

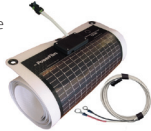
PowerFilm® Solar Powered Battery Chargers

The World's Most Rollable and Lightweight Solar Technology
OPERATING INSTRUCTIONS

PowerFilm® Rollable Solar Powered Battery Chargers are made with PowerFilm®, the world's most rollable, lightweight, and durable solar technology. This product is made with professional marine-grade components and rugged UV-stabilized materials. It is waterproof.

PowerFilm® Rollable Solar Powered Battery Chargers

Included inside package



Specifications	PowerFilm® R15-300	PowerFilm® R15-600	PowerFilm® R15-1200
Operating Voltage (V)	15.4	15.4	15.4
Operating Current (Amps)	.3	.6	1.2
Weight (lbs/kg)	.6/.29	1.46	1.9/.88
Dimensions (in/mm)	11.5 x 21 292 x 531	11.5 x 38 292 x 972	12 x 73 305 x 1858

Operating Voltage and Operating Current at AM1.5. Power performance may vary +/- 10% due to temperature variation, spectral variation, and related effects.

Please read the following information and instructions prior to using your PowerFilm® Rollable Solar Powered Battery Charger.

Important Notes

ALWAYS ROLL THIS PRODUCT WITH THE SOLAR PANEL (DARK SIDE) FACING OUT! DO NOT FOLD OR CREASE.

Check Polarity! All connections must be positive (+, red) to positive and negative (-, black) to negative. Reversing the polarity can be a risk for electric shock, a fire hazard, and cause damage to the solar module.

Consult your battery manufacturer if you have questions about the specifications of your battery.

Instructions for Use

- Unroll and place so solar panel (dark side) is face up with orientation to sun.
- With the grommets on each of the corners, use a tie cord to hold the panel in place. This is important to reduce loss or damage from high winds.
- Ensure the solar panel cord out of the junction box is well connected to the included 15 ft. extension cord. (Fig. 1)
- Identify the correct polarity! (Red +, Black -)
- Attach the o-ring battery terminal connectors at the end of the extension cord to your 12 volt battery or the 12 volt device you are directly powering. (Fig. 2)
- You may leave the panel permanently connected to your battery since there is an included blocking diode in the junction box that blocks reverse draining of current from your battery. As with any permanent connection to a battery, safely clean the connections on a periodic basis as needed.
- To store the product, simply disconnect the cords and roll with the SOLAR PANEL FACING OUT. Use the attached Velcro® strip to hold the roll in place.

Fig. 1

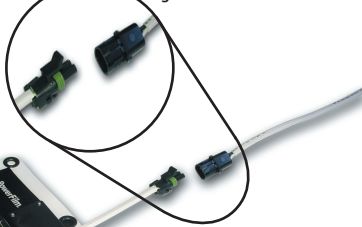


Fig. 2



12 Volt battery or other device

Use 3 Easy Ways

- 12 Volt Systems (Battery Maintenance, Marine, Field Communication Radios, Heavy Equipment, Military Vehicles, Lighting, Security Systems)**
Direct power or charge batteries.
Use included 15 ft. extension cord with o-ring battery terminal connectors, or purchase 12 Volt Cigarette Lighter Adapter (RA-1) to charge via cigarette lighter.
- Charging Wireless Electronics (Laptops, GPS, Cell Phones, PDAs)**
Use with your 12 volt charger adapter with your wireless electronics product. Purchase 12 Volt Female Cigarette Lighter Adapter (see RA-2).
- Charge Almost All Lithium, NiCad, or NiMH Batteries**
Use with a 12 volt Battery Charger Pack (See RA-3, RA-4, or RA-5 depending on specific power needs). RA-2 Female Cigarette Lighter Adapter required.

PowerFilm® Rollable Accessories

PowerFilm® Accessories can be purchased from one of the Authorized Resellers listed at www.iowathinfilm.com.

- RA-1 12 Volt Cigarette Lighter Adapter**
Charge a vehicle's battery directly through the cigarette lighter adapter.
- RA-2 12 Volt Female Cigarette Lighter Adapter**
Directly charge any wireless electronics device with its 12 V cigarette lighter adapter.
- RA-3 12 Volt Battery Charger Pack for AA and AAA**
Charge 1-4 NiCad or NiMH AA or AAA batteries. Includes 12 V cigarette lighter adapter.
- RA-4 12 Volt Standard Battery Charger Pack**
Charge NiCad or NiMH batteries: 2-4 AA, AAA, C, D, or 9V (1-2 batteries). Includes 12 Volt cigarette lighter adapter.
- RA-5 12 Volt Deluxe Universal Battery Charger/ Analyzer/ Conditioner**
Deluxe charger for almost all Lithium, NiCad, or NiMH batteries. 12 V cigarette lighter adapter included along with AA, AAA, C, & D battery holders.
- RA-6 Daisy Chain Accessory**
Use this to connect several PowerFilm® chargers in parallel for increased current output (Amps).
- RA-7 15 Ft. Extension Cord**
- RA-8 15 Ft. Extension Cord with Alligator Clips**
- RA-9 Charge Controller.**

