SONICS®
SONICS & MATERIALS, INC.

15 kHz

ultrasonic spot welding systems

ACTUATOR

FEATURES

- Rigid Cast Center Frame
- Single Piece, Dual Nodal Mount Horn and Booster Stack
- Precisely Adjustable Up and Down Stops
- Independent Horn and Converter Air Cooling Flow Controls
- Pre-Lubricated and Sealed Linear Bearings
- Pneumatic Actuation
- Electronic Pressure Control

MWB151 Actuator
on Integral Base

MWA151
Actuator

Sonics' 15 kHz ultrasonic metal welding systems consist of an actuator (available versions shown above) and a power supply (MX or MSC series) shown below.

POWER SUPPLIES

MODELS

MXE - Time and Energy Based Weld Modes
MSC - *SmartControl* with Time and Energy Based Weld Modes and Weld Height Verification

POWER LEVEL

- 6000 Watts Peak Power

MX Series High Profile

MSC High Profile

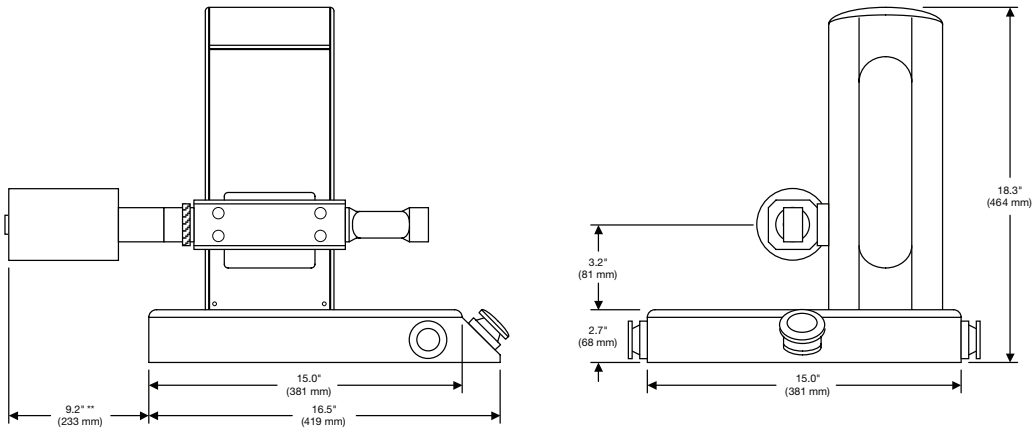
Sonics' 15 kHz power supplies are available in two versions, the MX Series, with standard keypad operation and the *SmartControl* MSC Series with full color touch screen controls. The features of the models are compared below.

POWER SUPPLY FEATURES	MXE	MSC
Microprocessor Controlled	■	■
Automatic Frequency Tuning	■	■
Digital Amplitude Control	■	■
Digital Force Triggering	■	■
Weld Time Delay Setting	■	■
Afterburst Time Setting	■	■
Multiple Job Storage	■	■
Digital Stack Wattage Display	■	■
Digital Stack Frequency Display	■	■
Weld Cycle Counter	■	■
Upper and Lower Weld Mode Limit Settings	■	■
Soft Start Overload Protection Circuitry	■	■
Load Regulation Circuitry	■	■

POWER SUPPLY FEATURES	MXE	MSC
Color Touch Panel Operator Screen		■
Weld Cycle Graph Chart Screen		■
Weld Teach Mode		■
Weld Sequence Mode		■
Amplitude and Pressure Ramping		■
Timed Converter and Horn Air Cooling Cycle		■
English and Metric Weld Height Settings		■
Password Protected Four-Level User Access		■
Serial Printer Port Connection	■*	■
PLC I/O Interface Connection	■*	■

*Optional

MWB151 dimensional data



**Add Approximately 7.5" (190 mm) for Secondary Booster)

system options

Foot Pedal Switch with Emergency Stop

Secondary Booster:
Aluminum or Titanium Secondary Booster

specifications

Actuator Data:

