



# Things to know Pre-Insulated Terminals

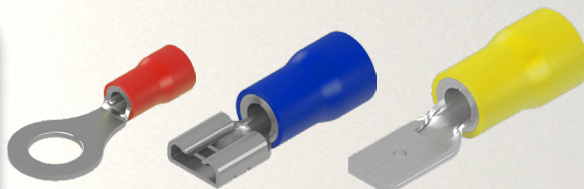
## Technical Breakdown

A pre-insulated terminal is essentially a copper or brass connector that comes sealed inside a non-conductive polymer casing, usually vinyl or nylon. These casings are almost always colour-coded to tell you the wire cross sectional area, always measured in mm<sup>2</sup>, they for instance, Red for the smallest wires 0.5-1.5mm<sup>2</sup>, Blue for medium 1.5-2.5mm<sup>2</sup> and Yellow for the largest 4.0-6.0mm<sup>2</sup>.

They are a massive step up from bare terminals because that insulation provides mechanical strain relief and protection against accidental shorting, right out of the box. We primarily use them for securing stranded wire to a connection point, whether that's a screw stud or a tab.

The design varies widely depending on the job. Ring and Fork terminals are most common for screw connections, the ring being safer as it can't vibrate loose once bolted. Blade and Pin terminals are for insertion into specific terminal blocks.

Finally, you have the quick disconnects: Male and Female Spade connectors let you quickly plug and unplug wires, and Male and Female Bullet connectors serve the same function but for circular plug-ins. Butt Connectors are unique; they splice two wires together permanently inside a single insulated tube.



**How to Choose** - Picking the right pre-insulated terminal involves three main decisions. First, match the wire size (cross sectional area) to the terminal colour code. Red, Blue or Yellow must be exact.

Second, match the stud size if you're bolting a ring terminal, the hole must fit the bolt. Third, match the terminal shape to the connection type. If the connection needs quick disconnection, use a Male/Female Spade set. If it needs permanent, reliable bolting, a Ring terminal is best. If you just need to join two wires permanently, select a Butt Connector. For wet or harsh areas, look for heat shrinkable solder sleeve versions, which offer a completely sealed, waterproof termination.

**Best Practices** - Like ferrules, the connection quality hinges entirely on the crimp. You have to use the correct ratchet-style crimping tool, specifically one designed for insulated terminals. Using the wrong jaw set can damage the insulation, which defeats the entire purpose.

When preparing the wire, strip just enough insulation so the copper strands fully enter the barrel of the terminal but the wire's insulation meets the start of the terminal's plastic collar. Always give the terminal a strong tug test after crimping to ensure the connection is physically sound. Also, never substitute a Fork terminal for a Ring terminal in high vibration installations; the fork can work its way out of the screw connection over time.

### Q How do I know the correct stud size for a ring or fork terminal?

A You need to measure the diameter of the screw or bolt you are connecting to. Pre-insulated terminals are marked with the wire size and the stud size. You must match both numbers for the connection to be secure.

### Q Can I use one of these pre-insulated terminals more than once, like unplugging a spade and plugging it back in?

A Yes, absolutely. That's the entire point of the spade and bullet connectors. They are specifically designed as quick disconnect terminals. However, if you keep plugging and unplugging them repeatedly, the friction fit will eventually weaken, so keep an eye on how tight that connection feels after many uses.

### Q Are butt connectors reversible, or do the wires have to go in a certain way?

A Butt connectors are fully reversible; they don't have a polarity. You insert the stripped end of the first wire into one side and the stripped end of the second wire into the other side, meeting in the middle. The key is to make two separate, secure crimps one on each wire to guarantee the splice is strong and reliable.