

TRISAN S8 / DL

Portable Appliance Tester

Operating Manual



TRISAN S8



TRISAN S8 DL

About TRISAN S8 / DL Portable Appliance Tester (PAT).

This tester is Trisan core technology that supports a range of customised firmware. The S8 is the current platform for the Trio SafeTcheck tester. (Pro Logger II & Plus)

The instrument requires the operator to have a good knowledge of the types or categories of Portable appliances. Categories are generally divided between Class I and II. The operator also requires an understanding between Insulation Resistance and run/leakage current testing.

The TRISAN S8 is designed specifically for performing tests as required by the Australian standards AS/NZS 3012 and 3760.

These standards are derived from the fundamental design, manufacture and safety Standards as follows:

1. AS/NZS 3000.2000.....Wiring Rules
2. AS/NZS 3100Approval and testing specification– general requirements for electrical equipment.
3. AS/NZS 60335.....Household and similar electrical appliances– Safety.
4. AS 4024.1Safety of machinery.
5. AS 61010.1-2003.....Safety requirements for electrical equipment for measurement, control and laboratory use.
- 6 AS 3551-2012.....Management programs for Medical equipment.
7. AS 3112.....Approval and test specifications - Plugs and socket outlets.

Including:

MANAGING ELECTRICAL RISK IN THE WORKPLACE – Code of practice -
Published by SafeWork Australia.

Trisan Australia P/L. declares that this product conforms with the standards and guarantees this Product to be free of defects in material and workmanship under normal use for a period of two years. The period of warranty will be effective from the day of reasonable usage.

**Trisan Australia Pty Ltd is registered with QAS International. ISO 9001:2015
Certificate No: AU 1659**

All tests performed by the TRISAN S8 on portable appliances strictly adhere to these standards.

Testing Electrical Safety of Appliances with the **TRISAN S8** is simple, fast, accurate, thorough and provides an elevated level of operator safety. Testing voltages, currents and duration times are set-up for the operator for a specified test type. This feature minimizes mistakes or stops unauthorised personnel changing critical test routines. Testing operators are considered competent, but do not have certification or qualification to prescribe their own testing regimes for any specific type of appliances.

TRISAN S8 tests the safety of Class 1 (earthed) appliances, Class 2 (double insulated) appliances, 3 Phase appliances, Fixed and Portable RCD's and extension leads in accordance with the standard, performed simply and efficiently with no ambiguity.

Regular inspection and testing of electrical appliances is about reducing risk of electric shock or indirect injury and removing the potential for electrical fire hazards.

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General description

The multifunctional portable appliance tester TRISAN S8 is intended to perform measurements for testing safety of portable electrical equipment.

The following tests can be performed:

- › Visual inspection (acknowledgement only)
- › Earth continuity resistance
- › Insulation resistance
- › Insulation resistance of isolated accessible conductive parts
- › IEC cord polarity test
- › Differential leakage current test
- › RCD and PRCD tests
- › Supply line voltage check before each run test.
- › Functional test on run socket only
- › 3 Phase leakage current testing (Can be conducted under battery powered mode).

Some instrument highlights:

- › Power supply from both mains power and batteries
- › Graphic LCD with resolution of 128 x 64 dots, with backlight
- › Large data flash memory for storing test results and parameters (approx. 2000 tests can be stored)
- › USB communication port for communication with PC, barcode scanner, printer, keyboard
- › Additional connectors for fixed appliances testing
- › Built-in real time clock
- › Fully compatible with FastTag, and simplyPATs database packages.
- › Pre-programmed test sequences for operator safety
- › Download utility software

The graphic display with backlight offers easy reading of results, indications, measurement parameters and messages. Two LED Pass/Fail indicators are placed at the sides of the START AND RESET buttons.

The unit is very intuitive to use and therefore the operator does not need any special training (except reading this instruction manual) to operate the instrument.

1.1 Warning

In order to reach a high level of operator safety while carrying out various measurements using the instrument, as well as to keep the test equipment undamaged, it is necessary to consider the following general warnings.

- >  Warning on the instrument means » Read the Instruction manual with special care to safety operation. This symbol requires action!
- > Read the instruction manual carefully.
- > If the test equipment is used in a manner not specified in this instruction manual the protection provided by the equipment may be impaired!
- > Do not use the instrument and accessories if any damage is noticed!
- > Do not touch any test leads/terminals while the appliance is connected to the TRISAN S8 while testing is in progress.
- > Consider all generally known precautions in order to avoid risk of electric shock while dealing with hazardous voltages!
- > Use only correctly earthed mains outlets to supply the instrument!
- > The mains supply voltage has to be higher than 90VAC.
- > Use only standard or optional test accessories, supplied by your distributor!

- >  Instrument servicing and adjustment **MUST** be carried out by Trisan Australia service and calibration centre, Adelaide. (08 8363 1770)
- >  Hazardous voltages can exist inside the instrument. Disconnect all test leads, remove the power supply cable and switch off the instrument before opening the battery compartment.

- >  Ensure before testing appliance, **CLEAN APPLIANCE PLUG** before inserting into tester. Dirt and contaminates will build up inside test sockets which create a false earth measurement reading. **DO NOT TWIST** appliance plug when inserted in test socket to make a good connection.

Battery

The battery feature allows the tester to perform insulation and some leakage current tests. RCD tests require batteries to be installed.

The battery is essential to hold date and time information. Operating with a printer and or data logging mode, it is important that the date is accurate. Always check the time and date by pressing the F1 menu button. (F1 ↑) If incorrect, set date & time using F2 menu button

The instrument uses six AA size NiMH, Alkaline or Lithium battery cells.

Whether using Alkaline or NiMH batteries one to two thousand tests are achievable.

A prompt will be displayed to indicate when batteries are getting low. This prompt will reappear regularly until action is taken to replace batteries.

BATTERY INSTALLATION.

- ◆ When installing batteries, the instruments battery compartment can contain hazardous voltage inside! Before opening the battery compartment cover, disconnect all accessories connected to the instrument and switch off the instrument.
- ◆ Ensure that the battery cells are inserted correctly otherwise the instrument will not operate and the batteries could be discharged.
- ◆ If the instrument is not to be used for a long period of time, remove all batteries from the battery compartment.
- ◆ Rechargeable NiMH batteries type 6 (size AA) can be used. We recommend only using rechargeable batteries with a capacity of 1900 to 2600mAh.
- ◆ Dispose of depleted (used) batteries responsibly

Definitions and explanations**If in doubt ask! Contact us to provide further explanations**

There are technical words and phrases that have specific meaning related to the standards and the Tester that may not be understood by the operator of this instrument. The following is a list of these words, meanings and explanations.

Active (A) - Neutral (N) continuity The copper circuit loop (conductor) which electric current flows to power electrical appliances. The **importance of electrical continuity** is to ensure the testing voltage is applied directly to the appliance internal electrics and not just applied between the plug through the power cord to the on/off switch.

Supply voltage (110-265VAC) is applied between each end of the copper loop to drive the current around and through the appliance.

Circuit: is the active to neutral loop via the appliance internal electric load resistance or impedance that current flows.

Closed circuit: if the loop is not broken or if a switch is closed

Open circuit: the loop is broken or switch is opened

Circuit resistance: limits amount of current flow through the appliance measured in ohms.

