INSTRUCTIONS FOR USE

Pulse battery charger AP–17
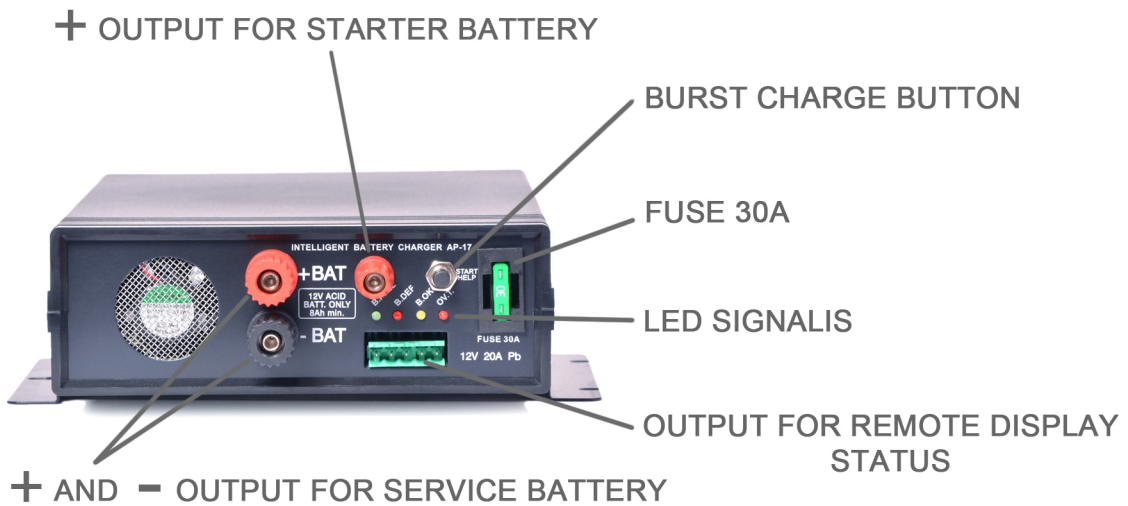## 12V 19A + 12V 1A (two outputs)

CHARGER CHARACTERISTICS

- **Pulsed charge current**
- configurable mode of operation; **charger or buffer**
- Charger that can "listen" to the chemistry of the battery
- **Fast, smooth and battery friendly charging**
- Battery determines charging current by itself under supervision of Intelligent microprocessor pulse charging system
- **4 charging programs**, **UNI** (universal), **AGM**, **GEL**, **CaCaWET** starter battery
- 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
- **Allows charging the starter battery**
- Precise full charge indicator (green LED)
- Working temperature range from 0º to +35ºC
- **"Burst Charge" button for completely discharged battery**
- Charging is independent of oscillations in the supply voltage (PWM technology)
- **External indicator connector**
- Console for mounting (option)

CHARGER OVERVIEW

+ AND − CONNECTING CABLE (OPTION)

CABLE WITH PLUG 230V$_{AC}$

SWITCH ON /OFF

MOUNTING CONSOLE (OPTION)

CONTROL PANEL OF CHARGER

+ OUTPUT FOR STARTER BATTERY

BURST CHARGE BUTTON

FUSE 30A

LED SIGNALIS

OUTPUT FOR REMOTE DISPLAY STATUS

+ AND − OUTPUT FOR SERVICE BATTERY

LEGEND OF LED SIGNALS WHILE CHARGING THE BATTERY

LED	LED activity	Charge phase	battery charge level
RED, YELLOW, GREEN	short blink all LEDs	charger is ready (Ready)	/
YELLOW	blinks	bulk charge (Bulk)	< 65%
YELLOW	continuously lit	absorption I charge (Abso1)	65%...75%
GREEN	blinks	absorption II charge (Abso2)	75%...85%
GREEN	2x fast blink	equalization charge (Equal)	85%...90%
GREEN	continuously lit	float charge (Float)	>90%
RED	continuously lit	temperature off (Error)	/

INSTRUCTIONS FOR CONNECTING THE CHARGER WITH BATTERY

Battery charger AP-17 is suitable for charging only 12V acid batteries from all together capacity of min. 10Ah. Max. capacity of charged battery is not limited. Battery charger AP-17 is for (we recommend that the charging time is not too long) battery systems up to 400Ah total capacity.

Connect battery and charger polls with a wire of at least 4 mm^2 wire, use 6mm^2 for longer distances.

