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Requirements for Electrical Installations

IET Wiring Regulations
Eighteenth Edition



BS 7671:2018+A1

By: Geoff Cronshaw

Amendment 1 of BS 7671:2018 was published at the beginning of February this year and may be implemented immediately. The - amendment concerns Section 722 of BS 7671:2018 (electric vehicle charging installations). In this article, we give a brief overview of some of the main changes to Section 722.

Protection against electric shock

Regulation 722.411.4.1 concerning the use of protective multiple earthing (PME) supply has been redrafted. Indent (iii) has been fully revised. In addition, Regulation 722.411.4.1 now includes an additional indent (iv) to cover single-phase installations and a further additional indent (v) has been added. Regulation 722.411.4.1 does not allow PME to be used to supply an electric vehicle (EV) charging point located outdoors (or that might be used to charge a vehicle located outdoors) unless you meet (i) or (ii) or (iii) or (iv) or (v) of 722.411.4.1.

A summary of the requirements of the indents to Regulation 722.411.4.1 is as follows.

Regulation 722.411.4.1(i) refers to a situation where a connecting point is supplied from a three-phase installation used to supply loads other than charging points and where the load is sufficiently well balanced.

Regulation 722.411.4.1(ii) requires a very low resistance earth electrode to mitigate the effects of an open-circuit (PEN) conductor fault on the supply.

Regulation 722.411.4.1 (iii) has been revised and refers to a voltage monitoring device (or functionality within the charging equipment) that detects PEN conductor failure. The informative Annex to Section 722 describes that suitable arrangements include measurement of the voltage between either:

- (a) the circuit protective conductor (CPC) and a suitable measurement earth electrode;
or
- (b) the CPC and a reference point derived from the line conductors of a three-phase system, provided that suitable precautions are also taken to disconnect the device when the supply to one or more of the line conductors is interrupted.

Regulation 722.411.4.1 now includes an additional new indent (iv) to cover protection by a device (or functionality within the charging equipment) for a single-phase installation.

Finally, Regulation 722.411.4.1 includes an additional new indent (v), which allows protection against electric shock to be provided by the use of an alternative device to those in (iii) or (iv), providing that it does not result in a lesser degree of safety than using (iii) or (iv). The indent states that equivalent means of functionality could be included within the charging equipment.

The touch voltage threshold of 70 V mentioned in Regulation 722.411.4.1 is on the basis that Table 2c (Ventricular fibrillation for alternating current 50/60 Hz) of IEC 60479-5{ed1.0} gives a value of 71 V for both-hands-to-feet, in water-wet conditions with medium contact area (12.5 cm²).

Regulation 722.411.4.1 includes some important notes. Note 5 explains that BS 7671 does not deal with the safety requirements for the construction of electrical equipment. Where equipment to be used is not covered by a British or Harmonized Standard, the electrical installation designer should establish that the manufacturer of the equipment has ensured that the equipment satisfies the safety objectives of the relevant directive(s).

Note 6 states that creating a TT earthing system for charging equipment or for the whole installation, as an alternative to using a PME earthing facility with one of methods (i) to (v) above, may not be an appropriate solution, due to the inability to provide sufficient separation from buried metalwork connected to the supply PEN conductor.

What is protective multiple earthing (PME)?

The Electricity Safety, Quality and Continuity Regulations 2002 (ESQCR) (as amended) permit the distributor to combine neutral and protective functions in a single conductor, provided that (in addition to the neutral to Earth connection at the supply transformer) there are one or more other connections with Earth. The supply neutral may then be used to connect the CPCs of the customer's installation with Earth if the customer's installation meets the requirements of BS 7671.

PME has been almost universally adopted by distributors in the UK as an effective and reliable method of providing their customers with an earth connection. Such a supply system is described in BS 7671 as TN-C-S. However, whilst a PME terminal provides an effective and reliable facility for the majority of installations, under certain supply system fault conditions (external to the installation), a potential can develop between the conductive parts connected to the PME earth terminal and the general mass of Earth.

The potential difference between true Earth and the PME earth terminal is of importance when:

- (a) body contact resistance is low (little clothing, damp/wet conditions); and/or
- (b) there is relatively good contact with true Earth.

Contact with Earth is always possible outside a building and, if exposed-conductive-parts and/or extraneous-conductive-parts connected to the PME earth terminal are accessible outside the building, people may be subjected to a voltage difference appearing between these parts and Earth.

