Achieve Optimum Performance, Speed and Cost-effectiveness in Metal Assembly.

Branson™ Ultrasonic Metal Welding Systems

Meeting the demand for metal assembly solutions for advanced technology manufacturing

EMERSON

You need to produce increasingly complex metal assemblies while keeping pace with rapidly changing market demands.

The race is on to produce reliable, advanced metal assemblies faster and more cost-effectively for everything from powerful, long-life Li-Ion batteries, to finding ways to weld a widening range of nonferrous materials. What if you could generate high-quality, metallurgical welds in seconds using clean, eco-friendly acoustic vibration technology that is easily integrated into automated systems? What if you could replace your outdated, visual QC methods with digital traceability of process parameters? Or meet the growing demands for reduced costs and increased productivity with a welding technology that requires no consumables, uses energy than other welding methods, and is capable of delivering superior, solid-state welds that meet the demands of consumer brands and OEMs in the automotive, HVAC and electronics industries.

Instead of being limited by the traditional methods of resistance welding, crimping connectors, or soldering, you can harness the speed, efficiency and cost savings of high-frequency acoustic vibrations to create a solid-state weld.

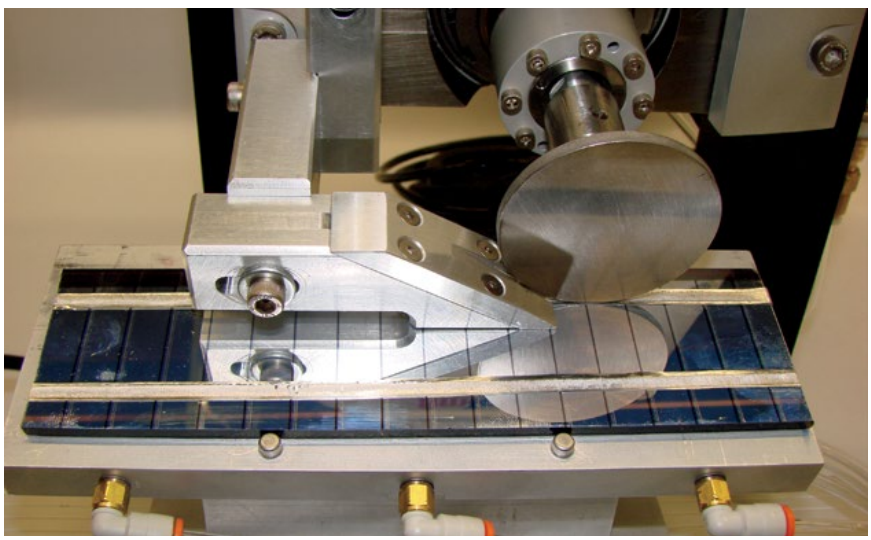
To learn more, visit www.Emerson.com/Branson

Branson ultrasonic metal welders deliver speed, precision, safety and cost-effectiveness other welding methods can't.

The high-quality, metallurgical welds created by our Branson metal welding systems can satisfy even the highest expectations for low joint resistance, thermal conductivity, mechanical strength and long life.

Branson ultrasonic metal welding is a high-speed welding technology that produces solid-state welds in a fraction of a second. It employs electronic process controls with digital traceability of weld parameters to ensure high quality welds and maximum productivity. There is low heat build-up and no heat or electricity directly applied to the work pieces.

