MA00174

ORDER NO.:

50631	13.5T	50681	5.5T
50661	7.5T	50691	4.5T
50671	6.5T	50711	3.5T

BRUSHLESS
NEW DESIGN
EXTRA POWER
SENSOR TECHNOLOGY

USER GUIDE

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1. WARNING NOTES

No toy. Not suitable for children under 14 years.

Keep the product out of the reach of children.

Pay close attention to the following points, as they can destroy the product and void your warranty. Non-observance of these points can lead to property damage, personal and severe injuries!

- Never leave the product unsupervised while it is switched on, in use or connected with a power source. If a defect occurs, it could set fire to the product or the surroundings.
- Avoid incorrect connections or connections with reversed polarity of the product.
- All wires and connections have to be well insulated. Short-circuits can possibly destroy the product.
- Never allow this product or other electronic components to come in contact with water, oil or fuels or other electroconductive liquids, as these could contain minerals, which are harmful for electronic circuits. If this happens, stop the use of your product immediately and let it dry carefully.
- Never open the product and never solder on the PCB or other components.
- Avoid overtightening the motor screws. Damaged threads are not covered under warranty!
- Avoid overloading the motor due to wrong or too long gear ratios.
- **Never apply full throttle if the motor is not installed. Due to the extremely high RPMs without load, the motor can get damaged.**
- Always wire up all the parts of the equipment carefully. If any of the connections come loose as a result of vibration, you could loose control over your model.
- Avoid soldering longer then 5 seconds per soldering joint when replacing the power wires to prevent possible damage to the product due to overheating of the components. Use a high power soldering station for soldering.

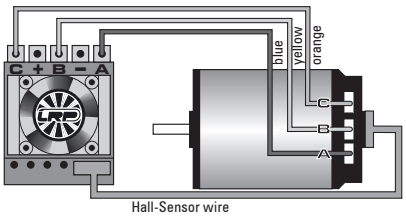
2. INSTALLATION / CONNECTIONS

HALL-SENSOR WIRE:
This bi-directional multipole wire connects the speed-control and the motor. Do not alter or modify this cable! The Hall-Sensor wire is imminent for the use of the LRP VECTOR X11 Brushless Modified motor. Make sure, that the plugs have a proper and tight fit.
There are replaceable hall sensor wires available: • #81910 (20cm) • #81920 (10cm)

POWER WIRES:
The LRP VECTOR X11 Brushless Modified comes pre-wired using common motor connectors (except 4.5T and 3.5T). It's simply „plug & play" when you intend using a LRP SPHERE speed-control. You can also use normal power wires (a complete set of power wires is included with the LRP SPHERE, SPHERE COMPETITION and SPHERE COMPETITION TC-SPEC) and solder them directly to the motor if you prefer to use a „hardwired" wire setup. The unique splitted solder-tabs allow easy and convenient replacement of the power wires. Nevertheless some soldering skills are required. Talk to your local hobbyshop if you are concerned about replacing the wires yourself.
There is a replacement power wire set available: • #82505 (13awg) • #82506 (12awg)

CAUTION: Avoid soldering longer then 5sec per soldering joint when replacing the power wires to prevent possible damage to the speed-control due to overheating of the components!

- Install the motor in the model.
  CAUTION! The maximum length of the motor screws shall not exceed **8mm**.
- Connect the motor and the speed-control, using the Hall-Sensor wire.
- Connect the power wires of the speed-control to the motor. You can do this by using the pre-assembled motor plugs or by soldering on the power wires directly to the motor.
- **CAUTION!** Make sure, that the polarity is right by checking the color code and the letters:
  - MOT.A = blue wire
  - MOT.B = yellow wire
  - MOT.C = orange wire
- Finally check all the connections before using the motor.



Hall-Sensor wire

3. TIMING

With the LRP VECTOR X11 Brushless Modified motor, you have the possibility to change the timing. You can easily see this by checking the mark on the plastic ring and the corresponding timing scale on the motor can. The factory setting is position 2. **When using a LRP SPHERE COMPETITION or LRP SPHERE COMPETITION TC-SPEC speedo, the timing of the motor has to be set to 2.**

By altering the timing, you change the characteristics of the motor. With a higher timing, the motor revs higher, but has less torque. **We recommend to use the factory setting. It is the best for most applications.**

To change the timing, do the following:
1. Loosen the 3 screws on the backplate of the motor.
2. Turn the plastic ring with the timimg mark to the desired timing position. You can use a small screwdriver to turn the plastic ring, if necessary. Only turn the plastic ring with the timing mark, not the whole backplate.
3. Re-tighten the 3 screws on the backplate of the motor again.
4. **Please note:** You need to use a shorter gearing, when using a higher timing!

Dear Customer,

thank you for your trust in this LRP product. By purchasing a LRP VECTOR X11 Brushless Modified motor, you have chosen a high-performance brushless motor. LRPs R&D team took all the experience and testing results from the last 3 years of practical tests with the LRP brushless motors on the highest levels of competition and put it into the new X11 motors. IFMAR ISTC Worlds A-finalist + European champion!

Please read the following instructions to ensure, that your LRP VECTOR X11 Brushless Modified motor always works up to your full satisfaction.

Please read and understand these instructions completely before you use this product! With operating this product, you accept the LRP warranty terms.