MWA151 Actuator Weight: 50 Lbs. (27.7 kg)
MWB151 Actuator on Integral Base Weight: 90 Lbs. (40.8 kg)
Pneumatic Requirement: 80 PSI Clean and Dry Air Service

High Profile Power Supply Data:

Peak Output Power: 6000 W
Power Supply Weight: 70 Lbs. (31.7 kg)
Power Supply Dimensions: 17.6" (447 mm) Wide x 10.7" (272 mm) High x 22.5" (571 mm) Deep
Power Requirement: 6000 W - 220 VAC @ 30A

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SONICS®
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20 kHz

ultrasonic spot welding systems

ACTUATORS

FEATURES

- Rigid Cast Center Frame
- Single Piece, Dual Nodal Mount Horn and Booster Stack
- Precisely Adjustable Up and Down Stops
- Independent Horn and Converter Air Cooling Flow Controls
- Pre-Lubricated and Sealed Linear Bearings
- Pneumatic Actuation
- Electronic Pressure Control

MWB201 Actuator
on Integral Base

MWA201
Actuator

Sonics' 20 kHz ultrasonic metal welding systems consist of an actuator (available versions shown above) and a power supply (MX or MSC series) shown below.

POWER SUPPLIES

MX Series Low Profile

MX Series High Profile

MSC Low Profile

MSC High Profile

MODELS

MXE - Time and Energy Based Weld Modes

MSC - *SmartControl* with Time and Energy Based Weld Modes and Weld Height Verification

POWER LEVELS

- 2500 Watts Peak Power
- 4000 Watts Peak Power

Sonics' 20 kHz power supplies are available in two versions, the MX Series, with standard keypad operation and the *SmartControl* MSC Series with full color touch screen controls. The features of the models are compared below.

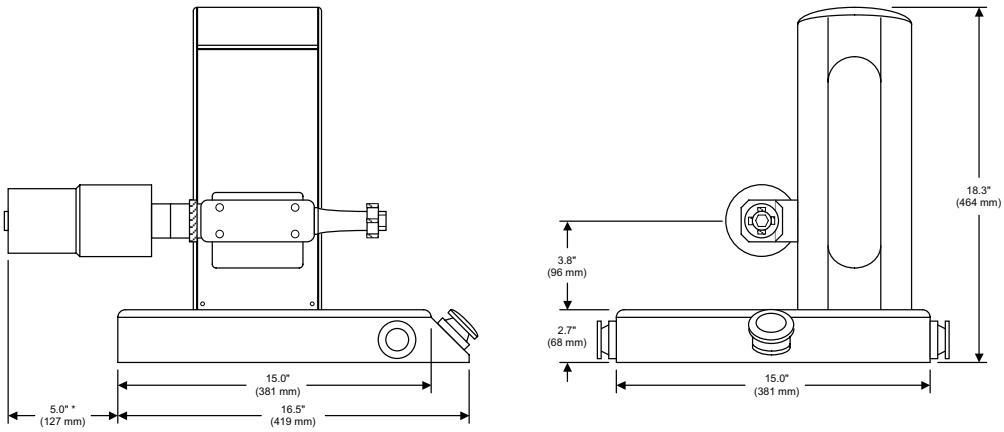
POWER SUPPLY FEATURES	MXE	MSC
Microprocessor Controlled	■	■
Automatic Frequency Tuning	■	■
Digital Amplitude Control	■	■
Digital Force Triggering	■	■
Weld Time Delay Setting	■	■
Afterburst Time Setting	■	■
Multiple Job Storage	■	■
Digital Stack Wattage Display	■	■
Digital Stack Frequency Display	■	■
Weld Cycle Counter	■	■
Upper and Lower Weld Mode Limit Settings	■	■
Soft Start Overload Protection Circuitry	■	■
Load Regulation Circuitry	■	■

POWER SUPPLY FEATURES	MXE	MSC
Color Touch Panel Operator Screen		■
Weld Cycle Graph Chart Screen		■
Weld Teach Mode		■
Weld Sequence Mode		■
Amplitude and Pressure Ramping		■
Timed Converter and Horn Air Cooling Cycle		■
English and Metric Weld Height Settings		■
Password Protected Four-Level User Access		■
Serial Printer Port Connection	■*	■
PLC I/O Interface Connection	■*	■

