PRIMETEST 100

Operating Instructions

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Limited Warranty & Limitation of Liability

SEAWARD Electronic Limited guarantees this product to be free from defects in material and workmanship under normal use and service for a period of 1 year. The period of warranty will be effective at the day of delivery.

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DECLARATION OF CONFORMITY

As the manufacturer of the apparatus listed, declare under our sole responsibility that the product:

PRIMETEST 100

To which this declaration relates are in conformity with the relevant clauses of the following standard:

BS EN 61010-1:2001
Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 1: General requirements.

BS EN 61326:1998
Electrical equipment for measurement, control and laboratory user-EMC Requirements

Performance: The instrument operates within specification when used under the conditions in the above standards EMC and Safety Standards.

The product identified above conforms to the requirements of Council Directive 89/336/EEC and 73/23 EEC.

Seaward Electronic Ltd is registered under BS EN ISO9001:2000 Certificate No: Q05356.

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1 Important Information

These operating instructions are intended for the use of adequately trained personnel.

The following symbols are used in these operating instructions and on the PrimeTest 100.



Caution, risk of electric shock. Indicates instructions must be followed to avoid danger to persons.



Caution, risk of danger. The operating instructions must be adhered to in order to avoid danger.

Before use, ensure unit is clean and dry; visually inspect all leads, connectors, and case. Any damage or wear must be rectified prior to use.

Standard Accessories

	Part Number
PrimeTest 100 unit	344A910
Carry Case	71G082
Black Test Lead 1m	347A002
UK IEC mains cord 0.5m	300A002
Operating Instructions	344A550

Optional Accessories

	Part Number
PATGuard Lite	352A930
PATGuard Workabout	336A910
NiMH Batteries and charger	339A950

Full details and specifications can be found at www.seaward.co.uk or by calling Seaward Sales on 0191 5878724 / 0191 5878748.

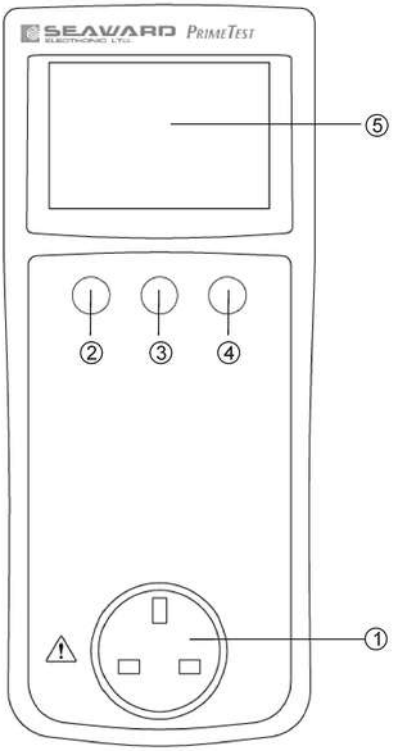


Figure 1. PrimeTest 100 Front View

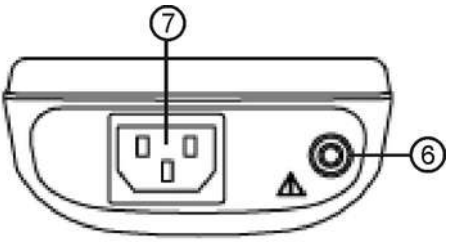


Figure 2. PrimeTest 100 End View

2 Introduction

The PrimeTest 100 is a hand held battery powered unit suitable for carrying out electrical safety checks on:

- Class I appliances
- Class II appliances
- IEC mains leads
- Extension leads
- Mains outlet wiring

Numbers shown in circles e.g. ① refer to figure 1 and figure 2 on page 6.

Test connections on the PrimeTest 100 are:

- Mains socket on front panel ① for connecting the appliance under test.
- 4mm socket on end panel ⑥ for earth test probe
- IEC socket on end panel ⑦ for mains cord testing.

User Interface

The LCD display ⑤ shows test progress, results for individual tests and the overall test result for an appliance or mains cord.

Tests are initiated using the three push buttons:

Power ON/OFF = ② **+** ③ ***until two beeps are heard***

Class I appliance test = ②

Class II appliance test = ③

Cord / extension lead test = ④

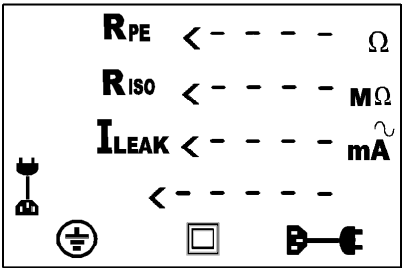
Note: The PrimeTest 100 will automatically switch OFF after approximately 3 minutes if no keys are pressed. The auto switch-off is disabled during a power socket test.

