



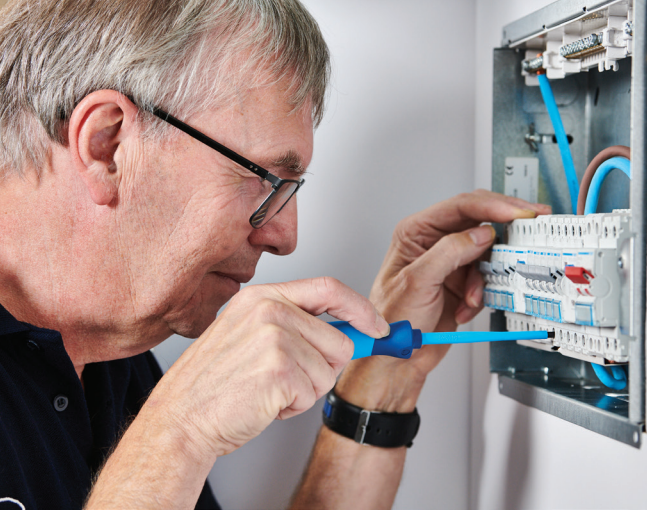
# 18<sup>th</sup> Edition Amendment 2

## Bitesize Guide

Have you got questions regarding the changes to the Wiring Regulations?

We've got you covered in this bitesize guide.

**:hager**



# Introducing

## 18th Edition Amendment 2

### **BS 7671:2018 Amendment 2** was issued 28<sup>th</sup> March 2022.

The Wiring Regulations (**BS 7671**) regularly come under review to ensure all standards are compliant with today's electrical needs.

These reviews may also happen when standards change at an International or European level to ensure technical consistency with the UK.

The general structure of the Wiring Regulations remains unchanged, however, there is now an additional Part 8 on the topic of Functional Requirements of Prosumer's Electrical Installations.

This edition may be implemented immediately however **BS 7671:2018+A1:2020** remains current until it is withdrawn on **27<sup>th</sup> September 2022**.

During this transition period, a designer or installer can use either edition for compliance for their installation. They will, however, have to choose which edition they are working to, as it is not acceptable to mix clauses from the two amendments.

Previously, there was the term 'installations designed after a certain date are to comply to the new edition'. This time, Amendment 1 is withdrawn on **27<sup>th</sup> September 2022** to bring **BS 7671** into line with other British Standards when they are reviewed.

### **Note 1: Completion of an electrical installation designed to the withdrawn standard can be subject to the contractual agreement between all parties involved.**

Existing installations that have been installed in accordance with earlier editions of the Regulations may not fully comply with Amendment 2 requirements. This does not necessarily mean that they are unsafe for continued use or require upgrading. However, work carried out on an existing installation will need to meet the requirements of Amendment 2 after **27<sup>th</sup> September 2022**.

This Bitesize guide covers some of the main changes to this edition.

To understand the full changes please refer to **BS 7671:2018+A2:2022**.

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## RCD protection of socket outlets

**Regulation 411.3.3** referring to RCD protection of socket-outlets up to 32 A has been redrafted and now has three indents for the requirements of RCD protection not exceeding 30 mA.

- (i) Socket-outlets with a rated current not exceeding 32 A in locations where they are liable to be used by persons of capability BA1, BA3 or children (BA2, BA3),
- (ii) Socket-outlets with a rated current not exceeding 32 A in other locations, and
- (iii) Mobile equipment with a rated current not exceeding 32 A for use outdoors

An explanation of BA1, BA2 and BA3 can be found in **Appendix 5** but are summarised as follows:

### BA1

Ordinary Person as defined in Part 2 i.e. not skilled or instructed

### BA2

Children

### BA3

Disabled persons i.e. Persons not in command of all their physical and/or intellectual abilities (sick persons, old persons)

There is still an exception to omit RCD protection where a documented risk assessment is carried out.

However this can only be applied for indent (ii) and not for (i) or (iii).

# Arc Fault Detection Devices

Probably the biggest change to be aware of in **Amendment 2**, is that the use of Arc Fault Detection Devices (AFDD) have changed from being recommended to a mandatory use in certain types of installations.

With the increase of new technologies being introduced and more widely used, these devices are becoming more vitality important to provide additional protection against fire.

**Regulation 421.1.7** now states AFDD conforming to **BS EN 62606** shall be provided for single-phase AC final circuits supplying socket-outlets with a rated current not exceeding 32 A in:

- Higher Risk Residential Buildings (HRRB)
- Houses in Multiple Occupation (HMO)
- Purpose-Built Student Accommodation (PBSA)
- Care homes

For all other premises, the use of AFDDs is recommended for single-phase AC final circuits supplying socket-outlets not exceeding 32 A.

In the notes of the 18<sup>th</sup> Edition there is guidance of the language used in **BS 7671**. The word recommendation is further explained as “Expression in the content of a document conveying that among several possibilities one is recommended as particularly suitable, without mentioning or excluding others.” There is also a table describing verbal forms which may be used and the verbal form for recommendation can be translated to “should”.



