



INSTALLATION GUIDE

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BS 7671: The 18th Edition Wiring Regulations

BS 7671:2018 regulation 443.4 states that surge protection shall be installed where the consequences of over voltage could:

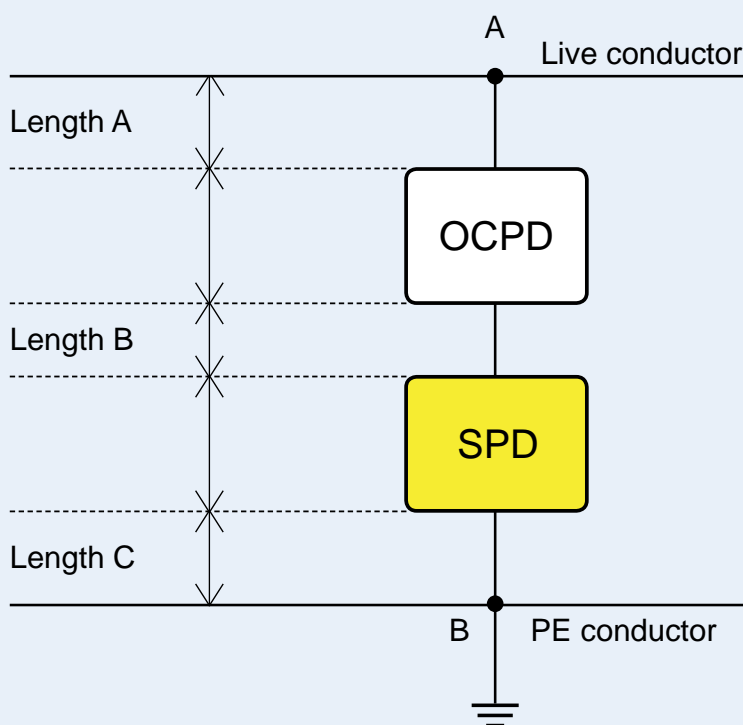
- Cause serious injury to or loss of human life.
- Damage of public services or cultural heritage.
- Interrupt commercial and industrial activity.
- Affect a large number of co-located individuals.

When applying these regulations, it is important to understand that the regulations are not retrospective, therefore will only apply if you are installing a new distribution board or making a significant amendment to an existing installation. The exception is single dwellings, where an SPD can be omitted if the value of the installation is not seen as significant. This means that the contractor must discuss with the installation owner whether they want an SPD installed or not.

It is recommended that if you discuss SPD's with the home owner and they decline to have an SPD installed, that you get a written confirmation. This will ensure that if any damage is caused in the future, which could have been prevented through the use of an SPD, that the contractor will have proof that it was declined by the customer, and therefore any damage is not the fault of the installer.

For all other installations, either an SPD is installed or there is a risk assessment which can be performed which will give you a risk level, to state if SPD's are needed in that installation.

Figure 534.8



Cable Length

Regulation 534.8 tells us that that the conductors for the SPD installation shall preferably not exceed 0.5m and in no case exceed 1m.

As figure 534.8 from page 169 of BS 7671:2018 shows, this is measured from the live supply through to the overcurrent protection device (Length A), then from the overcurrent protection device to the SPD (Length B), and from the SPD to the closest earth point (Length C). Length A + Length B + Length C must be less than 1m in length.

There are examples of these measurements explained throughout this guide book.

Overcurrent

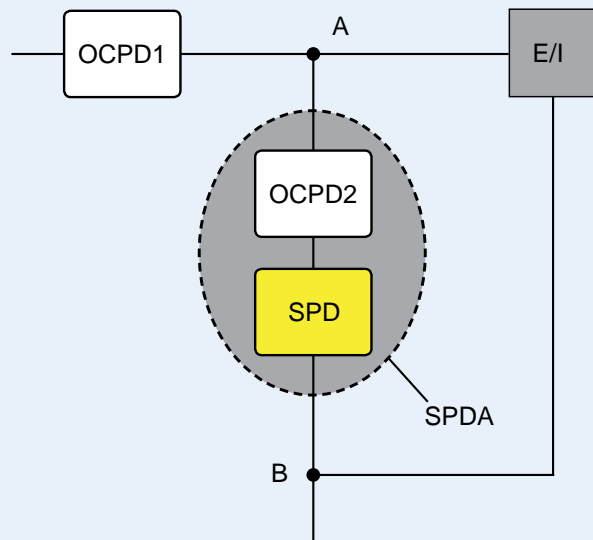
BS 7671:2018 tells us that SPD installations shall be protected against overcurrent, regulation 534.4.5 details that this can be done with either an MCB or an in-built fuse.