*Optional

Innovating since 1969

MWB201 dimensional data



**Add Approximately 5.5" (140 mm) for Secondary Booster)

system options

Foot Pedal Switch with Emergency Stop

Secondary Booster:
Aluminum or Titanium Secondary Booster

specifications

Actuator Data:

MWA201 Actuator Weight: 44 Lbs. (19.9 kg)
MWB201 Actuator on Integral Base Weight: 85 Lbs. (38.5 kg)
Pneumatic Requirement: 80 PSI Clean and Dry Air Service

Low Profile Power Supply Data:

Peak Output Power: 2500 W
Power Supply Weight: 21 Lbs. (9.5 kg)
Power Supply Dimensions: 15.2" (386 mm) Wide x 7.0" (178 mm) High x 18.7" (476 mm) Deep
Power Requirement: 220 VAC @ 20A

High Profile Power Supply Data:

Peak Output Power: 4000 W
Power Supply Weight: 70 Lbs. (31.7 kg)
Power Supply Dimensions: 17.6" (447 mm) Wide x 10.7" (272 mm) High x 22.5" (571 mm) Deep
Power Requirement: 220 VAC @ 30A

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40 kHz

ultrasonic spot welding systems

ACTUATORS

FEATURES

- Rigid Cast Center Frame
- Single Piece, Dual Nodal Mount Horn and Booster Stack
- Precisely Adjustable Up and Down Stops
- Independent Horn and Converter Air Cooling Flow Controls
- Pre-Lubricated and Sealed Linear Bearings
- Pneumatic Actuation
- Electronic Pressure Control

MWB401 Actuator
on Integral Base

MWA401
Actuator

Sonics' 40 kHz ultrasonic metal welding systems consist of an actuator (available versions shown above) and a power supply (MX or MSC series) shown below.

POWER SUPPLIES

MODELS

MXE - Time and Energy Based Weld Modes
MSC - *SmartControl* with Time and Energy Based Weld Modes and Weld Height Verification

POWER LEVELS

- 800 Watts Peak Power

MX Series Power Supplies

MSC *SmartControl*
Power Supplies

Sonics' 40 kHz power supplies are available in two versions, the MX Series, with standard keypad operation and the *SmartControl* MSC Series with full color touch screen controls. The features of the models are compared below.

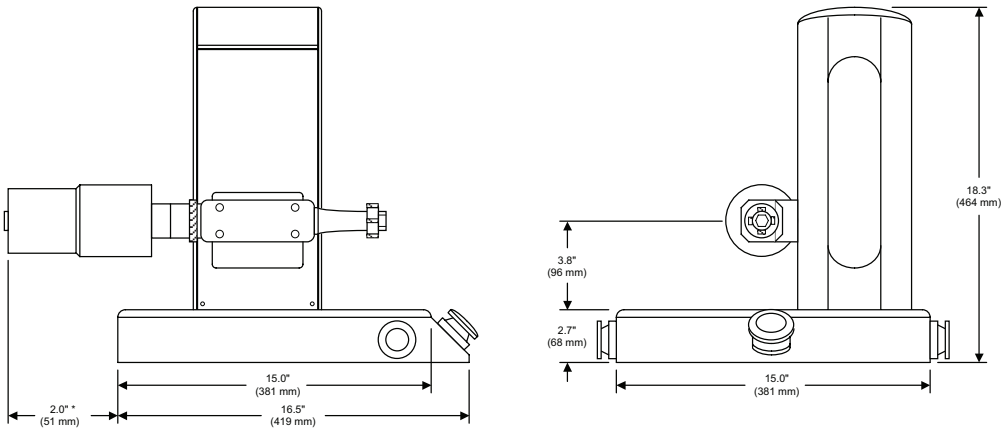
POWER SUPPLY FEATURES	MXE	MSC
Microprocessor Controlled	■	■
Automatic Frequency Tuning	■	■
Digital Amplitude Control	■	■
Digital Force Triggering	■	■
Weld Time Delay Setting	■	■
Afterburst Time Setting	■	■
Multiple Job Storage	■	■
Digital Stack Wattage Display	■	■
Digital Stack Frequency Display	■	■
Weld Cycle Counter	■	■
Upper and Lower Weld Mode Limit Settings	■	■
Soft Start Overload Protection Circuitry	■	■
Load Regulation Circuitry	■	■