Hi Z or impedance: a highly resistive circuit greater than 100k ohms. Frequency dependent resistor. The resistance cannot be measured by simply ohm-meter or multimeter. Relevant frequency range 45 to 400 Hz.

Portable appliance: equipment that is frequently moved from place to place, plugging in and out of power outlets frequently in use.

In-service appliance: an appliance that is **in use**. This is the appliance that requires inspection, test and tag.

Out of service appliance: shall not be safety tested until serviced by electrician. The electrician is required to test for safety after repair.

Stationery appliance: Equipment having a mass exceeding 18kg. These items are not considered portable appliances and do not require regular safety testing if the responsible person considers the appliance to be low risk. Appliances such as fridges fit this category provided it is directly connected to a power outlet and not connected via a power board or extension lead.

Colour coding safety tags: Recommended but not mandatory. Union construction and mining sites will not allow appliances on sites unless the tag colour readily indicates the retest date.

Red December to February
 Green March to May
 Blue June to August
 Yellow September to November
 Other colours for coding maybe suitable.

Cloak: An electrical conductive material that is used to tightly cover the surface of an appliance which acts as an earth screen for hazardous leakage currents. The cloak may be of steel, copper and aluminium flexible material. The material used must be kept clean of dirt, oil, oxides and salty materials or may influence test results.

Unless the cloak measures below 1 ohm it must not be used in Class II run tests.

Isolation: Insulation of an appliance between the power supply inlet and outlet or metal exposed parts.

IP: International Protection Marking, IEC standard 60529, sometimes interpreted as Ingress Protection Marking, classifies and rates the degree of protection provided against intrusion (body parts such as hands and fingers), dust, accidental contact, and water by mechanical casings and electrical enclosures. **See Finger Probe** definition, Page 11

Definitions and explanations**If in doubt ask!****Contact us to provide further explanations**

Work hardening copper: A mechanical process of continual flexing or vibrating soft copper until the material becomes brittle and fractures. This is the process which occurs in leaded appliances. By observation a lead becomes stiff and has a memory of shape rather than pliable with a soft lay. These leads become dangerous, the multi stranded copper become hard and brittle eventually piercing the insulated cord. The result will cause a fire or create carbon that will conduct around the surface of the break, leading to possible electric shock. This is quite a common occurrence in older appliances which is why inspection and testing has become so important.

Body Resistance:

The voltage necessary for electrocution depends on the current through the body and the duration of the current. Ohm's Law states that the current drawn depends on the resistance of the body. The resistance of human skin varies from person to person and fluctuates between different times of day. Under dry conditions, the resistance offered by the human body may be as high as 100,000 Ohms. Wet or broken skin may drop the body's resistance to 1,000 Ohms, adding to that high-voltage electrical energy quickly breaks down human skin, reducing the human body's resistance to 500 Ohms.

Insulation: A material that does not conduct electrical current. However, these materials can become conductive by contaminates such as salts, carbon and small fragments of metal particles etc.

Electrical cords and appliances behave in a similar way to body resistance, given the environmental conditions (temperature, humidity, mechanical movement and wear, conductive particles and acids in the atmosphere will vary the dielectric strength of the insulation resistance. Only by applying sufficient electrical strength over time across the insulation barrier will degrading dielectric material be measured. The higher the electric voltage applied for several seconds will induce potential weaknesses in an insulated body. With reference to standards these testing voltages lie between 250 to 500VDC or 240 to 1500VAC (high pot isolation testing can be as 3750 to 10,000VAC).

If there is an insulation weakness the high electric field ionises this zone, creating localized heating. Any partially conductive contaminates will break down the resistance even further to a point of flash over. (Total insulation breakdown). Relatively low test voltages as 250 or 500VC will produce similar results but not as severe and resistance of the insulation may fall to several hundred ohms. Reduction below 1M ohm is a failure according to AS/NZS 3760.

Lower test voltages will not produce the **electrical strength required** to impart the effect as described above. **Substitute leakage current testing is no better than using a resistance measurement on a multimeter (test voltage 40– 50VAC). Breakdown of insulation is non-linear** not linear as determined by this test. Multiplying a measured leakage by a factor of 6 does not equate to the same leakage determined by an electric potential of 250VDC. The behaviour of an insulation breakdown would follow an exponential law but the characteristic nature of the breakdown will determine the end result.

Substitute leakage current testing does not guarantee an electrical A - N continuity circuit or a measure of isolation between input and output. **No recognized electrical standard governing substitute leakage current testing.**

For this reason appliance testers are specified instead of general purpose resistance meters. Appliance testers with applied high test voltages to equipment will accelerate breakdown of possible or potential flaws in insulation as described above.

Be cautioned some testers on the market use extra low voltage to test for insulation breakdown. (check specifications before purchase). There are no standards which prescribe this type of testing. Portable appliance testers whose feature's list like a multimeter's description should be avoided. Competent operators other than electricians/engineers have no training in insulation materials and their behaviour, guidance is generally from the retailer and the little information received from training courses.

The testing of in-service electrical appliances is about finding the potential onset of hazards, not just the obvious breakdown that substitute leakage current testing will only find. Using this method of testing 99.9% of the appliances tested will pass. **Reliance on visual inspection becomes most important.**

Definitions and explanations**If in doubt ask!**

Competence: demonstrated ability to apply knowledge and skill. If you have only completed a training course on test and tag, where your new found knowledge is not assessed or certified does not make you competent. Insurance cover for this vocation does require certification.

Inspection and test person:

- Person who has received training in this vocation
- Should work under guidance from an electrician, electrical engineer or electrical inspector.
- Responsible to a responsibility representative/person or officer of a body corporate.
- Should not give advice only opinion or suggestion.
- Consults and document tasks as requested.

Responsible person: Shall be considered as: the owner of business or premise, the owner of electrical appliances. A person who has legal responsibility for the safety of electrical equipment.

Responsible person shall:

- assess the knowledge and integrity of a competent person before undertaking tasks.
- inspect the appliance testers and accessories that they are in good condition. The equipment **shall** display a **current calibration label** and **electrical safety tag**.
- The competent person has the required safety clothing to perform the required work.
- Outline any safety details of controlled areas where supervisors or observers **shall** be present.

Body Corporate: Any company, hospital, government department, small business, charity organization etc.

Traceability: Ability to trace history, application or location of that which is under consideration or inspection. The S8 DL has a database and print option for test tags. Use asset or appliance number not tag number. The asset number is locked to the appliance from cradle to grave and is easier for auditing purposes for the body corporate and SafeWork for record inspection. Safety records shall be kept for 5 Years.

SafeWork: A body corporate (government regulator) responsible for policing safety practices etc.

Record document: Stating results achieved or providing evidence of activities performed.

Inspection: Conformity evaluation by judgement and observation accompanied as appropriate by measurement, testing or gauging.

Verification: Confirmation through the provision of objective evidence that specified requirements have been fulfilled.

Calibration: An adjustment process to achieve conformity.

Should: Indicates a statement is preferred as indicating good practice, but not mandatory.

Shall: Indicates a statement is mandatory to achieve compliance with standard.

May: Indicates the existence of an option.

Hostile environment: One in which the appliance is normally subject to events or operating conditions likely to result in damage to equipment or reduction in its expected life span. This includes, but not limited to mechanical damage, exposure to moisture, heat, vibration, corrosive chemicals and dust. Environments can include hospitals, old age facilities, child care centres, disability centres, correctional service centres and schools. AS/NZS 3012 which is the higher safety standard will apply.

