SonicSniffer®

Non-contact ultrasonic frequency meter

For monitoring and predictive maintenance of power ultrasonic machines and equipment.

SonicSniffer® allows detection of operating frequency shifts that indicate potential failure and the need for preventive maintenance. Monitoring with SonicSniffer® reduces functional failures and breakdowns, decreasing machine downtime and maintenance costs.

How it works

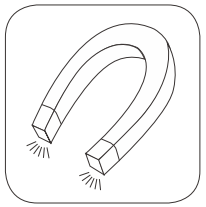
The SonicSniffer® measures the frequency based on the ultrasound emitted by the horn. Simply place it close to the horn on the production floor and read the result on the display screen (the equipment may be under a continuous or intermittent operating mode).

Technical specifications:

Frequency range:	From 1 to 80 kHz with 10 Hz resolution
Uncertainty:	± 8 Hz for signals with duration ≥ 0,35 s
Noise immunity:	≥ 105 dB in the range from 0 to 5 kHz
Measurement distance:	From 1 in (2.5 cm) to 4 ft. (1.2 m)
Memory:	01 (the last effective result)
Size - weight:	3/8 x 3/16 x 1/16 in - 1.6 oz. (50 g)

Non-contact

Light and handheld



Magnetic fixing

O SonicSniffer®:

- **Reduction of failures and maintenance costs.**
- **Reduction of equipment downtime.**
- **Traceability to the International System of Units.**

WORLDWIDE 2 YEARS WARRANTY

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Guide to predictive and preventive maintenance of acoustic stacks

This guide enables users to reduce the occurrence of failures and breakdowns in power ultrasonic equipment, especially in ultrasonic welding machines.

In general, failures are caused by interface degradation, loss of tightness and wear, which may evolve to cracks in the ultrasonic horn and converter burnout. In their early stages, faults cause progressive changes in the operating frequency that are detectable using SonicSniffer®.

For preventive maintenance, where elements are failing or the objective is to recover horns, converters and boosters, the TRZ® Analyzer and the PiezoClamping® pre-compression meter are recommended.

ATCP
Physical Engineering

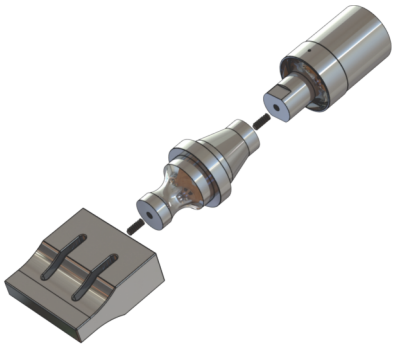
1 Monitoring

Bring the SonicSniffer® closer to the acoustic stack when in unloaded operation to measure the frequency and record the result for future comparisons. For high quality machines, deviations above ± 0.25% from rated frequency (± 50 Hz to 20 kHz) indicates the need for preventive maintenance. For general equipment, the assessment may be based on the manufacturer's specifications or working knowledge of the operating tolerance. If the frequency is out of range, proceed to Step 2.

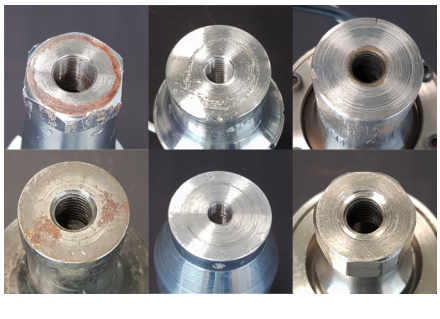
The most relevant symptom of possible failure in the acoustic stack is the deviation of the operating frequency, followed by overheating and loss of performance. Deviation can be caused by coupling degradation between components, loss of tightness, cracks or horn wear. Nevertheless, frequency monitoring and preventive maintenance can identify most of these problems early enough, preventing total failures and reducing the expenses with new components.

2 Interface check

Since the frequency is out of range, disassemble the acoustic stack to check the interfaces. Use appropriate tools to avoid deforming or scratching components. Clean surfaces and studs with solvent or in an ultrasonic cleaner.



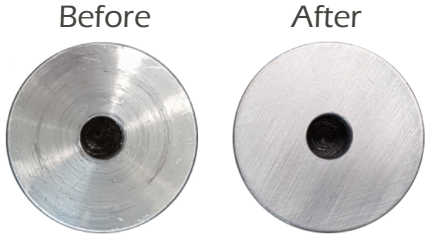
The contact surfaces between the converter and the booster and between the booster and the horn must be flat, parallel, smooth and clean. The presence of irregularities and contaminants results in frequency deviation, decreased efficiency and heating. The typical symptom of surface degradation is the presence of concentric rings of contamination, oxidation and surface damage (examples below), which must be eliminated by reconditioning it (Step 3).



In case of severe damage, correction should be carried out by machining and retuning with TRZ®.

3 Reconditioning

To recover the interfaces, use 280, 400, and 600 sandpaper and a clean class 0 granite straightener (a mirror is an acceptable alternative).



Attach the thicker sandpaper to the block and pass the component limiting the pressure to the minimum necessary to avoid inclines. Rotate the component 120° at each pass. Repeat this process until the surface is even, then, change to the next sandpaper. For moderate damage, start using sandpaper 400.

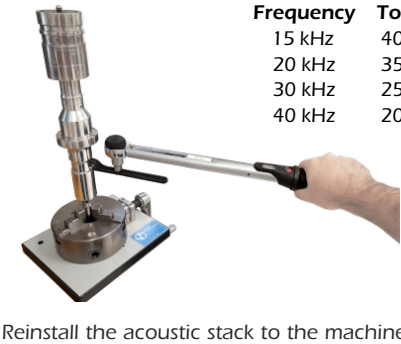
Important: Sanding increases the frequency by some Hertz, so sand as little as necessary.

4 Stack reassembly

Clean interfaces, studs, and threaded holes to eliminate debris and dirt. Use solvent or ultrasonic cleaning.

Apply a thin film of high temperature grease to the interfaces to maximize coupling and prevent sticking, but never apply lubricant to bolts or holes. Thread lubricants can cause elements to come loose with ultrasonic vibration. Reassemble the prisoners to 2 Nm.

Couple the acoustic stack elements by employing proper tools and the torque recommended by the manufacturer. In the absence of this information, consider the table below.



Frequency	Torque
15 kHz	40 Nm
20 kHz	35 Nm
30 kHz	25 Nm
40 kHz	20 Nm

Reinstall the acoustic stack to the machine, tune the generator and use SonicSniffer® to test the operating frequency with. If the frequency is still out of range, the defective element must be identified for replacement or refurbishing (see the guide in the TRZ® Analyzer folder).

For more information, visit our website: **www.atcp-ndt.com**