

A dark grey car is shown from a high-angle perspective. A rectangular solar panel is mounted on the hood, with a black charging cable connected to it. The car's windshield and front grille are visible. In the background, other cars are parked in a lot.

APOLLO BATTERY GUARD 12
INSTRUCTION MANUAL

By Apollo Power

For 12V Batteries Only



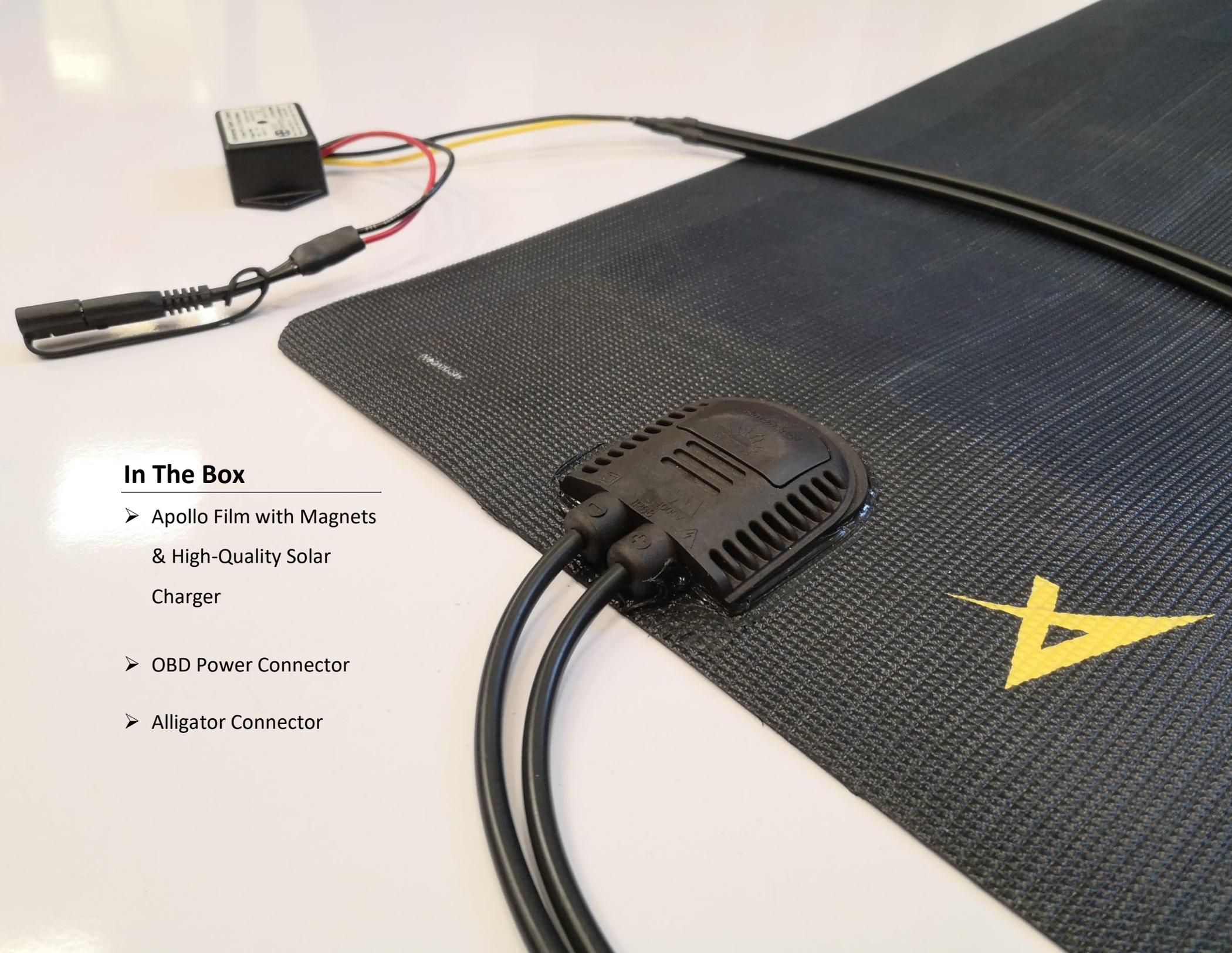
APOLLO Battery Guard For 12V Batteries INSTRUCTION MANUAL

