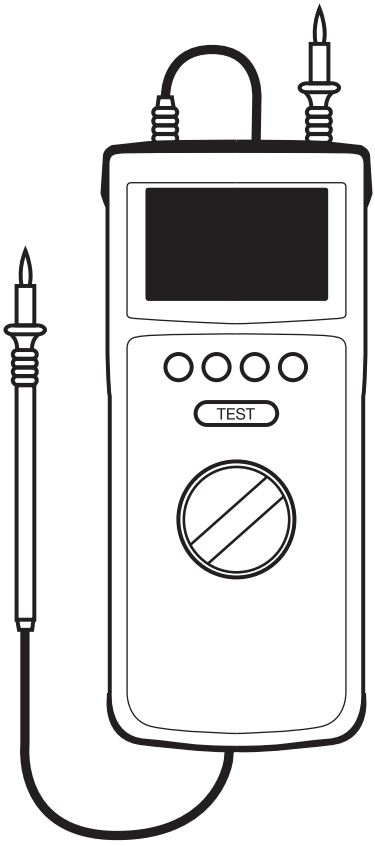
SEAWARD

POWERTEST 1557



Operating Instructions

PowerTest 1557

Operating Instructions

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Part Number 328A559 Revision 4
October 2013

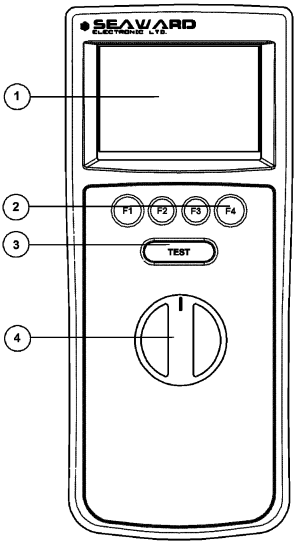


Figure 1 PowerTest 1557 Front View

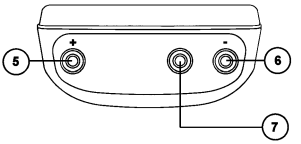


Figure 2 PowerTest 1557 End View

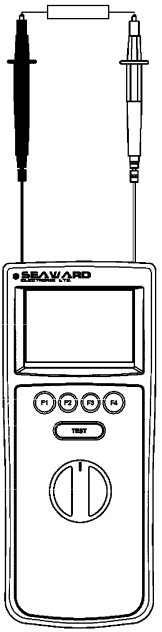


Figure 3 Earth Continuity/Insulation Measurement

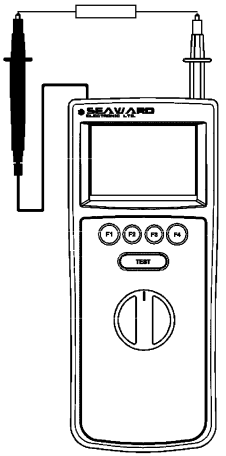


Figure 4 Earth Continuity/Insulation Measurement using Cordless probe

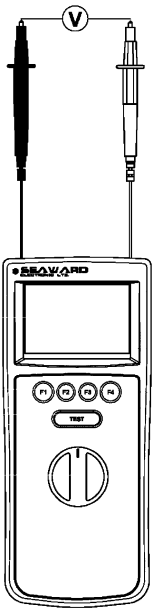


Figure 5 Voltage Measurement using test probes

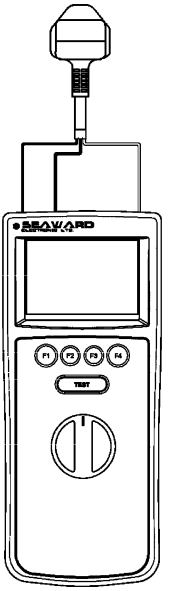


Figure 6 Mains Voltage/RCD/Earth Loop Impedance /Line Impedance Measurement

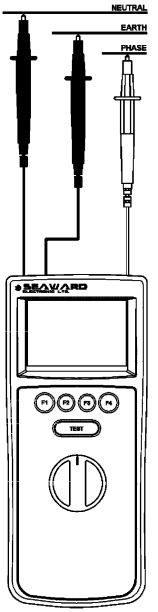


Figure 7 Earth Loop Impedance/Line Impedance

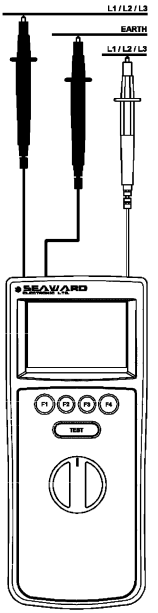


Figure 8 Line Impedance between phases

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 2 year. The period of warranty will be effective at the day of delivery.

