become damaged, the resulting internally generated high current could lead to abnormal chemical reactions, electrolyte leakage, overheating, smoke emission, bursting and/or ignition.
10. Do not use an apparently damaged or deformed battery pack. Otherwise, electrolyte leakage, overheating, smoke emission, bursting and/or ignition of the battery pack may occur.
11. Do not directly solder the battery pack. Otherwise, heat may melt down its insulation, damage its gas release vents or other safety features possibly leading to leakage, overheating, smoke emission, bursting and/or ignition.
12. Do not reverse the positive (+) and negative (-) terminals. Otherwise, during recharging, the battery pack will be reverse-charged, abnormal chemical reactions may occur, or excessively high current may flow during discharging possibly leading to chemical leakage, overheating, smoke emission, bursting and/or ignition.
13. The positive (+) and negative (-) terminals are arranged in a particular orientation. Do not force the connection if you may not easily connect the battery pack terminals to the

battery pack charger or other equipment. Confirm that the terminals are correctly oriented. Reversing the terminals will result in reverse charging, possibly leading to electrolyte leakage, overheating, smoke emission, bursting and/or ignition of the battery pack.

14. Do not use the battery pack for other purposes other than those specified. Otherwise, its guaranteed performance will be lost and/or its service life will be shortened. Depending on the equipment in which the battery pack is used, excessively high current may flow through battery pack, possibly damaging it and leading to electrolyte leakage, overheating, smoke emission, bursting and/or ignition.
15. If the battery pack leaks, and the electrolyte reaches the eyes, do not rub them. Instead, rinse the eyes with clean running water and immediately seek medical attention. Failure to do this may result in eye injury.

Warning

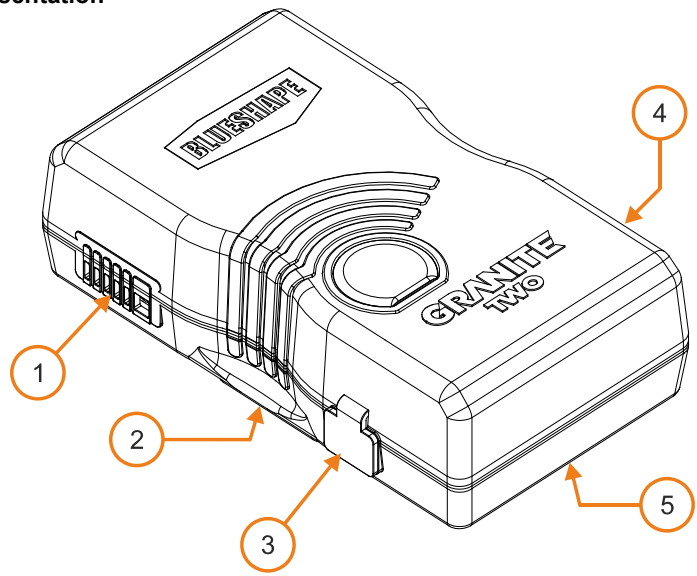
1. If recharging operation fails to complete even when a specified recharging time has elapsed, immediately stop further recharging. Otherwise, electrolyte leakage, overheating, smoke emission, bursting and/or ignition may occur.
2. Do not put the battery pack into a microwave oven or a pressurised container. Rapid heating or punctured sealing may lead to electrolyte leakage, overheating, smoke emission, bursting and/or ignition.
3. If the battery pack leaks or gives off a bad odour, remove it from any exposed flame. Otherwise, the leaking electrolyte may catch fire, and the battery pack may emit smoke, burst or ignite.
4. If the battery pack gives off an odour, generates heat, becomes discoloured or deformed, or in any way appears abnormal during use, recharging or storage, immediately remove it from the equipment or battery pack charger and stop using it. Otherwise, the problematic battery pack may develop electrolyte leakage, overheating, smoke emission, bursting and/or ignition.