Residual current device (RCD) protection

The requirements for RCD protection have been redrafted. The Regulation now contains further requirements for Type B and Type A or Type F RCDs, to take account of DC fault current, as follows (extract below):

“Except where provided by the EV charging equipment, protection against DC fault currents shall be provided by:

- (i) an RCD Type B; or*
- (ii) an RCD Type A or Type F in conjunction with a residual direct current detecting device (RDC-DD) complying with BS IEC 62955 as appropriate to the nature of the residual and superimposed currents and recommendation of the manufacturer of the charging equipment.”*

ANNEX A722 (Informative)

Annex A722 has been redrafted. This Annex now includes guidance on the voltage monitoring device described in Regulation 722.411.4.1 (iii). In addition, the Annex now includes an example arrangement of a separated system as described in Regulation 722.413.

Conclusion

It is important to note that this article gives only a very brief overview of some of the changes in the Amendment to BS 7671:2018. For more information, please refer to BS 7671:2018, Amendment 1:2020.

The Electrotechnical Assessment Specification – January 2020 Edition

By Steven Devine – IET representative on the EAS Management Committee and Leon Markwell - IET Secretary of the EAS Management Committee

1.0 Introduction

The Electrotechnical Assessment Specification (EAS) Management Committee is made up of a wide range of experts who are passionate about the electrotechnical industry. It includes representatives from the competent person scheme providers, certification and registration bodies, industry trade associations, the Ministry of Housing, Communities and Local Government, the Health and Safety Executive, Electrical Safety First and the IET (which also provides administrative support to the committee).

The primary purpose of the committee is to develop a framework to set minimum criteria for applicants when applying for various levels of registration with certification and registration bodies. The committee develops the scheme requirements necessary to carry out electrotechnical work in accordance with relevant regulations and Standards and prepares the EAS document.

The committee has been managed by the IET since 2005 and with the increasing number of opportunities for persons to become experienced and qualified in the electrotechnical sector of the construction industry, has become very active in recent years.

In developing the EAS document, committee members, with their wealth of experience in the sector, consider all aspects of the industry, including changes in the qualifications structure and delivery, government policy and legislation, employers' needs and concerns and the way that the industry is evolving in general. This is a long and difficult process in an ever-changing industry and the work of the members is to be commended by all who are as passionate as they are about the electrotechnical industry.

2.0 A new document

The EAS Committee has recently published a new edition of the EAS (dated January 2020), to replace the existing 2015 version. The new and existing documents can be downloaded from the IET website at <https://electrical.theiet.org/bs-7671/building-regulations/electrotechnical-assessment-specification/>.

The EAS is the industry-recognized specification used by certification and registration bodies authorized to undertake the assessment of enterprises carrying out electrical installation work in England, Wales, Scotland, Northern Ireland, the Channel Islands and the Isle of Man. It sets clear minimum technical competence and enterprise requirements and specifies everything from acceptable qualifications and experience to surveillance and personnel requirements. Enterprises (businesses undertaking electrotechnical work) can be certificated for a range of work categories, for example, limited to work in dwellings or certificated for work in all buildings and industrial locations.

This new version of the EAS provides requirements for the demonstration of competence of employed operatives doing electrical work, recognizing that the requirement for competence is not limited to qualified supervisors alone.

The EAS sets out the minimum requirements to be met by an enterprise in order to be recognized by a certification or registration body as technically competent to undertake the design, construction, maintenance, verification and/or inspection and testing of the work categories listed in the specification. Certification and registration bodies will develop their own scheme requirements around the minimum criteria set out in this specification. The enterprise, not the certification or registration body, has the responsibility of fulfilling all requirements for certification or registration. The certification or registration body is responsible for obtaining sufficient objective evidence upon which to base certification or registration against this specification.

The enterprise must employ persons to carry out electrotechnical work who are competent and/or adequately supervised, to ensure safety during and on completion of the work. The enterprise must demonstrate that all employees are competent and/or adequately supervised to undertake their work by making available suitable records for audit by the certification or registration body.

A '**Competent Person**' is defined in the EAS as a person who possesses the necessary technical knowledge, skill and experience to undertake assigned electrotechnical work and to prevent danger and injury.

A '**Qualified Supervisor**' is to have direct responsibility, on a day to day basis, for the safety, quality and technical standard of the electrotechnical work carried out by the enterprise.

The electrotechnical work categories identified in the EAS are based on the current edition of BS 7671. Other electrotechnical work categories, such as fire alarms (BS 5839), emergency lighting (BS 5266), temporary electrical systems (BS 7909) and data cabling (BS 6701), are not excluded, but such work would require the development of further education, training and practical skills requirements and specialist competence assessments not currently included in the EAS.

