

**Leak Location Detector
GSE Conductive HDPE**

Equipment Number		
Customer		
Dispatch/Receipt	Date Out / /	Date In / /
Store Location		
Expected Return Date		

Item Number	Number of items	Item name	Checked OUT	Checked IN	Comments
1	1	Black carry case			
2	1	Earthing pad			
3	1	Earthing cable			
4	1	Battery charger			
5	1	Power cable			
6	1	Power Pak with cable			
7	2	High voltage wand handle + Wand extension handle			
8	2	Large electrode brush + Small electrode brush			
9	1	Instrument with Battery			
10	1	Screw driver			

This equipment has received an in-service inspection and was found to have no obvious defects.

CHECKED OUT BY

CHECKED IN BY

Name:

Name:

Signature:

Signature:

Comments: _____

Dear Customer

On receipt of this equipment, please check all equipment has been received, ensure your site personnel read and understand the operating, maintenance and safety information, and use the equipment in a safe manner.

- You are responsible for the safe operation of the equipment and the safety of your personnel.
- Standard Occupational, Health and Safety guidelines should be followed as per normal site operations. Site safety and safe work practices are your responsibility.

- At the conclusion of the use of the equipment, please clean the equipment, repack it for transportation and return to Geofabrics.
- Please advise if there are any damaged or missing parts. All equipment usage must be in accordance with Geofabrics' Hire Agreement. You will be charged for any damaged or missing components.

LEAK LOCATION DETECTOR - OPERATING AND SAFETY INSTRUCTIONS

WARNING!

- Any alterations to this hire equipment may prove dangerous to the operator and will be in breach of the Equipment Hire Agreement.
- Service must only be performed by an authorised Geofabrics service organisation or representative.
- Please contact Geofabrics (0800 60 60 20) for return of this equipment or servicing if it is found to be faulty.
- All hire related documentation, operating and safety instructions are available on our website (www.geofabrics.co.nz).



Introduction

The Leak Location Detector is an all-purpose electrical inspection instrument which maintains a given inspection voltage in spite of the electrical load on the circuit. It is recommended for use on any pipe diameter as well as on flat surfaces when such surfaces are coated with a highly electrical resistance material, and when the surface beneath the coating is electrically conductive. The detector works equally well on damp or dry surfaces, and is especially desirable where humid conditions prevail.

Instructions for unpacking and inspection

After receiving Leak Location Detector please make sure all components are included in the case as per the **Figure 1**:

1. Black carry case
2. Earthing pad
3. Earthing cable
4. Battery charger
5. Power cable
6. Power Pak with cable
7. High voltage wand handle + Wand extension handle
8. Large electrode brush + Small electrode brush
9. Instrument with battery
10. Screw driver

Assembly instructions

- Connect high voltage wand by screwing onto front of Power Pak. Connect Power Pak to instrument with battery by lining up the wide key of the connector with the mating connector on the front of the instrument. Insert the connector fully into its mate and turn clockwise ¼ turn. If the connector does not turn easily, try pushing the cable connector more firmly into the instrument case connector mate. A positive lock will be felt when the cable connector is properly attached to the instrument.
- Attach the ground cable to instrument. The cable connector is pushed into its mating connector located on the front of the instrument case, in the lower left corner. Insert and twist clockwise to lock.

WARNING!

Never connect or disconnect the ground cable or Power Pak when the instrument is turned on.

- The Leak Location Detector is now ready to be set for a specific voltage.
- Remove the dust cover with the supplied screwdriver, to reveal the voltage adjustment knob.
- Push and HOLD the Power button on the panel of the Instrument case. Then push either the LOW or HIGH button to set the voltage range.

NOTE LOW voltage range is 800v to 8,000v, in 100v increments.

HIGH voltage range is 3,500v to 35,000v in 100v increments

- Continue holding the Power button on the panel of the Instrument case and use the screwdriver to adjust the voltage setting, using the digital display for reference.

NOTE When Power button on the panel of the Instrument case is held, there is NO output from the Power Pak. The Power Pak will output voltage only when the Safety handle of the Power Pak is held and the Power Pak ON button is pressed.

- Once the voltage has been set, as shown by the LCD on the panel of the Instrument Case, the Power button on the panel of the instrument case may be released.
- Attach electrode to the high voltage wand handle assembly and apply to the structure to be inspected. The electrode should always make intimate contact with the surface under inspection.
- Turn the instrument ON by holding the safety switch handle of the Power Pak firmly against the instrument handle. (Instrument handle has neoprene rubber grip), then pressing the ON button on the Power Pak.

NOTE The instrument will turn OFF when the safety handle is released

- The Instrument will “remember” the last HIGH or LOW and voltage setting selected, and after being turned OFF and then ON again.
- The instrument is now ready to use.

Integrated voltmeter

The Leak Locator Detector includes an integrated voltmeter displayed on the front panel of the main instrument.

