Products | Water Leak Detection
The principle

When a pressurized water pipe develops a leak, the water flows out into the surrounding soil at high speed resulting in two types of noise:

- Structure borne noise is created by the vibration of the pipe as the high pressure water exits the leaking pipe. This vibration or noise can often be heard at contact points along the pipe such as valves, hydrants, and services with amplification provided by the AQUAPHON® A 100.
- Ground borne noise is also created by the vibration of the pipe and the water spraying into the soil as it exits the pipe. The noise created by this disturbance of the soil can often be amplified by the AQUAPHON® A 100.

Leak Survey Tool: The Test Rod

Structure borne noises can be transmitted over distance especially on metallic pipe. The Test Rod utilizes a sensitive microphone that identifies this structure borne noise. Measuring the noise intensity, at contact points along the pipe with the Test Rod, produces a preliminary location for a leak detection investigation.

Leak Survey Tool: Ground Microphones

Structure borne noises are not transmitted well by non-metallic pipe. Sometimes, contact points may not be available or are located too far distant from the leak to be heard. Using a ground microphone for listening at short intervals along the pipe often enables the leak to be located with more accuracy. The A 100 has two ground microphone options for either flat surface or soft soil applications.

AQUAPHON® A100 – professional kit

1. Wind protected ground microphone BO-4
2. Ground microphone 3P-4 (additional accessory)
3. Carrying rod
4. Test rod T-4 with various adapters
5. Noise cancelling headphones
6. Docking station HS
7. AQUAPHON® A 100
8. Carrying system “Triangle”
9. Contact microphone EM 30 with tip and magnet
Leak detection within structures can involve working in some tight locations. To carry out this work we provide the small, light, contact microphone EM 30 complete with short probe tip. Also available: Magnet, tripod and compact case.

**AQUAPHON® A100 – standard kit**

Features of the AQUAPHON® A 100

- Automatic microphone recognition – appropriate frequency settings automatically selected
- Digital signal processor – for significant reduction of hissing
- Hearing-protection function – operator’s hearing no longer in danger
- Filter-optimisation function – makes even difficult to distinguish sounds easier to hear
- Minimum Noise Level Function – displays the lowest level of noise. More useful than the loudest!
- Memory function – no need to remember the last reading. Know if the leak is closer or further away
- Large illuminated display
- Built-in rechargeable batteries – integral/buffering automatic, battery level display
- Docking Station and 12 Volt Power Supply for recharging

**COMBIPHON® – the non-metallic pipe locator**

Locating plastic pipes acoustically

As non-metallic pipes are not electrically conductive, they cannot be located with the classic electro-magnetic method. Another principle in pipe location is used with the acoustic method: the pipes transmit mechanical vibrations better than the surrounding soil.

The vibrations are transmitted along the pipe and over the soil to the surface where they can be detected by a microphone (AQUAPHON®).

Just as with the acoustic location of water leaks, indication of the highest intensity the position of the pipe. Basically fiber cement or metallic pipes can also be located with this method.
SeCorr® 08 – the world’s smallest handheld correlator

Features of the SeCorr® 08
- Latest DSP-technique (Digital-Signal-Processor)
- High-resolution pixel display
- Water-resistant film-keyboard and increment dial for comfortable operation
- Coherence analysis for optimal filter settings
- Automatic frequency analysis
- Highest calculating accuracy and very high speed of measurements
- Radio reception for more than 1.24 miles transmission on each channel
- High flexibility in combination of all components
- Radio-signal monitoring

SeCorrPhon – the only combined fully functional correlator and leak detector in the world

SeCorrPhon as an electro-acoustic water leak detector
- Excellent sound thanks to powerful digital signal processor
- Listening with on-screen support: minimum sound level display, memory function
- Hearing-protection function
- Variable filter setting
- Automatic microphone recognition (ground microphones, test rod or small, light microphone for applications inside buildings)

Advantages
Electro-acoustic methods of leak detection can be affected by external noise interferences such as cars, wind etc. The correlator SeCorr® 08 is unaffected by these interferences making leak detection possible in even the noisiest environments. Other surrounding influences including the depth of pipe, ground conditions and rain have no effect on the accuracy of results. The operator’s experience and sense of hearing are paramount when utilizing electro-acoustic devices; Correlation is based on purely mathematical calculations. Consequently the reliance on these subjective views is eliminated allowing anyone with minimal training to carry out leak location.

1 SeCorrPhon AC 06
2 Radio transmitter RT 06
3 Test rod T-4
4 Wind protected ground microphone BO-4 with carrying rod
5 Ground microphone 3P-4 (additional accessory)
6 Piezo microphone EM 30
7 Headphones stereo
8 Docking station HS
**SeCorr® 300** – high-precision correlation on non-metallic pipes with the world’s best fully digital correlator

**The principle**

The **SeCorr® 300** is a system of unprecedented quality to complement the existing product range. The fully digital signal processing and transmission by and large eliminates the interference which so often causes problems in conventional correlators.