3.0 The main changes in the EAS

This EAS is intended for use by certification and registration bodies undertaking the assessment of enterprises carrying out electrotechnical work and has introduced minimum technical competence criteria for carrying out periodic electrical inspection and testing. The publication of this revised EAS supports the Electrical Safety Standards in the Private Rented Sector (England) Regulations 2020, which are before Parliament and aim to ensure that all privately rented properties in England meet minimum electrical safety standards.

The January 2020 EAS comes into effect from 1st September 2020, but can be used by certification and registration bodies voluntarily before that date.

The EAS describes:

- the minimum requirements for an enterprise (for example, a contractor) to be recognized by a certification body as competent to undertake electrotechnical work. It includes the minimum technical competence requirements for enterprises to be considered competent to carry out electrical installation work in dwellings in

accordance with Part P of the Building Regulations in England and Wales, and the equivalent building warrant requirements in Scotland.

- the competence requirements for registered qualified supervisors and electrical inspectors.
- requirements for compliance with the Scottish Building Standards.
- interpretation of the general requirements for bodies operating product certification (including process and service) schemes to ISO/IEC17065.

For the new edition of the EAS:

- the Definitions have been updated and new definitions introduced.
- Clause 12.2 has introduced a requirement for professional indemnity insurance where the scope of an enterprise's assessment certificate includes work category A.2, as defined in Appendix 1 of the EAS.
- Section 16 has been expanded regarding the records required to be held by an assessed enterprise.
- Appendix 1 has been expanded to include new categories of electrotechnical work regarding periodic inspection and testing.
- Appendix 4 has been updated and renamed. Appendix 4A specifies requirements valid from 1st September 2020 to 31st August 2021. Appendix 4B specifies requirements valid from 1st September 2021. Both sections now specify the requirements for persons undertaking periodic inspection and testing work.
- Appendix 11 has been added to provide guidance for demonstrating the competence of employed persons.

Appendix 4 of the EAS sets out the minimum requirements in terms of adequate education, training and practical skills required when:

- applying to be a qualified supervisor through a certification or registration body;
- applying as an individual to undertake periodic inspection and testing for an enterprise through a registration or certification body.

4.0 Future proposals

Appendix 4 now consists of two sections, with new requirements coming in on 1st September 2021:

- **Appendix 4A:** gives qualification, training and experience requirements for qualified supervisors and persons carrying out electrical inspection and testing. It is valid from 1st September 2020 until 31st August 2021 for applications to certification or registration bodies.
- **Appendix 4B:** the change to Appendix 4 from 4A to 4B is to simplify the entry criteria for applicant qualified supervisors and electrical inspectors from 1st September 2021. Requirements for qualified supervisors and those carrying out electrical inspection and testing are valid from 1st September 2021 for applications to certification or registration bodies.

From 1st September 2021, certification and registration bodies will not accept applications based on Tables 4A, 4B and 4C of Appendix 4A.

The current Appendix 4A has a number of routes, including auditable evidence routes, which have not been consistently applied. By introducing Appendix 4B and the associated EAS Qualification Guide, applicants that do not hold formal 'craft qualifications' will be able to be directed down the mature candidate assessment route, with recognition of prior experience and learning (RPEL). This means that each applicant applying to a certification or registration body for assessment will have a suitable electrotechnical qualification or will have been assessed in the previous two years as a qualified supervisor.

Some industry commentators have proposed that a Private Rented Sector (PRS) electrical testing competent person's scheme should be set up, which would be separate from the existing Building Regulations competent person's scheme. They have proposed that the Ministry of Housing, Communities and Local Government should commission the EAS Management Committee to consider the most effective method of recognizing 'competent PRS testers' to carry out electrical inspections and tests. Whilst the Management Committee would be pleased to assist, they maintain that any defining recognition of separate competent person schemes would not, perhaps, be helpful.

5.0 Acknowledgement

The IET would like to thank the staff of the trade associations, the competent person scheme providers and the certification and registration bodies who gave their knowledge, experience and time to the production of this document.

Mythbuster #5 – Will any old terminal block do?

In this issue, James Eade investigates terminals and connectors.

Nearly every electrical installation will need to join conductors of different parts of a circuit, typically by using a connector of some type, such as a terminal block, DIN rail terminal, junction box or similar. A common type of connector is the 'choc block' terminal strip, but more recently connectors using spring clamps to hold wires firmly are becoming common. While no competent electrician would wrap wires together and cover them with insulating tape (though it does happen!), is it actually acceptable to use any old terminal for an electrical connection?

