

REDLINE VERSION



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

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CONTENTS

FOREWORD	4
1 General	
1 Scope	6
2 Normal and special service conditions	
2 Normative references	6
3 Terms and definitions	7
4 Ratings	
4 Type tests	9
4.1 General	9
6.2 Dielectric tests	
6.3 Radio interference voltage (r.i.v.) test	
6.4 Measurement of the resistance of circuits	
6.5 Temperature rise tests	
6.6 Short time withstand current and peak withstand current tests	
6.7 Verification of protection	
6.8 Tightness tests	
6.9 Electromagnetic compatibility tests (EMC)	
6.101 Mechanical and environmental tests	
4.2 Miscellaneous provisions for making and breaking inductive load switching tests	10
4.3 High-voltage motor current switching tests	11
4.3.1 Applicability	11
4.3.2 General	11
4.3.3 Characteristics of the supply circuits	13
4.3.4 Characteristics of the load circuit	14
4.3.5 Test voltage	14
4.3.6 Test-duties	15
4.3.7 Test measurements	15
4.3.8 Behaviour and condition of circuit-breaker switching device	15
4.3.9 Test report	16
4.4 Shunt reactor current switching tests	17
4.4.1 Applicability	17
4.4.2 General	18
4.4.3 Test circuits	18
4.4.4 Characteristics of the supply circuit	21
4.4.5 Characteristics of the connecting leads	21
4.4.6 Characteristics of the load circuits	21
4.4.7 Earthing of the test circuit	26
4.4.8 Test voltage	26
4.4.9 Test-duties	26
5 Design and construction	
7 Routine tests	
8 Guide to selection of switchgear and controlgear	
9 Information to be given with enquiries, tenders and orders	
10 Transport, storage, installation, operation and maintenance	

11 – Safety	
12 – Influence of the product on the environment	
Annex A (normative) Calculation of t_3 values.....	31
Bibliography.....	33
Figure 1 – Motor switching test circuit and summary of parameters.....	13
Figure 2 – Illustration of voltage transients at interruption of inductive current for first phase clearing in a three-phase non-effectively earthed circuit	17
Figure 3 – Reactor switching test circuit – Three-phase test circuit for in-service load circuit configurations 1 and 2 (Table 2)	19
Figure 4 – Reactor switching test circuit – Single-phase test circuit for in-service load circuit configurations 1, 2 and 4 (Table 2)	20
Figure 5 – Reactor switching test circuit – Three-phase test circuit for in-service load circuit configuration 3 (Table 2).....	21
Figure 6 – Illustration of voltage transients at interruption of inductive current for a single-phase test	30
Table 1 – Test-duties at motor current switching tests.....	15
Table 2 – In-service load circuit configurations	18
Table 3 – Standard Values of prospective transient recovery voltages – Rated voltages 12 kV to 170 kV for effectively and non-effectively earthed systems – Switching shunt reactors with isolated neutrals (Table 2: In-service load circuit configuration 1).....	22
Table 4 – Standard Values of prospective transient recovery voltages – Rated voltages 100 kV to 1200 kV for effectively earthed systems – Switching shunt reactors with earthed neutrals (See Table 2: In-service load circuit configuration 2)	23
Table 5 – Standard Values of prospective transient recovery voltages – Rated voltages 12 kV to 52 kV for effectively and non-effectively earthed systems – Switching shunt reactors with isolated neutrals (See Table 2: In-service load circuit configuration 3)	24
Table 6 – Standard Values of prospective transient recovery voltages – Rated voltages 12 kV to 52 kV for effectively and non-effectively earthed systems – Switching shunt reactors with earthed neutrals (See Table 2: In-service load circuit configuration 4).....	25
Table 7 – Load circuit 1 test currents	25
Table 8 – Load circuit 2 test currents	26
Table 9 – Test-duties for reactor current switching tests	27

INTERNATIONAL ELECTROTECHNICAL COMMISSION

HIGH-VOLTAGE SWITCHGEAR AND CONTROLGEAR –

Part 110: Inductive load switching

FOREWORD

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This Redline version provides you with a quick and easy way to compare all the changes between this standard and its 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*

