

## INSTRUCTIONS FOR USE

### Pulse battery charger AP-800

12V 50A, 24V 28A, 36V 19A, 48V 14A, 60V 11A, 72V 10A



#### CHARGER CHARACTERISTICS

- Charger that can "listen" to the chemistry of the battery
- **Fast, smooth and battery friendly charging**
- Battery itself determines charging current under supervision of Intelligent microprocessor pulse charging system
- **8 charging programs for different type of batteries**
- There is no warming up effect, which reduces battery life at overcharge
- **4 charging phase: bulk charge, absorption, equalization, float charge**
- Regenerate cells majorly, when they were charged improperly- Battery desulfatization effect
- **Pulse-charging prolong the battery life**
- Safe against short-circuit
- **Safe against wrong polarity by connecting battery on the charger**
- Automatic battery detector (yellow LED)
- Precise charging indicator (green LED)
- Simple signaling of green, red, yellow LED and acoustic buzzer
- **"Burst Charge" button** for completely discharged battery
- Working temperature range from 0° to 35°C
- Charging is independent of oscillations in the supply voltage (PWM technology)
- **Desktop or mounting version.**

**CHARGER OVERVIEW (MOUNTING VERSION)**



**DESKTOP VERSION (OPTION)**



## HOW TO USE THE BATTERY CHARGER AP-800

The battery charger is designed to charge only 12V, 24V, 36V, 48V, 60V or 72V lead (Pb) batteries, depending on the type of charger. **Check if the charger and battery have the same voltage!**

▶ Plug the charger (230Vac cable) into the mains.
▶ Switch on the main supply switcher (POWER) on back of the charger.
▶ The device responds with a short beep and all three LED blinks briefly, the charger is ready to charge.
▶ <b>BLACK</b> on – poll of the battery
▶ <b>RED</b> on + poll of the battery
▶ At correct connection device short beeps and the yellow LED starts blinking. The battery is charging.
▶ When the battery is full, GREEN LED indicator lights on.

**Tip:** The battery is fully charged only a few hours after the green LED light is on. You can use the battery immediately after the green LED flashes when the charge is up to 90%, but it is recommended at least 1x per month to leave the battery on the charger to be fully charged.

**Warning:** If the battery is properly connected and all three LED blinks, but the charger does not charge, then the battery is over-discharged. Press the "**BURST**" button on the front panel of the charger to activate forced charging (instruction- page 6).

## LEGEND OF LED SIGNALS WHILE CHARGING THE BATTERY

LED	LED activity	Charge phase	battery charge level
<b>RED, YELLOW, GREEN</b>	short blink all LEDs	charger is ready (Ready)	/
<b>YELLOW</b>	blinks	bulk charge (Bulk)	< 65%
<b>YELLOW</b>	continuously lit	absorption I charge (Abso1)	65..75%
<b>GREEN</b>	blinks	absorption II charge (Abso2)	75..90%
<b>GREEN</b>	2x fast blink	equalization charge (Equal)	90..95%
<b>GREEN</b>	continuously lit	float charge (Float)	>95%
<b>RED</b>	continuously lit	temperature off (Error)	/

## CHARGING PROGRAMS

<b>"UNIVERSAL"</b>	universal program, used for unrecognized types of batteries
<b>"STANDARD"</b>	standard Pd program, used for older types of Pb batteries
<b>"CaCaWET"</b>	Pb Ca/Ca program, is used for starting maintenance free batteries
<b>"AGM"</b>	Pb with acid swab, used for hermetic AGM batteries
<b>"GEL"</b>	Pb GEL electrolyte program, used for hermetic GEL batteries
<b>"LeadCry"</b>	Crystal Pb-LC (SIPBE) program, used to lead Si crystal battery
<b>"TRACTION"</b>	Pb Traction program, used for Traction Lead with liquid electrolyte

## SELECTING CHARGING PROGRAM DEPENDS ON THE BATTERY TYPE

To set the correct charging program it is necessary to remove the cover. There are 4 screws on both sides. Unscrew them. Before that switch off the charger from the mains or off the main switch. Disconnect the battery from the charger and wait for all LED on the front panel to turn off. We can choose between 8 types of lead-acid batteries. With the jumper **JP1** and **JP2** and **JP3** set the program. The choice depends on the battery type.