As befits a Standard with such a pedigree as BS 7671, there are requirements for electrical connections, just as there were in the 1st Edition, back in 1882. As it happens, back then the jointing of conductors *was* an exercise in wrapping wires together in a rather elegant fashion, but of course, technology has moved on since and Regulation group 526 of BS 7671:2018 is where the relevant requirements are now detailed. While there is the obvious need to ensure that the connections between conductors are electrically and mechanically sound (Regulation 526.1), there are a few requirements that are often overlooked.

Regulation 526.2 requires that the selection of the means of connection should take into account the following:

- i. the material of the conductor and its insulation
- ii. the number and shape of the wires forming the conductor
- iii. the cross-sectional area of the conductor
- iv. the number of conductors to be connected together
- v. the temperature attained at the terminals in normal service such that the effectiveness of the insulation of the conductors connected to them is not impaired
- vi. the provision of adequate locking arrangements in situations subject to vibration or thermal cycling. Where a soldered connection is used, the design shall take account of creep, mechanical stress and temperature rise under fault conditions.

The materials used for the conductor and terminal are quite an important consideration, which is often overlooked. Where dissimilar metals are used, galvanic corrosion can occur giving rise to high impedances. This can not only impair the effectiveness of protection of a circuit, but can cause issues around the requirements for electromagnetic compatibility (Section 444), as poor joints may exhibit higher impedances at higher frequencies. Such poor joints can even cause interference if conductors are part of circuits where high frequencies are present, due to the 'rusty bolt effect', as well as creating noise voltages to which sensitive circuits may be susceptible.¹

The thermal aspects are another consideration in selecting an appropriate terminal. Firstly, Regulation 526.4 requires that the means of connection (and its insulation) must be rated for the maximum operating temperature of the conductor, the values of which are given for different cables in the appropriate tables in Appendix 4. Secondly, the insulation around the connection should be non-flame propagating, and Regulation 526.5 requires terminations and joints to be within a suitable

¹ See https://en.wikipedia.org/wiki/Rusty_bolt_effect for a brief description. Requirements for protective bonding co-ordination for electromagnetic interference (EMI) are contained in BS EN 50310:2016 *Telecommunications bonding networks for buildings and other structures*.

accessory or enclosure. This is important for reasons of mechanical protection, as well as for electrical insulation of the connections. When the inner cores of a cable are jointed (for example, in a terminal or spliced), the protection afforded by the sheath has been removed and needs to be replaced to provide electrical and mechanical protection. It is therefore possible to use maintenance-free joints that will not require access for inspecting or maintenance, but the joint(s) should be contained in a suitable, mechanically robust and suitably insulated enclosure – in other words, not PVC tape!

Regulation 526.3 is perhaps better known – it's the regulation that states that connections should be accessible for inspection, testing and maintenance, save for some exceptions, such as buried, soldered or welded joints. An exception is also made for connections made by an 'appropriate compression tool', which may, for example, include crimped splices. It's very tempting to use pliers to crimp many joints, but it is important to ensure that the correct pressure is applied uniformly, so the use of a proper ratchet crimp tool is appropriate to ensure a reliable maintenance-free joint.

An often raised question concerns what to do with the termination of finely stranded conductors, such as in flexible cables in light fittings or plugs/sockets. Regulation 526.9 deals with these and notes that in order to avoid separation or spreading of fine strands, 'suitable terminals shall be used or the conductor ends shall be suitably treated'. A suitable terminal could be a rising-clamp style terminal that compresses the conductor against flat surfaces, or a push-fit spring-loaded clamp that holds all the strands tight.

A 'suitable treatment' for a stranded conductor is commonly the bootlace ferrule, a funnel-mouthed thin-walled metal tube that is crimped over the conductor to hold the strands in place. These are a useful method of ensuring a good joint in connections relying on screws to clamp the conductor in place, such as in a ceiling rose. Again, the use of an appropriate crimp tool is required, as the ferrule should be crimped over the conductor before insertion in the terminal; the pressure from the screw should not be used to 'crimp' the tube.

In the old days, soldering (tinning) of the whole conductor end of stranded wires was common. Nowadays, this is not permitted if screw terminals are used, because the solder can 'cold flow' around the screw head, resulting, over time, in a loose joint.



A selection of stranded wire 'treatments', such as crimp joints and both insulated and uninsulated bootlace ferrules.

Interestingly, there are Standards for such connections. BS EN 60947-7-1 *Low-voltage switchgear and controlgear. Ancillary equipment. Terminal blocks for copper conductors* has requirements for the construction of terminals, while BS EN 60998 *Connecting devices for low-voltage circuits for household and similar purposes* covers connection units such as the traditional round lighting junction blocks.

