WORKED EXAMPLE: A 10 KW COOKER

A 10 KILOWATT COOKER, START TO FINISH. CAN YOU SIZE IT?

Build this one from scratch — it ties this whole part together.

A 10 KW LOAD ON A 230 V TN-S SYSTEM

1 · Design current
Ib = P ÷ V
Ib = 10 000 ÷ 230
Ib = 43.48 A (the full load current — everything on at once)

2 · Protective device
The rule: Ib ≤ In
The next size up from 43.48 A is **In = 50 A**, type B circuit breaker

3 · Disconnection time
Final circuit over 32 A supplying only fixed equipment
→ Reg 411.3.2.3: up to **5 seconds** (TN)
(If the cooker control unit has a socket-outlet, it's a ≤ 63 A circuit with a socket → Table 41.1, **0.4 s**.)

4 · Maximum Zs
Table 41.3, type B, 50 A (one value for both times, Reg 411.4.202)
0.87 Ω tabulated (circuit in use)

5 · What you should measure on a new circuit
0.87 × 0.8 = **0.70 Ω** (or read it straight from OSG Table B6)

6 · Fault current needed to trip it
Type B = 5 × In (worst case)
50 × 5 = **250 A**

✓ If the Zs of that purple fault path in service **does not exceed 0.87 Ω** (**0.70 Ω** measured on the new, cold circuit), the breaker will operate inside the permitted disconnection time, and **ADS is achieved**. That's the entire chain, in one sentence.

A reality note on Ib.

43.48 A assumes every ring, the grill and the oven all running flat out at once — a Christmas dinner, not a Tuesday. In real design you'd apply **diversity** (maximum demand), which is why the On-Site Guide's Appendix A will happily let you put a 15 kW domestic cooker on a 32 A breaker. That's a later module.

Ib ≤ In · device rating must be at least the design current

411.3.2.3 · 5 s (TN) · or Table 41.1, 0.4 s, with a socket on the control unit

Table 41.3 · 0.87 Ω

On-Site Guide · Appendix A · diversity

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