ZE, R1 + R2 AND ZS

HOW DO YOU WORK OUT THE TOTAL EARTH FAULT LOOP?

Ze	**External** earth fault loop impedance: everything from the transformer, through the supply, up to the intake. Measured **live** with test equipment.
R1	Resistance of the circuit's **line** conductor.
R2	Resistance of the circuit's **CPC** (circuit protective conductor): the green/yellow cable from the consumer unit to every socket, light, spur and so on. (Rn is the neutral.)
R1 + R2	Found by a **continuity test** (method 1) on each final circuit, done **dead**.
Zs	**Total** earth fault loop impedance.

THE FORMULA

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Zs = Ze + (R1 + R2)

Example (made-up figures, for practice):
TN-C-S supply, measured Ze = 0.30 Ω
Ring circuit continuity test, R1 + R2 = 0.52 Ω
Zs = 0.30 + 0.52 = 0.82 Ω
→ compare with the maximum permitted Zs for that protective device
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This is covered again in more depth in the 18th Edition and inspection & testing modules. For now, just know what each term means.

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