



## Section 2.

# Testers & Equipment

“Information contained within this section shall be read in conjunction with all sections of this Installation Supply Connection Tests & Procedures manual”

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## 2.2 Test Equipment Maintenance

### General

Care shall be taken in maintaining test equipment in a suitable manner. Equipment shall not be exposed to impact, solvents, excessive moisture, ultraviolet radiation or placed in any other environment that may effect the equipment performance.

The condition of leads, test and connection equipment shall be visually checked to ensure they are in a serviceable condition prior to use.

Testers and indicators should be tested for correct operation before and after use

### Calibration

Calibration and testing requirements are listed against each tester.

Calibration of testers shall be performed by a National Association of Testing Authorities (NATA) or to a criteria approved by the electricity Distributor.

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## 2.3 Testers

### Voltage Indicator

#### Neon Type Testers



#### Audible Testers



#### Ezyvolt Tester



### Application

Testing for De-energised, Polarity Testing & Check Testing

#### General

Voltage Indicators provide an indication of the approximate voltage and may be used in conjunction with an independent earth or as an individual unit depending upon the application.

Test the voltage indicator operation prior to and immediately after testing.

To test the operation of a voltage indicator and testing circuit:

- Test to a known live 240V source.
- Conduct continuity test using:
  - Self test function on Audible Voltage Indicators
  - Insulation Resistance and Continuity Tester set on 500 V scale.

#### Maintenance

Tester operation is to be proven prior to and after testing.

## Testers (Continued)

### Neutral & Supply Tester

#### M1110 series



#### M1120



### Application

Neutral & Supply Testing

### General

The Neutral & Supply Tester performs an impedance test of the supply active and supply neutral.

The tester demonstrates by indicators:-

- Power on
- High reference earth resistance
- Voltage outside acceptable test range
- High neutral and/or active impedance
- Audible fault alarm
- Safe for use

The faults detected are:

- Independent earth has high resistance
- Active to neutral voltage out of tolerance
- High earth to neutral voltage
- High resistance in active and neutral supply circuit

Results of the self check functions and test results are indicated by combinations of the instrument indicators. (refer Appendix 1).

Blue label models of the NST have a “Touch to Test” pad for manual operation of the Neutral impedance test when the indicating light “ready/pass” is flashing.

Yellow label models of the NST have a modified or removed “Touch to Test” pad for automatic operation of the Neutral Impedance test.

### NST Electronic Model

Provides the test functions as listed above with supporting digital readout of actual test results (refer Appendix 1)

Refer to specific instrument details and instructions

### Maintenance

Individual Distributors are to ensure the maintenance of accuracy and sound condition of the equipment including leads and probes.



## Testers (Continued)

### Insulation Resistance and Continuity Tester



#### Applications

Underground Consumers Mains Testing & Neutral Integrity Test Point - Testing.

#### General

Insulation Resistance and Continuity Testers are used for testing insulation resistance of cables and continuity of conductors.

Test the instrument operation prior to and immediately after testing.

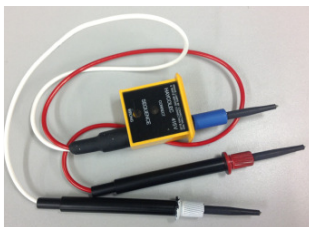
To test the operation of instrument and leads test as follows:

- Leads apart = Open Circuit
- Leads together = Zero Ohms

#### Maintenance

- Calibration test at intervals not to exceed twelve months.
- Periodic replacement of internal batteries where required.

### Phase Sequence Tester



#### Application

Phase Sequence Testing.

#### General.

Phase Sequence Testers are used to establish the phase sequence at various supply locations.

The tester is self-checking during phase sequence testing.

NOTE: The Eazyvolt tester is an approved Phase Sequence tester

#### Maintenance - General Care

### Load Tester



#### Application

Load Testing

#### General.

Load testers are applied between the neutral and the load side active/s terminal/s of direct metering equipment to verify that the metering equipment is registering the consumption of energy.

#### Maintenance - General Care

**Note:** Hair dryer type testers have potential to disturb dust and debris that may be present in close proximity of test location eg meter boxes.

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## 2.4 Test Equipment

### Independent Earth



### Applications

Testing for De-energised, Polarity Testing, Check Testing and Neutral & Supply Testing

### General

An independent earth is utilised in a number of test procedures.

The independent earth spike is pushed into the ground at least two (2) metres away from any installation earths, water pipes and conductive structures.

