900 Series Integrated Ultrasonic Plastic Welders
Models 910 IW and IW+ — 1000 Watts
Models 920 IW and IW+ — 2000 Watts

General Description

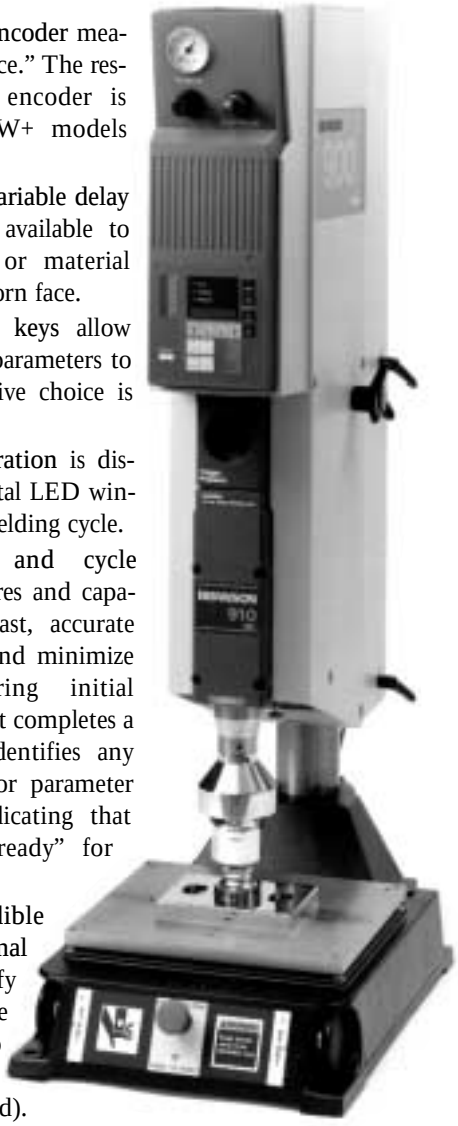
The Branson 900 Series Integrated Welders are self-contained ultrasonic plastics assembly systems that combine power supply, controls, indicators, and welding stand in a compact bench unit to conserve work space, ease setup, simplify operation, and facilitate relocation. The integrated welder is the ideal "entry level" system for new users of the technology and those with lower production requirements.

Available with power output of 1000 or 2000 Watts, the integrated welder Models IW and IW+ feature digital controls for accurate and repeatable setups. In addition, the IW+ models enable position (distance) welding in either collapse or absolute modes with limits.

When using the welder, the assembly operation is characterized by simplicity, speed, and efficiency. Once the system is programmed for a particular workpiece, no further adjustments are required.

Key Features

- Multiple operating modes – IW models feature welding in time; ultrasonics and force are applied to parts for a precise, preset time, and parts are held under force for a precise hold time; adjustable afterburst delay and duration times may be set, if required. Display of time and afterburst parameters is digital. IW+ models give choice of time or position (distance) modes (either absolute or collapse). In absolute, the weld is terminated at a predetermined point in the stroke, measured from the top of the stroke. In collapse, the weld is terminated at a predetermined point in the stroke after the horn contacts the part and the trigger switch is activated. The position display is digital. With position modes, upper and lower limit ranges may be selected.
- Direct Parameter Entry (DPE) allows easy, precise, and repeatable setting of weld time, hold time, afterburst delay and duration parameters. Tactile membrane keys on the front panel give positive indication of input entry.
- Digital parameter entry with autoranging when entering parameters gives precise settings for repeatable accuracy. The autoranged values enable fine resolution and setup accuracy.
- A linear optical encoder measures weld "distance." The resolution on the encoder is 0.0001 inch. (IW+ models only.)
- Afterburst with variable delay and duration is available to dislodge a part or material adhering to the horn face.
- Individual select keys allow easy selection of parameters to be modified. Active choice is lighted.
- Sequence of operation is displayed in the digital LED window during the welding cycle.
- Self-diagnostics and cycle monitoring features and capabilities provide fast, accurate troubleshooting and minimize downtime. During initial power-up, the unit completes a self-check and identifies any fault conditions or parameter errors before indicating that the system is "ready" for operation.
- Visual and audible alarms, and external outputs identify overload, machine faults and setup errors (e.g., emergency stop engaged).



