

4. MAINTENANCE

4.1. Cleaning

The E-Ze Check™ Xtra may be cleaned using a soft damp cloth and mild detergent. Do not use abrasives or solvents. Allow to completely dry before using.

4.2 Repair & Service

There are no user serviceable parts in this unit. Return to Martindale Electric Company Ltd if faulty. Our service department will promptly quote to repair any faults that occur outside the warranty period.

4.3 Storage Conditions

The E-Ze Check™ Xtra should be kept in warm dry conditions away from direct sources of heat or sunlight, and in such a manner as to preserve the working life of the E-Ze Check™ Xtra. It is strongly advised that the unit is not kept in a tool box where other tools may damage it.

4.4 Warranty

Faults in manufacture and materials are fully guaranteed for 2 years from date of invoice and will be rectified by us free of charge, provided the unit has not been tampered with and is returned to us with its housing unopened. Damage due to dropping, abuse or misuse is not covered by the guarantee. Nothing in these instructions reduces your statutory rights.

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The image shows the E-Ze Check Xtra Socket Tester, a yellow handheld device with a black face. It features a 'LOOP TEST' section with three buttons labeled 0.0Ω, 1.7Ω, and 5Ω. Below this is a 'CHECK Xtra' section with a red button labeled 100Ω and a black button labeled 200Ω. The main display area contains several rows of indicator lights and text: 'WIRING CORRECT, VOLTAGE OK', 'WIRING CORRECT, VOLTAGE HIGH', 'WIRING CORRECT, VOLTAGE LOW', 'OPEN NEUTRAL (>500Ω)', 'OPEN EARTH (LIVE) FAULT', 'PHASE NEUTRAL REVERSAL', 'PHASE EARTH REVERSAL', and 'VOLTAGE BELOW 160V'. The device also has a 'SAFE TEST' logo and the 'MARTINDALE ELECTRIC' logo at the bottom. The background of the advertisement is dark grey with three orange circles at the top and a blue background with faint images of electrical tools behind the device.

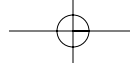
INSTRUCTIONS

EZ150 / EZ650 SOCKET TESTER

MARTINDALE

● ● ● ELECTRIC

Trusted by professionals



SAFETY INFORMATION: Always read before proceeding.

WARNING

These instructions contain both information and warnings that are necessary for the safe operation and maintenance of the E-Ze Check™ Xtra. It is recommended that you read the instructions carefully and ensure that the contents are fully understood. Failure to understand the instructions and to comply with the warnings and instructions contained herein can result in serious injury, damage or even death.



In order to avoid the danger of electrical shock, it is important that proper safety measures are taken when working with voltages exceeding 30 V AC rms, 42 V AC peak or 60 V DC.

The E-Ze Check™ Xtra must only be used under the conditions and for the purposes for which it has been constructed. Particular attention should be paid to the safety instructions, the technical specifications and the use of the E-Ze Check™ Xtra in dry surroundings.

Always verify the E-Ze Check™ Xtra is in good working order before use and that there are no signs of damage to the unit. Do not use if damaged. Updated instructions and product information are available on our website: www.martindale-electric.co.uk

Keep these instructions for future reference.

SYMBOLS:

-  AC (Alternating Current)
-  Equipment complies with relevant EU Directives

Note: The E-Ze Check™ Xtra does not detect earth-neutral reversal, or faults that have commoned the earth and neutral pins of the E-Ze Check™ Xtra.

3.4.3 RCD's in the Circuit Under Test

The E-Ze Check™ Xtra should operate satisfactorily on circuits protected by most 30mA or higher RCDs or RCBOs.

Factors which should be considered are where equipment, such as computers may introduce earth leakage currents due to internal noise filter circuits. This earth leakage current can approach the trip threshold of an RCD or RCBO, and the E-Ze Check™ Xtra test current will add to it with the possibility of the protective device tripping.

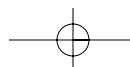
Before using the E-Ze Check™ Xtra on critical circuits which supply computers, medical equipment, or other systems where loss of supply is unacceptable, ensure these are not being operated, in line with normal practice when using electrical test equipment.

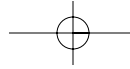
3.4.4 Possible Errors when Measuring Earth Loop Impedance

Where supply circuits under test have highly inductive or capacitive loads distributed on that circuit or there is an excessive amount of mains disturbance present (e.g. motors running, etc) it is possible the earth loop impedance measurement could be in error.

In such circumstances, where possible, disconnect any loads that may be a source of error. Alternatively, perform the measurement when the wiring under test is electrically quiet.

The effect of these measurement errors will cause errors on the lower two ranges, e.g. if the actual loop impedance of the circuit under test is <1.7Ω then the E-Ze Check™ Xtra may indicate in the range 1.7Ω to 5Ω.





