IEC TR 61439-0

Edition 3.0 2022-07

TECHNICAL REPORT

RAPPORT TECHNIQUE

Low-voltage switchgear and controlgear assemblies –
Part 0: Guidance to specifying assemblies

Ensembles d'appareillage à basse tension –
Partie 0: Recommandations pour la spécification d'ensembles

IEC TR 61439-0:2022-07(en-fr)

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FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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IEC TR 61439-0 has been prepared by subcommittee 121B: Low-voltage switchgear and controlgear assemblies, of IEC technical committee 121: Switchgear and controlgear and their assemblies for low voltage. It is a Technical Report.

This third edition cancels and replaces the second edition published in 2013. It constitutes a technical revision.

This third edition includes the following significant technical changes with respect to the previous edition:

a) alignment with IEC 61439-1:2020;
b) addition of new content in Clause 13 regarding current ratings;
c) addition of a new subclause 12.8.1 detailing the fundamentals of the forms of internal separation;
d) alignment of Annex B with Annex AA of 61439-2:2020;
e) removal of the annexes detailing items subject to agreement between specifier and manufacturer for all product parts as not all of them can always be up to date

The text of this Technical Report is based on the following documents:

Draft	Report on voting
121B/126/DTR	121B/152/RVDTR

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

The language used for the development of this Technical Report is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/standardsdev/publications.

The reader's attention is drawn to the fact that Annex E lists all of the "in-some-country" clauses on differing practices of a less permanent nature relating to the subject of this document.

A list of all parts of the IEC 61439 series, under the general title *Low-voltage switchgear and controlgear assemblies*, can be found on the IEC web site.

The committee has decided that the contents of this publication will remain unchanged until the stability 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

Low-voltage assemblies form an integral part of most electrical distribution networks. In their application they have two prime functions:

– to safely control and distribute electrical energy; and

– to safely isolate sections of faulted networks.

Whilst these two functions place very different demands on the assembly, an assembly has to be capable of performing both these functions throughout its expected service life. Controlling and distributing electrical energy is the assembly's routine ongoing duty. The second function, fault management, is a very rare occurrence within a well-managed and maintained system. Some assemblies will never be called upon to manage a fault, but if a fault does occur, it can place immense thermal and mechanical stresses on the assembly in an instant. Any ageing or deterioration of the assembly should be limited such that its safety function is not impaired.

Due to the nature of the application, if there are weaknesses in the design or application of an assembly, it is possible they will not be identified until years after the assembly was installed. In order to avoid latent issues, and to ensure that assemblies are suitable for their application, they will be designed and verified to meet the exacting requirements defined in the IEC 61439 series of standards. However, as the IEC 61439 series covers a wide range of applications, and some applications can be partially outside the scope of the standard, it is equally important that assemblies are correctly specified. Where options are given in the IEC 61439 series, the most suitable for the application will be selected; where the requirements are outside the scope of the standards, detailed requirements will be agreed between the specifier and manufacturer.

This document identifies the significance of each characteristic to be considered when specifying an assembly and provides the specifier with guidance on defining a suitable assembly for their application.

For the purposes of this document, the specifier is the party who specifies or selects the assembly characteristics. The specifier may be the same party as the one who will use and operate the assembly, or someone acting on their behalf. The aim of this document is to provide the specifier with guidance on the specification that should be provided in order to obtain an assembly with the required performance and at optimised costs.

Throughout this document, the term "assembly" is used for a low-voltage switchgear and controlgear assembly. The term "manufacturer" refers to the assembly manufacturer unless specifically indicated otherwise.

The term "line conductor" is used in many places throughout this document. Previously the terminology was phase conductors.

This document is focussed on the specifier, that is, the person or organization providing the specification for the assembly. It is assumed the specifier is acting on behalf of the user.

The purpose of the IEC 61439 series of standards is to harmonize, as far as practicable, all the general rules and requirements that apply to assemblies. The series further seeks, in order to obtain uniformity of requirements for assemblies, consistency in the verification of assemblies and to avoid the need for verification to other standards.

All the requirements for the various assemblies that can be considered as general, together with specific subjects dedicated to performances and application, for example temperature rise, short-circuit, dielectric properties, have therefore been gathered in IEC 61439-1 as general rules. For each type of assembly only two main standards are necessary to determine all requirements and the corresponding methods of verification:

1) the standard giving the general rules designated "IEC 61439-1", and

2) the specific product part of the IEC 61439 series, hereinafter referred to as the relevant product part of the IEC 61439 series.

