


**LIPO CAR/FLIGHT POWERPACKS**
**25C LITHIUMPOLYMER POWER:  
HIGH CAPACITY / HIGH POWER**

# USER GUIDE

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## 1. CONNECTION

All LRP VTEC LiPo-batteries come with properly sized power-wires incl. plugs. The special Competition Car Line Hardcase packs already have 4mm gold plug socket built into the battery pack. These power connections have to be used for standard charging and for all applications in the model/device. Be sure to always take care of the wire colors and the right polarity of the battery as a wrong connection will damage your battery and your speedo. While soldering, take care that you don't do any short circuits and that all wires are well insulated.

**NOTE:** Only use a reverse polarity protected plug system for the power-wires!

Additionally to the power connections, all LRP VTEC LiPo-batteries are equipped with a so-called EHR-Balancing-port. This EHR-Balancing-port can be used to condition and equalize the individual cells inside a battery pack. The Competition Car Line Hardcase packs use a 2mm gold plug socket, which acts as a cell connection between the two cells in the pack. Special balancers or certain chargers use this balancing port to perfectly condition and equalize the individual cells inside the pack. Please check the user manual of the balancer/charger in order to know how the battery needs to be hooked up.

**NOTE:** The Balancing-port shall not be used for the standard use in the model/device. Only use the power-wires incl. plugs to power your model/device.

For perfect conditioning of your LRP VTEC LiPo-batteries, we recommend the use of our LRP LiPo Parallel Precision Balancer (No. 45200). For best possible performance and safety, always use this balancer when charging your LiPo battery. We recommend the use of the LRP LiPo Hardcase balancing wire (No. 65832) when you are using a LRP Competition Car Line battery. The balancing wire allows to plug in the balancer directly without the need of additional soldering work.

### BALANCING-PORT PIN ASSIGNMENT:

Balancing-port 3-pole (7.4V packs)	
Black (Battery-Negative)	Cell 1-
Brown (cell connection)	Cell 1+ (Cell 2-)
Red (Battery-Positive)	Cell 2+

Balancing-port 4-pole (11.1V packs)	
Black (Battery-Negative)	Cell 1-
Brown (cell connection 1)	Cell 1+ (Cell 2-)
Blue (cell connection 2)	Cell 2+ (Cell 3-)
Red (Battery-Positive)	Cell 3+

Balancing-port 5-pole (14.8V packs)	
Black (Battery-Negative)	Cell 1-
Brown (cell connection 1)	Cell 1+ (Cell 2-)
Blue (cell connection 2)	Cell 2+ (Cell 3-)
Green (cell connection 3)	Cell 3+ (Cell 4-)
Red (Battery-Positive)	Cell 4+

Balancing-port „Competition Car Line“ (7.4V packs)	
4mm gold plug socket (battery -)	Cell 1-
2mm gold plug socket (cell conn.)	Cell 1+ (Cell 2-)
4mm gold plug socket (battery +)	Cell 2+

Power-wires incl. plugs	
Red	Battery-Positive +
Black	Battery-Negative -

e.g. balancing-port 3-pole



e.g. balancing-port 4-pole



## 2. CHARGING

All LRP VTEC LiPo-batteries can be charged with a maximum current of 1C\*. For charging, only use chargers, which are specially designed and developed for LiPo-batteries. These chargers charge the battery with the max. current till the battery reaches the max. charging voltage. The charger then reduces the charging current until the battery is fully charged. This charging method is called CC/CV (Constant Current/Constant Voltage).

**ATTENTION:** Under no circumstances use NiMH/NiCd-chargers for charging LiPo-batteries! These chargers do not reduce the charging current and therefore ultimately lead to overcharging the battery!

LRP VTEC LiPo-batteries do not heat up during charging. It is normal, that the battery still has ambient temperature when it is fully charged. If the battery heats up during charging or warps, immediately stop charging it. A Balancer which monitors the voltage of each single cell is mandatory during the charge of LiPo batteries.

**ATTENTION:** Never charge your LiPo battery without a balancer directly connected to the balancing port of your battery, unless your charger is already equipped with a balancer.

The maximum charging voltage for each single LiPo-cell is 4.20V. If the battery reaches this voltage, the charge current has to be lowered. This is automatically done by the charger. If the charge current reaches 0.05 - 0.1C\*, the battery is fully charged. All LRP VTEC LiPo-batteries consist of multiple LiPo-cells. You can see the max. charging voltage in the table below. We advise the following settings for charging our LRP VTEC LiPo-batteries:

Cell configuration	max. charge current	max. charging voltage
LRP VTEC LiPo - 7.4V - 2S (all types)	1C*	8.40V
LRP VTEC LiPo - 11.1V - 3S (all types)	1C*	12.60V
LRP VTEC LiPo - 14.8V - 4S (all types)	1C*	16.80V

\* C = Nominal capacity of the battery. E.g. with a nominal capacity of 2300mAh (2.3Ah), the battery can be charged with a max. current of 2.3A.

