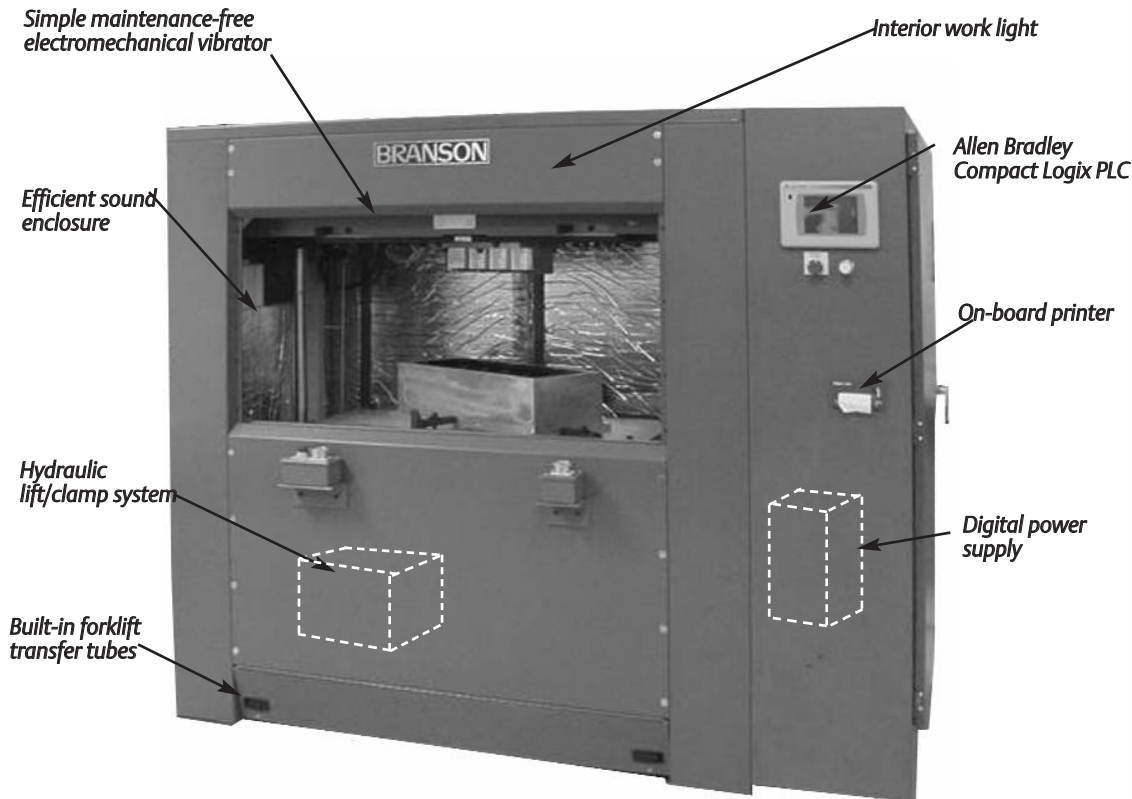


BRANSON



Data Sheet
VW-HYLINE-2

HyLine-2 Series Models VW-4H-2, VW-6H-2, and VW-8H-2 Linear Vibration Welders



General Description

Branson, the pioneer in vibration welding with over 25 years of real-life production experience, introduces an enhanced version of its popular HyLine Series linear vibration welders. Branson's HyLine-2 Series welders are complete assembly systems designed to weld large or irregularly-shaped parts.

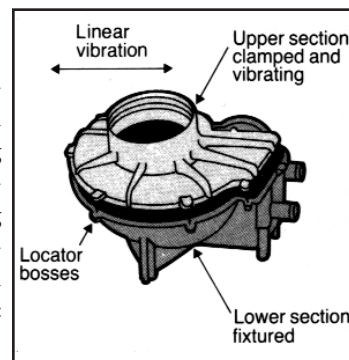
Three models, VW-4H-2, -6H-2, and -8H-2 are available to handle parts up to 58" by 22" (1473 by 559 mm), or multiple smaller parts.

The VW-4H-2 model has a solid-state 12.7 kW power supply, and the VW-6H-2 and VW-8H-2 both have 17.4 kW power supplies. All have an adjustable vibrating frequency range of 180 to 240 Hz. Modular construction allows the individual components, i.e., vibrator assembly and power supply/controller, to be adapted to automated or custom systems.