- Fast-response LED storage 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 the power supply is delivered at full meter reading.
- Peak power reading from the last welding cycle is available on the digital LED display by depressing the "reset" switch. Similarly, power in the tuning mode is digitally displayed when the "test" switch is depressed.
- LED readouts display parameter settings during setup and operation for easy reference and monitoring. LEDs are large and easy to read in most light conditions.

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- Lockout of front panel switches is provided by and internal dip switch, preventing unauthorized parameter changes to the setup.
- Nonvolatile storage of cycle parameters provides storage of last-used cycle parameters even if the system is shut off or a power interruption occurs.

Standard 900 Series Equipment Features

- Patented Autotune feature allows the power supply to track and compensate for changes in horn frequency that occur over time during production due to increased temperatures, wear of the horn face, or material buildup on the horn.
- Exclusive System Protection Monitor (SPM) circuitry—ensures maximum reliability by necessitating correct operating conditions, terminating ultrasonic power when the system is operated under adverse conditions (e.g., excessive power supply loading, improper, loose, or failed horns or boosters), thereby protecting power supply and other system components.
- Automatic amplitude compensation provides constant horn amplitude over the full range of rated power encountered during the operating cycle.
- Electronic pretriggering is available to provide pretriggering without a mechanical switch to wear, adjust, or fail.
- Dynamic Triggering provides consistent weld quality by initiating (triggering) ultrasonic vibrations after a preset force, ranging from 15-200 lbs. (67 - 890 N), is applied to the part. As melting of the plastic occurs, dynamic follow-through ensures the smooth, efficient transmission of ultrasonic energy into the part by maintaining horn/part contact and force. The range of dynamic follow-through is from 15 - 200 lbs. (67 N to 890 N).

  The enhanced Dynamic Trigger mechanism of the 900 Series includes a 48 position control dial for greater accuracy and control, and a self-contained optical switch for accurate repeatability and long-term reliability.
- Rugged construction and durability—Rigidity and consistent, precise alignment of the horn and parts during welding is provided by linear ball bearing slides. The slide system incorporates a rail in linear motion guides with four sets of preloaded, permanently pre-lubricated bearings. This design ensures long-term reliability (less wear, less binding), and allows smooth linear motion and well-balanced stiffness against loads applied from any direction.* Preload is built into the bearings and does not depend on actuator assembly.

  The model 920 has a larger cylinder (3" compared with 2-1/2" in the 910 models) to provide higher force if required by the application.
- Ease of setup and changeover – The converter/booster/horn stack is easily installed and removed from the front of the carriage assembly without repositioning the actuator. The stack may be rotated a full 360^{o} in the carriage for horn alignment with the workpiece.
- Versatility—The 900 Series Integrated Welders are capable of welding, staking, inserting, swaging, spot welding, and degating thermoplastics and can also seal synthetic fabrics, films, and other thin thermoplastic materials.

  A 4" stroke (102 mm) accommodates parts with deep cavities. The welding head can be rotated on the column; height is adjusted by turning a handwheel on the side of the unit. The system is compatible with automated systems and most material handling devices.
- A lower limit switch connector is provided on the back of the welder for external mounting of a lower limit switch, proximity switch, or other part sensing device provided by the user. A signal may be input to the actuator through this connector to terminate ultrasonics upon activation of the device. (IW model only.)
- Adjustable 20 tpi locking mechanical stop with an adjustment knob. When properly set, the stop prevents the horn from touching the fixture or nest when no workpiece is in place.
- Upper limit switch causes the power supply to produce a “ready” signal when the carriage has fully retracted. The ready signal is used as a safety interlock switch on automated systems to prevent the movement of material handling equipment (indexing) when the horn is down or the welder is in error. An optical switch is used to provide reliable, wear-free operation.
- Stroke indicator allows quick identification of the operating stroke length.
- Convenient Pneumatic Controls
  - Flush-mounted 2" diameter pressure gauge provides excellent visibility for ease of setup; calibration is in both USCS (English) and metric (SI) units.
  - High-precision regulator provides accuracy and repeatability. Included is a locking feature—pull to set, push to lock—that enables consistency of operation once the unit is set up.
  - Calibrated flow control valve for down-speed gives accuracy, consistency, and repeatability machine to machine. A locking mechanism is built in.

