BRANSON
2000 SERIES

Ultrasonic Power Supplies

2000bdc

GENERAL DESCRIPTION

The 2000bdc family of power supplies is Branson's latest offering in ultrasonic power supply technology and continuous process control. New patented circuitry with closed loop amplitude control provides significant new benefits in performance, consistency, and higher productivity, especially in applications requiring a high level of process control and weld quality. The 2000bdc has front panel digital amplitude control, settable from 10 to 100%. Six models are available in three frequencies: 20 kHz at 1100, 2200, and 3300 Watts; 30 kHz at 1500 Watts; and 40 kHz at 400 and 800 Watts. The power supplies may be combined with an actuator or a converter/booster/horn stack to form an ultrasonic package designed for continuous-duty or automated production systems. In addition, these models may be used with Branson FS-90 and FS-180 ultrasonic sewing machines as well as with other continuous applications.

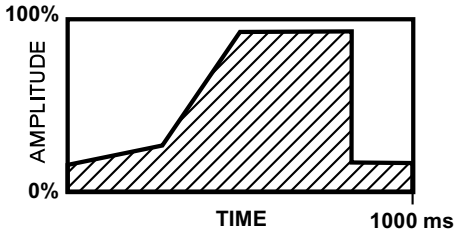

Figure 1. Sample Amplitude Profile

KEY FEATURES

- Electronic Amplitude Control - Amplitude is an extremely important variable in ultrasonic welding. Electronic amplitude control makes it possible to set amplitude, change amplitude *during* a weld cycle, and to maintain the specified amplitude regardless of variations in the incoming line voltage or applied load.

  The 2000bdc features a built-in digital amplitude control. This allows repeatable setups and digital accuracy in selecting amplitude. The amplitude is displayed via large LEDs that provide excellent visibility.
- Amplitude Change - Amplitude can be *increased or decreased* instantaneously *during* the weld, making possible a level of control of the process not previously feasible. (See Figure 1.) The control signal can come from a user-provided external source. The working amplitude range is from 10 to 100%.
- Amplitude can be set externally or via a digital display on the front panel.
- Line Regulation - Output amplitude is maintained with a variation of only ± 2% with line voltage variations of ±10%, providing the function of a constant voltage transformer. This corrects for variations due to power source fluctuations (Figure 2) through closed loop amplitude control. It ensures constant power in welding, and provides greater weld consistency and reliability.

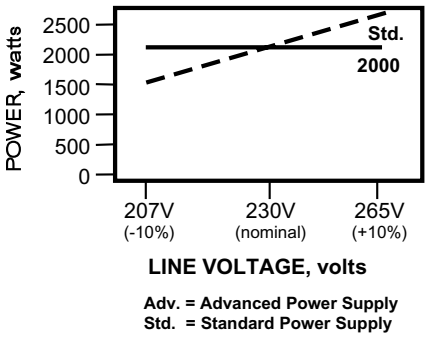

Figure 2. Constant Amplitude/Power

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- Load Regulation - Regardless of load, the power supply will deliver the selected amplitude from the converter. (Figure 3.)

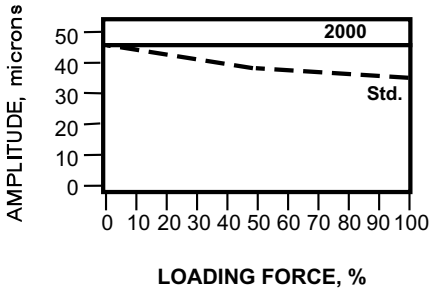

Figure 3. Amplitude vs. Loading

- Force Requirement - Because of constant amplitude, *significantly* less force, or conversely, less stack amplitude, is required to accomplish a weld. (Figure 4.)

  The advantages of lower force are less flash and less deflection of thin-walled parts during welding. Lower amplitude reduces the possibility of part marking and enables the welding of more delicate parts.

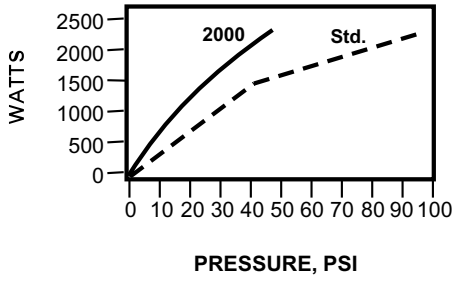

Figure 4. Power Output vs. Pressure

- Power vs. Amplitude Setting - When changes in amplitude are made, the maximum power available also changes. With electronic amplitude, a more stable linear relationship is maintained between amplitude setting and power. (Figure 5.)

