Orbital riveting technology

EcoLine EN/ENE 20 and EN/ENE 35

...joining is our business!

- Attractive price
- Many options
- Easy to operate
- Robust and reliable
At your service

Consulting and service tailored to your needs...

 Reduce costs!
 Our competent development advisory service during your planning stage reduces costs
 When designing your products, you can already take advantage of the expert know-how of the BalTec specialists on fastening, joining, and assembling during the planning stage. This helps to reduce optimization costs later on.

 Worldwide test centers!
 Informative application tests in the pre-production stage
 Benefit from the BalTec Competence and Test Centers around the world. In our test laboratories, BalTec specialists work with our customers to develop new fastening solutions and to optimize applications from both the technical and the economic standpoints.

 Rapid production integration!
 Delivery and commissioning, including documentation and training of your personnel
 On delivery, you will receive a complete set of documentation with operating manuals and maintenance schedules in accordance with CE guidelines. Your personnel will be trained during commissioning so that your new BalTec equipment can be rapidly integrated into your production process.

 10 years spare parts service!
 Training and service while production is in progress
 BalTec offers comprehensive customer training sessions – at your premises or at BalTec – to ensure that you get optimum use of all the features of your equipment right from the start. The worldwide BalTec service offers impressive advantages – competence, speed, and local availability. This guarantees a high availability of your equipment.
Simple, fast and reliable

- The principle of orbital riveting:
The longitudinal axis $A$ of the form tool describes the surface of a cone $K$, whose tip $N$ lies within the rivet (constant angle).
The form tool describes a crescent-shaped contact surface area $KF$.

Many different rivet shapes available

- The shape of the closing head depends on the design of the form tool. The above table shows the most important form tool profiles.
Other form tool profiles and shapes of closing heads can be ordered on request.
Orbital riveting machines EcoLine EN/ENE 20 and EN/ENE 35

**Overview**

**Lubricator** (for air supply)  
- For EcoLine EN/ENE 20 and EN/ENE 35

**Working lamp**  
- For EcoLine EN 20 and EN 35

**RC-10 Controller**  
- without RC-10 controller  
- RC-10 for EcoLine EN/ENE 20 and EN/ENE 35

**Pneumatic system**  
- For EcoLine EN/ENE 20 and EN/ENE 35

**Machine brackets**

<table>
<thead>
<tr>
<th>Model</th>
<th>EN 20</th>
<th>EN 35</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete bracket</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>Column only</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>Table only</td>
<td>✗</td>
<td>✗</td>
</tr>
</tbody>
</table>

**Foot switch**  
- For EcoLine EN/ENE 20 and EN/ENE 35

**Working lamp**  
- For EcoLine EN 20 and EN 35

**RC-10 Controller**  
- without RC-10 controller  
- RC-10 for EcoLine EN/ENE 20 and EN/ENE 35

**Two-hand operating unit**  
- For EcoLine EN/ENE 20 and EN/ENE 35
**RC-15 Controller**
- Without RC-15 controller
- RC-15 for EcoLine EN/ENE 20 and EN/ENE 35

**Options**
- Initiator to control the upper and lower end positions of the riveting spindle
- Pressure sensors
- Path-measuring system
- Pressure pad

---

**Riveting unit**
- Riveting unit ENE 20, max. rivet shank Ø13 mm
- Riveting unit ENE 35, max. rivet shank Ø18 mm

**Options**
- Initiator to control the upper and lower end positions of the riveting spindle
- Pressure sensors
- Path-measuring system
- Pressure pad
  - Holding force: __________
  - Combined with MyCom switch
  - Combined with path-measuring system
- Lower end proximity switch with jumper function (see page 10)

---

**Emergency stop button**
- For EcoLine EN/ENE 20 and EN/ENE 35

**Orbital riveting heads**
- With orbital riveting head 3°
- With orbital riveting head 5°
- Customized design

---

**Initiator**
- To monitor the end positions

**Pressure sensors**
- To measure the force

**Path-measuring system**

**Pressure pad**

---

For detailed dimensions, see page 15
Riveting unit
The riveting unit is the highlight of the EcoLine

The decisive factors for the selection of the right riveting unit are the rivet shank, rivet diameter, shape of the rivet head, and the rivet material – ask your local advisor.

The aim is to achieve the shortest possible cycle time to ensure cost effectiveness of your riveting machine. This means: a small distance to the workpiece along with the minimum necessary clearance to insert the workpiece.

<table>
<thead>
<tr>
<th>Model</th>
<th>ENE 20</th>
<th>ENE 35</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rivet shank</td>
<td>*max. Ø</td>
<td>13 mm</td>
</tr>
<tr>
<td>Pneumatic pressure</td>
<td>2–7 bar</td>
<td>2–6 bar</td>
</tr>
<tr>
<td>Max. riveting force</td>
<td>20 kN</td>
<td>35 kN</td>
</tr>
<tr>
<td>Working stroke</td>
<td>0–40 mm</td>
<td>0–50 mm</td>
</tr>
<tr>
<td>Weight of riveting unit ENE</td>
<td>110 kg</td>
<td>120 kg</td>
</tr>
<tr>
<td>Weight of machine EN (see page 15)</td>
<td>approx. 220 kg</td>
<td>approx. 270 kg</td>
</tr>
</tbody>
</table>

* Steel 370 N/mm² (ST 37) full shank rivet

Orbital riveting head
Holder with head

- Orbital riveting head with permanently attached form tool holder.
- Form tool angle of 3° or 5°.
- Custom-made orbital riveting heads on request.

<table>
<thead>
<tr>
<th>Model</th>
<th>EN 20</th>
<th>EN 35</th>
</tr>
</thead>
<tbody>
<tr>
<td>For rivet shank max.</td>
<td>13 mm</td>
<td>18 mm</td>
</tr>
<tr>
<td>3°</td>
<td>Length LS</td>
<td>116 mm</td>
</tr>
<tr>
<td></td>
<td>Height $S$</td>
<td>60 mm</td>
</tr>
<tr>
<td>5°</td>
<td>Length LS</td>
<td>84 mm</td>
</tr>
<tr>
<td></td>
<td>Height $S$</td>
<td>28 mm</td>
</tr>
</tbody>
</table>

Subject to technical changes
Pressure pad

*Holds the workpiece in position*

The pressure applied by the pad ensures that the expected riveting result is obtained.

In addition, a MyCom switch can be integrated for the N mode* or alternatively a path-measuring system for the H mode** (see page 12 for more information).

* Riveting controlled by a normally open contact
** Riveting controlled by rivet head height

Machine brackets

*Various brackets for your workstation*

The complete unit consists of a column and a table. It has a robust construction and can also be integrated into special-purpose machines.

Customized machine brackets or integration of the riveting unit into other equipment on request.

Combinations for all EcoLine sizes:
- Complete bracket (column and table)
- Column (only)
- Table (only)

Pneumatic system

*Continuously adjustable air maintenance unit*

The riveting force (operating pressure) is adjusted with the pneumatic unit, consisting of a pressure controller, water separator, and a pneumatic valve. The operating pressure can be continuously adjusted up to 6 bar (7 bar for ENE 20).
The amount of oil can be easily regulated to suit the operating conditions. Lubricated compressed air increases the service life and maintenance intervals of the riveting machines.

**Lubricator** (for air supply)
*Individually adjustable lubrication rate*

The working lamp (12 V halogen lamp) is mounted directly on the machine bracket. This spotlight provides optimum illumination of the workpiece.

**Working lamp**
*For better visibility*

The two-hand operating unit is used to start the riveting cycle and complies with safety and CE regulations.

**Two-hand operating unit**
*Starts the riveting cycle*
Emergency stop button

*Stops spindle advance immediately*

The emergency stop button stops the riveting cycle immediately and is usually installed in the two-hand operating unit. However, it can also be supplied in a separate box.

Foot switch

*Starts the riveting cycle (for integrators)*

BalTec provides a Declaration of Conformity for machines equipped with a foot switch. Foot switches are reserved for machine integrators who are responsible for CE conformity.

Pressure sensor

*For force measurement*

The pressure sensor determines the effective riveting force. This riveting force is used to monitor the quality of the riveting cycle.
Path-measuring system

Measurement of the riveting spindle path

This measurement is used to monitor the travel of the riveting spindle. It shows e.g. whether the form tool has completed its travel. The path measurement can be used as a control parameter (voltage or current).

Lower end proximity switch with jumper function

Self-locking function for two-hand operation

The jumper function self-locks the two-hand operating unit after the form tool has advanced towards the rivet to such an extent that fingers can no longer get caught. The correct functioning of this initiator is monitored by the controller.

Initiator

To monitor end positions

Standard initiator cable with connector, LED to indicate the PNP/NO switch status (other circuitry on request). The correct functioning of these initiators is also monitored by the controller.
**RC-10 Controller**  
*Control unit with basic functions*

**Product description**  
The RC-10 controller is suitable for riveting machines with basic functions and simple applications.

**Operation and setup**  
The controller is equipped with a simple operating panel and display. All operating elements are arranged on the front panel. The operating modes «Setup» and «Settings» of the riveting time (cycle) can be directly selected using the corresponding keys.

**Operating options**  
It has the following options:

- Time-controlled riveting
- Riveting controlled by a normally open contact

**Riveting time**  
- Adjustable between 0.1 and 9.9 seconds

**Operating mode of the riveting machine motor**  
- Permanently switched on
- Only switched on during the riveting cycle

**Initiation of the riveting process**

- Two-hand operating unit
- Two-hand operating unit with bridging initiator
- Foot switch
- External activation

**Technical specifications***

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protection class</td>
<td>IP54</td>
</tr>
<tr>
<td>Power supply</td>
<td>Three-phase 50/60 Hz</td>
</tr>
<tr>
<td>Permissible voltages</td>
<td>120/200/230/346/400/440/480/575 V</td>
</tr>
<tr>
<td>Ambient conditions</td>
<td>Operating temperature 0º C to + 50º C</td>
</tr>
<tr>
<td></td>
<td>Bearing temperature -10º C to + 70º C</td>
</tr>
<tr>
<td>Weight</td>
<td>4 kg</td>
</tr>
<tr>
<td>Standard</td>
<td>EN 60204-1</td>
</tr>
</tbody>
</table>

**External controller**  
The RC-10 can also be operated via an external control unit (e.g. plant control system). Ask our specialists.

*Extract from the technical specifications; if you require further information, please request the detailed data sheet or the operating manual.*
RC-15 Controller

Controller with a modular design and useful options

Product description
The RC-15 controller comprises a base unit and several add-on modules. It also can be used as a PLC and can thus be adjusted to suit the customer’s special requirements.

In addition to the basic functions, the riveting modes can be controlled by monitoring the measured values. Parameters are available that allow the use of various force and path sensors.

Operation and setup
The controller is equipped with a simple operating panel and display. All the operating elements are located on the front panel and can be directly selected using the corresponding keys.

Operating mode with ECO options
It has the following options:

<table>
<thead>
<tr>
<th>Mode</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>R mode (t)</td>
<td>Time-controlled riveting</td>
</tr>
<tr>
<td>N mode (t)</td>
<td>Riveting controlled by a normally open contact</td>
</tr>
<tr>
<td>E mode (mm)</td>
<td>Riveting to riveting end from upper end position</td>
</tr>
<tr>
<td>T mode (sec)</td>
<td>Riveting to riveting time from upper end position</td>
</tr>
<tr>
<td>F mode (kN)</td>
<td>Force-controlled riveting</td>
</tr>
<tr>
<td>H mode (mm)</td>
<td>Riveting controlled by rivet head height</td>
</tr>
</tbody>
</table>

Subject to technical changes
Control functions
The controller can be used to monitor diverse options. For example:

- PLC interface
- Initiator to control the upper and lower end position of the riveting spindle
- Pressure sensor
- Path-measuring system
- Pressure pad
- Pressure pad with MyCom switch
- Pressure pad with integrated path-measuring system
- 2-Hand relay
- Emergency stop relay

Technical specifications*

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protection class</td>
<td>IP53</td>
</tr>
<tr>
<td>Power supply</td>
<td>Three-phase 50/60 Hz</td>
</tr>
<tr>
<td>Permissible voltages</td>
<td>115/220/180/230/240/360/400/440/480/575 V</td>
</tr>
<tr>
<td>Interface</td>
<td>RS232 for RC-15 PC-Tool diagnosis software</td>
</tr>
<tr>
<td>Processor</td>
<td>ARM 9</td>
</tr>
<tr>
<td>Ambient conditions</td>
<td>Operating temperature 0° C to + 50° C</td>
</tr>
<tr>
<td></td>
<td>Bearing temperature -10° C to + 70° C</td>
</tr>
<tr>
<td>Weight</td>
<td>14 kg</td>
</tr>
<tr>
<td>Standard</td>
<td>EN 60204-1</td>
</tr>
</tbody>
</table>

External controller
The EcoLine EN/ENE 20 and EN/ENE 35 can also be operated via an external controller (e.g. plant control system). Ask our specialists.

*Extract from the technical specifications; if you require further information, please request the detailed data sheet or the operating manual.
The stable and compact design simplifies their positioning within your production facilities or in your production equipment. Please contact us if you have any technical queries. Please ask about customized models.

### Dimensions of all EcoLine EN 20 and EN 35 models

**Technical drawings**

<table>
<thead>
<tr>
<th>Model</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>S</th>
<th>Weight of riveting unit</th>
<th>Weight of machine</th>
</tr>
</thead>
<tbody>
<tr>
<td>EN/ENE 20</td>
<td>108 – 258</td>
<td>870</td>
<td>1078 – 1228</td>
<td>S</td>
<td>28/60</td>
<td>110 kg</td>
</tr>
<tr>
<td>EN/ENE 35</td>
<td>107 – 302</td>
<td>885</td>
<td>1114 – 1309</td>
<td>S</td>
<td>28/60</td>
<td>120 kg</td>
</tr>
</tbody>
</table>

EcoLine EN/ENE 20 and EcoLine EN/ENE 35

All dimensions in mm. Please request our detailed dimensional drawings. Subject to technical changes.
BalTec Maschinenbau AG, founded in 1983, specializes in the manufacture of riveting systems for fastening technology. The company, with a workforce of about 50, has marketing, engineering and service companies in Switzerland, Germany, England, France, and the USA.

In addition, we have about 40 distributors around the world who advise customers locally. BalTec maintains its position as a leading technologist through continuous innovation, today and in the future.

Distributors:

Germany
BalTec Maschinenbau AG
Niederlassung Uhingen
DE-73066 Uhingen
Tel. +49 (0)7161 3613 00

England/Ireland
BalTec (UK) Ltd.
Reading, Berkshire RG6, 4UT/England
Tel. +44 (0)1189 311 191

USA/Canada
BalTec Corporation
Canonsburg, PA 15317 USA
Tel. +1 (0)724 873 5757

France
BalTec France
FR-91070 Bondoufle
Tel. +33 (0)1 69 47 12 00

Your contact:

BalTec Maschinenbau AG
CH-8330 Pfäffikon
Switzerland
Tel. +41 (0)44 953 13 33
Fax +41 (0)44 953 13 44
E-mail: baltec@baltec.com
Internet: www.baltec.com

Distributors in:

Australia 
Austria
Belarus
Belgium
Brazil
Bulgaria
Canada
China
Colombia
Croatia
Czechia
Denmark
Egypt
Estonia
Finland
France
Germany
Great Britain
Hong Kong
Hungary
India
Indonesia
Iran
Ireland
Israel
Italy
Japan
Korea
Latvia
Lithuania
Luxembourg
Malaysia
Mexico
Netherlands
Norway
Philippines
Poland
Portugal
Romania
Russia
Singapore
Slovakia
Slovenia
South Africa
Spain
Sweden
Switzerland
Thailand
Turkey
Ukraine
USA

A member of the FEINTOOL Group
EcoLine EN/ENE 20 and EN/ENE 35

Outstanding value for money

Optimized operation

Worthwhile investment
These simple and robustly constructed orbital riveting machines from BalTec have an outstanding price-performance ratio. Simple operation with the sophisticated controller reduces personnel costs. Our wide range of form tools offers a suitable riveting tool for all applications.

High productivity
Simple operation and thus reduced personnel costs as well as short cycle times ensure efficient utilization.

Possible mounting positions

Please state which mounting position you require on ordering.

[Diagram showing possible mounting positions]

Optimally dimensioned models

Choose the right size of riveting unit for your application from five optimally dimensioned models. The EcoLine ENE riveting units can be integrated in any mounting position in special-purpose machines and other equipment.

Complete workstations

The EcoLine EN stand-alone machines equipped with an ENE orbital riveting unit are complete workstations with a stable cast machine bracket and pedestal, height adjustment, complete machine control system, and two-hand operating unit.

- ENE riveting units for integration into other equipment
- EN stand-alone machines as complete workstations