Due to a policy of continuous development SEAWARD Electronic Limited reserves the right to alter the equipment specification and description outlined in this publication without prior notice and no part of this publication shall be deemed to be part of any contract for the equipment unless specifically referred to as an inclusion within such contract.

Table of Contents

CERTIFICATE OF CONFORMITY

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

PowerTest 1557

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

BS EN 61010-1:2010
Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 1: General requirements.

BS EN 61010-2-030:2010
Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 2-030: Particular requirements for testing and measuring circuits.

BS EN 61557-1,2,3,4,6:2007, 10:2013
Electrical safety in low voltage distribution systems up to 1000V a.c. and 1500V d.c. – Equipment for testing, measuring and monitoring of protective measures

BS EN 61326:2006
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 2004/108/EC and 2006/95/EC.

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

Introduction

The PowerTest 1557 is a hand held, battery powered, multi-function electrical installation test instrument capable of performing a comprehensive range of tests, including:

Earth Continuity @ 200mA
Insulation Resistance at 100V, 250V and 500V
Voltage
Frequency
RCD Trip Time at ½IΔn, IΔn and 5xIΔn
RCD Trip current
Earth Loop Impedance and associated PFC
Mains Impedance and associated PSC
Power socket wiring polarity

1 User Notes

This instrument and its operating instructions are intended for use by adequately trained personnel.

The following symbols are used in these operating instructions and on the PowerTest 1557.

Warning of electrical danger!
Indicates instructions must be followed to avoid danger to persons.

Important, follow the documentation! This symbol indicates that the operating instructions must be adhered to in order to avoid danger.

2 Safety Notes

This PowerTest 1557 is fully compliant with the requirements of:

BS EN 61010-1: 2010.

BS EN 61557 part 1, 2, 3, 4, 6 and 10.

In order to ensure safe operation of this instrument, all notes and warnings in these instructions must be observed at all times.

The PowerTest 1557 has been designed to make measurements in a dry environment.

The PowerTest 1557 may be used to test circuits with a maximum over-voltage Category III, 300 V AC/DC with reference to earth.

High voltages are present at the probe tips of the PowerTest 1557 during insulation resistance measurement. Always hold test probes above the hand guards.

The PowerTest 1557 and all associated cables and leads must be checked for signs of damage before equipment is operated.

Prior to any resistance measurement, always ensure that the circuit under test is electrically isolated.

Where safe operation of the PowerTest 1557 is no longer possible it should be immediately shut down and secured to prevent accidental operation.

It must be assumed that safe operation is no longer possible:
- if the instrument or leads show visible signs of damage or
- the instrument does not function or
- after long periods of storage under adverse environmental conditions.

If the PowerTest 1557 is used in a manner not specified by this document then the protection provided by the equipment may be impaired.

3 Accessories

3.1 Standard Accessories

The PowerTest 1557 is supplied with the following items:

1 off PowerTest 1557 unit
1 off professional carry case
1 off Seaward (UK) mains lead
1 off 1.2 M black test lead
1 off 1.2 M red test lead
1 off 1.2 M green test lead
1 off Operating Instruction Manual
1 off Cordless probe
1 off black crocodile clip
1 off red crocodile clip
1 off green crocodile clip
6 off MN1500 (AA) 1.5v Batteries

3.2 Optional Accessories

3.15A T 500V Fuse

Do not open unit, no other serviceable parts.

4 Unit Description

The PowerTest 1557 is a hand held, multi-function electrical installation test instrument, capable of performing all of the required electrical tests. Tests are selected using the colour coded rotary switch.

