

BS 8488:2009+A1:2010

Incorporating Corrigendum No. 1



BSI Standards Publication

Prefabricated wiring systems intended for permanent connection in fixed installations – Specification

bsi.

...making excellence a habit.
AVA Documents™
Document Sharing Hub

Publishing and copyright information

The BSI copyright notice displayed in this document indicates when the document was last issued.

© BSI 2009

ISBN 978 0 580 73894 4

ICS 29.120.50

The following BSI references relate to the work on this standard:

Committee reference PEL/23

Draft for comment 08/30147373 DC, 10/30219838 DC

Publication history

First published February 2009

Amendments issued since publication

Date	Text affected
November 2010	A1, see foreword
December 2010	C1, correction to 5.1.1b)

Contents

Foreword *ii*

1	Scope	1
2	Normative references	1
3	Terms and definitions	2
4	Classification	4
5	Marking and documentation	4
6	Construction	6
7	Wiring systems	7
8	Provision for earthing	8
9	Protection against electric shock	9
10	Resistance to solid objects, dust and moisture	9
11	Insulation resistance and electric strength	10
12	Clearances, creepage distances and distances through insulation	10
13	Resistance to heat, fire and tracking	10
14	Electrical connections	11

Annexes

Annex A (informative)	Guide to use	13
Annex B (normative)	Routine testing	15
Annex C (normative)	Test methods	17

Bibliography **21**

List of figures

Figure A.1 – Diagrammatic presentation of a typical prefabricated wiring system **14**

List of tables

Table 1 – Prefabricated wiring systems intended for use in supply systems with a maximum voltage to earth of 150 V a.c. (rated impulse voltage 2.5 kV)	11
Table 2 – Prefabricated wiring systems intended for use in supply systems with a maximum voltage to earth of 300 V a.c. (rated impulse voltage 4.0 kV)	12
Table B.1 – Values for electrical tests	16
Table C.1 – Minimum insulation resistance	18
Table C.2 – Electric strength	19

Summary of pages

This document comprises a front cover, an inside front cover, pages i to ii, pages 1 to 22, an inside back cover and a back cover.

Foreword

Publishing information

This British Standard is published by BSI and came into effect on 28 February 2009. It was prepared by Technical Committee PEL/23, *Electrical accessories*. A list of organizations represented on this committee can be obtained on request to its secretary.

Supersession

This British Standard supersedes BS 8488-1:2009, which is withdrawn.

Information about this document

The start and finish of text introduced or altered by Amendment No. 1 is indicated in the text by tags **A1** **A1**. Minor editorial changes are not tagged.

Amendment A1 introduces the following principal changes:

- the addition of requirements on how rated current is to be assigned and marked on prefabricated wiring systems;
- additional documentation to be supplied with each prefabricated wiring section;
- the specification of the maximum operating temperature of the wiring system;
- the addition of requirements for connection to the low voltage switchgear and controlgear assembly;
- the addition of requirements for an assembly containing couplers.

The start and finish of text introduced or altered by Corrigendum No. 1 is indicated in the text by tags **C1** **C1**.

Use of this document

It has been assumed in the preparation of this British Standard that the execution of its provisions will be entrusted to appropriately qualified and experienced people, for whose use it has been produced.

Presentational conventions

The provisions of this standard are presented in roman (i.e. upright) type. Its requirements are expressed in sentences in which the principal auxiliary verb is “shall”.

Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.

Contractual and legal considerations

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

1 Scope

This British Standard specifies safety requirements, together with associated tests, for prefabricated wiring systems incorporating installation couplers conforming to [BS EN 61535](#) with a rated voltage up to and including 500 V a.c. and a maximum operating temperature not exceeding 70 °C for permanent connection in fixed installations. Prefabricated wiring systems are intended to be installed by instructed or skilled persons, including the connection and disconnection of installation couplers.

This British Standard includes tests to be conducted as part of the manufacturing process.

Text deleted.

NOTE 1 Prefabricated wiring systems are typically used in prefabricated houses, installation cavities (such as suspended floors and ceilings), cable tray systems, cable ladder systems, cable ducting systems, cable trunking systems, commercial showrooms, partition walls and in similar applications.

NOTE 2 In locations where special conditions prevail, additional requirements might apply, e.g. accessible areas might require IP4X connectors.