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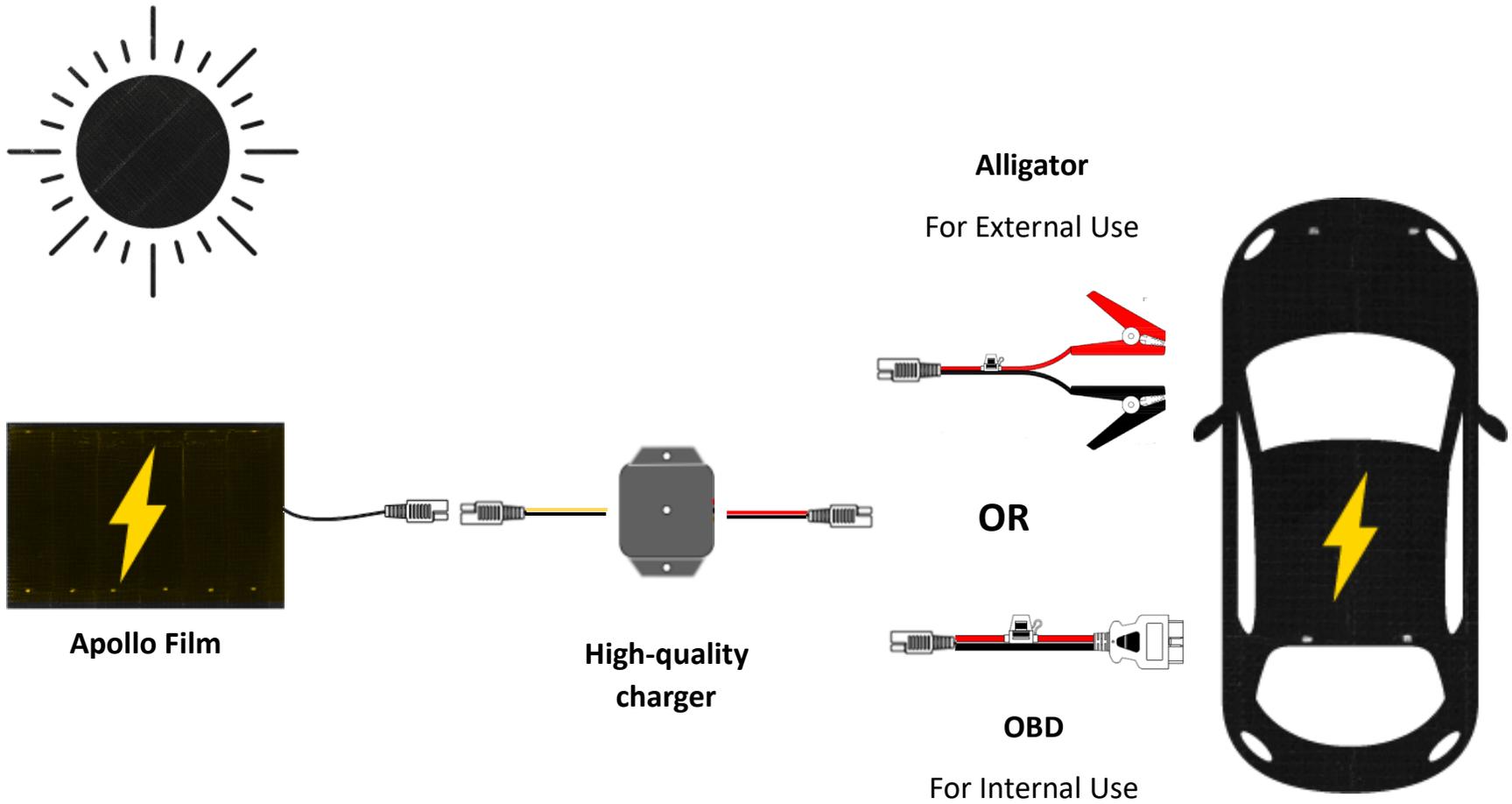
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In The Box

- Apollo Film with Magnets & High-Quality Solar Charger
- OBD Power Connector
- Alligator Connector



System Overview (not to scale)



Get Started

Our Plug & Play film is easy to use, there is just few things you better know before getting started:

1. Connect only with the supplied connectors, and only to a vehicle with a 12V lead acid battery
2. Make sure the  is facing up
3. Connect the charger to the film. **Pay attention – the black and yellow wires are the ones that connect to the film.**

For fast charge (if the vehicle does not start), use outside the vehicle

4. Use the magnets to mount the film on the vehicle frame.
5. Connect the red alligator to the positive terminal (+) of the battery.
6. Connect the black alligator to the negative terminal (-) of the battery.
7. Connect the alligators to the charger (connector with red and black wires).
8. A green light in the charger indicates the functionality of the system.

Charging can take between 1-3 hours, Remember, unlike wall outlet, the film is affected from the environmental conditions and therefore the charging will change according to the time of the day, the angle of the film, sky clarity and more.

 **Warning!** Do not use outside the vehicle under wet conditions or severe weather

When parking for several days (to prevent the battery's discharge), use on the vehicle's dashboard

4. Place the film on the vehicle's dashboard so it is exposed to the sunlight.
5. Connect the supplied OBD to the vehicle's OBD port.
6. Connect the OBD to the charger (connector with red and black wires).
7. A green light in the charger indicates the functionality of the system.

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Maintenance

Periodically, check the Apollo Film surface for debris or dirt. To clean the module surfaces, verify there is no visible damage on the modules and then clean with wet towel or soft brush.

Clean the film with tap water only.

When cleaning, avoid using excessive down force.

Check all wiring to confirm no loose connections or insulation wear.

When not in use, close the connector caps.

Operation

The controller protects batteries from overcharging. It allows solar power to charge the batteries until the batteries rise to the full voltage set point. It then maintains the battery voltage at this setpoint. Because a battery voltage fluctuates, it is normal for the charging light to turn on and off as the battery approaches full charge. When full charge is achieved the charging light will go out completely.

