



Sonosystems®



# 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 Wetzten (Germany), we have locations in Boston (USA), Moscow (Russia), Kenitra (Morocco) and Taicang (Jiangsu Province, China). We also have a global sales and service network.



## Wire Harness

- Wire / Wire
- X-/Y-Splices
- Cascade
- Ground and high current contacts
- Busbars



## Battery

- Battery modules
- Li-Ion Technology
- Capacitors
- Anode/cathode connections
- Copper/Tab connections



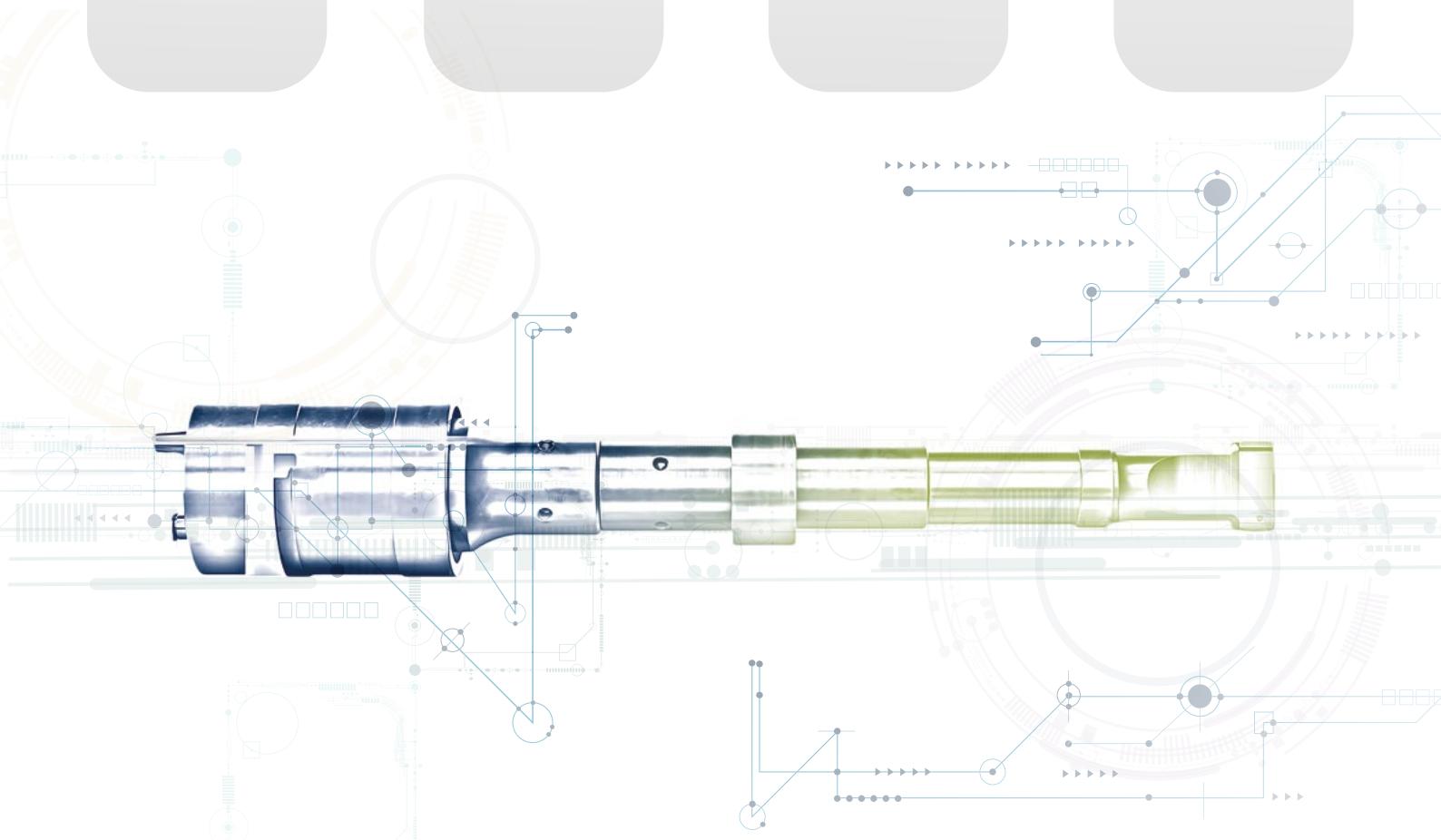
## Cooling Technology

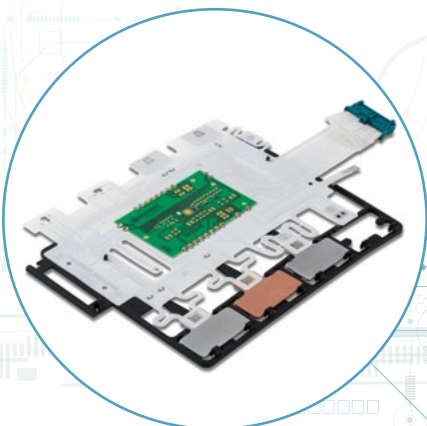
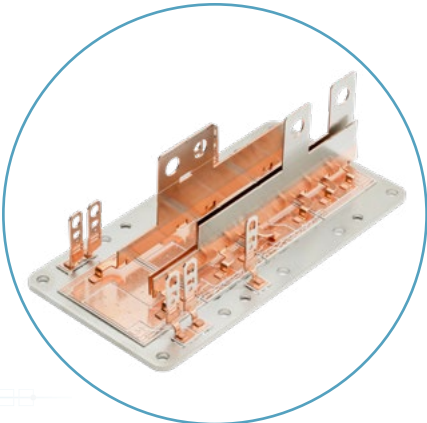
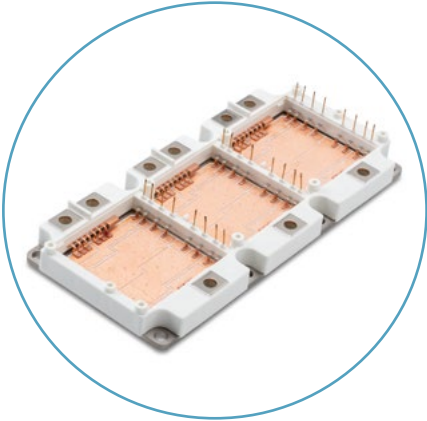
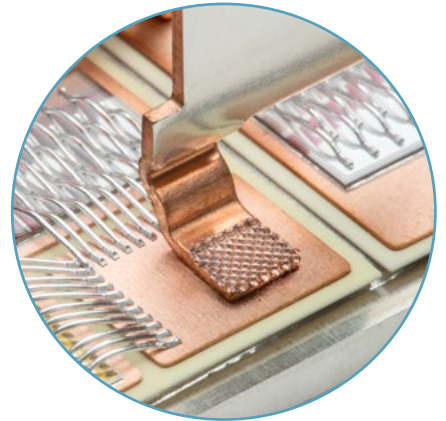
