

WR1 Wet Roof Leak Detector

Instruction Manual

English Version



Please read carefully before use

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Specifications and symbols

Output pulse voltage:	35V DC
Output power:	<12 Watts
Generator Unit dimensions:	(W) 210mm x (H) 125mm x (D) 265mm
Detector Unit dimensions:	(W) 140mm x (H) 80mm x (D) 40mm
Generator Unit weight:	4.0Kg - Including carry case
Detector Unit weight:	240g - Including carry case and battery
Max relative humidity:	80% non-condensing
Altitude:	Up to 2000m
Temperature range:	+4°C - +40°C



Caution, risk of danger



Caution, risk of shock

Warning



Misuse or failure to comply with the guidelines outlined in this manual may impair the safety provided by the equipment.

Description

The WR1 Wet Roof Leak Detector Kit is designed to aid the process of identifying the source of leaks on roofing technologies that incorporate dielectric membrane overlays.

Brief Functional Description

The WR1 generator delivers a stabilised negative low frequency pulse to its output terminals. The negative output of the generator is applied to the trace wire, which borders the test area, and the positive output is connected to a suitable building substrate.

The test area of the roof needs to be wet for the equipment to function. The trace wire is required to be in the water as it uses the water to pass the current.

Within the test area, if moisture has penetrated the dielectric membrane or coating of the roof a current will flow from this source point, via the water on the roof, towards the trace wire. The WR1 detector is used to identify the direction of electrical current and detect the point of origin. The point of origin is where moisture is penetrating the roof covering. The generator is powered by an internal lead acid battery, which is charged by an external charger. A single PP3 battery powers the detector. Both units feature automatic shutdown when unused for a prolonged period of time.

Unpacking

Remove the WR1 units and accessories from the packaging and check for any damage. Should any item be damaged or missing, notify the supplier and carrier immediately. Keep all packing material for inspection and do not use the equipment.

The kit should contain the following items:

- 1 x WR1 Generator unit in red canvas carrying bag
- 1 x 500mA quick blow fuses
- 1 x WR1 Detector unit with black neck strap
- 2 x Test probes
- 2 x Connection leads
- 1 x 10m earth lead
- 1 x 10m ring lead
- 1 x Cable reel with 200m of stainless steel wire
- 1 x Power supply unit (18V power supply for battery charging)
- 1 x Instruction manual

Keep all packaging in case the kit needs to be sent back for repair or calibration, or if it needs to be stored.



Controls and connections

WR1 Detector

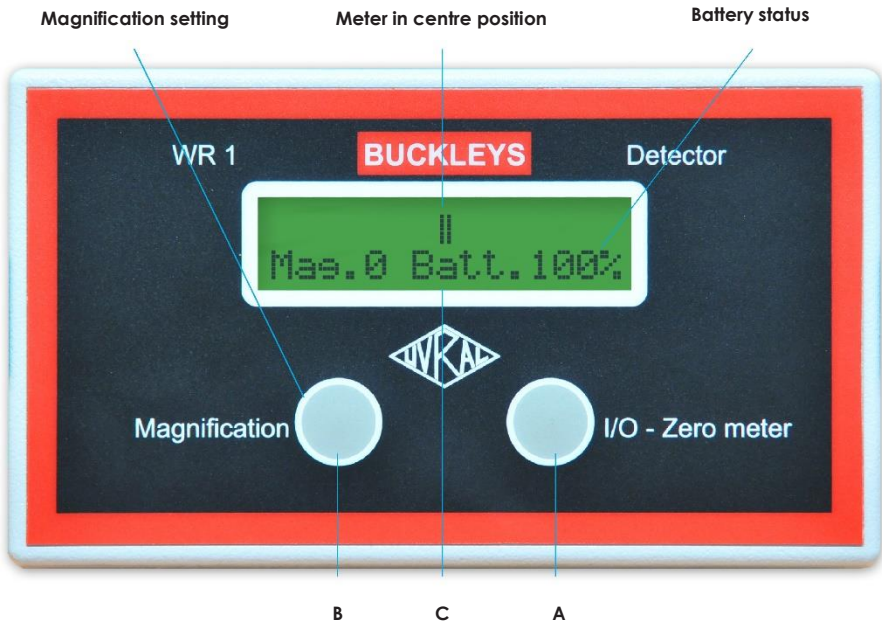


Fig 1. WR 1 Detector Panel

- A** – I/O -Zero meter button
- B** – Magnification button
- C** – 2x16 character LCD

To switch on the detector unit press and release button A. The unit will calibrate (null) the meter bar graph to the centre position then display parameters as shown in Fig 1 (perform this function without probes connected). Once the unit is on button A is also used to recalibrate the meter bar graph if necessary.