JP3	JP2	JP1	Tip baterije
open (0)	open (0)	open (0)	Universal program ( <b>UNIVERSAL</b> )
open (0)	open (0)	connect (1)	Standard Pb program ( <b>STANDARD</b> )
open (0)	connect (1)	open(0)	Pb Ca/Ca program ( <b>CaCaWET</b> )
open (0)	connect (1)	connect (1)	Pb with acid swab program ( <b>AGM</b> )
connect (1)	open (0)	open (0)	Pb GEL electrolyte program ( <b>GEL</b> )
connect (1)	open (0)	connect (1)	Cristal Pb-LC p. ( <b>Lead cristal</b> ) >100Ah
connect (1)	connect (1)	open (0)	Cristal Pb-LC p. ( <b>Lead cristal</b> ) <100Ah
connect (1)	connect (1)	connect (1)	Pb Traction program ( <b>TRA</b> )

## DESCRIPTION OF CHARGE PHASE

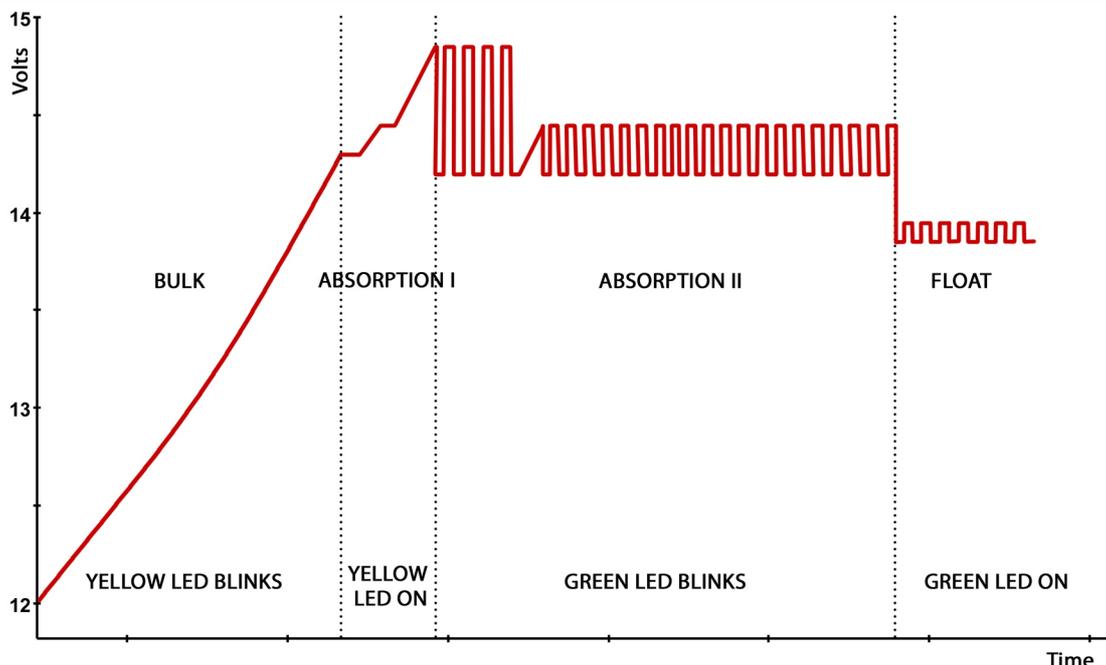
Charge phase:		Description:
<b>Bulk</b>	<b>BULK CHARGE</b>	Charges the battery up to 65%, delivering a lot of energy to the battery in a short time.
<b>Abso 1</b>	<b>ABSORPTION I</b>	The charge is slowed down so that the battery absorbs more energy. The battery reaches 65..75% of the capacity.
<b>Abso 2</b>	<b>ABSORPTION II</b>	Charge current is gradually reduced. The battery reaches 75..85% of the capacity.
<b>Equal</b>	<b>EQUALIZATION</b>	At this phase, levels between different filled cells are equalized. The battery reaches 90..95% of the capacity.
<b>Float</b>	<b>FLOAT CHARGE</b>	Keeps the battery at 100% of the capacity without causing damage to the battery. Also, can not over-charge the battery.

## CHARGING VOLTAGE RELATING TO CHARGE PHASE

The table below shows the charging voltage per cell in the battery. The charging voltage per cell are indicated for each charging profile or for each type of battery and charging phase.