There are other related Standards, such as BS 5733 *General requirements for electrical accessories*, which has requirements for maintenance-free connections (for example, spring-loaded terminals) and BS EN 60670-22, which is the Standard for connection boxes required where two or more circuits are terminated in a single junction (Regulation 521.8.3).

Product Standards are there for a reason, namely, to ensure that products will perform as expected and, as required, afford an appropriate level of safety. The lack of application of Standards to choc-block terminal strips, for example, is illustrated by the following comment on the IET Forum:

“I’ve had problems with the quality of 5A connectors where the tunnel splits as you tighten the screw.”

A terminal made to a suitable Standard should not fail when tightened appropriately, but if there is no Standard for aspects such as the material metallurgy, the thickness of the wall or other dimensions, then it is not unexpected that the more unscrupulous manufacturers will save costs by using less material, with the results that the forum member has found.



A selection of readily available connecting terminals for the jointing of circuits. Not all are compliant with appropriate Standards

For these reasons, it is important to ensure that wiring and accessories are demonstrably safe and compliance with Standards is the most established method of proving as much. In the Common Rules for selection and erection of equipment (Chapter 51), Regulation 511.1 requires that:

Every item of equipment shall comply with the relevant requirements of the applicable British or Harmonized Standard, appropriate to the intended use of the equipment. The edition of the standard shall be the current edition, with those amendments pertaining at a date to be agreed by the parties to the contract concerned (see Appendix 1).

Alternatively, if equipment complying with a foreign national standard based on an IEC Standard is to be used, the designer or other person responsible for specifying the installation

shall verify that any differences between that standard and the corresponding British or Harmonized Standard will not result in a lesser degree of safety than that afforded by compliance with the British or Harmonized Standard. Such use shall be recorded on the appropriate electrical certification specified in Part 6.

Perhaps the last word should go to Regulation 133.1.3 – one of the Fundamental Principles contained in Chapter 13 which is summarised as follows:

Where equipment to be used is not [covered by a British or Harmonized Standard] or is to be used outside the scope of its standard, the designer or other person responsible for specifying the installation shall confirm that the equipment provides at least the same degree of safety as that afforded by compliance.

So, will any old joint do? Clearly not – choose your connectors wisely!

The Electrical Safety Standards in the Private Rented Sector (England) Regulations 2020

By Michael Peace



What are the Electrical Safety Standards in the Private Rented Sector (England) Regulations 2020?

Between 17th February and 16th April 2018, the government invited comments on the Electrical Safety Standards Working Group's decision to make a recommendation to introduce mandatory inspection and testing for private rented properties.

The full response to the consultation can be found on the [government website](#). There was strong support for the recommendation, and on 19th July 2018 it was announced that electrical inspection and testing in the private rented sector would become mandatory.

On 29th January 2019 it was announced by the then Housing Minister, Heather Wheeler MP, that legislation would be brought in to provide enhanced safety for people living in rented accommodation.

The Electrical Safety Standards in the Private Rented Sector (England) Regulations 2020 place an obligation on private landlords to ensure that electrical installations in the private rented sector are safe for continued use by checking compliance with the relevant electrical safety Standards.

On 12th January 2020 the government laid in Parliament [The Electrical Safety Standards in the Private Rented Sector \(England\) Regulations 2020](#) (hereafter referred to as the Electrical Safety Regulations 2020). The draft legislation still requires approval from the House of Commons and the House of Lords, but it is intended that the new regulations will come into force on 1st June 2020 and will apply to England only.

To whom do these regulations apply?

The regulations apply to private landlords for all new specified tenancies from 1st July 2020 and all existing tenancies from 1st April 2021. An 'existing specified tenancy' means a tenancy for a specified period of time that was granted **before** the regulations come into force, whereas a 'new specified tenancy' means a tenancy specified for a period of time granted **on** or **after** these regulations come into force.

In the UK, any property that is privately owned and being rented out as housing is classified as Private Rented Sector housing and the owner is considered to be the landlord. This includes houses in multiple occupation (HMOs), with the new regulations replacing the existing requirements for electrical testing of HMOs. A house is considered to be an HMO when it has at least three tenants forming more than one household, with the tenants sharing a toilet, bathroom or kitchen with the other tenants.

Do the Electrical Safety Regulations 2020 apply to all tenancies?

There are some tenancies that are excluded from the scope of the new regulations.

These include:

- private registered providers of social housing;
- shared accommodation with the landlord or landlord's family;
- long leases, i.e. longer than seven years;
- student halls of residence;
- hostels;
- refuges;
- care homes;
- hospitals;
- hospices;
- other accommodation relating to healthcare provision.

What is required under the new legislation?