NOTE 3 A guide to use is provided in Annex A.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

[BS 5733:2010](#), *Specification for general requirements for electrical accessories*

[BS 7671:2008](#), *Requirements for electrical installations – IEE Wiring Regulations – Seventeenth edition*

[BS EN 60439-1](#), *Low-voltage switchgear and controlgear assemblies – Part 1: Type tested and partially type-tested assemblies*

[BS EN 60439-2](#), *Low-voltage switchgear and controlgear assemblies – Part 2: Particular requirements for busbar trunking systems (busways)*

[BS EN 60439-3](#), *Low-voltage switchgear and controlgear assemblies – Part 3: Particular requirements for low-voltage switchgear and controlgear assemblies intended to be installed in places where unskilled persons have access to their use – Distribution boards*

[BS EN 60439-4](#), *Low-voltage switchgear and controlgear assemblies – Part 4: Particular requirements for assemblies for construction sites (ACS)*

[BS EN 60439-5](#), *Low-voltage switchgear and controlgear assemblies – Part 5: Particular requirements for assemblies for power distribution in public networks*

[BS EN 60529:1992+A2:2000](#), *Degrees of protection provided by enclosures (IP code)*

[BS EN 60664-1](#), *Insulation co-ordination for equipment within low-voltage systems – Part 1: Principles, requirements and tests*

BS EN 61032, *Protection of persons and equipment by enclosures – Probes for verification*

BS EN 61439-1, *Low-voltage switchgear and controlgear assemblies – Part 1: General rules*

BS EN 61439-2, *Low-voltage switchgear and controlgear assemblies – Part 2: Power switchgear and controlgear assemblies*

BS EN 61534-1, *Powertrack systems – Part 1: General requirements*

BS EN 61534-21, *Powertrack systems – Part 21: Particular requirements for powertrack systems intended for wall and ceiling mounting*

BS EN 61534-22, *Powertrack systems – Part 22: Particular requirements for powertrack systems intended for on floor or under floor installation*

BS EN 61535:2009, *Installation couplers intended for permanent connection in fixed installations*

BS EN 61984, *Connectors – Safety requirements and tests*

3 Terms and definitions

For the purpose of this British Standard, the following terms and definitions apply; other definitions related to installation couplers are to be found in BS EN 61535.

3.1 assembly containing couplers

enclosure containing one or more installation couplers

3.2 basic insulation

insulation applied to live parts to provide basic protection and which does not necessarily include insulation used exclusively for functional purposes

[BS 7671:2008]

3.3 by hand

not requiring the use of a tool

3.4 installation coupler

connecting device consisting of an installation female connector and an installation male connector for permanent connection not intended to be engaged or disengaged under load nor to be engaged or disengaged other than during first installation, during maintenance or during re-configuration of the installation

3.5 installation female connector

supply side portion of an installation coupler which contains the receptacle contacts designed to accommodate the male connector

3.6 installation male connector

load side portion of an installation coupler which contains the pin contacts and is to be inserted into the female connector

3.7 instructed person

person adequately advised or supervised by skilled persons to enable him/her to avoid dangers which electricity can create

3.8 mains voltage

voltage exceeding 50 V but not exceeding 1 000 V a.c. between conductors, or 600 V a.c. between conductors and earth

NOTE The actual voltage of an installation may differ from the nominal value by a quantity within normal tolerances.

3.9 metal encased prefabricated wiring system

prefabricated wiring system with metal encasement to provide mechanical protection

3.10 prefabricated wiring system

wiring system consisting of wiring sections incorporating the means of inter-connection designed to allow sections to be connected together forming a given system

3.11 rated current

maximum current assigned to each individual section of the prefabricated wiring system by the manufacturer

NOTE See 5.1.1b).

3.12 rated maximum ambient temperature (t_a)

temperature assigned to a prefabricated wiring system by the manufacturer to indicate the highest sustained temperature in which the system may be operated

NOTE 1 This does not preclude temporary operation at a temperature not exceeding ($t_a + 10$) °C.

NOTE 2 De-rating factors based on BS 7671 might be appropriate.

