



Elite PRO 2 and 4

Models: GREENUL_xxVxxxA

HIGH FREQUENCY ELECTRONIC
BATTERY CHARGER

OPERATING MANUAL



Attention: Carefully read this operating manual before connecting the charger to AC supply and the battery pack.

GENERAL INFORMATION ABOUT THIS CHARGER

- This device is an electronic battery charger with microprocessor control suitable for any lead acid battery type when correctly set. Charging of lithium batteries is possible – see special warnings for charging lithium batteries below.
- Fully automatic charging with electronic setting; protected against overload, short-circuit and reversed polarity.



WARNINGS

- Never disconnect the battery while charging: this could cause sparks.
- Never use the equipment in the rain, in areas used for washing or in damp areas.
- Caution: the gases generated during charging are explosive. Do not smoke in the vicinity of the batteries. When working with cables and electrical equipment, avoid open flames and sparks.
- Before starting to charge, make sure the voltage of the equipment suits the voltage of the battery, that the charging current suits the capacity of the battery and that the selected charging curve (for lead-acid wet batteries or VRLA - i.e. gel or agm - batteries) is correct for the type of battery to be charged. In addition, make sure the rated input voltage of the charger suits the available supply voltage and the system is grounded.
- If necessary, replace the fuse with another of the same type and value as indicated on the rating plate.
- Use battery chargers only in well ventilated areas.
- Pay attention to any remarks of the battery manufacturer.
- To use the charger, you must abide by safety regulations contained in laws and any regulations or other provisions stipulated by local authorities.
- The user of the equipment is responsible for the installation site of the charger. They must check if sensitive appliances are disturbed by the influence of the battery charger. They must choose an installation site so that the operation of the charger does not affect the function of electromagnetic devices and magnetic data carriers (e.g. pace makers, monitors, magnetic disks and diskettes, magnetic tapes, magnetic cards, watches etc.), since a high direct current may produce interfering magnetic fields
- **Attention:** Use protective glasses and gloves during battery maintenance. Battery acid causes injuries. In case of contact with battery acid, wash the affected parts with fresh water and consult a doctor if necessary.

- **CAUTION!** The models belonging to the category identified as 2KW in the table on page 6, comply with **EMC class A + B** as established by the CEI EN 61000-6-2, CEI 61000-6-3 and CEI EN 61000-6-4, that is both for **RESIDENTIAL** and **INDUSTRIAL ENVIRONMENTS**. The models belonging to the category identified as 4KW in the table on page 7 are in conformity **EMC class A** as established by the CEI EN 61000-6-4 (2002) and CEI EN 61000-6-2 (2002) for **INDUSTRIAL ENVIRONMENTS**.
- **NOTE:** The ability to select different levels for voltage and current for charging is in some cases entrusted to the control and supervision of field technicians or the end user. Brierly Technologies, Inc. is not liable for any consequences resulting from the selection of an incorrect level of voltage or current. If in any doubt, the field technician or end user should ask a qualified professional for clarification.



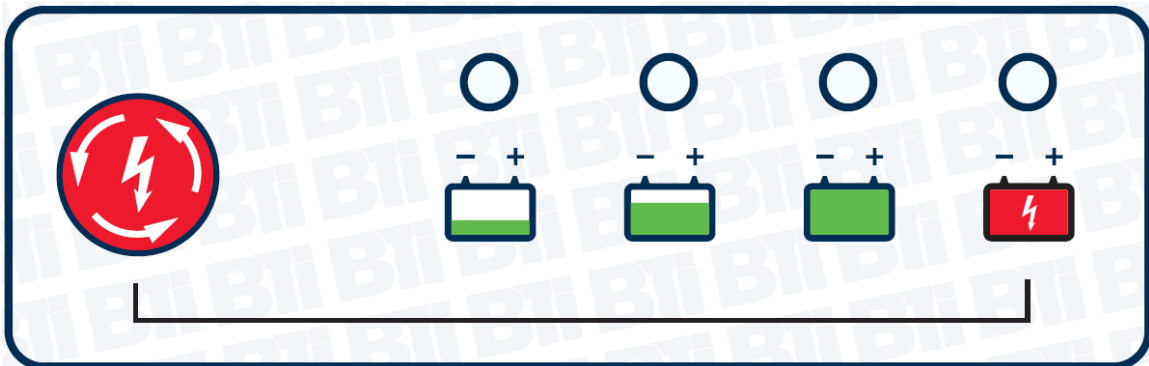
SPECIAL WARNINGS FOR CHARGING LITHIUM BATTERIES