	(Bulk) V/cel	(Absorption I) V/cel	(Absorption II) V/cel	(Equalization) V/cel	(Float) V/cel
<b>Universal</b>	1.. 2,355	2,430	2,397	/	2,20..2,30
<b>Standard</b>	1.. 2,355	2,460	2,410	2,490	2,25..2,30
<b>Ca/Ca WET</b>	1.. 2,355	2,600	2,550	2,660	2,25..2,30
<b>AGM</b>	1.. 2,355	2,470	2,450	2,510	2,25..2,38
<b>GEL</b>	1.. 2,355	2,400	2,380	/	2,25..2,30
<b>Lead crystal</b>	1.. 2,355	2,460	2,380	/	2,316..2,325
<b>Traction</b>	1.. 2,355	2,580	2,400	2,630	2,28..2,32

## CHARGING DIAGRAM



## DESCRIPTION OF THE PULSE BATTERY CHARGING TECHNOLOGY

Pulse charging system is electrode specific charging system; it is new technology of battery charging. It presents a small revolution on this area, because the results in practice are drastically better. With this technology is possible very fast and very precise charging, because only electrochemical condition of battery "dictates" the charging phase and charging current, which is momentarily correctly for the battery.

When charging with pulse charger AP-800, does not come to the gasification of the electrolyte and heating up, that destroys (breaks) cell lead-acid batteries. So as a result, pulse charging majorly prolong battery life and shortens the charging time.

Your experience with this charging method please send to [info@eyra-elektronika.si](mailto:info@eyra-elektronika.si).

## HOW AND WHEN TO USE THE BURST CHARGING

When charging an overdischarged battery which has a voltage below 6V (at 12V charger), the system does not start charging, even though the charger is properly connected. In this case, press the "**BURST**" button on the front panel of the charger to activate forced charging with the single-pulse. If necessary, press the button several times, up to 100x, until a short beep is heard and a voltage of 6V is reached at 12V charger (For the other chargers, see table below). From then on the system automatically starts charging.

Charger model:	AP-800 12V	AP-800 24V	AP-800 36V	AP-800 48V	AP-800 60V	AP-800 72V
Start charge at:	<b>6V</b>	<b>12V</b>	<b>18V</b>	<b>24V</b>	<b>30V</b>	<b>36V</b>

## OPERATIONAL PROBLEMS

Error	Cause	Solution
The charger is connected to the mains, power switch is ON. LED not flashing.	- there is no able mains voltage 230Vac	- ensure supply voltage 230Vac
Battery is connected but the charger is not charging, all LED blinking.	- to low voltage on the battery (Over-discharged battery)	- press BURST button
Red LED is on.	- devices has overheated due to high ambient temperatures - fan error	- decrease temp. of environment - service intervention - clean up fan

## WARNING!

- The charger is designed for indoor use (do not expose the charger to rain).
- Charger AP800 48V/14A can not use unauthorized person!
- During charging ensure adequate ventilation!
- Never hold with hand red and black crocodile + and – and push BURST button!
- We recommend disconnecting the battery from the car if the CaCaWET or Traction charging program is used.
- The charger AP-800 has a built-in security feature that prevents the automatic charging start if charger detects an over-discharged battery. **Over-discharged battery could be in damage.** Therefore, the charger will start only if you press the »Burst button« Sometimes it is necessary to press it several times, up to 100x, until a voltage of 6V is reached at 12V charger (For the other chargers, see technical data), then the system automatically starts charging. **From this moment on, the user is obliged to control the charging of batteries. Because in case of a defect on the battery, it can overheat, begin to gasify and in extreme cases may happen an explosion and /or a fire.**

