

## How many square millimeters is the relay protection wire



### Overview

American Wire Gauge “AWG” Chart – Wire Size & Ampacity Table Complete AWG wire gauge chart from 0000 to 40. Diameter in mm and inches, resistance, cross-sec.

### Key Takeaways

Relay protection wires typically range from 0.5 mm<sup>2</sup> to 2.5 mm<sup>2</sup>, depending on current and installation requirements. Typical Wire Sizes

Relay protection circuits generally carry low currents, often in the range of 1–5 A, and are used for control, signaling, and tripping purposes rather than power transmission. For such applications, the cross-sectional area of the wire is usually between 0.5 mm<sup>2</sup> and 2.5 mm<sup>2</sup>. Smaller wires (0.5–1 mm<sup>2</sup>) are common for signal and indication circuits, while slightly larger wires (1.5–2.5 mm<sup>2</sup>) are used for tripping circuits that may carry higher currents or longer cable runs to ensure minimal voltage drop and reliable operation .

#### Factors Affecting Wire Selection

- **Current Rating (Ampacity):** The wire must safely carry the expected current without overheating. For relay circuits, this is typically low, but longer runs may require larger cross-sectional areas to reduce voltage drop .
- **Voltage Drop:** Excessive voltage drop can prevent relays from operating correctly. Using a wire with sufficient cross-sectional area ensures reliable operation over the distance of the circuit .

- **Insulation and Environmental Conditions:** Wires may be insulated for high temperatures, chemical exposure, or outdoor use, which can influence the choice of wire size.
- **Standards Compliance:** IEC 60228 and other international standards provide guidance on conductor sizes in square millimeters for low-voltage control and protection circuits .

#### Conversion Reference

For reference, common wire sizes in AWG and their approximate cross-sectional areas in mm<sup>2</sup> are:

- 24 AWG  $\approx 0.2 \text{ mm}^2$
- 22 AWG  $\approx 0.33 \text{ mm}^2$
- 20 AWG  $\approx 0.52 \text{ mm}^2$
- 18 AWG  $\approx 0.82 \text{ mm}^2$
- 16 AWG  $\approx 1.31 \text{ mm}^2$
- 14 AWG  $\approx 2.08 \text{ mm}^2$  This shows that typical relay protection wires fall in the 18–14 AWG range, corresponding to 0.8–2.1 mm<sup>2</sup> .

#### Summary

While there is no single fixed size for all relay protection wires, 0.5–2.5 mm<sup>2</sup> is the standard range used in practice. The exact size depends on the current, distance, voltage drop, and environmental conditions. Using wires within this range ensures reliable relay operation and compliance with electrical standards .

## Article Content

### Wire Gauge Table

Most of the wire and cable made in the US uses the American Wire Gauge (AWG) system. In the rest of the world conductors are

How to Find the Right Size of Wire and Cable in NEC & IEC?

How to Determine the Suitable Size of Wire and Cable or Electrical Wiring Installation? Examples in Imperial and Metric Systems

### Cable Size Calculator

**Example Use Case: Residential Water Pump Installation** Imagine you're wiring a 1.5 HP water pump that draws 12A from a 230V

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