

BRANSON

ULTRASONIC ASSEMBLY SYSTEMS

2000X f/aef

- Weld by time, energy, peak power, ground detect, collapse, absolute
- Full VGA touch screen
- Graphing
- Available in 3 frequencies - 20, 30, and 40 kHz
- Digital amplitude setting
- Patented amplitude and force profiling
- Multiple language choices including Japanese, Korean, and Chinese
- Multiple communications options
- Digital setting of weld force and downspeed
- Increased power levels



2000X

TOTALLY DIGITAL

DIGITAL CONTROLS

DIGITAL POWER SUPPLY

ADDITIONAL SOFTWARE FEATURES

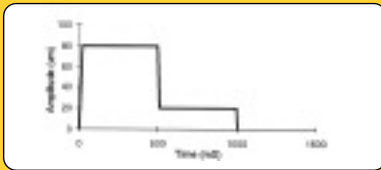
WELDING | STAKING | INSERTION | SWAGING | FORMING | SPOT WELDING | DEGATING | CUTTING AND SEALING

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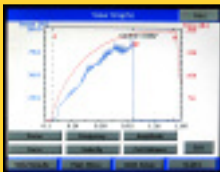
PROCESS CONTROL

- **Multiple weld modes:** weld by time, peak power, energy, distance (absolute and collapse), ground detect, and force
- **Patented Amplitude Stepping** for optimization of weld strength and appearance (**Fig.1**)



(Fig. 1)

- **Built-in digital amplitude control** - for fine tuning of critical applications.
- **True alarm messages for ease of troubleshooting**, with links to additional information.
- **Self-diagnostics and monitoring** - visual, audible, and logic output alarms.
- **Built-in alarm and cycle counters** to track production.
- **Printing capability** - Provides a record for future comparison and validation. Includes drivers for ESC/P and HPL drivers. Prints single line weld data, print setup, and overlaid color graphs (**Fig. 2**).



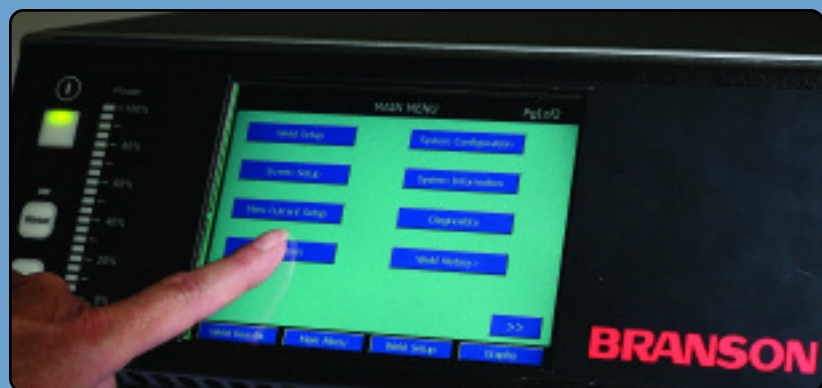
(Fig. 2)

- **Sixteen nameable presets** for ease of setup and changeover of applications.
- **Selectable pretriggering** - auto, distance, and time
- **Password protection** feature for lock-out of unauthorized process changes once the equipment is set up for a specific application.
- **Total cycle time can be displayed** in weld results screen.
- **Available in 3 frequencies** - 20, 30, 40 kHz.
- **Weld results screen** allows user to monitor key operating parameters.
- **VQSSM (Visual Quality Screen)** provides basic real-time quality monitoring.



COMMUNICATIONS

- **Windows CE Operating System with Industrial PC** - a fully-functional Windows program specifically designed for non-PC devices
- **Ethernet** permits easy access for networking the welder
- **USB** - the addition of this port allows for any USB device to be linked to the unit, including mouse, memory sticks, printers, etc.
- **X-Net** - an embedded program that allows for remote monitoring and networking
- **External VGA port** - allows for the addition of either a remote monitor or touch screen to the system

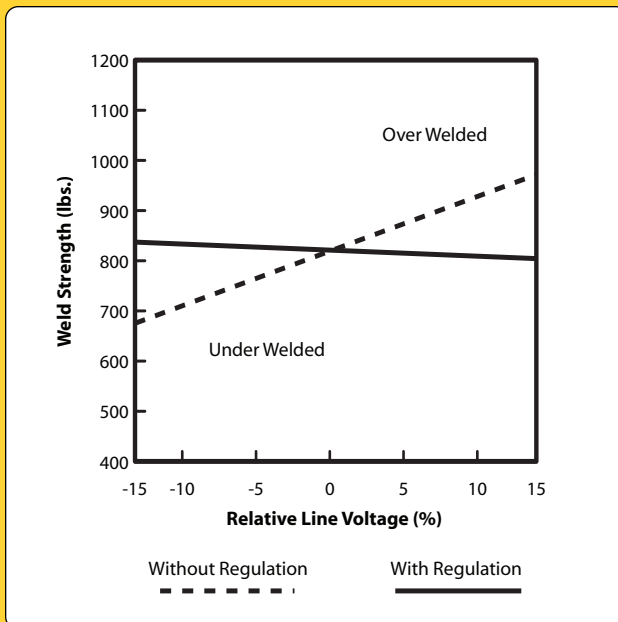


USER INTERFACE

- **Full VGA touch screen**
- **Process graphing with graph overlay capability** - graphing of power, collapse distance, amplitude, force, velocity, and frequency. Any two graphs can be overlaid.
- **PMC - Power Match Curve:** a feature that allows the user to develop a standard power graph, then set limits for process monitoring
- **Choice of language for message display and printout** - English, French, German, Italian, Spanish, Japanese, Korean, traditional and simplified Chinese
- **Two write-in fields for additional setup information**
- **USB port** for data collection, mouse, printer, etc.
- **Horn signature graph** with comparison of up to three graphs