**TECHNICAL DATA OF THE CHARGER**

Model		AP-800 12V 50A	AP-800 24V 28A	AP-800 36V 19A	AP-800 48V 14A
Output	Bulk charge voltage	14,6V yellow LED	29,2V yellow LED	43,8V yellow LED	58,4V yellow LED
	Float charge voltage	13,7V green LED	27,4V green LED	41,1V green LED	54,8V green LED
	Pulse current-eff	50A	28A	19A	14A
	Battery capacity	50Ah (min)	25Ah (min)	20Ah (min)	15Ah (min)
	Battery type	GEL, AGM, CaCaWET, traction, universal, standard, Lead crystal			
	Charging mode	intelligent pulse charging, 20Hz			
	Charge phases	bulk / absorption I / absorption II / equalization float			
Input	Mains voltage	185V-265Vac			
	Mains frequency	40-65 Hz			
	Power factor	> 0,95 at all volt. range, active PFC			
	Efficiency	91%	92%	93%	94%
	Input current	8.5Aeff at 105Vac, 5Aeff at 180Vac, 4Aeff at 230Vac			
	Inrush current	cold start 23A			
	Leakage current	< 3,5mA / 240Vac, class I			
Protect	Short circuit	save, no voltage on output if battery is no connect			
	Start charge at	6V	12V	18V	24V
	Reverse polarity	save, active protect, acoustic buzzer active, Error on LCD			
	Over temperature	automatically disconnect charge current and red LED is active			
	Cooling	active with fan, 5 speeds			
Environment	working temperature	0-35 °C			
	IP protect	IP20			
	Temperature compensation	+2mV/°C /cel, if temp < 15°C and -2mV/°C/cel, if temp > 25°C, for SiPb battery: +4mV/°C/cel, if temp <15°C and -4mV/°C/cel., if temp >25°C			
Other	Weight	4kg			
	Dimensions	350 x 170 x 100 mm (L x W x H)			
	Signals	red, yellow, green LEDs & buzzer sound			
	Use area	nautics, industry, workroom, labs, el. vehicle, el. scooter, el. vessels, car service...			
	Assembling	desktop or wall mounting			

Model		AP-800 60V 11A	AP-800 72V 10A		
Output	Bulk charge voltage	73V yellow LED	87,6V yellow LED		
	Float charge voltage	68V green LED	81,7V green LED		
	Pulse current-eff	11A	10A		
	Battery capacity	15Ah (min)	10Ah (min)		
	Battery type	GEL, AGM, CaCaWET, traction, universal, standard, Lead crystal			
	Charging mode	intelligent pulse charging, 20Hz			
	Charge phases	bulk / absorption I / absorption II / equalization float			
Input	Mains voltage	185V-265Vac			
	Mains frequency	40-65 Hz			
	Power factor	> 0,95 at all volt. range, active PFC			
	Efficiency	94,00%	94,00%		
	Input current	8.5Aeff at 105Vac, 5Aeff at 180Vac, 4Aeff at 230Vac			
	Inrush current	cold start 23A			
	Leakage current	< 3,5mA / 240Vac, class I			
Protect	Short circuit	save, no voltage on output if battery is no connect			
	Start charge at	30V	36V		
	Reverse polarity	save, active protect, acoustic buzzer active, error on LCD			
	Over temperature	automatically disconnect charge current and red LED is active			
	Cooling	active with fan, 5 speeds			
Environment	working temperature	0-35 °C			
	IP protect	IP20			
	Temperature compensation	+2mV/°C /cel, if temp < 15°C and -2mV/°C/cel, if temp > 25°C, for SiPb battery: +4mV/°C/cel, if temp <15°C and -4mV/°C/cel., if temp >25°C			
Other	Weight	4kg			
	Dimensions	350 x 170 x 100 mm (L x W x H)			
	Signals	red, yellow, green LEDs & buzzer sound			
	Use area	nautics, industry, workroom, labs, el. vehicle, el. scooter, el. vessels, car service...			
	Assembling	desktop or wall mounting			

**SERVICE AND GUARANTEE**

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**GUARANTEE STATEMENT**

**Guarantee conditions:**

1. The guarantee is valid for 24 months from the date of sale.
2. The guarantee repairs are carried out exclusively by an authorized service center.
3. The guarantee applies only to the charger, and not to any other device connected to this module.
4. The guarantee and liability does not include any fees, postal costs, damages and any costs related to the failure of this device.
5. The guarantee does not apply to batteries, mechanical damage or lightning strikes.
6. The guarantee does not apply if the device was mounted or used in violation of the instructions.
7. The guarantee does not apply if an unauthorized person interferes with the device.
8. If, during the guarantee period the device is not repaired within 45 days from the date of receipt in our service center, we are obliged to replace it with a new one.
9. The guarantee period shall be extended for the period of repair.
10. The original invoice must be submitted for the enforcement of the guarantee.

seller :

**company:**

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**name and surname of the seller:**

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**signature of the seller:**

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**date of sale:**

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**stamp:**