This overcurrent protection is there to protect the technology inside the SPD and to also protect the installation in case of an SPD failure. What is quite important to note is that regulation 534.4.5.2 tells us that in the case of the overcurrent protection device operating from an SPD failure, the continuity of the supply must not be affected. This means that whatever overcurrent protection you use for the SPD, it must not be the district network operator (DNO) fuse, as if this operates then the supply to the installation would be immediately disconnected.

At SPD Ltd we recommend all of our devices are fitted with the relevant sized MCB. Not only does this give the SPD the overcurrent protection required, it also provides a point of isolation, should the SPD require maintenance, or if the board requires resistance testing, as the results would be skewed with the presence of an SPD in the circuit.

As figure 534.5 shows, the overcurrent device specified by the SPD manufacturer should be second to the overcurrent protection device for the installation. The manufacturer specified overcurrent device and the SPD form the complete SPD assembly, which is referred to as the SPDA in BS 7671.

Figure 534.5



Can be found on page 166 of BS 7671:2018

Key

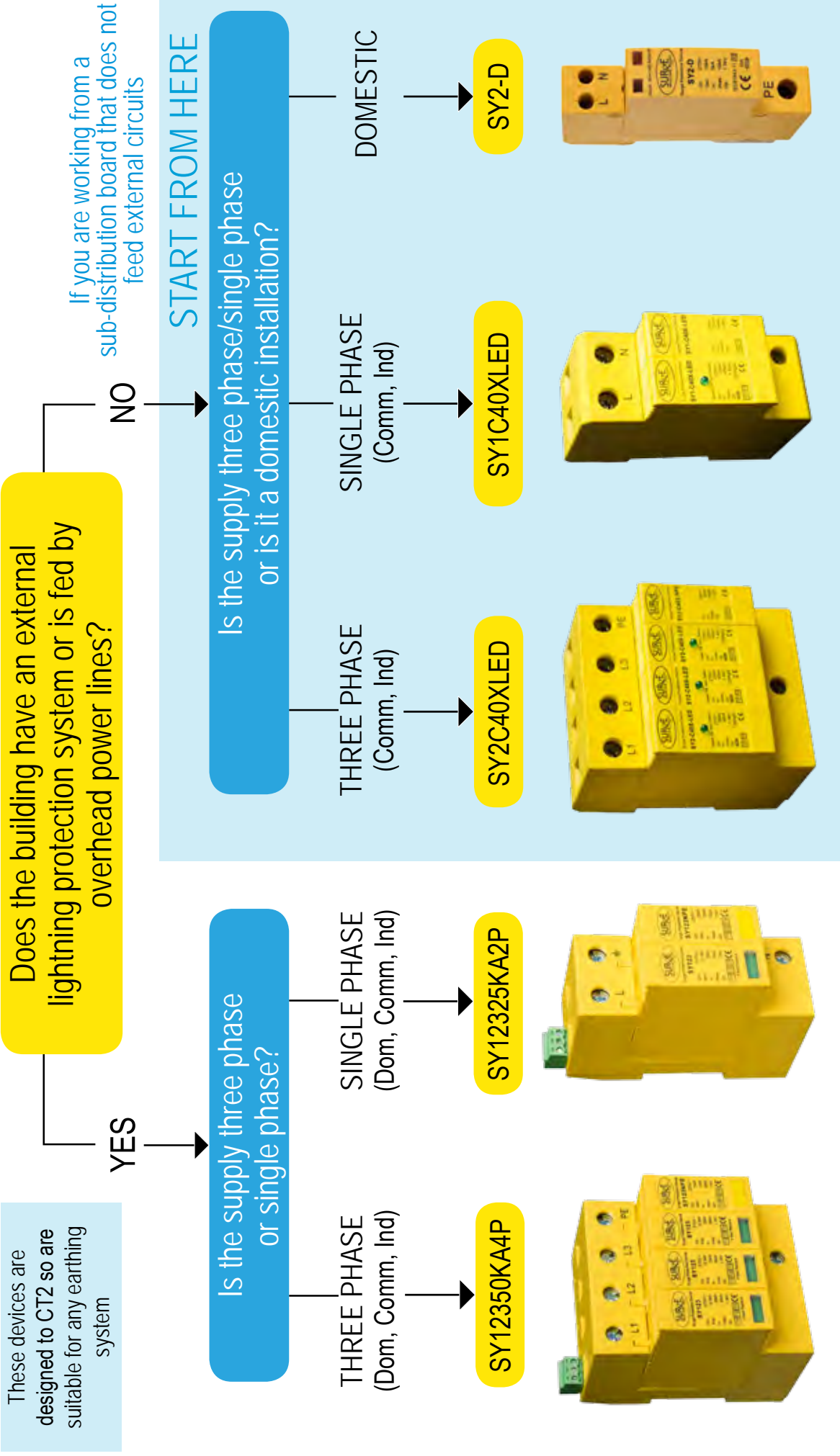
- OCPD 1 – Overcurrent Protection Device in the Installation
- OCPD 2 – Overcurrent Protection Device specified by the SPD manufacturer
- SPD – Surge Protection Device
- SPD A – SPD Assembly
- E/I – Equipment / Installation to be protected
- A and B – Connection Points of the assembly