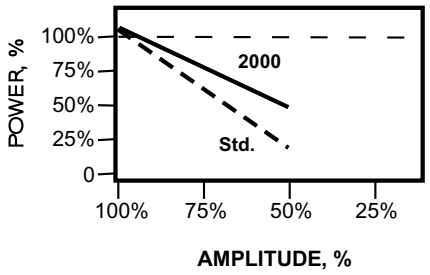

Figure 5. Maximum Power Output

- 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 at 30 kHz for 30 kHz horns, and ± 1000 around 39.900 kHz for 40 kHz horns, and stores horn frequency at the end of each weld.
- Auto Seek is used to track the operating frequency when the system is idle. It automatically measures horn frequency by running the horn at a low-level amplitude (5%) to find and lock on to the horn operating frequency and store it in memory. Four 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.
- Selectable Starting Rates - Dipswitch selectable start rates - 10, 35, 80, 105 milliseconds, to accommodate starting characteristics of a wide variety (range) of horns.
- System Protection Monitor (SPM) circuitry ensures maximum reliability by necessitating correct operating conditions to protect power supply, converter, and other system components. Three levels of power supply protection are provided: 1) phasing, 2) over voltage, 3) over current. The benefit of this circuitry is to avoid equipment failures and, thereby, downtime, as well as to provide greater weld accuracy and repeatability, and to reduce rejects.
- High Cycle Rate - The power supply is capable of in excess of 200 welds per minute. Actual cycle rate is dependent upon the application and controls.
- Improved Power Measurement - Power measurement includes both RF voltage and current, and is corrected for any amplitude setting. Fast-response LED meter displays power loading in 5% increments, and provides storage of the peak power achieved during the weld cycle as well as better visibility. 100% of rated output of power supply is delivered at full meter reading.
- Interface provided for direct hook-up with programmable controllers. Overload and weld on outputs and external reset input are available for customer access, either through relays or 24V DC logic interfaces. External reset input available in +24V.
- Choice of method of ultrasonics activation – either autosonics or external control with closure. The autosonics option provides activation of ultrasonics when the power supply is turned on. External control is provided by the user with a switch or contact closure.

SPECIFICATIONS

2000bdc Power Supply	20:01.1	20:02.2	20:03.3	30:01.5	40:.4	40:.8
Electrical Specifications						
Peak output power:	1100 watts	2200 watts	3300 watts	1500 watts	400 watts	800 watts
Max. continuous power:	800 watts	1500 watts	1800 watts	800 watts	300 watts	450 watts
Line voltage:	100-120 V AC*, 50/60 Hz, 1Ø	200-240 V AC, 50/60 Hz, 1Ø	200-240 V AC, 50/60 Hz, 1Ø	100-120 V AC*, 50/60 Hz, 1Ø	100-120 V AC*, 50/60 Hz, 1Ø	100-120 V AC*, 50/60 Hz, 1Ø
Max. current:	13 amps	13 amps	19 amps	20 amps	5 amps	10 amps
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
External inputs/outputs						
Overload indication and Weld on:	Both 24V DC, 25 mA max. negative logic, and dry (clean) contact closure (120V AC, 50 VA max.) available					
External reset:	+24V DC, 25 mA max.					
Advanced features connector for J954	0-10V power signal, % U/S power, memory out, run out, store out, external seek in, external amp. In, amp. out, frequency out, and other hardware interface signals					
Mechanical Specifications						
Height:	6-1/4" (160 mm)					
Width:	16-5/8" (422 mm)					
Depth:	19-3/8" (492 mm) (depth: plus 3" [76 mm] cable clearance)					

**200-240 V units optional.*

The Branson 2000 Series ultrasonic power supplies are in compliance with OSHA safety requirements and European requirements of the Low Voltage Directive. These products also comply with the FCC requirements of 47 CFR Part 18; those bearing the CE mark comply with the European requirements of the EMC Directive.

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

ORDERING INFORMATION

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

(Power supplies and converters marked ◆ are CE compliant.)