Caution

1. Do not use or subject the battery pack to intense sunlight or hot temperatures such as in a car in hot weather. Otherwise, electrolyte leakage, overheating and/or smoke emission may occur. Also, its guaranteed performance will be lost and/or its service life will be shortened.
2. The battery pack incorporates built-in safety devices. Do not use it in a location where static electricity may be present. Otherwise, the safety devices may be damaged, possibly leading to electrolyte leakage, overheating, smoke emission, bursting and/or ignition.
3. The guaranteed recharging temperature range is 0°C to 45°C. A recharging operation outside this temperature range may lead to electrolyte leakage and/or overheating of the battery pack, and may cause damage to it.
4. If electrolyte leaking from the battery pack contacts your skin or clothing, immediately wash it away with running water. Failure to do this may result in skin inflammation.
5. Store the battery pack in a location where children cannot reach it. Also, make sure that a child does not take out the battery pack from the battery pack charger or equipment.
6. If you find discoloration, a bad odour due to leakage, overheating and/or other irregularities when using the battery pack for the first time return it to your supplier or vendor.

GRANITE TWO battery series:

Presentation



This drawing is for reference only. The size of the real battery may vary depending on model. Please see the next table for precise dimensions.

1 5-LED gauge (4x blue+1x RGB) and push button for capacity check and Wi-Fi activation. The RGB LED indicates the Wi-Fi activity status.

2 Contact block

3 D-TAP sockets 14.8V(nominal)/5A with overload protection*[1]

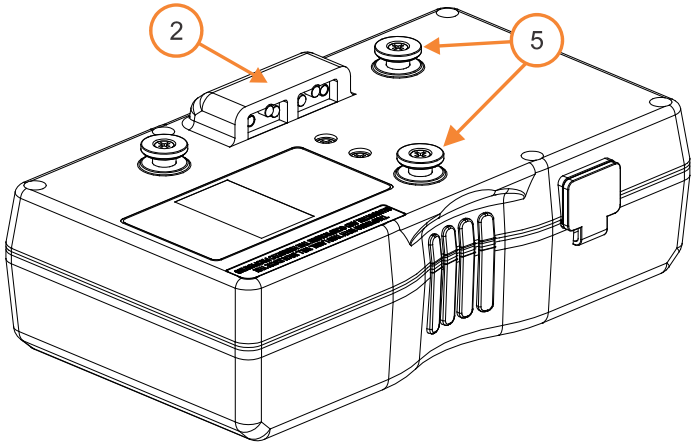
4 D-TAP sockets 14.8V(nominal) without overload protection*[2] can be used as alternative charging socket

5 3-Stud mounting system

*[1]The output from this D-TAP socket should not exceed 70W. Above this value, the D-TAP protection circuit intervenes, disconnecting the output but without effecting the battery operation through the main terminals. The power is automatically resumed by removing the overload condition from the D-TAP. The total output power from the battery terminals and D-TAPs should never exceed the nominal power of the model in use. Above this value, the battery may go into main protection but will again resume operation a few seconds after the overload condition has been removed.

*[2]This D-TAP socket is not independently overload protected meaning that an excessive current or a short circuit will trip temporarily the battery

protections. This socket can be used as alternative battery charge input by means of dedicated D-TAP chargers.



Specifications

The GRANITE TWO series of 3-Stud batteries consists of 9 models:

- 3 standard models for normal-medium load
- 3 HD models for high-demanding applications
- 3 HD models IP65 rated for outdoor usage

Parameter	BG090two	BG100HDtwo	BG100Hdtwo SPLASH	BG150two	BG180two
Nominal Voltage	14.8V	14.4V	14.4V	14.8V	14.8V
Operating voltage range	10.8~16.8V	10.8~16.8V	10.8~16.8V	10.8~16.8V	10.8~16.8V
Nominal Capacity	6.2Ah	6.2Ah	6.2Ah	10Ah	12Ah
Nominal Energy	90Wh	94Wh	94Wh	150Wh	180Wh
Max Continuous Discharge	7A	12A	12A	9A	9A
Max D-TAP combined output	5A	5A	5A	5A	5A
Operating Temp.	-20° ~ +60°C	-20° ~ +60°C	-20° ~ +60°C	-20° ~ +60°C	-20° ~ +60°C
IP rating	IP54	IP54	IP65	IP54	IP54
Wi-Fi module	Wi-Fi 2.4 GHz - 802.11 b/g/n				
Dimensions (L x W x H) mm (L x W x H) in	171x95x37 6.73x3.74x1.45	171x95x53 6.73x3.74x2.08	171x95x53 6.73x3.74x2.08	171x95x53 6.73x3.74x2.08	171x95x53 6.73x3.74x2.08
Weight (net)	770g (1.68lbs)	1.03Kg(2.27lbs)	1.03Kg(2.27lbs)	1.19Kg(2.62lbs)	1.19Kg(2.62lbs)

