



AQUASCOPE²

Acoustic Water Leak Detection Kit

Operating Manual



V1.1 Date 02/11/2015

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1. Introduction

Welcome to the AQUASCOPE 2 leak detection system. The AQUASCOPE 2 is a digital acoustic leak locator with superior crystal clear sound with simple to use operation. It's light weight with a waist strap for user comfort. The AQUASCOPE 2 has a versatile hand probe for direct sounding and leak location on soft ground.

2. System Components

AQUASCOPE 2 system is supplied with the following configuration:

All Configuration Types include:

- Amplifier control unit with waist belt
- Stereo Headphones
- Connection Cable
- Hand probe microphone
- 2 x Probe rods including 1 with a tip

3. How to Switch on the Amplifier

Turn the volume control knob clockwise to turn the amplifier on. When the headphones and microphone are connected a comfortable volume level can be set.

Note: In order to save battery consumption, please ensure that the volume control knob is always set to '0' (off position) when the device is not in use.



4. Connecting the Headphones

The headphone is connected to the AQUASCOPE 2 control unit via the 3.5mm stereo socket.

5. The Hand probe Microphone

Screw the desired amount of probe rods together as required, generally an extension together with the tip rod is recommended. Next, attach the rod assembly to the hand probe microphone. The longer the rod assembly the more background noise is introduced especially on windy days. Some people lag the rod with pipe insulation to reduce wind noise. The hand probe is used for direct sounding on pipes and fittings.



5.1 Techniques using the hand probe Microphone with Rods

The following photos show example methods of using the AQUASCOPE 2 hand probe:

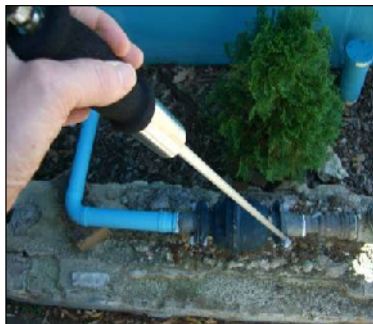


Fig.1 Listening directly on a Water Meter



Fig.2 listening directly on a Valve or Hydrant

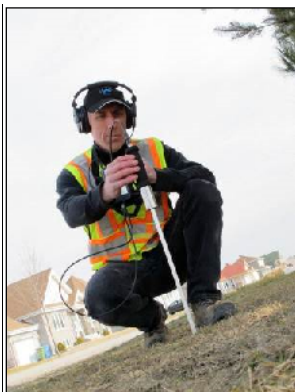


Fig.3 listening directly on a pipe with the rod inserted through soft soil



Fig.4 listening to the pipe via an insulated toughened probe



Caution: when probing through the soil it's highly recommended that a certified insulated probe such as a punch bar is used. This helps prevent the possibility of electrical shock or damaging the aluminium rods while probing through the ground.

5.2 How to find leaks with the AQUASCOPE 2 listening stick

An electronic listening stick is usually used to perform a leakage survey by walking the street listening on every valve, hydrant and accessible service connection. Each sounding is usually for 10 seconds. It takes longer to assess the noise when there is more background noise. It is not unusual to perform this work at night in busy cities when the pressure is highest and the background noise is lowest. It is important to hold the stick still and firmly pressed against the pipe, valve or hydrant. Ensure there is no long grass or cables making contact with the stick.

The electronic listening stick is considered to be a localization tool used to localize the leak position; however when the leak is suspected to be in a pipe under soft ground, the electronic listening stick can be used to pinpoint the leak. It is preferable to make the hole with an electrically insulated punch bar or another probe and then insert the stick into the hole made. Extreme care should be taken to ensure there is no contact with other underground services. Check with your company Health and Safety Officer before proceeding with this method.

1. Listen on all fittings in an area making note of the noise frequency and characteristics. It is usual to listen at each location for a period of 10 seconds, waiting for background noise to stop. If there is noise generated from consumption, pumps, road works or heavy traffic you will need to return when the noise stops.
2. Use a pipe locator to trace and mark the pipe location in the area of interest and check to see if there are any other services in the same trench as your pipe.
3. If it is safe to do so, make a series of holes at 3 meter intervals in the ground with an insulated punch bar and insert the probe from the electronic listening stick into the ground as deep as it is safe.
4. Continue this process along the section of pipe work until the leak is found. Holes will need to be made at 1 meter intervals when the leak has been located to a 6 meter span.
5. Determine which point has the loudest minimum noise.
6. Perform a "star check" moving about 30 cm from this point to all 8 points of a star. Each point should have a lower noise than the pinpointed leak position. If a point has a louder noise than the centre, this could be the correct position, repeat the star check to verify.

5.3 Techniques using the hand probe Microphone with Tripod

The optional hand-probe tripod attachment is used to find leaks buried in concrete slab, walls and shallow ground. Attach to the tripod foot, lift or move the hand-probe to each point and then listen.

The following photos show example methods of using the AQUASCOPE 2 hand probe with Tripod:



Fig.5 using the tripod attached to the hand probe microphone



Fig.6 listening to a leaking pipe through the wall

5.4 How to find Leaks with the AQUASCOPE 2 Tripod foot

The tripod foot is a pinpointing tool that attaches to the electronic listening stick in place of the probe bars. It is used to find leaks in concrete slab, shallow underground pipes and in walls. It should always be placed or held in a still position during operation.

1. Localise the leak position with noise loggers or an electronic listening stick. If a Correlator is available this can be used to narrow down the location to a much smaller area.
2. It is best practice to locate the pipe position with a pipe locator.
3. Follow the path of the pipe listening for the leak at 1 meter intervals.
4. When the location with the highest noise has been identified use your leakage experience to confirm this is a leak noise.
5. Perform a “star check” moving about 30 cm from this point to all 8 points of a star. Each point should have a lower noise than the pinpointed leak position. If a point is louder this could be the correct position, repeat the star check to verify.

6. Wearing the Control Unit



Fig.7 Waist Mounted Control Unit

Attach the AQUASCOPE 2 control unit around the waist using the webbing strap and quick release clips provided. The waist band can be adjusted to suit. An alternative method of holding the control unit is around the neck using the waist band.

7. Battery replacement

At the back of the amplifier is the battery compartment. Please lift the battery compartment cover. There are 4 LR6 (AA) size alkaline batteries. When the battery charge indicator on the display suggests replacing the batteries, please make sure that all 4 batteries are replaced at the same time. When inserting the batteries please observe the correct direction (+ and – according to the indicated position).

8. Technical Specifications

1. The control unit should be manufactured from a high strength PVC material that is resistant to exposure from high levels of UV exposure.
2. Power supply with 4 LR6 or “AA” Alkaline batteries.
3. The System has a Frequency range of 40 – 5000Hz
4. The control unit has amplification of 60DB or more.
5. The Sensitivity in the hand probe is 15v/g or more.

9. Trouble Shooting

Fault	Possible cause	Solution
No Sound	A Damaged cable or Headphones. Headphone Volume control is too low	Replace connection cable or headphones. Increase headphone volume control.
Sound in 1 earpiece	Headphone	Replace Headphone
Cannot plug in hand microphone	Damaged connection socket	Return to Gutermann