- In order to charge lithium batteries, a BMS (Battery Management System) must always be used, comprising an active and passive safety system in compliance with any regulations in force.
- The function of the BMS acting directly on the battery charger operation during cell balancing rules out, in any situation, that the battery charger can be held responsible should any damage be caused to the battery or if there is any fire or explosion.
- The battery charger tolerance values and thresholds, in terms of over-voltage and overcharging, have no safety functions for the battery itself. The safety of the battery depends solely on the BMS even when the battery charger is connected to the battery, whether the battery is being charged or not.
- Under no circumstances can Brierly Technologies, Inc. be held responsible for the malfunctions of the batteries, fire or explosions as the safety of the battery is the task of the BMS and not the battery charger.

OPERATION

- Before operation, check that the battery charger programming/setting is correct for the batteries, that the charging current suits the capacity of the batteries and that the selected charging curve (for flooded lead-acid, valve regulated gel or agm, lithium ion) is correct for the battery type to be charged.
- Connect the battery pack, checking the polarity.
- Plug the charger into the AC supply, thus starting the automatic charging cycle.

VISUAL SIGNALS



This chart below explains the status of the charger via the 4 LEDs on the front display.

GREEN LED (DL4)	YELLOW LED (DL3)	GREEN LED (DL2)	RED LED (DL1)	DESCRIPTION	DISPLAY
OFF	OFF	OFF	OFF	Power supply from battery only	OFF
OFF	OFF	OFF	OFF	Power supply from AC connected	ON
ON	OFF	OFF	OFF	Power supply from AC and from battery	ON
BL	BL	BL	BL	Charge is in start-up mode.	ON
BL	OFF	OFF	OFF	Charging begins - Phase 1	ON
BL	ON	OFF	OFF	Charger in Phase 2 to 7 (# phases depends on programming)	ON
ON	ON	ON	OFF	Equalize standby	ON
BL	BL	ON	OFF	Equalization is ON	ON
ON	ON	ON	OFF	Equalization charge is OFF (in standby)	ON
BL	BL	ON	OFF	Maintenance / Float is ON	ON
ON	ON	ON	OFF	Charging Process Ended	ON

Legend: OFF = the LED is OFF
 ON = the LED is ON
 BL = the LED is FLASHING (Blink time = 1 second)

KEYPAD FUNCTIONS

Technicians and users can interact with the battery charger using the UP and DOWN buttons and the POWER button.

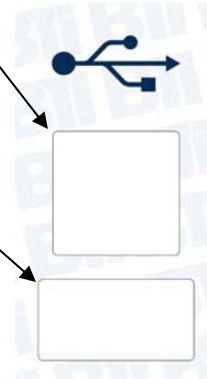


BUTTON	FUNCTION	DESCRIPTION
UP ARROW	Set-Up	Allows you to enter menus, move around Change or increase parameters
	Increase	
DOWN ARROW	Parameters	Allows you to move between monitor screens 1-2-3, view various screen with charging parameters Change or decrease parameters
	Decrease	
POWER	On-Off	Allows you to suspend or restart the charge cycle or select menu.
	Select	Also used to CONFIRM a parameter when making changes.

