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Low-voltage switchgear and controlgear – Over-current protective devices – Part 2: Selectivity under over-current conditions

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR – OVER-CURRENT PROTECTIVE DEVICES –

Part 2: Selectivity under over-current conditions

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IEC 61912-2, which is a technical report, has been prepared by subcommittee 17B: Low-voltage switchgear and controlgear, of IEC technical committee 17: Switchgear and controlgear.

The text of this technical report is based on the following documents:

Enquiry draft	Report on voting
17B/1606/DTR	17B/1666/RVC

Full information on the voting for the approval of this technical report 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 parts of IEC 61912 series, published under the general title *Low-voltage switchgear and controlgear – Over-current protective devices,* 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- withdrawn,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.

A bilingual version of this publication may be issued at a later date.

INTRODUCTION

Low-voltage equipment standards IEC 60947, IEC 60269, IEC 60898-1 and IEC 61009-1 currently include operating characteristics for over-current protective devices, defined in terms of the ability of the equipment to operate at levels of over-current up to their maximum short-circuit current ratings. In practice, the installation of such devices in series requires consideration of the relationship between the device characteristics to achieve the optimum in supply availability in the event of an over-current causing operation of any device. The ability of an over-current device to perform selectively in combination with other such devices needs to be fully understood by the circuit designer to avoid leaving a circuit vulnerable to unnecessary loss of supply, particularly where critical supplies are concerned. It is also useful to take full advantage of the capability of devices and systems to avoid over-engineering, with the consequent unnecessary additional cost. Selectivity over the whole range of fault current up to the prospective fault current at the point of installation is not always possible or necessary. A more economic solution may be found in many cases by accepting a limited selectivity, particularly taking into account the low probability of a high short-circuit fault current.

Where a short-circuit protective device is used to provide back-up protection to a downstream device, guidance on the application is provided in IEC/TR 61912-1.

LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR – OVER-CURRENT PROTECTIVE DEVICES –

Part 2: Selectivity under over-current conditions

1 Scope

This technical report, which serves as an application guide for the determination of selectivity between over-current protective devices of low-voltage switchgear and controlgear, summarises the definitions of the terminology and provides examples of application.

The following standards for devices are considered in this technical report:

– IEC 60255-3; IEC 60255-6; IEC 60255-8, IEC 60255-12

– IEC 60269-1, IEC 60269-2, IEC 60269-3;IEC 60269-4;

– IEC 60898-1;

– IEC 60947 series;

– IEC 61008-1;

– IEC 61009-1.

This report does not deal with other forms of protection, such as power-reversal protection, directional protection and arc-protection systems.

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 60255 (all parts), *Electrical relays*

IEC 60269-1, *Low-voltage fuses – Part 1: General requirements*

IEC 60269-2, *Low-voltage fuses – Part 2: Supplementary requirements for fuses for use by authorized persons (fuses mainly for industrial application) – Examples of standardized systems of fuses A to I*

IEC 60269-3, *Low-voltage fuses – Part 3: Supplementary requirements for fuses for use by unskilled persons (fuses mainly for household and similar applications)*

IEC 60269-4, *Low-voltage fuses – Part 4: Supplementary requirements for fuse-links for the protection of semiconductor devices*

IEC 60898-1, *Electrical accessories – Circuit-breakers for over-current protection for household and similar installations – Part 1: Circuit-breakers for a.c. operation*

IEC 60947-2, *Low-voltage switchgear and controlgear – Part 2: Circuit-breakers*

IEC 60947-4-1, *Low-voltage switchgear and controlgear – Part 4-1: Contactors and motor-starters – Electromechanical contactors and motor-starters*

IEC 60947-4-2, *Low-voltage switchgear and controlgear – Part 4-2: Contactors and motor-starters – AC semiconductor motor controllers and starters*

IEC 60947-6-2, *Low-voltage switchgear and controlgear – Part 6-2: Multiple function equipment – Control and protective switching devices (or equipment) (CPS)*

IEC 61008-1, *Residual current operated circuit-breakers without integral over-current protection for household and similar uses (RCCBs) – Part 1: General rules*

IEC 61009-1, *Residual current operated circuit-breakers with integral over-current protection for household and similar uses (RCBOs) – Part 1: General rules*

IEC/TR 61459, *Coordination between fuses and contactors/motor-starters – Application guide*

IEC/TR 61818, *Application guide for low-voltage fuses*

IEC/TR 61912-1, *Low-voltage switchgear and controlgear – Overcurrent protective devices – Part 1: Application of short-circuit ratings*