Process Description

Vibration welding is a proven friction welding technique capable of producing strong, pressure-tight joints in thermoplastic parts.

Frictional heat is generated by pressing the surfaces of two plastic parts together and vibrating the parts through a small linear displacement in the plane of the joint. When a molten state is reached at the joint interface, vibration is stopped and the parts are automatically aligned. Clamping pressure is maintained briefly while the molten plastic solidifies to form a bond approaching or equal to the strength of the parent material.



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EMERSON
Industrial Automation

Standard Machine Description

- **Machine Frame** - Welded construction of steel tubing and profiles incorporates four height-adjustable rubber mounts to allow both machine leveling and absorption of mechanical vibrations.
- **Vibrator Housing** - A rigid steel welded assembly houses the individual vibrator components; the main assembly areas are precision machined.
- **Vibrator** - The electromagnetic principle of Branson's vibrator assembly is patented and operates in a linear mode. The vibrator assembly consists of a set of laminations and four cantilever springs suspended from the vibrator housing. Electromagnets mounted in the housing act directly upon the mechanical suspension producing a peak-to-peak reciprocating displacement of 0.040 to 0.070 inch (1.02 to 1.8 mm) at 240 Hz. The springs return the vibrator to the precisely-aligned position when the electromagnets are de-energized, ensuring final part alignment.
- **Sound Protection Cabinet** - The sound protection cabinet is lined with sound absorbing material. An automatic vertical sliding access door with acoustic lining is incorporated in the front of the cabinet. For operator safety, the door automatically retracts if the start buttons are released before the door is closed.
- **Door Drive** - The two major components for the door drive are an air cylinder and specially designed and selected plastic and steel elements to provide smooth and consistent movement.
- **Rear Access Door** - The rear panel of the machine is fitted with a full-size, interlocked door to allow full access to the internal machine components.
- **Hydraulic Clamp Power System**, completely self-contained with drip pan, is located inside the rear access door.

Key Features

- **New controls system** using an Allen Bradley Compact Logix PLC. All system parameters are set through an Allen Bradley Panelview Plus 700. The PLC system monitors the welding parameters and controls all functions of the machine including: frequency (direct reading in Hz), weld time, melt distance (collapse), hold time, amplitude, weld clamp forces, and hold clamp forces.
- **On-board panel-mounted, 40 character, dot matrix printer** - printouts of setpoints, high/low limits and last cycle readings can be obtained manually at any time or automatically every 1-100 cycles.

- **Storage of up to twenty sets of weld parameters.** By calling up one of these presets, the operator automatically programs the machine to the setpoints for that particular application.
- The system also provides **process verification during each weld cycle.** This verification is a live reading of the actual amplitude, force, weld time, and melt distance occurring during that cycle.
- **Linear displacement transducer** for table positioning and meltdown. The transducer provides a positioning repeatability of 0.001" over the 24" length of the transducer and a meltdown resolution of 0.0005". This ensures tight control of the pre-weld stack-up height and precise meltdown capabilities, as well as the ability to set the table loading height.
- **SPC capabilities.** The PLC program can provide a data stream to a communications port to enable the user to hook up a computer and log the weld parameters over a period of time. The data can then be manipulated by the user's program to provide a printout in any number of forms: bar charts, histograms, range charts, etc.
- **Diagnostic program** which allows the machine to be compared against a known set of conditions. This enhances troubleshooting capabilities by matching the unit's current outputs with a standard set of values recorded during initial setup.
- **Digital power supply** provides increased starting power and better control of the weld process.
- **Self-tuning frequency program.** Pressing a button on the interface will allow the machine to automatically find and store the resonant frequency of the upper tooling mass. This known value can then be saved in a preset or manually input the next time the same upper tool is installed for production. The frequency range of the unit is variable between 180 Hz and 240 Hz.
- **Precise amplitude input and control** in a range between 0.040" and 0.070" (1.02-1.8 mm). The peak-to-peak welding amplitude can be set at the keypad in 0.001" increments.
- **Simple maintenance-free electromechanical vibrator** with only one moving part and no bearing surfaces to lubricate or wear.
- **Hydraulic lift/clamp system** includes two proportional valves to control the speed of the lift table and the clamp force applied to the parts.
- **Force profiling** - The HyLine control has up to four programmable weld forces to provide more accurate control of weld meltdown velocity. It also has one hold force to secure the parts as they cool after welding.

