INSTRUCTIONS FOR USE OF BATTERY CHARGER AND STARTING DEVICE ON WHEELS

FEATURES
- For charging lead batteries.
- 12-24 V Battery charger and starting device.
- Single-phase electrical power (follow the values shown on the unit)
- Thermostatic protection with automatic resetting against possible transformer overloads.
- Fuse on charge-start circuit against polarity inversions of the clamps.

HOW TO USE IT
1) Find out the voltage of the battery to be charged or the voltage of the electrical system in the motor vehicle that you want to start and then connect the terminal of the cable with black (—) clamp to the corresponding screw connection (29) of the unit.
2) Set switch
3) If the unit has the timer (28), set timer knob on OFF.
4) Connect clamps to battery: red (+) clamp to positive terminal post, black (—) clamp to negative terminal post.
5) Make sure that mains voltage corresponds to unit voltage and then connect mains supply cable (9) to mains socket (provided with ground).

BATTERY CHARGER
A) If the unit has the timer (28), set timer knob on ■.
B) Set switch knob (13) on ■ and choose correct regulation without exceeding the max. rated charging current of the unit.
C) For finding out the required charging current value, proceed as follows:
   - regular charging current = 12% of Ah capacity
   - Max. charging current = 25% of Ah capacity
EXAMPLE: 80 Ah battery / 20 hours rating:
   12% of 80 = 9.6 A regular charging current
   25% of 80 = 20 A max. charging current
D) If there is the timer (28), the unit can even carry out a preset fast charge (1 hour max.) by setting knob on ■ position. Reduce time to a minimum.

STARTING DEVICE
E) Turn motor vehicle ignition key and at the same time switch knob (13) to ■ position only for the time which is necessary to start the engine.

N.B.: When charging or starting are over, turn switch knob (13) to OFF before disconnecting clamps from battery terminal posts.

TECHNICAL NOTES
To check the state of charge in the batteries it is necessary to use a hydrometer. Following values refer to 25°C temperature.
- fully charged battery: 1.28 Kg/L = 32 Bé
- half charged battery: 1.2 Kg/L = 24.5 Bé
- flat battery: 1.12 Kg/L = 16 Bé
Batteries which are left flat are seriously damaged by sulfatation.
Battery electrolyte must not exceed 40°C during charging.
The battery is charged when:
a) voltage reaches 2.6 - 2.7 V in each element.
b) electrolyte density remains constant for 2 hours at the above mentioned values.

When several batteries have to be charged, providing that their voltage and capacity allow it, connection in series is preferable (see fig. 1). To avoid accumulation of dangerous gas, charge batteries in a ventilated area. Batteries must be charged without cell caps. Electrolyte level must be a few millimeters higher than lead plates in the cells.

CHECKING DISCONNECT THE UNIT
If unit fails to work, make sure that:
1) mains socket has voltage,
2) clamps are making good contact with battery posts,
3) screw connections (29) are well tightened,
4) fuse (27) is efficient (fuse is on the base (16) inside the unit),
5) battery is in good condition.

SERIES CONNECTIONS TO BE PREFERRED

CONNECTIONS TO BE USED ONLY, IF NECESSARY