

BS 7654:2010



BSI Standards Publication

Specification for single-phase street lighting cut-out assemblies for low-voltage public electricity distribution systems – 25 A rating for highway power supplies and street furniture

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Summary of pages

This document comprises a front cover, an inside front cover, pages i to iv, pages 1 to 28, 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 2010. It was prepared by Technical Committee PEL/17, *Switchgear, Controlgear and HV-LV co-ordination*. A list of organizations represented on this committee can be obtained on request to its secretary.

Supersession

This British Standard supersedes BS 7654:1997, which is withdrawn.

Relationship with other publications

This British Standard is to be read in conjunction with BS EN 60947-1:2007, *Low-voltage switchgear and controlgear – Part 1: General rules*. The provisions of the general rules dealt with in BS EN 60947-1:2007 are only applicable when specifically cited and they may be supplemented or modified as detailed in the standard.

The clause numbering of this British Standard follows that of BS EN 60947-1:2007 as closely as possible. Where a subclause of BS EN 60947-1:2007 is not relevant to this British Standard, it is marked as “Vacant” or omitted.

Information about this document

This is a full revision of the standard and introduces the following principal changes:

- the standard has been aligned as closely as possible with the principal reference standard, BS EN 60947-1:2007;
- all other references have been updated.

Hazard warnings

WARNING. This British Standard calls for the use of substances and/or procedures that can be injurious to health if adequate precautions are not taken. It refers only to technical suitability and does not absolve the user from legal obligations relating to health and safety at any stage.

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 and references

1.1 Scope

This British Standard specifies the requirements for street lighting cut-out assemblies of 25 A rating for the protection of power supplies to highway lighting and street furniture. The cut-out assemblies are for use on single-phase, or one phase of a three-phase, low-voltage public electricity supply system with a maximum voltage up to 440 V a.c. and at a frequency of 50 Hz, the neutral being effectively earthed.

The cut-out assemblies can also be used on distribution systems owned by lighting and highway authorities.

The provisions of the general rules dealt with in BS EN 60947-1:2007 are applicable to this standard when specifically called for.

NOTE Clauses and subclauses, tables, figures and annexes of the general rules thus applicable are identified by reference to BS EN 60947-1:2007, for example, BS EN 60947-1:2007, 1.2.3; BS EN 60947-1:2007, Table 1; BS EN 60947-1:2007, Annex A.

1.2 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 923-1, *Guide on high-voltage testing techniques – Part 1: General*

BS 3643-1, *ISO metric screw threads – Part 1: Principles and basic data*

BS 4579-2, *Specification for performance of mechanical and compression joints in electric cable and wire connectors – Part 2: Compression joints in nickel, iron and plated copper conductors*

BS 6004, *Electric cables – PVC insulated, non-armoured cables for voltages up to and including 450/750V, for electric power, lighting and internal wiring*

BS 7870-3.10, *LV and MV polymeric insulated cables for use by distribution and generation utilities – Part 3: Specification for distribution cables of rated voltage 0.6/1 kV – Section 3.10: PVC insulated combined neutral and earth copper wire concentric cables with copper or aluminium conductors*

BS EN 12163, *Copper and copper alloys – Rod for general purposes*

BS EN 12164, *Copper and copper alloys – Rod for free machining purposes*

BS EN 12167, *Copper and copper alloys – Profiles and rectangular bar for general purposes*

BS EN 60112, *Method for the determination of the proof and the comparative tracking indices of solid insulating materials*

BS EN 60269-1:2007+A1:2009, *Low voltage fuses – Part 1: General requirements*

BS EN 60335-1:2002+A2:2006, *Household and similar electrical appliances – Safety – Part 1: General requirements*

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

BS EN 60529:1992, *Specification for degrees of protection provided by enclosures (IP code)*

BS EN 60695-11-10:1999, *Fire hazard testing – Part 11-10: Test flames – 50 W horizontal and vertical flame test methods*

BS EN 60947-1:2007, *Low-voltage switchgear and controlgear – Part 1: General rules*

BS EN 61238-1:2003, *Compression and mechanical connectors for power cables for rated voltages up to 36 kV ($U_m = 42$ kV) – Part 1: Test methods and requirements*

2 Terms and definitions

For the purposes of this British Standard, the definitions given in BS EN 60947-1:2007 apply, together with the following.

2.1 cut-out assemblies, fuses and their components

2.1.1 cut-out assembly

combination of fuse-link(s), neutral terminal(s), earth terminal(s), combined neutral and earth terminal(s), ancillary terminals block(s), connecting units and anti-tamper facilities, as applicable, so as to provide facilities for terminating service cables and a means of protection, isolation and earthing of electricity supplies to highway lighting and street furniture

2.1.2 fuse

device that by fusing of one or more of its specifically designed and proportioned components opens the circuit in which it is inserted by breaking the current when this exceeds a given value for a sufficient time

NOTE The fuse comprises all the parts that form the complete device.

