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Elcometer 270

Pinhole Detector

Operating Instructions

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The Elcometer 270 generates a voltage which is used to test for holes in a coating applied to a metal surface. Should a user make contact with the wand while holding the earth signal return lead, a very mild shock may be experienced with the higher voltage settings. The current capability of the detector is low and the health risk directly from the voltage is negligible.

CE This product meets the Electromagnetic Compatibility and Low Voltage Directives.

The product is Class B, Group 1 ISM equipment according to CISPR 11.

Group 1 ISM product: A product in which there is intentionally generated and/or used conductively coupled radio-frequency energy which is necessary for the internal functioning of the equipment itself.

Class B product are suitable for use in domestic establishments and in establishments directly connected to a low voltage power supply network which supplies buildings used for domestic purposes.

A Material Safety Data Sheet for the Wetting Agent (Kodak Photo-Flo™) supplied as an accessory for the Elcometer 270 is available to download via our website:

www.elcometer.com/images/MSDS/elcometer_270_wetting_agent.pdf

A copy of this Instruction Manual is available for download on our Website via www.elcometer.com.

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Thank you for your purchase of this Elcometer 270 Pinhole Detector. Welcome to Elcometer.

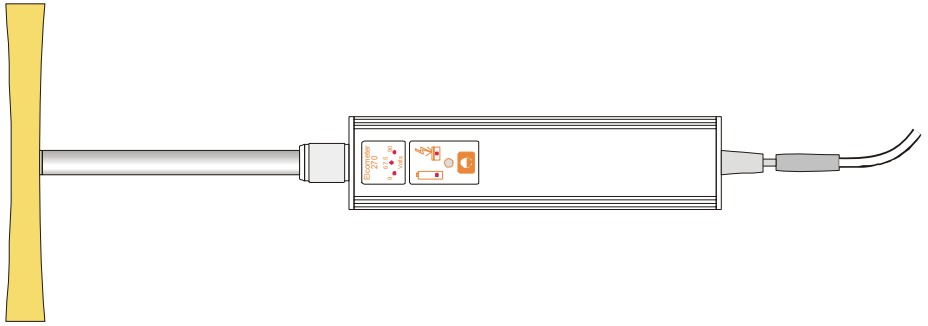
Elcometer are world leaders in the design, manufacture and supply of inspection equipment for coatings and concrete. Our products cover all aspects of coating inspection, from development through application to post application inspection.

Your Elcometer 270 Pinhole Detector is a world beating product. With the purchase of this product you now have access to the worldwide service and support network of Elcometer. For more information visit our website at www.elcometer.com

1 ABOUT YOUR GAUGE

The Elcometer 270 Pinhole Detector utilises the ‘wet sponge’ method of holiday detection. When the wand sponge is passed over a pinhole, current flows from the detector through the moisture in the hole to the substrate below and back to the detector via the signal return lead. This current flow triggers an audible alarm and causes the alarm LED to flash.

The Elcometer 270 Pinhole Detector is capable of testing at three voltages; 9 V, 67.5 V and 90 V (depending upon model).



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1.1 THESE INSTRUCTIONS

These instructions describe the operation of the following Elcometer 270 models:

- Elcometer 270/3: 9 V and 90 V (dual voltage)
- Elcometer 270/4: 9 V, 67.5 V and 90 V (triple voltage)

The voltage on dual and triple voltage models can be selected by the user.

1.2 STANDARDS

The Elcometer 270 Pinhole Detector can be used in accordance with the following National and International Standards: AS 3894.2, ASTM D-5162 A, ASTM G6, ASTM G62-A, BS 7793-2, ISO 8289 A, ISO 14654, JIS K 6766, NACE SP 0188, NACE TM 0384.

1.3 WHAT THE BOX CONTAINS

- Elcometer 270 Pinhole Detector
- Standard wand and sponge
- Return lead with crocodile clip
- Batteries, x 3
- Operating instructions

Your Elcometer 270 Pinhole Detector is packed in a cardboard package. Please ensure that this packaging is disposed of in an environmentally sensitive manner. Please consult your local Environmental Authority for further guidance.

To maximise the benefits of your new Elcometer 270 Pinhole Detector, please take some time to read these Operating Instructions. Do not hesitate to contact Elcometer or your Elcometer supplier if you have any questions.