Definitions and explanations**If in doubt ask!****Complacency:**

Self involvement in action and thought, unaware of some potential hazard, defect, bad behaviour or activity. Satisfied with an existing situation or condition no matter the circumstance. All people as a matter of human nature are drawn into this state on a daily or weekly basis. Only through the intervention of training, procedures, corrective observations and auditing to a set standard can we improve hazard and injury reduction.

Electrical Safety Threshold levels:

These are the levels established by standards above which **corrective action is mandatory** to return the measured value of an appliance to within the limits. This is achieved by repair or replacement. These various threshold levels are a magnitude departed from serious life threatening levels. The levels are based on materials designed into an electrical appliance that have an electrical strength over the service life (generally 15 years) to hold relatively constant, given reasonable in service maintenance, care and managed environment. Threshold levels for similar appliances will vary according to different standards. The standards vary dependent on the level of environmental hostility.

Example: An IEC extension cord

For use on a computer in an office.**For use on a medical device (patient care)**

Threshold levels:

The cord must perform as purchased new throughout its service life.

Earth resistance :	1 ohm	0.2 ohms
Leakage current :	5mA	1mA
Insulation resistance :	1M ohm.	> 1M ohm.
Frequency of test	5 years	< 12 months

Personal Computer....abbreviated ... **PC**

Protective Earth.....The conductor that connects the exposed metallic parts of the consumer's electrical appliance (PE or Ground).

Downloader utility. A software utility application that is installed on a computer to format and save data from the appliance tester. The TRISAN S8DL has such a utility that enables data to be viewed in windows excel, SimplyPATs and FASTtag. The client must register with Trisan Australia Pty Ltd. for this service to operate. Each Trisan S8 DL is serialised and a key-code is required to enable each tester with the downloader. Contact Trisan Australia for further details.

A **portable appliance tester** is an appliance that **shall** be safety tested, inspected for good condition and verified that the standard reference electrical thresholds are within tolerance. (see maintenance section for further details). This shall be conducted on a regular basis, governed by manufacturer recommendations.

Finger Probe: A device that is used to wipe and probe the surfaces of an electrical apparatus or appliance to determine that it complies with IP standards. The diameter is 12mm. which is the largest accessible opening permissible through to the internal active surfaces of an appliance. (12mm. Represents the size of a small finger). The probe has a defined conical blunt point so as not to scour the surfaces of the item under test. By connecting the earth test lead to a finger probe hazardous leakage currents can also be detected and measured on the surfaces of Class I & II appliances.

Under no circumstances use a multimeter probe to undertake this evaluation. IF IN DOUBT ASK!!!

INSTRUMENT INFORMATION F1

Information about the testers options, configuration, firmware and hardware version, database size and usage, clock time and date, serial number and manufacturer details. (DL Version Only)

It's important to keep the firmware versions current at least every two years. This is only possible by sending it back to the manufacturer—Trisan Australia Pty Ltd 08 8363 1770 or sales@trisan.com.au
Generally, firmware is upgraded during calibration time at no cost.

Upgrading is important for the productive operation of the tester and operator.

Upgrades offer:

- New features

- Firmware corrections/errata

- Revisions that incrementally improve and enhance the operation of the technology.

- Enhanced prompting of safety advice/instruction messaging to the operator.

Finger Probe:

A device that is used to wipe and probe the surfaces of an electrical apparatus or appliance to determine that it complies with IP standard AS 60529. The diameter is 12mm, which is the largest accessible opening permissible through to the internal active surfaces of an appliance. (12mm. Represents the size of a small finger). The probe has a defined conical blunt point so as not to scour the surfaces of the item under test. By connecting the earth test lead to a finger probe, hazardous leakage currents can also be detected and measured on the surfaces of Class I & II appliances.

Application:

Probe all surfaces, vents, joints and holes of an electrical appliance. If the probe can pass through any of these areas and touch internal metal surfaces, the electrical item under test has failed the I.P test. Do not proceed with electrical testing.

If the mechanical clearance test has passed connect probe to the tester via the earth test return lead and proceed with Class I & II electrical appliance testing.

Do not touch possible rotating parts if applying a run leakage current test.

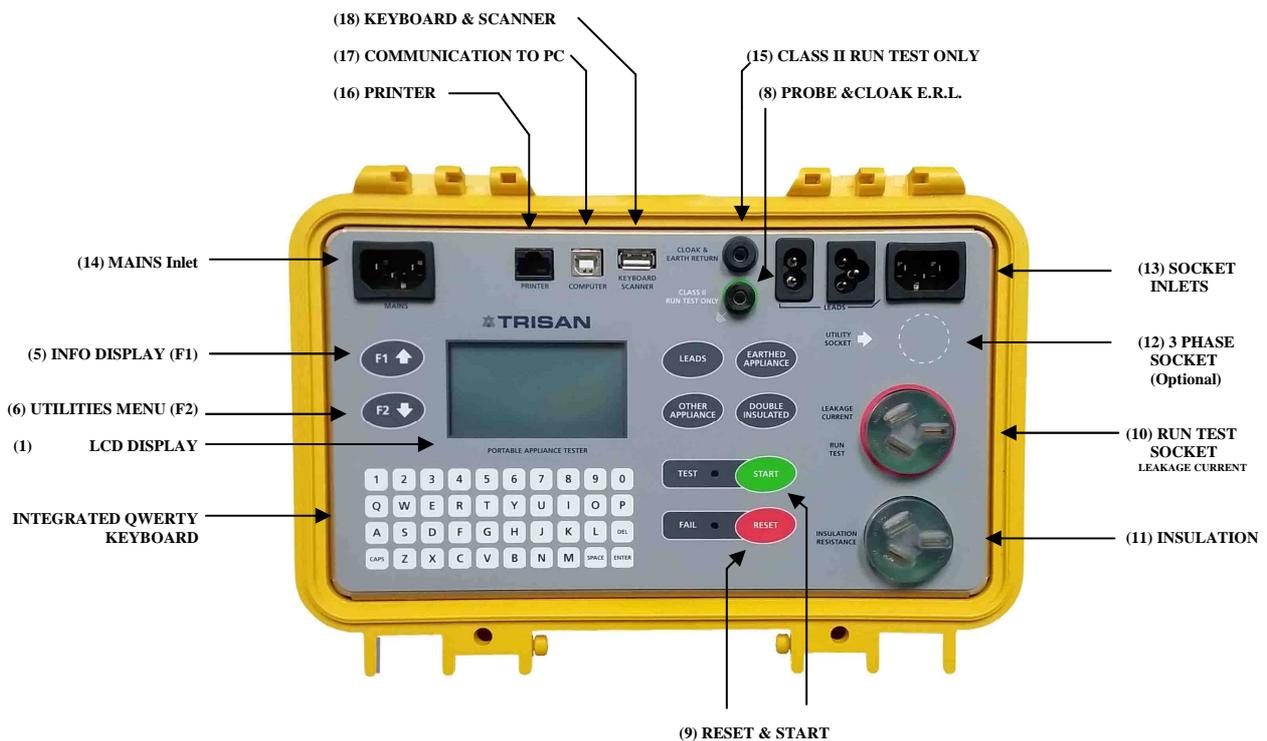
Under no circumstances use a multimeter probe to undertake this evaluation. IF IN DOUBT ASK!!!