3.4.2 Wiring and Voltage Check

If the wiring is faulty or the supply voltage is <195V or >270V or the earth loop impedance is >500Ω one of the fault sequences of figure 2 will be indicated on the lower indicators. The top indicators will not illuminate as a loop impedance measurement is not made if a wiring fault is detected or the supply voltage is <195V or >270V.

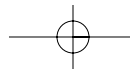
The wiring fault conditions of figure 2 are the most common for the respective indicator sequences shown, but the wiring fault could be different to that described.

E.g. The sequence of indicators that depict a phase earth reversal fault would also be present for a fault where the neutral was open between the distribution board and the socket under test and the neutral was shorted to the phase at the socket under test.

If a fault is detected, always investigate the wiring under test or have the wiring investigated by a competent person.

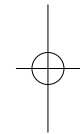
Figure 2. Wiring and Voltage Check (Lower indicators)

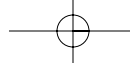
	Wiring correct, voltage ok (>195V & <270V)
	Wiring correct, voltage high (>270V)
	Wiring correct, voltage low (<195V)
	Wiring correct, earth neutral voltage >30V
	Open neutral
	Open earth
	Phase (live) fault
	Phase neutral reversal
	Phase earth reversal
	Voltage <160V (see section 3.1 Precautions)



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1. INTRODUCTION

1.1 Description

The E-Ze Check™ Xtra is a socket tester that additionally checks the earth loop impedance of the wiring under test, and indicates the range that the measured earth loop impedance falls within. If the wiring is faulty the earth loop impedance test is not performed.

The E-Ze Check™ Xtra will also indicate if the mains voltage is below 195V or above 270V.

The 'T Safe' technology employed by the E-Ze Check™ Xtra allows the earth loop impedance to be measured with a 30mA or higher RCD in circuit without it tripping.

The E-Ze Check™ Xtra Professional Kit is supplied with both a 13A 3 pin adaptor and a flying lead with croc clips which can be used at junction boxes and terminals where there is only access to bare wires.

1.2 Earth Loop Impedance

Health and Safety regulations require that electrical installations be periodically checked for satisfactory operation, and for electricians to work to the British Standard BS7671, which lays down a schedule for such testing.

The presence, quality and connection of the earth wiring is part of the check, with loop impedance a necessary test. This measurement requires some current to flow through a temporary live to earth link (made by the tester), which causes a small mains voltage change and allows the impedance value to be assessed.

Readings for earth loop impedance should normally be a few ohms, or less; but in rural areas can be tens of ohms. This is because outlying locations rely on one or two copper coated steel earth rods inserted into the ground, instead of the more usual solid metal sheath of the supply cable being connected back to a main earth at the source of supply.

In such circumstances verify the E-Ze Check™ Xtra in a known correctly wired socket or distribution board if using the professional kit.

The E-Ze Check™ Xtra is designed to be plugged into a socket and removed after the test has been performed. If the E-Ze Check™ Xtra is left plugged into a socket or connected to wiring, then after approximately 2 minutes the measurement rate and indicator flash rate will be decreased automatically.

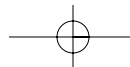
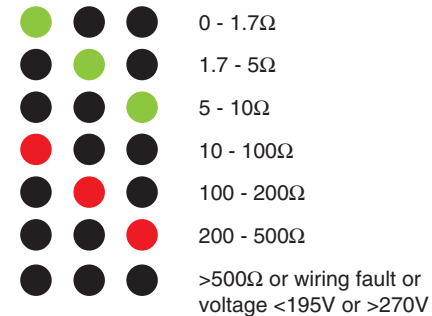
3.4.1. Loop Test

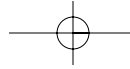
If the wiring is correct and the supply voltage of the circuit under test is between 195V and 270V the lower indicators will all flash green and one of the top indicators (Loop Test) will indicate the range into which the measured earth loop impedance falls.

E.g. If the top centre indicator is flashing green then the measured earth loop impedance of the circuit under test is between 1.7Ω and 5Ω, or if the top left-hand indicator is flashing red then the measured earth loop impedance is between 10Ω and 100Ω.

Refer to BS7671:2001, IEE Wiring Regulations, 16th Edition to determine if the indicated earth loop impedance of the wiring under test meets the necessary requirements.

Figure 1. Loop Test (Top Indicators)





3.3. Self Test

Every time the E-Ze Check™ Xtra is plugged in it will perform its self-test routine by flashing each row of indicators once in the following sequence:-



If the E-Ze Check™ Xtra does not perform its self-test and none of the indicators illuminate this could mean the supply voltage is less than 160V (see section 3.1 Precautions). Verify the E-Ze Check™ Xtra in a known correctly wired socket or secondary distribution board if using the professional kit.

If any indicators do not illuminate or do not illuminate in the above sequence then do not use the E-Ze Check™ Xtra and return it for repair.

