

Using the Scorpion Pack

- Operate your car normally.
- When the pack output drops to the cutoff voltage, the built-in Low Voltage Cutoff works with your ESC to turn off power to the motor. This prevents overdischarge of the LiPo cells.
- When the motor cuts off, it will remain off for a second or two to enable the pack to recover. Reduce throttle until the motor runs again. You can continue this off/on sequence until the pack no longer recovers above the cutoff voltage. This enables you to return the car to the pits.

Scorpion Pack specifications

Common specifications

Application	Electric powered radio controlled cars
Functions	Lithium Polymer battery power Built-in low voltage cutoff (to prevent overdischarge) Overvoltage protection (for charging) when used with FMA Safe Charge Connector and FMA Scorpion 2s Charger Model No. LIPOCH2S10
Motor support	Supports ESCs for both brushed and brushless motors
Throttle input	Accepts standard receiver throttle channel output
Throttle output	Drives standard ESC throttle input
Voltage output	Nominal 7.4VDC
Low voltage cutoff	When pack output voltage drops to 5.5V/6.5V during operation
Charge voltage cutoff	Use only with FMA Scorpion 2s Charger

Model-dependent specifications

Model	Continuous output current, A	Weight, g	Dimensions, mm
SCKOK1250-15C-1P2S	18.75	95	87x45x11
SCKOK2000-15C-1P2S	30	135	80x46x18
SCKOK3200-20C-1P2S	60 (limited by pack wiring)	220	140x48x15
SCKOK3200-20C-2P2S	60 (limited by pack wiring)	385	140x48x30

FMA limited warranty

FMA, Inc. warrants this product to be free of manufacturing defects for the term of 90 days from the date of purchase. Should any defects covered by this warranty occur, the product shall be repaired or replaced with a unit of equal performance by FMA or an authorized FMA service station.

Limits and exclusions

This warranty may be enforced only by the original purchaser, who uses this product in its original condition as purchased, in strict accordance with the product's instructions. Units returned for warranty service to an FMA service center will be accepted for service when shipped postpaid, with a copy of the original sales receipt or warranty registration form, to the service station designated by FMA.

This warranty does not apply to:

- Consequential or incidental losses resulting from the use of this product.
- Damage resulting from accident, misuse, abuse, neglect, electrical surges, reversed polarity on connectors, lightning or other acts of God.
- Damage from failure to follow instructions supplied with the product.
- Damage occurring during shipment of the product either to the customer or from the customer for service (claims must be presented to the carrier).
- Damage resulting from repair, adjustment, or any alteration of the product by anyone other than an authorized FMA technician.
- Installation or removal charges, or damage caused by improper installation or removal.

Call (301) 668-7614 for more information about service and warranty repairs.



Scorpion Packs for RC cars

featuring Low Voltage Cutoff and Safe Charge Connector (for use with FMA Scorpion 2s Charger Model No. LIPOCH2S10)

SCKOK1250-15C-1P2S, 18.75A continuous output
SCKOK2000-15C-1P2S, 30A continuous output
SCKOK3200-20C-1P2S, 60A continuous output
SCKOK3200-20C-2P2S, 60A continuous output

Features

- 2s Super High Discharge Lithium Polymer battery pack supplies 7.4V at high continuous current.
- Built-in Low Voltage Cutoff (LVC) prevents cell damage from overdischarge.
- Safe Charge Connector prevents cell damage from overvoltage during charging when used with FMA Scorpion 2s Charger Model No. LIPOCH2S10.
- Up to 10 times longer battery life than other brands.
- Works with both brushed and brushless ESCs.

Kokam/FMA Direct Lithium Polymer cells are the next-generation replacement for NiCd, NiMH and Lithium Ion cells. This unique power technology offers high energy density, low weight, long life, safe operation and environmentally-friendly chemistry. FMA Direct offers a full line of LiPo cells, packs and compatible electronics at www.fmadirect.com. LiPo technical and application information is available in the Support section of the Web site.

Precautions

- Follow all instructions in this manual to assure safe operation.
- **Never charge the pack through the Run (discharge) connector.**
- **Always disconnect the Run (discharge) connector before charging.**
- **Always charge through the Safe Charge (3-pin) connector.**
- Always watch LiPo packs while they are charging. Never leave LiPo packs unsupervised during charging.
- Allow packs to cool down before charging them.
- Follow all LiPo charging precautions, including charging packs in a fireproof container and monitoring the entire charging operation. See additional warning sheet provided with this pack.
- Wiring on the SCKOK3200-20C-1P2S and SCKOK3200-20C-2P2S packs limits continuous output to 60 Amps, even though the cell configurations are rated higher.