Standard finger probe

Attention!

Do not modify the construction of this probe in any way. The stainless steel probe is dimensioned to Australian standards.



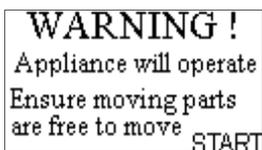


Legend		
1	LCD	128 X 64 dots matrix display with backlight
2	FAIL	Red indicator
3	PASS	Green indicator
4	TEST	Starts testing / confirms selection option
5	F1 ↑ UP	Scroll control through various utilities and test categories (DUAL FUNCTION) (DUAL FUNCTION) Utilities menu via task screen
6	F2 ↓ DOWN	
7	F1	Instrument information.....version number/options/memory usage/time date
8	PROBE & CLOAK E.R.L	Socket for Earth Return Lead for Class I & II with attachments for clip, probe & cloak
9	START RESET RESET	Switches the instrument power on or off and Starts testing. (DUAL FUNCTION) Under Battery Power. Hold down 3 seconds until beeper sounds. To switch the instrument “Off” the key must be pressed for 2 seconds. The instrument automatically turns off in 8 minutes after the last key is pressed. Returns to previous level. (Turn off instrument under Battery Power)
10	Test socket	Leakage current socket and used for functional appliance run test (20 AMPS max.)
11	Test socket	Insulation Resistance socket (Shall be isolated from protective earth for safety)
12	3 Phase test socket	Signals from 3Phase test leads measuring electrical and earth continuity, leakage
13	Socket inlets	Return path for leads: testing earth and electrical continuity, polarity and leakage
14	Mains inlet	Mains power input: 90-265VAC 45-65Hz.
15	Class II Run test only	Chassis protective earth potential. Ensures cloak or probe are directly connected to earth
16	Printer	Sato Printer: RS232 communication (USB option available)
17	Communication to PC	USB output. Transfers data to PC . CSV Format
18	Keyboard & Scanner	PS2 keyboard or scanner to modify clock and data entry

Consider displayed warnings before starting appliance testing

Meaning of symbols and messages on the instrument display

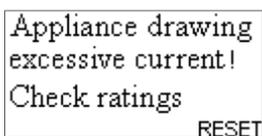
Before performing a measurement, the instrument performs a series of pre-tests to ensure safety and to prevent any damage. These safety pre-tests are checking for any external voltage and load condition on test terminals. If a pre-test fails, an appropriate warning message will be displayed. Warnings and protective measures are described in this chapter.



Run test warning message prior to appliance operation.



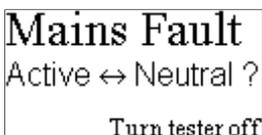
Supply voltage is monitored between 90 to 265VAC. This monitoring feature is principally used for RCD testing. Tester will not function properly below 90VAC.



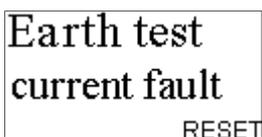
The maximum appliance run current is 16 amperes, above this threshold message appears. The supply to the appliance will shut off.



This earth fault refers to the earth supply connection to the tester. The power cord, tester or the power supply socket is damaged. The tester will not proceed to operate. This feature can be disabled.



The supply to the tester has a cross over connection or the supply neutral is also active similar to inverter or ship supplies. This feature can be disabled.



The test current is not being supplied or not of the correct magnitude to undertake an earth resistance measurement. Could be the earth test probe, appliance under test, bad connection or a faulty tester.



The measured value of earth resistance is above the standard earth resistance allowable.



The electrical continuity of an appliance between active and neutral has not been established. Safety testing cannot proceed until establishing the cause. Ensure the appliance on/off switch is in the **on** position. Some appliances do have high impedance inputs like switch mode power supplies. Go to utilities menu to disable the electrical continuity measurement for high Z appliances.



As above but applies to leads testing. Measures loss of active or neutral, active –neutral swap or possible short between active and neutral.



The measured value of insulation resistance below the standard leakage allowable.

HV Fault
Excessive leakage or
tester verification failure
RESET

The Standard applied testing voltage for insulation testing is out of range caused by faulty appliance insulation, electrical protection devices present or an internal fault of the tester. (Test a known safe appliance to determine that the tester is or not at fault)

Probe all hazardous
surfaces and exposed
metal during the test
START

If the appliance is too large for a cloak, select probe mode in the utilities menu under the check connect utility. In this mode the test is elongated in duration to probe all possible suspect surface areas.

WARNING
This unit does not test
for Active-Neutral swap
RESET

The S8 is factory defaulted for inverter, IT, hospital or ship derived power, where there is no neutral leg. Three wire power network with two phase active with earth.

Symbols

- 
Battery operation
- 
Earth Appliance Class I
- 
Double Insulation Appliance Class II
- 
Scroll Up
- 
Scroll Down
- F1** 
Select tests using four buttons or scroll up
- F2** 
Select for configuration or scroll down

Technical Specifications:

The mains power inlet supplying the TRISAN S8 is checked for the existence of an Earth, Active-Neutral transposition and Mains voltage tolerance.

Earthed appliances CLASS I are tested for:-

- Electrical continuity $\leq 100K$ Ohm
- Earth continuity ≤ 1 Ohm @ 200mA
- Insulation resistance (IR) $\geq 1M$ Ohm (250/500V DC Selectable) **Isolated from protective earth**
- Differential Leakage current ≤ 5 mA **Referenced to protective earth**
- Test Duration 2 –6 seconds
- Mains or Battery powered

Note: If the appliance requires mains power to energise its Off switch (and the switch must be “on” to complete the mains electrical circuit), the TRISAN S8 can conduct a Current Leakage Test).

Double insulated appliances CLASS II are tested for:

- Requires a return path via a cloak or probe for any leakage current during the insulation resistance test.
- Electrical continuity $\leq 100K$ Ohm
- Insulation resistance $\geq 1M$ Ohm (250/500V DC Selectable) **Isolated from protective earth**
- Differential Leakage current ≤ 1 mA **Referenced to protective earth**
- Test Duration 2 – 6 seconds
- Mains or Battery powered

Note: If the appliance requires mains power to energise its On/Off switch (and the switch must be “on” to complete the mains electrical circuit), the TRISAN S8 can conduct a Current Leakage Test (Run Test) to ensure Leakage Current is ≤ 1 mA.

Extension/Mains leads CLASS I are tested for:

Isolated from protective earth

- Insulation resistance $\geq 1M$ Ohm
- Earth circuit continuity ≤ 1.0 Ohm @ 200mA

Figure 8 leads (no earth) insulation resistance A-N to Cloak $\geq 1M$ Ohm

- For electrical continuity > A-N.... greater than 10k Ohms nominal PASS
- For electrical continuity < 10k Ohms considered a near short circuit FAIL
- Polarity test A– N swap
- Neutral (N) openFAIL
- Active (A) open FAIL
- Earth (E) openFAIL

- Test Duration 2 –6 seconds
- Mains or Battery powered

Earth Tests CLASS I

- Open circuit voltage < 12 VDC
- Threshold levels 0.2 Ω , 0.5 Ω and 1.0 Ω
- Test duration 2 - 6 seconds
- Test method 2-wire measurement

Portable RCD Class I

Differential Leakage current	for less than 1mA.....	PASS
Polarity A –N swap detect		
Neutral open detect		
Active open detect		
Earth open detect		
Electrical continuity	> 10k ohm	
Short circuit A –N	< 10k ohm	
Earth continuity	<1 Ohm @ 200mA	
Trip time measurement	< 40ms. @ 10mA For 0° and 180°	PASS
Trip time measurement	<300ms. @ 30mA For 0° and 180°	PASS

Measurements made between LEADS socket inlet and RUN socket outlet

Fixed RCD

Electrical continuity:		
Polarity A –N swap detect		
Neutral open detect		
Active open detect		
Earth open detect		
Supply Earth continuity check before test		
Trip time measurement	< 40ms. @ 10mA For 0° and 180°	PASS
Trip time measurement	<300ms. @ 30mA For 0° and 180°	PASS

Measurements made on mains supply inlet to tester.

