

Socket Testing Safety

What they do (and don't do)

All socket testers check that the earth, live and neutral are the right way round (called polarity testing). Some offer added features – they may include a buzzer in addition to LEDs to indicate a good socket or they may show a combination of indicators to identify which particular fault type is present.

There is one fault that a socket tester and indeed no other piece of equipment can easily find – the swapping of the Earth and Neutral wires. This is because the earth and neutral are common at the substation, (if not closer), so electrically they are indistinguishable.

When selecting a socket tester it's important to understand the different types available and their capabilities and limitations.

Socket Tester Categories

There are 3 main categories of socket testers, simple, advanced and professional, summarised in the following table. The key differentiator is in the ability to measure and display either ranges or numerical values for earth fault loop impedance.

	Simple CP501, BZ101	Advanced EZ150	Professional EZ250
Capabilities			
Indicate functional socket	✓	✓	✓
Detect line / neutral reversal	✓	✓	✓
Detect presence of earth	✓	✓	✓
Display range of earth loop impedance values	×	✓	×
Display the numerical value of earth loop impedance	×	×	✓

All socket testers will show the absence of an Earth; the Martindale EZ150 will show you how good your earth is and the EZ2500 will give you numerical values for certification and reporting.

This differentiation is important as some simple socket testers on the market have been seen to show an earth as good even when the impedance is as high as 500kΩ. As 0.5 MΩ (500 kΩ) is normally considered a good insulation level, it's clear that in this case the "protective" earth will not protect. Given the choice, electricity will flow through the average human (resistance around 2000 Ohms) a lot more easily – and possibly fatally - than through a wire with a resistance of 500,000 Ohms or more.

A reliable earth loop impedance measurement is important to ensure that the over current protection devices achieve a fast enough disconnection time to avoid electrocution. In the case of an earth fault, loop impedance values must be less than those specified in the BS7671 Wiring Regulations. Often earth loop values higher than a few ohms can cause problems with disconnection times and therefore socket testers capable of indicating earth loop impedance values in this range reveal a lot more about the electrical safety of the installation than just an LED fault indicator. The Martindale EZ150 and EZ2500 have this capability built-in.

Socket Testers and the 18th Edition Wiring Regulations

So is that all you need to do to fully test an installation? Unfortunately not, to carry out a full Installation verification test to the BS7671 18th Edition Wiring Regulations you also need to know that the RCD is working properly, if one is fitted and carry out dead circuit testing for insulation and continuity. Please note that just pushing the self-test button on an RCD in a consumer unit or a

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test button on a socket tester is not enough – it may tell you the unit trips under one condition but it doesn't test it fully and it certainly doesn't show that it trips within the required time.

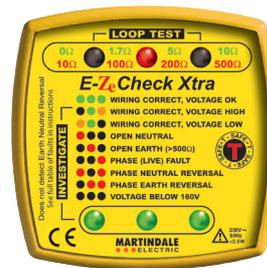
For certification purposes, you will also need to record the actual earth loop impedance reading to a higher accuracy than the less than 1.7Ω band on the EZ150 using an EZ2500 or dedicated loop tester. Clearly socket testers are not an alternative to the full verification of wiring installations, however as a first line indicator to identify potentially unsafe installations and wiring faults, socket testers offer a fast and effective solution when properly specified. They can also be particularly useful as a service tool in identifying potentially unsafe conditions prior to carrying out work on existing installations and appliances. For more information on the use of socket testers including their benefits and limitations, Electrical Safety First have published a useful best practice guide available on our applications page.

[Socket Testers Best Practice Guide 8](#)

For information on professional loop testers and multifunction testers suitable for carrying out all the tests needed to verify the safety of domestic, commercial and industrial wiring installations in accordance with BS7671 18th Edition Wiring Regulations see our [ET4000 / 4500 installation testers](#).



Simple Socket Tester
CP501 BZ101 with sounder



Advanced Socket Tester
E-Ze Check Xtra™
EZ150 with non-trip loop impedance ranges



Professional Socket Tester
EZ2500 socket tester with automatic non-trip earth loop testing plus voltage and frequency measurement