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Nippon Avionics Co., Ltd.

<http://www.avio.co.jp/english/>

**4 models with different frequency/output are added,  
to ultrasonic generator lineup realizing high speed welding  
and contributing to quality improvement and tact shortening  
in various secondary plastic fabrication!**

Nippon Avionics Co., Ltd. (Headquarters: Shinagawa-ku, Tokyo. President: Katsuhiko Akitsu) will release 4 models of SW-D series ultrasonic generator simultaneously which will contribute to quality improvement and tact shortening in secondary fabrication of plastic components.

The products released this time are designed to be easily incorporated into automatic systems by variety of control modes and control by external signal. Furthermore, they are provided with abundant monitoring functions focusing on traceability, which is required in MONOZUKURI (the art of manufacturing), and they enable “high speed welding” not only in automotive application but also in various secondary fabrication of plastic components including electronics, packaging, medical, food and apparel.



In recent years, demand for highly functional plastic material is increasing due to the promotion of light weight, robustness, long life and safety, and fabrication of plastic has become an important area together with the development of new material. In particular, elaborate components for next generation automobile are needed, and high quality MONOZUKURI (the art of manufacturing) and quality control are required in “plastic joining technology”.

The ultrasonic generators (hereinafter “SW-D series”) released this time have evolved high speed welding made available by Avio unique algorithm called “ultrasonic oscillation frequency tracking system”, and realized “high quality and stable welding” which features “high speed” yet controlling variation. Furthermore, various control modes, including external sensor oscillation mode, are available enabling selection of control system most suitable for the work of the customer, and abundant monitoring functions are available for GOOD/NO GOOD judgment of the welding result.

## ■ Features

### 1. High speed welding for shortening of tact time

“Fast amplitude rise” at the time of force application and “least amplitude loss”, which are the features of Avio ultrasonic generator and which realize fastest welding in the industry, are evolved to a stage of digital control. As a result, various controls and monitoring have been enabled, plus production tact time has been shortened.

### 2. Welding quality improvement by Avio unique external sensor control/monitoring.

Control modes for ultrasonic oscillation supporting improvement of welding quality are enhanced. “External sensor control” is equipped in addition to controls by timer, energy, peak power and continuous oscillation, and “oscillation stop control” using displacement sensor and temperature sensor is realized. Furthermore, monitoring function is strengthened by enabling monitoring based on “external sensor signal” in addition to monitoring based on frequency, oscillation time, peak power and energy. By enhancing control and sensing, ultrasonic generator which can satisfy more requirements and accommodate different works is realized.

### 3. Central control of traceability is made possible.

Ethernet interface is provided as a standard configuration enabling central control of traceability. Condition setting or program switching can be executed externally, in addition to output of results, which help to maintain uniform welding quality worldwide.

### 4. Space saving (improved remote control capability and freedom of generator arrangement by small and light weight controller)

SW-D series employs remote control system by a dedicated small and light weight controller for incorporation into automated systems. As a result, freedom of generator arrangement is increased, and it contributes to reduction of design time for automated systems and to space saving.

### 5. Enhancement of interface and strengthening of robustness. Occurrence of ultrasonic oscillation error is reduced.

In order to make it suitable for automated system application, enhancement of external interface and robustness is realized. In addition to being compatible to high definition operation based on high level external signal, cooling performance and dust-proof structure have been improved considerably making the generator hard to cause oscillation error. Furthermore, in order to make the generator durable to high load in severe operational environment, over current protection circuit is strengthened. As a result, we are offering an ultrasonic generator which the customers can use safely for many years.

## 6. Product family and suitable applications

Items	SW-D900S-20	SW-D900S-27	SW-D900S-39	SW-D600S-39	SW-D600S-48
Max. Output Power	900W (In continuous : 400W)			600W (In continuous : 300W)	
Frequency	20kHz	27kHz	39kHz	39kHz	48.5kHz
Oscillation Method	Digital ATHMOS				
Amplitude Adjustment	30~100% (1% step)				
Oscillation Control Mode	Time / Energy / Peak Power / External Sensor / Continuous				
Monitor Function (Pass / Fail Judgement)	Frequency / Oscillate Time / Energy / Peak Power / External Sensor				
Parameter Memory	31				
Interface	I/O / Analog / RS-232C / LAN / CF Card				
Input Power	Single Phase AC100~240V ±10%				
Power Consumption	1,350VA			900VA	

### <Major applications>

Automobile, packaging, electronics, medical, food, apparel.