The digital radio eradicates the notorious hissing in transmission paths. Even the narrow bandwidth of analog modules no longer poses a restriction. The noises recorded from the leak are already digitized in the microphone thus eliminating feedback via the cables.

This produces significant advantages, particularly in plastic pipes, where the noise emitted from the leak is, as a rule, very poorly transmitted and thus very quiet. The result is improved leak coverage in non-metallic pipes, which is increasingly used nowadays in water pipe networks.

Notebooks and desktop PCs can be used to analyze the measurements, as can Tablet PCs or field notebooks, for example, which have been specially designed for use in adverse conditions. Thanks to the USB standard, the system can be easily connected to the computers. Provided the computer is state-of-the-art, the **SeCorr® 300** system offers the user every possibility to produce optimal results, even under difficult conditions where conventional correlators would reach their limits.

**System requirements**

- Pentium 4 processor with 1.2 GHz minimum (1.8 GHz recommended)
- Minimum 512 MB DDR (recommended 1024 MB)
- Windows 2000 SP4, XP32/64 SP2, Vista 32/64
- Sound card
- Graphics card
- Minimum screen resolution 1024 x 768 pixels

**Overview of basic functions**

- Database-based software, no more cumbersome searching through folders for file names, all measurements at a glance
- Can also be run on 64-bit operating systems thanks to .net 2.0, future-proof
- Mode of curve of correlatable, synchronous data on a time axis with free selection of correlation section; loud areas and areas with interference can thus be reliably identified and hidden (e.g. times with noises of consumption)
- Original noises can be recorded; there is the option of creating a noise archive for comparison purposes
- Filters of up to 10 types in up to 5 filter groups; the results of various, arbitrary filter settings can be compared
- Input up to 5 different pipe sections and up to 3 freely definable extra materials; optimal flexibility as opposed to fixed standards for correlation professionals
- Easy drawing of damage sketches to supplement measurement reports; optimal documentation for service companies

**Hydrophones HY 300**

- 2 hydrophones **HY 300**
- 2 connection cables
The principle of stationary noise logging

The duration of time that water leaks from the distribution network has a significant influence on “real water loss” and “non-revenue water” calculations. The goal is to quickly identify water leaks to reduce the dollars lost, reduce the impact on non-revenue water calculations, be efficient, be good stewards of the environment, and reduce potential property damage. This goal can be achieved with SePem®01 Loggers.

In addition to conventional leak detection survey methods, SePem® 01 Loggers are an effective, permanent monitoring tool to quickly identify leaks that may never reach the surface. With its ease of reprogramming and versatility, the SePem® 01 Loggers can also be redeployed to other locations for shorter-term leak detection surveys. This process is often referred to as “lift and shift”.

With the aid of the SePem® 01 - Master, the user establishes listening times, frequency and duration, alarm levels and Patrol Times for the collection of data. The “listening times” are typically programmed for periods during which flow and traffic noise are at their minimum level. “Patrol Times” are typically set for “regular working hours” eliminating the need for overtime.

The compact design of the SePem® 01 enables the logger to be placed in valve boxes, meter pits, and on unusual contact points. The highly sensitive microphone enables programmed monitoring of distances up to 1,600 linear feet of pipe between loggers. Spacing of the logger is dependent on the pipe size, pipe material, service density, and contact points available.

The SePem® 01 - Master is portable and can be carried, or placed in the vehicle mounting bracket, while patrolling for data collection. During Patrol, the result is both an audible and visual “leak/no leak” indicator, substantiated by two pieces of critical leak detection data—“minimum noise level” and “noise consistency”. Data results are cataloged by physical location, logger, patrol, date, and can be easily archived for comparison with future data. One SePem® 01 - Master can accommodate up to 500 SePem® 01 Loggers.

Features

SePem® 01

- Robust aluminium die-casting housing with refined surface
- Horizontal or vertical installation by 2 magnet connections M10
- By threaded slide in horizontal installation also applicable in valves boxes with eccentric valves
- Bi-directional data radio FCC-approved
- Errors automatically corrected, digital high-performance radio transmission
- Power supply by built-in Lithium battery
- Operating time: typically 5 years, with daily radio standby (with radio transmission once per week significantly longer)
- Protection according to IP68

SePem® 01 - Master

- Innovative handling concept by jog dial and soft keys as well as intuitive menu guidance
- Flexible carrying concept
- Supporting handle
- 8 MB internal memory
- Power supply by 4 AA rechargeable or disposable batteries
- Operation from the 12 V supply of the car by direct cable link
- Operating time min. 8 hours when rechargeable batteries are selected
- Protection according to IP54
**SePem® 01 GSM** – loggers with cell phone technology

Monitor your water network 24/7 from the office with **SePem® 01 GSM** loggers

Highly sensitive noise logger for stationary monitoring of water networks including a GSM module for data transmission. The compact design of the **SePem® 01 GSM** is especially suitable for fire hydrant valves and line valves. Because of the small height of the logger, when horizontally installed, the **SePem® 01 GSM** can also be placed inside meter pits. The logger records the noises during a user-defined measuring period and analyzes the data. The results are then sent directly via Short Message Service (SMS) through an email gateway, downloaded to a computer and viewed using the **SePem** software. One push of a button is sufficient – driving along the measuring points is not required.

