Electrical Testing — Inspection & Test Plan

Mandatory verification of new electrical work to AS/NZS 3000:2018 Section 8, using AS/NZS 3017 test methods. Every circuit gets a recorded result in the Fit-Off Sign-Off digital test schedule. Where multiple readings exist (multi-phase, multiple bonds), record the lowest. Diagrams in this document are Copper Electrical originals illustrating the standard methods — figures from AS/NZS 3017 itself are Standards Australia copyright and are referenced by clause for cross-checking against a licensed copy.

Before you start

1. Check your tester — in calibration (sticker current), leads undamaged, correct category rating
2. Prove your voltage tester on a known live source **before and after** proving dead
3. Isolate at the main switch, lock off / tag out, and prove dead at the point of work
4. Tell others on site the power is off and staying off until testing is complete
5. Have the circuit schedule (from the form) in front of you — you are testing against it

Test sequence

1. Visual inspection
2. Isolate and prove dead
3. Earth continuity — every circuit
4. Insulation resistance — every circuit
5. Polarity — dead, then verify energised
6. Correct circuit connections
7. Energise
8. RCD tests — push button, then trip time
9. Phase rotation (3Ø only)
10. Record every result; investigate and retest anything marginal

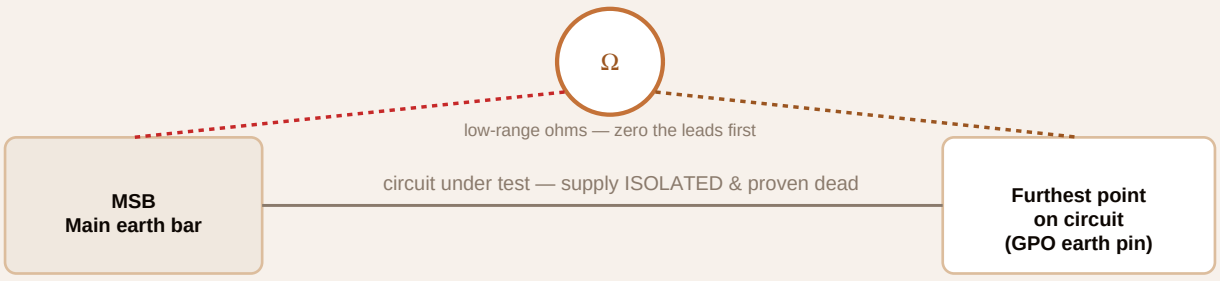
1. Earth continuity — AS/NZS 3017 (continuity of the earthing system)

What you are proving

That every exposed conductive part has a continuous, low-resistance path back to the main earth bar — so a fault trips the breaker fast instead of making the toaster live.

How to do it

1. Supply isolated and proven dead
2. Set the tester to low-range ohms / continuity. **Zero (null) the leads** — unzeroed leads add 0.2–0.5 Ω and fail good circuits
3. Identify the furthest point on the circuit (end of the run — check the plan)
4. One lead on the main earth bar, the other on the earth pin or earth terminal at that furthest point (use a wander lead for long runs)
5. Record the actual reading in the form — it checks it against Table 8.2 for the breaker automatically
6. Repeat for every circuit, including hardwired appliances (test at the appliance earth terminal)
7. Also test: main earthing conductor to the electrode, and every equipotential bond (pool, wet area) — max 0.5 Ω each



Read Re between earth bar and the furthest earth pin. Compare against Table 8.2 (max shown in the form).

Copper Electrical original — illustrates AS/NZS 3017 earth continuity method

Pass: at or below the Table 8.2 maximum shown in the form cell (values assume Type C breakers). Main earth and bonds: max 0.5 Ω.

If it fails: look for a loose earth termination, a missed connector in a junction, an undersized earth, or a broken CPC. Beware parallel paths through metal frames masking a broken earth — disconnect at the point to confirm if suspicious.