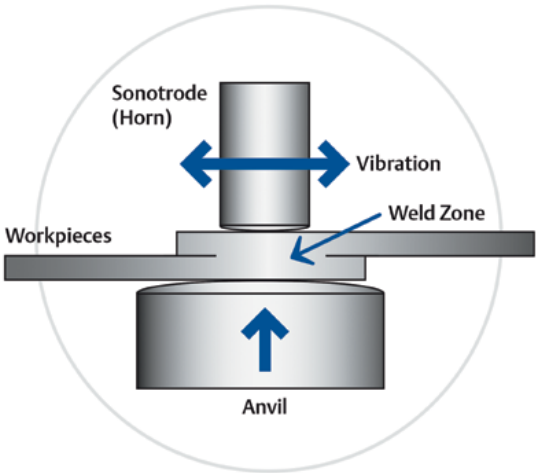
Branson ultrasonic welders are also low-energy-consumption, requiring just 10% of the energy of resistance welding. Ultrasonic welding is a highly cost-effective process that requires no consumables and can weld through contaminants, eliminating your need for pre-cleaning and the cost of hazardous cleaning chemicals. They are easily adaptable to fully automated product lines for continuous batch processing, while producing weld quality that can increase energy density, improve conversion efficiency and lower energy consumption.



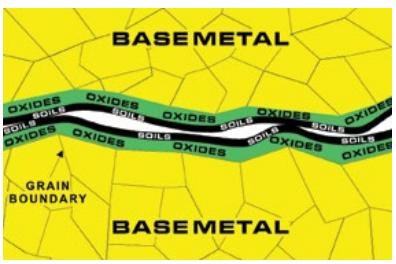
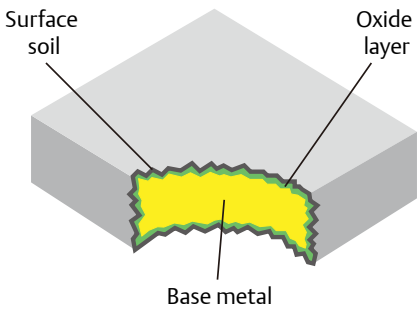
Continuous-feed welding systems can operate at speeds up to 22 meters per minute.

How Branson ultrasonic metal welding produces superior performing bonds.

During the ultrasonic welding operation, the upper metal component is oscillated by the horn against the lower component. This rapid, oscillating shear force disrupts surface oxides, contaminants and asperities, creating pure metal-to-metal contact until the oscillation stops at the of the weld cycle. The entire process is very rapid, with welds typically completed in a fraction of a second. The now-welded area is characterized by atomic diffusion across the interface of the joined parts, as the metal surfaces of the welded parts recrystallize into finely grained structures, similar to the structures of cold-worked metals.



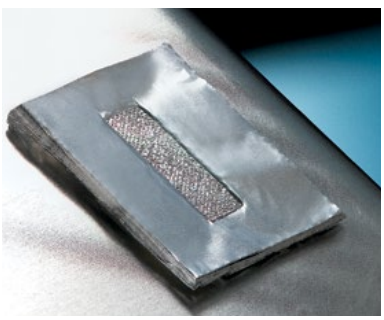
Branson ultrasonic welders produce clean, high-strength, metallurgical welds using high-frequency, acoustic vibrations.

Metal interface before welding	Typical metal surface conditions	Metal interface after welding
		
This microscopic view illustrates the oxides, contaminants, metal grain structure and typical rough surface of metal. During the welding operation, the high-frequency vibrations, under pressure, establish a shear force on the interface of the two parts being welded. These shear forces work to disperse surface soils and contamination.	Illustration of the non-metallic surface contaminants and oxide layer that must be removed prior to the welding process.	After welding, it is common to see a slight reduction in the metal grain size. This reduction is due to a minor amount of work hardening that occurs during the weld. The dark areas represent pockets where the contamination and oxides congregate.

Ultrasonic metal welding meets the challenge of advanced technology applications.

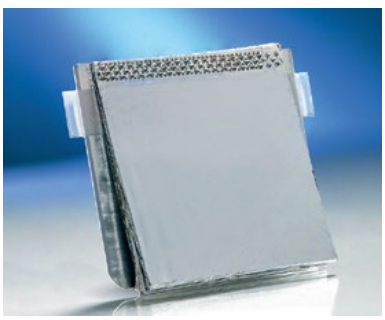
Ideal for welding nonferrous metals, Emerson ultrasonic metal welding systems meet the production demands of consumer brands and OEMs in the automotive, HVAC and electronics industries. Branson ultrasonic welders are able to tackle tough, nonferrous welding challenges, from joining solar panels to sealing charged tubes in air conditioners, to bonding multiple layers of smaller gauge foils such as the delicate assemblies needed for electric vehicle batteries, as well as photovoltaic cells, automotive air bag systems, capacitors and other critical components.