Parameter	BG190HDtwo	BG190Hdtwo SPLASH	BG270HDtwo	BG270HDtwo SPLASH
Nominal Voltage	14.4V	14.4V	14.4V	14.4V
Operating voltage range	10.8~16.8V	10.8~16.8V	10.8~16.8V	10.8~16.8V
Nominal Capacity	13.2Ah	13.2Ah	18Ah	18Ah
Nominal Energy	190Wh	190Wh	270Wh	266Wh
Max Continuous Discharge	12A	12A	12A	12A
Max D-TAP combined output	5A	5A	5A	5A
Operating Temp.	-20° ~ +60°C	-20° ~ +60°C	-20° ~ +60°C	-20° ~ +60°C
Wi-Fi module	Wi-Fi 2.4 GHz - 802.11 b/g/n			
IP rating	IP54	IP65	IP54	IP65
Dimensions (L x W x H) mm (L x W x H) in	171x95x69 6.73x3.74x2.71	171x95x69 6.73x3.74x2.71	171x95x69 6.73x3.74x2.71	171x95x69 6.73x3.74x2.71
Weight (net)	1.62Kg(3.57lbs)	1.62Kg(3.57lbs)	1.62Kg(3.57lbs)	1.62Kg(3.57lbs)

Introduction

BLUESHAPE professional broadcast batteries use multiple lithium ion rechargeable battery cells. These batteries are designed for use with cameras and apparatus equipped with the 3-Stud mount.

Battery Features

- Robust thick-walled housing made of special plastic resin for superior impact resistance. The battery can withstand several drops from altitudes of up to 2 metres without breaking or suffering internal damage.
- Water and dust ingress resistant construction (IP54 and IP65 for the SPLASH models) for safe use, even in difficult environments.
- Compact size and lightweight. The external dimensions of the battery have been optimised for maximum capacity in the space available.
- Only the best available components are used in the battery construction for ensured longevity.
- Sophisticated factory programmed on-board electronics provide the operator with full safety protection together with premium performance and reliability.
- Advanced interior design permits easy servicing and restoration by qualified BLUESHAPE service personnel.
- Dual D-TAP outputs, one overload-protected, one permitting charge. A generous 70W can be tapped from the protected output. The D-tap overload circuit runs independently from the main battery overload protection.
- A 5-step LED indicator provides accurate remaining capacity monitoring. Each LED accounts for 20% of state-of-charge; when the capacity falls below 10%, the lower (first) LED blinks.
- No memory effect - batteries can be recharged at any time.

- The battery's energy is conserved during operation, stand-by and low capacity states through intelligent power mode management. When the pack capacity is very low, it enters automatically into “shutdown mode” to minimise further capacity losses and prolong cell life. The LED indicator is permanently off and the pack can only be re-activated by charging.
- Wi-Fi enabled: this new, advanced BLUESHAPE technology permits users and rental houses to be in command of their battery fleet through a free App available for iOS and Android, called “GRANITE Link”

The battery will shut down if the maximum specification discharge current for the model in use is exceeded. It will reset approximately 30 seconds after the excessive load has been removed. The battery will also shut down when fully discharged but will reactivate upon charging. Pre-Charge is enabled on all batteries to limit the charging current and gently charge low voltage cells.

Further precautions

- Please consult your vendor before use, to ensure compatibility with your equipment. Although the battery has been designed for use with most standard 3-Stud enabled equipment, there may be instances when the battery may not be compatible.
- Never attempt to open or dismantle the battery
- Opening the battery during warranty will automatically invalidate the guarantee
- Do not short circuit the battery even though it is short circuit protected
- Do not use the battery in extreme temperature environments
- Keep the battery away from fire to avoid explosion

Charging

The battery can be charged using original or BLUESHAPE 3-Stud chargers. Consult your vendor if you intend to charge the battery using third-party chargers.
Since the battery is normally shipped in ultra-low power consumption mode, IT NEEDS TO BE CHARGED BEFORE FIRST USE.