20kHz: Food cutting, sheet press cutting, welding of small molded parts

27kHz: Sheet welding/fusing/cutoff

39kHz: Thick boss crimping, insulator welding, sheet fusing/cutoff

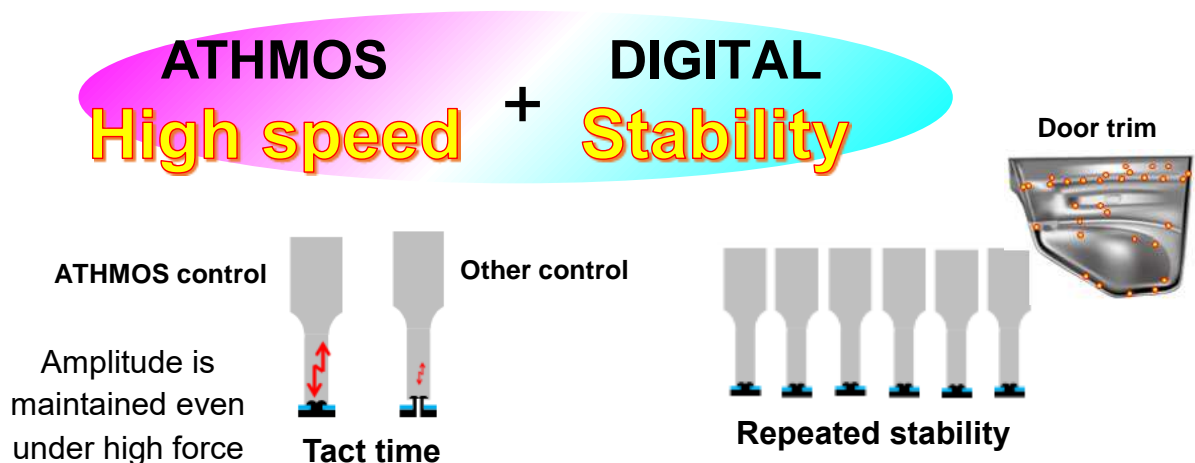
48kHz: Thin boss crimping, film welding/fusing/cutoff

### ■ Benefit brought by the new product

#### Digital ultrasonic generator 【SW-D Series】

#### ◆ Avio proprietary digital ATHMOS control

By combining Avio unique technology of ultrasonic oscillation frequency auto tracking ATHMOS system (Automatic Tuning Hold Master Oscillator System) and digital circuitry, digital ATHMOS control is realized. While maintaining our conventional feature of high speed welding, stability and high functionality have been added by digital control.

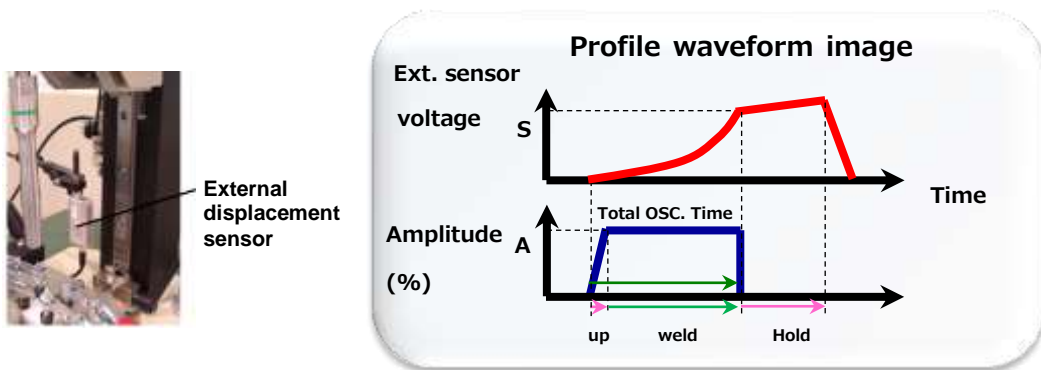


#### ◆ Equipped with “external sensor control” mode

Optimum oscillation mode can be selected depending on the welding application.