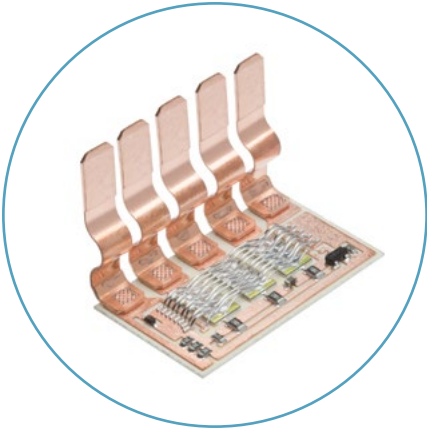
- Copper tubes for refrigeration circuits
- Capillary tubes for thermostats
- EX-certified



## Service

- Technical advice and support
- Process development and integration
- Software development
- Training system

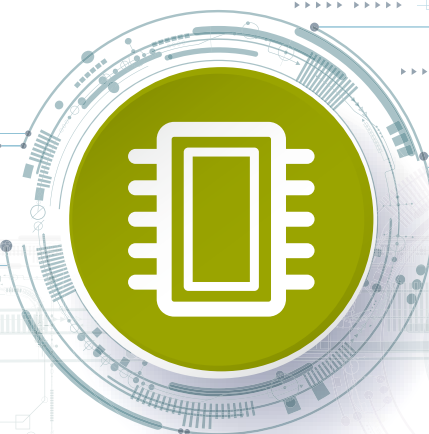




### Ultrasonic welding in the field of power electronics

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.

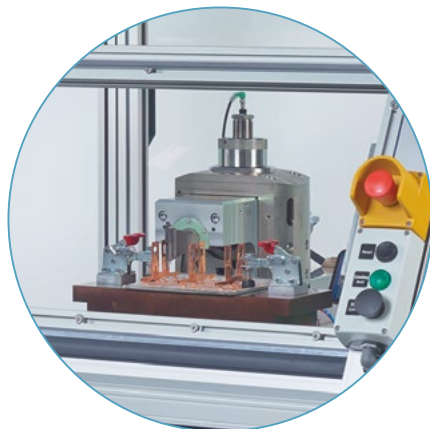
In reliability tests, ultrasonically welded power modules last up to ten times longer. The intermetallic connection leads to a significantly reduced power dissipation at the contact points, which increases the electrical efficiency of the module and minimizes the cooling effort.



