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FIRST USE OF YOUR NEW OPTIPOWER LITHIUM CELLS

GUIDANCE DOCUMENT

1. Cells upon receipt

a. On receipt of your new OPTIPOWER lithium cells you must inspect for any physical damage that may have been caused during transport. Check for any impact or impingement into the cells, that the wires and connectors are not detached and that there is no 'pear drop' odour.
b. The newly delivered OPTIPOWER lithium cells will are with no main connections only tinned power delivery cables. Your choice of connection type will need to be soldered on. The balance leads will be in place with a JST-XH connector.
c. When you solder the connector of choice on make sure:-
    i. You use a suitably hot soldering iron.
    ii. You do not overheat the cables such that damage can be caused at the lithium tabs.
    iii. That you DO NOT short the black to red cables as this could cause a fire.
    iv. That you use the correct convention with respect to positive and negative connections so inadvertent polarity connection cannot occur.

2. Voltage of cells upon receipt

a. The newly delivered OPTIPOWER lithium cells should be delivered in a storage charge state this is around 3.8v per cell and 43% capacity.
b. Each cell in the pack should be at this state of charge if it is not please call our support line for advice +44 (0)1484 843708.

3. Charging cells for the first time

a. The newly delivered cells will require connections adding to allow them to be charged.
b. Always charge using a 'balance' charger of good quality such as a CellPro Power Lab 6 or 8.
c. Never charge a lithium cell unattended.
d. If the charger has a 'cycle' function cycle the lithium cell three times at 1C charge, 1C = 5Amps for 5000mAh cell.
e. The cells need to be 'formed or run in' prior to use.

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4. **Use of lithium cells for the first time**
    a. It is good practice to 'run in' or 'form' lithium cells and this is done by careful first use of the cells. On the first flight only discharge the lithium pack to 50% of its full capacity. On second use 45% and consequent uses reduce by 5% until 20% is achieved at this point the lithium pack is considered as 'formed' or 'run in'.
    b. If at any point during this process the packs become very hot or puffy cease using it and call for advice.

5. **Proper use and maintenance of lithium packs**

    a. Lithium packs degrade with use but properly handled are safe and will last for up to 400 cycle's dependant on type of application. There are rules which will help to extend the life of your new OPTIPOWER lithium packs.
        i. Always 'form or run in' your packs before first use.
        ii. Never charge on an inappropriate charger.
        iii. Never charge at more than 3C and wherever possible charge at 1C.
        iv. Always balance charge
        v. Never over discharge your packs.
        vi. Never drive the pack capacity to less than 10%
        vii. Keep an eye on the IR (internal resistance) if your charger has that capability as this is an early indication of pack problems particularly if one cell has a very high IR relative to the other cells in the pack.
        viii. Never use your lithium packs if the ambient conditions are less 5 degrees C without warming the packs first. Lithium chemistry is not good when cold and this will badly stress the packs or even destroy them.
        ix. Never use in an application where the C rating is inappropriate for the use as this will stress the pack and damage it.
        x. Always leave your lithium packs at storage charge after use this is 3.83v/cell and around 43% capacity.
        xi. Never leave your lithium packs fully charged as this will lead to pack degradation and severely reduce the cycle life.
        xii. After use allow the pack to cool to ambient temperature before it is recharged.
        xiii. Never use lithium cells in ambient conditions that exceed 45 degrees C.

6. **General Safety Issues**

    a. Lithium packs must be used with caution as they store a large amount of energy and if abused can catch fire. If you see any signs of localised heating, swelling on use, hot spots, cable heating that is

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inconsistent with normal use please cease to use the cell and seek advice.

b. Never use a cell if it has any signs of damage.
c. Never connect with reversed polarity.
d. Always make sure the pack is secure in the machine in which it is being used.
e. Always check the pack is fully charged prior to use.
f. Never leave a pack in a charged condition.
g. Never charge a pack whilst it is hot leave until it achieves ambient temperature before recharging.
h. Lithium operating conditions are:-

i.	Charging	Min Temp	0 degrees C (32F)
ii.	Charging	Max Temp	45 degrees C (113F)
iii.	Discharging	Min Temp	0 degrees C (32F)
iv.	Discharging	Max Temp	60 degrees C (140F)
v.	Never exceed temperature of pack		71 degrees C (160F)

i. Have a fire extinguisher to hand.

Lithium Fires

Lithium fires must be tackled with a specialist lithium extinguisher only, commonly sold as a L2 extinguisher. A sodium chloride extinguisher is not suitable for use on a lithium fire.

If you have any questions please call our support line +44 (0)1484 843708

LITHIUM PACKS ARE A FIRE RISK IF NOT USED CORRECTLY.

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