Cable Sizes

Regulation 534.4.10 gives us minimum cable sizes for the SPD installation, these are in the table below. But remember, these are the minimum required cable sizes to BS 7671:2018 and some manufacturers will vary from this. Ensure you consult the relevant data sheets for your SPD installations.

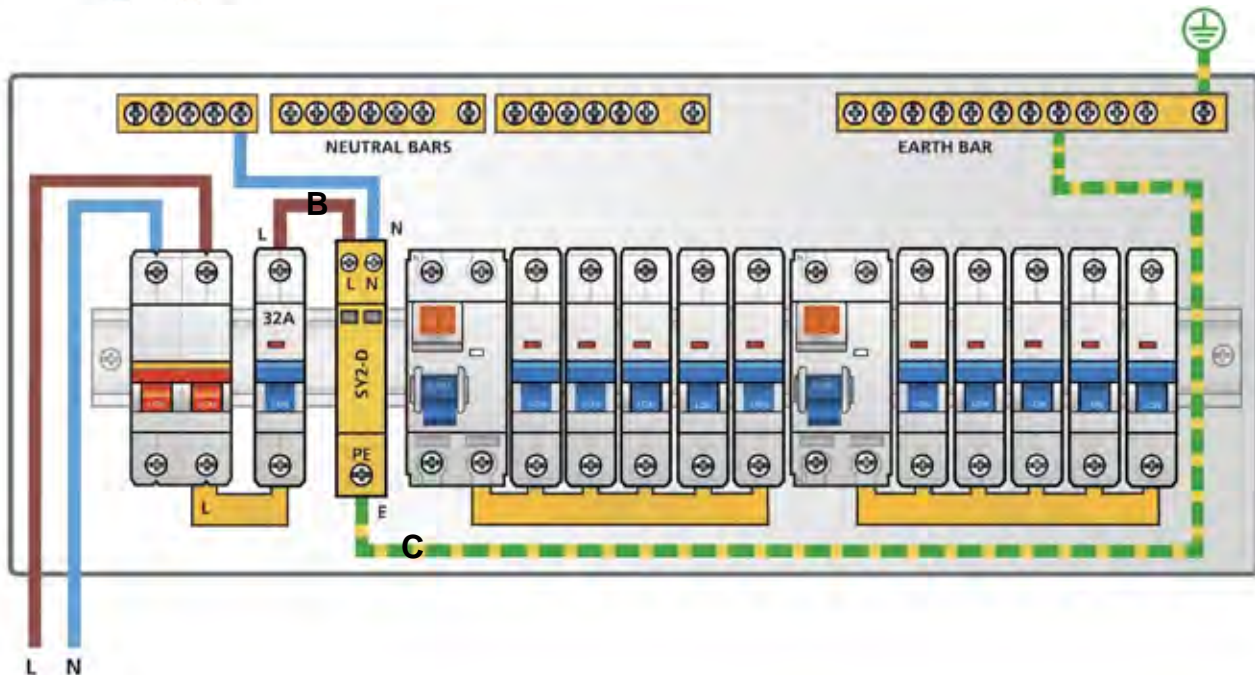
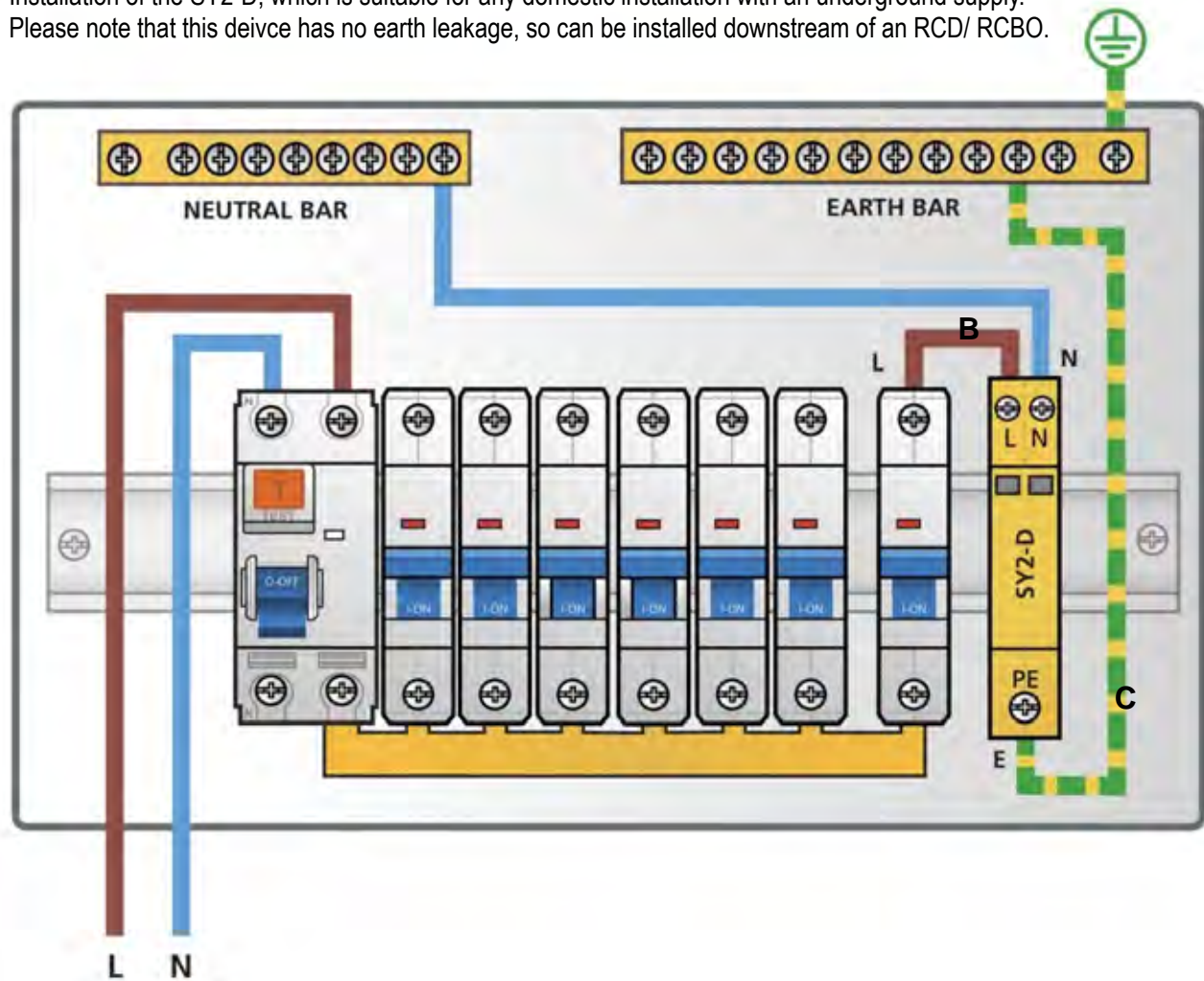
TYPE OF SPD	LIVE/NEUTRAL CABLE MINIMUM	EARTH CABLE MINIMUM
Type 1	6mm ²	16mm ²
Type 2	2.5mm ²	6mm ²