WARNING! Maximum Charge Rate 3C. Charge this battery pack using only the Scorpion 2s charger from FMA Direct. FMA, Inc. will not be liable for damages that result from charging this pack with any other charger. **This product may ignite under certain conditions. Read all safety precautions completely before using this product!**

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Charging the Scorpion Pack

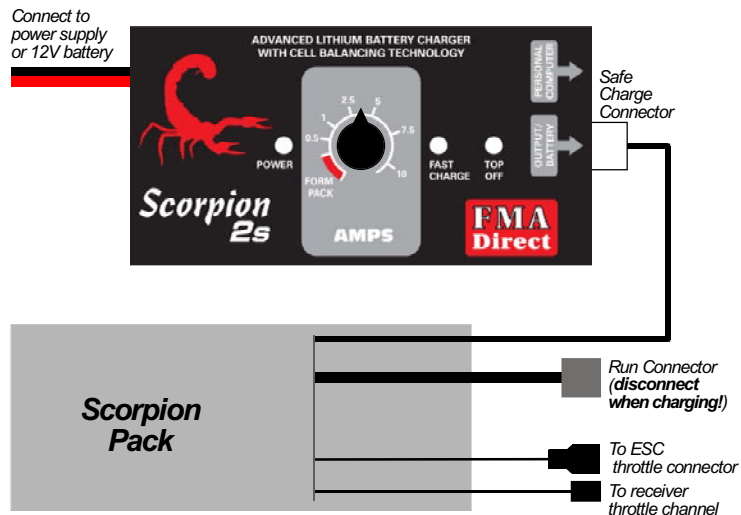
IMPORTANT:

- Make sure the ESC switch is OFF and disconnect the Run (discharge) connector, or remove the Scorpion Pack from the car before charging it.
- Charge the battery pack only with FMA Scorpion 2s Charger.
- Charge only through the Scorpion Pack's Safe Charge Connector. Do not charge through the Run Connector. Charging through the Run Connector may result in damage to the battery pack and/or charger, and possibly fire. Attempts to charge through the Run Connector voids the warranty!
- If the pack is new, consider forming it to increase capacity by 1% to 2%. Instructions are in the Scorpion 2s Charger user guide.
- Charge the Scorpion Pack before using it for the first time.

Charge the battery pack only with FMA Scorpion 2s Charger Model No. LIPOCH2S10. See the Scorpion 2s Charger user guide for detailed information about using the charger.

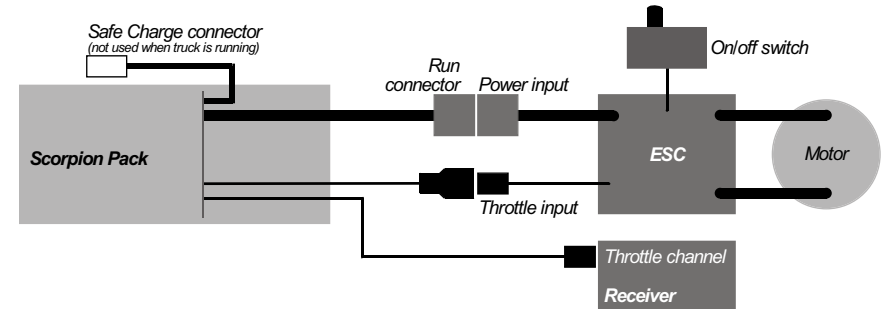
Pack Model No.	Max. charge current (3C)	Recommended current (1C)
SCKOK1250-15C-1P2S	3.75A	1.25A
SCKOK2000-15C-1P2S	6.0A	2.0A
SCKOK3200-20C-1P2S	9.6A	3.2A
SCKOK3200-20C-2P2S	10A (charger maximum)	6.4A

1. Disconnect the Run Connector from the ESC.
2. Set the Charger's Current control to a level at or below the maximum recommended charge current for the pack you are charging.
3. Connect the Pack's Charge Connector to the charger's Output connector (see illustration below).
4. Apply power to the charger.
5. When charging is complete, disconnect the charger from the power source and disconnect the pack from the charger (in any order).



Installing the Scorpion Pack

1. Plug the Scorpion Pack's Throttle Connector into the receiver's throttle channel.
2. Attach the ESC's throttle connector to the Scorpion Pack's throttle input.
3. Attach the Scorpion Pack's Run Connector to the ESC's battery connector.



Testing for Low Voltage Cutoff

The Scorpion Pack's Low Voltage Cutoff feature requires that the ESC stop the motor on loss of signal. **To prevent damage to the LiPo cells, you must verify that the ESC does, in fact, stop the motor on loss of signal, and that the Scorpion Pack output voltage does not drop below the cutoff voltage.**

1. Test ESC operation:
 - a. Increase throttle on your transmitter to run the motor.
 - b. Without reducing throttle, turn off the transmitter.
 - c. **If the motor stops**, the ESC can be used with the Scorpion Pack. Go to step 2.

If the motor does not stop, the ESC cannot be used with the Scorpion Pack. Try again using another ESC.
2. Measure cutoff voltage. Do this while the car cannot move:
 - a. Securely attach a voltmeter to the system so you can measure the Scorpion Pack's output voltage.
 - b. Increase throttle on your transmitter to run the motor.
 - c. Watch the voltmeter:

If the motor stops when the Scorpion Pack's output voltage drops below 5.5V or 6.5V (depending on the ESC), your car is ready to run.

If the motor continues to run when the Scorpion Pack's output voltage drops below 5.5V, check all connections, then repeat steps 1 and 2. Contact FMA Customer Service.