Batteries

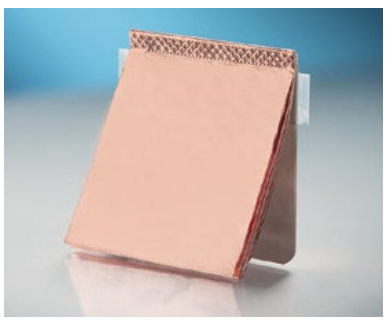


EV battery: 100-layer Al foil

EV battery: 100-layer Cu foil



High Power battery: Al tab + Al foil



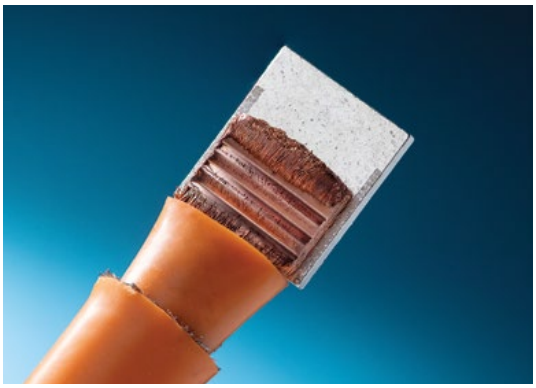
High Power battery: Ni tab + Cu foil

Small battery: Al tab + Al foil

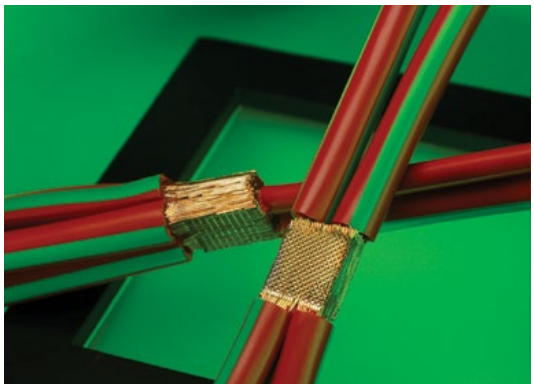
Small battery: Ni tab + Cu foil

Other Applications

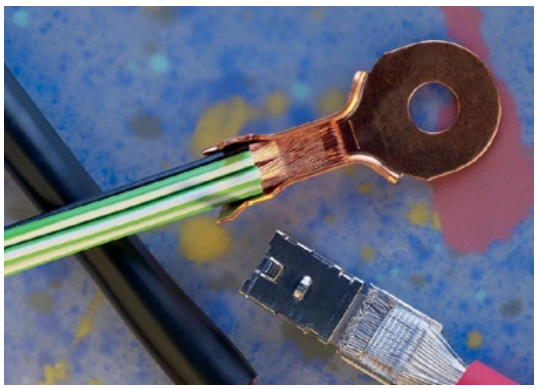
Wire Termination



Wire Splicing

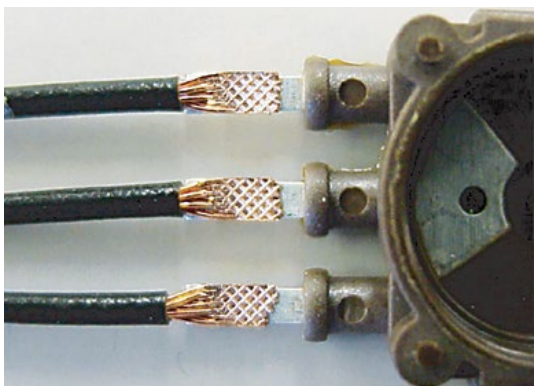


Ground Terminal

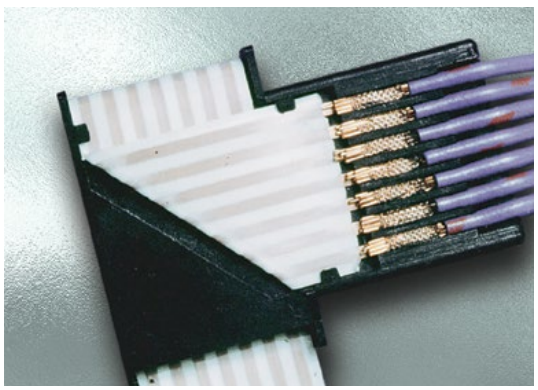


Metal Tube Cut & Seal

Motor Lead Wire



Air Bag Sensor



Branson Ultrasonic Welding Systems: Features and Specifications

Metal Welding Product Index

The extensive Branson metal welding portfolio offers a diverse array of capabilities to meet your specific needs and application requirements.

Welder: GMX-20MA

Features

- Dual linear bearings ensure a smooth, precise welding process.
- Nodal support design precisely balances the horn and anvil during the welding process. This ensures effective transfer of ultrasonic energy for improved weld quality and consistency.
- Precise linear encoder enables precise height and distance control during welding to ensure welding accuracy.
- Increased weld modes options make it applicable for more welding applications.
- Upgraded control & power supply provides multiple real-time welding data quality monitoring.
