

# resistance welding

# Series 300

## High Precision Weld Head System with Force and Displacement Control

- High speed weld head
- Programmable force and weld positions
- Excellent force and position repeatability
- Displacement monitoring
- I/O ports for automation

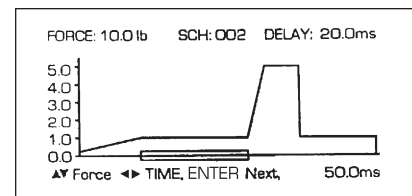


The Series 300 electromagnetic weld head system (U.S. Patent #5386092, #5225647) is comprised of a linear magnetic force actuator and a microprocessor-based electronic control, providing a precisely controlled weld force profile for miniature parts welding.

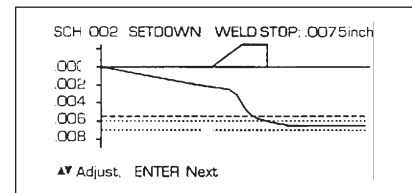
By showing actual displacement (set-down) with .0001 inch (2.5 $\mu$ m) resolution, the graphical screen allows the user to “fine tune” the weld time, follow-up force, and weld energy relationships between the Series 300 and the external welding power supply. The built-in displacement monitoring feature can be used to optimize the weld and isolate potential quality problems.

## Key Features

- **Electronic control and traceability of all weld head functions**  
Ensures repeatable weld head schedules that can be electronically dictated and documented for GMP, TQC, and ISO 9001.
- **Weld to displacement**  
Ensures consistent weld nugget size by controlling the amount of material collapse or set-down; excellent diagnostic tool for monitoring welding process.
- **Programmable follow-up force**  
Ensures consistent weld quality by preventing molten metal from escaping from the weld joint. Superior to pneumatic or spring weld force systems.
- **I/O ports for automation applications**  
Remote displacement or weld force profile schedule selection for simple automated applications via RS232/RS485 communications.



Program Mode – Weld Force Profile



Run Mode – Actual Weld Displacement

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## SERIES 300 WELD HEAD SYSTEM SPECIFICATIONS

<b>Electronic Control – Model 350</b>	
<b>Line Voltage (Input)</b>	100, 115, 208, or 230 VAC, ±13%, 50/60 Hz, single phase
<b>Input Circuit Rating</b>	100 to 115 VAC: 15A; 208 to 230 VAC: 8A
<b>Operating Temperature Range</b>	0 to 40°C
<b>Weld Force</b>	2 to 20 lbs. (0.9 to 9.1 Kg) (9 to 89 N)
<b>Follow-up Weld Force</b>	2 to 50 lbs. (0.9 to 22.7 Kg) (9 to 222 N)
<b>Squeeze Period</b>	1 to 999 msec
<b>Weld Period</b>	0.1 to 99.9 msec
<b>Delay Period</b>	0.1 to 99.9 msec
<b>Follow-Up Force Period</b>	1.0 to 9.9 msec
<b>Up-Stop Position Inches (mm)</b>	.006 to .999 (0.3 to 25.4)
<b>Search Position Inches (mm)</b>	.005 to .998 (0.2 to 25.3)
<b>Graphical Weld Display</b>	Graphical display of programmed weld force profile and actual displacement.
<b>Weld Force Profiles</b>	The user can write/save 128 different weld force profiles. Schedules 1 through 127 can be protected. Schedule 0 is used as a scratchpad for schedule development.
<b>Object Detection</b>	Detects the presence of objects located directly in the electrode path between the up-stop position and the search position and will automatically bring the electrode back to the up-stop position.
<b>Run/Dress Mode</b>	Provides adjustable electrode force to easily clean electrodes and then automatically re-calibrates the absolute position of the closed electrode tips.
<b>Physical Characteristics</b>	
<b>Dimensions H x W x D Inches (cm)</b>	8.5 x 10.5 x 15.1 (21.6 x 26.7 x 38.4)
<b>Weight – Lbs. (Kg)</b>	45 (20.4)
<b>Electronic Control</b>	
<b>Control Signal Input</b>	Provides control for the following remote control signals: Emergency Stop, Weld Inhibit, and Remote Schedule Selection. Use dry relay contacts, optocouplers, or 5 VDC logic levels.
<b>Foot Switch</b>	Provides process initiation using a 2-Level Foot Switch. For automated installations, use dry relays contacts, optocouplers, or 5 VDC logic levels.
<b>Output Signals</b>	
<b>Control Signal Output</b>	5 VDC logic, 35 ma (Max) sink or source. Designed for selecting weld schedules on Unitek Peco power supplies.
<b>Solid State Relays</b>	2 user programmable Solid State Relays: AC – 24/115 VAC @ 15VA; DC-24 VDC @ 15VA.
<b>Weld Fire Switch</b>	Solid state relay output for initiating the power supply weld current.
<b>RS485/RS232 Data</b>	Transmit weld displacement data to a user provided serial data logging device.

<b>Weld Head – Model 301 and Model 302</b>	
<b>Stroke (Maximum) Inches (mm)</b>	.999 (25.4)
<b>Force (Maximum) Lbs. (Kg)</b>	50 (22.7)
<b>Force (Weld) Lbs. (Kg)</b>	2 to 20 (0.9 to 9.1)
<b>Force Rating (continuous) Lbs. (Kg)</b>	7.1 (3.2)
<b>Force Linearity</b>	±5% of setting or ±0.3 lb (136 gm)
<b>Force Repeatability</b>	±0.1 lb (45 gm)
<b>Force Response Time</b>	Assuming no shaft movement, the rise time going from 0 lbs force to a step input force of 50 lbs (22.7 Kg) is 1 msec maximum.
<b>Slew Rate (Maximum)</b>	30 in/sec (76.2 cm/sec.)
<b>Operating Temperature (Maximum)</b>	93° C
<b>Physical Characteristics</b>	
<b>Dimensions L x W x D Inches (cm)</b>	14 x 2 x 4 (35.6 x 5.1 x 10.2)
<b>Weight: Lbs (Kg)</b>	13 (5.9)

## ORDERING INFORMATION

Model	Description
301H/xxxV	Includes Model 350 electronic head control and Model 301H in-line weld head. Specify line voltage of 100V, 115V, 208V, or 230V when ordering.
302H/xxxV	Includes Model 350 electronic head control and Model 302H offset weld head. Specify line voltage of 100V, 115V, 208V, or 230V when ordering.
<b>Required Accessories</b>	
MK301	Bench mounting kit for 301H system, includes stand, lower quick-change holder, head adapter plate, and one set of 2/0 AWG weld cables. Accepts 1/8 inch, 1/4 inch, 6mm, and 3mm electrodes.
MK302	Bench mounting kit for 302H system, includes stand, offset bottom electrode holder, head adapter plate, and one set of 2/0 AWG weld cables. Accepts .125 inch diameter electrodes.
FS2L	Two level footswitch used to initiate welding process.

Your Local Representative

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