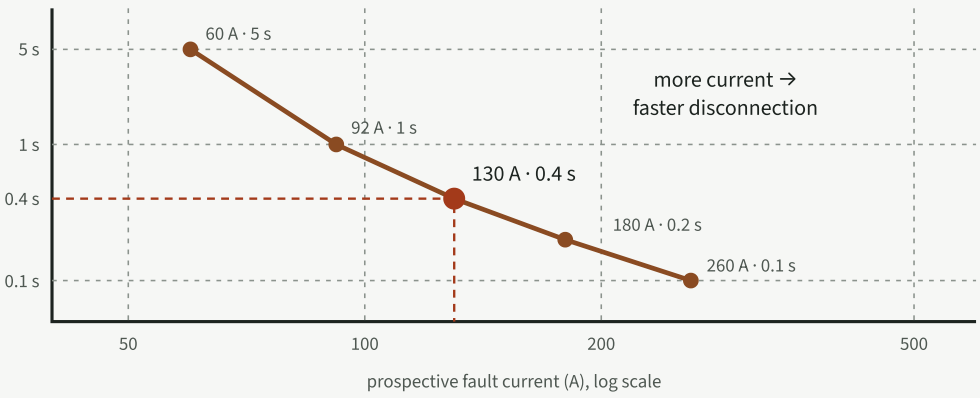
IA: HOW FAST THE DEVICE DISCONNECTS

HOW MANY AMPS BLOW A 20 AMP FUSE IN 0.4 SECONDS?

What it's for: using the PEFC to find how long the protective device takes to disconnect. `Ia` is the current that makes the device operate within a given time. It isn't a calculation as such. You read it from the **time/current curves** (and the tables beside them) in **Appendix 3** of BS 7671.

Our example is a piece of **20 A BS 3036 fuse wire** (a rewireable fuse). The wire has to get hot enough to melt, and that depends on the current through it. In normal use it mustn't blow ("melt, melt, blow, oh no, replace the fuse wire!"). But in an earth fault (a low-impedance path to earth, high current, parts live that shouldn't be) we **want** it to melt, and quickly.



The five time-current points used here for a **20 A BS 3036** fuse, drawn on log scales (our sketch, not the real curve). For a 0.4 s maximum disconnection time, this fuse needs **130 A**. Check the values against the table beside the BS 3036 graph in Appendix 3 of your copy.

20 A BS 3036 FUSE (VALUES USED HERE)	0.1 S	0.2 S	0.4 S	1 S	5 S
Ia needed to disconnect in that time	260 A	180 A	**130 A**	92 A	60 A

- The circuit's maximum disconnection time is **0.4 s**, so the fuse needs at least **130 A**.
- Only **50 A**? It takes longer than 5 s. Only **70 A**? Somewhere between 1 and 5 s, probably about 3 s.
- **500 A**? Well under 0.1 s. Very quick.

So the rule is: **the more current, the faster it trips or blows**. Every circuit has a maximum disconnection time, and if the fault current doesn't reach Ia, the device won't operate in time.

BS 7671 · Appendix 3 · time/current characteristics · BS 3036 semi-enclosed (rewireable) fuses · check your copy for the page

BS 7671 · Appendix 3 · Fig 3A4 Type B circuit-breakers · **p.445**

ANOTHER EXAMPLE: WOULD THE 20 A FUSE DO?

PEFC (section 11 example) = 291.3 A
Table above: 260 A → 0.1 s
291.3 A > 260 A → disconnects in under 0.1 s ✓ (well inside 0.4 s)

Free section from Sparky Study Notes. The full Level 3 notes, 1,463 practice questions and the video lessons: sparkystudynotes.co.uk