|	
▸	Plug the charger (230Vac cable) into the mains.
▸	Switch on the main supply switcher (POWER) on back of the charger.
▸	All three LEDs flash briefly, the charger is ready to charge.
▸	**BLACK** on **–** poll of the battery
▸	**RED** on **+** poll of the battery
▸	At correct connection YELLOW LED indicator lights on. The battery is charging.
▸	When the battery is full, GREEN LED indicator lights on.
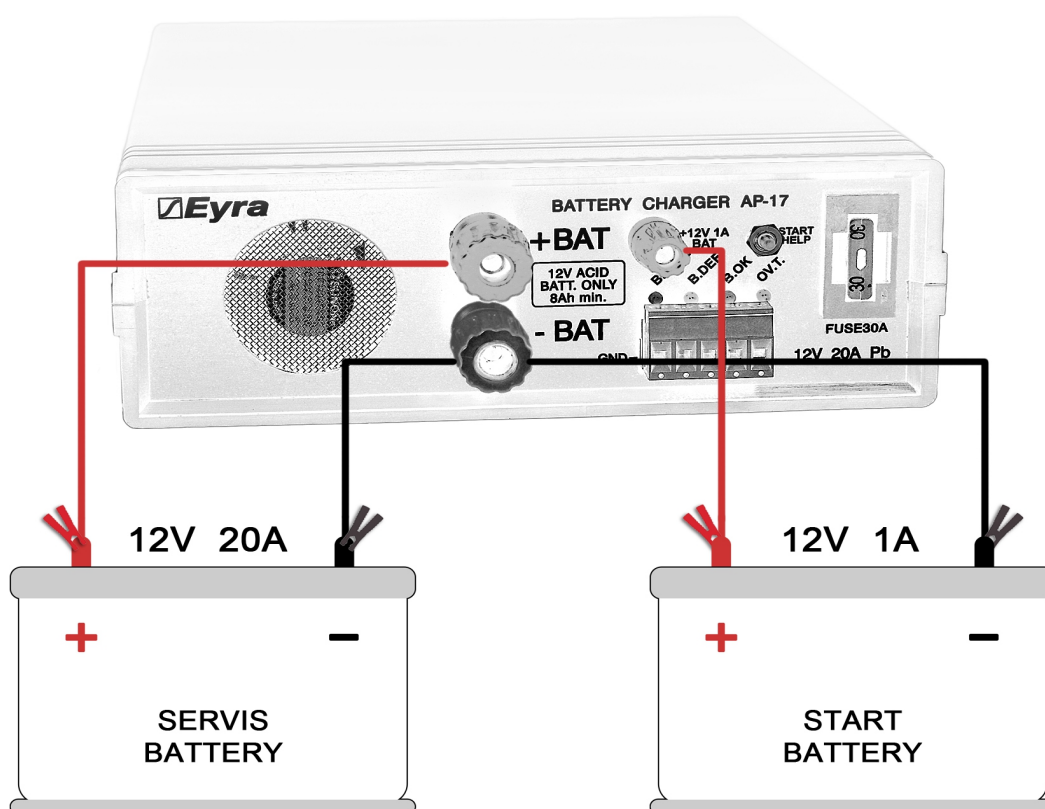
CHARGING PROGRAMS

There are 3 jumpers inside the device, which are used to set charging programme. To do that, we first unplug the device from socket. On bottom of the case, we unscrew 4 bolts and remove cover. There are 3 jumpers on the smaller power circuit board, which we use for setting charging programme and device operation mode. Charger has 4 charging programmes: universal programme - **UNI**, programme for wet hermetic start battery **CaCaWET**, programme for **AGM** battery and programme for **GEL** battery. Setting the charging mode enables the device to operate either as **charger** (it charges battery until it is full) or as a battery-**buffer** (battery is constantly connected to charger and is providing power for load, such as light, refrigerator in case of caravan, boat or sailboat).

Mode	JP3	JP2	JP1	Type of battery
Charger	Conect (1)	Conect (1)	Conect (1)	**UNI** (Universal)
Charger	Conect (1)	Conect (1)	Disconect(0)	**CaCaWET**
Charger	Conect (1)	Disconect(0)	Conect (1)	**AGM**
Charger	Conect (1)	Disconect(0)	Disconect(0)	**GEL**
Buffer	Disconect(0)	Conect (1)	Conect (1)	**UNI** (Universal)
Buffer	Disconect(0)	Conect (1)	Disconect(0)	**CaCaWET**
Buffer	Disconect(0)	Disconect(0)	Conect (1)	**AGM**
Buffer	Disconect(0)	Disconect(0)	Disconect(0)	**GEL**

Illustration of jumpers in the battery charge controller.

With the proper jumpers adjustment, we select the filling profile and the charging method **»charger«** or as a **»buffer«**

JP3 JP2 JP1
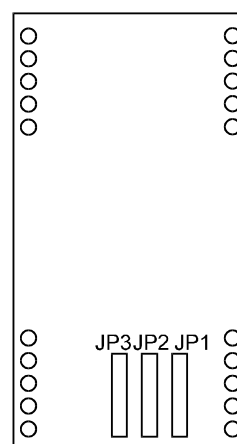
CHARGING PHASE

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

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-17, does not come to the gasification of the electrolyte and warming up, that destroys (breaks) cell lead-acid batteries. So as a result, pulse charging majorly prolong battery life and shortens the charging time.

We can say that pulse charging technology works as transformer between battery chemistry and signals that commands the charge. Each battery is treated individually. Your experience with this charging method please send to info@eyra-elektronika.si.