- Pressure trigger mechanism & load cell ensure accurate welding control & welding quality.

Specifications

System Parameters

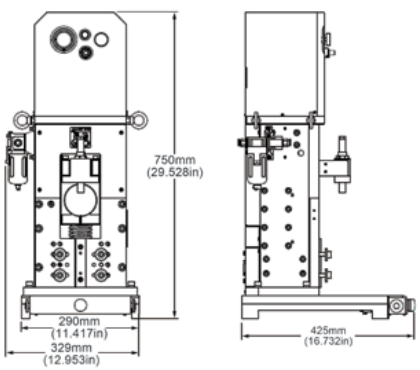
Overall dimension (actuator only)	425 x 329 x 750mm
Gross weight	90kg, 198lbs
Working voltage	220V (4kW) 3 phase 380V (5.5kW, Asia) 3 phase 400V (5.5kW, Europe) 3 phase 480V (5.5kW, N. America)
Air supply requirement	Minimum 0.6MPa, 87psi
Filter precision	5μm
Cylinder diameter	ϕ63mm, 80mm & 100mm
Maximum stroke	50mm
Working temperature	+5-50°C
Working humidity	30%~90%
Power Supply Compatibility	2000Xct

Actuator Performance Parameter

Valid stroke	11mm ~ 45mm
Valid pressure	0.05MPa~0.6MPa, 7-87 psi
Down speed	8-100mm/s
Force range	400N-4200N

*Please consult Branson representative for CE certification for European market

Dimensions



Welder: GMX-20DP

Features

- Unique pressure applying mechanism enables more efficient ultrasonic energy transmission
- Lower vibration amplitude results in low heat and particulate during welding, better protecting parts through the weld process
- Pressure trip mechanism enables accurate welding control to ensure welding quality
- High-definition linear encoder enables precision height and distance control during welding to ensure accuracy
- Various welding modes enable wide range of applications
- Real-time welding data allows quality monitoring and enables seamless connection to Manufacturing Execution System (MES)