Note: When a key is pressed to initiate a test sequence, the PrimeTest 100 will compare the type of appliance connected with the test sequence that has been selected, and where possible, will prompt the user if an inappropriate test has been selected.

For example, if an IEC lead is connected between the front panel mains socket ① **and the IEC socket on the end panel** ⑦ **and a Class I** ② **or Class II** ③ **appliance test is selected, the PrimeTest 100 will flash the Cord test enunciator to indicate that the Cord test** ④ ***is the most appropriate test.***

3 Performing Tests

Press keys ②+③ to switch on the PrimeTest 100. When the unit is ready the display will be as shown below.



3.1 Checking a mains power outlet

Connect the IEC power cord to the PrimeTest 100 socket ⑦ and plug into the mains power outlet to be tested.

If the mains socket wiring is correct the display will show.



If the Live and Neutral in the socket wiring are reversed or there is a fault with the protective earth connection this is indicated by the display below.



If there is a fault with the Neutral connection this is indicated by the display below.



In the event of a test failure, disconnect the PrimeTest 100 from the supply and rectify the fault.

⚠ ***Do not leave the PrimeTest 100 permanently connected to a mains supply.***

The auto switch-off function is disabled when the PrimeTest 100 is connected to a live mains socket. The unit will beep continually after 3 minutes to remind the user to disconnect from the mains socket.

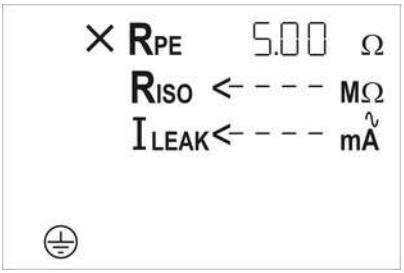
3.2 Testing a Class I Appliance

- Visually inspect the appliance and mains cord for signs of damage.
- If the appliance passes a visual inspection proceed with the electrical tests.
- Plug the earth test lead into the 4mm socket ⑥ on the PrimeTest 100 end panel.
- Plug the appliance into the PrimeTest 100 front panel mains socket ①
- Connect the earth test probe to an exposed metal part on the appliance.
- If the Appliance under test has an ON/OFF switch, make sure it is in the ON position.
- Press the Class I test key ②
- The PrimeTest 100 will now test the continuity of the protective earth.
- If the measured value is greater than 100 ohms no reading is shown, a cross is placed next to the $\mathbf{R_{PE}}$ enunciator and a fail result is

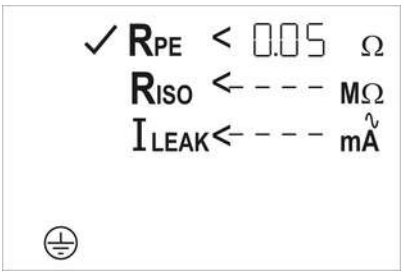
indicated as shown below.



- The test sequence is halted.
- If the measured value is less than 20 ohms but greater than the factory set pass/fail threshold, the measured value is displayed and the unit indicates a fail result as shown below

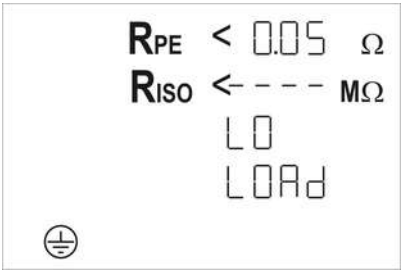


- If the measured value is less than the factory set pass/fail threshold, the measured value is displayed and the unit indicates a pass result, as shown below.

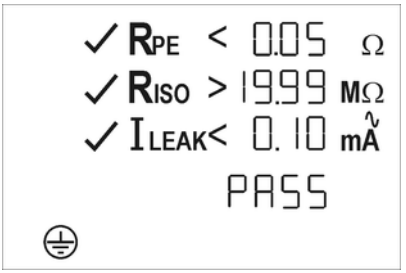


- The unit will proceed with the Insulation and Leakage tests.

Note: The power switch on the appliance under must be in the ON position to perform an insulation test. If no appliance is detected the PrimeTest 100 will display the following.