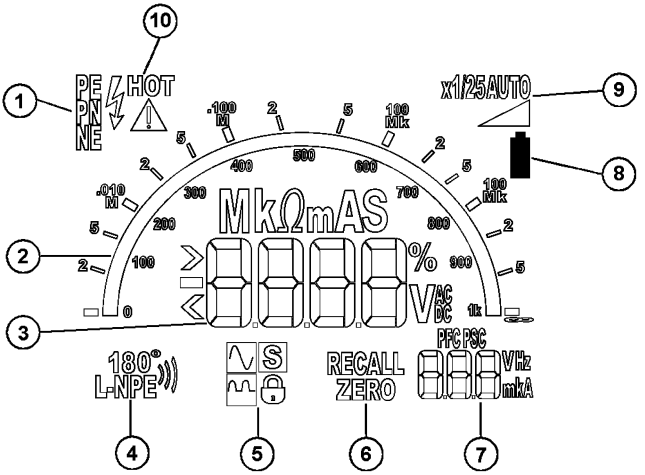
4.1 Identifying parts of the unit

The numbering below refers to fig. 1 and fig. 2.

1. LCD Display
2. Function keys F1, F2, F3 and F4
3. TEST key
4. Rotary Switch
    a. Voltage/frequency
    b. Insulation resistance @ 100V
    c. Insulation resistance @ 250V
    d. Insulation resistance @ 500V
    e. Continuity @ 200mA
    f. Off
    g. Earth Loop / Mains Impedance
    h. Auto RCD
    i. RCD trip time @ ½ IΔN
    j. RCD trip time @ IΔN
    k. RCD trip time @ 5IΔN
    l. RCD trip time (ramp test)
5. Test lead input (RED)
6. Test lead input (BLACK
7. Test lead input (GREEN)

Note: The function performed by keys F1 – F4 depends upon the rotary switch position. For each rotary switch position, the lower part of the LCD display indicates the function of the key above.

4.2 LCD display



1. Mains supply status icons

These icons indicate the status of the mains supply between phase-earth (PE), phase-neutral (PN) and neutral-earth (NE) during RCD and Loop tests.

Note: Testing is inhibited if the mains supply is incorrect.

2. Analog bargraph

The analogue bargraph provides an analogue representation of the measurement shown by the primary digital display.

3. Primary digital display

The primary digital display is used to indicate the test measurement for the active test type.

4. Icons for function key F1.

These icons are used to display the available options for the selected test. Repeatedly pressing function key F1 cycles through the available options.

5. Icons for function key F2.

These icons are used to display the available options for the selected test. Repeatedly pressing function key F2 cycles through the available options.

6. Icons for function key F3.

These icons are used to display the available options for the selected test. Repeatedly pressing function key F3 cycles through the available options.

7. Secondary display and Icons for function key F4.

The secondary display is used to show the measured output voltage during insulation resistance

measurements and PFC/PSC calculations during earth loop / line impedance measurements. The icons are used to display the available functions for the selected test. Repeatedly pressing function key F4 cycles through the available options.

8. Battery status icon.

This icon displays the status of the battery voltage.

9. RCD test icons.

These icons display the selected RCD test function.

10. Warning Icons.

These icons are used to inform the user of the potential of any hazard or warning which may restrict the operation of the PowerTest 1557. Details are provided in the relevant parts of these operating instructions.

5 Using the PowerTest 1557

5.1 Power On

To turn the PowerTest 1557 on simply rotate the rotary switch to the required test type.

5.2 Battery Health Check

The PowerTest 1557 will automatically perform battery health checks periodically or when a new test type is selected.

Note: When the battery symbol is flashing all tests will be inhibited and the batteries should be replaced as described in section 8.4.

5.3 Continuity Tests

Always ensure that the circuit under test is electrically isolated.

If the test probes are connected across a voltage of >30V then the PowerTest 1557 will automatically display the voltage between the probes, the warning buzzer will sound and the TEST key is inhibited.

Rotate the rotary switch until the R_{PE} test is selected.

When the continuity test is selected, the PowerTest 1557 will display the available test options for 1 second; Buzzer, Test Lock, Lead Zero. If the Buzzer was previously enabled then the icon will remain highlighted. The Test Lock and Lead Zero must be enabled each time the Continuity test is selected.

Functions keys F1-F4 have are used to select the options below:

F1	F2	F3	F4
Buzzer	Test Lock	Zero	Not used

Buzzer (F1)

When enabled, the Buzzer will sound when the continuity measurement is less than 20 ohms.