Specifications

System Parameters

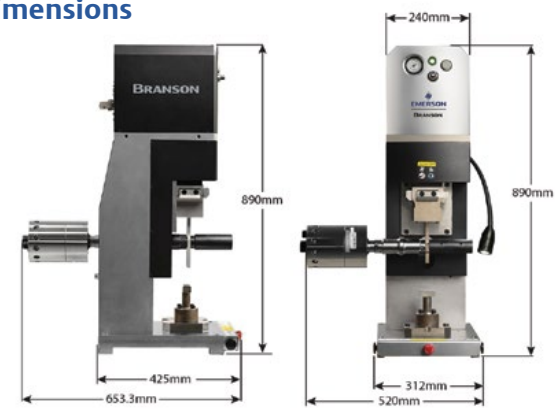
Overall dimension (actuator only)	425 x 312 x 890mm 16.7" x 12.3" x 35"
Gross weight	140kg, 308lbs
Working voltage**	220V (4kW) 3 phase 380V (5.5kW, Asia) 3 phase 400V (5.5kW, Europe) 3 phase 480V (5.5kW, N. America)
Air supply requirement	Minimum 0.6MPa, 87psi
Filter precision	5μm
Cylinder diameter	ϕ125mm
Maximum stroke	50mm
Working temperature	+5°C-50°C
Working humidity	30%~95%
Power Supply Compatibility	2000Xct

**6.5kw & 8kw will be available soon

Actuator Performance Parameter

Valid pressure	0.05MPa~0.6MPa, 7-87 psi
Down speed	8mm/s~100mm/s
Force range	600N~6100N

Dimensions



Welder: GMX-W1

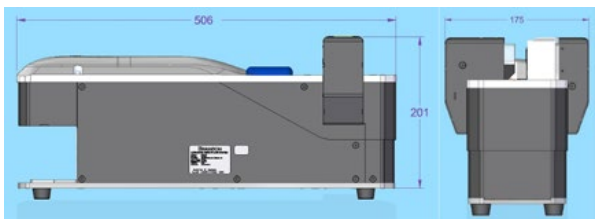
Features

- 22" capacitive touchscreen for fast response time
- User-friendly HMI
  - User-friendly intuitive interface
  - Optimized production capability for splicing, sequencing and harness boards
  - Multiple user level and access management
  - Traceability for statistical evaluation and log file
- Ergonomic design – allows ease of use and flexibility for different applications
- LED color status indicator for real time monitoring of machine status and splice quality
- Illuminated weld area facilitates part loading
- Capable of splicing wires with cross section up to 40mm^2

Specifications

Frequency	20kHz
Output power	4,000W
Power supply	200~230V, single phase, 25A max
Pneumatic	5.5 bar (80psi) clean, dry air
Actuator weight	22kg
Power Supply Compatibility	VersaGraphix

Dimensions



Welder: MWX-100

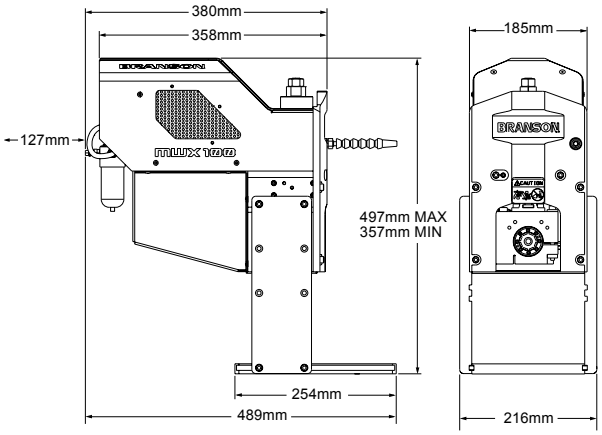
Features

- A rugged, easily tooled welder for a wide range of nonferrous metal welding applications
- Available in 30, 40, and 60kHz
- Ideal for precise welding of smaller-gauge nonferrous metals and delicate assemblies such as batteries,photovoltaic cells, automotive air bag systems, capacitors, and other critical components

Specifications

Actuator dimension (mm)	216 W x 489 D x 497(MAX) H
Maximum stroke	25mm
Maximum force	158lbs
Air supply requirement	Max 0.7 MPa
Power Supply Compatibility	VersaGraphix Touch screen power supply controller