PowerFilm® Rollable Series Limited Warranty

For a warranty claim, contact the company which sold you the product. Your original proof of purchase will be required. Iowa Thin Film Technologies, Inc. warrants to the original purchaser that PowerFilm® R15-300, R15-600, and R15-1200 products are free from defects in materials and workmanship and to provide at least 80% of rated minimum power for a period of 3 years. Accessories are warranted to be free from defects in materials and workmanship for a period of 1 year. The duration of the Limited Warranty is from the date of initial purchase from Iowa Thin Film Technologies (ITFT). The foregoing warranty does not apply to any products which have been subject to misuse, unauthorized modifications, neglect, improper testing, attempts to repair, or by accident, fire or other hazard. ITFT's sole obligation and liability for modules failing to comply with this warranty shall be, at ITFT's choice, either to supply replacement products or to credit the amount due for such nonconforming products, provided that the warranty procedures have been followed. Disclaimer of Warranties. EXCEPT AS EXPRESSLY SET FORTH IN THIS AGREEMENT THE PRODUCTS ARE PROVIDED ON AN "AS IS" BASIS AND ITFT MAKES NO WARRANTY IN CONNECTION WITH THE SUBJECT MATTER OF THIS AGREEMENT AND HEREBY DISCLAIMS ANY AND ALL IMPLIED OR STATUTORY WARRANTIES, INCLUDING ALL IMPLIED WARRANTIES OF TITLE, NON-INFRINGEMENT, QUIET ENJOYMENT, ACCURACY OF DATA, MERCHANTABILITY AND FITNESS FOR A PARTICULAR USE OR PURPOSE REGARDING SUCH SUBJECT MATTER. To the extent that a party may not, as a matter of applicable law, disclaim any implied warranty, the scope and duration of such warranty shall be the minimum permitted under such law.

No Warranty Pass-Through. ITFT grants no warranty pass-through for any ITFT product. Customer shall not pass through to its customers or any other third party the warranties made by ITFT and will expressly indicate to its customers that they must look solely to them (not ITFT) in connection with any problems, warranty claims or other matters arising in relation to the modules.

FAQs

- If I have a problem with this product whom do I contact?**
First, contact the company that sold you the product. Additional PowerFilm® information is available at www.iowathinfilm.com.
- How do I know which size I need?**
Consult the Application Charging Example Chart.
- How do I know if it is working?**
You can check the PowerFilm® Rollable Battery Charger with a voltmeter.
- Will this product drain my battery at night?**
No. It has a built-in blocking diode to protect against reverse draining of current.
- Can I leave it outside permanently?**
The PowerFilm® Rollable Battery Charger can be left outside permanently if maintained properly. It must be properly secured to avoid damage from high winds. Terminals should be kept clean and firmly connected.
- What if the product gets wet?**
No problem. The product is waterproof.
- What if the product goes under water?**
Simply wipe the product with a dry cloth and allow the product to dry before use. Avoid having the product completely submerged for an extended period of time.
- Can I leave it outside in freezing temperatures?**
Yes.

- If I need more power can I connect several of these together? How?**
Yes, it is acceptable to connect several PowerFilm® Rollable Battery Chargers in parallel. Connect using the PowerFilm® Rollable Daisy Chain Accessory (RA-6). Connect chargers up to a combined output of 20 Amps.
- Can I use an extension cord?**
You can use the 15 ft. Extension Cord accessory (RA-7) complete with matching marine-grade connectors. Total cord length greater than 30 feet likely will result in reduced power output.
- Do I need to disconnect this charger when I start my vehicle or when I recharge the battery with an auxiliary power source?**
You do not need to disconnect the rollable solar panel. You need to disconnect any battery charger pack accessory that is connected to the solar panel.
- Do I need a charge controller?**
A charge controller is used to prevent overcharging. As a general recommendation, a charge controller should be used if the current output of the solar panel, in Amps, is more than 1% of the battery capacity, in Amp-hours. For example, a charge controller would be recommended if the R15-1200 (with 1.2 Amps) were connected to a battery that is less than 120 Amp-hours. Consult the battery manufacturer for complete battery information and recommendations.
- How do I clean the product?**
Use a damp cloth with a mild soap solution.
- Where can I get more product information?**
Contact the company that sold you the product. Additional information can be found online at www.iowathinfilm.com.

Troubleshooting

- Connection-** Inspect your wiring for any sign of loose wires or corrosion. Check Polarity!
- Voltage -** Using a voltmeter, test the open circuit voltage between the positive (+, red) and negative (-, black) o-ring terminals.
- Battery -** Ensure your battery continues to be able to be recharged. Contact your battery manufacturer.
- Size -** Make sure you are using a properly sized system. Consult the application chart for guidelines, or contact the company that sold you this product.

Calculating Power Needs

To determine the size of the solar-powered battery charger you need, first identify the Amp-hours that are consumed by what you are powering. For example, a typical 12 Volt Bilge Pump consumes 3 Amps every hour it is used.

	PowerFilm® R15-300	PowerFilm® R15-600	PowerFilm® R15-1200
Amps	.3 Amps (300 mAmps)	.6 Amps (600 mAmps)	1.2 Amps (1200 mAmps)

Application Charging Example Chart

The PowerFilm chargers provide the following number of Amps for each hour in full sun:
The table below shows the typical hours of run time per week for various devices. Assumes 5 hours of full sun per day.

Typical Power Consumed Every Hour Used	Typical Hours of Run Time Per Week		
	R15-300	R15-600	R15-1200
12V Bilge pump (3 Amps)	3.5	7	14
12V Fish Finder (.83 Amps)	13	25	51
12V GPS (.42 Amps)	25	50	100
Cell phone charger (.5 Amps)	21	42	84
CB radio (.42 Amps)	25	50	100
AM/FM radio (.42 Amps)	25	50	100
Lighting (.83 Amps)	13	25	51
14" Color TV (3.33 Amps)	3	6	12
Search Light (8.33 Amps)	1.3	2.5	5
Laptop (2.5 Amps)	4.2	8.4	16.8

Contact Info:

First please contact the company that sold you the product.

MADE IN THE USA

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