Test Lock (F2)
The Test Lock is used to 'lock' the instrument in a continuous measurement mode, with a single press of the TEST key. When Test Lock is enabled the LCD shows the padlock icon. When Test Lock is active the TEST key is locked until the option is disabled or the rotary switch is moved to another position.
To enable the Test Lock mode test press the TEST key and F2 simultaneously.
To disable Test Lock, press F2 or turn the rotary switch to another position.

ZERO (F3)
The instrument can automatically compensate for the resistance of the test leads as follows:
Connect the two test probes firmly together, then press and hold the ZERO key. The measured resistance of the test leads is shown in the primary display until a beep is heard and the ZERO icon is illuminated. All subsequent measurements will take into account the test lead resistance compensation until the function is disabled by pressing function key F3.

Note: A maximum test lead resistance of 10 ohms can be taken into account. If the test lead resistance is great than 10 ohms an error beep will indicate that the Lead Zero function has failed.

Note: For ease of use, the PowerTest 1557 will store the lead compensation when switched off and recall this value when next switched on. The stored value is only applicable to the test leads used when the compensation measurement was made. If the test leads are replaced the ZERO function should be repeated using the replacement test leads.

To make a continuity measurement, press and hold the TEST key. The resistance between the test probes is displayed until the TEST key is released. Alternatively, use the Test Lock function to allow measurements to be started or stopped with single press of the TEST key. During a measurement, the measured value is shown in the primary display and on the analogue bargraph.

5.3 Insulation Resistance Tests

Always ensure that the circuit under test is electrically isolated.

If the test probes are connected across a voltage of >30V then the PowerTest 1557 will automatically display the voltage between the probes, the warning buzzer will sound and the TEST key is inhibited.

Use the rotary switch to select either the 100V, 250V or 500V MΩ test.
The PowerTest 1557 will display the Test Lock and battery symbol for 1 second. If the Test Lock feature is required, it should be activated as described below.

Functions keys F1-F4 have are used to select the options below:

F1	F2	F3	F4
Not used	Test Lock	Not used	Not used

Test Lock (F2)
The Test Lock is used to 'lock' the instrument in a continuous measurement mode, with a single press of the TEST key. When Test Lock is enabled the LCD shows the padlock icon. When Test Lock is active the TEST key is locked until the option is disabled or the rotary switch is moved to another position.
To enable the Test Lock mode test press the TEST key and F2 simultaneously.
To disable Test Lock, press F2 or turn the rotary switch to another position.

To make an insulation resistance measurement, press and hold the TEST key. The resistance between the test probes is displayed until the TEST key is released. Alternatively, use the Test Lock function to allow measurements to be started or stopped with single press of the TEST key. During a measurement, the measured value is shown in the primary display and analogue bargraph and the measured test voltage is shown in the secondary display.

5.5 Voltage Measurement

Rotate the rotary switch until the V test is selected. The PowerTest 1557 will start measuring voltage immediately and use of the TEST key is not required.

The function keys do not perform any operations while in Voltage mode.

For AC voltage measurements, the frequency of the measured voltage is shown in the secondary display.

5.6 Earth Loop Impedance / Line Impedance

⚠ The PowerTest 1557 will only allow the Earth Loop Impedance test to be performed if the correct voltages are detected between phase-neutral (PN illuminated), phase-earth (PE illuminated) and neutral-earth (NE **not** illuminated).

Rotate the rotary switch until the Zs test is selected. Press the function key F1 to select either the Earth Loop Impedance test (L-PE) or the Line Impedance test (L-N).

F1	F2	F3	F4
Line Impedance	Not used	Not used	Not used

The secondary display will automatically show the appropriate icon: PFC when L-PE is selected and PSC when L-N is selected.

Note: When the Zs switch position is selected, the PowerTest 1557 will default to the last used setting, even if it has been switched off.

To begin the test, press and release the TEST key.

Note: The PowerTest 1557 will determine the fault voltage that may appear on the protective conductor during the test. If the fault voltage is greater than 25V the PowerTest 1557 will indicate >25V on the LCD, but the user may proceed with the test. If the fault voltage is

great than 50V, this is indicated on the LCD and the test is inhibited.

During the test, progress is shown by the analogue bargraph. When the test is complete, the Earth Loop Impedance measurement is shown in the primary display and the calculated Prospective Fault Current (PFC) is shown in the secondary display.

Note: A Line Impedance measurement is automatically made as part of the Earth Loop Impedance test. The Line Impedance measurement (L-N) and Prospective Short-circuit Current (PSC) can be viewed by simply pressing function key F1, without the need to repeat the test.