The IEC 61439 series of standards encompasses assemblies for a wide variety of uses, some of which have specific needs as imposed by their particular application. In order to clearly define these specific needs, relevant product parts of the IEC 61439 series focussed on a particular type of application have been (or are being) developed. These are identified as IEC 61439-2, IEC 61439-3, and so on (for a list of all parts of the IEC 61439 series, refer to the IEC web site). Each relevant product part of the IEC 61439 series with reference to IEC 61439-1, the general rules, as appropriate, specifies the characteristics and performance required by an assembly within its defined scope of application. Each relevant product part of the IEC 61439 series includes, as an annex, a template for “items subject to agreement between the assembly manufacturer and the specifier” to facilitate the specifying of an assembly.

General characteristics of all types of assemblies are considered in this document. Details which are applicable to each type of assembly can be determined by reference to the specification schedule in the relevant product part of the IEC 61439 series.

Within this document, reference to IEC 61439 means the current edition of the IEC 61439 series of standards, including:

- IEC 61439-1, *Low-voltage switchgear and controlgear assemblies – Part 1: General rules*
- IEC 61439-2, *Low-voltage switchgear and controlgear assemblies – Part 2: Power switchgear and controlgear assemblies*
- IEC 61439-3, *Low-voltage switchgear and controlgear assemblies – Part 3: Distribution boards intended to be operated by ordinary persons (DBO)*
- IEC 61439-4*, Low-voltage switchgear and controlgear assemblies – Part 4: Particular requirements for assemblies for construction sites (ACS)*
- IEC 61439-5, *Low-voltage switchgear and controlgear assemblies – Part 5: Assemblies for power distribution in public networks*
- IEC 61439-6, *Low-voltage switchgear and controlgear assemblies – Part 6: Busbar trunking systems (busways)*
- IEC 61439-7, *Low-voltage switchgear and controlgear assemblies – Part 7: Assemblies for specific applications such as marinas, camping sites, market squares, electric vehicles charging stations*

Refer to the IEC web site for the latest edition of each product part of the IEC 61439 series and additional product part of the IEC 61439 series published for other specific applications.

NOTE Each product part of the IEC 61439 series is related to the appropriate edition of IEC 61439-1, as listed in the product part, and the corresponding edition of IEC TR 61439-0.

A reference to “general rules” means a reference to IEC 61439-1:2020.

A reference to “product standard” means the relevant part or parts of the IEC standard for the components used in the assembly (e.g. IEC 60947-2 for circuit-breakers).

LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR ASSEMBLIES –

Part 0: Guidance to specifying assemblies

1 Scope

Within the IEC 61439 series of standards for low-voltage switchgear and controlgear assemblies, there are system and application details that are specified by the specifier to enable the manufacturer to produce an assembly that meets the needs and expectations of the specifier.

This part of IEC 61439, which is a technical report, identifies from the specifier's perspective those functions and characteristics that are defined when specifying assemblies. It provides:

– an explanation of the assembly characteristics and options within the IEC 61439 series;
– a guidance on how to select the appropriate options and define characteristics so as to meet specific application needs; and
– an assistance in the specification of assemblies.

References within this document to the interface characteristics of an assembly and the requirements with which they will comply assume that the assembly is designed, manufactured, and verified in accordance with the relevant part of the IEC 61439 series.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 61439 (all parts), *Low-voltage switchgear and controlgear assemblies*

IEC 61439-1:2020, *Low-voltage switchgear and controlgear assemblies – Part 1: General rules*

IEC 61439-2:2020, *Low-voltage switchgear and controlgear assemblies – Part 2: Power switchgear and controlgear assemblies*

IEC 61439-3, *Low-voltage switchgear and controlgear assemblies – Part 3: Distribution boards intended to be operated by ordinary persons (DBO)*

IEC 61439-4, *Low-voltage switchgear and controlgear assemblies – Part 4: Particular requirements for assemblies for construction sites (ACS)*

IEC 61439-5, *Low-voltage switchgear and controlgear assemblies – Part 5: Assemblies for power distribution in public networks*

IEC 61439-6, *Low-voltage switchgear and controlgear assemblies – Part 6: Busbar trunking systems (busways)*

IEC 61439-7, *Low-voltage switchgear and controlgear assemblies – Part 7: Assemblies for specific applications such as marinas, camping sites, market squares, electric vehicle charging stations*