

BRANSON

2000 SERIES

Ultrasonic Assembly Systems

2000t/ae

GENERAL DESCRIPTION

Branson's 2000t/ae ultrasonic assembly systems set a new standard for users operating in the "time" welding mode. These systems include the improved *UPS* power supply module with Branson's patented closed loop circuitry, providing enhanced performance, consistency, and reliability.

The 2000t/ae includes a new user interface with a 4-line vacuum fluorescent display designed for ease of use in setup, operation, and troubleshooting. The system also has enhanced data capabilities for configuration and information management.

The 2000t/ae systems are available in 20 kHz, 30 kHz, and 40 kHz. The power supplies have increased power output for all frequencies: 20 kHz units are rated at 1100, 2200, and 3300 Watts; 30 kHz units are available in 1500 Watts; and 40 kHz are available in 400 and 800 Watts.

The 2000t/ae systems are designed for use in manual, semi-automated, or fully automated environments. The actuator may be mounted directly on a machine frame, with a fixed support on a column and hub, or as a stand-alone system on a base with palm button switches.

- ✓ *Weld by time*
- ✓ *Easy-to-use operator interface*
- ✓ *Available in 3 frequencies*
- ✓ *Digital amplitude setting*
- ✓ *Multiple Language Choices*



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welding • staking • insertion • swaging • forming • spot welding • degating • cutting & sealing

KEY FEATURES

Note: items in blue are unique to the 2000t/ae systems over 900 Series.

User Interface/Process Controls

- New user interface featuring 4-line vacuum fluorescent (VF) display makes setup, operation, diagnostics, and troubleshooting easier.
- **Built-in digital amplitude control** - for fine tuning of critical applications, because amplitude is the most important variable in ultrasonic welding. The setting has a range of 10% to 100%.
- **True alarm messages** for ease of troubleshooting, with links to additional information.
- **Self-diagnostics and monitoring** - visual, audible, and logic output alarms.
- **Built-in frequency and memory bargraph** diagnostics for simplified troubleshooting of the converter/booster/ horn stack.
- **Nonvolatile storage of cycle parameters.**
- **Alarm and cycle counters** are built in for tracking production; works via a real time clock.
- **Built-in ground detect** with scrub time to increase tooling and converter life in textile and film applications.
- **Printing capability** - Provides a record for future comparison and validation. Includes drivers for ESC/P and HPL drivers. Prints single line weld data and print setup.
- **Choice of language** for message display and printout—English, French, German, Italian, or Spanish—for ease of use in worldwide operations and multilingual workplaces.
- **One nameable preset** for ease of setup and changeover of applications.
- **Selectable pretriggering**
- **Password protection** feature for lock-out of unauthorized process changes once the equipment is set up for a specific application.
- **Optional terminal** for ease of setup and cycle information display.

Power Supply

- **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. It ensures constant power in welding, and provides greater weld consistency and reliability.
- **Autotune plus Memory (AT/M)** - Provides fully-automatic tuning in a range of ± 500 Hz centered around 19.950 kHz for 20 kHz horns, ± 750 Hz centered around 30 kHz for 30 kHz horns, and ± 1000 Hz around 39.900 kHz for 40 kHz horns, and stores horn frequency at the end of each weld.
- **Selectable Starting Ramp** - Four selectable start rates—10, 35, 80, 105 milliseconds—to accommodate starting characteristics of a wide range of horns. This feature makes it easier to start more difficult horns or enables faster cycle rates.



- **Auto Seek** automatically measures stack frequency and stores it in memory. Five selectable Auto Seek choices are available:
 1. On power-up
 2. Externally with automation controller
 3. Depressing "test" switch
 4. By once/minute timer to track heating, cooling, and other effects
 5. Post weld seek.
- **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. The benefits of this circuitry are to avoid equipment failures, and to provide greater weld accuracy and repeatability.
- **Automation interface** is available for direct hookup with PLCs and PCs. Required automation I/O's are provided through a 24V DC logic interface. Signals include weld on, general alarm, and external reset. Systems without an actuator may be operated via a simplified interface to a PLC.

Actuator

- **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.



2000t/ae

2000 SERIES PRODUCT/PERFORMANCE ENHANCEMENTS

The following chart gives a comparison of the 2000t/ae system with 900 Series products.

