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E2L Limited

The logo for E2L Limited, featuring a stylized 'E' and 'L' in black with a pink '2' in the middle.

User Manual for ULTRASCAN High Pressure Leak and Corona Discharge Detector

*A manual for users of the E2L
ULTRASCAN High Pressure Leak
Detector. Its operation, deployment
and maintenance.*

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ULTRASCAN High Pressure Leak Detector

This manual provides necessary operating instructions for successful remote detection and location of leaks in high pressure systems, such as compressed air, steam pipe, and hydraulic systems.

The unit can also be used to monitor medium to high voltage plant for partial corona or plasma discharge indicating insulator or contactor breakdown.

Principle

All systems with gas under pressure, such as compressed air, will have some element of leakage. As the gas escapes the localised changes in pressure produce considerable levels of high frequency noise. Similarly electrical discharge also emits high frequency noise

This noise is usually inaudible since it both too high for human perception, and the surrounding environment is too noisy to distinguish the sound.

By using an ultrasonic microphone the surrounding environmental noise is quieter and it is much easier to discern the signal coming from a gas leak.

By demodulating the ultrasonic noise we can make the signal audible to the human ear. Consequently a leak sounds like a rush of air, just as you would expect, but without all the other audible surrounding noises included.

The same principle applies to vacuum systems and corona or plasma discharge.

By effectively detecting leaks results in:

- 1) The cost of generating the compressed air, vacuum or steam can be optimised not wasted.
- 2) The workplace becomes safer.

Introduction

Welcome to your ULTRASCAN leak detector.

We have made the ULTRASCAN simple to use but please read this manual to familiarise yourself with all of the operations and especially the safety instructions.

ULTRASCAN is a rechargeable battery powered portable unit intended for investigative tests lasting up to 18 hours.

As with any machine the care that you give it will reflect on its operational life and reliability. Please take note of any safety and care instructions in this manual.

Because of the sophisticated design of the ULTRASCAN none of the internal parts are user serviceable. Only have your instrument serviced or repaired by a approved E2L agent who has access to the correct equipment and spares.

In each section we guide you through the investigation process, with examples, plus other information that may help.

If you have any questions or any advice on improving both the ULTRASCAN and this manual please contact your agent.

Equipment Identification

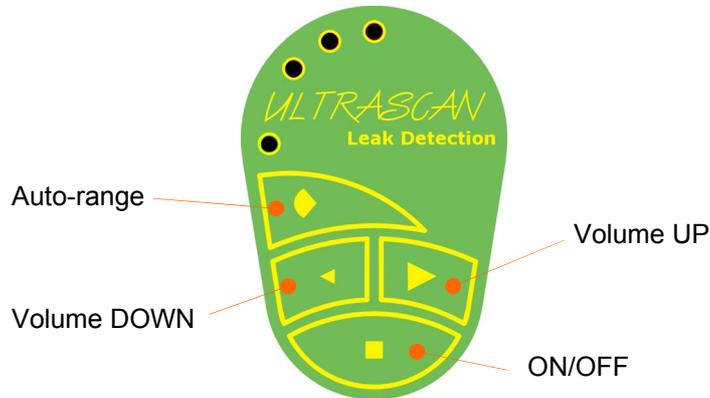
The ULTRASCAN case contains all the equipment you will need to conduct an investigation.

The case is shower proof but water should be avoided. Similarly do not place the case on any high temperature surfaces.



Using the ULTRASCAN Leak Detector

The unit is designed to be as simple as possible whilst providing the highest performance. There are only four controls on the instrument:



There are two modes of operation: Setting the **Power Down Time**, and normal **Leak Detection**.

Power Down Time

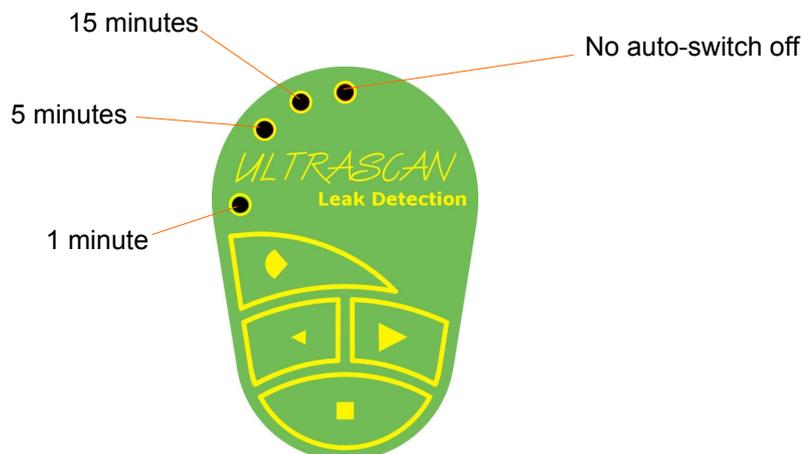
'Power down time' is the time before the unit automatically switches off, if the user forgets to manually press the ON/OFF switch. You will probably only set this feature once.

