

**LIPO EXPERT
AIRPLANE
LINE**

LRP

**HIGH-PERFORMANCE
AIRPLANE
POWERPACKS**

**3C CHARGE
CURRENT**

VTEC

**35C CONSTANT
DISCHARGE**

USER MANUAL



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1. CONNECTIONS

All LRP VTEC Expert Airplane Line 35C LiPo batteries come with properly sized power-wires without plugs. 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! These power-wires have to be used for standard charging and for all applications in the model/device.

Additionally to the power-wires, all LRP VTEC Expert Airplane Line 35C 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 LRP VTEC Expert Airplane Line 35C LiPo battery 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 to power your model/device.

Balancing-port 3-pole (2S - 7.4V packs)

Black (Battery-Negative) = Cell 1-
Brown (cell connection) = Cell 1+ (Cell 2-)
Red (Battery-Positive) = Cell 2+

Balancing-port 4-pole (3S - 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 (4S - 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+

Power-wires

Red = Battery-Positive +
Black = Battery-Negative -

Dear Customer,

thank you for your trust in this LRP product. By purchasing a LRP VTEC Expert Airplane Line 35C LiPo battery, you have chosen a high-performance battery for your RC model. Please read the following instructions to ensure, that your LRP VTEC Expert Airplane Line 35C LiPo always works up to your full satisfaction.

LiPo-batteries need special treatment and care. Please read the following instructions carefully before you start using your LRP VTEC Expert Airplane Line 35C LiPo battery. 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 Expert Airplane Line 35C LiPo battery better. Please take your time as you will have much more joy with your product 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.

2. CHARGING

Due to new and special manufacturing technologies, all LRP VTEC Expert Airplane Line 35C LiPo batteries can be charged with a maximum current of 3C*. 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 Expert Airplane Line 35C 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 Expert Airplane Line 35C 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 Expert Airplane Line 35C LiPo batteries:

Cell configuration	max. charge current	max. charging voltage
LRP VTEC Expert Airplane Line Lipo - 35C - 2S - 7.4V	3C*	8.40V
LRP VTEC Expert Airplane Line Lipo - 35C - 3S - 11.1V	3C*	12.60V
LRP VTEC Expert Airplane Line Lipo - 35C - 4S - 14.8V	3C*	16.80V

Please Note: You can use your LRP VTEC Expert Airplane Line 35C 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 Expert Airplane Line 35C 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.

* C=Nominal capacity of the battery. E.g. with a nominal capacity of 3300mAh (3.3Ah), the battery can be charged with a max. current of 9.9A.

3. DISCHARGING

All LRP VTEC Expert Airplane Line 35C LiPo batteries are capable of a maximum peak discharge current of 60C. The special manufacturing technology of the LRP VTEC Expert Airplane Line 35C LiPo batteries make these high discharge currents possible.

The **continuous** discharge current for all LRP VTEC Expert Airplane Line 35C LiPo batteries is 35C.

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 is protected by a heatshrink. The actual Lipo-cell is directly under this heatshrink. 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 battery.
- 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 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 you are allowed to solder directly on the tabs of the LiPo-cells. Please note, that there is 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 lose 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.

5. STORAGE

LRP VTEC Expert Airplane Line 35C 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 Expert Airplane Line 35C LiPo batteries 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. 3.8V. 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.

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 countries 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.

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. The following points do also result in a service fee:

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

With sending in this product, the customer has to advise LRP if the product should be repaired in either case. If there is neither a warranty nor guarantee claim, the inspection of the product and the repairs, if necessary, in either case will be charged with a fee at the customer's expense according to our price list. A proof of purchase including date of purchase needs to be included. Otherwise, no warranty can be granted. For quick repair- and return service, add your address and detailed description of the malfunction.

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.

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.

