Battery chargers mod. EKRI have been designed according to the resonance technology that guarantees a constant charging current when battery voltage increases and allows optimal charging with a duration up to 10 hours.

Moreover this technology has enabled the creation of a very light battery charger.

The logic unit is aided by a microprocessor that controls battery charger functioning and charging curves.

On the battery charger a display shows charging curves, charging data and error codes.

The different options may be selected by means of two buttons.

Before starting the procedure, the battery charger tests battery conditions and enables charging only in case of positive response.

--- MAIN TECHNICAL FEATURES ---

- Supply voltage:
  - 380V +/- 10% without neutral wire for three-phase models
  - 220V +/- 10% for monophase models

- Efficiency: 85%

- Running frequency: 50 KHz

- 5KV input / output insulation

- Grounded external case

- Possibility to disable traction through a relay (max. capacity: 10 Amp.)

- Lighter weight than traditional battery chargers:
  - 3.3 Kg. for the monophase CB 1K2
  - 6 Kg. for the three-phase CB 5K
  - 11 Kg. for the three-phase CB 10K

- Easy and practical installation of the battery charger on the vehicle as it does not absorb current from the battery when switched off.

- Easy vertical installation on a wall by hooks to insert in special holes.

- Possibility to select battery voltage by a selector (in three-phase models) or by a push button (in monophase models).
  The battery charger may also be supplied with single voltage. The supplied current is the same for all voltages, the max. power corresponds to the max. selectable voltage.

- Charging current is continuous and not pulse-like as in traditional battery chargers, with a lower deterioration of the battery.

- Protections against:
  - Output polarity reversal
  - Output short circuit
  - Battery charger overheating

The charging curves available are generally used for charging of lead-acid batteries. On request it is possible to create personalized charging curves.
RUNNING

Before charging, the display fitted on the charger shows the charging curves available and the current supplied during last charging (only if this has been correctly completed). When a new charging procedure starts the data are erased and updated with the new values.

During charging the following parameters are displayed:
- battery voltage (V/el)
- current supplied by the battery charger (Amp.)
- amount of current supplied to the battery (Amp/hour up to 999 Amp./hour and then tens of Amp./hour)
- charging curve and phase in use.

When charging starts the -CH- writing blinks for a few seconds indicating that the charger is testing the battery, then in the last phase, when charging has been completed, the display shows the curve number used.

When an error condition occurs, the letter E followed by a number (error code) appears on the display.

Use the key START/STOP to start or stop charging and the key SELECT to display the different options.

Before charging, the current supplied during last charge operation can be displayed striking and keeping struck the keys SELECT and then START/STOP.

The data are correct only if last charging has been correctly ended either by striking the key START/STOP or by normally reaching charging end. If mains voltage is interrupted, the data are erased.

USE

Once connected to the power supply, the battery charger switches on and waits for charging curve selection and starting.

- CB 1K2

The right side of the display shows battery voltage, the left side indicates the selected curve. To modify battery voltage strike and immediately release the key SELECT until the wanted voltage is displayed (after the last voltage available the values are shown again from the beginning). To modify the charging curve strike the key SELECT and release it when the desired curve is displayed.

- CB 5K and CB 10K

Select the battery voltage using the rotative selector on the battery charger and the curve striking the key SELECT. Strike the key START/STOP to start charging. At the end of this phase (20-30 sec.), if tests have obtained a positive response, the display shows the charging voltage. In case of negative response, charging ends and the display shows the error code. Strike the key START/STOP to exit this situation and return to the curve selection phase.

Charging may be interrupted whenever desired striking the key START/STOP.

If the battery is disconnected during charging, the procedure is interrupted and the error is signalled. In this case strike the key START/STOP to exit the error conditions and strike it again to re-start charging.

Error code meaning:
- E1-: battery voltage is not included in the range.
  The battery is damaged or the voltage selector is on the wrong position.
  It is important to pay attention to this last case, as the microprocessor could not recognize the error and perform an uncomplete battery charging (the selected voltage is lower than the battery one) or damage the battery with a charging overvoltage (the selected voltage is higher than the battery one). This error may occur during testing, after charging beginning.

- E2-: the battery is not connected to the charger or it has been disconnected during charging. This error may also indicate that the output fuse of the battery charger has been interrupted. The error may occur by striking the key START/STOP when starting the charge or by disconnecting the battery during charging.

- E3-: the battery charger does not supply current. The error may occur during testing after starting the charging.
  - E4-: battery charger overheating.
  - E5-: the data stored in the microprocessor are no longer available. When this error occurs it is necessary to reprogram the memory of the curves stored in the microprocessor.
  - E6-: the battery hasn't succeeded in reaching the charging voltage. This condition is often caused by a worn or damaged battery, but can even happen with a new battery during the first charging. In this case simply restart charging.

Whenever the above errors occur the battery charger switches off. To exit the error situation it is necessary to strike the START/STOP key and find out the anomaly cause. Otherwise, by starting again the charge procedure, the battery charger may fall in error again.

What to do in case of error:

- E1: Check voltage selector position and battery life conditions. Try to restart charging. If the error persists, consider the possible replacement of the battery.
- E2: Check the connection of the battery to the charger. If the output fuse of the charger is interrupted contact the assistance for its replacement.
- E3: Restart charging. If the error persists contact the assistance for a revision of the battery charger.
- E4: Check that ventilation grids of the charger are not obstructed or blocked and that the fan is perfectly working.
- E5: Contact the assistance to reprogram the microprocessor.
- E6: Check battery life conditions. Try to restart charging. If the error persists consider the possible replacement of the battery.

In case error conditions should persist even after careful tests, contact the assistance.

It is highly recommended not to tamper the battery charger for any reason.

Technical data are subject to modifications without prior notice.
MODEL CB 1K2 VOLTAGES AND SIZE

<table>
<thead>
<tr>
<th>CB 1K2</th>
<th>12 V</th>
<th>24 V</th>
<th>36 V</th>
<th>40 V</th>
<th>48 V</th>
<th>60 V</th>
<th>72 V</th>
<th>80 V</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 A</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
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<tr>
<td>40 A</td>
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MODEL CB 5K VOLTAGES AND SIZE

<table>
<thead>
<tr>
<th>CB 5K</th>
<th>12 V</th>
<th>24 V</th>
<th>36 V</th>
<th>40 V</th>
<th>48 V</th>
<th>60 V</th>
<th>72 V</th>
<th>80 V</th>
</tr>
</thead>
<tbody>
<tr>
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<td>●</td>
<td>●</td>
<td>●</td>
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<td>●</td>
</tr>
<tr>
<td>70 A</td>
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**MODEL CB 10K VOLTAGES AND SIZE**

<table>
<thead>
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<th>CB 10K</th>
<th>12 V</th>
<th>24 V</th>
<th>36 V</th>
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<th>80 V</th>
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</thead>
<tbody>
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</table>

* Upon request it is possible to have versions with a max. power of 140A at 96V.

N.B. All battery chargers are supplied with an emi-filter. However to comply with electromagnetic compatibility directives it is necessary to install an external filter.