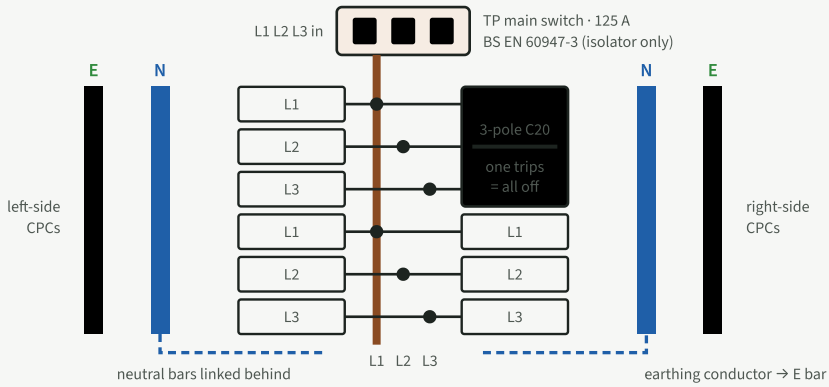
THE THREE-PHASE DISTRIBUTION BOARD

WHY DO THREE-POLE BREAKERS TRIP TOGETHER?

Our three-phase board is **physically bigger** than the 10-way single-phase board, but it's a **12-way**, only two more ways. It can take **12 single-phase circuits**, or **three-phase circuits**, or a mix.



Redrawn three-phase busbar layout. Each way on each side picks up the next phase in turn (L1, L2, L3, L1…). A single-phase CB uses one way. A three-pole CB spans three ways, so it gets one of each phase.

THREE-POLE BREAKERS

- A three-pole circuit breaker is really **three single-pole breakers joined together** with a **common bar** through the handles. Ours is three **Type C 20 A** poles.
- If **any one phase** has an overload, short circuit or earth fault, that pole trips and the common bar takes **all three off**.
- **Why that matters:** old boards used **BS 3036 rewireable fuses**, one per phase. If L1 blew, only L1 went off. The machine would stop working, but it would **still be live on L2 and L3**. Three-pole breakers fixed that. You'll still come across rewireable boards on site.

MAIN SWITCH AND BUSBARS

- The **triple-pole main switch** is again a **BS EN 60947-3** on-load isolator (you can just see the circles in its symbol), rated **125 A**. On this board L1, L2 and L3 come in the top, and each pair of terminals is joined when it's on. Boards differ, so when you prove dead, test on the load (busbar) side of the main switch, whichever end that is on the board in front of you, or in the busbar chamber. It won't trip.
- You can get **four-pole** switches that also switch the **neutral**. On our board the neutral goes **straight to the neutral bar**, not through the switch.

- A pre-made **busbar cover** sits over the busbars, with a label so you can write which circuit does what.
- Underneath are three busbars, **L1, L2 and L3**. A **continuity tester** proves which terminals are joined: it beeps between every L1 terminal, but not from L1 to L2 or L3.
- **Single-phase circuits** (lighting needs only 230 V) use a single-pole CB on one way. The neutral goes to the **corresponding neutral terminal**.
- **Three-phase circuits** (a machine or motor) use a three-pole CB across L1, L2 and L3, with the neutral (if needed) in the relevant terminal.
- There are **two neutral bars**, one for each side, joined by a **solid bar hidden behind**. The same goes for the **earth bars**: CPCs from each side go on that side's bar, and the incoming **earthing conductor** lands on the earth bar. The main neutral makes a big, solid connection onto its bar.

> **No split-load version**You typically **can't get split-load** three-phase boards with RCDs built in like this one. If a circuit needs RCD protection (and plenty will), use an **RCBO**: fly lead to the neutral bar, circuit line and neutral into the RCBO, CPC to the earth bar.

> That's true of the style of board shown here. Some manufacturers do make three-phase boards with a
> **four-pole RCD incomer**
> or RCD-protected sections, so check what's available before you design one in.

BS 3036 · semi-enclosed (rewireable) fuses

BS EN 60947-3 · TP main switch (isolator)

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