Prospective fault current.

This important consideration is required to be determined wherever an overcurrent protective device is required to operate under fault conditions. This is a requirement of Regulation 434.1

This shall be determined by calculation, measurement or enquiry.

"In domestic (household) premises, where a consumer unit to BS EN 61439-3 is used and the maximum prospective fault current declared by the distributor is 16 kA, it is not necessary to measure or calculate prospective fault current at the origin of the supply."

This is sufficient for design purposes; however, the prospective fault current (P_{fc}) needs to be measured for other reasons: we need to verify that the breaking capacity (I_{cn}) of the device is greater than the P_{fc} or the P_{fc} is **BELOW** the breaking capacity depending on which way you choose to look at it!

When it comes measuring the P_{fc} in a single-phase installation, it is simply the greater of the current between

- PEFC: The current between the Line and earth conductors
- PSCC: The current between the Line and Neutral conductors.

These measurements must be carried out with the earthing conductor connected to the main earthing terminal (MET). It is important to understand that this will include any parallel paths; this in turn, will lower the impedance and increase the fault current.

This also means than we cannot legitimately read off the *PEFC* when carrying out the Z_e test, because the earthing conductor should be disconnected from the MET to intentionally exclude parallel paths for the Z_e test to be valid.

In a TN-C-S system, it is noteworthy that there will be very little difference between the two readings because earth and neutral are joined in the supplier's cutout; the only difference being the short length of 16mm^2 conductor connecting the MET to the supplier's cutout!

In a TT system, the two measurements will be very different because the earth fault path is now through the general mass of earth and the resistance will be much higher, leading to a very low PEFC. (This being the reason why we need an RCD for fault protection)!

When it comes to a three-phase installation, we need to take a slightly different approach.

The current between phases (PEFC) will be at 400V and the current from phase to earth (PEFC) will be at 230V. The relationship between the two voltages is $\sqrt{3}$!

There are further issues with measuring between phases, because some Multi-function testers (MFT's) may be Cat iv, but only up to 300V! This has safety issues and must be verified before this measurement is carried out: If you have such an MFT then you should not measure between phases which are at 400V!

The applied wisdom is to measure between all phases to neutral, (this will actually be 230V single-phase), Then simply double the result. This will give a close approximation to the current that will occur if all the phases and neutral come together, as opposed to two phases shorting out!

So, to summarize: Measure the three phases to neutral, take the highest measurement and double it.

For the Schedule of Test Results, a suggested method of recording this is as follows:

- PEFC N/A
- PSCC The highest single-phase result
- PFC Double the highest single-phase result.

This also helps, if there are any single-phase boards downstream of the origin. You have already measured the Pfc and therefore the Pfc of the single-phase board can be assessed from the figure recorded at the origin.