5.7 Auto RCD Test Sequence

⚠ The PowerTest 1557 will only allow the Earth Loop Impedance test to be performed if the correct voltages are detected between phase-neutral (**PN** illuminated), phase-earth (**PE** illuminated) and neutral-earth (**NE not** illuminated).

⚠ Leakage currents in the circuit following the residual current protection device may influence the measurement.

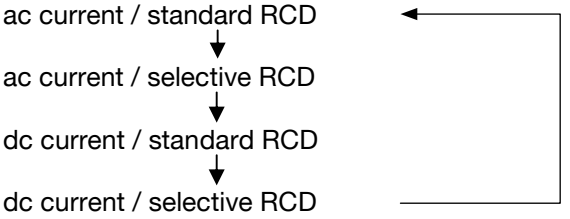
The Auto RCD test is used to automatically perform a sequence of 6 RCD trip time tests with a single press of the TEST key. Each time the RCD trips, the sequence will automatically continue once the RCD is reset. The sequence comprises of test at:

½IΔn / 0°
½IΔn / 180°
IΔn / 0°
IΔn / 180°
5IΔn / 0°
5IΔn / 180°

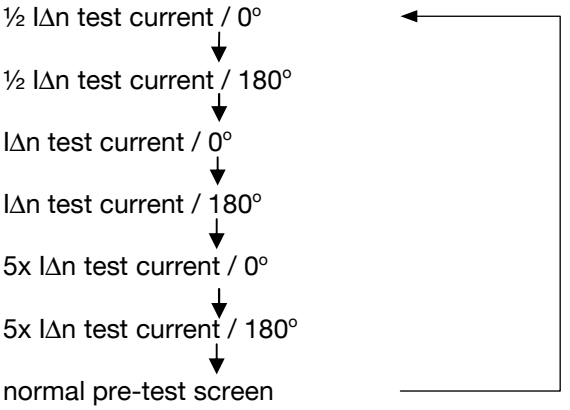
Functions keys F1-F4 have are used to select the options below:

F1	F2	F3	F4
Not used	ac/dc/ selective	RCL	Test current

AC/DC/Selective (F2)
Function key F2 is used to select the required RCD type: AC or DC sensitive combined with standard or selective RCD types. Each time the F2 key is pressed the next option is selected
During selective tests the PowerTest 1557 will display a delay timer which counts down from 30s to 0s. Pressing the Test key or turning the rotary switch while the PowerTest 1557 is counting will terminate the count.

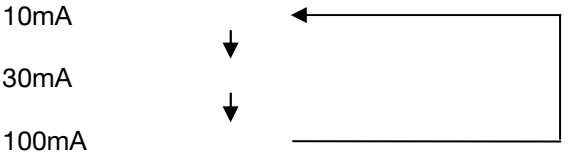


RCL (F3)
The RCL (Recall) key is used to recall the results of the last automatic RCD test performed by the PowerTest 1557. The LCD will update to show all of the relevant parameters for the result displayed. Continue to press the F3 key to rotate through the results.



Pressing any key while displaying a recalled measurement will return the PowerTest 1557 to the normal pre-test screen.

Rated residual operating current IΔn (F4)
The test current can be selected by pressing the F4 key.



When the required settings have been selected, press the TEST key to begin the sequence.

Note: The PowerTest 1557 will determine the fault voltage that may appear on the protective conductor during the test. If the fault voltage is greater than 25V the PowerTest 1557 will indicate >25V on the LCD, but the user may proceed with the test. If the fault voltage is great than 50V, this is indicated on the LCD and the test is inhibited.

If the fault voltage is less than 50V the test sequence will proceed and the trip times are shown in the primary display.
When the sequence is completed, the RCL key (F3) is used to recall the measurements.

5.8 RCD Trip Time Tests

⚠ The PowerTest 1557 will only allow the Earth Loop Impedance test to be performed if the correct voltages are detected between phase-neutral (PN illuminated), phase-earth (PE illuminated) and neutral-earth (NE **not** illuminated).

⚠ Leakage currents in the circuit following the residual current protection device may influence the measurement.

