PROVING VOLT DROP WITHOUT A VOLT DROP TEST

NO VOLT DROP TEST. CAN YOU STILL PROVE IT?

The best thing here. There is no test for volt drop — but as the inspector you can still prove it is adequate, because almost everything you need is already on the certificate.

THE SCENARIO

4.0/1.5 mm² twin and earth, 25 m
16 A Type B, immersion heater
Reference method C (clipped direct)
Z_e provided = 0.56 Ω

STEP 1 — EXPECTED $R_1 + R_2$, FROM TABLE B1

4/1.5 = 16.71 mΩ/m

(16.71 × 25) ÷ 1000 = 0.4178 → **0.42 Ω**

STEP 2 — THE CABLE'S FIGURES, FROM ON-SITE GUIDE · APPENDIX F · TABLE F6 (P.193)

4 mm², reference method C:

I_t (tabulated current-carrying capacity) = **37 A**
millivolt drop per amp per metre = **11 mV/A/m**

Both are on the same row — the mV figure is the column right next to the current rating.

STEP 3 — THE VOLT DROP

volt drop = (mV/A/m × I_B × length) ÷ 1000
= (11 × 16 × 25) ÷ 1000
= **4.4 V**

5% of 230 V = **11.5 V** → 4.4 V is comfortably inside

Why I_N can stand in for I_B.

Because $I_B \leq I_N$. If you are given the device rating but not the design current, the device rating is the safe figure to use.

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STEP 4 — AND THE Zs THAT FOLLOWS

Zs = Ze + (R1 + R2) = 0.56 + 0.42 = 0.98 Ω

16 A Type B, 80% value from [ OSG Table B6 p.159 ] = 2.19 Ω
0.98 Ω is well inside. Pass.
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> `The only thing not on the certificate is the length`

And you can get that too: measure $R_1 + R_2$, look up the mΩ/m in Table B1, and run the formula backwards. Cable type, reference method, device rating, RCD protection — all of it is on the paperwork already.

So volt drop is verifiable during inspection and testing, even though no instrument measures it. That is a genuinely useful thing to be able to do.

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