



INTERNATIONAL STANDARD



**High-voltage switchgear and controlgear –
Part 110: Inductive load switching**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 29.130.10

ISBN 978-2-8322-4923-9

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

HIGH-VOLTAGE SWITCHGEAR AND CONTROLGEAR –

Part 110: Inductive load switching

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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This redline version of the official IEC Standard allows the user to identify the changes made to the previous edition. A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text.

International Standard IEC 62271-110 has been prepared by subcommittee 17A: Switching devices, of IEC technical committee 17: High-voltage switchgear and controlgear.

This fourth edition cancels and replaces the third edition published in 2012 and constitutes a technical revision.

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

- all switching devices are now covered, not only circuit-breakers;
- a limited number of T10 tests no longer covers shunt-reactor switching tests below 52 kV;
- evaluation and reporting of a re-ignition-free arcing time window has been added.

The text of this International Standard is based on the following documents:

FDIS	Report on voting
17A/1151/FDIS	17A/1155/RVD

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

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

A list of all parts of the IEC 62271 series can be found, under the general title *High-voltage switchgear and controlgear*, on the IEC website.

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HIGH-VOLTAGE SWITCHGEAR AND CONTROLGEAR –

Part 110: Inductive load switching

1—General

1 Scope

This part of IEC 62271 is applicable to AC ~~circuit-breakers~~ switching devices designed for indoor or outdoor installation, for operation at frequencies of 50 Hz and 60 Hz on systems having voltages above 1000 V and applied for inductive current switching ~~with or without additional short-circuit current breaking duties~~. It is applicable to switching devices (including circuit-breakers in accordance with IEC 62271-100) that are used to switch high-voltage motor currents and shunt reactor currents and also to high-voltage contactors used to switch high-voltage motor currents as covered by IEC 62271-106. ~~For circuit breakers applied to switch shunt reactor currents at rated voltages according to IEC 62271-1:2007 Tables 2a and 2b, combined voltage tests across the isolating distance are not required (refer to 4.2).~~

Switching unloaded transformers, i.e. breaking transformer magnetizing current, is not considered in this document. The reasons for this are as follows:

- a) Owing to the non-linearity of the transformer core, it is not possible to correctly model the switching of transformer magnetizing current using linear components in a test laboratory. Tests conducted using an available transformer, such as a test transformer, will only be valid for the transformer tested and cannot be representative for other transformers.
- b) As detailed in IEC TR 62271-306¹, the characteristics of this duty are usually less severe than any other inductive current switching duty. ~~It should be noted that~~ Such a duty may produce severe overvoltages within the transformer winding(s) depending on the ~~circuit-breaker~~ re-ignition behaviour of the switching device and transformer winding resonance frequencies.

~~Short-line faults, out of phase current making and breaking and capacitive current switching are not applicable to circuit breakers applied to switch shunt reactors or motors. These duties are therefore not included in this standard.~~

~~Subclause 1.1 of IEC 62271-100:2008 is otherwise applicable.~~

NOTE 1 The switching of tertiary reactors from the high-voltage side of the transformer is not covered by this document.

NOTE 2 The switching of shunt reactors earthed through neutral reactors is not covered by this document. However, the application of test results according to this document, on the switching of neutral reactor earthed reactors (4-leg reactor scheme), is discussed in IEC TR 62271-306.

2 Normative references

~~Subclause 1.2 of IEC 62271-100:2008 is applicable with the following addition:~~

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.

¹ ~~To be published.~~

IEC 60050-441, *International Electrotechnical Vocabulary – Chapter 441: Switchgear, controlgear and fuses* (available at www.electropedia.org)

IEC 62271-1:2017, *High-voltage switchgear and controlgear – Part 1: Common specifications for alternating current switchgear and controlgear*

IEC 62271-100:2008, *High-voltage switchgear and controlgear – Part 100: Alternating current circuit-breakers*

IEC 62271-100:2008/AMD1:2012

IEC 62271-106:2011, *High-voltage switchgear and controlgear – Part 106: Alternating current contactors, contactor-based controllers and motor-starters*

2—Normal and special service conditions

~~Clause 2 of IEC 62271-1:2007 is applicable.~~

Withdrawn

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**High-voltage switchgear and controlgear –
Part 110: Inductive load switching**

**Appareillage à haute tension –
Partie 110: Manœuvre de charges inductives**

Withstand

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Withdrawing

INTERNATIONAL ELECTROTECHNICAL COMMISSION

HIGH-VOLTAGE SWITCHGEAR AND CONTROLGEAR –

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Part 110: Inductive load switching