**PLEASE NOTE:** You can use your LRP VTEC LiPo-battery several times a day. However be sure, that the battery has completely cooled down to ambient temperature, before re-charging it again.

LRP VTEC LiPo-batteries do not have a memory effect and only a very low self-discharge rate. Therefore you can also charge batteries with a partial charge in them, without the need of discharging the pack before. Partially charged packs can be stored over a long period of time, without getting damaged. Please also see the „Storage“ section for further reference.

Dear Customer,

thank you for your trust in this LRP product. By purchasing a LRP VTEC Lithium-Polymer Ultra Performance 25C battery, you have chosen a high-performance LiPo-battery for your RC model.

LiPo-batteries need special treatment and care. Please read the following instructions carefully before you start using your LRP VTEC LiPo-battery for the first time and to ensure that your LRP VTEC LiPo-battery always works up to your full satisfaction. This user guide contains important notes for the installation, the safety, the use and the maintenance of this product. Thus protecting yourself and avoid damages of the product.

Proceed according to the user guide in order to understand your LRP VTEC LiPo-battery better. Please take your time as you will have much more joy with your LRP VTEC LiPo-battery if you know it exactly.

This user manual shall be kept in a safe place. If another customer is using this product, this manual has to be handed out together with it.

## 3. DISCHARGING

All LRP VTEC LiPo-batteries are capable of a maximum peak discharge current of 25C. The continuous discharge current for all LRP VTEC LiPo-batteries is 15C. The continuous discharge current for the RX-/TX-only types is 3C.

**PLEASE NOTE:** Always take care that the battery gets enough cooling when discharging it with high discharge currents.

You have to take care, that the batteries do not get deep discharged. As soon as the battery voltage falls below 3.00V per single cell, the battery pack gets damaged irrevocably.

With 2S packs, the discharge cut-off voltage under load is 6.0V, with 3S packs it is 9.0V and with 4S packs the discharge cut-off voltage under load is 12.0V. The battery voltage should never fall below these discharge cut-off voltages.

If your speed control does not have a special undervoltage protection for LiPo-batteries, you have to stop your model early enough in order not to deep discharge the battery pack. Therefore stop immediately as soon as you feel a rapid loss in power.

**IMPORTANT:** The max. temperature of the LiPo-battery during discharge must never exceed 65°C (150°F).

## 4. SPECIAL NOTES FOR HANDLING

- Avoid short-circuits! Short-circuiting the battery results in very high currents, which damage the internal structure of a LiPo-battery. This leads to a loss of power and capacity.
- Never charge LiPo batteries without a balancer. Charging without a balancer can damage the battery. Please note, that your limited warranty will void if you charge without balancer.
- Be sure, not to damage the outside of the LiPo-battery. The battery inside the hardcase is only protected by a heatsink. The actual Lipo-cell is directly under this heatsink. If the outer skin of the cell gets damaged, the battery can no longer be used. Therefore take special care, that no sharp objects like knives, tools, carbon fibre edges or similar items can damage the hardcase and/or the cells within it.
- When securing the LiPo-battery inside your model/device, you have to take care that the LiPo-battery does not get damaged or warped in case of a crash. LiPo-batteries with a hardcase are less mechanical resistant than NiMH-batteries in a metal can. Therefore pay special attention that the LiPo-battery does not get damaged or warped by letting it fall down, hitting it, bending it or by similar actions.
- If you want to change the plug system of your LiPo-battery, take care that you only attach the new plugs to the power-wires directly. Under no circumstances your allowed to solder directly on the tabs of the LiPo-cells. Please note, that there's the possibility to void your limited warranty when using a non reverse polarity protected plug system.
- Never charge several LiPo-battery packs at once with one charger. The different capacities and charge levels can lead to serious overcharging of the battery, even if you are using a charger with LiPo capabilities.
- Damaged packs cannot be used any longer. If the packs show signs of damage, are bent or similar, do not use the packs anymore.
- The chemical reaction during charging and discharging a LiPo-battery is not fully reversible. Due to that, LiPo-batteries loose capacity during their life-span. This is normal and not a manufacturing nor production fault.

**DISPOSAL NOTE:** Damaged packs or packs, which can no longer be used are hazardous waste and have to be disposed accordingly. Do not dispose the batteries in your household waste. Completely discharge the batteries and hand them over to a designated collection point.