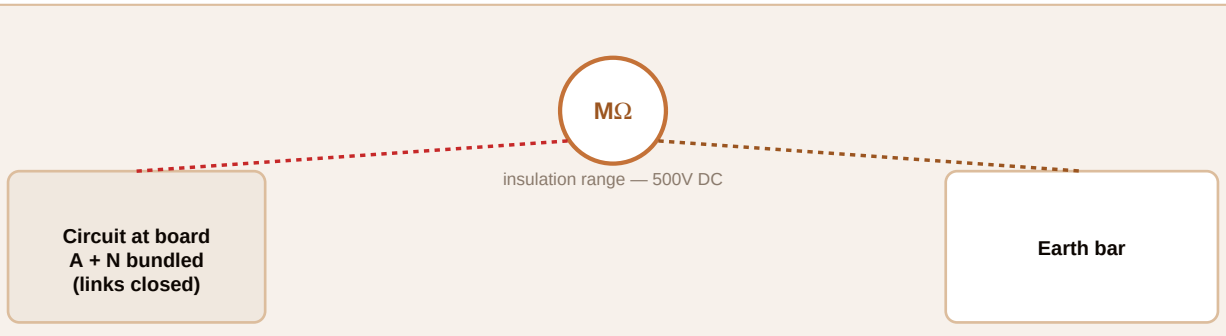
2. Insulation resistance — AS/NZS 3017 (insulation resistance test)

What you are proving

That the insulation between live conductors and earth is intact — no pinched cables, staples through TPS, moisture, or damaged sheathing anywhere on the circuit.

How to do it

1. Supply isolated and proven dead
2. **Disconnect or isolate anything electronic**: dimmers, LED drivers, sensors, fans with receivers, appliances, USB mechanisms, SPDs — 500V kills them
3. Switches ON so the whole circuit is included; lamps out where practical
4. Set the tester to insulation range, 500V DC
5. Test between all live conductors (active + neutral bundled at the board) and earth
6. Where practical also test active to neutral with all loads disconnected
7. Test the whole installation first; if low, break it down circuit by circuit to find the culprit
8. Record the lowest reading per circuit in the form



Dimmers, LED drivers, sensors and appliances disconnected · switches ON, lamps out · record the LOWEST reading.

Copper Electrical original — illustrates AS/NZS 3017 insulation resistance method

Pass: ≥ 1 MΩ. Good new work reads well above — typically hundreds of MΩ (enter as “>200”).

If it fails or reads low: something electronic is still connected, or the cable is damaged — staple, screw, pinched in a stud, or moisture in an external fitting. A reading of 1–2 MΩ on brand-new work is not a pass in practice; find the cause.

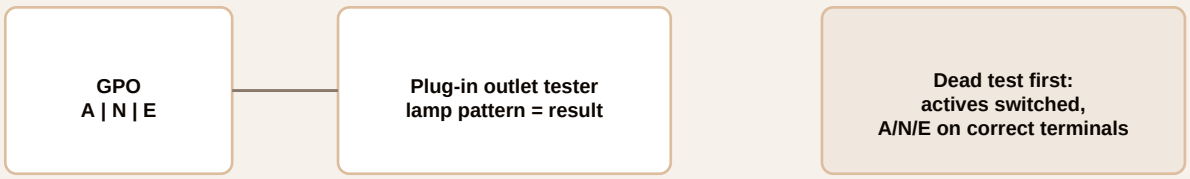
3. Polarity — AS/NZS 3017 (polarity and correct connections)

What you are proving

That actives are switched (never neutrals), and active, neutral and earth land on the correct terminals at every single point.

How to do it

1. Dead: with continuity from a known reference, confirm the switch breaks the ACTIVE on every lighting point and switched outlet
2. Dead: confirm A/N/E on correct terminals at each outlet and appliance connection
3. Confirm the MEN connection and main neutral at the board are correctly terminated
4. Energise, then verify every socket outlet with a plug-in outlet tester AND test lamps
5. Check hardwired appliances at their terminals or isolators



Every socket outlet gets tested — tester at the point, plus test lamps. Confirm MEN polarity at the board.