3.4. Using the E-Ze Check™ Xtra

Ensure you have read the precautions (Section 3.1) before proceeding and have tested the unit in a known correctly wired socket or fitting if using the professional kit.

Plug the E-Ze Check™ Xtra EZ150 into the socket to be tested. If you are using the E-Ze Check™ Xtra EZ650 with TL88 leads to test wiring, connect the green clip to earth, black to neutral and red to live in that order and then plug the TL88 lead into the E-Ze Check™ Xtra IEC inlet socket.

Verify that the E-Ze Check™ Xtra performs its self-test routine correctly (see section 3.3) then simply compare the status of the flashing indicators with figures 1 & 2 referring also to sections 3.4.1 and 3.4.2.

If the E-Ze Check™ Xtra does not power up and perform its self-test and none of the LED's illuminate this could mean the supply voltage is less than 160V (see section 3.1 Precautions).

Low earth loop impedance values are important to achieve the flow of a large fault current in the event of a fault in order to disconnect the mains supply very quickly through a circuit breaker.

Increasingly, protective devices (RCD's or RCBO's) are used for the earth circuit, just as fuses or breakers are used in the live circuit. These RCD's can be sensitive to test currents used during a temporary measurement link and trip out easily, which can cause both nuisance and loss of data in computer systems. More modern electronic protective devices are particularly sensitive, even being tripped out by instruments which were usable with the earlier electro-mechanical types.

Martindale non-trip testers use our own T-Safe™ (patent pending) technique to make earth loop impedance checks. They ensure rapid, easy to use operation, all without tripping the 30mA or higher RCD or RCBO.

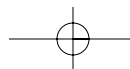
1.3 Variants

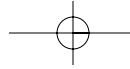
The E-Ze Check™ Xtra, EZ150, is a plug style unit that plugs straight into a 13A socket.

The E-Ze Check™ Xtra Professional Kit, EZ650, is fitted with an IEC inlet to allow the unit to be used with either a 13A plug lead or a TL88 lead set.

1.4 Unpacking and Inspection

Before unpacking the E-Ze Check™ Xtra, examine the shipping carton for any sign of damage. Unpack and inspect the E-Ze Check™ Xtra and any associated leads for damage. If there is any damage then consult your distributor immediately.





2. TECHNICAL SPECIFICATION

Nominal voltage rating: 230V.

Frequency: 50Hz.

Earth loop impedance ranges: 0 - 1.7 - 5 - 10 - 100 - 200 - 500Ω.

Earth loop threshold accuracy: $\pm(10\% + 0.3\Omega)$ *.

Voltage low indication: < 195V $\pm 5\%$.

Voltage high indication: > 270V $\pm 5\%$.

Earth neutral voltage high indication: > 30V $\pm 5\%$.

Open earth indication: > 500Ω.

Temperature Range: -10 to 40°C, non-condensing.

Dimensions: Approx 65 x 65 x 50mm.

Weight: Approx 64g.

Power supply: From mains.

Power consumption: < 2.5W.

Overvoltage category: Cat II/300V.

Pollution degree: 2.

Safety: Complies with BS EN 61010-1:1993.

* **Note:** Measurement accuracy can be affected by highly inductive or capacitive loads distributed on the supply (see section 3.4.4).

3. OPERATION

3.1. Precautions

Warning Before use check the E-Ze Check™ Xtra for cracks or any other damage, and make sure the unit is free from dust, grease and moisture. Also check any associated leads for damage. Do not use if damaged.

Warning If the E-Ze Check™ Xtra does not power-up and none of the indicators illuminate this does not necessarily mean the circuit under test is dead. E.g. the earth and neutral lines could both be open circuit, or the mains supply voltage could be less than 160V but still at a dangerous level.

Warning Always verify the E-Ze Check™ Xtra is in good working order before use by testing it in a known correctly wired socket or distribution board if using the professional kit.

Warning If the E-Ze Check™ Xtra indicates a fault condition in the wiring under test, always investigate the wiring or have the wiring investigated by a competent person.

Warning Do not use the E-Ze Check™ Xtra EZ650 at main incoming distribution boards, or any other area which would require a Cat. III / 300V instrument.

Warning Do not connect across two phases of a three phase supply.

Warning The E-Ze Check™ Xtra will not correctly test circuits using isolation transformers.

Caution Avoid severe mechanical shock or vibration and extreme temperature.

3.2. Description of Indicators

The E-Ze Check™ Xtra uses two rows of 3 LED's to indicate earth loop impedance, mains voltage level and wiring faults. The top row of 3 tri-colour LED's marked LOOP TEST indicate the range within which the measured earth loop impedance falls.

Note:- The Loop Test indicators will not illuminate if there is a wiring fault or the mains voltage is <195V or >270V. The bottom row of 3 tri-colour LED's indicate the condition of the wiring and if the mains supply is <195V or >270V.

Note:- The level of the mains supply is only indicated if the wiring is correct.