Under the new regulations, private landlords are required to ensure that:

- the electrical safety standards are met during any period when the residential premises are occupied under a specified tenancy; and
- every electrical installation is inspected and tested at regular intervals by a suitably qualified person (regular intervals means at intervals of no more than five years).

What is electrical safety?

Throughout the new regulations, the term 'electrical safety standards' is cited. This means the standards for electrical installations and, more specifically, refers to the 18th Edition of the IET Wiring Regulations, [BS 7671:2018](#).

BS 7671:2018 – in particular, Chapter 65 – sets out the requirements for periodic inspection and testing. The purpose of inspection and testing is to determine if the electrical installation is safe for continued use.

Who can carry out inspection and testing?

It's important that the person carrying out the inspection and testing is competent to do so. The term 'qualified person' is used throughout the new regulations to define a person who is competent to undertake the inspection and testing and any subsequent remedial works.

Carrying out an inspection of electrical installations is a complex task that requires an extra level of qualification and competency, beyond the standard four-year vocational route commonly followed by qualified inspectors and testers. The government, in conjunction with industry experts, will develop new guidance for landlords stipulating who can carry out the mandatory electrical installation checks.

What is the extent of the inspection and testing?

Regulation 3(1)(b) of the Electrical Safety Regulations 2020 states that every electrical installation in the residential premises is to be inspected and tested at regular intervals. But what is covered by the term 'electrical installation'?

While the term is not defined within the new regulations, it refers to the definition within the Building Regulations 2010 for England and Wales, which defines an 'electrical installation' as *'fixed electrical cables or fixed electrical equipment located on the consumer's side of the electricity supply meter.'*

The wording suggests that the distributors and supplier's equipment is not part of the inspection and testing. However, this does not align with BS 7671:2018+A1:2020.

The equipment at the intake position is owned by the distributor, with the meter, meter tails and isolator (where present) belonging to the supplier. However, as part of the inspection process, BS 7671:2018+A1:2020 requires the inspector to carry out a visual inspection of the external condition of the distributor's equipment.

Examples of distributor's equipment requiring inspection include:

- service cable;
- service head;
- earthing arrangements;
- meter tails;
- metering equipment; and
- isolators (where present).

The equipment should be inspected for signs of exposed live parts, damage or evidence of overheating. If a defect is observed, the person ordering the report should be informed immediately, as well as in writing. It is the responsibility of the person ordering the report to inform the distribution network operator (DNO) or supplier.

What is electrical equipment?

In a domestic installation, permanently connected fixed current-using equipment, such as hobs, ovens, showers, extractor fans and luminaires, is covered by the inspection and testing process.

Portable appliances that are typically supplied by a plug and socket are not part of the fixed wiring inspection and testing process. However, this does not mean that they do not require user checks or inspection and testing.

Limitations?

If the inspector cannot carry out all necessary inspection and testing, for example, permission to switch off the entire installation to facilitate the measurement of external earth fault loop impedance (Z_e) was not granted, will be recorded on the report as a limitation. It should be remembered that any recorded limitation will dilute the report. Inspection and testing will be incomplete, and deficiencies may be not be discovered if access to certain areas or the ability to carry out particular tests is prevented.

When does the inspection and testing need to be carried out?

The electrical installation must be deemed safe for continued use before the tenancy commences, from 1st July 2020. If the installation is already covered by an existing Electrical Installation Certificate (EIC) or an Electrical Installation Condition Report (EICR) that was issued before the new Regulations came into force, there is no need for it to be inspected and tested again. The next re-test date will be stated on the certificate or report.

When will the electrical installation need inspection and testing again?

The new regulations require the electrical installation to be inspected and tested at intervals not exceeding five years. However, this interval may be reduced by the inspector if he or she has any concerns regarding the installation. As per the requirements of BS 7671:2018+A1:2020, the frequency of periodic inspection and testing of an electrical installation shall be determined with regard to the:

- type of installation and equipment;
- use and operation of the installation and equipment;
- frequency and quality of maintenance; and
- external influences to which the installation or equipment may be subjected.

Electrical Installation Condition Reports

Following the inspection and testing, the inspector is required to complete an EICR to detail the results of testing and any observations apparent at the time. The report will also indicate the due date for the next inspection.

A copy of the report should be provided to the landlord. The landlord must supply a copy of the report to each existing tenant within 28 days of the inspection.

If the report is requested from a local housing authority, this should be supplied within seven days of receiving a request in writing from that authority.

Any observations noted by the inspector during the inspection and testing will be recorded on the report and a classification code according to the degree of urgency will be attributed.

