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INTERNATIONAL STANDARD

NORME INTERNATIONALE

Low-voltage switchgear and controlgear – Part 7-3: Ancillary equipment – Safety requirements for fuse terminal blocks

Appareillage à basse tension – Partie 7-3: Matériels accessoires – Exigences de sécurité pour les blocs de jonction à fusible

IEC 60947-7-3:2009

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LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR –

Part 7-3: Ancillary equipment – Safety requirements for fuse terminal blocks

FOREWORD

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International Standard IEC 60947-7-3 has been prepared by subcommittee 17B: Low-voltage switchgear and controlgear, of IEC technical committee 17: Switchgear and controlgear.

This second edition of IEC 60947-7-3 cancels and replaces the first edition, published in 2002, and constitutes a technical revision.

The main technical modifications of this standard since this previous publication are listed below:

– requirements regarding clearances and creepage distances replaced by reference to Annex H of IEC 60947-1;
– requirements for the test of the mechanical strength of the clamping units improved in 8.3.3.1;
– requirements for tightening torques for the tests improved and referenced to Table 4 of IEC 60947-1;

– requirements for the resistance and the dimensions of dummy fuse-links specified in 8.5.2.5.

This standard shall be read in conjunction with IEC 60947-1 and IEC 60947-7-1. The provisions of the general rules dealt with in IEC 60947-1 and the requirements for terminal blocks of IEC 60947-7-1 are applicable to this standard, where specifically called for. Clauses and subclauses, tables, figures and annexes thus applicable are identified by reference to IEC 60947-1 or IEC 60947-7-1, e.g. 1.2 of IEC 60947-1, Table 4 of IEC 60947-7-1 or Annex A of IEC 60947-1.

The text of this standard is based on the following documents:

FDIS	Report on voting
17B/1657/FDIS	17B/1671/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all the parts in the IEC 60947 series, under the general title *Low-voltage switchgear and controlgear*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

INTRODUCTION

The standard for fuse terminal blocks covers not only the terminal block requirements but also takes into account the specifications of the cartridge fuse-links according to IEC 60127-1 and IEC 60127-2. A connection between these two standards is made by adding (adapting) the fundamental specifications of cartridge fuse-links (rated current, rated voltage, maximum voltage drop and maximum sustained power dissipation for cartridge fuse-links with the dimension of 5 mm × 20 mm or 6,3 mm × 32 mm with their different response characteristics) to the IEC 60947-7-1 requirements for terminal blocks. By this means, it is possible to judge the quality of the product “fuse terminal blocks”.

An important fact when using such cartridge fuse-links with fuse terminal blocks is that fuses heat up much less under rated load than they would do under overload conditions. The rated load is the result of rated current and maximum voltage drop. But there is a considerably increased power dissipation under overload conditions, equalling the maximum sustained power dissipation loss according to IEC 60127-2.

In industrial applications, single fuse terminal blocks are used within an arrangement of terminal blocks or many of them forming an arrangement on their own. This means that the same current and fuse-link will result in different heat emissions. Furthermore, it should be taken into account that apart from the general full range fuse (for overload and short-circuit protection), some fuse terminal blocks are exclusively used for short-circuit protection according to IEC 60364-4-43, e.g. in control circuits, where no overloads occur (i.e. safety coils, indicator lights or similar equipment).

Consequently there are four different types of application that need to be described in the catalogue or indicated on the fuse terminal block. For more information, see Annex B.

LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR –

Part 7-3: Ancillary equipment – Safety requirements for fuse terminal blocks

1 General

1.1 Scope

This part of IEC 60947 applies to fuse terminal blocks with screw-type or screwless-type clamping units for the connection of rigid (solid or stranded) or flexible copper conductors for the reception of cartridge fuse-links in accordance with IEC 60127-2, intended primarily for industrial or similar use in circuits not exceeding 1 000 V a.c., up to 1 000 Hz or 1 500 V d.c., and having a maximum short-circuit breaking capacity of 1 500 A.

They are intended for installation in electrical equipment with enclosures which surround the fuse terminal blocks to such an extent that they are accessible only with the aid of a tool.

For certain applications, for example in control circuits, the fuse terminal blocks may be designed exclusively for short-circuit protection.

NOTE This standard may be used as a guide for fuse terminal blocks for the reception of special cartridge fuse-links which do not meet the requirements of IEC 60127-2.

The object of this standard is to specify safety requirements and test methods for the mechanical, electrical and thermal characteristics of fuse terminal blocks, to ensure the compatibility between terminal blocks and standardized fuse-links.

This standard may be used as a guide for

– fuse terminal blocks requiring the fixing of special devices to the conductors, for example quick connect terminations or wrapped connections, etc.;
– fuse terminal blocks providing direct contact to the conductors by means of edges or points penetrating the insulation, for example insulation displacement connections, etc.

Where applicable in this standard, the term “clamping unit” has been used instead of the term “terminal”. This is taken into account in case of reference to IEC 60947-1.

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.

IEC 60127-1:2006, *Miniature fuses – Part 1: Definitions for miniature fuses and general requirements for miniature fuse-links*

IEC 60127-2:2003, *Miniature fuses – Part 2: Cartridge fuse-links*
Amendment 1 (2003)

IEC 60216-1:2001, *Electrical insulating materials – Properties of thermal endurance – Part 1: Ageing procedures and evaluation of test results*

IEC 60695-11-5:2004, *Fire hazard testing – Part 11-5: Test flames – Needle flame test method – Apparatus, confirmatory test arrangement and guidance*

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

IEC 60947-7-1, *Low-voltage switchgear and controlgear – Part 7-1: Ancillary equipment – Terminal blocks for copper conductors*

ISO 3:1973, *Preferred numbers – Series of preferred numbers*

ISO 4046-4:2002, *Paper, board, pulp and related terms – Vocabulary– Part 4: Paper and board grades and coverted products*

2 Definitions

For the purposes of this document, definitions given in IEC 60947-7-1, together with the following definitions, apply.

2.1
fuse terminal block
terminal block base with a fuse-carrier

2.2
terminal block base
insulating part of a fuse terminal block carrying the clamping units and contacts, intended to be fixed to a support

2.3
fuse-carrier
movable part of a fuse terminal block designed to carry the cartridge fuse-link and enable its exchange

NOTE The fuse-carrier can be mechanically coupled with the terminal block base.

2.4
maximum power dissipation of the cartridge fuse-link
2.4.1 in the case of an overload of P_{V1}, equal to the maximum sustained power dissipation as given in IEC 60127-2

2.4.2 in the case of a nominal load of P_{V2}, equal to the power dissipation value calculated from the nominal values, i.e. the maximum voltage drop and the rated current in accordance with IEC 60127-2

2.5
separate arrangement of a fuse terminal block
arrangement of a single fuse terminal block between adjacent terminal blocks (without additional function) (see Figure 2)

NOTE Mounting of fuse terminal blocks side by side with a spacing that securely prevents any mutual thermal influence is also considered as a separate arrangement.

2.6
compound arrangement of fuse terminal blocks
arrangement of two or several fuse terminal blocks side by side or the arrangement of a single fuse terminal block between adjacent terminal blocks with additional function (see Figure 3)

NOTE Additional functions within the meaning of this standard include all components which may thermally influence the function of the fuse terminal block due to their own power dissipation.