Dimensions



Welder: Ultraweld L20

Features

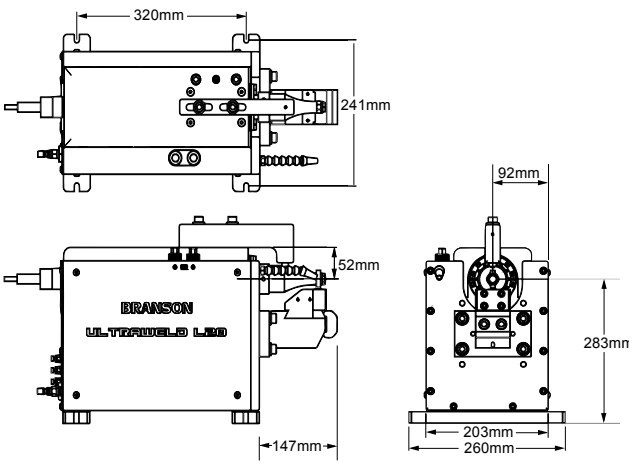
- A low maintenance actuator incorporating a rigid cross roller bearing slide for a smooth and precise weld process
- Heavy-duty polar mounting of ultrasonic components ensuring efficient transmission of ultrasonic energy facilitating linear and axial setup
- Rugged, compact design facilitates mounting on high-speed automation systems or for bench top use

Specifications

Actuator dimension (mm)	203 W x 374 D x 329 H
Maximum stroke	48mm
Cylinder diameter	ϕ63mm /ϕ100mm
Pneumatic	5.5 bar (80psi) clean, dry air
Power Supply Compatibility	VersaGraphix Touch screen power supply controller
Power Supply	220VAC, 50/60 Hz, 30 Amp
Output power	3.3kW*, 4.0kW, 5.5kW

*3.3kW output power available only in Asia

Dimensions



Welder: Ultraseal 20EX

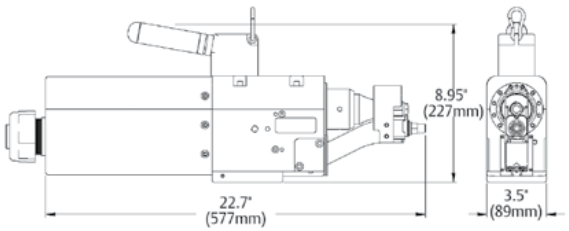
The Branson Ultraseal 20EX is a rigid, lightweight and ergonomic metal joining system able to seal metal tubes from 4mm capillary up to 12mm diameter. It is easily operated directly on the charge line, supported by a balancer, or as a bench top unit to reliably seal pressurized charge tubes.

Environmentally friendly, the Ultraseal 20EX requires no stored energy, minimal energy at 'standby weld ready' and, with a stack efficiency of approximately 95%, delivers the lowest total operating cost over life of ownership.

Specifications

Actuator dimension (mm)	89 W x 577 D x 227 H
Electrical	245V AC, 50/60Hz, 1ϕ, 15 amp
Pneumatic	5.5 bar (80 psig) clean, dry (0.5µ coalescing filter) air
Actuator weight	10.9kg (24 lbs.)

Dimensions



Welder: Ultraseam 20

The Ultraseam® 20 is the ultimate metal seam welder – ideal for continuous welding of aluminum and copper foils at speeds up to 22 meters per minute.

Optional Equipment

- Rotating anvil assembly for continuous welding.
- Machine base with drive mechanism to shuttle the weld head over a fixtured workpiece.