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Specifications

Note: All dimensions are nominal.

Note: All specifications subject to change without notice.

	VW-4H-2	VW-6H-2	VW-8H-2
MECHANICAL			
Weight:	Approx. 4,500 lbs. (2,040 kg)	Approx. 5,000 lbs. (2,268 kg)	Approx. 6,500 lbs. (2,720 kg)
Dimensions: Overall:	73" wide x 74" high x 42" deep (1854 x 1880 x 1067 mm)	87" wide x 73.5" high x 46" deep (2010 x 1867 x 1168 mm)	99" wide x 73.5" high x 46" deep (2515 x 1867 x 1168 mm)
Lift table:			
Overall:	33.5" long x 21" deep (851 x 534 mm)	46" long x 21.5" wide (1168 x 546 mm)	58" long x 23" wide (1473 x 584 mm)
Central opening:	23.5" long x 11.5" wide x 1.3" deep (597 x 292 x 33 mm)	38" long x 11.5" wide x 1.75" deep (965 x 292 x 44.4 mm)	50" long x 11.5" wide x 1.75" deep (1270 x 292 x 44.4 mm)
Drive platen:			
Overall:	30" long x 18" wide (762 x 457 mm)	40" long x 18" wide (1016 x 457 mm)	52" long x 18" wide (1321 x 457 mm)
Central opening:	15" long x 12" wide x 7.5" deep (381 x 305 x 190 mm)	30" long x 12" wide x 8" deep (762 x 305 x 203 mm)	43" long x 12" wide x 8" deep (1092 x 305 x 203 mm)
Front opening:	37" wide x 25" high (940 x 635 mm)	49" wide x 25" high (1245 x 635 mm)	61" wide x 25" high (1550 x 635 mm)
Variable stroke:	20" (508 mm) maximum	20" (508 mm) maximum	20" (508 mm) maximum
Noise level:	83 dBA standard	83 dBA standard	83 dBA standard
Drive power:	12.7 kW	17.4 kW	17.4 kW
ELECTRICAL			
Power requirements:	480VAC, 20 amps, 3 phase, 50/60 Hz	480VAC, 20 amps, 3 phase, 50/60 Hz	480VAC, 20 amps, 3 phase, 50/60 Hz
Output frequency:	180 - 240 Hz variable	180 - 240 Hz variable	180 - 240 Hz variable
Ambient temp:	32 - 105° F (0 - 40° C)	32 - 105° F (0 - 40° C)	32 - 105° F (0 - 40° C)
PERFORMANCE			
Driven platen fixture weight capacity:	35 lbs. (16 kg) recommended (50 lbs. (22.6 kg) maximum)	45 lbs. (20 kg) recommended (80 lbs. (36.3 kg) maximum)	110 lbs. (50 kg) recommended (120 lbs. (54.4 kg) maximum)
Max. clamp force:	4,000 lbs. (17.8 kN)	6,000 lbs. (26.7 kN)	6,000 lbs. (26.7 kN)
Amplitude range:	0.040" to 0.070" (1.0 to 1.8 mm)	0.040" to 0.070" (1.0 to 1.8 mm)	0.040" to 0.070" (1.0 to 1.8 mm)
Lift table speed:	10"/sec. (254 mm/sec.)	10"/sec. (254 mm/sec)	10"/sec (254 mm/sec.)
Total dry cycle time (without welding):	5.0 sec. (at 20" [508 mm max.] stroke)	5.0 sec. (at 20" [508 mm max.] stroke)	5.0 sec. (at 20" [508 mm max.] stroke)

- **Amplitude profiling** - Four programmable amplitudes are available for controlling welding.
- **Six outputs and three inputs** are available for tooling functions. An additional 32 I/Os are optional.

Warranty

The HyLine-2 Vibration Welder Models VW-4H-2, VW-6H-2, and VW-8H-2 are warranted to be free from defects two years for parts and one year for labor from the date of shipment.

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.

Branson EDP No.

Model VW-4H-2 vibration welder 300-101-095
 Model VW-6H-2 vibration welder 300-101-096
 Model VW-8H-2 vibration welder 300-101-097

Options

- Light curtain
- External work light
- Special paint
- Duplex electrical outlet (120V) (exterior mount)
- Dual lift cylinders (provides 21"/533 mm stroke and table opening depth of 12.5"/317 mm)

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VW-HYLINE-2

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