This series of 3-Stud mount batteries feature a digital communication with the chargers. When the battery is installed on chargers, it is important that the internal electronic is active and running for the battery to be detected correctly and the charge session to start. In the event that the charger remains in the “Evaluate” state, push the LEDs button once, to activate the battery communication circuitry.

The battery may become hot during charging. This is normal. Consult your vendor if during charging, the battery becomes excessively hot or stops charging. Charging is only allowed at temperatures between 0°C

and 45°C. While charging, the LED indicator lights up automatically to show the battery capacity as it increases.

Performance

- The battery will give full capacity performance only if it has been fully charged before use.
- The battery will self-discharge to some extent over time due to internal electronic consumption. Recharging will restore this lost capacity.
- It is recommended to charge the battery after each use, and before an expected prolonged shelf period.
- Performance degradation may be observed in very cold or very hot environments.
- Performance decreases as the battery ages or if it has a high cycle count or if it is not stored at the recommended temperature. When the performance noticeably decreases, the battery should be renewed.

Storage

The battery should be stored in a dry place at normal temperatures, ideally below 25°C and not above 60°C (recommended 0°C to 20°C)
The battery is shipped in ultra-low power consumption mode and in this state can withstand long period of storage. However, after the battery has been reactivated with the first charge, more attention and care need to be used:

- It is recommended to charge the battery after each use.
- If the battery is not going to be used for a prolonged period of time, it is advisable to recharge the battery so as not to store it in a very low state of charge. Remember that there will always be some internal power consumption.
- It is advisable to check the state of charge every 6 months and if possible to exercise the battery regularly.

Battery Wi-Fi transmission

All GRANITE TWO batteries have an embedded Wi-Fi module that is the core of the GRANITE Link architecture. This module is normally off by default.
To switch it on, press the LED button for at least 5 sec until the topmost RGB LED lights up and starts a blinking sequence till the module is on, after which the LED blinks every ~2sec.

How to switch it on

- Press and hold the LED button for at least 5 sec, until the topmost RGB LED lights up and starts a blinking sequence till the module is on, after which the LED blinks every ~2 sec.
- (exception): If the battery voltage is below 12000mV while booting up, the LED blinks green-red for 5 seconds and then turns off indicating that the system cannot operate due to the low voltage. Wait for the battery to rise above this threshold before powering the module again.

How to switch it off

Different methods are available:

- Press and hold the LED push button for at least 5 sec, when a red LED lights up and initiates a blinking sequence lasting about 5 sec, after which the system is off.
- If the battery is not connected to the GRANITE Link App for more than the hours indicated by the Off-Timer set in the battery by the user through the App (default: 8hours), it switches off automatically without user intervention to conserve power.
- If the battery voltage drops below 12000mV for a time longer than 5 minutes, it switches off automatically without user intervention to conserve power.

Please note that the status of the Wi-Fi embedded module does not alter the operation of the battery pack: it may be turned on or off as desired without any consequence to the battery performance.
Once the system is on, GRANITE TWO batteries operate in two modes concurrently, Access-Point and Client.

Access Point Mode

By default, the battery is an access point and generates its unique network whose SSID is the model name followed by the serial number. The devices (smartphone, tablet, PC) would have to connect directly to this network generated by the battery in order to communicate. Up to 4 devices can be connected at the same time and each one can monitor the battery status. The standard password to connect to the battery network is “blueshape00”.

This mode offers the simpler “out of the box” connectivity, but on the other hand limits the battery monitoring to one pack at a time: to monitor

another battery the user has to manually connect to the desired network every time.

Client Mode

The battery automatically becomes a 'client' of a network called "BLUESHAPE Granite Link", if this exists. This network is generated, for instance, by our portable GRANITE Link Wi-Fi router - a solution that offers convenient connectivity on the field. More batteries can be on this same network at the same time and within this mode, the same device (a smartphone, tablet, PC) also connected to the same network can monitor several batteries.