# 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)
- 50 N - 1.500 N welding force by servomotoric z-axis with soft touchdown and active force monitoring
- Up to 100 mm tool stroke
- Accessibility in z-direction (sonotrode): max. 62 mm
- Digital 3.000 W ultrasonic generator system
- 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
- Up to 12.000 N clamping force including vacuum system for reliable welding results
- Adjustable major welding parameters for each welding point: force (several steps), amplitude (several steps), energy, heights, deformation
- Monitoring of power, force and height curves by using patented dynamic process control
- Traceability for e.g. product serial number (option)
- Measurement and calibration station with embedded tool adjustment (option)
- Interfaces: SMEMA / SECS-GEM / MES (option)

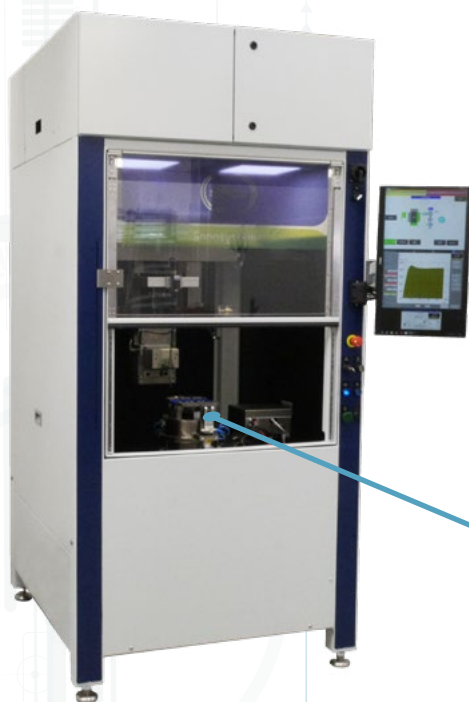


All machines are equipped with a quick-change system for welding tools and a patented dynamic process monitoring system. The latter monitors the powerforce and height curves and provides adjustable tolerances for welding time, height, energy and deformation for each welding spot.





**i** further information



# FX20-L-T

The FX20-L-T is an 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 particle cleaning system.

- Ultrasonic welding head: 20 kHz (35 kHz available)
- 50 N - 1.500 N welding force by servomotoric z-axis with soft touchdown and active force monitoring
- Welding stroke (z-movement) up to 100 mm
- Accessibility in z-direction: max. 62 mm - special long welding tools available
- Digital 3.000 W ultrasonic generator system
- Working area: x-axis: 400 mm, y-axis: 400 mm - turntable: 360°
- Special stiff axis systems resistant to ultrasonic vibrations
- Up to 12.000 N clamping force including vacuum system for reliable welding results
- Pattern recognition and automatic correction of the welding position through our innovative camera system (option)
- Adjustable major welding parameters for each welding point: force (several steps), Amplitude (several steps), energy, heights deformation
- Monitoring of power, force and height curves by using patent dynamic process control
- Traceability for e.g. product serial number, carrier tracking number, tooling codes (option)
- Particle cleaning system for particle / debris reduction (option)
- Manual loading, Integration of conveyor system, robot handling and inline particle cleaning system possible (option)
- Interfaces: SMEMA / SECS-GEM / MES (option)

# FX20-2L-R



The FX20-2L-R is an 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)
- 50 N - 1.500 N welding force by servomotoric z-axis with soft touchdown and active force monitoring
- Welding stroke (z-movement) up to 100 mm
- Accessibility in z-direction: max. 62 mm - special long welding tools available
- Digital 3.000 W ultrasonic generator system
- Working area (two x-y-tables): x-axis: 200 mm, y-axis: 600 mm.
- Special stiff axis systems resistant to ultrasonic vibrations
- Up to 12.000 N clamping force including vacuum system for reliable welding results
- Mirrored dual anvil system for maximum throughput
- Pattern recognition and automatic correction of the welding position through our innovative camera system (option)
- Adjustable major welding parameters for each welding point: force (several steps), amplitude (several steps), energy, heights, deformation
- Monitoring of power, force and height curves by using patented dynamic process control
- Traceability for e.g. product serial number, carrier tracking number, tooling codes (option)
- Integrated particle cleaning system for particle / debris reduction (option)
- Integration of conveyor system, robot handling possible (option)
- Interfaces: SMEMA / SECS-GEM / MES (option)



further information

# Specifications

	DS20-S-plus	FX20-L-T	FX20-2L-R
<b>Welding head</b>	1 welding head: 20 kHz (35 kHz available on demand)	1 welding head: 20 kHz (35 kHz available on demand)	2 welding heads: 20 kHz (35 kHz available on demand)
<b>Working area</b>	x-axis: 100 mm, y-axis: 250 mm (manually with crank handles)	x-axis: 400 mm, y-axis: 400 mm (automatic) turntable: 360°	2 x-y-tables: x-axis: 200 mm, y-axis: 600 mm (automatic)
<b>Accessibility in z-direction</b>	max. 62 mm	max. 62 mm	max. 62 mm
<b>Welding stroke</b>	up tp 100 mm	up tp 100 mm	up tp 100 mm
<b>Ultrasonic Generator</b>	3 kW	3 kW	3 kW
<b>Welding force (servomotoric)</b>	50-1500 N soft touch down available	50-1500 N soft touch down available	50-1500 N soft touch down available
<b>Dimesions L x W x H</b>	950 mm x 1000 mm x 1850 mm	1300 mm x 1500 mm x 200 mm	1800 mm x 2300 mm x 2300 mm
<b>Weight</b>	approx. 420 kg	approx. 1200-1600 kg	approx. 2000 kg



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