4. SPECIFICATION

	VECTOR X11 13.5T	VECTOR X11 7.5T	VECTOR X11 6.5T	VECTOR X11 5.5T	VECTOR X11 4.5T	VECTOR X11 3.5T
Order No.	50631	50661	50671	50681	50691	50711
Voltage input	4.8 - 7.4V					
RPM[1]	24.120 rpm/min	42.480 rpm/min	49.680 rpm/min	58.320 rpm/min	56.160 rpm/min	70.560 rpm/min
Specific RPM per volt, kv	3.350 rpm/volt	5.900 rpm/volt	6.900 rpm/volt	8.100 rpm/volt	7.800 rpm/volt	9.800 rpm/volt
Power[1]	180W	291W	332W	393W	528W	653W
Efficiency[1]	93%	92%	92%	91%	90%	88%
Magnet material	Bonded	Bonded	Bonded	Bonded	Sintered	Sintered
Minimum requirements for speedo	LRP SPHERE Brushless + Brushed digital (Order No. 80500)[2]			LRP SPHERE COMPETITION digital (Order No. 80700)[3]		LRP SPHERE COMPETITION TC-SPEC (#80750)
Winding	Stern					
Hall-Sensor pin assignment	Compliant to IFMAR/EFRA/ROAR/BRCA/DMC rules					

[1]Measured at 7.2V. [2]For competition use together with the VECTOR X11 6.5T, we recommend to use the Brushless Worlds Option Kit (Order No. 82700). [3]For competition use together with the VECTOR X11 4.5T, we recommend to use the Brushless Worlds Option Kit (Order No. 82700). Specifications subject to change without notice.

Team Tip: Under tough race conditions, our teamdrivers are using the optional Brushless+Brushed Cooling Set (Order No. 82510) which includes a heatsink that is specially made for the LRP VECTOR X11 motors and a high-performance fan. Additionally, they use the optional ceramic bearings (Order No. 50608) to get the most out of their LRP VECTOR X11 brushless motors.

5. GEARING

Due to the unique VECTOR X11 brushless design, these motors need to be geared different then normal brushed motors. **Therefore please pay special attention to our gear ratio recommendations, before using the motor for the first time.**

Never overgear your LRP VECTOR X11 Brushless Modified motor. A wrong gear-ratio causes much more heating and may result in a temperature shutdown of your speed-control under extreme conditions.

Take your kits instruction manual to find the correct pinion. **Please note, that following gear ratios are only a recommendation and a good starting point.** The actual gearing may vary due to different tracks, models, track conditions and/or batteries:

Motor	TC 1:10 (small track)	TC 1:10 (big track)	On-Road 1:12	Off-Road 2WD	Off-Road 4WD high trac.	Off-Road 4WD low trac.
3.5T (sintered)	10.3 : 1	8.9 : 1	--	--	--	--
4.5T (sintered)	9.5 : 1	7.8 : 1	33.5mm	12.4 : 1	13.5 : 1	12.5 : 1
5.5T (bonded)	10.0 : 1	8.8 : 1	31.2mm	14.1 : 1	14.0 : 1	13.0 : 1
6.5T (bonded)	9.3 : 1	7.8 : 1	34.1mm	12.4 : 1	13.5 : 1	12.5 : 1
7.5T (bonded)	8.5 : 1	7.1 : 1	36.9mm	11.1 : 1	13.0 : 1	12.0 : 1
13.5T (bonded)	7.0 : 1	5.5 : 1	42.0mm	8.0 : 1	8.0 : 1	8.0 : 1

TC = Touringcar

6. DISASSEMBLY

Due to the maintenance free design of the LRP VECTOR X11 Brushless Modified motor, it is not necessary to open the motor under normal conditions. Nevertheless, if you intend to check the ball bearings and oil them from time to time, you can disassemble the motor.

Disassembling of the motor:
1. Remove the 3 screws at the front of the motor and take off the front cover. You can now take out the ball bearing to clean it or, if necessary, to oil it.
2. Carefully take the magnet out of the can.
3. Remove the 3 screws from the back of the motor and take off the backplate. You can now take out the ball bearing to clean it or, if necessary, to oil it.
4. To re-assemble the motor, begin with step 3. Double-check, that all screws are securely retightened. Do not overtighten.

VECTOR X11 13.5T - 5.5T Rotor (bonded)
(Order No. 50603)

VECTOR X11 4.5T and 3.5T Rotor (sintered)
(Order No. 50610)

The crossed-out wheeled bin means that within the European Union the product must be taken to seperate collection at the product end-of-life. Do not dispose of these products as unsorted municipal waste.

REPAIR PROCEDURES / LIMITED WARRANTY

All products from LRP electronic (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 normal wear, misuse or improper maintenance. This applies among other things on:

- Overload (for example: unsoldered Star-ring)
- Excessive amounts of dirt inside the motor
- Rotor damage due to debris inside motor
- Mechanical damage due to external causes
- Rust

To eliminate all other possibilities or improper handling, first check all other components and the trouble shooting guide, if available, before you send in this product for repair or warranty. Products sent in for repair, that operate perfect have to be charged with a service fee.

By sending in this product, you assign LRP to repair the product, if it is no warranty or Limited Lifetime Warranty case. The original sales receipt 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.

Because we don't have control over the installation or use of this product, we can't accept any liability for any damages resulting from using this product. Therefore using this product is at owner's risk. Our limited warranty liability shall be limited to repairing the unit to our original specifications. In no case shall our liability exceed the original cost of the unit. By installing or operating this product, the user accepts all resulting liability.

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.