3.13 rated voltage

voltage or voltages assigned to the prefabricated wiring system by the manufacturer

3.14 readily accessible

zone of accessibility to touch extending from any point on a surface where persons usually stand or move about to the limits which a person can reach with their hand, in any direction, without assistance
[BS IEC 60050-195:1998, 06-12, modified]

3.15 routine test

test to which each device is subjected during and/or after manufacture to ascertain whether it conforms to certain criteria

3.16 skilled person

person with technical knowledge or sufficient experience to enable him/her to avoid dangers which electricity can create 

3.17 terminal

that part of a prefabricated wiring section or metal encasement which is necessary to make electrical connection to a conductor

3.18 type test

test or series of tests made on a type test sample, for the purpose of checking conformity of the design of a given product with the requirements of the relevant standard

3.19 type test sample

sample consisting of one or more similar units submitted by the manufacturer or the responsible vendor for the purpose of a type test

4 Classification

4.1 Classification according to rated voltage

Prefabricated wiring systems shall be classified according to the rated voltage, which shall be not greater than 500 V a.c.

4.2 Classification according to rated current

Prefabricated wiring systems shall be classified according to the rated current of one of the following values:

- 6 A a.c.;
- 10 A a.c.;
- 16 A a.c.;
- 20 A a.c.;
- 25 A a.c.;
- 32 A a.c.;
- 40 A a.c.;
- 63 A a.c.;
- 80 A a.c.;
- 100 A a.c.

4.3 Classification according to the degree of protection against ingress of solid objects, dust and moisture

Prefabricated wiring systems shall be classified according to the degree of protection against ingress of solid objects, dust and moisture, which shall be not less than IP 2X.

5 Marking and documentation

5.1 Marking on wiring sections

5.1.1 When tested in accordance with C.1, the following information shall be distinctly and durably marked on each individual section and shall be easily discernible during installation, maintenance or re-configuration of the installation of the wiring system.

- a) Mark of origin (this may take the form of a trade mark, the manufacturer's identification mark or name of responsible vendor).
- b)  Rated current (A) and corresponding reference method from BS 7671:2008, Table 4A2.

The current shall be assigned according to a reference method defined by the manufacturer from BS 7671:2008, Table 4A2.

The rated current and cross-sectional area of the wiring section conductors shall be determined on the following basis:

- 1) the number of loaded cores defined by the manufacturer.
A loaded core is where the conductor carries more than 30% of its rating, after applying the rating factor for the total number of current carrying cores;
- 2) not being grouped with other wiring systems or cables;

- 3) not being in contact with thermal insulation;
- 4) the ambient temperature not exceeding 30 °C;
- 5) the frequency of operating being not greater than 61 Hz.

NOTE 1 The required current-carrying capacity of a system section should be determined by the system designer by applying rating factors for the specific installation conditions. This current carrying capacity may be different from the rated current.

[C1] The rated current and reference method shall be marked in one of the following ways:

- X A BS 7671:2008, Table 4A2, reference method X; or
- X A
BS 7671:2008, Table 4A2, reference method X

NOTE 2 i.e. The marking can be on one line, or the rated current can be on a separate line above the reference method. For example, if the rated current is 32 A for reference method B, the marking would be as follows:

- 32 A BS 7671:2008, Table 4A2, reference method B; or
- 32 A
BS 7671:2008, Table 4A2, reference method B **[C1]** **[A1]**

- c) Rated voltage (V).
- d) IP code if higher than IP 20.
- e) Manufacturer's model number or type reference.
- f) Unique manufacturing batch reference that provides traceability.
- g) Electrical test status when the test requirements in Annex B have been satisfactorily met.

5.1.2 Markings in accordance with **5.1.2 a)** shall be distinctly and durably marked on each individual section or marked on individual system components.

Markings in accordance with **5.1.2 b)** and **c)** shall be distinctly and durably marked on each individual section or alternatively be included in the manufacturer's instructions and/or literature.

- a) Marking of earth terminals and terminations with earth symbol.
- b) Notice warning that prefabricated wiring systems manufactured to this standard by different manufacturers might not be compatible nor safely inter-connectable.
- c) Details of internal connections to be made available for each type reference (including cable identification colours).

5.1.3 The durability of markings made by impression, moulding, pressing or engraving or the like shall be deemed to conform without test.

5.2 **[A1]** Additional documentation **[A1]**

[A1] In addition to the markings specified in **5.1**, the following details, if they are necessary to ensure safe use and maintenance, shall be provided with each prefabricated wiring section:

- a) instructions for safe use (e.g. readily accessible areas);
- b) system design information, validating conformity with BS 7671. The information can be a system design and not provided with each wiring section;