The battery has the ability to be connected to any other 2.4Ghz 802.11 b/g/n network, and to do so the user has to instruct the battery through the GRANITE Link App. Once the battery is connected to a new network and has acquired an IP, this network becomes a preferred one and the pack will attempt to connect to it every time on start-up. If not available the battery will try to connect to any other preferred networks it has already connected to, if these exists.

"BLUESHAPE Granite Link" has the topmost priority among the preferred networks: if it exists, the battery connects automatically.

A battery is in Client Mode when:

- There is a portable access point (GRANITE Link Wi-Fi router), or
- There is a third party network (conventional Access point like for example, a camera equipped with Wi-Fi connectivity) and the battery has therefore been instructed to connect with this preferred network.

Operation

When the Wi-Fi module is on, the battery automatically sends out continuously data packets to any client connect to its network (AP mode) and any other clients of the same subnet (Client Mode), so that any device connected is updated with the same info.

The data broadcasted contains information such as:

- Voltage
- Current
- State of charge
- Capacity
- Residual runtime to empty (or to full, if in charge)
- Cycle life
- Wi-Fi signal strength
- Other status information, including the rental timers

At the same time, the battery listens and waits for specific commands that are available to engage other actions, such as:

- "findme", to have the 5th topmost RGB LED to blink red-green for some seconds
- Set a personal password in a battery, so that only the owner can lock and unlock it (lock means the battery cannot release any power, while it can be normally charged)

- Lock/unlock the battery: note that when the battery is unlocked (default) it blinks green, while when locked it blinks red.
- Connect to another Wi-Fi network. All networks that are requested to connect to, will populate the list of the preferred networks that the battery searches at startup.
- Change the battery nickname shown, to simplify the display of the list of batteries in the field
- Upload a newer firmware to the Wi-Fi module, when available
- Define the rental counters

This activity is shown by the topmost blinking LED:
- if the LED is green, the battery is unlocked and can discharge (default mode)
- it the LED is red, the battery is locked and cannot discharge, meaning that the user has protected it or that a rental timer is expired.

Rental Mode management
The GRANITE Link system allows rental houses to pre-program timers in each battery, so that when at least one of them expires, the battery stops releasing power while remaining chargeable.
Two timers are available and can be set individually or both:
- Rental timer: number of rental days, not depending on the usage of the battery. The battery starts counting immediately when the timer is set and when the counters expire it stops.
- Rental usage timer: amount of pre-programmed working hours. The battery counts only when the battery is releasing power, and not in stand-by or charge. When the counters expire it stops.

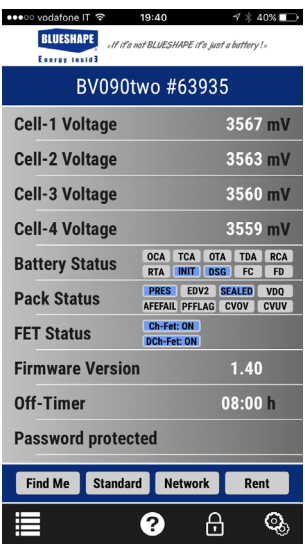
These timers, once generated and sent to the battery are protected and cannot be halted even if the module is switched off. They can eventually be extended (even remotely through the App), if a customer needs to.
These timers are amongst the information broadcasted by the battery and so the user is always notified.

Rental houses can manage this system through a web-based application where they can subscribe for free. The web-application generates the special action codes to set or extend timers on each different battery.
Individually, action codes must be generated and programmed in each battery. The web application helps in this task, also allowing to send the codes generated to customers by SMS,so that they can copy and upload to batteries through their smartphone and/or tablet.

For faster operation with a large fleet of batteries, we offer GRANITE Link Web Hub, a smart device that connects as a client to the local network and acts as a gateway to all the GRANITE TWO batteries in proximity, allowing faster and massive operations through the web App.

BLUESHAPE Granite Link App

In order to allow users to watch battery live data in real time and interact with them as described, we have designed an App, available for iOS and Android. The App can be downloaded for free from the relative stores, and is available for both smartphones and tablets.
Here below, are some screenshots for reference.