Note: The PowerTest 1557 will determine the fault voltage that may appear on the protective conductor during the test. If the fault voltage is greater than 25V the PowerTest 1557 will indicate >25V on the LCD, but the user may

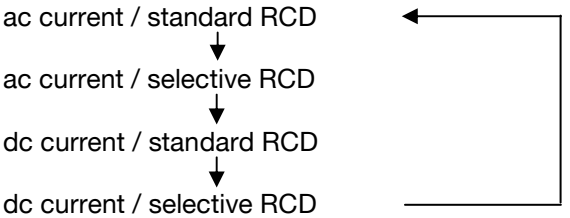
proceed with the test. If the fault voltage is great than 50V, this is indicated on the LCD and the test is inhibited.

Use the rotary switch to select the ½ IΔn, IΔn or 5 IΔn test position.
The ½ IΔn test will perform the RCD test with a current of 50% of that indicated on the LCD.
The IΔn test will perform the RCD with the test current indicated on the LCD.
The 5 IΔn test will perform the RCD with 500% that which is indicated on the LCD.

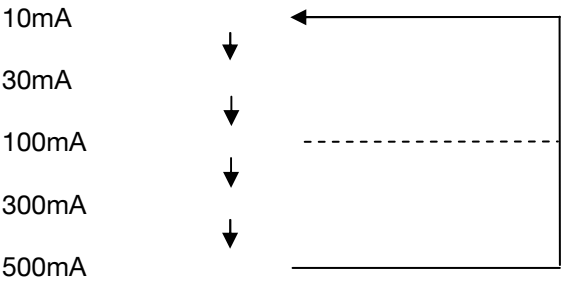
F1	F2	F3	F4
0° / 180°	ac/dc/ selective	Not used	Test current

0° / 180° (F1)
Use the F1 key to alternate between the starting angle of the current. All RCD tests will start on zero crossing.

AC/DC/Selective (F2)
Function key F2 is used to select the required RCD type: AC or DC sensitive combined with standard or selective RCD types. Each time the F2 key is pressed the next option is selected
During selective tests the PowerTest 1557 will display a delay timer which counts down from 30s to 0s. Pressing the Test key or turning the rotary switch while the PowerTest 1557 is counting will terminate the count.



Rated residual operating current IΔn (F4)
The test current can be selected by pressing the F4 key.



Please note that the PowerTest 1557 is not capable of performing all of the different test currents for all of the different manual RCD settings.

	10mA	30mA	100mA	300mA	500mA
½ IΔN	✔	✔	✔	✔	✔
1 IΔN	✔	✔	✔	✔	✔
5 IΔN	✔	✔	✔		

5.9 RCD trip current (Ramp) Tests

⚠ The PowerTest 1557 will only allow the Earth Loop Impedance test to be performed if the correct voltages are detected between phase-neutral (PN illuminated), phase-earth (PE illuminated) and neutral-earth (NE **not** illuminated).

⚠ Leakage currents in the circuit following the residual current protection device may influence the measurement.

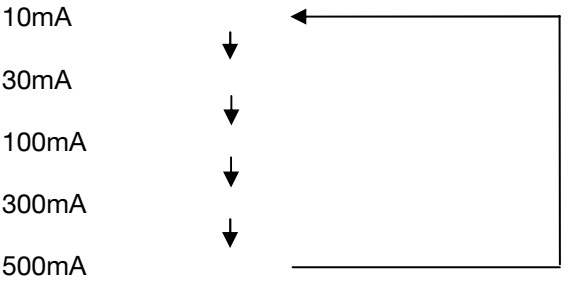
Note: The PowerTest 1557 will determine the fault voltage that may appear on the protective conductor during the test. If the fault voltage is greater than 25V the PowerTest 1557will indicate >25V on the LCD, but the user may proceed with the test. If the fault voltage is great than 50V, this is indicated on the LCD and the test is inhibited.

F1	F2	F3	F4
0° / 180°	AC/DC/Selective	Not used	Test current

0° / 180° (F1)
Use the F1 key to alternate between the starting angle of the current. All RCD tests will start on zero crossing.

AC/DC/Selective (F2)
Function key F2 is used to select the required RCD type: AC or DC sensitive combined with standard or selective RCD types. Each time the F2 key is pressed the next option is selected
During selective tests the PowerTest 1557 will display a delay timer which counts down from 30s to 0s. Pressing the Test key or turning the rotary switch while the PowerTest 1557 is counting will terminate the count.

