

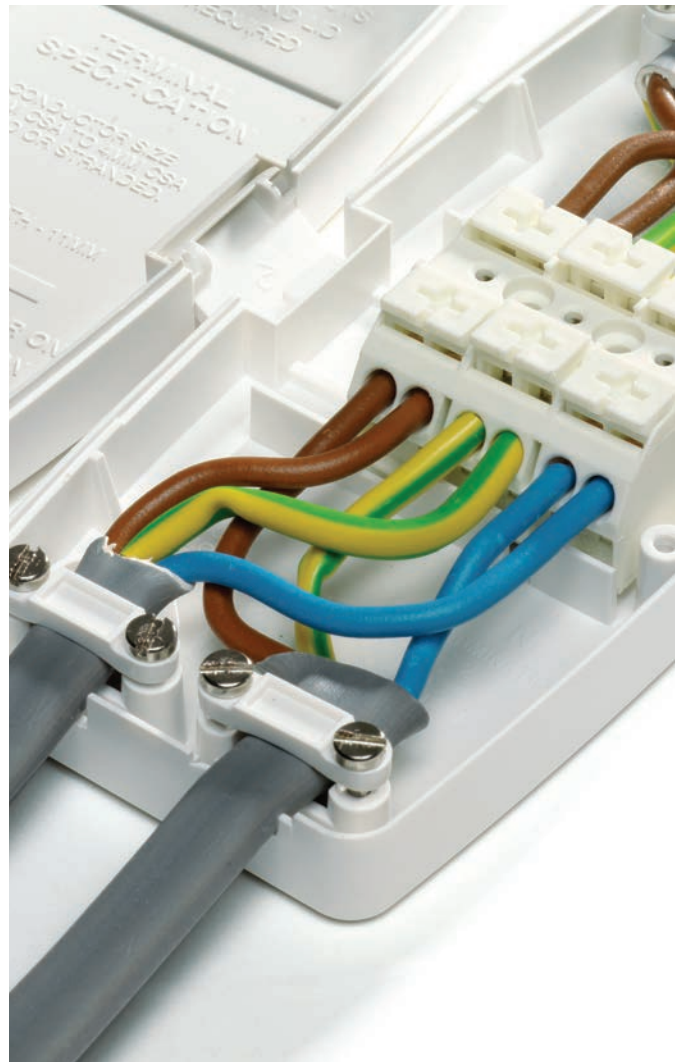
Accessibility of connections and maintenance-free junction boxes

The introduction of maintenance free junction boxes was a small change made in the last Amendment but it is likely to have the most practical results.

By Paul Cook

Amendment No 1

One of the smaller changes made by Amendment No 1 was the introduction of maintenance free junction boxes. Item (vi) was added to regulation 526.3:



526.3 Every connection shall be accessible for inspection, testing and maintenance except for the following:

- (i) A joint designed to be buried in the ground
- (ii) A compound-filled or encapsulated joint
- (iii) A connection between a cold tail and the heating element as in ceiling heating, floor heating or a trace heating system
- (iv) A joint made by welding, soldering, brazing or appropriate compression tool
- (v) Joints or connections made in equipment by the manufacturer of the product and not intended to be inspected or maintained

(vi) Equipment complying with BS 5733 for maintenance-free accessory and marked with the symbol  and installed in accordance with the manufacturer's instructions.

This amendment allows junction boxes complying with the maintenance free requirements of BS 5733 as well as the general requirements of BS 5733 to be installed in inaccessible positions.

There has always been much debate as to when a junction box is accessible. Is it accessible when installed under floorboards, is a trap necessary, is a screwed down floorboard acceptable? Do fitted carpets make any difference? And the big

problem, who will know where it is and what maintenance is required, and when it should be carried out.

Of course it is preferable if all junction boxes are accessible; however this amendment does

provide a solution to those difficult and unavoidable situations where a junction box is inaccessible and will avoid disputes.

So what are the requirements of BS 5733 for maintenance free accessory?

BS 5733

BS 5733 is the standard for accessories it has the title: General requirements for electrical accessories –Specification

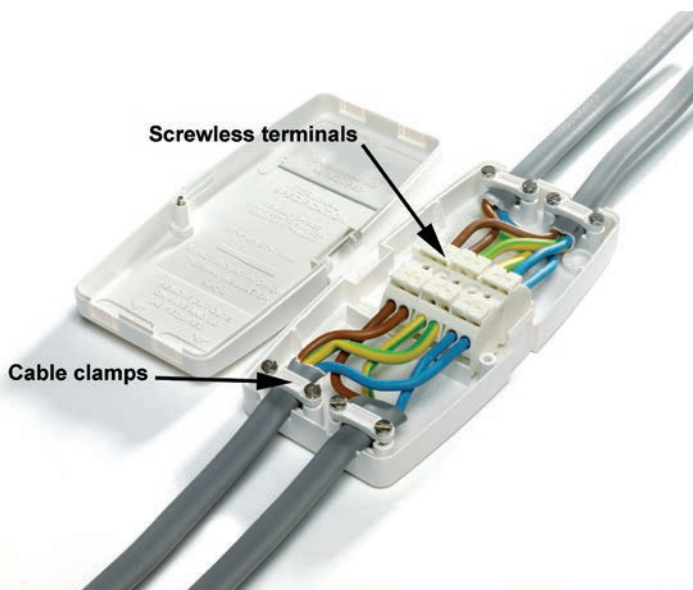
Changes made to the 2010 edition of the standard include requirements for maintenance-free accessories.