## Higher Risk Residential Buildings (HRRB)

Higher Risk Residential Buildings are assumed to be residential buildings over 18 m in height or in excess of six storeys, whichever is met first. Should this building incorporate a business premises on the ground floor for example then this too could fall under this requirement.



## Houses in Multiple Occupation (HMO)

A house in multiple occupation is a property rented out by at least three people who are not from one “Household” but share facilities like a bathroom or kitchen.



## Purpose-Built Student Accommodation

PBSA is housing built specifically for students to live in.



## Care home

A care home is a place where personal care and accommodation are provided together.

# Precautions where particular risk of fire exists

A new definition has been included in **Amendment 2** of protected escape route.

This is defined as:

A route enclosed with specified fire-resisting construction designated for escape to a place of safety in the event of an emergency.

**Regulation 422.2** requires that:

Cables or other electrical equipment shall not be installed in a protected escape route unless part of:

- (i) an essential fire safety or related safety system
- (ii) general needs lighting
- (iii) socket-outlets provided for cleaning or maintenance

There are also requirements for the types of cables and cable management systems to be used in this specific area which are fire resistant or installed within non-flame propagating cable management systems.



# Surge Protection Devices

**Regulation 443.4.1** now requires protection against transient overvoltages to be provided where the consequence caused by the overvoltage could result in:

- (i) serious injury to, or loss of, human life
- (ii) failure of a safety service, as defined in Part 2
- (iii) significant financial or data loss

For all other cases, protection against transient overvoltages shall be provided, unless the owner of the installation declares it is not required due to any loss or damage being tolerable and they accept the risk of damage to equipment and any consequential loss.

Indent (ii) however requires the use of overvoltage protection devices to protect a Safety Service.

This is defined in Part 2 as;

**“An electrical system for electrical equipment provided to protect or warn persons in the event of a hazard, or essential to their evacuation from a location.”**

A fire or smoke detection system would fall into this definition. If this system is supplied from the electrical installation then an overvoltage could cause it to fail and, as such, requires protection.

The simplest way to provide this protection may be to supply it at the distribution board or consumer unit.

**The requirements of Section 443 on protection against transient overvoltages has been completely rewritten with the risk assessment removed.**



# Selection of RCDs

Different types of RCDs were introduced when the 18<sup>th</sup> Edition was first published in 2018 with **Regulation 531.3**.

**Amendment 2** has gone further saying that Type AC RCDs shall only be used where it is known the load current contains no DC components.

This will only be in a purely resistive item of equipment such as a resistive heating element or filament lighting. It is likely then that Type A RCDs as a minimum will generally be used.

## Unwanted tripping

This is still a consideration for the designer of the installation with **Regulation 531.3.2**.

To achieve this, they should ideally ensure there is no more than 30% of the rated residual operating current due to protective conductor current and/or earth leakage currents (i.e. 9mA for a 30mA device).

There is a new indent (ii) to consider the use of RCBOs as opposed to split load arrangements for this purpose.



### Type AC

#### General purpose use

RCD can detect & respond to AC sinusoidal wave only



### Type A

#### Equipment incorporating electronic components

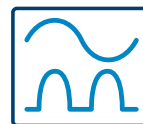
RCD can detect & respond as for Type AC, PLUS pulsating DC components



### Type F

#### Equipment with frequency controlled speed drives

RCD can detect & respond as for Type A, PLUS high-frequency residual current



### Type B

#### Electric vehicle chargers, PV supplies

RCD can detect & respond as for Type F, PLUS smooth DC residual current





# Identification and notices

It is not uncommon now for consumer units in particular to be in a location visible to a user/homeowner.

**BS 7671** requires warning and/or instruction labels to be fitted at or near this distribution board for the information of the installation owner.

Such labels usually have been in the form of stickers attached to the enclosure and are required for RCD test information, periodic inspection intervals among others.

**Amendment 2** states that the requirements of this regulation now need not be applied for domestic or similar installations where certification for initial verification, complete with guidance for recipients, has been issued to the person ordering the work. This guidance for recipients must contain all the information previously contained on the sticker or label.

This applies to the RCD test label, periodic test label, presence of SPD label (new requirement).

The only exception is the warning notice of additional supplies which, if required, will still need to be present on the enclosure.



# Generating set operating in parallel

Solar photovoltaic (PV) installations are covered by **Section 712** which has been extensively revised and expanded.

Connected with this subject is **Section 551** Low Voltage Generator Sets. As a PV system is a generating set usually operating in parallel with the normal electrical supply, **Regulation 551.7** refers.

A new requirement is for the current rating of low voltage switchgear assembly to be suitably rated, considering the additional supply from this generating set.