Specifications

Weld head weight	34kg (80 lbs.)
Weld head size (mm)	362 W x 203 H x 578 L
Voltage	200-250V AC, 50/60Hz, 1ϕ, 20 amps service
Cooling requirements	80 liters/minute (2 cfm)
Air pressure	5 Bar (60 psig)
Range of weldable materials	2 layers of 0.2mm up to 1.0mm or annealed copper or aluminum
Linear speed	Adjustable up to 15 meters/minute (22 by special orer)

Power Supply

VersaGraphix Controller

Features

- 15-inch touch panel monitor with user-friendly interface
- Weld Modes: different weld modes to suit your particular application
  - Energy
  - Time
  - Height (compaction)
  - Energy with Height Compensation
  - Amplitude Stepping
- Statistical screen tracks and displays the last 128 welds
- 14 selectable languages
- Ethernet ready
- Manage welding data through Ethernet/USB
- Alarm messages are easy for troubleshooting
- 1000 part preset library

Specifications

Frequency	20kHz	30kHz	40kHz
Maximum output	4000W	750W 1500W	400W 800W
Work voltage	AC 200V 1ϕ50/60Hz	AC 100V AC 200V 1ϕ50/60Hz	
Maximum current	20A AC 200V	14A AC 100V 7A AC 200V	
Work temperature	5-50°C		
Gross weight	Approx. 16kg		

Power Supply: 2000Xea / 2000Xeat

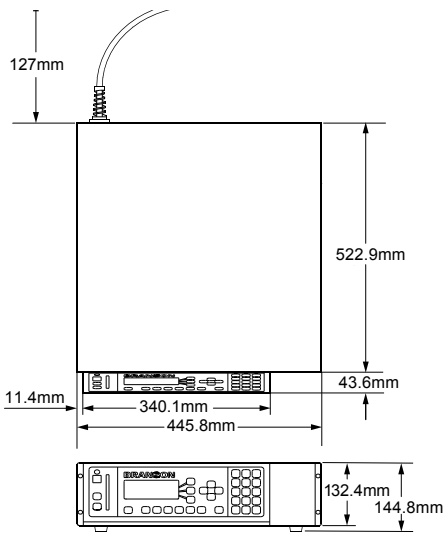
Features

- Digital Amplitude Control — Accurate Amplitude Setting
- Line / Load Regulation — Corrects for variations due to power line fluctuations and varying load conditions through Branson's closed-loop amplitude control. Output amplitude is maintained with a variation of only ±2% with line voltage variations of ±10%
- Alarm message suitable for troubleshooting
- Self-diagnosis and monitoring — Visual, sound, external output
- Alarms and cycle counters to track production
- Printing function — One-line printing of welding data
- Pre-trigger settings — Auto, time
- Password protection — Prevents unauthorized changes