Rated residual operating current IΔn (F4)
The test current can be selected by pressing the F4 key.



6 Electrical Specifications

6.1 Earth Continuity

Test Voltage Open Circuit	>4V
Test Current into 2Δ	>200mA
Display Range	0.00Ω - 1.99Ω
	2.0Ω – 19.9Ω
	20 Ω - 199Ω
Measuring Range	0.01Ω – 1.99Ω
(EN 61557-4)	2.0Ω – 19.9Ω
	20Ω – 199Ω
Resolution	0.01Ω maximum
Accuracy	±2% ±5 digits
Number of repeat tests as per IEC61557-4	Approx 4000

6.2 Insulation Resistance

Test Voltage Specification	-0% +20% (open circuit)
Test Voltage @ 1mA	>1mA into U_N x (1000Ω/V)
Test Current Short Circuit	<2mA
Display Range	0.05MΩ - 199MΩ
Measuring Range	0.05MΩ – 1.99MΩ
(EN 61557-2)	2.0MΩ – 19.9MΩ
	20MΩ – 100MΩ
Resolution	0.01MΩ maximum
Accuracy	±5% ±5 digits
Voltage Indication Accuracy	±5%
Number of repeat tests as per IEC61557-2	Approx 3000

6.3 Earth Loop Impedance

Supply Voltage	195 – 253V, 45Hz – 65Hz
Nominal Test Current	15mA
Display Range	0.01Ω - 2000Ω
Measuring Range	1.00Ω - 1.99Ω
(EN 61557-3)	2.0Ω – 19.9Ω
	20Ω - 2000 Ω
Resolution	0.01Ω maximum
Accuracy	±5%±12d (1.00Ω - 1.99Ω)
	±5%±5d (2.0Ω - 19.9Ω)
PFC Range	0 – 26kA

6.4 Line Impedance

Supply Voltage	195V – 440V, 45Hz – 65Hz
Nominal Test Current	15mA
Display Range	0.01Ω - 2000Ω
Measuring Range	0.05Ω - 1.99Ω 2.0Ω – 19.9Ω 20Ω - 2000Ω
Resolution	0.01Ω maximum
Accuracy	±5% ±2 digits
PFC Range	0kA – 26kA

6.5 RCD

Supply Voltage	195V – 253V, 45Hz – 65Hz
Nominal Test Currents	10mA,30mA,100mA,300mA, 500mA
Test Current Accuracy	-0% +10% at IΔn and 5IΔn -10% +0% at ½ IΔn
Trip Time Ranges	0ms – 2000ms, ½ IΔn 0ms – 300ms, IΔn General 0ms – 500ms, IΔn Selective 0ms – 40ms, 5IΔn
Trip Time Accuracy	±5% ±2 digits
Ramp Current Range	½ IΔn to 1.1 IΔn
Trip Current Measurement Accuracy	10%

6.6 Voltage/Frequency Measurement

Display Range	0V – 440V
Voltage Measuring Range	0V – 440V
Resolution	1V
Accuracy	±5% ±2 digits
Frequency Range	45Hz – 65Hz
Frequency Accuracy	Indication only

7 Environmental Conditions

The PowerTest 1557 has been designed to perform tests and measurements in a dry environment.

Maximum barometric elevation for making measurements is 2000M.

Overvoltage category IEC 60664/IEC 61010, 300V Category III.

Pollution degree 2 according to IEC 61010-1.

Protective system IP40 according to IEC 60529.

Electromagnetic compatibility (EMC). Interference immunity and emitted interference conforming to IEC 61326-1.

Operating temperature range of 0°C to 40°C, without moisture condensation.

The PowerTest 1557 can be stored at any temperature in the range -25°C to +65°C (relative humidity up to 90%). The batteries should be taken out of the instrument for storage.

Operating Altitude 0 to 2000 metres

8 Maintenance

Before opening the PowerTest 1557 ensure that it is disconnected from all voltage! Electric shock danger!

8.1 Preparing to work on the PowerTest 1557.

Make the PowerTest 1557 is voltage free as follows, before opening the instrument;

Power the unit off using the rotary switch by selecting the Off position on the rotary switch.

Disconnect all of the test leads from the unit

8.2 Securing the PowerTest 1557

Under certain conditions safe operation of the PowerTest 1557 can no longer be assumed:

Visible damage of the instrument case.

Incorrect measurement results.