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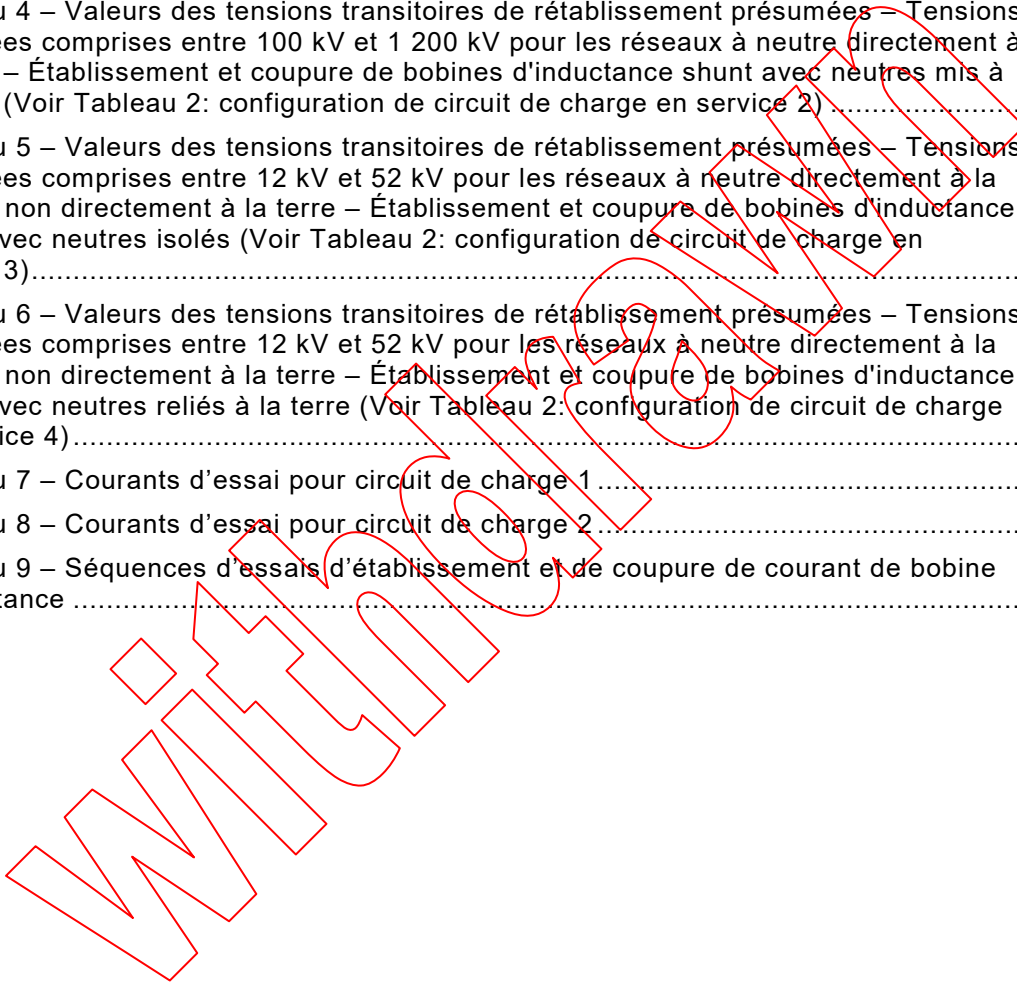
IEC 62271-100:2008/AMD1:2012

IEC 62271-106:2011, *High-voltage switchgear and controlgear – Part 106: Alternating current contactors, contactor-based controllers and motor-starters*

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COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

APPAREILLAGE À HAUTE TENSION –

Partie 110: Manœuvre de charges inductives

AVANT-PROPOS

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- 9) L'attention est attirée sur le fait que certains des éléments de la présente Publication de l'IEC peuvent faire l'objet de droits de brevet. L'IEC ne saurait être tenue pour responsable de ne pas avoir identifié de tels droits de brevets et de ne pas avoir signalé leur existence.

La Norme internationale IEC 62271-110 a été établie par le sous-comité 17A: Appareils de connexion, du comité d'études 17 de l'IEC: Appareillage haute tension.

Cette quatrième édition annule et remplace la troisième édition parue en 2012. Cette édition constitue une révision technique.

Cette édition inclut les modifications techniques majeures suivantes par rapport à l'édition précédente:

- tous les appareils de connexion sont dorénavant couverts, et non uniquement les disjoncteurs;
- un nombre limité d'essais T10 ne couvrent plus les essais d'établissement et de coupure de courant de bobine d'inductance shunt en dessous de 52 kV;

– l'évaluation et la consignation d'une plage de coupure sans réallumage ont été ajoutées.