2000bdc Power Supplies

		Branson EDP No.
20:1.1 ◆	100-120V	101-132-661
20:1.1 ◆	200-240V	101-132-662
20:2.2 ◆	200-240V	101-132-663
20:3.3 ◆	200-240V	101-132-664
30:1.5 ◆	100-120V	101-132-721
30:1.5 ◆	200-240V	101-132-680
40:.4	100-120V	101-132-665
40:.4 ◆	200-240V	101-132-862
40:.8	100-120V	101-132-667
40:.8 ◆	200-240V	101-132-864

Converters

	Branson EDP No.
CJ20◆, 20 kHz (acorn contact)	101-135-059
CR20◆, 20 kHz (MS connector)	101-135-060
CJ30◆, 30 kHz (acorn contact)	101-135-082
CR30◆, 30 kHz (SHV connector; use J934C RF cable)	101-135-081
CH30◆, 30 kHz (SHV connector; use J934C RF cable)	101-135-071
4TJ◆, 40 kHz (acorn contact)	101-135-041
4TR, 40 kHz (MS connector; use J934 RF cable)	101-135-042
4TP◆, 40 kHz (SHV connector; use J934C RF cable)	101-135-068
4TH◆, 40 kHz (SHV connector; use J934C RF cable)	101-135-067

Cables

		Branson EDP No.
RF, J931	8'	101-240-017
	15'	101-240-012
	25'	101-240-007
RF, J931C (CE only)	8'	101-240-176
	15'	101-240-177
	25'	101-240-178
RF, J934	8'	101-240-034
	15'	101-240-035
RF, J934C (CE only)	8'	101-240-179
	15'	101-240-181
Alarm, J971 (CE)	8'	101-240-021
	15'	101-240-016
	25'	101-240-011
Keying cable, J913, for use with 2000bdc for control of ultrasonics	25'	101-240-072
Advanced features accessory cable, J954		101-240-128

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Boosters

Boosters are available in the standard O-ring mount configuration or with solid mount for increased rigidity. Available boosters and their EDP Numbers are listed below

O-Ring Mount Booster	*20 kHz*	*30 kHz*	*40 kHz*
Purple (Al) 1:0.6	101-149-055	--	101-149-087
Green (Al) 1:1	101-149-051	--	101-149-079
Gold (Al) 1:1.5	101-149-052	--	101-149-080
Silver (Al) 1:2	101-149-053	--	101-149-081
Black (Al) 1:2.5	--	--	101-149-082
Purple (Ti) 1:0.6	101-149-060	--	--
Green (Ti) 1:1	101-149-056	101-149-106	101-149-085
Gold (Ti) 1:1.5	101-149-057	101-149-105	101-149-086
Silver (Ti) 1:2	101-149-058	101-149-104	101-149-083
Black (Ti) 1:2.5	101-149-059	101-149-103	101-149-084
Solid Mount Boosters			
Purple (Ti) 1:0.6	101-149-095	--	109-041-178
Green (Ti) 1:1	101-149-096	--	109-041-177
Gold (Ti) 1:1.5	101-149-097	--	109-041-176
Silver (Ti) 1:2	101-149-098	--	109-041-175
Black (Ti) 1:2.5	101-149-099	--	109-041-174

WARRANTY

The Branson 2000bdc Power Supplies 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.

COMPATIBILITY / INTERCONNECTION GUIDE

Power Supply	*Interconnect Cables*	*Actuator/ Converter*
	System with Actuator	
bdc	J913 start*	2000ao actuator
	J971 alarm*	20 kHz –CJ20 converter
	J931 RF or J931C RF*	30 kHz –CJ30 converter**
		40 kHz –4TJ converter***
		Option: remote pneumatics, cable, mounting kit
	System with SHV converter (30 and 40 kHz only)	
bdc	J913 start* J971 alarm*	30 kHz –CR30 converter Option: CH30 converter
	J934C RF*	40 kHz –4TH converter
		Option: 4TP platen mount converter
	System with MS converter (20 and 40 kHz only)	
bdc	J913 start*	20 kHz –CR20 converter
	J971alarm*	40 kHz –4TR converter
	J931 RF (20 kHz) or J931C RF*	
	J934 RF (40 kHz)	

** CE compatible.*
*** Requires 30 kHz sleeve assembly.*
**** Requires 40 kHz sleeve assembly.*

CE

REGIONAL TECHNICAL CENTERS

Headquarters:	Toll free: 888-BUC-JOIN (888-282-5646)	
Boston:	781-938-8168	Fax: 781-935-0535
Chicago:	847-229-0800	Fax: 847-229-0861
Atlanta:	770-962-2111	Fax: 770-962-3720
Los Angeles:	909-305-2080	Fax: 909-305-2060
Dallas:	972-484-9228	Fax: 972-484-9976
Detroit (Automotive):	248-299-0400	Fax: 248-299-9343
Rochester, NY:	585-624-8000	Fax: 585-624-1262
Toronto, Canada:	905-201-4633	Fax: 905-201-4637
Mexico City (Resoplast):	011-52-555-670-4470	Fax: 011-52-555-670-7885

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