A maintenance free accessory is defined in the standard as

An accessory which does not require further inspection, testing or maintenance after installation in a circuit, and which incorporates screwless terminals and cable clamps to secure any associated cables

It is to be noted that as well as requiring screwless terminals for maintenance free accessories the standard also requires cable clamps to secure the cables in the accessory, see the figure.

Maintenance free junction box



The standard has particular test requirements for the terminals in order to determine whether they are maintenance free. The standard requires:

- 14.5.2 Terminals shall have long-term connection capability.
- 14.5.3 Terminals shall be resistant to the effects of vibration.
- 14.5.4 Terminals shall withstand the effects of overloads and shall not cause ignition or damage to the mounting surface.
- 14.5.5 Terminals shall be sufficiently resilient to the effects of thermal shock.

There are tests and inspections specified that the test samples must pass. ►

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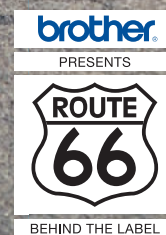


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What to look for

BS7671 also required junction boxes to meet the requirements of BS EN 60670-22: **Particular requirements for connecting boxes and enclosures.**

When buying junction boxes you will need to look for marking to indicate compliance with both BSEN 60670-22 and BS 5733, plus the CE mark -- a statement by the manufacturer that the accessory meets all relevant European directives



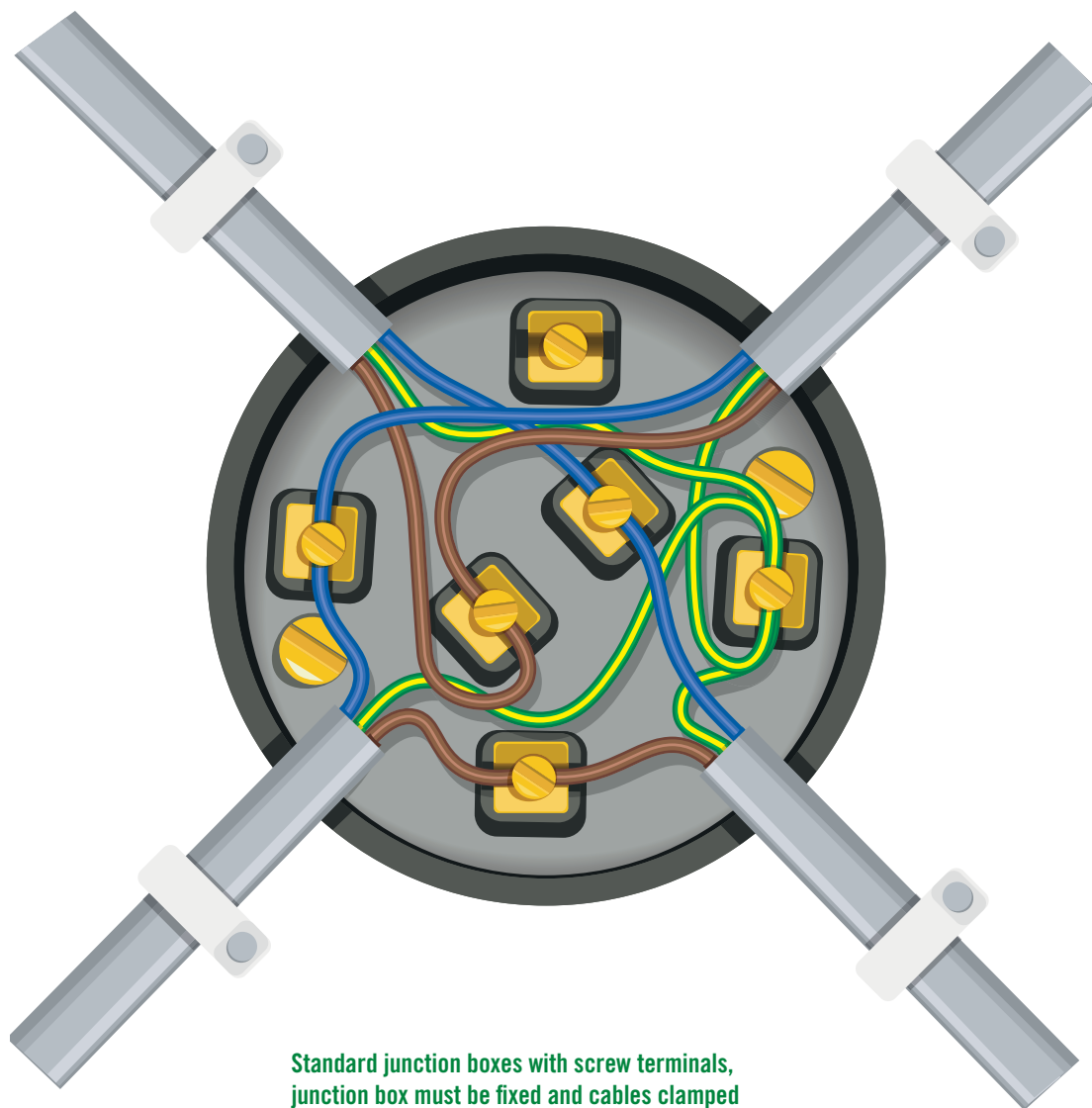
and of course not forgetting the mark to indicate the accessory is **Maintenance Free**:

