



# ASSEMBLY

## Description

### Automatic enveloping and stacking machine

- Programmable with PLC.
- Nominal speed up to 100 enveloped plates per minute
- Machine covering in front with Polycarbonat glass doors

### *Plates*

The machine can envelope the positives plates or the negatives plates:

- Dry charge or unformed
- Casting grid or "expanded" or "continuous"
- Antimony or calcium lead
- Height 100-150mm
- Width 108 – 150mm
- Thickness 1-2,5mm

### *Elements*

The machine can prepare elements:

- with the external plate enveloped
- without the external plate enveloped
- with the same number the plates enveloped and no enveloped

### *Separator*

Polyethylene microporous separator

Manufacturer: ELBAK - mod. 100 CE/RB

Construction year: 1999

### Hole Punching Machine

The machine punches simultaneously five holes in the partitions of polypropylene containers.

The position of the punching heads is adjustable in order to punch different types of batteries.

The machine can be supplied with the punching heads mounted on two lines: for normal batteries or with one of the heads mounted on a third support in a transverse position, to suit the models with "U" layout (3 x 2).

The operation of the machine is hydraulic.

The machine is supplied complete with two set of punches: for car boxes and for truck boxes.

### Machine COS (Cast-on-Strap)

The machine is designed for 6-12 V starter batteries with groups of thickness between 23-120 mm.

The machine consists of 4 work stations linked by a rotary table.

The following operations are performed:

- Loading and group alignment on racks
- De-oxidizing and heating of lugs
- Immersion welding of groups
- Unloading of welded groups

Machine productivity: until 750 batteries per shift with groups of thickness up to 48 mm; 300 batteries per shift with groups of 49-120 mm thickness.

The machine is equipped with the Power control panel and programmable controller.

The machine is equipped with lead melting pot, 2 ton capacity designed for floor installation.

Heating is provided by a gas burner (about 150.000 Kcal/h gas LPG) with automatic ignition. Complete with thermocouple for temperature control.

Consumption: max about 7,5Nm<sup>3</sup>/h - Pressure: max about 40mbar

The machine is equipped with a lead metering and delivery system with return of lead to the pot. The lead feeding is controlled by a pneumatically operated poppet valve, synchronized with the casting m/c.

The duration of the flow is adjusted by means of a timer.

The feed line is insulated and electrically heated, with thermostatic control.

The system is composed of a lead rotary pump, a poppet valve, a lead feeding pipe

The machine is equipped with the mould to produce batteries elements

The mould is specific for each type of battery, complete of the resistance and cooling system.

The moulds are for the batteries:

L1 207x175x175 ou 190 height - 36Ah-55Ah

L2 241x175 x175 ou 190 height - 52Ah-65Ah

L3 276x175 x175 ou 190 height - 63Ah-80Ah

L5 303x175x175 ou 190 height - 83Ah-100Ah

DIN A 513x189x223 height - 110Ah-130Ah

DIN B 513x223x223 height - 140Ah-180Ah

DIN C 518x280x240 height - 180Ah-220Ah

Manufacturer: COSMEC

Construction year: 1998

#### Automatic polypropylene batteries assembly line

The line is intended for the production of SLI batteries with polypropylene containers, with the following characteristics:

- capacity between 36 and 200Ah
- total width between 135 and 300mm
- length between 160 and 520mm

Productivity: until 2 batteries per minute (until 100Ah) and until 1 battery per minute (over 100Ah).

The line consists of the following stations:

- Automatic High Voltage Testing Unit – All the elements are tested automatically on a programmed sequence; the batteries, which are found to be defective, are sent automatically to a rejection bench
- One operating head, carrying a couple of tongs, which are hydraulically closed with a straight horizontal movement. The welding is carried out by means of a high current pulse, whose intensity is previously set and is automatically controlled by an electronic equipment. For batteries with 3x2 cell layout the 90 degrees rotation of one head is pneumatically powered
- The welding control unit includes a electronic system for testing the connections: during each welding. When the system recognizes a defective welding, the battery is automatically switched to the rejection bench.
- Heat sealing machine (cover and box). The hot plates are mounted on a controlled, electrically-heated surface used for all batteries and the sealing equipment only consists of the jigs for different formats, which will be assembled in preset position
- Automatic post finishing – The station allows to burn together the battery terminal pillars. The unit is equipped with a gas electro valves system which reduces the feeding of the welding torch during the waiting times, in order to limit the consumption and also as a safety provision
- Automatic air leakage unit – The Air Leakage station is included for automatic checking of any leakage on the external or inter-cell walls of the battery. The unit tests first the cells 1-3-5, and subsequently the cells 2-4-6, with compressed air at 0,2-0,3 Atm. for a duration of 5 seconds. If any leakage is found the unit gives an alarm and the battery is automatically rejected. In this way leakage both between the cells and towards the outside are detected.
- Heat stamping unit – The station allows to stamp the code on the battery cover

The machine is equipped with tools for heat sealing station

The hot plates are completed with the resistances and the probe for temperature control.

The tools are manufactured in aluminium

The tools are for the batteries:

L1 207x175x175 ou 190 height - 36Ah-55Ah

L2 241x175 x175 ou 190 height - 52Ah-65Ah

L3 276x175 x175 ou 190 height - 63Ah-80Ah

L5 303x175x175 ou 190 height - 83Ah-100Ah

DIN A 513x189x223 height - 110Ah-130Ah

DIN B 513x223x223 height - 140Ah-180Ah

DIN B 518x280x240 height - 180Ah-220Ah

Manufacturer: Several

Construction year: 1998

#### Hydraulic system to lift the pallets

The system is placed at the end assembly line to lift the pallets and allows to unload the assembled batteries. Table "*U*" Profile.