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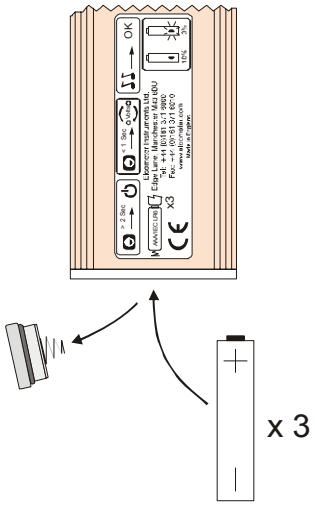
2 GETTING STARTED

2.1 FITTING THE BATTERIES



1. Switch off the detector
2. Unscrew knurled battery cover
3. Insert three batteries taking care to ensure correct polarity
4. Replace knurled battery cover

Alkaline batteries must be disposed of carefully to avoid environmental contamination. Please consult your local Environmental Authority for information on disposal in your region.

Do not dispose of any battery in fire.

2.2 BATTERY CONDITION

When the batteries contain adequate charge, the battery condition LED is not illuminated.

When the batteries reach the final 10% of their capacity, the battery condition LED illuminates continuously.

When the battery condition LED flashes, the batteries are exhausted and new batteries must be fitted.

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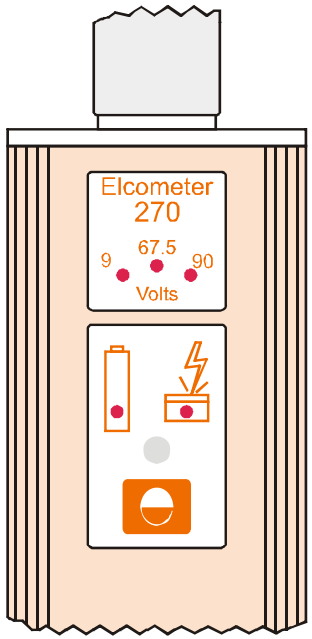
2.3 SWITCHING ON AND OFF

To switch on, press and hold . The detector will emit an audible signal and switch on.

To switch off, press and hold . The detector will emit an audible signal and switch off.



2.4 SELECTING VOLTAGE

(Dual and triple voltage models only)

To change voltage, press . The detector will emit an audible signal and change to the next voltage. The LED for the voltage selected will illuminate.

The voltage selected is retained while the detector is switched off. When the detector is switched on again, the voltage will be set to the retained value.

2.5 CALIBRATION TEST

When the detector is switched on, or after changing voltage, the unit will test the calibration of the internal voltage and sensitivity setting. This test takes approximately four seconds.

During the test the voltage indicator LED flashes slowly and then quickly. At the end of the test the LED remains permanently illuminated and the detector emits a loud double bleep to indicate a successful test.

In the unlikely event that the detector does not achieve a successful internal calibration test, check the batteries - see “Battery condition” on page 4. If fitting new batteries does not result in a successful calibration test, contact Elcometer or your local supplier in order to restore the correct calibration of the detector.

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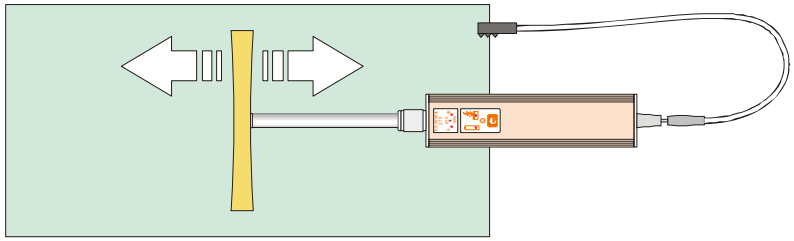
3 USING YOUR DETECTOR



1. Connect the signal return cable to an uncoated part of the metal substrate using the crocodile clip.
2. Moisten the sponge with clean tap[a] water[b].
3. Keep the sponge clear of the test surface and switch on the detector.
4. Wait approximately four seconds for a loud double beep indicating that the internal calibration test routine is complete.
5. If using the dual or triple voltage versions, select the test voltage required:
   - 9 V is suitable for coatings up to 300 µm (12 mils) thick.
   - 90 V is suitable for coatings up to 500 µm (20 mils) thick.
   - 67.5 V is the US standard test requirement.
6. Pass the sponge over the coated surface.

   If the sponge passes across a pinhole in the coating, the alarm LED will flash and an audible alarm will sound. The alarm will stop when the sponge moves away from the pinhole.
7. If required, locate the pinhole more precisely by retesting the area using a corner of the sponge only.

a. Tap water contains salts which allow it to conduct electricity.
b. To maximise the efficiency of your detector, add a surfactant such as Kodak Photo-flo™ to the water. Follow the dilution instructions supplied with the surfactant. Kodak Photo-flo™ can significantly reduce the surface tension of the water, therefore allowing the moisture to penetrate the smallest of pinholes. To order Kodak Photo-flo™ see “Spare parts and accessories” on page 8.