The buyer will also need to confirm from the manufacturer's catalogue that the box is suitable for the cables to be connected e.g.

- a) rigid (solid or stranded) copper conductors only;
- b) flexible copper conductors only; or
- c) both rigid (solid or stranded) and flexible copper conductors

Good practice

When carrying out an electrical installation, accessories including junction boxes should not be installed in inaccessible positions, and for new installations this can be a firm objective. However when carrying out additions and alterations as well as rewires maintenance free junction boxes



Standard junction boxes with screw terminals, junction box must be fixed and cables clamped

are going to be of great use.

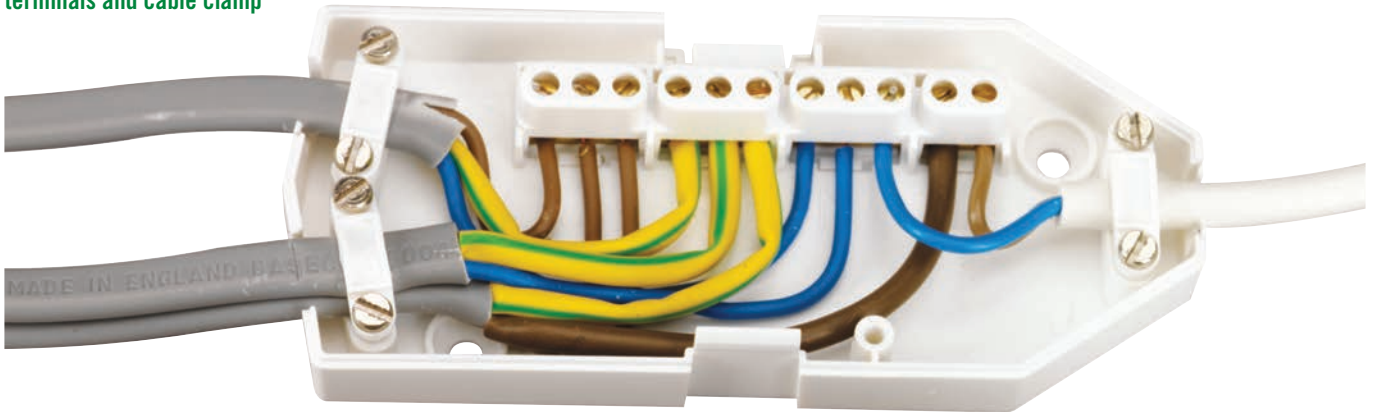
Junction boxes with screw terminals are still going to be used. They can be used where they are accessible for maintenance inspection and repair. As standard junction

boxes have no cable clamps this means the box must be screwed down and the cables fixed to prevent strain on the connections.

Care must be taken with the connectors particularly with

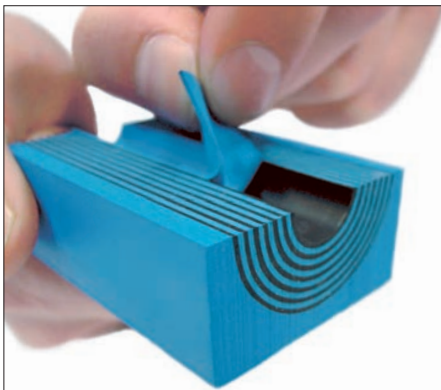
stranded cables to ensure all the strands are clamped in the connector. If it is not going to be possible to clamp the cables then to comply with regulation 522.8.5 junction boxes incorporating a cable clamp must be used.

Junction box with screw terminals and cable clamp

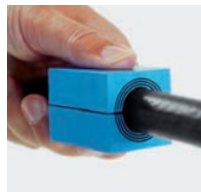


522.8.5 Every cable or conductor shall be supported in such a way that it is not exposed to undue mechanical strain and so that there is no appreciable mechanical strain on the terminations of the conductors, account being taken of mechanical strain imposed by the weight of the cable or conductor itself.

There are a range of such connecting boxes, some particularly designed for connecting luminaires. ■



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