**Note: Building mains supply will be interrupted for duration of test.
 Ensure batteries are installed in the tester for Fixed RCD tests to function properly.**

Visual inspection:

Foreword

Under recent changes to WHS (Work, Health and Safety) hazard identification and risk assessment has become compulsory for all body corporate.

All persons are responsible for identifying hazards in their immediate area of workplace, report and follow through with correction. Persons are required to follow appropriate training in all areas including recognising electrical appliance hazards and ensuring they are maintained in good condition. **Fines are applicable** for individuals who are complacent about safety within their immediate working environment.

Visual inspection of electrical appliances is required to be undertaken by all on a continuous basis. Contract electrical testing personnel still follow through with the same inspections, but clearly less frequent.

One important additional requirement relevant to the electrical testing personnel is manual repetitive handling of appliances. Repetitive bending and stooping on an hourly basis all day is regarded as hazardous. Back injuries are on the rise through this process. When testing appliances the correct procedure is to involve the personnel immediately concerned with their area to assist in the inspection, testing tagging process. The additional benefit is further training and corrective process in electrical safety.

Visual inspection:

Ensure the appliance to be safety tested has no obvious mechanical faults and is free from external damage.

Inspect the mains lead for any damage, defects or loose terminals in the accessories, connectors, plugs or outlet sockets. Common faults encountered:

- . Frayed, cracked or otherwise damaged mains lead.
- . Exposed conductors and/or covered by insulation tape.
- . Abrasions in the outside insulation jacket.
- . Mains lead anchorage at plug or appliance entry not secured.
- . Signs of overheating discolouration (yellowing)
- . Signs of corrosion

Check that any controls, alarms and replaceable protective devices accessible to the user, are of correct rating and in good working order.

Inspect all switches and speed controls for mechanical operation; Ensure switches and controls are clear of any obstruction, e.g. filings, swarf, metal particles, grease, etc.

Confirm all identity tags/labels etc. pertaining to the frequency of safety testing are correctly attached and records of all test/inspections are kept to ensure the safety integrity and history of the appliance.

Identify the appliance to be tested.

Examine the appliance to be tested and identify whether the appliance is an earthed appliance, a double insulated appliance or an extension cord.

Earthed appliances should always have an earth pin on their plug, and will normally have exposed metal components.

Double insulated appliances may be identified by the double insulation symbol, and /or by the absence of an earth pin on a moulded socket (not deliberately removed or broken off).

Note 1: Many double insulated tools are colour coded blue.

Note 2: If any doubt exists about the Class of an appliance (Class 1 or 11), the appliance should be tested as an earthed appliance first.

COMMON APPLIANCES TESTS

0. EARTHED APPLIANCES CLASS I insulation resistance test isolated from protective earth

Suitable appliance category for testing any earthed equipment. Recognised as an appliance with exposed metal parts
 This test is conducted with the standard 500VDC. electrical strength test. Applied to obtain an insulation resistance figure which is required to be above 1 M ohm. for a PASS result.

Select EARTHED APPLIANCES

Press START

Measures: Electrical continuity (A –N) less than 100k ohm..... for PASS
 Earth resistance (socket earth to chassis earth with earth probe connect).....less than 1 ohm.....PASS
 Insulation resistance (A , N shorted to EARTH).....greater than 1M ohm.....PASS



1. DOUBLE INSULATED CLASS II insulation resistance test isolated from protective earth

Suitable appliance category for testing any double insulated equipment. Recognised as an appliance with no exposed metal parts. It may have a 2 or 3 pin plug where the latter has a functional and protective earth cord. The standard double appliance insulation strength test at 500Vdc.. A cloak or probe must be employed **in contact** with the insulation surfaces of the appliance during test, until completed.

Select DOUBLE INSULATED

Press START

Measures: Electrical continuity (A –N) less than 100k ohm.....for PASS
 Insulation resistance (A , N shorted to CLOAK).....greater than 1M ohm..... PASS



2. LEADS Class I and Class II Insulation resistance test required to be isolated from protective earth

Suitable appliance category for testing any earthed leads or power boards.

This test is conducted with the standard 500VDC. electrical strength test. Applied to obtain an insulation resistance figure which is required to be above 1 M ohm. for a PASS result.

Select LEADS

Press START

Measures: Electrical continuity (A –N) less than 100k ohm.....for PASS
 Polarity A-N swap
 Short circuit between A-N
 Earth resistance (socket earth to chassis earth with earth probe connect).....less than 1 ohm.....PASS
 Insulation resistance (A - N short to EARTH).....greater than 1M ohm.....PASS

If power boards are to be tested, all outlet sockets are to be tested individually.

2 wire or figure 8 leads

For 2 wire leads a prompt warning will be displayed detecting no earth.

Two conductor lead?

START (Y) RESET (N)

Press START second prompt:

**Fit conductive cloak
and connect to front
panel socket before
proceeding**

Press START to run test

Measures: Electrical continuity (A –N) less than 100k ohm.....for PASS
 Polarity A-N swap (Not important)
 Short circuit between A-N
 Insulation resistance (A - N short to Earth Test Probe or Cloak)...greater than 1M ohm.....PASS

Cloak is vital for test integrity. This provides the return path for dangerous leakage currents. Wrap entire lead with conductive cloak and connect to earth probe.

OTHER APPLIANCES TESTS

3. CLASS I 250V insulation resistance test

Suitable appliance category for testing any earthed equipment with protection devices installed that have failed the standard earthed appliance insulation strength test at 500Vdc. There must be evidence that the appliance tested does have a protection device installed.

Select CLASS I 250V from OTHER APPLIANCE

Press START

Measures: Electrical continuity (A –N) less than 100k ohm..... for PASS
 Earth resistance (socket earth to chassis earth with earth probe connect).....less than 1 ohm.....PASS
 Insulation resistance (A -N short to EARTH)..... greater than 1M ohm.....PASS

4. CLASS II 250 V insulation resistance test

Suitable appliance category for testing any double insulated equipment with protection devices installed that have failed the standard earthed appliance insulation strength test at 500Vdc. There must be evidence that the appliance tested does have protection devices installed. A cloak or probe must be employed in contact with the insulation surfaces of the appliance during testing until complete.