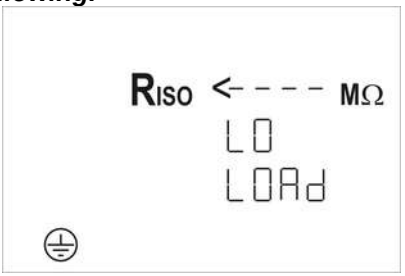
- Check that the appliance power switch is in the ON position. The test will automatically proceed if the appliance power switch is placed in the ON position.
- If the ***LO LOAd*** enunciator remains on the display, the load presented by the appliance may be too small for the PrimeTest 100 to detect. In this case, press the test key ② to continue.
- If the Insulation Resistance is greater than the factory set limit a tick is placed next to the ***Riso*** enunciator. If the Leakage current is less than the factory set limit a tick is placed next to the I_{LEAK} enunciator.
- The ***PASS*** enunciator is illuminated.



3.3 Testing a Class II Appliance

- Visually inspect the appliance and mains cord for signs of damage.
- If the appliance passes a visual inspection proceed with the electrical tests.
- Plug the earth test lead into the 4mm socket ⑥ on the PrimeTest 100 end panel.
- Plug the appliance into the PrimeTest 100 front panel mains socket ①
- Connect the earth test probe to an exposed metal part on the appliance.
- If the Appliance under test has an ON/OFF switch, make sure it is in the ON position.
- Press the Class II test key ③
- The PrimeTest 100 will now test Insulation Resistance and Leakage current.

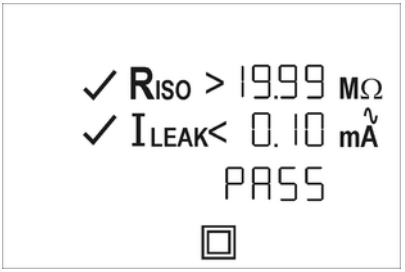
Note: The power switch on the appliance under must be in the ON position to perform an insulation test. If no appliance is detected the PrimeTest 100 will display the following.



- Check that the appliance power switch is in the ON position. The test will automatically proceed if the appliance power switch is placed in the ON position.
- If the ***LO LOAd*** enunciator remains on the display, the load presented by the appliance may be too small for the PrimeTest 100 to detect. In this case, press the test key ③ to continue.
- If the Insulation Resistance is greater than the factory set limit a tick is placed next to the ***Riso*** enunciator. Similarly, if the Leakage

current is less than the factory set limit a tick is placed next to the $\mathbf{I_{LEAK}}$ enunciator.

- The ***PASS*** enunciator is illuminated.



3.4 Testing a mains cord

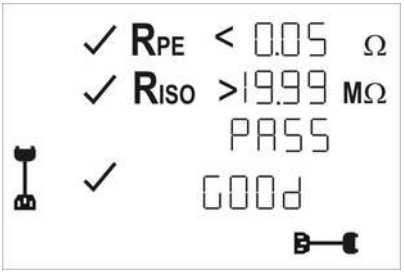
- Visually inspect the mains cord and plug for signs of damage.
- Check that the correct fuse is fitted.
- If the cord passes a visual inspection proceed with the electrical tests.
- Plug the mains cord under test into the IEC socket ⑦ and the front panel mains socket ① on the PrimeTest 100.
- Press the cords test key ④
- The PrimeTest 100 will first test the continuity of the protective earth.
- If the measured value is greater than the factory set limit a cross is placed next to the $\mathbf{R_{PE}}$ enunciator, a FAIL is indicated.

Note: ***The protective earth resistance will depend upon the length of the extension lead and the size (cross sectional area) of the cable. The measured value may be acceptable even if a cross is shown next to the*** $\mathbf{R_{PE}}$ **enunciator. For reference, typical resistance values for a variety of cable lengths and cross-sectional area are given in Table 1.**

- If the measured value is less than the factory set limit a tick is placed next the $\mathbf{R_{PE}}$ enunciator.
- The unit will proceed with the Insulation test.
- If the Insulation Resistance is lower than the factory set limit a cross is placed next

to the ***Riso*** enunciator and the test sequence is halted.

- If the Insulation Resistance is greater than the factory set limit a tick is placed next to the ***Riso*** enunciator.
- The unit will proceed with the wiring test, checking the live and neutral conductors for short or open circuits or reversed connections.
- If the wiring is correct a tick is placed next to the cord enunciator, the **GOOd** enunciator is illuminated and a **PASS** is indicated for the sequence.