Three Flashes - Charging below charging setpoint

Two Flashes - Charging at charging setpoint mode

No Flash - Charging on hold

At night the control shuts down to save power.

Troubleshooting

Problem	Cause	What to do
The film doesn't generate any electricity	Wires were not connected correctly	Make sure the wires are connected properly
	The film is shaded/not exposed to light	Expose the front side of the film to sunlight
The charger light is off	fault during solar short circuit, solar or reversed battery, overtemperature and battery short circuit conditions	Remove solar power to reset the control and then plug it back
The film and charger are working but the battery isn't charged	Burned Fuse	Replace fuse at the cable

Film Technical Data*

APOLLO BATTERY GUARD 12	
Length (cm)	82
Width (cm)	31.5
Thickness (cm)	2.3
Weight (kg)	0.760 (w/o charger)
P_{mpp} (W)	21
V_{mpp} (V)	15.9-16.5
I_{mpp} (A)	1.3-1.4
V_{oc} (V)	18
I_{sc} (A)	1.7

*All electrical specifications are within a $\pm 10\%$ tolerance.

Note: Under normal conditions, a photovoltaic module is likely to experience conditions that produce higher current and/or voltage than reported at standard test conditions. Accordingly, the values of I_{sc} and V_{oc} marked on this PV module should be multiplied by a factor of 1,25 when determining component voltage ratings, conductor current ratings, and size of controls (e.g. inverter) connected to the PV output.

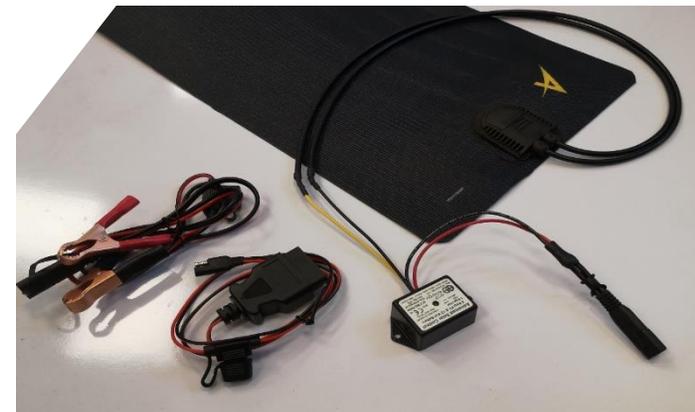
Charger and Cables Technical Data

APOLLO BATTERY GUARD 12	
Charger Voltage (V)	12
Max Charging Current (ADC)	3
Daytime consumption (mA)	0.7, 2.5 when charging
Night time consumption (mA)	0.24
Charger Weight (g)	90
Charger Size (cm)	5X5X3.8
Charger Cable Length (cm)	30 \pm 2
OBD Cable Length (cm)	100 \pm 2
Alligator Cable Length (cm)	100 \pm 2
Connector Type	SAE

Unique - Night time shutdown.

Protection (PV & Batt), against short-circuit & reverse polarity, overload, over temperature & battery removal.

Can charge a completely discharged battery.



Warnings

- ✓ All instructions should be read and understood before attempting to install, wire, operate or maintain the film.
- ✓ Solar films generate DC electrical energy when exposed to sunlight or other light sources. Active parts of the film such as terminals, can result in burns and sparks.
- ✓ Artificially concentrated sunlight should not be directed on the film.
- ✓ Front and back protective materials are utilized on the film. Damaged solar film protective material is an electrical safety hazard (may cause electric shock and fire). These films cannot be repaired and should be replaced immediately.
- ✓ Do not touch live terminals with bare hands. Use insulated tools for electrical connections.
- ✓ Do not clean the cover material with chemicals.
- ✓ Do not disassemble the film.
- ✓ Due to the risk of electrical shock, do not perform any work if the terminals of the solar film are wet.
- ✓ Do not chain Apollo Film with other solar products.
- ✓ Do not drive with the system connected.
- ✓ Make sure you connect the terminal of the battery correctly.



Handling and Storage

The following guidelines are to be followed in order to protect the product and prevent body injury and damage to the product. Failure to comply with these instructions will invalidate the limited warranty.

- ✓ Use the system with the supplied charger and cables only.
- ✓ Do not handle the Apollo Film from the junction box or connecting cables, as it may cause damage to the product.
- ✓ Handle with caution in a safe manner.
- ✓ Do not stand on the Apollo Film or place any part of the solar film under heavy items.
- ✓ Do not open or cut the product.
- ✓ Do not place the Apollo Film facing down.
- ✓ Assure the Apollo Films are stored adequately at environmentally controlled conditions; not exposed to excessive moisture, cold or heat.
- ✓ If a designated transportation device was supplied with the Apollo Film, use the transportation device to transport and store the Apollo Film.
- ✓ Do not fold or roll the Apollo Film to a diameter less than 8 cm.
- ✓ Do not stretch the Apollo Film.
- ✓ Do not cut the supplied wires.
- ✓ Install the system according to the manual.