TOTALLY DIGITAL POWER SUPPLY

- **True Digital Autotune with Memory (AT/M)** - Provides fully-automatic tuning and stores horn frequency at the end of each weld.
- **Total Amplitude Control** - Utilizing Branson's digital power supply technology, you have complete control of amplitude throughout the weld cycle: programmable starting ramp, digital setting of weld amplitude or patented amplitude stepping, and energy braking.
- **Programmable Starting Ramp** - Adjustable starting ramps from 10 milliseconds to 1.0 second to accommodate the starting characteristics of a wide range of horns. This feature makes it easier to start more difficult horns. When utilizing smaller horns, you can minimize the starting ramp reducing cycle times.
- **Energy Braking** - a controlled stoppage of the ultrasonic stack. This feature eliminates the traditional "ring down" of the stack creating a more consistent energy input into the parts. Small horns can actually be stopped faster, increasing throughput in high-speed automation.
- **Line / Load Regulation** - Corrects for variations due to power line fluctuations and varying load conditions through Branson's patented closed-loop amplitude control. Output amplitude is maintained with a variation of only $\pm 2\%$ with line voltage variations of $\pm 10\%$, regardless of load, improving weld consistency (**Fig. 3**).
- **System Protection Monitor (SPM)** - Five levels of power supply protection are provided: 1) phasing, 2) over voltage, 3) over current, 4) over temperature, and 5) power.
- **Auto Seek automatically measures stack frequency and stores it in memory** - Five selectable Auto Seek choices are available.
- **Automation interface is available for direct hookup with PLCs and PCs**
Required automation I/Os are provided through a 24V DC logic interface.



(Fig. 3)



ACTUATOR

- **Weld force and velocity (downspeed) settable through the VGA interface.**
- **Variable Dynamic Triggering provides consistent weld quality** by triggering ultrasonic vibrations after a preset force is applied to the part.
- **Dynamic Follow-through ensures the smooth, efficient transmission of ultrasonic energy into the part** by maintaining horn/part contact and force.

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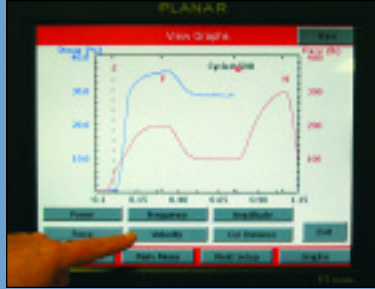
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AVAILABLE OPTIONS

- SPC software
- Touchscreen monitor
- Base-mounted leveling plate for horn/fixture/part alignment
- Solid mount boosters
- Longer columns - 4' to 6' lengths
- Ground detect cable



2000X f/aef Specifications

2000X f Power Supply	20:1.25	20:2.5	20:4.0	30:0.75	30:1.5	40:0.4	40:0.8
Output power:	1250 Watts	2500 Watts	4000 Watts	750 Watts	1500 Watts	400 Watts	800 Watts
Line voltage:	117 V AC * 50/60 Hz, 1Ø	200-240 V AC 50/60 Hz, 1Ø	200-240 V AC 50/60 Hz, 1Ø	117 V AC * 50/60 Hz, 1Ø	117 V AC * 50/60 Hz, 1Ø	117 V AC * 50/60 Hz, 1Ø	117 V AC * 50/60 Hz, 1Ø
Max. current:	14 amps max.	14 amps max.	19 amps max.	10 amps max.	10 amps max.	5 amps max.	10 amps max.
Receptacle required:	NEMA 5-15R	NEMA L6-20R	NEMA L6-20R	NEMA 5-15R	NEMA 5-20R	NEMA 5-15R	NEMA 5-15R
Frequency:	20 kHz	20 kHz	20 kHz	30 kHz	30 kHz	40 kHz	40 kHz
Max. cycle rate:	80 cpm (application dependent)						
Ambient temp. range:	41-122° F (5-50° C) (104° F / 40° C max @ 90% humidity)						
External inputs/outputs:	9-pin start connector; 44-pin user I/O connector						

*200-240 V AC optional.

Actuator Model	aef 2.0	aef 3.0
Max. clamp force on part (digitally set)	154 lbs (685 N) at 60 psi (represents system setting) 217 lbs (965 N) at 80 psi (represents system setting)	378 lbs. (1.68 kN) at 60 psi (represents system setting) 519 lbs (2.31 kN) at 80 psi (represents system setting)
Dynamic Triggering range: (digitally set)	5 to 217 lbf. / 22 to 965 N (based on system setting)	10 to 519 lbf. / 44 N to 2.3 kN (based on system setting)
Stroke length:	4" (101.6 mm)	
Pneumatic requirement:	Clean (5 micron, filtered, 3 micron coalescing), dry, non-lubricated air at 100 psi (690 kPa). (For system setting of 60 psi, a minimum of 70 psi is required. For system setting of 80 psi, a minimum of 90 psi is required.)	

All specifications subject to change without notice. All dimensions are nominal.

All units are CE compliant and comply with FCC rules and regulations governing radio frequency interference.

Note: All sales shall be subject to the Supplier's terms and conditions of sale as described in Branson's quotations and sales contracts.

WARRANTY

The Branson 2000X Series ultrasonic assembly systems carry a three-year warranty on materials or workmanship. Note: This warranty applies to equipment purchased and operated in North America. For warranty information on units purchased and/or operated outside the U.S. contact your local representative.



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