Select CLASS II 250V from OTHER APPLIANCE

Press START

Measures: Electrical continuity (A –N) less than 100k ohm.....for PASS
 Insulation resistance (A - N to CLOAK/PROBE).....greater than 1M ohm..... PASS

5. CLASS I Run test

Referenced to protective earth

Suitable appliance category for testing any earthed equipment in which insulation testing has failed electrical continuity test. The appliance has a soft switch (see definitions). **Run tests can be dangerous to the operator. Ensure the equipment is in-service and wear appropriate protective clothing before use.**

Select CLASS I Run test from OTHER APPLIANCE

Press START

Use RUN TEST socket

Press START

WARNING! Appliance will operate.....Ensure moving parts are free to move

Press START

Testing in progress

Measures: Electrical continuity (A –N) less than 100k ohm.....for PASS
 Earth resistance (socket earth to chassis earth with earth probe connect).....less than 1 ohm.....PASS
 Leakage current (A and N to earth chassis and SE) less than 5mA..... PASS

OTHER APPLIANCES TESTS

6. CLASS II Run test Read and repeat CLASS 1 instruction as above carefully

Referenced to protective earth

Measures: Electrical continuity (A –N) less than 100k ohm.....for PASS
 Leakage current (A and N to CLOAK) less than 1mA..... PASS
Use the probe or cloak Class II return socket which is internally connected to protective earth.
Manufacturer recommends the use of the standard finger probe for safety.
 (Explanation on page 12must read).



Standard finger probe accessory



7. Earth Test Only

This test provides an earth test on Class I appliances.

The test duration is approximately 6 seconds. This is an adequate time to **agitate or flex the cord** of an appliance to instigate a possible fault. This test is applied to stationary appliances like fridges and built in items that are difficult to move or access.

Test set-up:

Connect earth probe to any exposed metal parts securely. **Clean plug contacts** if required Plug the appliance **directly** into the insulation resistance socket. The appliance does not have to be switched on for this test.

The appliance needs to be **insulated from ground** to prevent multiple earth returns.

Multiple earth returns will give a false measurement result.

Select Earth test only from the OTHER APPLIANCE MENU.

Press START button.

Progress bar will migrate from left to right

Measurement: Continuous measurement of earth resistance : (< less than)

- < 1 ohm at 200mA reference current..... PASS ideal for detection of **dirty plugs, sockets and contacts**
- < 0.5 ohms at 200mA..... PASS used for high compliance safety testing (outdoor lighting)
- < 0.2 ohms at 200mA..... PASS medical testing of lead appliances. (AS3551-2012)
- < 0.2 ohm at 10 amperes..... PASS routine testing of **new appliances** direct from factory
- < 0.1 ohm and 0.2 ohm at 25 amperes..... PASS **engineering** testing on new products.

8. MIMS Run Test CLASS I Mineral Insulated Metal Sheath

These appliances include stoves and portable immersion heating elements. Appliances of this nature need to be operated for some minutes before safety testing. Some manufacturing materials have a moisture absorption characteristic that may result in an initial high current leakage result. This leakage reduces over a short time when the element is heated to below the safe 5mA leakage threshold if the element is not faulty.

Select MIMS from OTHER APPLIANCE MENU

Press START

Measures: Electrical continuity	less than 100k	PASS
Earth resistance	less than 1ohm (if default)	PASS
Leakage current	less than 5mA.	PASS

9. EPOD 250V Insulation Resistance test CLASS I Electrical Portable Outlet Device

These appliances are multi outlet power boards from 2 to as many as 12 outlets which contain electrical spike protection devices called MOV's. or varistors that clamp the mains voltage supply to earth at 275 to 300VAC. Applying the Standard 500VDC insulation electrical strength test will fail with these devices fitted. A reduced voltage of 250VDC is considered an acceptable electrical strength test substitute. (A strength test voltage just below the clamping action of these devices).

Select EPOD 250V from OTHER APPLIANCE MENU

Press START

Measures: Electrical continuity (A - N) including polarity and possible short circuit.....	PASS/FAIL	
Earth resistance	less than 1 ohm	PASS
Insulation resistance.....	greater than 1 M ohm.	PASS

Residual current devices (RCD).....Treatment

When testing RCD's a 10mA or 30 mA. Sinusoidal waveform is instantaneously applied at 0° where the time is measured to trip the tested RCD. The test is repeated for 180°.

For 10mA RCD. The trip time should be < 40ms. For a PASS
 For 30mA RCD The trip time should be < 300ms. For a PASS

When testing portable RCD's the TRISAN S8 inserts isolation circuitry to ensure any fixed RCD (in the mains supply) is not tripped.
 Portable RCD's are treated as an extension lead appliance and therefore a pre-test lead test is performed on the Portable RCD, measuring earth resistance, polarity and leakage current before proceeding to measure trip time.

10. Portable RCD 10mA

Tests include:

1. Earth resistance < 1ohm.PASS
2. Polarity.....A - N correct orientation....PASS
3. Leakage current < 1mA.....PASS
 (NOTE: for RCD's with test button 5mA is the maximum allowed value)
 A prompt will appear for a response from the operator if leakage current exceeds 1mA
4. Trip time < 40ms.....PASS

Set-up:

Select 10mA Portable RCD from OTHER APPLIANCE menu.
 Connect P RCD appliance between leads socket and RUN/LEAKAGE socket.
 Press START.
 Prompt appears on screen Use "Run test socket"
 Press START.
 Prompt appears Arm RCD then hit START.
 The S8 tests continuity and leakage current after this operation.
 Prompt appears if electrical tests are successful

Time RCD
 START

Press START button.
 PASS or FAIL trip time and screen displays trip time.
 Repeats for 180° trip time test.

11. Portable RCD 30mA.

Operation as outlined above



12. 10mA. Fixed RCD. Ensure batteries are installed in tester for RCD tests to function properly.

This test offers trip time only.

The S8 is plugged into an outlet power socket, it applies the standard earth continuity and active - neutral swap test while it does self check tests.

Start the selected Fixed RCD test by pressing the “Start” button.

A warning will be displayed stating “Power will fail during this test”.

Press the START button again to initiate the test.

After the RCD trips, the trip time will be displayed in milliseconds together with a “Pass” or “Fail” message.

The S8 will provide power to the display while the RCD is reset and mains power is returned for re-testing at 180°.

Press START button again to initiate test.

Trip time will be displayed together with a PASS or FAIL.

13. 30mA. Fixed RCD. Ensure batteries are installed in tester for RCD tests to function properly.

S8 tests 30mA Fixed RCD as above.

14. PIEZO Run Test CLASS I

Appliances that have very high input resistance or high impedance above 100k ohms.
Examples of these appliances: piezo electric starts for gas ovens and switch mode power supplies.

Tests conducted as follows:

1. Earth resistance < 1ohm.PASS
2. Leakage current < 5mA.PASS
3. Duration of test 60 seconds touch and release RESET button to terminate test sooner.

15. 3-Pin Run Test CLASS II

For appliances that have an earth pin that serves as a grounding for EMC currents. This is considered a functional earth not a protective earth.
There is no exposed conductive chassis earth.

Given that it is connected to the supply earth it does have a protective purpose. If the supply cord is cut or damaged during operation of the appliance an RCD would be tripped before a circuit breaker trip. These appliances are permitted to have leakage currents up to 5mA.

An earth return cloak or probe is used to touch the surface of the appliance and cord especially in worn areas, This provides an additional return path to earth for surface leakage currents.

The S8 prompts a warning for leakage currents above 1mA. But fails leakage current above 5mA.