The magnification button may be used to increase the detectors sensitivity if required. The detector may be toggled between display modes by holding down button B and pressing and releasing button A. The default display is mode one as shown in Fig 1. Display mode two allocates both lines of the LCD to the meter bar graph (see Fig 8).

WR1 Generator

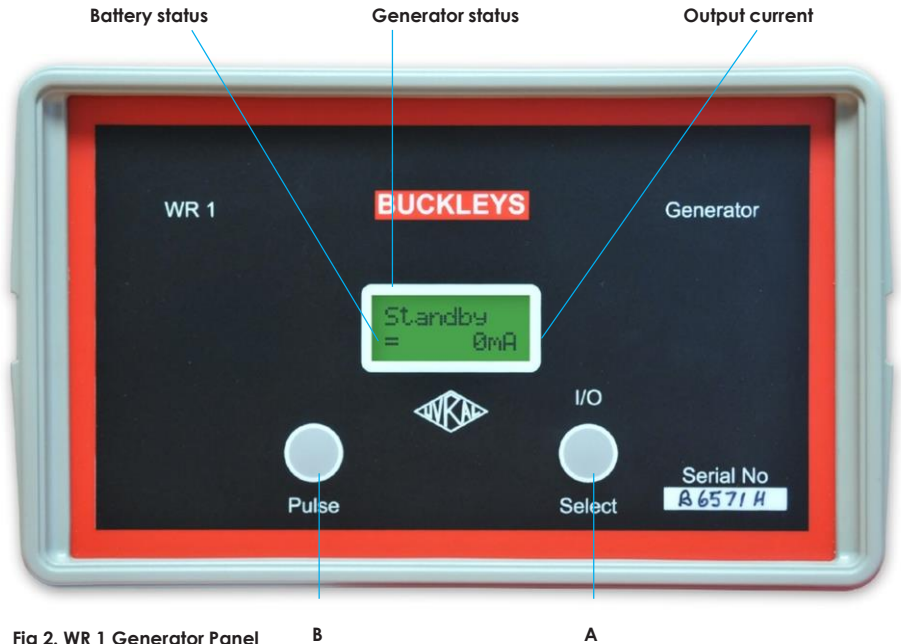


Fig 2. WR 1 Generator Panel

- A** – Unit I/O button / option select button
- B** – Output pulse on / off button.
- C** – 2x8 character LCD with backlight.

To switch on the generator unit press and release button A. The unit will momentarily display its model type before displaying the parameters as shown in Fig 2.

Battery Status Indicator

- Battery fully charged.
- = Battery nominal.
- Battery exhausted.

The output current is displayed in mA with a full scale of 300mA. Current in excess of 300mA is displayed as over range (OvrRng).

To change the output setting press and release button A to select the required output option.



Fig 3. Stepping Through the Output Options

A 0.5Hz is the frequency of the output pulse. 0.5Hz is equal to two seconds.

B 30% Duty refers to the on time. 30% of two seconds is equal to 600ms on time therefore 1.4s is the off time.

C Sounder symbol – Sounder will activate during the on time of the pulse.