Guidance on classification codes can be found in the [IET On-Site Guide](#) and [Best Practice Guide \(BPG\) 4](#) on the [Electrical Safety First](#) (ESF) website. Some trade associations also provide guidance on the coding of observations made during EICR inspections.

Model EICR forms for reporting on the condition of an existing electrical installation can be found in Appendix 6 of BS 7671:2018+AMD1:2020. These can be downloaded from the [IET website](#). Further guidance on inspection and testing can be found in [IET Guidance Note 3 Inspection & Testing](#). Guidance on maintaining electrical equipment can be found in [IET Code of Practice for In-service Inspection and Testing of Electrical Equipment](#).

What is urgent remedial action?

Part 4 of the Electrical Safety Regulations 2020 sets out the requirements for 'urgent remedial action'. This is defined as '*action identified in a report under regulation 3(3) as is immediately necessary in order to remove the danger present and risk of injury.*'

If an item is discovered that is immediately dangerous, a classification code C1 should be issued.

The person ordering the report is to be advised immediately that immediate action is required (or preferably, has been taken) to remove the danger. This is to be followed up in writing before the report is issued.

The inspector must discharge his or her duty under the [Health and Safety at Work etc Act 1974](#) and the [Electricity at Work Regulations 1989](#).

What is remedial action?

Part 3 of the Electrical Safety Regulations 2020 sets out the requirements for remedial action, which is generally required for observations that have been attributed a C2 classification code. A C2 classification code means potentially dangerous and urgent action is required. Items with a C2 code are required to be rectified within 28 days.

What is the outcome of inspection and testing?

If any items are identified that have been attributed either a C1 or C2 classification code, the report will result in an **unsatisfactory outcome**. Any observations that result in an unsatisfactory outcome will require remedial works to rectify the issue.

Items where improvement is recommended (C3) will be noted, but will not result in an unsatisfactory outcome on the report. These are items generally considered not to conform with the current edition of the IET Wiring Regulations, but which are not considered to be unsafe. These items do not necessarily require remedial works.

Who is responsible for enforcement of the new regulations?

Local authorities (LAs) are required to enforce the new legislation and can impose a fine of up to £30,000 for a breach of the regulations. Where there are multiple breaches, the LA can impose multiple penalties.

What if remedial action is not completed?

If the LA has reason to believe that a private landlord is in breach of the Regulations, the authority must serve a remedial notice. If the private landlord is considered to have failed to have taken all reasonable steps to complete the remedial works, as required in the new regulations within 28 days, the LA has the power to enter the premises and arrange for an authorized person to complete the remedial works.

For works that are considered urgent, the LA may arrange remedial action at any time, with consent from the tenants. Any costs incurred by the LA will be recovered from the private landlord and will be payable within 21 days of the demand.

What happens when remedial work is completed?

Following completion of the remedial works, a Minor Electrical Installation Works Certificate (MEIWC) or EIC will be issued, depending on the nature of the remedial works. This should be kept with the EICR and any other documentation to demonstrate compliance with BS 7671:2018 and to provide a history of the electrical installation that will be useful for future inspections.

A new EICR with a 'satisfactory' outcome will not be issued by the contractor unless specifically requested, which is likely to incur an additional charge.

The landlord should obtain and issue the certificate for remedial works to each affected tenant within 28 days of completion of the remedial works.

The combination of the original unsatisfactory report and the subsequent installation certificates covering the remedial work is adequate to demonstrate compliance with BS 7671:2018+A1:2020.

What happens when specialists are required to complete remedial work?

In some cases, specialist contractors, such as solar photovoltaic (PV) installers, will be required to complete certain elements of remedial works following inspection and testing. The specialist contractor is responsible for issuing their own relevant report and certification to cover their works, which should be kept with all other documentation for the electrical installation.

The requirements under Electricity Safety, Quality and Continuity Regulations (ESQCR) for DNOs are different, and it's unlikely you will receive any documentation from them for their works.

Summary

The new regulations require private landlords to ensure that electrical safety standards are met, providing compliance with BS 7671:2018. The new regulations affect all new specified tenancies from 1st July 2020 and all existing tenancies from 1st April 2021.

It is difficult accurately to estimate the number of private rented properties in England. When the Ministry of Housing, Communities and Local Government carried out the [English Housing Survey \(EHS\) in 2018-19](#), the data released indicated that there were 4.6 million private rented households, accounting for 19% of all households, with this number having almost doubled since 2002.