USB PORTS


The USB Service Port is to be used only for programming the charging parameters and downloading of historical data and graphs. You must *disconnect the USB cable from the charger when in use* to prevent EMI noise from interfere with the charging process which may unpredictable consequences for the charger and battery.

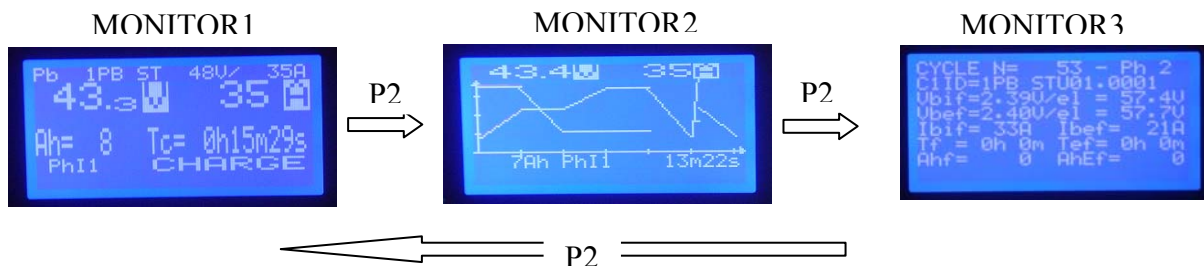
The USB Host Port is used for firmware updates and uploading charger settings or profiles.



DISPLAY LCD

The battery charger display will show 3 menus to show charging details during the charger process.

The **DOWN ARROW**  button, will navigate between the menus consecutively.

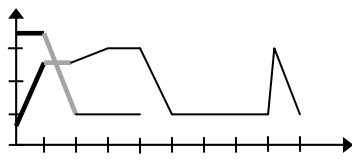


The information provided by the monitor screens is shown below.

MONITOR1

ROW	EXAMPLE	DESCRIPTION
(1)	Pb 1Pb ST 48V /35A	Battery (Pb), Charging Curve # and Type (1Pb ST), Output of Charger (48V-35A)
(2)	43.3 V 35A	Active battery voltage (43.3V) and supplied output current (35A).
(3)	Ah= 8 Tc= 0h15m29s	Ah provided to battery (8) and charging time in hours, minutes, seconds (0h15m29s)
(4)	Ph11 CHARGE	Active charging phase (Ph11) Status of the battery charger. (CHARGE)
(5)	-- Messages	Possible fault or status messages (none showing on sample screen)

MONITOR2

ROW	EXAMPLE	DESCRIPTION
(1)	43.4V 35A	Instantaneous Battery Voltage (43.4V) and Output Current (35A)
(2)		Active charging profile indicating : <ul style="list-style-type: none"> - Phase completed (bold line) - Active phase (flashing line) - Phases pending (Thin line)
(3)	7Ah Ph11 13m22s	Ah provided to battery in active cycle (7Ah) Charging time in hours, min, sec. (13m22s)
(4)	-- Message	Possible fault or status messages (none showing on sample screen)

MONITOR3

ROW	EXAMPLE	DESCRIPTION
(1)	CYCLE N= 53 – Ph 2	Charging cycle number (53) and active phase (2)
(2)	C1ID=1PB ST_01.0001	Unique code number for the active charging curve
(3)	Vbif=2.39V/el = 57.4V	Voltage of the battery in initial phase. Shown as volts per element i.e. volts per cell (2.39) and as total voltage (57.4)
(4)	Vbef=2.40V/el = 57.7V	Voltage of the battery at the end of the active phase. Shown as volts per element i.e. volts per cell (2.40) and as total voltage (57.7)
(5)	Ibif= 33A Ibef= 21A	Current provided at the beginning of the phase (33A) Current provided at ten end of the phase. (21)
(6)	Tf =0h0m Tef=0hm	Elapsed time of the active phase (0h0m) Total charging time at the end of the phase (0h0min)
(7)	Ahf= 0 AhEf = 0	Ah output in the active phase (0) Total Ah returned to the battery. (0)
(8)	-- Message	Possible fault or status messages (none showing on sample screen)

TROUBLESHOOTING

If the charger display fails to light up - check the AC connection and power.
 If the display light up but the charger does not start – check the last line of the Monitor1 display for any possible error messages. This will show the class of the fault.
 The Monitor 2 screen will show the detail of the fault – code and description.