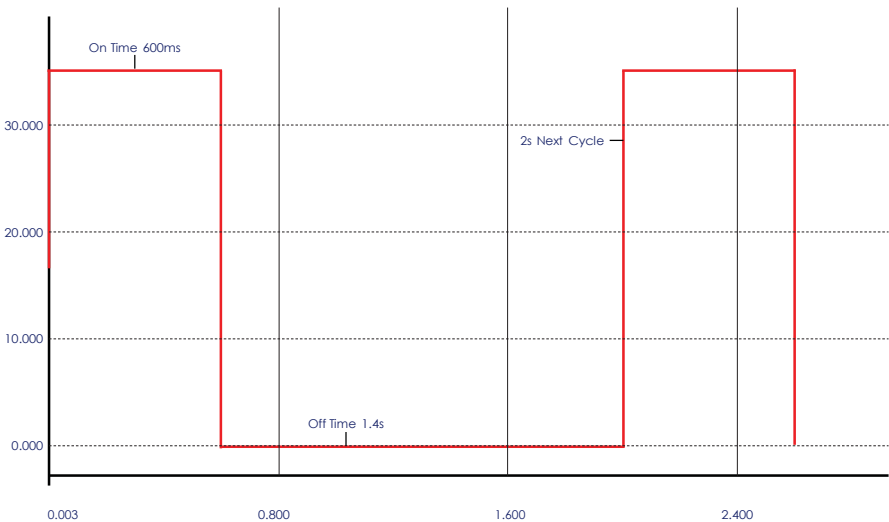


Fig 4. Output Pulse with Option 1 Selected

To enable the output press and release button B. If one of the three sounder options is selected the alarm will sound during the on time of the output pulse.

This may be used as an aid when identifying the pulse with the detector unit. A continuous alarm indicates that the output voltage is low.

Note: Low output voltage may be caused by the trace wire being short-circuited to the building earth point.

To disable the output, press and release button B once more.

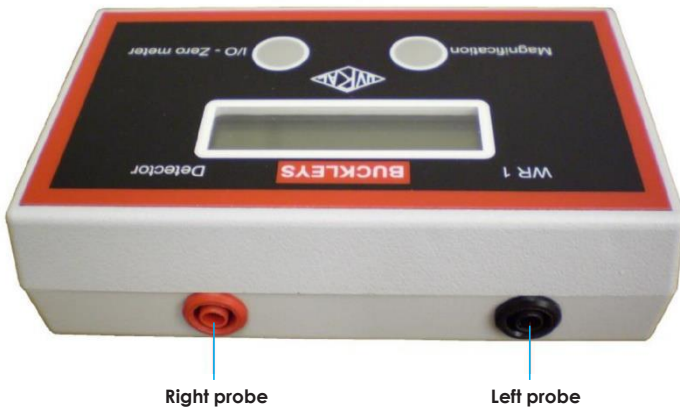


Fig 5. Detector Probe Connections

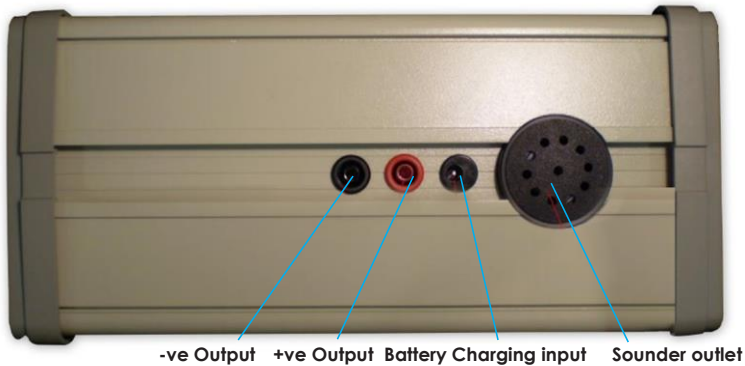


Fig 6. Generator Connections

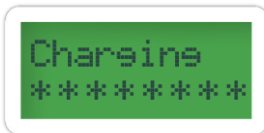
Note: The red plug fits into the positive (red) output and connects to the earth point on the building substrate. The black plug fits into the negative (black) output and connects to the trace wire. The crocodile clip on the other end of the lead can be used to clamp together the ends of the trace wire to ensure a loop is formed around the test area.



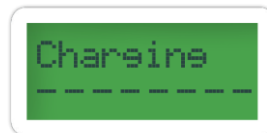
Your wet roof leak detector Generator will be fitted with a 0.5A 250V quick-blow fuse. A spare fuse is also supplied with the Generator unit, please ensure this is kept in a safe place.