Copper Electrical original — energised polarity verification

Pass: every point correct — no reversed active/neutral, no transposed earth/neutral, no switched neutrals.

4. Correct circuit connections — AS/NZS 3017

What you are proving

That every point is fed by the circuit it belongs to — no crossed circuits, no borrowed neutrals — so isolating a circuit at the board actually makes its points dead.

How to do it

1. Energise one circuit at a time and confirm only its intended points are live (or do the equivalent continuity test dead)
2. With links open, check for interconnection between circuits — there should be none
3. Neutral check: lift the circuit neutral at the bar — only that circuit's points go dead. Anything else dying means a shared neutral
4. Confirm switching matches the switchboard labelling while you go

Pass: each circuit isolated kills only its own points, and everything on it belongs to it. Fix any borrowed neutral before sign-off — they trip RCBOs and are dangerous under maintenance.

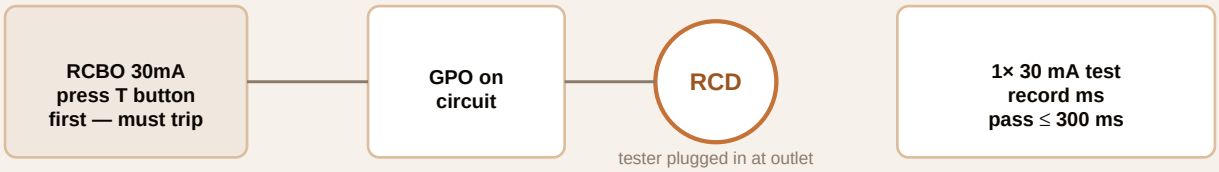
5. RCD tests — AS/NZS 3000 cl 8.3.10 / AS/NZS 3017

What you are proving

That every RCD actually disconnects fast enough to protect a person — the test button proves the mechanism, the timed test proves the speed.

How to do it

1. Energise the installation
2. Press the integral test button on EVERY RCD/RCBO — each must trip. Reset
3. Plug the RCD tester into an outlet on the circuit (furthest point is best practice)
4. Run a trip-time test at 1× rated residual current (30 mA) and record the milliseconds in the form
5. Reset, confirm the circuit re-energises, move to the next device



Reset after each trip and confirm the circuit re-energises. Test every RCD/RCBO on the board.

Copper Electrical original — RCD trip-time test

Pass: 30 mA RCDs trip within **300 ms** at 1× rated current, and do not trip at ½×. Type A devices on final subcircuits.

If it fails: device faulty (replace), or leakage from a connected appliance skewing the test — disconnect loads and retest before condemning the device.

6. Phase rotation — three-phase only

How to do it

1. Energised, with a phase-rotation meter
2. Check at the main switch, then at every three-phase outlet and appliance isolator
3. Confirm A-B-C rotation is consistent with the supply throughout
4. Record in the form (single-phase circuits auto-mark N/A)

Wrong rotation runs motors in reverse — pool pumps, lifts, some AC. Check every 3Ø point, not just the board.

Copper Electrical original — phase rotation check (3Ø)

Pass: identical rotation at every 3Ø point.

Maximum earth continuity (Re) — AS/NZS 3000 Table 8.2, Type C breakers

Breaker rating	6A	10A	16A	20A	25A	32A	40A	50A	63A
Max Re (Ω)	1.6	1.0	0.6	0.5	0.5	0.4	0.3	0.3	0.2

Copper standard is Type C MCBs/RCBOs. Type B limits are higher, Type D lower — check Table 8.2 in a licensed copy of AS/NZS 3000 if using other curves. The fit-off form applies these maximums automatically.

Recording & sign-off

All results go in the digital test schedule on the Fit-Off Sign-Off form, which flags out-of-limit readings automatically. Testing is not complete until every circuit has a recorded result and every flagged reading has been investigated, rectified and retested. The CCEW must not be issued until testing passes in full.

Reviewed and approved for issue by (licence holder): _____ Date: _____