



FR-1 MULTI-VOLTAGE CHARGER

Operation Guide

fullriverbattery.com

Important Safety Guidelines

Read the FR-1 Operation Guide thoroughly and follow the directions before using the FR-1 charger. Failure to do so could result in the charger malfunctioning, battery failure, and/or personal injury. Please be aware that working in the vicinity of lead-acid battery(s) can be dangerous. Please read & exercise the guidelines listed below to ensure safe operation of the charger and the battery(s). If these conditions cannot be met, discontinue operation of the charger until they can be corrected. Failure to install and use the charger in accordance with these instructions may impair the protection provided by the charger and may void the manufacturer's warranty.

- * Do not attempt to open the charger. There is risk of electric shock even if the charger is unplugged. No user serviceable components are inside.
- * Do not install the charger in a closed compartment or restrict the internal fan in anyway. The internal fan must have at least one inch of clearance on the vented ends of the charger.
- * Never place the charger directly above or below the battery being charged. Gases or fluids from the battery can easily damage the charger or cause an electrical short.
- * Use of an AC adapter is not allowed in Canada. If a grounding type receptacle is not available, do not use this appliance until the proper outlet is installed by a qualified electrician.
- * Use protective glasses and gloves when maintaining batteries. Battery acid causes injuries. In case of contact with battery acid, thoroughly wash the affected parts with fresh water and consult a doctor if necessary.
- * Please follow any additional charging instructions from your specific battery manufacturer.
- * The charger is not intended for outdoor use. Never use charging equipment in the rain or damp areas.
- * Do not install the charger on or over combustible surfaces.
- * Do not attempt to charge batteries not specified as compatible with the FR-1. This charger is intended only for use on the lead acid batteries (Wet, Gel, or AGM) in the range 50 – 400 amp hours in configurations of 12v, 24v, 36v, and 48v.
- * Charging batteries carries an inherent risk of fire/explosion:
 - » Please provide adequate battery ventilation during charging to avoid buildup of flammable gasses. Never smoke or allow an open spark or flame in the vicinity of the battery.
 - » Always disconnect the AC power cable before connecting or disconnecting the charger to the battery(s). Never disconnect the battery while it is still charging – this could cause sparks.
- * Charger surfaces will get hot during charging and remain for a few hours after completion. If surface is ever too hot to touch, disconnect the charger from AC power and consult with Fullriver before using again.
- * The charger is not authorized for use with critical components in life support devices or systems without express written approval of Fullriver Battery.

General Information & Operation

The FR-1 is an electronic automatic battery charger with microprocessor suitable for any lead acid battery types (Wet, Gel, or AGM). The FR-1 has a fully automatic charging cycle with the following protections: reverse polarity, short-circuit at clamps, and against overload.

BEFORE CHARGING THE BATTERY

Charge only lead-acid type batteries (Wet, Gel, or AGM). Verify the rated AC input voltage of the charger is compatible with the available AC supply voltage and is also equipped with grounding capability. If necessary, replace the fuse with another of the same type and value as indicated on the rating plate.

OPERATION

1. Connect the charger's DC cables/ clamps to the battery(s) ensuring proper polarity; (+) and (-).
2. Plug the AC cord into a socket and allow charger to complete its startup sequence (~15 seconds).
3. The following will be displayed on startup: Battery voltage, charging current, charging curve number, and the battery type - "**GEL**", "**Acd**" (for Flooded), or "**bat**" (for AGM).
4. During startup, the charger will immediately test the battery voltage and determine if a charge is necessary or not.
5. The battery voltage will then be displayed for five seconds indicating if a charge is necessary. The charging sequence will then initiate if necessary (red or yellow LED) and the battery will begin being charged.
6. The charging cycle progress will be shown by red, yellow, and green LED indicators (*see back*).
7. The charge is complete once the green LED indicator is displayed. The battery can now be disconnected.

For wet batteries only: Insure proper maintenance of your battery(s) by adding distilled water. Contact your battery supplier for more information.



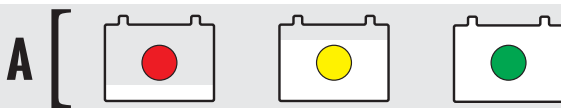
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NOTE: Visit our website to view FR-1 warranty and policy information.

Control Interface



A = Amps

U = Volts

h = Hours

C = Ah

E = KWh



CHARGE CONTROL INDICATOR

- A** RED - Charge cycle started
 YELLOW - Final phase started
 GREEN - Charge cycle done



MODE DISPLAY BUTTON

Press the MODE button to display the desired mode indicated above the display. Idling for 10 seconds returns to displaying charging current.

THREE DIGIT + MODE DISPLAY

B Displays the corresponding value for the selected mode. The mode is the small digit on the right.

Trouble Shooting

ISSUE	SOLUTION
The charger does not turn on.	Check AC outlet. Check internal charger fuse.
Charging cycle fails to start; "bat" displayed.	Verify that cable and terminal polarity match.
E03; Fails to transition through cycles after 15 hours.	Batteries suspect. Perform load/voltage tests.
E01; Max voltage exceeded.	Batteries suspect. Perform load/voltage tests.
E02; Max temp exceeded (with safety thermometer).	Allow cool air flow to charger. Repeat charge cycle.
E03; Max charging time exceeded.	Perform load/voltage tests or repeat charge cycle.
SCt; Total safety timer interrupted charging cycle.	Perform load/voltage tests or repeat charge cycle.
Srt; Possible internal short circuit.	Stop charging. Repair or replace charger.