Recognisable abuse to the instrument due to prolonged storage under improper conditions.

Recognisable abuse to the instrument due to extraordinary transportation stress.

Check the battery compartment for signs of battery electrolyte leakage.

In these cases, the PowerTest 1557 should be immediately switched off, disconnected from any test or measurement function and secured to prevent any further use.

8.3 Cleaning

Clean the external case of the PowerTest 1557 with a clean dry cloth.

Avoid using solvents and abrasive scouring agents to clean the external case of the PowerTest 1557.

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.

8.4 Battery Replacement

Before opening the PowerTest 1557 ensure that it is disconnected from all voltage! Electric shock danger!

Power the unit off by selecting the Off position on the rotary switch.

Disconnect all the test leads from the unit

Position the PowerTest 1557 face down and release the captive screw in the battery compartment cover.

Remove the battery compartment cover.

Remove the discharged batteries from the compartment.

Fit a new set of alkaline batteries.

Relocate the battery cover over the battery compartment and fasten in position with the battery cover captive screw.

8.5 Replacing the Fuse.

Before opening the PowerTest 1557 ensure that it is disconnected from all voltages! Electric shock danger!

All replacement fuse types are specified for ratings and size on the battery compartment cover on the rear of the PowerTest 1557.

Power the unit off by selecting the Off position on the rotary switch.

Disconnect all the test leads from the unit.

Position the PowerTest 1557 face down and release the captive screw in the battery compartment cover.

Remove the battery compartment cover.

Lift one end of the fuse out of the fuse holder with the help of a flat bladed screwdriver.

Lift the defective fuse completely out of the fuse holder.

Insert a new fuse as described and specified by the text on the battery compartment cover.

Ensure that the new fuse is seated and centred in the fuse holder.

Relocate the battery cover over the battery compartment and fasten in position with the battery cover captive screw.

8.6 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.

8.7 Spare Parts.

	Seaward Part No.
Test lead set	328A950
UK Mains lead	328A951
Cordless Probe	328A952
Carrying Case	328A953
500mA 1000V 1¼'	27B098

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

Appendix A

IEC61557-2: Insulation		
Intrinsic error or influence quantity	Reference conditions or specified operating range	Designation code
Intrinsic error	Reference conditions	A
Position	Reference position ±90°	E_1
Supply voltage	At the limits stated by the manufacturer	E_2
Temperature	0°C and 40°C	E_3
Operating Error	$B=\pm(\lvert A\rvert+1.15\sqrt{E_1^2+E_2^2+E_3^2})$	

IEC61557-3: Loop Impedance		
Intrinsic error or influence quantity	Reference conditions or specified operating range	Designation code
Intrinsic error	Reference conditions	A
Position	Reference position ±90°	E_1
Supply voltage	At the limits stated by the manufacturer	E_2
Temperature	0°C and 40°C	E_3
Phase Angle	At a phase angle 0° to 18°	E_4
System frequency	99% to 101% of the nominal frequency	E_7
System voltage	85% to 110% of the nominal voltage	E_8
Operating Error	$B=\pm(\lvert A\rvert+1.15\sqrt{E_1^2+E_2^2+E_3^2+E_6^2+E_7^2+E_8^2})$	

IEC61557-4: Resistance of earth connection and equipotential bonding		
Intrinsic error or influence quantity	Reference conditions or specified operating range	Designation code
Intrinsic error	Reference conditions	A
Position	Reference position ±90°	E_1
Supply voltage	At the limits stated by the manufacturer	E_2
Temperature	0°C and 40°C	E_3
Operating Error	$B=\pm(\lvert A\rvert+1.15\sqrt{E_1^2+E_2^2+E_3^2})$	

IEC61557-6: Residual current devices (RCD) in TT and TN systems		
Intrinsic error or influence quantity	Reference conditions or specified operating range	Designation code
Intrinsic error	Reference conditions	A
Position	Reference position ±90°	E_1
Supply voltage	At the limits stated by the manufacturer	E_2
Temperature	0°C and 40°C	E_3
Resistance of the probes	Within the limits stated by the manufacturer	E_4
System voltage	85% to 110% of the nominal voltage	E_5
Operating Error	$B=\pm(\lvert A\rvert+1.15\sqrt{E_1^2+E_2^2+E_3^2+E_5^2+E_8^2})$	