SURGE PROTECTION SELECTION CHART



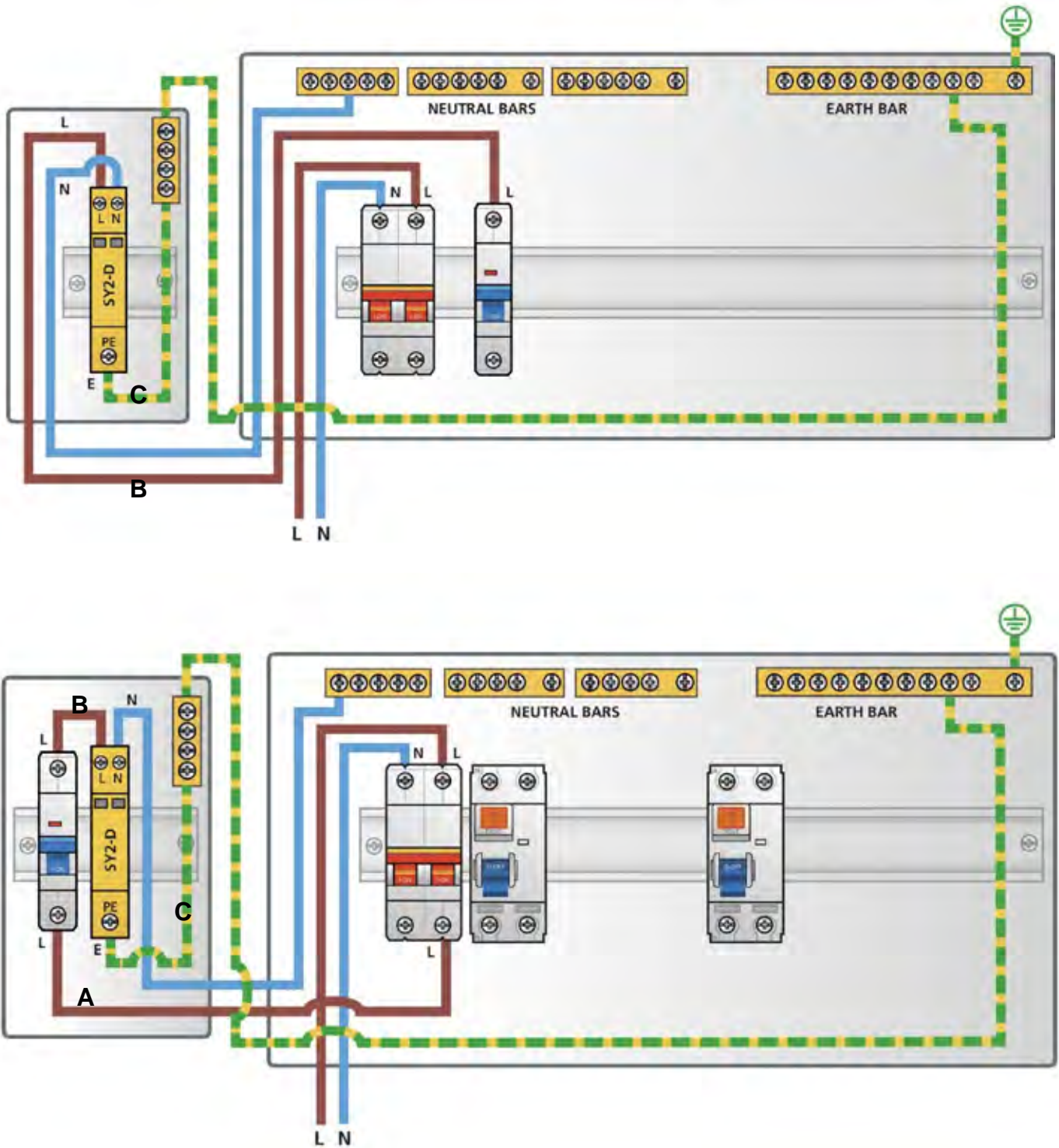
Domestic Installations

Installation of the SY2-D, which is suitable for any domestic installation with an underground supply. Please note that this device has no earth leakage, so can be installed downstream of an RCD/ RCBO.



For both of the above installation methods, we can disregard length A as the MCB is directly on the busbar, so the only lengths we need to consider are Length B & Length C to BS 7671: 2018 534.4.8. Remember the maximum cable length allowed is 0.5m-1m.

