



Ultrasonics World Group

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NEW UNIVERSAL ULTRASONIC GENERATORS

Our line of ultrasonic power supplies are compatible or easily modifiable to drive almost any piezoelectric ultrasonic transducer presently used or known in the Power Ultrasonic Industry. With minimum adjustment, they can replace almost any industrial ultrasonic power supply that is presently available from well-known worldwide producers, including generators for cleaning, welding, atomizing, cutting etc. With their extreme flexibility, these generators are the best choice for both R&D and mass production.



Unique Features:

1. The only true universal generator: MPI's generator is so far the only universal generator in the market, which opens numerous parameters to the end user. We have the largest number of settings regarding operating parameters and conditions controls, frequency modulations, forced and/or automatic resonance-regimes driving, applicable for all presently known Industrial Ultrasonics Applications (such as welding, cleaning, sonochemistry, materials processing, ultrasonically assisted metallurgy, bonding, sieving, cutting, machining, atomizing, driving multi-frequency & wideband transducers etc.). In addition, we have internally adjustable compensating, inductive and capacitive components, adjustable voltage outputs etc.

2. Wide band frequency range: our generators can operate on any frequency between 15 and 100 KHz. Wider frequency ranges are possible on demand. Operating frequency window can be freely selected and set through software settings

3. Largest and modifiable frequency-tracking window: our generators can automatically track the resonant frequency within almost any set intervals, compared to only 1 to 2 kHz tracking range of generators from other manufactures.

4. Dynamic load power regulation: Our ultrasonic power supplies are using advantages of dynamic load power regulation between series and parallel resonance (capturing even wider frequency intervals). We can operate any piezoelectric, ultrasonic transducer in its resonant, fixed frequency regimes, in any numerically selected operating frequency interval, and in many forced, arbitrary frequency-modulated wideband regimes. Our generators can be used on the same way as any other ultrasonic generator, and on many other unique ways. All presently known industrial and manual control options are available (manual, LCD front panel settings and controls, analog, PLC... Everything can be arranged as any other producer (or user) of ultrasonic generators is doing).

5. Safe internal scanning: Safe operating internal scanning procedure is implemented in our generator for easy selection of the optimal operating regime and settings for certain ultrasonic transducer.

6. Wide and flexible frequency tracking range: When ultrasonic tool/sonotrode/load is operating in a very large temperature range (from – 300°C until +1000°C), or when user would make mechanical corrections on a sonotrode (for instance cutting blade sharpening), resonant frequency of such systems could change for several kHz. Our ultrasonic generators can make automatic frequency, amplitude and power tracking in such situations.

7. Smooth power and amplitude regulation: We are applying limitation of maximal load power, maximal transducer amplitude and maximal output voltage on piezoceramics. We are applying overheating, short-circuit, over-current and over-voltage protections.

8. Unlimited power on demand: We can produce customized ultrasonic power supplies without power limitations (from 100 W until 100 kW, operating until 100 kHz or higher).

9. All industrial control options available: Our ultrasonic Power Supplies have all kind of modern industrial control options (PLC, PC software controls, LabVIEW, ModBus, USB, analog input controls...). We can customize and introduce any other control option. Our ultrasonic generators can be controlled with:

- any kind of PLC
- analogue control signals from 0-10V
- amplitude variable and discrete signals
- on/off switching, error signals, etc
- or with RS485 based communications (we are giving the communication protocol).

10. Stand-alone system: Once the optimal settings are made, the generator can be used without a computer or control unit. Basic parameters (like timing, amplitude, energy etc.) can be adjusted from the front panel. Computer and software is good mostly for internal factory operations before generator is sent to end users.

Important facts for non-expert users

- There exist broad band ultrasonic generator (MPI generator is), but NOT a broad band high power ultrasonic transducer. Any transducer has a fixed resonant frequency. The most commonly used high power transducers are around 20 kHz. Once the physical system (transducer with booster, tool etc.) is fixed, the resonant frequency is determined. Therefore, we will not be able to “tune” the frequency of the system any more. If a different frequency is needed, we will have to use a difference sonotrode and adjust the setting of the generator to match it. “Wide band” transducer/sonotrode can only be realized with a series transducers/sonotrodes, each having a different fixed frequency (20, 25, 30, 35 kHz...)
- Ultrasonic generators need to be tuned to match a un-known ultrasonic system (transducer and booster...etc..). The biggest challenge in operating different ultrasonic loads (and transducers) is related to the fact that all electrical adjustments and settings are completely related to properties of mechanical system we would like to drive. The same transducer (with different mechanical loading) can produce different output power at the same output voltage and frequency. Such matching is usually not supported by generators from other manufacture, and has to be done by a trained personal.
- Connecting a generator to an unmatched load can cause serious damage to the generator or the transducer.
- In certain cases, it is necessary that the first-time modifications and settings be made in our labs. Systematically we are converging to design solutions for ultrasonic power supplies, which are close to universal, but there will always be a space when client will need our assistance.
- Our standard line of Ultrasonic Power Supplies is operating on European main supply voltage input, being tolerable to input voltages from 200 Vac until 240 Vac, 50/60 Hz. We can easily produce the same Power supplies for other input voltages (115 Vac 50/60 Hz). Internally, all of our standard Ultrasonic Power Supplies have stabilized, universal voltage SMPS for control and logic modules operating from 95 to 265 Vac. We can also (optionally) apply high power PFC input for customized Power Supplies.

Information about new Ultrasonic World Generators is here (web links):

[AMMM Generator User Manual \(with signal modulations\)](#)

[W+S Generator User Manual \(fixed frequency tracking\)](#)

Webpage:

<http://www.mpi-ultrasonics.com/wg-generators.html>

<http://www.mpi-ultrasonics.com/generators.html>

Literature (web link):

[Piezoelectric Transducers Modeling and Characterization \(e-book\)](#)

http://bookstore.mpi-ultrasonics.com/index.php?main_page=product_info&products_id=165

http://bookstore.mpi-ultrasonics.com/index.php?main_page=product_info&cPath=48&products_id=165