POWER SUPPLY FEATURES	MXE	MSC
Color Touch Panel Operator Screen		■
Weld Cycle Graph Chart Screen		■
Weld Teach Mode		■
Weld Sequence Mode		■
Amplitude and Pressure Ramping		■
Timed Converter and Horn Air Cooling Cycle		■
English and Metric Weld Height Settings		■
Password Protected Four-Level User Access		■
Serial Printer Port Connection	■*	■
PLC I/O Interface Connection	■*	■

*Optional

Innovating since 1969

MWB401 dimensional data



**Add Approximately 2.5" (63 mm) for Secondary Booster)

system options

Foot Pedal Switch with Emergency Stop

Secondary Booster:
Aluminum or Titanium Secondary Booster

specifications

Actuator Data:

MWA401 Actuator Weight: 44 Lbs. (19.9 kg)
MWB401 Actuator on Integral Base Weight: 85 Lbs. (38.5 kg)
Pneumatic Requirement: 80 PSI Clean and Dry Air Service

High Profile Power Supply Data:

Peak Output Power: 800 W
Power Supply Weight: 21 Lbs. (9.5 kg)
Power Supply Dimensions: 15.2" (386 mm) Wide x 7.0" (178 mm) High x 18.7" (476 mm) Deep
Power Requirement: 220 VAC @ 20A

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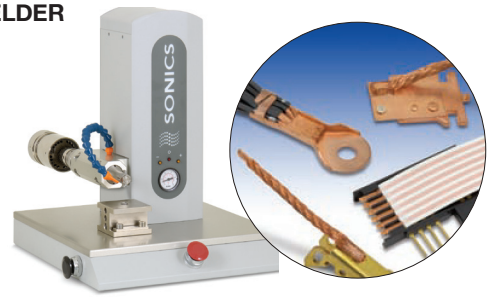
ultrasonic metal welding

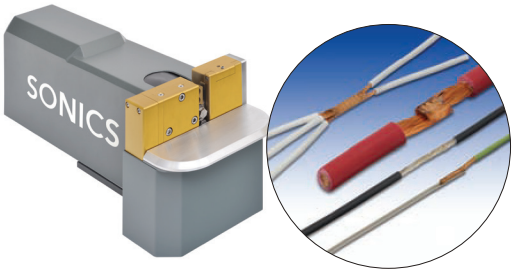
FEATURES & BENEFITS

- Ultrasonic Metal Welding is the ideal process for bonding conductive materials such as copper, aluminum, brass, gold and silver.
- Excellent welds are achieved with otherwise difficult applications, such as welding materials that are dissimilar in thickness and composition.
- The process is environmentally green as no solders, flux or braze material are required.
- Ultrasonic metal welding is a very efficient process with short weld times and low energy consumption.
- The process is a solid state weld so that components are not annealed and no harmful intermetallics are formed during welding.
- The ultrasonic weld is extremely reliable with built-in process monitoring to help assure zero rejects.
- Weld tooling typically lasts for several hundred-thousand cycles with no maintenance.
- Large weld areas of up to 150 mm^2 can be produced with our 6000 watt power supply.
- Key equipment features include automatic frequency tuning, digital amplitude control, soft-start overload protection, upper and lower weld limit settings, smart-logic navigation.

SPOT WELDER



SPLICER



POWER SUPPLIES

ultrasonic metal welding equipment

Sonics and Materials, Inc. manufactures ultrasonic metal welding systems in frequencies of 40 kHz, 20 kHz and 15 kHz with available power supplies ranging from 800 to 6000 watts. Sonics has been a world leader and innovator in ultrasonic welding for over five decades.