The tests conducted are as follows:

1. Electrical continuity A-N < 100k..... PASS
2. Leakage current < 5mA.PASS
3. Duration of test 30 seconds..... touch and release RESET button to terminate test sooner.

16. Long Run Test CLASS I

This test offers a test duration of 10 minutes.
Identical to run test in specifications, but allows appliances to fully energise over time.
(i.e.) computers and motorised appliances with timed contactors.

17. Single (20 Amp) or 3 Phase Leakage Run test (option) CLASS I

Requires 1 or 3 phase test lead set 10, 20, 32 and 50 amp. Available in 4 or 5 pin

Tester powered by mains or battery.

The test measures: Electrical continuityload < 100k ohms. Ensures load is powered
 Earth resistance.....threshold <1 ohm. Is a PASS
 Leakage current.....Threshold < 5mA. Is a PASS

Duration of test is up to 45 minutes. Touch and release RESET button to terminate test sooner.



- Set up:** Select the appropriate 1 or 3 phase test lead and insert control plug into utility socket as shown in picture.
 Connect 1 or 3 phase appliance to socket end of the test lead and the plug into the GPO.
 Connect the earth test clamp to exposed metal surface of the appliance.
 Select 3phase Run test option from the other appliance menu
- Operate the 1 or 3 phase appliance
- Start the test

TRISAN S8 / DL INSTALLATION OF DRIVER SOFTWARE ON PC TO ENABLE COMMUNICATION TO
TRISAN S8 DL ONLY

The software described herein is only suitable for use on the Windows OS (Versions 7, 8 and 10)

Trisan PAT testers require driver software to facilitate USB connection to personal computers for the purpose of downloading and saving test results using a suitable application.

The proprietary driver software is supplied by FTDI. (Future Technology Devices Inc.)

Before using our testers, these drivers must be installed on your computer.

Connect the tester to the computer using the supplied USB cable.

Windows should install the drivers automatically. This will require internet access and may take several minutes.

A computer restart may be necessary after the installation.

Windows dialog boxes should indicate installation progress.

To check for the presence of drivers, disconnect the tester from the computer and then re-connect.

(refer to diagram below for cable details)

On the computer, navigate to “Printers and Drivers” and look for an icon named “**FT232**”.

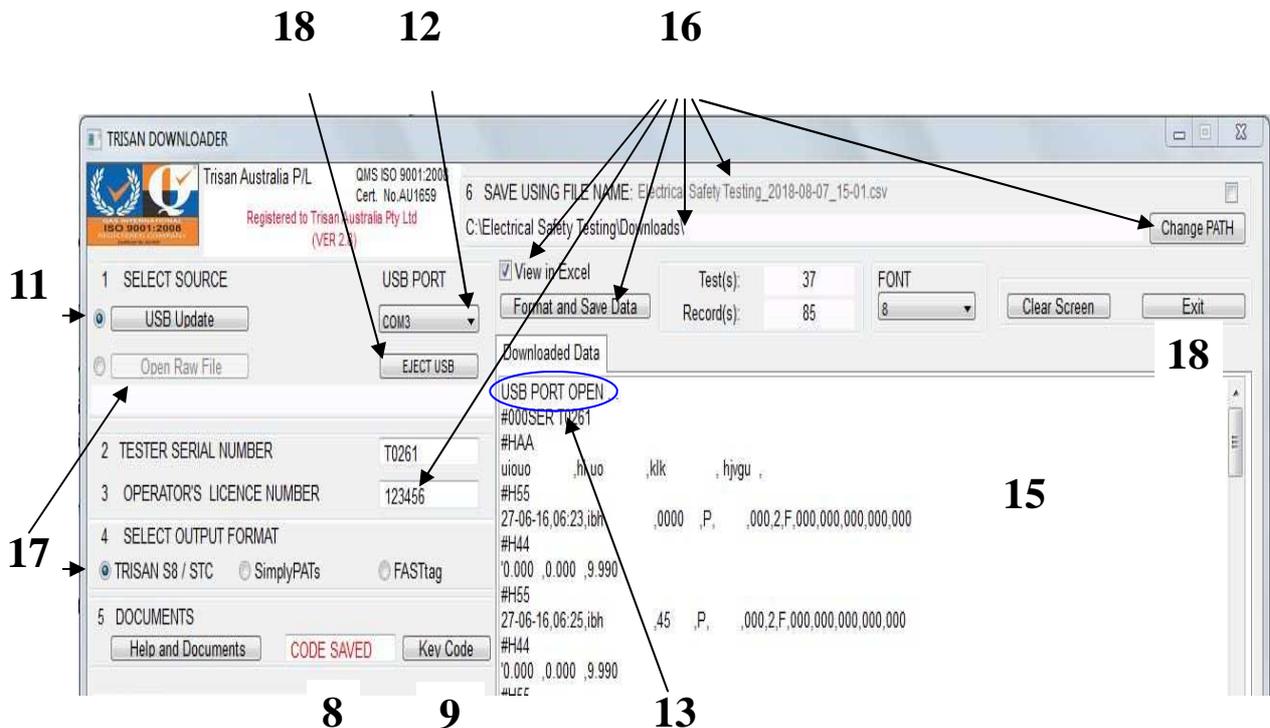
Important: The installation of these drivers will most likely require Administrator privileges on the PC.
Refer to your IT support person if required.

In case of driver installation failure, please refer your IT professional to the
FTDI website:- www.FTDIChip.com/Drivers/VCP.htm



Before starting, obtain Key Code to unlock software from Trisan Australia.

1. This software has been tested to run under Windows OS 7, 8 and 10.
2. Computer administrative privileges will be required during installation.
3. Unzip supplied software into folder named C:\Electrical Safety Testing.
4. Create shortcut on the desktop for Downloader.
5. Run Downloader. (Files and Folders will be created in chosen folder).
6. Connect computer and tester using USB cable (centre connector on tester).
7. Accept driver installation messages.
8. Enter Key Code in box.
9. Click on “**Key Code**”. “CODE SAVED” appears.
10. Apply power to tester if not already powdered up.
11. In section (1) of downloader screen, click on “USB Update”.
12. To view available COM ports, click on pull-down menu and select tester’s port.
13. If communication is successful, the message “USB PORT OPEN” will appear on downloader screen.
14. You are now ready to upload data. Use F2 menu on tester to select “Upload test results”. Press “START”. (Please ensure there is data in tester)
15. Data being transferred will be visible on downloader screen.
16. When data transfer is complete, the “Format and Save Data” button becomes active. An operator’s license or approval number must be entered before saving. Click on this button to save data in both “Raw” and spreadsheet format. Raw files will be found in the installation folder, “RawFiles” sub-folder. CSV. Files for spreadsheet use will be found in the folder selected using “Change PATH”. The path maybe changed but the filename is not user changeable.
17. In this release of the software, “Select Output Format” is fixed at “TRISAN S8/STC”. To view Raw Formatted Data, use button marked “Open Raw File”.
18. When downloading from two or more testers use the “EJECT USB” button or “Exit” to quit program.



Miscellaneous utilities

Earth continuity 200mA. (default 1 ohm measurement threshold)

Suitable for general earth continuity testing detection of damaged earth connections.

Best for use: detecting dirty or contaminated plugs, sockets and contacts. If result greater than 1 ohm, (FAIL) clean or replace. Test again.

PASS <1ohm.