[BS EN 60269-1:2007+A1, IEC 60050-441:1984+A1]

2.1.3 fuse-base (fuse-mount)

fixed part of a fuse provided with contacts and terminals

[BS EN 60269-1:2007+A1, IEC 60050-441:1984+A1]

NOTE Where applicable, covers are considered as part of the fuse-base.

2.1.4 fuse-carrier

moveable part of a fuse designed to carry a fuse-link

[BS EN 60269-1:2007+A1, IEC 60050-441:1984+A1]

2.1.5 fuse-holder

combination of a fuse-base with its fuse-carrier

[BS EN 60269-1:2007+A1, IEC 60050-441:1984+A1]

2.1.6 fuse-link

part of a fuse [including the fuse-element(s)] intended to be replaced after the fuse has operated

[BS EN 60269-1:2007+A1, IEC 60050-441:1984+A1]

2.1.7 fuse-unit

fuse-holder incorporating neutral and earth terminals for the termination of multi-core cables, within an integral enclosure(s) which can also include a protective cover

2.1.8 fuseway

outgoing circuit in which the protective device is a fuse that is connected to a pole of the system of distribution fed into the fuse-unit

2.1.9 integral fuse-carrier and neutral-earth cover

removable part of a fuse-unit designed to carry a fuse-link(s) having an integral extension cover plate which shields the fuseway(s) and neutral and earth or neutral-earth terminals when it is inserted into the fuse-unit

2.2 insulation**2.2.1 basic insulation**

insulation applied to live parts to provide basic protection against electric shock

[BS EN 60335-1:2002+A2]

2.2.2 supplementary insulation

independent insulation applied in addition to the basic insulation in order to ensure protection against electric shock in the event of a failure of the basic insulation

[BS EN 60335-1:2002+A2]

2.2.3 double insulation

insulation system comprising both basic insulation and supplementary insulation

[BS EN 60335-1:2002+A2]

2.2.4 reinforced insulation

single insulation applied to live parts that provides a degree of protection against electric shock equivalent to double insulation under the conditions specified in this standard

NOTE It is not implied that the term insulation system is one homogeneous piece. The insulation can comprise several layers which cannot be tested singly as supplementary or basic insulation.

[BS EN 60335-1:2002+A2]

3 Classification

The fuse-unit type shall be classified in accordance with Table 1.

Table 1 Classification of fuse-units

Classification	Incoming terminal type	Separate neutral and earth terminals	Combined neutral and earth terminals	Number of fuseways	Poles
Type 1	Pillar	Yes	No	One	Single
Type 1L	Lug				
Type 2	Pillar	No	Yes		
Type 2L	Lug				
Type 3	Pillar	No	Yes	Two	
Type 3L	Lug				
Type 4	Pillar	Yes	No	One	Double
Type 4L	Lug				
Type 5	Pillar	No	Yes		
Type 5L	Lug				
Type 6	Pillar	Yes	No	Two	
Type 6L	Lug				

- The fuse-unit includes a cable termination cover which can be separate from, or integral with, the fuse-base.
- A double-pole type of fuse-unit provides disconnection of the outgoing phase and neutral terminals from the incoming phase and neutral terminals.
- All fuse-units are provided with pillar type terminals for the connection of outgoing conductors, unless otherwise agreed between manufacturer and user.

4 Characteristics

4.1 General

BS EN 60947-1:2007, 4.1, applies.

4.2 Type of equipment

BS EN 60947-1:2007, 4.2, applies.

4.3 Rated and limiting values for the main circuit

4.3.1 Rated voltages

4.3.1.1 Rated operational voltage (U_e)

BS EN 60947-1:2007, 4.3.1.1, applies.

4.3.1.2 Rated insulation voltage (U_i)

BS EN 60947-1:2007, 4.3.1.2, applies.

4.3.1.3 Rated impulse withstand voltage (U_{imp})

BS EN 60947-1:2007, 4.3.1.3, applies.

4.3.2 Currents**4.3.2.1 Vacant****4.3.2.2 Vacant****4.3.2.3 Vacant****4.3.2.4 Rated uninterrupted current (I_u)**

BS EN 60947-1:2007, 4.3.2.4, applies with the following addition.

Fuse-units.

A fuse-unit shall be capable of carrying current up to its rated uninterrupted current of 25 A, and the currents associated with the operation under fault conditions of any fuse-link which the fuse-units are designed to accommodate. In addition, the incoming phase and neutral terminal assemblies shall be capable of carrying twice the rated uninterrupted current to allow service looping.

4.3.3 Rated frequency

BS EN 60947-1:2007, 4.3.3, applies.

4.3.4 Vacant**4.3.5 Vacant****4.3.6 Short-circuit characteristics****4.3.6.1 Vacant****4.3.6.2 Vacant****4.3.6.3 Vacant****4.3.6.4 Rated conditional short-circuit current**

BS EN 60947-1:2007, 4.3.6.4, applies.