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4 TECHNICAL SPECIFICATIONS

Range,	9V:	300 µm (12 mil)
	67.5 V:	500 µm (20 mil)
	90 V:	500 µm (20 mil)
Sensitivity,	9 V:	90 kΩ ± 5%
	67.5 V:	125 kΩ ± 5%
	90 V:	400 kΩ ± 5%
Accuracy (of all voltages):		± 5%
Operating temperature:		0°C to 50°C (32°F to 120°F)
Dimensions,	detector only:	210 mm x 42 mm x 37 mm (8.3" x 1.7" x 1.5")
	standard wand:	175 mm (6.9") long with sponge
	standard sponge when wet:	150 mm x 60 mm x 25 mm (6" x 2.4" x 1")
Signal return cable length:		4 m (13')
Weight:		610 g (21 oz) (including batteries, wand assembly and standard earth signal return cable)
Batteries:		3 x LR6 (AA) 1.5 Alkaline[c]
Battery life,	9 V alkaline:	200 hours
	67.5 V alkaline:	100 hours
	90 V alkaline:	80 hours

c. Rechargeable NiMH batteries can be used, but battery life will be shorter than the equivalent alkaline batteries.

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5 SPARE PARTS AND ACCESSORIES

A range of spare parts and optional accessories which expand the capabilities of your Elcometer 270 Pinhole Detector is available from your local Elcometer supplier or direct from Elcometer.

Refer to the numbers and illustrations on the following pages for part identification.

1	Standard Sponge Wand with Sponge	T27016867
	Rectangular Sponge Set, x 3, 150 mm x 60 mm x 25 mm (6" x 2.4" x 1") with wing nut	T27018050
2	Roller Wand with Roller Sponge	T27016960
	Roller Sponge Set, x 4, 60 mm dia. x 50 mm long (2.4" x 2") with washer and clip	T27018051
3	Bottle of Wetting Agent (Kodak Photo-flo™)	T27018024
4	Telescopic Wand - extends to 1m (39"), with Lead and Belt Clip	T27016998
5	420 mm (16.5") Extension Piece *(Extension pieces can be connected together to make longer wands.)*	T27016965
6	Handle, Lead & Belt Clip for Separate Wand using extension piece(s)	T27016999
7	Replacement Separate Wand Lead (1.7 m/5.5 ft)	T27016983
8	Replacement Belt Clip	T27016981
9	10m (32.5ft) Signal Return Cable and Storage Drum	T99916996
10	Consultant's Carry Case Accommodates detector and items 1 to 9	T27018025
	Replacement Battery Cap Assembly	T27016997

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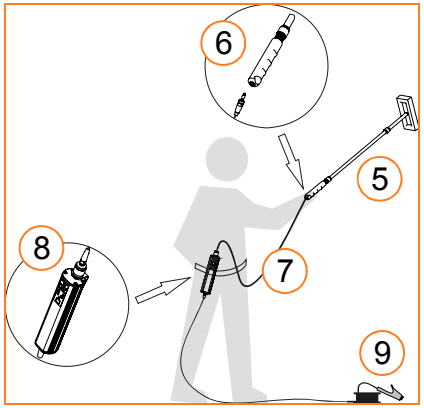

Spare parts and optional accessories

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Elcometer 270 with 10m (32.5') Signal Return Cable, Storage Drum and:

- A - Standard sponge wand with sponge
- B - Roller wand with roller sponge
- C - Standard sponge wand with sponge and 420 mm (16.5") extension piece

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6 MAINTENANCE

You own one of the finest pinhole detectors in the world. If looked after, it will last a lifetime.

Regular calibration checks of the voltage output and alarm sensitivity during the life of the detector are a requirement of quality management procedures e.g. ISO 9000 and other similar standards. For checks and certification contact Elcometer or your Elcometer supplier.

Note: *Sponge wands will eventually wear; the life of the sponge will depend on use and the abrasive nature of the coatings. Replacement sponges are available along with a comprehensive selection of wand accessories - see “Spare parts and accessories” on page 8).*

Your detector does not contain any user-serviceable components. In the unlikely event of a fault, the instrument should be returned to your Elcometer supplier or directly to Elcometer. The warranty will be invalidated if the instrument has been opened.

Contact details can be found:

- On the outside cover of these operating instructions.
- At www.elcometer.com

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7 RELATED EQUIPMENT

In addition to the Elcometer 270 Pinhole Detector, Elcometer produces a wide range of other paint inspection equipment.

Users of the Elcometer 270 Pinhole Detector may also benefit from the following Elcometer products:

- Elcometer 236 DC Holiday Detectors
- Elcometer 266 DC Holiday Detector
- Elcometer Coating Adhesion Testers
- Elcometer Coating Thickness Gauges
- Elcometer Coating Inspection Kits

For further information contact Elcometer, your local Elcometer supplier, or visit www.elcometer.com

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