

TECHNICAL REPORT

RAPPORT TECHNIQUE



**High-voltage switchgear and controlgear –
Part 302: Alternating current circuit-breakers with intentionally non-simultaneous
pole operation**

**Appareillage à haute tension –
Partie 302: Disjoncteurs à courant alternatif à fonctionnement intentionnellement
non simultané des pôles**



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

HIGH-VOLTAGE SWITCHGEAR AND CONTROLGEAR –

**Part 302: Alternating current circuit-breakers
with intentionally non-simultaneous pole operation**

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IEC 62271-302, which is a technical report, has been prepared by subcommittee 17A: High-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
17A/888/DTR	17A/909/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.

This standard is to be read in conjunction with IEC 62271-100:2008, to which it refers and which is applicable, unless otherwise specified. In order to simplify the indication of corresponding requirements, the same numbering of clauses and subclauses is used as in IEC 62271-100. Amendments to these clauses and subclauses are given under the same references, whilst additional subclauses are numbered from 101.

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HIGH-VOLTAGE SWITCHGEAR AND CONTROLGEAR –

Part 302: Alternating current circuit-breakers with intentionally non-simultaneous pole operation

1 General

Clause 1 of IEC 62271-100 is applicable with the following modifications.

1.1 Scope

This part of IEC 62271 provides guidance on the design, construction, specification and testing of circuit-breakers with intentional non-simultaneous pole operation which are excluded from the scope of IEC 62271-100. In all other respects the scope of this technical report is identical to that of IEC 62271-100. This technical report provides supplementary information and guidance for this type of circuit-breaker and is intended to be used in conjunction with IEC 62271-100.

Intentional non-simultaneous pole operation may be implemented by mechanical or electrical means and both methods are within the scope of this technical report. Where the implementation is by purely electrical means, for example for independent pole operated circuit-breakers, adequate precautions should be taken in the application to prevent operation outside the proven capability of the circuit-breaker.

Circuit-breakers with intentional non-simultaneous pole operation are mainly used for the implementation of controlled switching, and this technical report primarily addresses the requirements of circuit-breakers for such applications. More detailed information regarding the use of controlled switching can be found in CIGRE Technical Brochures 262 [1]¹⁾, 263 [2] and 264 [3]. Requirements for associated protection and/or control facilities are not covered unless these form an integral part of the circuit-breaker.

This technical report considers two basic system configurations for achieving non-simultaneous operation:

- a circuit-breaker intended for non-simultaneous operation which is supplied and tested independent from any particular controller;
- a circuit-breaker intended for non-simultaneous operation with a dedicated controller (which may be integrated into the circuit-breaker) and necessary sensors and auxiliary equipment which form part of the tested equipment.

The basic requirements in each case are identical, however the interpretation of the test results depends upon whether the intended controller is included in the test programme. Further details on this aspect are incorporated into Clause 6 of this technical report.

For the purposes of this technical report, it has been assumed that there is no significant interaction between the effects of the various parameters (for example ambient temperature, control voltage etc) which are considered to affect the mechanical performance of the circuit-breaker. This has not been proven for all combinations however service experience with controlled switching suggests this assumption is valid in practice for most commonly used drive technologies. Annex F provides some examples in support of this assumption.

1) Figures in square brackets refer to the bibliography.

1.2 Normative references

No normative references are made in this technical report. The normative references of IEC 62271-100 apply and are used as necessary to supplement the guidance presented herein.

2 Normal and special service conditions

Clause 2 of IEC 62271-100 is applicable.

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 62271-100 as well as the following terms and definitions apply.

3.1 General terms

3.1.1

idle time

time between consecutive operations (either close or open) of a circuit-breaker during which the circuit-breaker remains static

3.1.2

compensation

predictive correction for changes in operating time taking account of ambient, drive and supply conditions

3.1.3

adaption

correction for changes in operating time based on past operating pattern

3.2 Assemblies

3.2.1

controlled switching system

combination of circuit-breaker, controller and necessary sensors and auxiliary equipment required to achieve controlled switching

NOTE Necessary sensors refers to those required to provide inputs to the controlled system and may include voltage transformers, current transformers, temperature sensors etc.

3.3 Parts of assemblies

No particular definitions.

3.4 Switching devices

No particular definitions.

3.5 Parts of circuit-breakers

No particular definitions.