*For applications involving severe side loading, check with Branson before operation.

- "Horn down" key on front panel facilitates setup allowing alignment of the horn with parts during setup without activating ultrasonics.

- Molded thermoplastic structural foam housing (Noryl®) enclosed all internal electronic components in a housing that is durable, compact, lightweight, non-conducting, and non-corrosive, single door access is provided to most internal components.

Automation Interfacing

Branson's 900 Series Integrated Welders can be interfaced with external devices and controls (e.g., PLCs, etc.). This use will require a J971 alarm cable and harness kit.

- Select faults or weld errors sensed by the system can be communicated outside the welder for monitoring cycles and sorting suspect parts. Front panel or external reset access is provided.
- General alarm and weld on outputs are available for customer access through 24V DC negative logic devices. The ready signal is both a 24V DC and and isolated contact closure.
- 0-5 Volt power signal (proportional to power output) can be attached to standard recording devices; provides quick, easy power measurement.
- External reset is available for customer access as a 24V DC input. A 24V source is provided by the welder.

Warranty

The Branson 900 Series Integrated welders carry a three-year warranty on all parts and workmanship. *Note:* this warranty applies to welders purchased and operated in the United States. For warranty information on units purchased and/or operated outside the U.S., contact your local representative.

Electrical Specifications

Power requirements:	910 IW/IW+	920 IW/IW+
Line voltage:	117V AC	200-245 V AC
Input current:	14 amps	13 amps

Electrical connection:

910: NEMA 5-15P plug provided; requires NEMA 5-15R receptacle.

920: NEMA L6-20P plug provided; requires NEMA L6-20R receptacle.

Note: Model 910 also available in 100 and 200-245 V; contact Branson, Danbury, for information.

Output power:	910 IW/IW+	920 IW/IW+
Output power to converter*:	1000 watts	2000 watts
Output power to load:	950 watts	1900 watts
Frequency:	20 kHz	20 kHz

Parameter ranges:	Range **	Increment/step
Weld & hold time range:	50-1,000 milliseconds (1 sec.)	1 millisecond
	1-10 seconds	10 milliseconds
Afterburst delay and duration:	"Off" or 50-1,000 milliseconds (1 sec.)	1 millisecond
	1-10 seconds	10 milliseconds
Position (IW+ only):	0.0001"-4.0"	Slow up/down key: 0.0001"
		Fast up/down key: 0.01"
Ambient temperature:	41-122º F (5-50º C)	

External inputs/outputs:

Power Signal, variable, 0-5V:	200k ohm minimum load impedance

The following signals require alarm harness kit 101-063-537 to be installed:

Ready signal	Both 24V DC and dry (clean) contact closure available.
General alarm Weld on	24V DC, negative logic 25 mA max.
External reset	+24V DC, 25 mA max.

The Branson 900 IW/IW+ Series Integrated Welders comply with FCC rules and regulations governing radio frequency interference.

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* At 100% meter reading.

** Note: With autoranging, the power supply will automatically display settings in the next range with the appropriate increments when the extremes of a range are reached.

Mechanical Specifications

Pneumatic requirement: Clean (5 micron, filtered), dry, non-lubricated air at 100 psi (690 kPa)

Maximum force on part:

Model 910 IW/IW+: 440 lbs. at 100 psig (1.96 kN at 690 kPa)(2-1/2" cyl.)

Model 920 IW/IW+: 630 lbs. at 100 psig (2.8 kN at 690 kPa)(3" cyl.)

Dynamic Triggering range: 15-200 lbs. (67-890 N) max.

Dynamic Follow-through range: 15-200 lbs. (67-890 N) max.

Stroke length: 4" (102 mm)

Cycle rate: IW = 90 CPM, IW+ = 65 CPM at 1" stroke length, 50 psig (345kPa), 50 ms weld, 50 ms hold.

Weight: 145 lbs. (66 kg)

Note: All specifications subject to change without notice.