900DA/AE	2000t/ae	Benefits
Weld by time, digital	Weld by time, digital	
<i>Power levels (Watts):</i>	<i>Increased power levels (Watts):</i>	
20 kHz - 1000, 2000, 3000	20 kHz - increased to 1100, 2200, 3300	Higher available power for faster weld cycles
40 kHz - 700	40 kHz - increased to 400, 800	Higher available power for faster weld cycles
	30 kHz - new frequency, 1500	Higher power at higher frequencies; expands application range for delicate parts.
Single line LED display	Four-line alphanumeric VF display	More information visible; easier setup
Autotune with memory	Autotune with memory	Consistency and improved performance
Line/load regulation	Line /load regulation	Consistency and improved performance
Selectable starting ramps	Selectable starting ramps	Easier to start more difficult horns; faster cycle rates
	Digital amplitude setting with range of 10-100%	Fine tuning of critical applications
	Single 20 kHz converter at all power levels	Eliminates setup errors
	20% higher converter output amplitude at 20 kHz	Faster weld cycles
	Printing capability	Troubleshooting and process record provided for future comparison, troubleshooting, validation, etc.
	Alarm & cycle counters	Production data
	Password protection	Lock out unauthorized process changes
	True alarm messages, no error codes	Ease of troubleshooting; more specific information
	Single-turn down speed control with lock	Easier to set up and adjust; lock-out of unauthorized process changes
	Frequency and memory bargraph diagnostics built in	Simplified stack troubleshooting
	Built-in ground detect with scrub time	Increased tooling and converter life
	Power supply status indicators (run, seek, store, clear)	Easier power supply diagnostics and troubleshooting
	Horn down function	Ease of horn/fixture alignment
	1 nameable preset	Ease of setup
	"Hand-held" mode (when power supply is used without an actuator)	Flexibility for automation
	ASCII data output	External data logging

- A single 20 kHz converter is used for all 20 kHz power supplies. This converter produces 20% higher output amplitude for faster weld cycles.
- Converter cooling - Cooling air is directed into the converter during each operating cycle.
- Five air cylinder sizes are available for better control of clamp force. Sizes include: 1.5, 2.0, 2.5, 3.0, and 3.25 inches.
- Custom single-turn flow control provides for more accurate setting of downspeed, and easier resetting during application changeover.
- Stroke indicator
- Calibratable pressure gauge

AVAILABLE OPTIONS

- ▶ Leveling fixture - base-mounted plate for horn/fixture alignment.
- ▶ Dump valve - for release of cylinder pressure for ease of setup.
- ▶ Solid mount boosters
- ▶ Longer columns - 4' to 6' lengths
- ▶ Printer with cable - printing of setup and cycle information for comparison and troubleshooting.
- ▶ Terminal with cable - for screen-driven setup
- ▶ Ground detect cable

WARRANTY

The Branson 2000 Series t/ae 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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SPECIFICATIONS

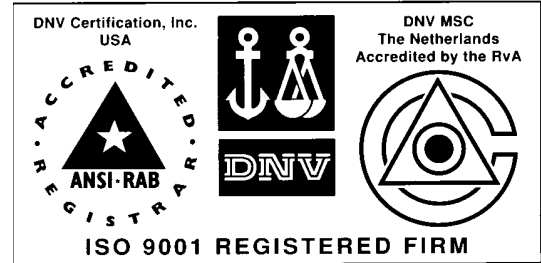
Most units are CE compliant, and comply with FCC rules and regulations governing radio frequency interference. Contact Branson, Danbury, for information.

2000t Power Supply	20:1.1	20:2.2	20:3.3	30:1.5	40:0.4	40:0.8
Output power:	1100 Watts	2200 Watts	3300 Watts	1500 Watts	400 Watts	800 Watts
Line voltage:	117 V AC * 50/60 Hz, 1ph.	200-240 V AC 50/60 Hz, 1ph.	200-240 V AC 50/60 Hz, 1ph.	117 V AC * 50/60 Hz, 1ph.	117 V AC * 50/60 Hz, 1ph.	117 V AC * 50/60 Hz, 1ph.
Max. current:	14 amps max.	14 amps max.	17 amps max.	20 amps max.	6 amps max.	12 amps max.
Receptacle required:	NEMA 5-15R	NEMA L6-20R	NEMA L6-20R	NEMA 5-20R	NEMA 5-15R	NEMA 5-15R
Frequency:	20 kHz	20 kHz	20 kHz	30 kHz	40 kHz	40 kHz
Max. cycle rate:	80 cpm **					
Ambient temp. range:	41-122° F (5-50°C)					
External inputs/outputs:	9-pin start connector; 44-pin user I/O connector					
Actuator Model						
	ae1.5	ae2.0	ae2.5	ae3.0	ae3.2	
Max. clamp force on part (at 100 psig/ 690 kPa)	140 lbs. 623 N	270 lbs. 1.2 kN	440 lbs. 1.96 kN	650 lbs. 2.89 kN	770 lbs. 3.42 kN	
Dynamic Triggering range:	15-140 lbf. 67-623 N	15-180 lbf. 67-800 N	15-180 lbf. 67-800 N	15-180 lbf. 67-800 N	15-180 lbf. 67-800 N	
Dynamic Follow-through range:	15-140 lbf. 67-623 N	15-270 lbf. 67 N-1.2 kN	15-400 lbf. 67 N-1.78 kN	15-400 lbf. 67N-1.78 kN	15 lbf. -400 lbf. 67 N-1.78 kN	
Stroke length:	4" (101.6 mm)					
Pneumatic requirement:	Clean (5 micron, filtered), dry, non-lubricated air at 100 psi (690 kPa)					
<p>* 200-240 V AC optional. <i>All specifications subject to change without notice. All dimensions are nominal.</i></p> <p>** Application dependent.</p>						

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

REGIONAL TECHNICAL CENTERS

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