If the charge is interrupted during the charging process the display will show as follows:

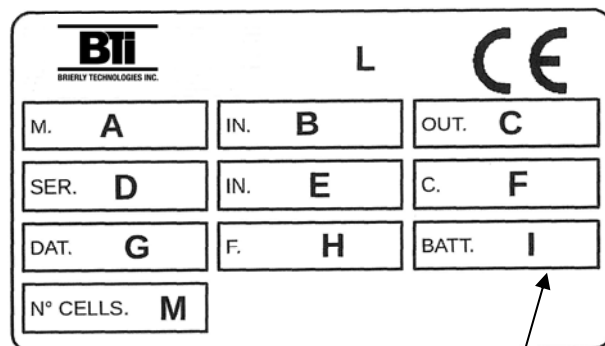
GREEN LED (DL4)	YELLOW LED (DL3)	GREEN LED (DL2)	RED LED (DL1)	DESCRIPTION	DISPLAY
OFF	OFF	OFF	OFF	Indicates a BLOCKING fault has occurred	OFF
OFF	OFF	OFF	BL	Indicates a non-blocking fault has occurred	OFF

Use this information to pass to a service technician for analysis.

RATING PLATE

The rating label on the side of the unit provides the following details:

- A – model
- B – input voltage
- C – output voltage and current
- D – serial number
- E – input current
- F – charging curve
- G – date of manufacture
- H – input fuse value
- I – battery capacity range
- L – product certification marking
- M – number of cells



NOTE: The rating plate stipulates the initial setting of DC output voltage and current (C) and plus charging curve (F). The setting of your particular unit may be different. Refer to the programming of the charger in the display screen as described above.

TECHNICAL DATA

- Storage Temperature Range: - 20 to +50 degrees Celcius
- Relative Humidity Range: 0 – 80% up to 50 degrees C
- Operating Temperature Range: 0 to +40 degrees Celcius
- The following tables provides electrical specifications and fuse ratings for each model.

Elite PRO 2

TYPE		AC Fuse (120Vac)	AC Fuse (200-208Vac)	AC Fuse (240Vac)	D.C. FUSE	
					MERSEN (Ferraz Shaumut)	COOPER BUSMAN
V	(A)	(A)	(A)	(A)	Model	Model
12	40	8,0	4,0	4,0	URGS 17/50	50LET
12	45	8,0	6,0	4,0	URGS 17/60	63LET
12	50	8,0	6,0	4,0	URGS 17/80	80LET
12	60	10,0	6,0	6,0	URGS 17/80	80LET
12	70	12,0	8,0	6,0	URZ 17/100	100LET
24	40	15,0	8,0	8,0	URGS 17/50	50LET
24	45	15,0	10,0	8,0	URGS 17/60	63LET
24	50	20,0	10,0	8,0	URGS 17/80	80LET
24	60	20,0	12,0	10,0	URGS 17/80	80LET
24	70	25,0	15,0	12,0	URZ 17/100	100LET
24	80	30,0	15,0	15,0	URZ 17/100	100LET
36	30	15,0	10,0	8,0	URGS 17/50	50LET
36	35	20,0	10,0	10,0	URGS 17/50	50LET
36	40	20,0	12,0	10,0	URGS 17/50	50LET
36	45	25,0	15,0	12,0	URGS 17/60	63LET
48	25	20,0	10,0	8,0	URGS 17/35	35LET
48	30	20,0	12,0	10,0	URGS 17/50	50LET
48	35	25,0	15,0	12,0	URGS 17/50	50LET
48	40	30,0	15,0	15,0	URGS 17/50	50LET
72	15	15,0	10,0	8,0	URGS 17/25	25LET
72	20	20,0	12,0	10,0	URGS 17/25	25LET
80	10	12,0	8,0	6,0	URGS 17/25	25LET
80	15	20,0	10,0	8,0	URGS 17/25	25LET
80	20	25,0	15,0	12,0	URGS 17/25	25LET