Note: If the tested cord has a wiring fault, one of the following enunciators will be illuminated in place of GOOd

- **OPEn indicates that either the live or neutral conductor is broken (open circuit) or the plug top fuse has blown**
- **Short indicates that the live and neutral conductors are shorted together**
- **CrOSS indicates that the live and neutral connections are crossed (live and neutral conductors reversed)**

3.5 Testing an extension lead

- Visually inspect the mains cord and plug for signs of damage.
- Check that the correct fuse is fitted.
- If the cord passes a visual inspection proceed with the electrical tests.

- Plug the supplied 0.5m red IEC lead into the IEC socket ⑦ and into a mains outlet on the extension lead. Plug the mains plug of the extension lead into the front panel mains socket ① on the PrimeTest 100.
- The extension lead can now be tested in the same manner as an IEC as described above.

Note: The protective earth resistance will depend upon the length of the extension lead and the size (cross sectional area) of the cable. The measured value maybe be acceptable even if a cross is shown next to the **R_{PE} enunciator.**

Table 1: Approximate resistance of protective earth conductors.

	Cord size / current rating		
length	0.5mm^2/(3A)	1.0 mm^2/(10A)	1.25 mm^2/(13A)
5m	0.20	0.10	0.10
10m	0.40	0.20	0.20
25m	1.00	0.50	0.40

For further information on protective conductor resistance and testing of portable appliances can be found in the Code of Practise for In-service Inspection and Testing of Electrical Equipment published by the IEE.

4 Specification

Earth Continuity

Accuracy*	± (5% + 2 digits)
Test current	200mA minimum
Test voltage	9V nominal

Insulation resistance

Accuracy	± (5% + 2 digits)
Test voltage	500V
Test current	>1mA into 500kΩ
Test current	<2mA into 2kΩ

Leakage Current

Accuracy	± (5% + 2 digits)
Test voltage	40V rms, 50Hz AC
Test current	<5mA into 2kΩ

Cord Test

Earth continuity, insulation resistance as above. Check for Live and Neutral open circuit, short circuit or reversed polarity.

*When used with Seaward test lead, Part Number 347A002

Factory Set Pass/Fail limits

	Class I	**Class II**	**Cord**
Earth Continuity	0.2 ohms	N/A	0.2 ohm
Insulation Resistance	1.0Mohm	2.0Mohm	2.0Mohm
Leakage	0.75mA	0.25mA	N/A

Environmental rating
IP Rating IP40
Operating temperature range 0°C to 40°C, without moisture condensation.
Storage temperature range –25° to 65°.
Note: Batteries should be removed prior to storage.
Overvoltage category 300V CAT II

5 Maintenance

Clean only with a dry cloth; do not use solvents.
Before use, ensure unit is clean and dry; visually inspect all leads, connectors, and case. Any damage or wear must be rectified to preserve user safety.

Check the battery contacts and compartment are free of electrolytic contamination.
Any contamination of the battery contacts or compartment should be cleaned with a dry cloth.

Note: The PrimeTest 100 contains no user serviceable parts. If an **Error** warning should appear on the display please contact the manufacturer or an **authorised Seaward Service Agent** for advise.

6 Battery Check

The PrimeTest 100 is powered from a 6 AA cells which are checked before a test is performed. When the battery voltage is low the  enunciator is illuminated. The unit will continue to perform within specification for a limited number of tests, dependent upon the type of the batteries fitted.

When the battery voltage reaches a level where the performance is affected the  enunciator will flash and all test keys are disabled. The batteries must be replaced.

6.1 Battery Replacement



Before opening the PrimeTest 100 ensure that all test leads are disconnected.

- Switch off the unit by pressing and holding keys ② and ③.
- Disconnect the black test lead from 4mm test socket ⑥.
- Disconnect the IEC mains cable from the IEC socket ⑦.
- Disconnect the EUT mains cable from the EUT socket ①.
- Place the PrimeTest 100 face down and release the captive screw in the battery compartment cover.
- Remove the battery compartment cover and remove the discharged batteries.
- Insert the replacement batteries into the battery compartment ensuring that the battery polarity matches the marking on the inside of the battery compartment.
- Relocate the battery cover over the battery compartment and fasten in position with the battery cover captive screw.

7 Service and Calibration

To maintain the specified accuracy of the measurement results, the instrument must be recalibrated at regular intervals by either the manufacturer or an **authorised Seaward Service Agent**. We recommend a recalibration period of one year.
For help or advise on Service and Calibration contact:

Service Department
Seaward Electronic
Bracken Hill
South West Industrial Estate
Peterlee
Co Durham SR8 2SW
England

Tel: 0191 5878739 / 0191 5878737
Email: service@seaward.co.uk
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