The advantages

- Leaks are recognized very early – saving money by reducing duration of leak times
- No additional time required for driving past measuring points, saving fuel, salaries and productivity
- Flexible programming of measurement and data transmission – optimal configuration according to local and network conditions. The information is delivered directly to you, on your terms.
- Very low maintenance

**Stethophon® 04 wireless** – Compact listening device for detecting water leaks

Applications

- To be used as a fast leak detector in water networks
- Examination of house service lines when the water meter is replaced
- Examination and localization of damages in compressed air systems
- Detecting defects in the plumbing and heating installations of buildings
- Check on machine bearings

Features

- Wireless headphones using digital signal transmission (**SDR**)
- External ground microphone
- 8 filter levels
- Hearing protection function
- Numerical display of minimum noise level (0 – 1000)
- Min. operating time 8 hours
- Lightweight packaging, the sound detector only weighs 0.64 lbs
- Handy dimensions: just 1.96 x 8.97 x 1.18 inches (W x H x D)

Characteristics

The **Stethophon® 04** is a sound detector for recording and amplifying structure-borne oscillations of all kinds. The oscillation sensor provides undistorted sound reproduction even when the noise is barely audible.

Besides the cable headphones, a wireless version is available including **SDR** digital radio. The **Sewerin Digital Radio** (SDR) offers a sound transmission quality equal to or better than cable. By going without the cable, the comfort of work is improved considerably. Headphones and detector connect automatically by bidirectional radio link when switched on.

**Sewerin Digital Radio** works over short distances without any loss. Unlike simple analogue radio transmissions, the completely digital signal processing does not allow acoustic interferences, caused by hissing, re-amplifying, etc., to occur.

The filter function enables the users to listen to the sound at the frequency that best suits their hearing and the particular noise being listened to. The filters make it easier to hear certain noises such as the deep-pitched sounds typical from leaks in plastic pipes and higher frequencies from metallic pipes.

The hearing protection feature automatically ensures that the headphones are muted when loud noises suddenly arise to protect the operator.

To help with the leak detection, the **Stethophon® 04** not only indicates the noise levels acoustically, but also displays them digitally.

The lowest measured noises of the previous and current locations are numerically displayed and can be compared objectively.

Components

- **Stethophon® 04**
- Wireless headphones F5
- **Ground microphone EM 35**
**AquaTest T10**

The AquaTest T10 is a test rod with innovative technology and ergonomic design. It acts as a surveying tool for leaks in water pipe networks and allows the user to identify where additional efforts should be concentrated. The AquaTest T10 is the first test rod made by SEWERIN for which no additional receiver is required.

The headphones are activated by merely touching the special sensor area on the keypad. The noises that are picked up are visualized on a display incorporated into the handle. In the SDR radio module configuration, the test rod can be used with radio headphones. This means no more cables to get in the way.

### Principal application

The high-quality microphone technology of the AquaTest T10 permits first-class sensitivity in picking up noises. Even the smallest leaks are reliably detected by the test rod. When using the test rod on objects that lie deeper under the surface, extensions can easily be screwed on between the probe tip and microphone. Individual optimization of acoustic results is assisted by the option of selecting one of eight different filter settings. When operating the unit, noise can be sampled by simply placing your thumb on the sensor area. The unit listens only as needed, thereby reducing the annoyance and distraction of unwanted sounds. The AquaTest T10 display shows the current and previous minimum noise levels, as well as the current noise intensity. The minimum noise levels are shown as numeric values; the actual noise intensity is displayed as a bar graph. This gives even less experienced operators visual support if and when they are approaching a leak.

### Additional applications – pinpointing leaks and acoustic pipe location

Previously surveyed leaks can also be pinpointed with the AquaTest T10. For this, the probe tip is replaced with a tripod. This picks up the noise of the leak at the surface. If a pipe is set into vibration, e.g. using the knocker or stopper of the COMBIPHON system, the position of the pipe can be located using the AquaTest T10. This involves systematically testing the surface in short intervals. The volume increases in approach to the vibrating pipeline. The noise is loudest directly above the pipe.

### Features

- Innovative combination of electronic amplifier and test rod without interfering cables
- Ergonomic design ensures non-tiring operation
- Robust construction for use outdoors
- Built-in rechargeable batteries
- Outstanding noise quality, using high-performance microphone technology
- Visual display helps the operator determine the noise level
- No irritating operating noises in the headphones, thanks to the keypad touch sensor area
- Individual adjustment of the filter bands and volume / hearing protection setting for optimum noise recognition
- Two product configurations are available – with or without wireless technology

### Delivery contents

- **AquaTest T10**
- Headphones
- Probe tip
- Chargers
- Transport bag

### Optional accessories

- Tripod
- Extensions for the probe tip

Please contact us for a comprehensive quotation, including additional technical specifications and information on accessories.