ASSEMBLY LINE

For Automotive Battery Production
The Assembly Line is a set of highly flexible machines for assembling up to 6 batteries per minute.

Different levels of automation can be chosen. Starting from a semi-automatic line to a fully automatic solution.

The line is optimized for easy and central adjustment to different battery types, even while line is in use.

Central line adjustments for all battery types keep movements of working heads on all stations simple.

The optional SCADA-System enables central control and management of the line as well as running statistics.

All machines fulfil state of the art safety standards.

The automatic Assembly Line is essential for consistently reliable battery quality.

Based on our long experience, modern engineering, and proficiency, we offer a market oriented and efficient solution.
THE ASSEMBLY PROCESS

1. Battery Testing and Intercell Welding
2. Placing the Lid
3. Welding the Lid to the Box
4. Creating the Final Poles
5. Leakage Testing and Marking

THE ASSEMBLY MACHINE

- Short Circuit Tester and Intercell Welding Machine
- Lid Placer
- Heat Sealing Machine
- Post Welding Machine
- Leakage Control and Marking Machine

OPTIONS
- Magic Eye Setting Machine
- Assembly Software Support (SCADA)

Based on individual requirements we offer customized solutions.
The short circuit control head is equipped with automatic height regulation by recipe on the operator panel.

The intercell welding (through the partition) is done by parallel welding clamps.

Welding clamps are operated hydraulically for accurate control.

Linear movement of welding clamps prevents undesirable stress on straps.

The automatic intercell welding head is adjustable on three axes by recipe via the operator panel.

The battery conveyor is equipped with synchronizers, guides and stoppers.

The discarding bench is equipped with an eject cylinder and has a capacity of 3 batteries.

Accurate strap alignment for best welding results.

FOR TESTING AND INTERCELL WELDING

For car and truck batteries.

**Short Circuit Control Head:**
Tester 3,000 V, 100 mA type DHVT 3,000 VAC

**Intercell Welding Device:**
SAFCO type IP3/S 1650 (one per each head, max. 3 heads possible)

**CHARACTERISTICS**

<table>
<thead>
<tr>
<th>Performance</th>
<th>Single Welding Head</th>
<th>Double Welding Head</th>
<th>Triple Welding Head</th>
</tr>
</thead>
<tbody>
<tr>
<td>Container Length</td>
<td>175 - 500 mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Container Height</td>
<td>160 - 300 mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Container Width</td>
<td>125 - 275 mm</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**MACHINE DIMENSIONS (single welding head)**

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
<td>4,500 mm</td>
</tr>
<tr>
<td>Width</td>
<td>2,000 mm</td>
</tr>
<tr>
<td>Height</td>
<td>2,375 mm</td>
</tr>
<tr>
<td>Net Weight</td>
<td>1,800 kg</td>
</tr>
</tbody>
</table>

**UTILITIES**

<table>
<thead>
<tr>
<th>Utility</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Pressure</td>
<td>6 bar</td>
</tr>
<tr>
<td>Uncompressed Air Volume</td>
<td>5.4 m³/h</td>
</tr>
<tr>
<td>Electrical Power Consumption</td>
<td>16 kVA</td>
</tr>
</tbody>
</table>

Technical data may change.

**OPTIONS**

- Up to three electro welding heads
- Second short circuit control machine after intercell welding
- Roller conveyor for battery recirculation after reject bench
- Tools for different battery types
A sophisticated rack management system allows easy and user-friendly loading during operation.

The rotatable lid placing unit is equipped with pole detection system in order to always place the lid in correct position.

The lid placing machine is equipped with PLC and operation panel.

The storage racks are adjustable according to customer’s battery range.
Separated heating systems allow the creation of temperature differences of 20 - 30°C between box and lid.

Heating plates are manually changed quickly and easily; automatic change is available as well.

The welding temperature can be regulated automatically by recipe on the operator panel.

The lid handling system is equipped with mechanical hooking for quick manual change of tools.

The battery conveyor within the machine is equipped with synchronizers, guides and stoppers.

FOR WELDING THE LID TO THE BOX

Homogeneous temperature for the whole heating plate and innovative design for double heating plate facilitate a proper sealing process.

Heating plates are equipped with splitting heaters for easy maintenance of the tool. With one head you are able to process batteries with a maximum length of 350 mm.