The purpose of setting the power down time is to ensure the maximum battery life, but also to match the user's requirements. For example, if you are using the device as a safety indicator then you would probably want the unit to always be on.

The unit can be set to auto-switch off after 1 minute, 5 minutes, 15 minutes, or never. The unit can always be switched off manually.

What mode am I in?

When the unit is initially switched on a sequence of flashing lights indicates the auto-switch off mode. The different lights have the following meaning:



How do I change the auto-switch off mode?

To change the mode to a different timeout press and hold the ON/OFF button. The unit will then indicate its current mode, and then illuminate each light in isolation.

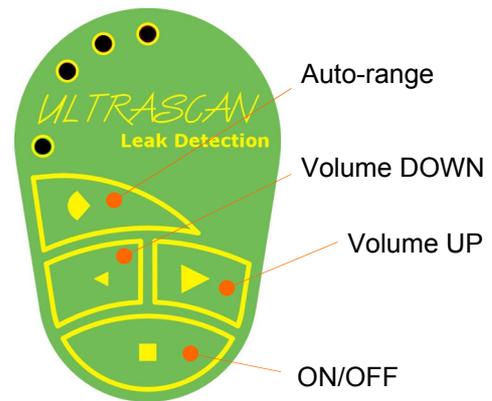
When the correct timeout is reached, release the ON/OFF button and the unit will store this mode for future use.

After the button is released the mode is displayed again, as if the unit has been powered up.

Leak/Discharge Detection

Connect the earphones and a suitable focussing attachment if required.

- Power on the unit by pressing the ON/OFF switch
- The unit will initialise and indicate which auto-switch off mode it is in
- Point the unit away from the main area of investigation and press the Auto-range button
- The green light will flash several times until the unit has auto-ranged. When auto-range is complete all the lights will flash once
- Adjust the volume in the headphones to suit your own hearing preference



Setup is now complete and leaks can be identified by pointing the focus tube in the direction of equipment under test. Range will vary according to size and pressure of leak. A leak is indicated by flickering of the red lights (similar to volume on a HI-FI system) and is clearly audible in the earphones.

If entering another area with a different level of ambient noise repeat:

- Point the unit away from the main area of investigation and press the Auto-range button
- The green light will flash several times until the unit has auto-ranged. When auto-range is complete all the lights will flash once

Battery Low?

If the green light starts to flicker quickly during normal operation the battery is beginning to run low and will need recharging. Operation is unaffected for a considerable time whilst this condition exists.

Battery Charging?

Using the supplied battery charger, plug it into the socket at the base of the unit and then connect to your mains supply. The green light indicates the charging status and is always less bright in charging mode than in normal operation:

Flashing green light	Trickle charging
Constant green light	Fast charge
No light	Charging complete

Focussing attachments

ULTRASCAN Leak Detectors come with three different focussing attachments (horns) that assist in identifying the source of a leak.

They are changed by means of a simple screw connection. The unit can be used without any focussing attachments for very general or safety purposes.

30° horn

The normal mode of operation is to use the 30° horn. This allows general area coverage in order to perform wide area scans.

The 30° horn is identified by a single groove in the horn body and the large aperture at the end of the horn.

Signals wider than 30° can be detected but their intensity is reduced. Their source is easily identifiable by the audio feedback the user has.



3° horn

For very accurate location of the leak source the 3° horn can be used. This gives a very narrow beam of acceptance of signal and thus pin-points the source of the leak.

It is not a good idea to start general leak surveys with this horn attached.

The 3° horn is identified by two grooves in the horn body and a small aperture at the end of the horn.



Bending horn

The bending horn is for detecting leaks in difficult to access places such as boxed-in pipework or in clusters of pipes.

The flexible pipe allows it to be threaded into hard-to-gain locations and essentially allows the detector to 'listen around corners'.



Spare parts

If any items are damaged or lost then they can be obtained separately from your agent. A list of parts and their part numbers is included below

P311-010-010 30° horn

P311-010-020 3° horn

P311-010-030 Bending horn

P311-050-100 Battery charger

P311-050-200 Earphones

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