RECYCLE

This GRANITE TWO battery can be recycled. Different countries have different regulations on recycling. Please consult the responsible authority in your country or your BLUESHAPE dealer for further information.

AIR TRANSPORT (IATA regulations)

All BLUESHAPE batteries meet the standard of the UN Manual of Tests and Criteria, and therefore can be transported by air. Li-Ion batteries can be transported by air only in carry-on baggage, either stand-alone (UN3480) or packed with equipment (UN3481). For check-in of Li-Ion batteries to be allowed, it is advisable to pack them in their original boxes using the contact protectors provided for additional safety.

Li-Ion batteries less than 100Wh can only be transported by air in carry-on baggage and in reasonable (though unlimited) quantities, either stand-alone (UN3480) or packed with equipment (UN3481).
The BG090 and BG00HD and SPLASH model fall under this category.

For Li-Ion batteries that have capacities between 100Wh, and 160Wh, users can carry 2 units only and in their hand luggage.
The BG150 model falls under this category.

Models larger than 160Wh have to be presented and can only be carried as cargo in accordance with IATA dangerous goods requirements. This applies to batteries on board equipment and also spare batteries. The battery terminals should be protected from short circuit, preferably by enclosing the battery in its original packing box and plastic bag and using the contact protectors, if provided.
The BG180, BG190HD, BG190HD SPLASH, BG270HD and BG270HD SPLASH fall under this category.
It is suggested to check with your airline in case the latter applies different policies or if there exists, different legislation in your country.

IATA approved Battery flight cases

It is strongly suggested to make use of the BX4 and BX5, IATA approved cases for transporting batteries on aircraft.

BX4

BX5

BLUESHAPE offers an innovative solution for greater convenience and safety when travelling or shipping lithium-ion batteries greater than 100Wh by air. Current IATA regulations for passengers limit batteries to 2 between 100-160Wh and any reasonable number below 100Wh. Any larger batteries or a higher quantity must be shipped with special packaging and markings and under many circumstances cannot be shipped on passenger aircraft.

IATA Regulation, Packing Instructions 965 Section 1A, states that only cargo flight can accept packages containing Li-ion batteries approved under UN3480 designation. Nowadays this is the only possible way to ship batteries larger than 100Wh by air.

The stringent shipping procedures impose the usage of special UN approved packaging.
BLUESHAPE in co-operation with a leading manufacturer of professional cases, has created a dedicated solution for the BLUESHAPE GRANITE TWO series models.
These cases have been certified in accordance with UN regulations and have a unique homologation number from an international body, thus guaranteeing the user, more peace of mind for transporting batteries by air.
The BX4 and BX5 cases have an impact-resistant outer case. The interior has high-density cushioning foam to eliminate and chance of interior contact. Each battery is segregated in individual compartments. When a BLUESHAPE battery is shipped in this case with the provided contact covers in place, the chance of damage during flight is reduced to zero. The number of batteries allowed in each case is specifically calculated to comply with the UN3480 regulations.

Please refer to our website for further details.

Warranty

BLUESHAPE batteries are warranted to be free from defects in materials, workmanship and functionality for a period of 18 months commencing from the date of purchase. This warranty shall not apply to any products or parts there-of, that have been subjected to misuse, negligence, accidental or abnormal conditions of operation.
The buyer should always contact the place of purchase for any return of defective product. It is important that the buyer provides us with as much information as possible about the failure being claimed.
In the event of product failure for which warranty applies, we will repair or replace the product free of charge. In these cases, all expenses including transport charges will be borne by us.
In the case where the failure has been caused by one of the causes explained above, repairs shall be billed at a nominal cost. Prior to the carrying out of any repairs, we will inform the customer of the estimated costs of these repairs.
These warranty conditions are the only ones applicable to our products and overrule any other expressed or implied warranties. We shall not be held liable for any damages resulting from warranty statements other than those contained in this declaration.
This warranty is not transferable and is only applicable to the original buyer. In all warranty claims, the buyer must reproduce the original purchase invoice.

BLUESHAPE®
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