For paved areas where the spike cannot be pushed into the ground, have the spike held in firm contact with the paving.

Testing of the independent earth is performed in conjunction with the test equipment.

### Maintenance – General Care

**Test Equipment shown above is typical of the Test Equipment used. Other equipment maybe used provided it is approved for use by the individual Distributor/Network Operator.**

## Test Equipment (Continued)

### Trailing Leads



### Application

Neutral Integrity Test Point - Testing.

NST testing at Neutral Integrity Test Point locations.

### General Information

Trailing leads are used in test procedures where there is a need to extend the testing circuit.

Testing of the trailing leads is performed in conjunction with the test equipment.

### Maintenance – General Care

Test Equipment shown above is typical of the Test Equipment used. Other equipment maybe used provided it is approved for use by the individual Distributor/Network Operator.

## 2.5 Connection Equipment

### Low Voltage Stick and Fuse Extractor.



#### Application

For the extraction/insertion of stick operated Low voltage Service Fuse wedges up to 100amp

**Maintenance** - General care

### Pit Protector



#### Application

All underground activity where the pit is exposed and unattended.

#### General Information

Hazard Signs or barriers are used to provide a safety warning to the public or other workers of a road opening or pit hazard

### Installation Under Test Notice



#### Application

Metering positions and Customers Main Switchboard

#### General Information

Installation Under Test Notices are used to provide a safety warning to the public and other workers. The notices may also be used at locations other than the above mentioned when required e.g. underground pits/pillars

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## 2.6 Meter Programmers

### Pic Programmer



### Application

Program tariffs for Nilsen EMS meters /time switches

### Maintenance

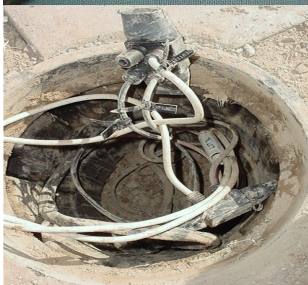
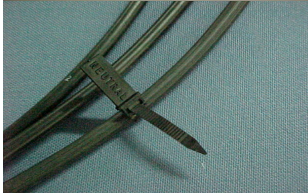
General care, replacement of batteries and re-programming to match required tariffs.

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## 2.7 Neutral Tags

### Identification and marking of LV Neutral conductors



### Application

**Distribution mains neutral conductors** – shall be identified and marked in accordance with the responsible Distributors standards, policies and works practices.

**Service Cables** - Overhead and underground service cable neutral conductors must be identified by visual examination and testing, and marked by means of a neutral tag fitted adjacent to the origin and load end terminations of the conductors, or other means acceptable to the responsible Distributor .

**Underground Consumer Mains** - Underground consumer mains neutral conductors must be identified by visual examination and testing and marked adjacent to the point of supply termination by means of a neutral tag, except where they are terminated in an Fused Overhead Connection Box or Circuit Breaker.

**All Consumer Mains.-** Due to electricity safety regulation requirements, Distributor test procedures and standards relating to the identification of installations un-metered and metered consumer mains neutral conductors by colour, termination position and testing; the marking by connection workers is not required unless there is a risk of mistaken identification and connection.

Where a risk of mistaken identification and connection may exist, eg, aging and discoloured VIR and/or TRS conductors, or neutral continuity relying on meter connections, the installations consumer mains neutral conductors must be identified by visual identification and testing and marked adjacent the terminations being worked on.

Marking may be by a small or modified neutral tag or black insulation tape applied to form a permanent layer around the conductor at the cable/s termination.

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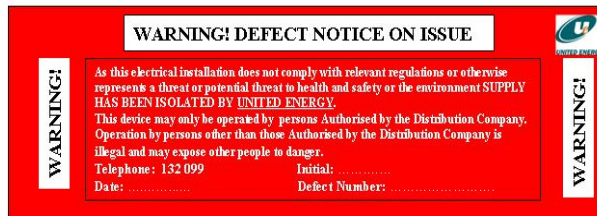
## 2.8 Labels

The labels displayed are examples used by various Distributors in accordance with their relevant procedures.



### Caution Supply connected

**Typical Application:**  
Usually larger or complex installations to indicate that an installation or equipment has been energised.



### Defect on Issue

**Typical Application:**  
Used to notify customers and other industry workers of a defect at an installation.

### CitiPower/Powercor



### Warning Label



**Typical Application:**  
Used on meter panels and meters to deter interference to seals and metering equipment

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