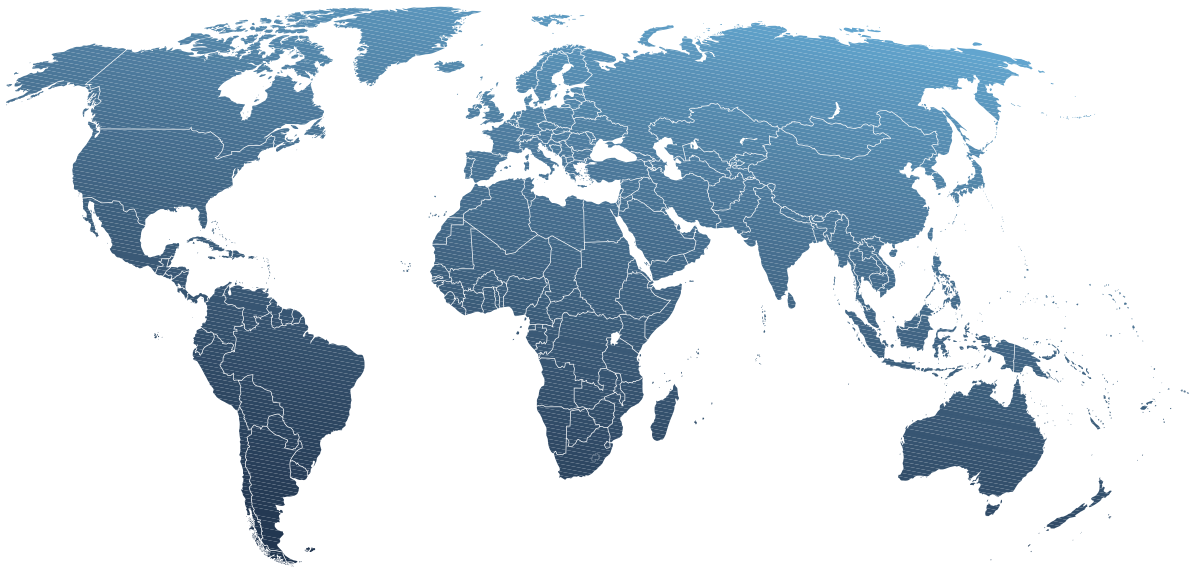
Specifications

Type	2000Xea / 2000Xeat 40:0.4	2000Xea / 2000Xeat 40:0.8
Frequency	40kHz	
Maximum output	4000W	800W
Work voltage	AC 100V AC 200V 1φ50/60Hz	
Maximum current	5A AC100V 3A AC200V	10A AC 100V 5A AC 200V
Work temperature	5-50°C	
External input / output	9-pin start connector 44-pin user I/O connector	
Gross weight	15.5kg	

Dimensions



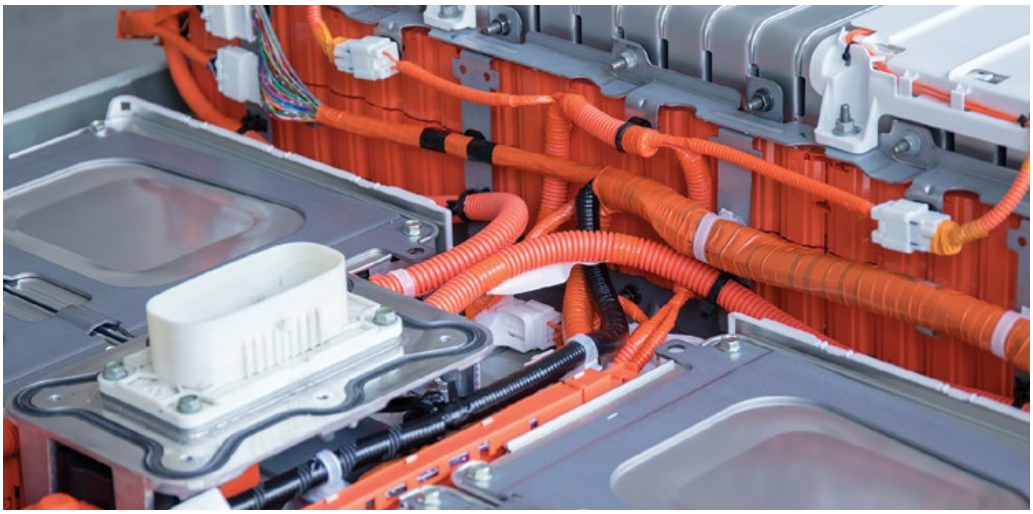
Service and Support Anywhere, Anytime



Our global network of dedicated experts provides first class support and advise from facilities in 70 countries, including 12 main labs and 31 regional technical centers to keep your project on target.

At Emerson, we promise aftermarket service and support for Branson equipment that is as globally available, capable, and predictable as your global operations. To support that promise, we offer 35 Branson service centers and over 170 service specialists at more than 60 locations worldwide. Our dedicated aftermarket service programs ensure 24/7 technical and onsite support, spare parts, preventive maintenance, calibration, and equipment evaluations to keep production flowing.

Maximize precision, reliability and efficiency of your metal assemblies.



BRANSON™

Emerson ultrasonic metal welding systems provide high-quality, metallurgical welds faster, safer, and more cost-effectively for everything from the simplest to the most-demanding applications.

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