Charging

The on/off switch should be in the **ON** position for charging of the internal battery. When charging the following should be displayed:



Requires Charging



Fully Charged

Using the WR 1

Preparation

Firstly, the trace wire must be laid down to form a border around the area to be tested. The two ends of the trace wire must be connected together to form a “closed circuit”. It is also necessary to ensure that there is good contact between the trace wire and the roof surface. If necessary the trace wire may be fixed down with adhesive tape.

The trace wire is connected to the negative output of the WR1 generator. The positive output of the generator is connected to a good building earth (substrate) point. Any earthed protrusions through the roof such as ventilation shafts must be screened off with an additional loop of trace wire which itself must be connected to the main trace wire.

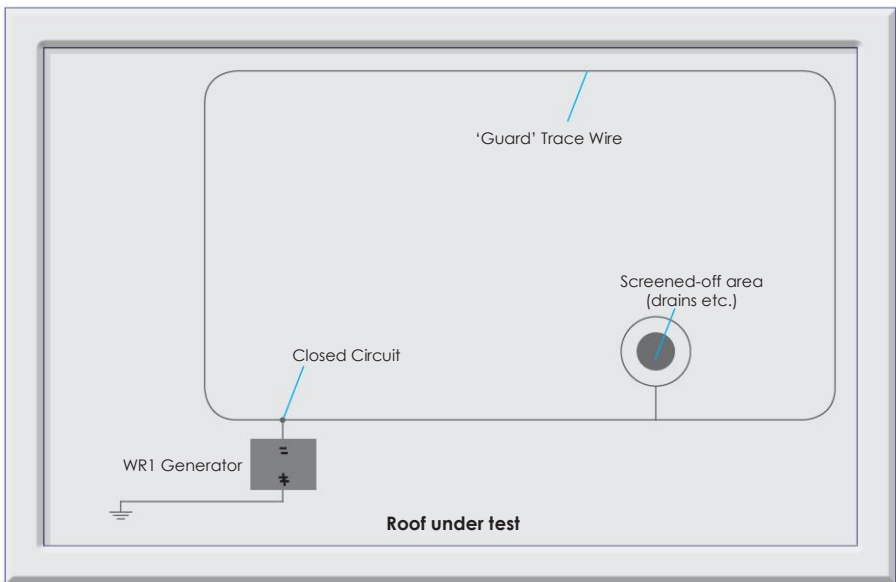


Fig 7. WR1 Generator Connections

Any defects that have been located may be screened off using the same method in order to continue testing for further leaks.

Locating a leak

Switch on the WR1 generator and detector and ensure that the trace wire test area is completely wet. Once inside the test area, position the two measuring probes a comfortable distance apart on the roof surface. The pulses are now shown on the detector unit.

Note: Interference voltages such as battery effect may cause an offset on the detector but not in a pulsed manner.

The direction of the observed pulse indicates the direction of the leak.

Note: It is the direction of the pulse that is important and not strength. Continue to search in the direction of the pulse until the pulse reading swings in the opposite direction. At this point turn through 90° and measure in a direction perpendicular to the first line.