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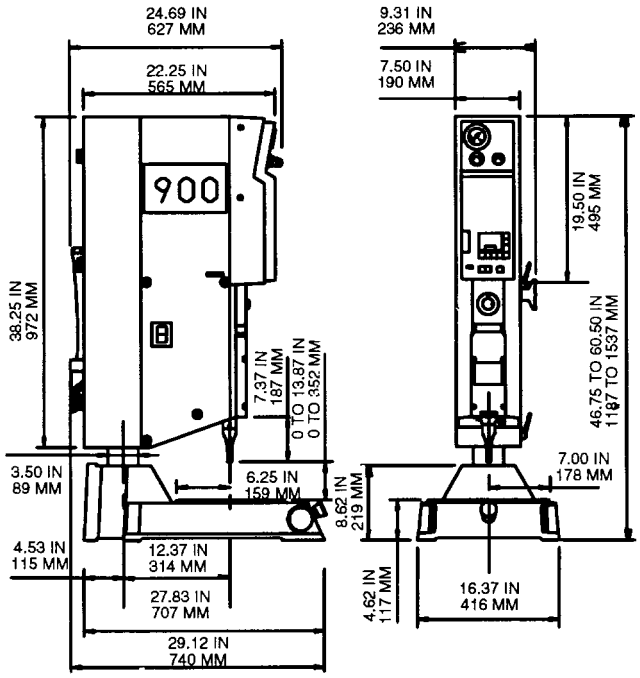

Note: Dimensions are approximate.

Ordering Information

900 Series Integrated Welders – include converter and choice of aluminum booster.

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

Note: Items marked with "◆CE" indicate models that are usable in Europe and comply with CE regulations.

	Branson EDP No.
Model 910 IW, 1000 Watts, 117V 50/60 Hz	101-162-072
Model 920 IW, 2000 Watts, 200/245V, 50/60 Hz	101-162-075
Model 910 IW+, 1000 Watts, 117V 50/60 Hz	101-162-077
Model 920 IW+, 2000 Watts, 200/245V, 50/60 Hz	101-162-080
Model 910 IW, 1000 Watts, 100/200-245V, 50/60 Hz(◆CE)	101-162-074
Model 910 IW+, 1000 Watts, 100/200-245V, 50/60 Hz(◆CE)	101-162-079
Model 920 IW, 2000 Watts, 200/245V, 50/60 Hz(◆CE)	101-162-090
Model 920 IW+, 2000 Watts, 200/245V, 50/60 Hz(◆CE)	101-162-091

Note: CE units cannot use alarm harness kit EDP No. 101-063-537.

Note: All models available with 1-1/2" cylinder or 2" cylinder (factory installed only). Contact Branson, Danbury, to order.

Branson EDP No.

Optional Columns–Integrated welders include a 40" long column with 1/4" wall, standard.

3.5" O.D., 4' (1/2" wall)*	100-028-004
3.5" O.D., 5' (1/2" wall)*	100-028-008
3.5" O.D., 6' (1/2" wall)*	100-028-005

**Note: When ordering 1/2" wall columns, spacer EDP No. 100-094-107 is required and must also be ordered.*

Hub - Used in automation with column in place of base assembly. 101-063-071

Converters (one included with welder)

Model 902J (acorn contact); use with Model 910 IW/IW+: 101-135-047

Model 922JA (acorn contact); use with Model 920 IW/IW+: 101-135-049

Boosters	Horn End Drill and Tap 1/2-20	3/8-24*
Aluminum		
1:0.6 (Purple)	101-149-055	101-149-090
1:1 (Green)	101-149-051	101-149-093
1:1.5 (Gold)	101-149-052	101-149-092
1:2 (Silver)	101-149-053	101-149-094
Titanium		
1:0.6 (Purple)	101-149-060	---
1:1 (Green)	101-149-056	---
1:1.5 (Gold)	101-149-057	---
1:2 (Silver))	101-149-058	---
1:2.5 (Black)	101-149-059	101-149-091

*IMPORTANT: Use with models 910 IW and IW+ only. With 920 IW/IW+, use 1/2-20 boosters, only.

Other System Cables

Start Cable, J911 (◆CE)	8'	101-240-020
(Requires Product	15'	101-240-015
Liability Agreement)	25'	101-240-010
Alarm, J971 (◆CE)	8'	101-240-021
	15'	101-240-016
	25'	101-240-011
Power Signal Cable, J952 (BNC output connector)	8'	100-240-027

Options and Accessories

Alarm harness kit	101-063-537

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