Le texte de cette Norme internationale est issu des documents suivants:

FDIS	Rapport de vote
17A/1151/FDIS	17A/1155/RVD

Le rapport de vote indiqué dans le tableau ci-dessus donne toute information sur le vote ayant abouti à l'approbation de cette norme.

Ce document a été rédigé selon les Directives ISO/IEC, Partie 2.

Une liste de toutes les parties de la série IEC 62271, publiées sous le titre général *Appareillage à haute tension*, peut être consultée sur le site web de l'IEC.

Le comité a décidé que le contenu de ce document ne sera pas modifié avant la date de stabilité indiquée sur le site web de l'IEC sous "http://webstore.iec.ch" dans les données relatives au document recherché. A cette date, le document sera

- reconduit,
- supprimé,
- remplacé par une édition révisée, ou
- amendé.

Le contenu des corrigenda de décembre 2017 et février 2018 a été pris en considération dans cet exemplaire.

Witholdraw

APPAREILLAGE À HAUTE TENSION –

Partie 110: Manœuvre de charges inductives

1 Domaine d'application

La présente partie de l'IEC 62271 est applicable aux appareils de connexion à courant alternatif conçus pour une installation à l'intérieur ou à l'extérieur, et pour fonctionner à des fréquences de 50 Hz à 60 Hz, sur des réseaux de tensions supérieures à 1000 V, et prévus pour l'établissement et la coupure de courants inductifs. Le présent document est applicable aux appareils de connexion (y compris les disjoncteurs selon l'IEC 62271-100) qui sont utilisés pour l'établissement et la coupure de courants de moteurs à haute tension et de courants de bobines d'inductance shunt, et aussi aux contacteurs à haute tension utilisés pour l'établissement et la coupure de courants de moteurs à haute tension, tels que couverts par l'IEC 62271-106.

La manœuvre de transformateurs à vide, c'est-à-dire la coupure de courants magnétisants de transformateurs, n'est pas prise en compte dans ce document. Les raisons pour cela sont les suivantes:

- a) En raison du comportement non linéaire du circuit magnétique du transformateur, il n'est pas possible de modéliser correctement l'établissement et la coupure d'un courant magnétisant d'un transformateur en utilisant des composants linéaires dans un laboratoire d'essais. Les essais effectués en utilisant un transformateur à disposition, tel qu'un transformateur d'essai, sont valables seulement pour le transformateur soumis à l'essai et ne peuvent pas être représentatifs pour d'autres transformateurs.
- b) Ainsi qu'il est détaillé dans l'IEC TR 62271-306, les caractéristiques de cette manœuvre sont habituellement moins sévères que les autres manœuvres d'établissement et de coupure de courants inductifs. Une telle manœuvre peut produire des surtensions sévères dans le ou les bobinages d'un transformateur en fonction de la caractéristique de réallumage de l'appareil de connexion et des fréquences de résonance du bobinage du transformateur.

NOTE 1 L'établissement et la coupure de bobines d'inductance tertiaire, du côté haute tension du transformateur, ne sont pas couverts par le présent document.

NOTE 2 L'établissement et la coupure de bobines d'inductance shunt mises à la terre à travers des bobines d'inductance de neutre ne sont pas couverts par le présent document. Cependant, l'application des résultats d'essai, effectués suivant le présent document, à l'établissement et à la coupure des bobines d'inductance mises à la terre par bobine d'inductance de neutre (schéma à quatre noyaux), est abordée dans l'IEC TR 62271-306.

2 Références normatives

Les documents suivants cités dans le texte constituent, pour tout ou partie de leur contenu, des exigences du présent document. Pour les références datées, seule l'édition citée s'applique. Pour les références non datées, la dernière édition du document de référence s'applique (y compris les éventuels amendements).

IEC 60050-441, *Vocabulaire électrotechnique international – Chapitre 441: Appareillage et fusibles* (disponible à l'adresse www.electropedia.org)

IEC 62271-1:2017, *Appareillage à haute tension – Partie 1: Spécifications communes pour appareillage à courant alternatif*

IEC 62271-100:2008, *Appareillage à haute tension – Partie 100: Disjoncteurs à courant alternatif*

IEC 62271-100:2008/AMD1:2012

IEC 62271-106:2011, *Appareillage à haute tension – Partie 106: Contacteurs, combinés de démarrage à contacteurs et démarreurs de moteurs, pour courant alternatif*

Withdrawn