AC Fuse: UL Listed, one of following family:

MERSEN USA NEWBURYPORT-MA L L C, Series TRM COOPER BUSSMANN LLC Series FNQ LITTELFUSE INC, Series FLM

DC Fuse one of following family:

Mersen USA, Series URGS/URZ or COOPER BUSSMANN LLC, Series LET

Elite PRO 4

TYPE		AC Fuse (200-208Vac)	AC Fuse (240Vac)	D.C. FUSE	D.C. FUSE
				MERSEN (Ferraz Shaumut)	COOPER BUSMAN
V	A	(A)	(A)	Model	Model
24	80	15,00	15,00	URZ 17/100	100LET
24	90	20,00	15,00	URZ 17/125	125LET
24	100	20,00	20,00	URZ 17/125	125LET
24	120	25,00	20,00	URZ 17/160	160LET
36	50	15,00	12,00	URGS 17/80	80LET
36	60	20,00	15,00	URGS 17/80	80LET
36	70	20,00	20,00	URZ 17/100	100LET
36	80	25,00	20,00	URZ 17/100	100LET
36	90	25,00	25,00	URZ 17/125	125LET
36	100	30,00	25,00	URZ 17/125	125LET
48	40	15,00	15,00	URGS 17/50	50LET
48	45	20,00	15,00	URGS 17/60	63LET
48	50	20,00	20,00	URGS 17/80	80LET
48	60	25,00	20,00	URGS 17/80	80LET
48	70	30,00	25,00	URZ 17/100	100LET
48	80	30,00	25,00	URZ 17/100	100LET
48	90	30,00	30,00	URZ 17/125	125LET
48	95	30,00	30,00	URZ 17/125	125LET
72	25	15,00	12,00	URGS 17/35	35LET
72	30	20,00	15,00	URGS 17/50	50LET
72	35	20,00	20,00	URGS 17/50	50LET
72	40	25,00	20,00	URGS 17/50	50LET
72	45	25,00	25,00	URGS 17/60	63LET
72	50	30,00	25,00	URGS 17/80	80LET
72	60	30,00	30,00	URGS 17/80	80LET
80	25	15,00	15,00	URGS 17/35	35LET
80	30	20,00	20,00	URGS 17/50	50LET
80	35	25,00	20,00	URGS 17/50	50LET
80	40	25,00	25,00	URGS 17/50	50LET
80	45	30,00	25,00	URGS 17/60	63LET
80	50	30,00	30,00	URGS 17/80	80LET

AC Fuse: UL Listed, one of following family:

MERSEN USA NEWBURYPORT-MA L L C, Series TRM COOPER BUSSMANN LLC Series
FNQ LITTELFUSE INC, Series FLM

DC Fuse one of following family:

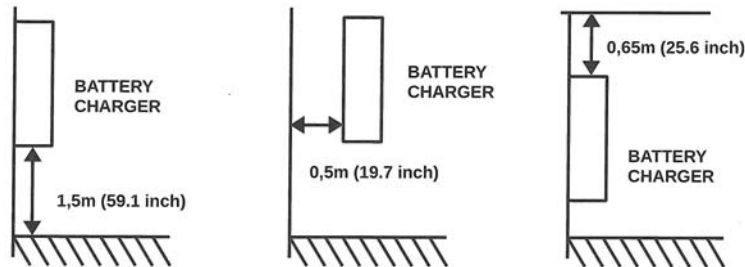
Mersen USA, Series URGS/URZ or COOPER BUSSMANN LLC, Series LET

INSTALLATION

The battery charger should be placed as far away from the batteries as the DC cable length permits. This prevents gasses produced and/or emitted by the battery from corroding or otherwise damaging the charger.