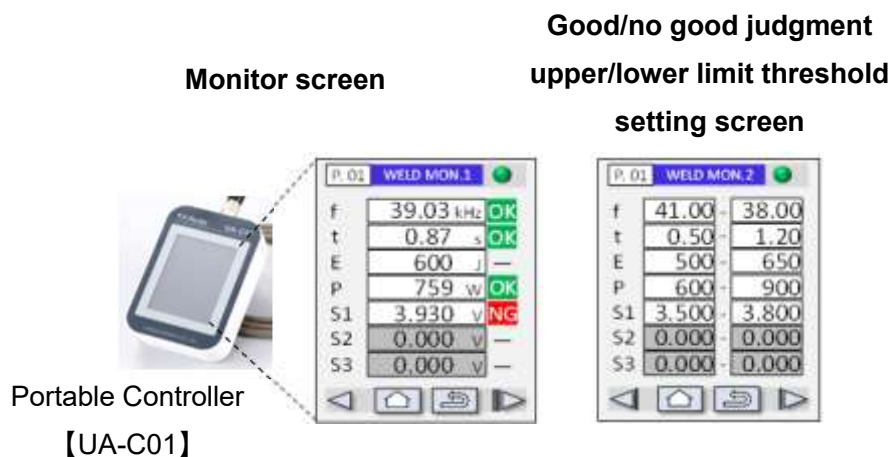
- Timer control: Control mode whereby oscillation is started/stopped by time (s).
- Energy control: Control mode whereby oscillation is started/stopped by energy (J).
- Peak power control: Control mode whereby oscillation is started/stopped by peak power (W).
- External sensor control: Control mode whereby oscillation is started/stopped by external sensor voltage (V).
- Continuous oscillation control: Control mode whereby continuous oscillation is made.

Oscillation control by external sensor, first in the industry, is realized in this generator. Start/stop control based on the combination of commercially available external sensors, such as displacement sensor, temperature sensor and vibration sensor, is enabled for further improvement of welding quality and stability. Up to 3 channels of external sensor can be connected, and 1ch out of those 3 can control the generator. The control by such external sensor is achieved by entering analog voltage signal directly to the generator without going through PLC or other external control device. Therefore, it contributes to high speed, small equipment and less cost.



### ◆GOOD/NO GOOD judgement of welding result by external sensor

Good/no good judgment can be made for each welding shot by monitoring external sensor signal in addition to frequency, oscillation time, peak power and energy, first in the industry. Judgment result is displayed on the control box (UA-C01) or sent out via external I/O, RS-232C or LAN. Up to 3 channels of external sensor can be monitored (2 additional channels if external sensor is used for oscillation control).

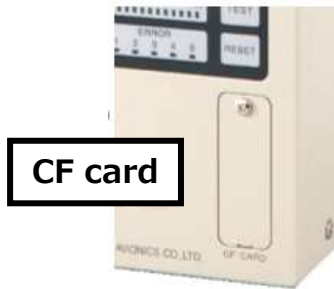


## ◆IoT compatible external interface

External interface is significantly enhanced for incorporation into automated system. In addition to compatibility to high level external control, collection of various output data contributes to the total control of production history (traceability).

LAN capability (Ethernet) enables condition setting of multiple units, program switching and monitored value output.

**Generator front face**



CF card

**Generator rear face**



LAN

RS-232C

Analog

I/O

## <Product specifications>

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Monitor Function (Pass / Fail Judgement)	Frequency / Oscillate Time / Energy / Peak Power / External Sensor				
Parameter Memory	31				
Interface	I/O / Analog / RS-232C / LAN / CF Card				
Input Power	Single Phase AC100~240V ±10%				
Power Consumption	1,350VA			900VA	
Operating temperature	5~50°C (No freezing)				
Operating Humidity	Less than 90% (No condensation)				
Dimension	W150×D370×H310mm (Including protrusions)				
Weight	Approx. 8.5kg				



Portable Controller UA-C01

Items		UA-C01
LCD	Size	3.5 inch TFT LCD
	Resolution	W320×H240
	Color	4,096 colors
Touch Panel	Method	RESISTANCE FILM TYPE
	Buzzer	available
Language	English	
Power Input	Supplied From Welding	
Cable Length	1.5m	

**For Further Information, Please Contact;**

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**<Sample welding accommodated>**

We will be pleased to accommodate sample welding so that customers can verify the performance of our new product with their own work.

If a sample welding is desired, please contact Overseas Department or local distributor near you.