The LCD of the voltmeter measures and displays the output voltage of the Leak Locator Detector. This display gives the user the ability to tune the instrument to a specific voltage within the 800v – 8,000v LOW range and the 3,500v – 35,000v HIGH range. Voltages increment in 100v steps.

Because the Leak Locator Detector includes this integrated peak reading voltmeter, it is not suggested that an external peak reading voltmeter be used with this instrument. Most external peak reading voltmeters currently available are not as accurate as the integrated voltmeter of the Leak Locator Detector and will not show accurate results.

Accuracy and calibration

The Leak Location Detector voltmeter is accurate to +/- 5% of the output voltage, as shown on the LCD display on the instrument panel.

It is recommended that the Detector follow an annual calibration cycle to ensure the instrument is in good working order and that the LCD of the integration voltmeter is accurate.

Operating methods

A good ground return system for both the pipe and the detector will always provide the best and most reliable inspection. The pipe to be inspected must be grounded from the bare pipe to earth at some point along the pipe. If individual joints of the pipe are to be inspected that are not electrically connected, each joint must be grounded.

The speed of the electrode's travel along the pipe should never be excessive, as faulty inspection may result.

Occasional checks of the detector operation should be made, particularly if no leaks are being found. This can be accomplished by testing for the spark and signal at the edge of the coating where bare pipe exists or by touching the probe end to the bare pipe and noting the length of the spark and the visual and audible signal effectiveness.

If the visual and audible signal do not both occur when the spark discharges from the electrode into a known leak, the ground return (i.e. the path between the metallic pipe and earth and the earth to the ground trail of the detector) is of high resistance. In this case, a better ground is required and a direct connection between the metal pipe and the ground wire may be necessary. This type of grounding is

extremely uncommon unless the soil is very dry (if using a grounding rod) or the detectors output is low.

The most accurate and recommended inspection voltage should be obtained from the coating manufacturer spec or by contracting the coating manufacture or rep. Correct voltage output for a given thickness of coating has long been a matter of controversy.

However, formulas have been suggested which may be used as a guide for correct peak voltages on various coating thickness. The calculation is as follows:

$$V = K\sqrt{T}$$

Where V = Peak voltage in volts
 T = Thickness of coating in mils
 K = constant of 1,250 for coatings over 20 mils thick

Note Formula taken from NACE International Standard RP0274-04. This standard and others available for free download to members at: www.nace.org

A common practice used in setting inspection voltages in the field is to adjust the output voltage by visual observation. It is the general consensus that a spark discharge across a gap distance of at least twice the thickness of the coating will give adequate inspection voltage and compensate for any irregularity in coating thickness and grounding conditions. If this practice is desired for determining inspection voltage, it should be done while the electrode is in the normal operating position and under actual grounding conditions.

The formula and suggestions for setting voltage are supplied as a guide, and are not necessarily recommended by the manufacturer of this detector.

Charging the battery

The instrument (Figure 2) comes with an internal rechargeable battery. The battery should be charged after each use. The instrument will indicate when the battery voltage is low, by flashing or flickering of the Green Power LED, instead of providing a steady glow.

The red BATT. CHARGE INDICATOR light will light when the battery charger is correctly connected to the instrument.



Figure 2 – Instrument with battery

Beginning with the Leak Location Detector, the battery charger included with the instrument has a slide switch that will allow the charger to operate from 115V AC or 230V AC. To adjust for 230V AC, slide the switch so that 230V AC shows.

The battery charger has a special plug that is designed to fit into the connector on the side of the battery, so that polarity of the connection is not an issue.

The battery charger has an LED on its side. This LED will glow steady while charging the battery. The LED will begin BLINKING when the battery is fully charged.

Connect the charger to the instrument body, using the special connector, fitted into the charge port on the front and lower right of the instrument. Attach the battery charger to an AC power source, ensuring the slide switch is in the appropriate AC supply position: 115v AC or 230v AC. Leave on charge for 8-10 hours between uses. The battery charger is equipped with a trickle charge feature, so the battery will not be harmed by leaving the instrument on charge for too long.

Instrument servicing instructions

- **Cleaning**
Keep the instrument clean and dry. Clean the instrument case with a soft, damp cloth, then wipe dry. Do not use solvents such as lacquer thinner, methyl ethyl, etc.

- **Voltage output checks**
- ❖ In case of LOW output voltage:
 1. Check the LED indicator for the HIGH or LOW Range selector, to ensure the instrument is in the correct range.
 2. Check the display for voltage output. Voltage displayed is in kilovolts (22,000volts = 22.0 on display)
 3. Check green ON LED. If flashing, this indicated low battery voltage.

- ❖ In case of NO output voltage
 1. Check green ON LED. If flashing, this indicated low battery voltage.
 2. Check ground cable and wand handle connections.

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