INSULATION RESISTANCE ON APPLIANCES, AND WHEN TO DROP TO 250 V

ONE MEGOHM OR TWO?

INSULATION RESISTANCE

The opposite question to continuity. Continuity wants a path; insulation resistance wants **no path at all**.

? Insulation resistance checks that the live conductors are **not touching** the earth or the body. Line and neutral are **connected together** and tested to the protective conductor or the body — the earth pin, or accessible metal. So here you want the resistance **as high as possible**.

Before the test:

power switches **on**, all covers in place. Where 500 V could damage sensitive circuitry, test at 250 V DC or measure protective conductor or touch current instead — and check the manufacturer's instructions.

EQUIPMENT	MINIMUM	TEST VOLTAGE
Class I	1 MΩ	500 V DC
Class II (and class II with functional earth)	2 MΩ	500 V DC

What the meters actually show.

A dedicated PAT tester may only display "**> 20 MΩ**" because that's the top of its range. A multifunction tester will resolve much further — "> 2000 MΩ" on a healthy appliance. Both are passes.

✋ **Write the "greater than" symbol on your paperwork.** If the meter shows > 20 MΩ you record **> 20 MΩ**, not 20. Marks are lost on this.

Unlike continuity, insulation resistance is done on **class I and class II** alike. Of the earth and insulation tests, a class II appliance gets insulation resistance only — plus the functional check every item gets.

Why old cable fails it.
Insulation goes brittle and cracks with age, so readings drop over time. A high reading on an old cable in good condition is a good sign, not a suspicious one.

Section 10 · 10.6 · insulation resistance · 500 V DC (250 V alternative)

Table 10.2 · 1 MΩ and 2 MΩ · **p.72**

WHEN TO DROP TO 250 V

500 V DC is the standard test voltage. There is one reason to reduce it.

⚠ Where **SPDs or other sensitive electronic equipment** are built into the item, test at **250 V DC** instead. 500 V through electronics expecting 230 V can destroy them.

ITEM	WHY
Surge-protected extension lead	Contains an SPD
Sockets with **USB** outlets	Electronics behind the faceplate
Switches with **neon** indicators	Sensitive components
IT equipment	Treat with extra care

Section 10 · reduced test voltage for sensitive equipment

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