<table>
<thead>
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</tr>
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<tbody>
<tr>
<td>Performance</td>
<td></td>
</tr>
<tr>
<td>Single Welding Head</td>
<td>up to 2.8 batteries/min.</td>
</tr>
<tr>
<td>Double Welding Head</td>
<td>up to 4 batteries/min.</td>
</tr>
<tr>
<td>Triple Welding Head</td>
<td>up to 6 batteries/min.</td>
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<td>Container Height</td>
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<tr>
<td>MACHINE DIMENSIONS (single welding head)</td>
<td></td>
</tr>
<tr>
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<td>2,000 mm</td>
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<tr>
<td>Height</td>
<td>2,375 mm</td>
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<tr>
<td>Net Weight</td>
<td>1,800 kg</td>
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<td>UTILITIES</td>
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</tr>
<tr>
<td>Air Pressure</td>
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<td>Uncompressed Air Volume</td>
<td>5.4 m³/h</td>
</tr>
<tr>
<td>Electrical Power Consumption</td>
<td>30 kVA</td>
</tr>
</tbody>
</table>

OPTIONS

- Automatic change system for heating plate and lid handler (including pre-heating system)
- Additional set of tools
The post welding head is equipped with automatic height regulation by recipe on the operator panel.

The welding torches are equipped with eccentrically adjustable devices.

The water cooled welding shells ensure optimally controlled thermal conditions.

Gas and oxygen regulation is done manually by pressure reducers.

A flow meter with capacity regulation device and graduated scale for reading the quantity of gas and oxygen ensures high-quality welding (option: automatic controlled valves).

The post welding head is equipped with oxyacetylene welding torches and welding bushes with cooling system.

Optionally, we offer post welding with hot-pin technology.

**FOR CREATING THE FINAL POLES**

The post welding head is equipped with automatic height regulation by recipe on the operator panel.

The welding torches are equipped with eccentrically adjustable devices.

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A flow meter with capacity regulation device and graduated scale for reading the quantity of gas and oxygen ensures high-quality welding (option: automatic controlled valves).

**CHARACTERISTICS**

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<tr>
<th>Performance</th>
<th>Single Welding Head</th>
<th>up to 4 batteries/min.</th>
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<tbody>
<tr>
<td></td>
<td>Double Welding Head</td>
<td>up to 6 batteries/min.</td>
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<td></td>
</tr>
</tbody>
</table>

**MACHINE DIMENSIONS (single welding head)**

| Length               | 2,650 mm            |
| Width                | 1,800 mm            |
| Height               | 2,500 mm            |
| Net Weight           | 1,200 kg            |

**UTILITIES**

| Air Pressure         | 6 bar               |
| Uncompressed Air Volume | 3 m³/h            |
| Electrical Power Consumption | 3 kVA             |

Technical data may change.

**OPTIONS**

- Gas heated hot-pin
- Connection conveyor with manual post welding unit
- Automatic gas flow regulation valves
- Automatic post welding machine for car and truck batteries
FOR LEAKAGE TESTING AND MARKING

Leakage testing is done in two cycles (cells 1-3-5; cells 2-4-6).

The standard machine includes a hot marking unit. In addition we offer dot or laser marking.

OPTIONS
- Second leakage control head
- Pole height control unit
- Dot or laser marker
- Six pressure-transducer system

The leakage tester is equipped with automatic height regulation by recipe on the operator interface panel.

The manual positioning of the leakage heads is done by templates according to the different lid dimensions.

The leakage control head can be equipped with different nozzles to check “Kamina” lid types as well as M18 flat lids.

The leakage testing pressure is adjustable from 0 to 400 mbar.

The marking unit is equipped with temperature regulation.

CHARACTERISTICS

Performances
- Single Leakage Head: up to 4 batteries/min.
- Double Leakage Head: up to 6 batteries/min.

Container Length: 175 - 500 mm
Container Height: 160 - 300 mm
Container Width: 125 - 275 mm

MACHINE DIMENSIONS (single leakage head)
- Length: 4,200 mm
- Width: 1,500 mm
- Height: 2,200 mm
- Net Weight: 1,150 kg

UTILITIES
- Air Pressure: 6 bar
- Uncompressed Air Volume: 4.8 m³/h

Technical data may change.

No liability is accepted for errors or misprints. We reserve the right to modify or improve the design or manufacture of machinery and equipment described herein and to alter specifications accordingly without prior notice.