The assembly shall be selected such that:

$$I_{nA} \geq I_n + I_{g(s)}$$

Where

- $I_{nA}$  is rated current of the assembly
- $I_n$  is rated current of incoming protective device (e.g. 100 A)
- $I_{g(s)}$  is rated current of generating set (e.g. 16 A)

Consumer units will generally not have a current rating  $I_{nA}$  of 116 A. Manufacturers instructions will need to be followed to ensure a compliant installation.

One solution could be to provide an overcurrent protective device within (or external to) the consumer unit, thus limiting the current through the assembly.

The assembly will need to be certified by the manufacturer to the relevant part of the **BS EN 61439** series and a declaration of conformity to this standard should be provided if requested.



# Inspection & testing

## Insulation resistance

**Chapter 64** to do with initial verification has undergone some changes.

**Regulation group 643.3** covering insulation resistance explains that, where equipment in the installation could influence the result of the test or be damaged, it should be disconnected in order to carry out this insulation resistance test.

However following the reconnection of such equipment, a test at 250 V DC shall be carried out between live conductors and the protective conductor, which should be connected to the earthing arrangement. The result of this test shall be at least 1 M $\Omega$ .

There may be some equipment however that would show false readings at this test. It is therefore important that manufacturer's instructions be consulted and if necessary the equipment disconnected during this 250 V DC test.

## RCD testing

The testing of RCDs has become more complex with the introduction of various different types of RCD. All RCDs, regardless of type, can detect and respond to an AC waveform. To simplify the testing procedure it is only now a requirement for verification purposes to carry out the AC test that is common to all types.

So regardless of RCD type, the effectiveness is deemed to have been verified by testing the device using an AC waveform at a test current of  $1 \times I_{\Delta n}$ .

The disconnection time shall be;

- 300 ms maximum for general non-delayed type
- For delayed or 'S' type devices between 130 ms minimum and 500 ms maximum



# Electric vehicle charging installations

**Section 722** Electric vehicle charging installations was the subject of **BS 7671:2018+A1:2020**.

This has been incorporated into **Amendment 2** along with some minor changes.

More details on this subject can be found in the Hager Bitesize guide to electric vehicles.



# Chapter 8

## Prosumer's low voltage electrical installations

This **Edition of BS 7671** introduces an entirely new **Part 8** and **Chapter 82** which refers to prosumer's low voltage electrical installations.

A prosumer is a new definition in Part 2 and is defined as an:

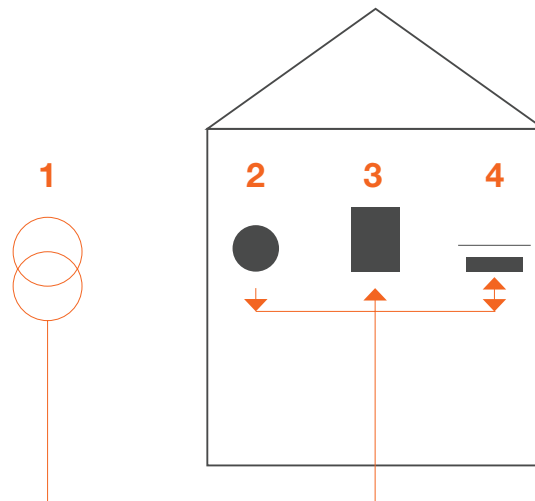
**“Entity or party which can be both a producer and a consumer of electrical energy”**

This new chapter provides additional requirements, measures and recommendations for design, erection and verification of low voltage electrical installations including those with local production and/or storage of energy.

This is to cater for both existing and future ways of delivering electrical energy to either current-using equipment or to the public network.

Depending on the system it may be possible to provide the installation in 'island mode'.

Care needs to be taken to ensure the protective system operates in all modes of operation.



- 1 Public network
- 2 Power supplies
- 3 Loads
- 4 Storage units

# Training support

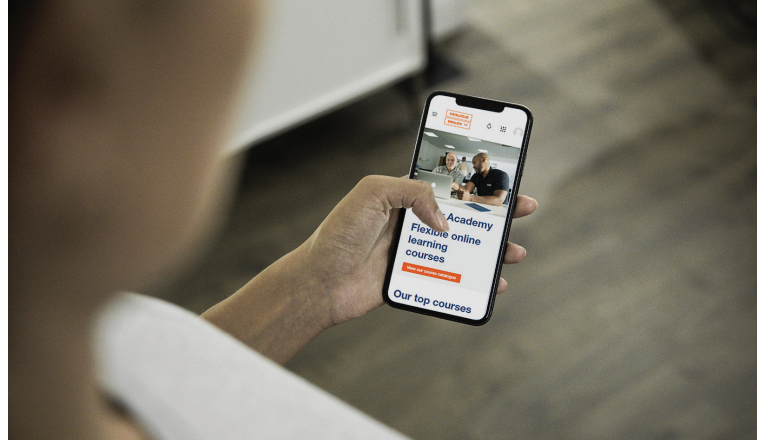
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