Do not install the battery charger in a closed space or in such a way as to prevent ventilation. See illustration below for recommended floor, wall and ceiling clearances.

Do not use outdoors. Do not expose to rain, water splashes or steam. Do not install near heat sources or an areas with high concentrations of dust. Do not install near any sources of flammable material such as gases or fuels. Do not place or fit the charger on or near surfaces manufactured out of combustible materials such as wood.



AC CONNECTION

This charger is cULuc Listed. Units are supplied without an AC plug to connect to the AC power supply. Supply of an appropriate plug for connection to AC must to be performed only by skilled personnel.

In some cases the chargers are supplied without AC cables. In this case the installer can note the following:

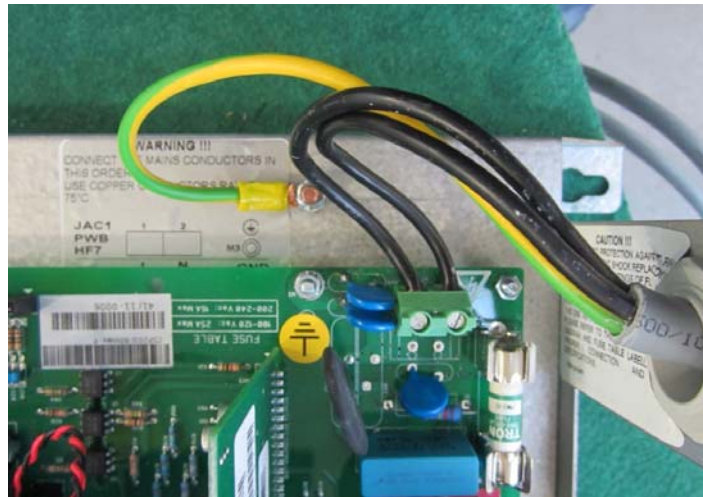
There are knock-outs on the charger with the diameters listed in the table below. The table shows the diameter of the strain relief for each kind of hole and the diameter of the power cord for which it is suitable.

Intended Conduit Size (inches)	Hole Diameter (mm)
1/2	22.2
3/4	27.8

The person connecting charger to AC has to correctly dimension the power cord, depending on the input fuse as described on the rating plate. In addition, he has to decide which strain relief has to be used and in which hole the strain relief has to be installed.

The connection has to follow the arrangement as shown on the label set above the connection terminals. (see image below)

The input cord has to be secured so as to not touch sharp metal parts or heating elements (such as the power transformer). As shown on the labels, use copper conductors rated min. 75° C. / 167° F.



It is essential to connect the charger to a mains supply of standards corresponding to the power of the battery charger installed.

SINGLE-PHASE 120/200-208/240 VAC / 50-60Hz (2 poles + earth).
Make sure to earth the charger properly.

REPAIRS

Repairs must only be carried out by qualified personnel.
Use only original equipment manufacturers (OEM) parts for repairs.

ELECTROMAGNETIC COMPATIBILITY

This battery charger complies with the following standards:
EN 55014-1 (Emission)
EN 55014-2+A1+A2 Immunity – Category II)
EN 61000-3-2 (Harmonic Current Emission)
EN 6100-3-3 (Voltage Fluctuation and Flicker)

SAFETY AND ELECTRICAL APPROVALS

EN 60335-2-29: "SAFETY OF HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCE – PART 2; PARTICULAR REQUIREMENTS FOR BATTERY CHARGERS".

EN 62233: MEASUREMENT METHODS FOR ELECTROMEGNETIC FIELDS OF HOUSEHOLD APPLIANCES AND SIMILAR APPARATUS WITH REGARD TO HUMAN EXPOSURE".