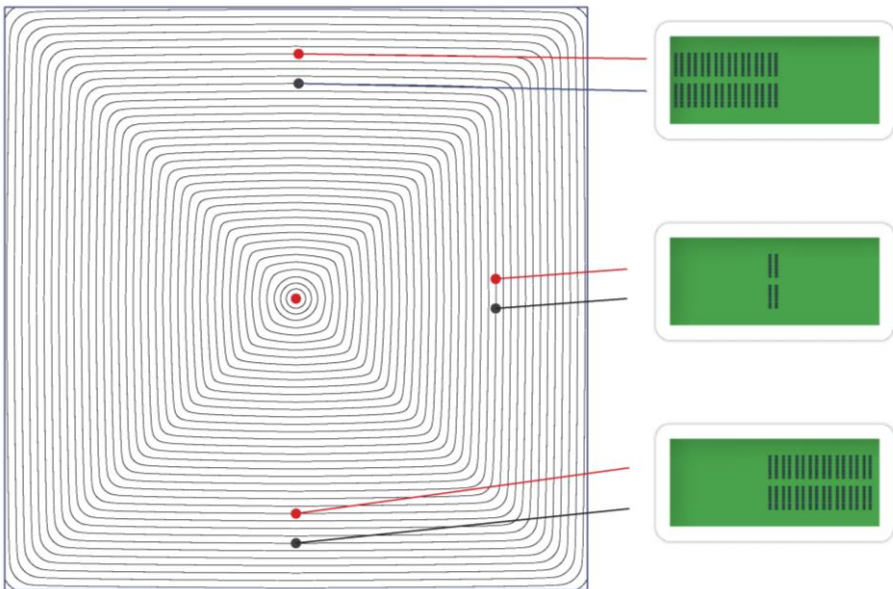


Fig 8. Electric Field Lines

Fig. 8. is a representation of how lines of equal voltage potential may appear on a square test area with a single central fault and how the detector would display the measured potential.

Note: The middle meter representation is not displaying any direction due to the fact that both its probes are on the same line of equal potential.

If the probes were rotated by 90° the characteristics shown by either the top or bottom meters would be displayed depending upon direction of rotation. Again it is the direction of the displayed pulse that is important, not the magnitude.

The voltage gradient and therefore the magnitude of the displayed pulses in the test area is somewhat unpredictable due to several variables:

- i) Conductivity of the water to the building earth.
- ii) Distance the poles are apart.

The greater the penetration of the leak to the building earth point the greater the conductivity and therefore current flow is likely to be.

When testing an area, the detection of a momentary weak pulse, which always leads the operator to the centre of the test area, is a probable indication that no leaks are present. This may be verified by shifting the position of the trace wire, which will shift the apparent origin of the weak pulse respectively.

Maintenance

WR1 Detector

Remove the battery if the unit is not in use for prolonged periods.

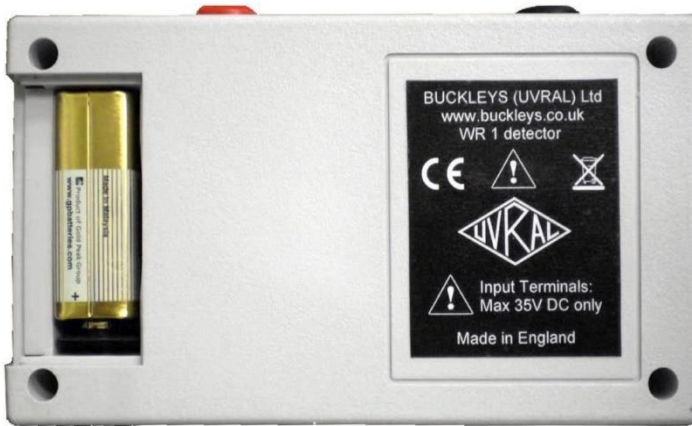


Fig 9. Detector battery location

WR1 Generator

The WR1 generator internal battery should be charged as required

- Battery fully charged
- = Battery nominal
- Battery exhausted (Battery requires charging).

Note: the generator unit is disabled during battery charging.



Warning: Connect only the supplied PSU to the battery charge input socket (See Fig. 6.).

The exterior of both units should be cleaned regularly. Dirt that is difficult to remove from the units may be removed with a moistened cloth (99% water +1% mild detergent).

Washing benzine (petroleum ether) may be used to remove greasy dirt. Under no circumstances may the cleaning fluid be allowed to enter the unit. The use of other cleaning agents may lead to damage to the unit's surface areas.

When you are not using the generator you should turn the machine to its off position on the back of the generator. This will prolong the battery life.

Disposal Information

Waste Electrical and Electronic Equipment recycling (WEEE)

Producer registration number: WEE/HJ0051TQ



This product must be disposed of in accordance with UK WEEE regulations.

For further information on UK WEEE regulations click on:
www.gov.uk/government/publications/weee-regulations-2013-government-guidance-notes

Declaration of conformity

We:

Buckleys (UVRAL) Ltd

As manufacturer of the apparatus listed,
declare that the product:

WR1 Wet Roof Leak Detector

Is manufactured in conformity with
the following directives:

2004/108/EC

2006/95/EC

Authorised by:



J P Hoveman

Managing Director
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