Press START

Press START: Use setting until tester turns off

Or

Press F2: Keep setting as default

Routine Test 10A. (default 0.2 and 1 ohm measurement threshold) Under development on TRISAN S8

Suitable for general earth continuity testing detection of damaged earth connections for **new appliances**

Use on **END OF PRODUCTION LINE** safety systems.

Best for use: Detection of broken strands in new equipment and poor crimping of terminals . If result greater than 1 ohm, (FAIL) repair or replace. Test again.

PASS <1ohm.

Press START

Press START: Use setting until tester turns off

Or

Press F2: Keep setting as default

**Type Test. (default 0.2 ohm measurement threshold) including test probe resistance
(0.1 ohm resistance allowed within appliance under test)**

For use in the developmental testing of new appliances. High sensitivity to damaged earth wiring.

Best for use: Detection of poor capacity earth track wiring within the appliance to the plug. If result greater than 0.2 ohm, (FAIL) repair or replace. Test again.

PASS <0.2ohm.

Press START

Press START: Use setting until tester turn off

Or

Press F2: Keep setting as default

Measured values

For viewing failed results after every test. The need for viewing pass results is a distraction to the task. Even if the result is close to a failed result, a competent person is not authorised to fail an appliance just below the threshold. Threshold levels are established more than 10 fold from dangerous levels. A PASS IS A PASS alternately a FAIL IS A FAIL for all competent personnel. Failed appliances must be removed for maintenance only at failed thresholds.

Press START

Prompt message:

<p>Measured values ? Start (Y) Reset (N)</p>

Adjust Display:

Suitable for the adjustment of contrast.

Select F2 utilities menu while in select task screen.

Scroll up or down to adjust Display (F1 or F2).

Press START

Prompts Message.....

- Press: F1..... darkens the display
- F2..... fades the display
- Reset .. a negative of screen

ADJUST DISPLAY
Use F1, F2 or RESET START when ready

Press START when finished

Set time /Date S8 DL ONLY

Important to check and set regularly for recalibration and routine maintenance reminder periods.

Enter utilities menu via F2 from select task screen. Scroll up or down to **Set time and date**

Press START

Set time (24Hr) and Date then ENTER HH : MM DD-MM-YY
--

Enter new time and date in the format above via a keyboard

Press ENTER

time and date saved.

IMPORTANT NOTE: Ensure time and date is set accurately before testing commences when using database, otherwise records will not be date and time stamped properly.

Check CONNECT

Applied to Class II appliances to check faulty insulation

Choice between Probe and cloak mode

Select F2 while in select task screen

Scroll up or down to Check CONNECT (F1 or F2)

Prompts Message.....F1 == Cloak
F2 == Probe

Cloak mode allows the user to wrap the appliance under test with a cloak. If the cloak is not attached to the earth return after start of test a prompt will alert the operator to earth the cloak for the test to proceed. The test will fail if the appliance and cord are not wrapped tightly.

Probe mode allows the operator to use a probe on Class II appliances. The operator has 25 seconds to touch test the appliance for dangerous leakage currents over the surface. (Read more on finger probe page 11)

Warning! Do not probe through grills or air inlets/outlets of appliances (**internal metal parts may be live or move**)

Fail on poor cont.

Suitable for use when testing high impedance or resistance greater than 100k ohms. Appliances Class I or II
The electrical continuity (A-N) threshold setting can be negated by a decision from the operator.

Select F2 while in select task screen

Scroll up or down using F1 or F2 to Fail on poor cont....

Press START

Prompt message.....Fail if poor A-N continuity?
Start (Y) Reset (N)

Earth Threshold

Changes the earth test threshold from the standard 1 ohm to 0.5 ohm or 0.2 ohm.

Suitable for use when required to test appliances used in hostile environments. Differing safety standards or code of practice apply when selecting other than 1 ohm threshold.

Select F2 while in select task screen

Scroll up to **Earth threshold**

Press START

Press: F1 = 1 ohm
F2 = 0.5 ohm
OTHER (appliance)= 0.2 ohm

Press START to enter choice or RESET to escape

Communications—S8 DL Only

The instrument can communicate with the Download software. The following actions are supported:

- › Saved results can be uploaded and stored to a PC
- › Save results can be uploaded after every test to a PC

There are two communication interfaces available on the instrument:
USB (computer) or RS232 (printer)

- › PS/2 serial communication cable for keyboard
- › RS232 serial communication cable for printer
- › USB communication: connect a PC USB port to the instrument USB connector using the USB interface cable.
- › Switch on the PC and the instrument.
- › Run the TRISAN Download program on PC
- › Set communication port and baud rate speed.
- › The instrument is prepared to upload data to the PC.

Printer and keyboard connection



Maintenance

1. Periodic calibration

Recommended every 12 months (24 months periods also available with verification every 12 months—contact manufacturer for details).

The TRISAN S8 **can only be calibrated/routine maintained by Trisan Australia Pty Ltd.** The TRISAN S8 can be verified to meet calibration by approved Laboratories.

We recommend that the TRISAN S8 is returned to Trisan Australia for repair and/or calibration. In doing so you are assured that any recent enhancements to the hardware & firmware where applicable to your product will be included in the repair or calibration as a matter of policy.

2. Replacement of Batteries



Warnings:

Disconnect all measuring accessories, mains supply and power off the instrument before opening the battery compartment cover, hazardous voltage inside.

3. Service

For repairs under or out of warranty please contact Trisan Australia for further information. Unauthorised personnel are not permitted to open the TRISAN S8 instrument. There are no user replaceable parts inside the instrument.

4. Cleaning and care

Use a soft cloth, slightly moistened with soapy water or alcohol to clean the surface of the instrument. Leave the instrument to dry totally before using it. **Cleaning solutions can contaminate plastic surfaces.**

Notes:

- Do not** use liquids based on petrol or hydrocarbons
- Do not** spill cleaning liquid over the instrument
- Do not** leave in the sun without protective cover.
- Do not spray cleaning solution into or on the control surfaces of the tester.**

Trisan Australia will clean the unit under calibration if deemed necessary. Under “Managing electrical risk in the workplace” code of practice, it is required to keep all electrical appliances in good condition (like new). There maybe an additional charge if in an unreasonable state.

5. Register your TRISAN S8

Your registration provides valuable feedback to you including:
Details of upgrades both firmware and hardware
Errata that needs to be corrected
What’s new information about the TRISAN S8.
Optional feature upgrades to a more powerful and productive tool.
To add Database capability (Transferring data to a computer)

Email: eng@trisan.com.au You will receive a registration acknowledgement

Instrument set and accessories:

Supplied as standard

- > Instrument S8 PAT
- > Crocodile clip, black
- > 1 x IEC cord, 1.8 m
- > Instruction manual
- > Calibration certificate
- > Earth test lead
- > Orange IEC Adaptor, 26cm

Optional accessories and upgrade

- > Finger probe
- > USB cable
- > Cloak
- > Sato Printer
- > Black pelican case option
- > Test labels for printer
- > Keyboard, Scanner
- > TRISAN S8 upgraded to data logging tester DL

Manual Revision

Revision 1.1

This manual may change without notice. Contact Trisan Australia if errors are noticed or interpretation issues.

Contact Trisan Australia for further information or explanations
eng@trisan.com.au OR 08 8363 1770

Downloader utility screenshot