A typical metal welding bench-top system consists of an ultrasonic power supply, converter, booster, horn, pneumatic press/actuator and holding fixture.

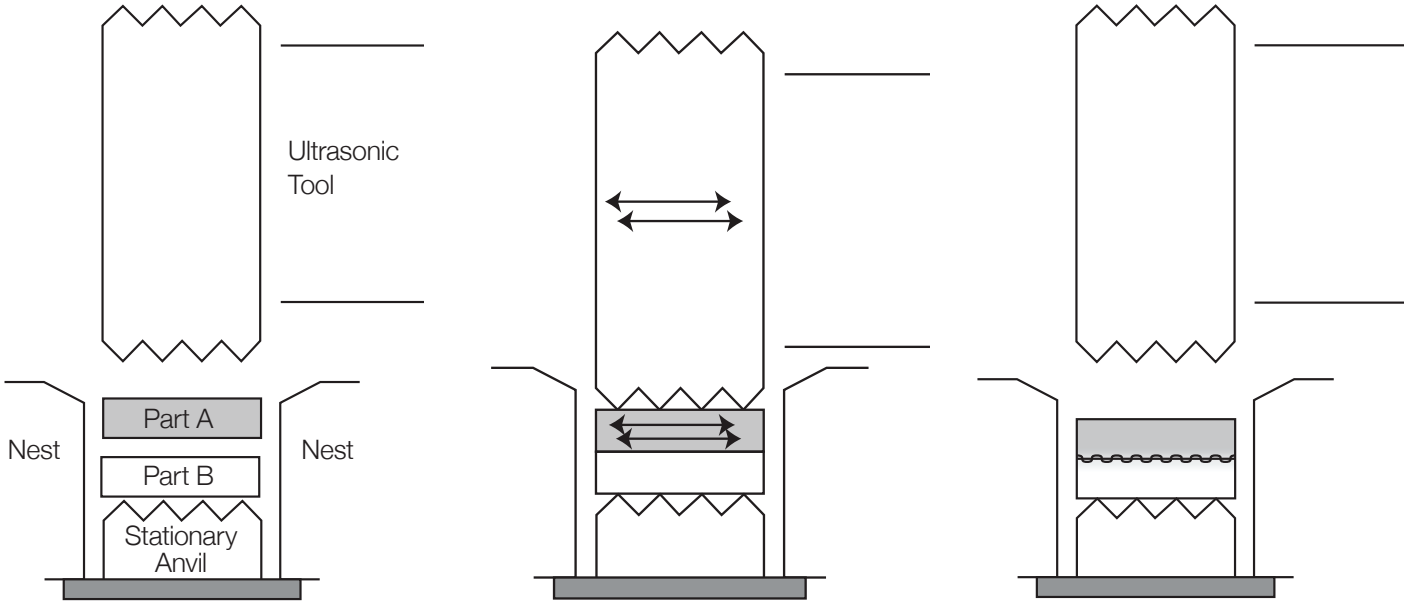
Sonics also offers component packages for integration into automated systems for customer production requirements.

In addition to complete ultrasonic metal welding systems, Sonics manufactures a full range of custom tooling in a variety of materials, as well as holding fixtures and components. Sonics also offers free application evaluation and analysis in our fully equipped applications laboratory.

typical applications

- **Wire Splicing**
- **Wire Termination**
- **Flex Cable Termination**
- **Batteries**
- **Heat Sinks**
- **Solar Panels**
- **Coils**
- **Contacts**
- **Switches**

How Ultrasonic Metal Welding Works



The parts to be welded are placed into a locating nest.

One component rests on a stationary anvil that is serrated to grip the component and hold it still.

The ultrasonic tool descends to apply a clamping pressure between the parts being welded.

The tool then vibrates at a frequency of 20kHz, 40kHz or 15 kHz.

The materials to be welded are thus scrubbed together under pressure causing surface oils and oxides to be dispersed.

The base metals are then mechanically mixed causing a metallurgical bond between the parts.

The parts are immediately welded; there is typically no hold time or curing time.

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