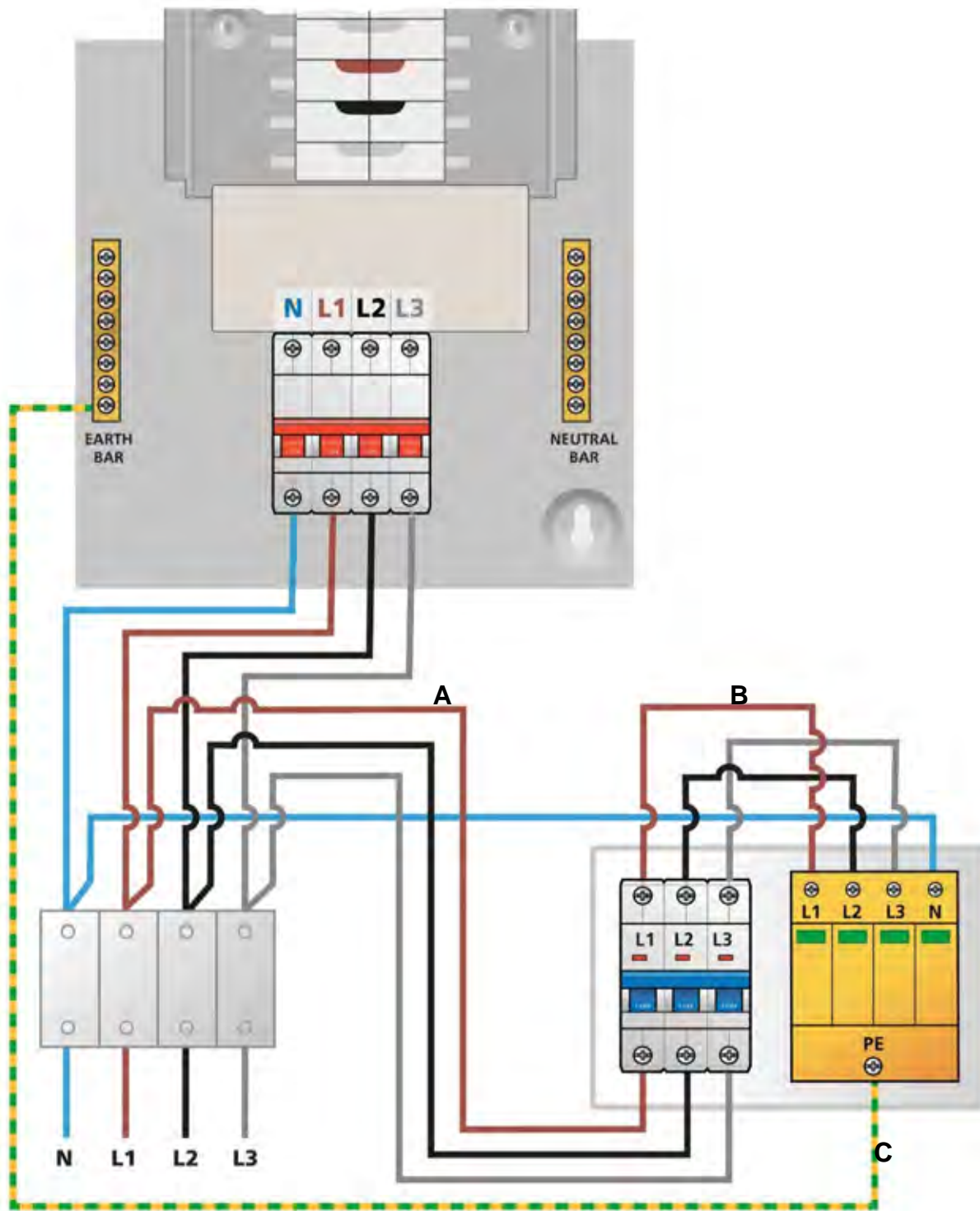
Domestic Installation in a separate enclosure fed from within the consumer unit.



If the MCB for the SPD is located in the consumer unit, on the bus bar, then as with previous installations, we can disregard length A, BUT installers must be mindful that when we move outside the consumer unit, the cable length B from the MCB to the SPD can increase, so care needs to be taken to ensure that this cable is as short as possible.

When installing the MCB in the enclosure with the SPD, we are adding in a length A, so again care must be taken to ensure that the cable lengths do not exceed the 1m maximum allowed to regulation 534.4.8. Figure 534.9 on page 170 of BS 7671:2018 does illustrate that we are allowed to use a local earth bar in the enclosure to shorten the cable distance to the earth terminal, so this can be useful when working outside of the consumer unit.

Three Phase Installation from Henley Blocks or a Bus Bar System



When installing the MCB in the enclosure with the SPD, we are adding in a length A, which will be the length of cable from the henley block to the MCB, so again care must be taken to ensure that the cable lengths do not exceed the 1m maximum allowed to regulation 534.4.8. If working from a live bus bar, the MCB feeding the SPD can be installed on the bus bar meaning that again Length A is 0.

Length C could be shortened by using a local earth in the enclosure with the SPD as allowed in BS 7671:2018, but the usefulness of this will depend on your installation. Please also note that for a three phase supply, a three phase SPD will need to be installed across all three phases and neutral to give 100% protection, even if the board only has single phase MCB's installed.

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