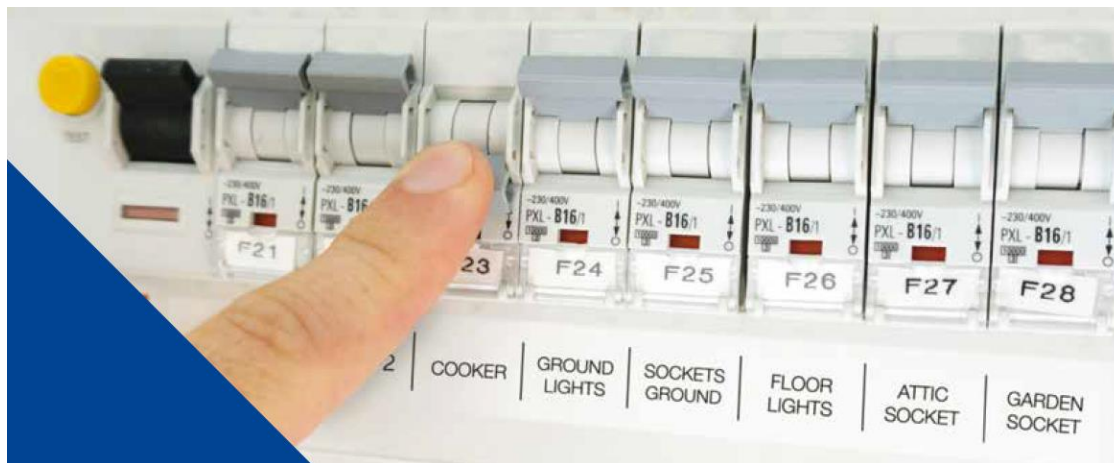
It is important that the person ordering the work ensures that the person carrying out the inspection, testing and any subsequent remedial work is competent to do so. One way of ensuring this is to use electrical contractors and electricians who are registered members of trade associations and self-certification schemes, as they are subjected to regular inspections to ensure they meet the relevant requirements.

In England and Wales some works in domestic properties will be building control notifiable and will need to meet the requirements of [Part P of the Building Regulations](#). On the recommendation of the Building Regulations Advisory Committee (BRAC), the government has approved competent person self-certification schemes to be operated by various organizations. Electricians that register with one of these schemes are able to self-certify compliance with Part P. Further information can be found on the [IET website](#).

Getting important labelling right leaves a lasting impression

What you leave behind after an installation speaks volumes. While electrical labelling is most importantly about safety, it should also be convenient, professional, time-saving, making your life easier and leave a lasting impression with your customers. In fact, it is so important that an entire section of the Requirements for Electrical Installations, IET Wiring Regulations* is dedicated to it.

Section 514*, entitled 'Marking and Identification', provides clear instruction, with label illustrations, that are supported by UK Health and Safety Law. A correctly labelled installation looks more professional and complies with the regulations. The immediate benefit to the customer is easy identification of well-labelled switchgear, that makes circuit isolation and protection both quick and accurate.



Historically label creation has been a time consuming and arduous task. It used to involve a labeller, a pair of scissors, a great deal of wasted tape offcuts and no small amount of frustration to make labels fit distribution boards, sockets, switches, trunking, conduit and equipment. As technology developed things became easier with semi-automated labellers sizing text to fit distribution boards, cables and pattress boxes. Whilst these printing devices made life easier, they tended to demand multi-step button pushing processes to achieve the desired result. So, while you could create and print on-site, for convenience, using earlier electronic labellers would still require more time and effort compared to today's portable label makers.

With correct identification potentially saving injury or, in serious cases, life, the scope of labelling within the Wiring Regulations goes beyond Section 514*. For example, the introduction of the 18th edition*, Section 534.4.1.7, states that the presence of Surge Protection Devices (SPDs) installed downstream of a distribution board (e.g. in a socket-outlet) shall be permanently indicated at, or near, the distribution board. Subsequently the client needs to check the SPD periodically, in a similar fashion to the periodic RCD test, to ensure the device is still effective. Whilst a label is not specifically required by this regulation, an easy, clear and professional way to indicate the periodic check, would be to place a durable label on or near to the board.

Using an intuitive smart-phone app with your labelling device, connected using seamless Bluetooth, allows you to quickly create new labels, store them and recall for future editing and printing. Seeing a life-sized image of the label before printing eliminates extra tape waste, saves time and helps to ensure the label meets current Regulations, whilst also being easy and convenient to complete.

Epson LabelWorks printers have been specifically designed for electrical applications. To find out more visit www.epson.co.uk/labelworks-tco or come along to one of the forthcoming NAPIT Expo events and visit the Epson stand.

*Requirements for Electrical Installations, IET Wiring Regulations 18th Edition BS 7671:2018