



## SDT Ultrawave 170

### **Application Note - Compressed Air Leaks**

*Compressed air leaks represent the most insidious form of industrial waste in your plant.*

- 35 to 45% of electricity used to compress air is wasted because of leaks.
- Compressed air is too often viewed as a "free" commodity.
- Compressed air leaks are invisible, odourless, and don't make a mess on the floor; So they are ignored.
- A 1/4" hole that consumes 94 scfm at 100psig will cost \$ 4,528.50 - \$ 15,439.50 per shift, per year.
- Identifying and fixing leaks produces a payback of a few months.
- Ultrawave 170 pinpoints the exact source of a leak in plants with ambient noise in excess of 115 dBA

*Find and fix compressed air leaks quickly using SDT's Ultrawave Technology*

Compressed air leaks are invisible and odourless. They create a familiar "hissing" sound that cannot be heard over ambient plant noise. So without adequate technology to find leaks the prevalent maintenance philosophy has been "out of sight, out of mind." SDT's Ultrawave technology simplifies leak detection even in the noisiest industrial environment.

The Ultrawave 170 uses advanced digital filtering techniques to detect compressed air leaks. The Ultrawave 170 hears high frequency ultrasound that is inaudible to humans, and converts it to an audible sound that can be listened to in the headphones.

Compressed air leaks create a familiar "hissing" sound that has both an audible and ultrasonic component. The audible component is not useful for leak detection due to its non-directional properties and ambient plant noise that can exceed 130 decibels. However the ultrasonic component of a leak is very useful for leak detection because of its directional properties and the ability of the Ultrawave 170 Ultrasonic Detector to filter out ambient plant noise and concentrate only on the ultrasonic component of the leak.

*Find and fix leaks as part of a regular PM schedule*

Compressed air is rarely clean. It contains pipe scale, iron oxide, and other contaminants. As long as the system is pressurized these contaminants cause the size of the hole to grow and contribute to creating new leaks. When demand can no longer be met production will ask maintenance to "Jack up the pressure." So effectively the contaminants are boring through the hole at an increased velocity so leaks can grow even faster than before. The only right answer is to get your leaks under control. A compressed air maintenance program involves a complete inspection of your airlines 3-4 times per year. Regular inspections will ensure that new leaks are found, and also confirm that tagged leaks from past surveys were repaired.

The largest motors in many plants drive compressors. Fewer leaks mean less demand on your compressor motor. This equates to between 10 and 15% reduction in electricity consumption and obvious extension to your motor's longevity.



## Technical Data and Attributes

The Ultrawave technology represents 20 years of R&D of ultrasound detection. SDT introduced the first digital ultrasonic detector in 1985. Our competitors released their first digital technology in 1999. We have nearly 15 years head start and they are only now going to realize all the errors and complications that we ratified since the first release.

The Ultrawave technology is a major component in many provincially sponsored energy reduction initiatives. Ontario Hydro Energy Services, Manitoba Hydro and BC Hydro Power Smart Program, as well as NS Power, NB Power, Hydro Quebec, NFLD and Labrador Hydro, Sask Power, City of Calgary, Enmax Power all use Ultrawave technology for compressed air management. In many cases the acquisition of our equipment went through a tender process.

What makes the Ultrawave technology special?

By definition, ultrasound refers to noise that is above the range of human hearing (beyond 20 kHz). Many cheaper units on the marketplace are by definition ultrasonic detectors. But by function they are simply noise amplifiers. It is relatively easy to build electronics that can detect ultrasound. But it requires considerable expertise and cost to develop electronics that detect ONLY ultrasound in a specified bandwidth.

Ultrawave technology takes advantage of expertise gathered over 20 years.

What frequency is best for detecting compressed air leaks in areas with high ambient noise? 40kHz. Why? Air leaks produce wide-band sounds and ultrasounds. Normally a leak sound gets more energy the higher it goes into the frequency band. But the higher we go in the frequency band the less conductive air is for ultrasound. If we plot air conductivity (attenuation) and frequency energy on a graph we will see the two lines meeting at around 40 kHz. By choosing this frequency and filtering out all others the Ultrawave takes advantage of maximum detection distance from the source and minimum disruption from parasite noise. This combination makes our detector the most effective unit on the market for high noise areas.

