

Size of PE wire in distribution box

Article Overview

The PE wire in a distribution box should generally match or exceed the size of the phase conductors, with a minimum of 10 mm² for copper.

Sizing Guidelines

o Based on Phase Conductor Size

- o For phase conductors $\leq 16 \text{ mm}^2$, the PE conductor should be the same size as the phase conductor.
- o For phase conductors 16-35 mm², the PE conductor should be 16 mm².
- o For phase conductors $> 35 \text{ mm}^2$, the PE conductor should be half the size of the phase conductor ($S_{PE} = S_{ph} / 2$) if using the same material (copper or aluminum) .

o Minimum Cross-Section

- o The PE conductor must have a minimum cross-section of 10 mm² for copper or 16 mm² for aluminum, regardless of phase conductor size .
- o In TT systems, if the earth electrode is far from the source, the PE can be limited to 25 mm² (copper) or 35 mm² (aluminum) .

o Connection in Distribution Boxes

- o The PE conductor should be connected to a dedicated terminal on the main earthing bar.
- o It is recommended to run PE conductors close to the phase conductors to minimize inductive reactance in fault conditions .
- o Color coding should be green-and-yellow for easy identification, or green in some countries like Canada .

o Special Considerations

- o For PEN conductors (combined protective and neutral), the cross-section must comply with neutral conductor requirements and be $\geq 10 \text{ mm}^2$ for copper or 16 mm² for aluminum .
- o If multiple PE connections are used, at least one should match the size of the mains feeder .

Practical Recommendation

For a typical low-voltage distribution box in a TN-S or TN-C-S system:

- o Phase conductors $\leq 16 \text{ mm}^2 \rightarrow$ PE = same as phase (e.g., 2.5 mm² or 4 mm² depending on phase)
- o Phase conductors 16-35 mm² $\rightarrow$ PE = 16 mm²
- o Phase conductors $> 35 \text{ mm}^2 \rightarrow$ PE = $S_{ph} / 2$, but not less than 10 mm² (copper) This ensures compliance with IEC standards, proper fault current handling, and safety for all exposed conductive parts.

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This method is based on PE conductor sizes being related to those of the corresponding circuit phase conductors,

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The document discusses guidelines for sizing protective earthing conductors in electrical installations. It provides two

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This document provides guidance on sizing protective earthing conductors. It references a table from IEC 60364-5-54

Choosing the correct electrical box dimensions is essential for safe wiring, code

GSDB-4030 400x300x190 3 Phase Service Connection Distribution Box/ ABC Distribution Box 11.

This chapters details the different steps and methodologies for conductor sizing. And the specific recommendations for

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first sentence of 314.28 (A) (2), the power distribution block shall be installed in a box with dimensions not smaller than

The size of the ties should be appropriate and the spacing should be uniform to ensure that

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