CHARGING DIAGRAM
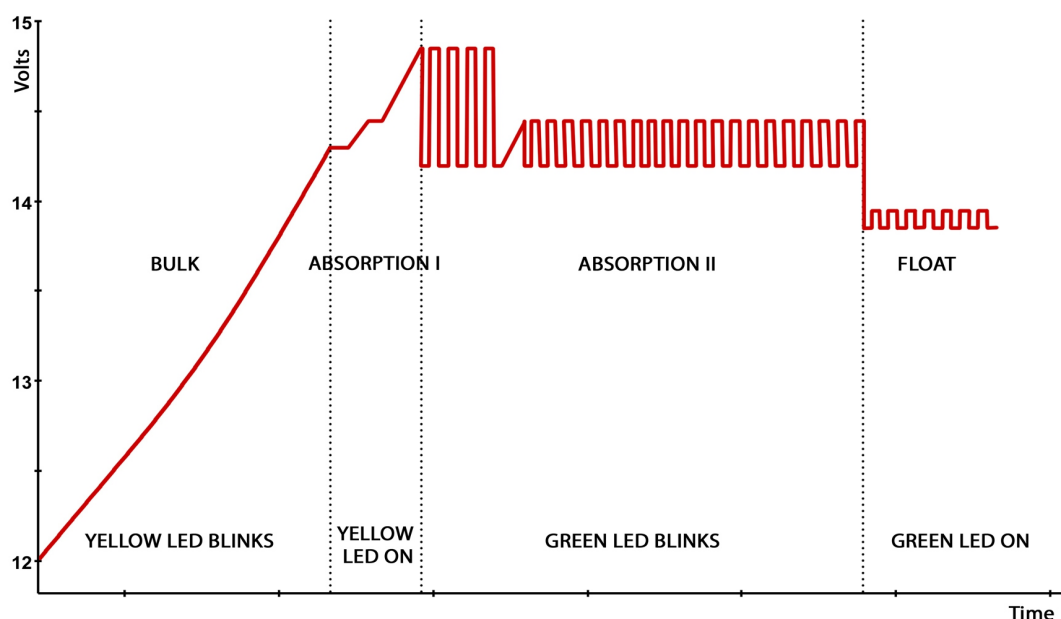
HOW AND WHEN TO USE THE BURST CHARGING

When charging an over-discharged battery which has a voltage below 6V, the system does not start charging, even though the charger is properly connected. In this case, press **START HELP** button to activate forced charging with the single-pulse. If necessary, press the button several times (up to 100x). When the 6V voltage is reached, the yellow LED flashes, then the system automatically starts charging.

CONNECTION OF OUTSIDE INDIKATOR

- Mount the control plate and connect it with coaxial cable as shown on picture right.

- Connect main supply to one of the fuse on the distribution plate.

- Interface for connection of outside indicator is galvanic separated and does not influence on the activity of the charger.
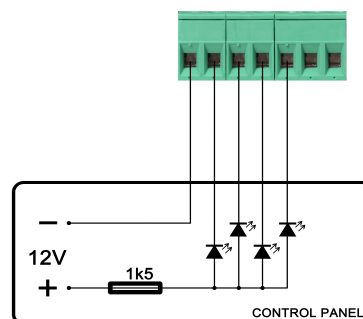
TECHNICAL DATA

- type of battery:	Pb battery, UNI (Universal), AGM, GEL, CaCaWET
- charge phases:	bulk / absorption I / absorption II / equalization / float
- capacity of battery:	min 10Ah, maximum is not limited
- battery voltage:	12V, extra battery (slave) 12V
- nominal charging current (max):	20A, intelligent pulse system, extra battery (slave) 1A
- charging current:	20A (pulse)
- charging mode:	pulse charging system 20Hz
- main voltage:	195V – 242VAC
- main voltage frequency:	40 – 60Hz
- max. power:	370 VA
- ambient temperature:	from 0 °C to +35 °C
- short contact output:	save, no voltage on output if battery is not connect
- wrong polarity output (main output):	fuse 30A (fuse burn)
- main input fuse:	T 3,15A (on the main grid side -230V)
- cooling:	fan controlled with thermostat
- dimensions:	170 x 60 x 245
- weight:	1,9 Kg
- IP protect:	IP20
- housing grounding:	housing grounded, Class I
- recommended battery capacity:	10...400Ah
- field of use:	caravaning, nautic, emergency vehicles, workshops, ...

TROUBLESHOOTING

Error	Cause	Solution
The charger is connected to the mains, power switch is ON. LED signals not blinks.	- there is no 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)	- use START HELP button
Red LED is on.	- devices has overheated - to high ambient temperatures - fan error	- reduce the ambient temperature - service intervention - clean up fan

WARNING!

- **The charger is designed for indoor use (do not expose the charger to rain).**

- **Polarity + and - must not be confused!**

- **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 charging program is used.**

- The charger AP-17 has a built-in security feature that stops the automatic charging start if charger detects an over-discharged battery. **Over-discharged battery could be in damage.** In this case press **START HELP** button to activate forced charging with the single-pulse. If necessary, press the button several times (up to 100x). When the 6V voltage is reached, the yellow LED flashes, 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.**

SERVICE AND GUARANTEE

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Slovenia

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e-mail: info@eyra-elektronika.si   http://www.eyra-elektronika.si

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: