Ultrasonic metal welding
for power electronics and cell contacting systems
ultra fast. ultra strong. ultrasonic.

Our 300 employees worldwide develop and produce innovative ultrasonic welding machines - and, together with our representatives, are always close to our customers. In addition to our headquarters in Wettenberg (Germany), we have locations in Graevenwiesbach (Germany), Boston (USA), Moscow (Russia), Kenitra (Morocco) and Taicang (Jiangsu Province, China). We also have a global sales and service network.

In the field of power electronics increasingly high-performance modules such as IGBTs (Insulated-Gate Bipolar Transistors) or IPMs (Intelligent Power Modules) are produced with the help of ultrasonic welding. Ultrasonic welding of the load and control connections to substrates (e.g. DBC) offers full process and quality monitoring compared to conventional soldering.

In reliability tests, ultrasonically welded power modules last up to ten times longer. The intermetallic connection leads to a significantly reduced power dissipation at the contact points, which increases the electrical efficiency of the module and minimizes the cooling effort.
DS20-S-plus

The manually operated ultrasonic welding machine DS20-S-plus is based on a flexible concept and is suitable for laboratories, prototypes, sample series production and smaller series production of e.g. power electronics, cell contacting systems or special applications.

- Ultrasonic welding head: 20 kHz (35 kHz available on demand)
- Working area (x-y-table): x-axis: 100 mm, y-axis: 250 mm (manually with crank handles)
- Special stiff axis systems resistant to ultrasonic vibrations
- Accessibility in z-direction (sonotrode): max. 62 mm

FX20-L

The FX20-L is a semi-automated ultrasonic welding machine for production. It is suitable for welding power electronic modules (e.g. IGBT modules) or cell contacting systems (battery applications).

The machine is available with a pattern recognition system for checking and correcting the welding position and an external particle cleaning system.

- Ultrasonic welding head: 20 kHz (35 kHz available on demand)
- Working area: x-axis: 250 mm, y-axis: 400 mm - turntable: 360°
- Special stiff axis systems resistant to ultrasonic vibrations
- Accessibility z-direction: max. 62 mm - special long welding tool available

All machines are equipped with a quick-change system for welding tools and a patented dynamic process monitoring system. The latter monitors the power and height curves and provides adjustable tolerances for welding time, height, energy and deformation for each welding spot.
The FX20-2L-R is a flexible and fully automated ultrasonic welding machine for welding power electronic modules and cell contacting systems. Numerous options are available for the machine, such as an internal particle cleaning system, robot loading and component feeding via conveyor system.

- Two ultrasonic welding heads: 20 kHz (35 kHz available on demand)
- Working area (two x-y-tables): x-axis: 250 mm, y-axis: 600 mm. The highly reliable and precise axles are equipped with a brake system that ensures maximum stability during the welding process. The axle system is also designed to withstand ultrasonic vibrations.
- Special stiff axis systems resistant to ultrasonic vibrations
- Accessibility in z-direction: max. 62 mm - special long welding tools available

### Specifications

<table>
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<tr>
<th>Specifications</th>
<th>FX20-2L-R</th>
<th>DS20-S plus</th>
<th>FX20-L</th>
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<tr>
<td><strong>Welding head</strong></td>
<td>2 welding heads: 20 kHz (35 kHz available on demand)</td>
<td>1 welding head: 20 kHz (35 kHz available on demand)</td>
<td>1 welding head: 20 kHz (35 kHz available on demand)</td>
</tr>
<tr>
<td><strong>Working area</strong></td>
<td>x-axis: 250 mm, y-axis: 600 mm (automatic)</td>
<td>x-axis: 250 mm, y-axis: 250 mm (manually with crank handles)</td>
<td>x-axis: 100 mm, y-axis: 250 mm (manually with crank handles)</td>
</tr>
<tr>
<td><strong>Accessibility in z-direction</strong></td>
<td>max. 62 mm</td>
<td>max. 62 mm</td>
<td>max. 62 mm</td>
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<tr>
<td><strong>Stroke</strong></td>
<td>max. 62 mm</td>
<td>max. 30 mm, adjustable (higher stroke on demand)</td>
<td>max. 30 mm, adjustable (higher stroke on demand)</td>
</tr>
<tr>
<td><strong>Pressing force</strong></td>
<td>50-900 N (1400 N on demand)</td>
<td>soft touch down available</td>
<td>soft touch down available</td>
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<tr>
<td><strong>Generator</strong></td>
<td>3 kW (4 kW possible)</td>
<td>50-900 N (1400 N on demand)</td>
<td>50-900 N (1400 N on demand)</td>
</tr>
<tr>
<td><strong>Dimensions L x W x H</strong></td>
<td>1800 mm x 2300 mm x 2300 mm</td>
<td>1100 mm x 980 mm x 2600 mm</td>
<td>1200-1600 mm</td>
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<tr>
<td><strong>Weight</strong></td>
<td>ca. 2000 kg</td>
<td>ca. 1200-1600 kg</td>
<td>ca. 420 kg</td>
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</table>

### Options
- Data Matrix Code (DMC) Reader
- Measurement and calibration station
- Pattern Recognition System
- Particle cleaning (external system)
- Integration in automated production lines incl. data interface
- Full traceability for production and maintenance

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1. Further information