## 5. STORAGE

LRP VTEC LiPo-batteries do not have a memory effect and only a very low self-discharge rate. Therefore these batteries can be stored over a longer period of time without special treatment. You only have to take care, that the batteries do not get stored completely empty.

For a storage over a longer period of time, we recommend to charge the battery up to 50% of the nominal capacity. Therefore fully discharge the battery pack and then partially charge it with a charge current of 1C for 30 minutes. In this condition, the battery can be stored at least half a year at 25°C room temperature without the need of recharging it.

For a storage over a short period of time, you also have to pay attention, that the battery is partially charged. Never store the battery completely empty.

Even if you are using your battery regularly every week, always pay attention that the battery is partially charged with at least 30% of the nominal capacity during storage. A partial charge with 1C charge current for 20 minutes is sufficient in this case, if the battery was completely empty before.

If you pay attention to the above mentioned notes, you can enjoy your LRP VTEC LiPo-battery for a very long time.

## 6. INTERESTING FACTS ABOUT LIPO BATTERIES

- LiPo batteries shall only be charged at a temperature between 0-45°C. If this will not be observed, the cycle life of the battery will be reduced drastically.
- The single cell open voltage of a fully charged LiPo battery is 4.2V. The single cell open voltage of a 50% partial charged LiPo battery is approx. 3.85V. The single cell open voltage of an empty LiPo battery is approx. 3.3V.
- A voltage below 3.3V per cell without load is in either case harmful for a LiPo battery. Therefore always avoid voltages below 3.3V per cell.
- It is not visible from the outside when a LiPo battery gets overcharged. The only way to find this out is to measure the voltage of the LiPo battery. The battery does not heat up nor does it swell when it gets overcharged. Therefore always check the battery voltage during charging. If it exceeds the max. charging voltage stop the charging process immediately and check all settings.
- We recommend to stop discharging a LiPo battery if the remaining capacity reaches 30% of the nominal capacity. With this, LiPo batteries will have the max. possible cycle life. Real-Life application showed, that the cycle life of LiPo batteries is reduced if the battery always gets completely discharged. This phenomenon can be seen with all types of LiPo batteries.

## 7. USE OF RX-ONLY PACKS

Due to the nominal voltage of 7.4V of all RX-only packs, these battery packs cannot be connected directly to the receiver. Standard receivers and servos work with a voltage of 6V and therefore will not work properly or get damaged.

You need our LRP LiPo RX Regulator 6V/5A (No. 45000) or our LRP Heavy-Duty BEC 6V/10A (No. 45010) to connect a RX-only pack to your receiver. These regulators reduce the voltage to a safe level of 6V and will be connected directly between the LRP VTEC LiPo RX-only battery and the receiver. Please see the instruction manual of the regulators for further reference.

## REPAIR PROCEDURES / LIMITED WARRANTY

All products from LRP electronic GmbH (hereinafter called "LRP") are manufactured according to the highest quality standards. LRP guarantees this product to be free from defects in materials or workmanship for 90 days (non-european countris only) from the original date of purchase verified by sales receipt. This limited warranty doesn't cover defects, which are a result of misuse, improper maintenance, outside interference or mechanical damage. This especially applies on already used batteries or batteries, which show signs of heavy usage. Damages or output losses due to improper handling and/or overload are not a product fault. Signs of wear (loss of capacity) after intensive usage are also no product fault. The following points do also result in a service fee:

- Original power plugs replaced with a NON reverse polarity protected power plug system.
- Use of a non reverse polarity protected power plug system.
- Send in the battery without power plugs.
- Removed or damaged original heatshrink.

To eliminate all other possibilities or improper handling, first check all other components in your model and the trouble shooting guide, if available, before you send in this product for repair. If products are sent in for repair, which do operate perfectly, we have to charge a service fee according to our pricelist.

If LRP no longer manufactures a returned defective product and we are unable to service it, we shall provide you with a product that has at least the same value from one of the successor series.

The specifications like weight, size and others should be seen as guide values. Due to ongoing technical improvements, which are done in the interest of the product, LRP does not take any responsibility for the accuracy of these specs.

With LRP 25-Years Warranty products, the warranty terms on the LRP 25-Years Warranty card do also apply. The legal warranty claims, which arose originally when the product was purchased, shall remain unaffected.

### LRP-DISTRIBUTOR-SERVICE:

- Package your product carefully and include sales receipt and detailed description of malfunction.
- Send parcel to your national LRP distributor.
- Distributor repairs or exchanges the product.
- Shipment back to you usually by COD (cash on delivery), but this is subject to your national LRP distributor's general policy.