INTERNATIONAL STANDARD

NORME INTERNATIONALE

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

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



CONTENTS

FOREWORD	4
1 Scope	6
2 Normative references	6
3 Terms and definitions	7
4 Type tests	8
4.1 General.....	8
4.2 Miscellaneous provisions for inductive load switching tests	8
4.3 High-voltage motor current switching tests	9
4.3.1 Applicability	9
4.3.2 General	9
4.3.3 Characteristics of the supply circuits.....	10
4.3.4 Characteristics of the load circuit.....	11
4.3.5 Test voltage.....	11
4.3.6 Test-duties	12
4.3.7 Test measurements	12
4.3.8 Behaviour and condition of switching device	12
4.3.9 Test report.....	13
4.4 Shunt reactor current switching tests	14
4.4.1 Applicability	14
4.4.2 General	15
4.4.3 Test circuits.....	15
4.4.4 Characteristics of the supply circuit	18
4.4.5 Characteristics of the connecting leads.....	18
4.4.6 Characteristics of the load circuits	18
4.4.7 Earthing of the test circuit.....	23
4.4.8 Test voltage.....	23
4.4.9 Test-duties	23
Annex A (normative) Calculation of t_3 values	27
Bibliography.....	29
Figure 1 – Motor switching test circuit and summary of parameters.....	10
Figure 2 – Illustration of voltage transients at interruption of inductive current for first phase clearing in a three-phase non-effectively earthed circuit	14
Figure 3 – Reactor switching test circuit – Three-phase test circuit for in-service load circuit configurations 1 and 2 (Table 2)	16
Figure 4 – Reactor switching test circuit – Single-phase test circuit for in-service load circuit configurations 1, 2 and 4 (Table 2)	17
Figure 5 – Reactor switching test circuit – Three-phase test circuit for in-service load circuit configuration 3 (Table 2).....	18
Figure 6 – Illustration of voltage transients at interruption of inductive current for a single-phase test	26
Table 1 – Test-duties at motor current switching tests.....	12
Table 2 – In-service load circuit configurations	15

Table 3 – Values of prospective transient recovery voltages – Rated voltages 12 kV to 170 kV for effectively and non-effectively earthed systems – Switching shunt reactors with isolated neutrals (Table 2: In-service load circuit configuration 1) 19

Table 4 – Values of prospective transient recovery voltages – Rated voltages 100 kV to 1 200 kV for effectively earthed systems – Switching shunt reactors with earthed neutrals (See Table 2: In-service load circuit configuration 2) 20

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Table 6 – Values of prospective transient recovery voltages – Rated voltages 12 kV to 52 kV for effectively and non-effectively earthed systems – Switching shunt reactors with earthed neutrals (See Table 2: In-service load circuit configuration 4) 22

Table 7 – Load circuit 1 test currents 22

Table 8 – Load circuit 2 test currents 23

Table 9 – Test-duties for reactor current switching tests 24

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HIGH-VOLTAGE SWITCHGEAR AND CONTROLGEAR –

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HIGH-VOLTAGE SWITCHGEAR AND CONTROLGEAR –

Part 110: Inductive load switching

1 Scope

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

SOMMAIRE

AVANT-PROPOS	32
1 Domaine d'application	34
2 Références normatives	34
3 Termes et définitions	35
4 Essais de type	36
4.1 Généralités	36
4.2 Dispositions diverses pour les essais de manœuvres de charges inductives	37
4.3 Essais d'établissement et de coupure de courants de moteurs à haute tension	37
4.3.1 Applicabilité	37
4.3.2 Généralités	37
4.3.3 Caractéristiques des circuits d'alimentation	39
4.3.4 Caractéristiques du circuit de charge	40
4.3.5 Tension d'essai	41
4.3.6 Séquences d'essais	41
4.3.7 Mesurages d'essai	42
4.3.8 Comportement et état de l'appareil de connexion	42
4.3.9 Rapport d'essai	42
4.4 Essais d'établissement et de coupure de courant de bobine d'inductance shunt	44
4.4.1 Applicabilité	44
4.4.2 Généralités	45
4.4.3 Circuits d'essais	45
4.4.4 Caractéristiques du circuit d'alimentation	49
4.4.5 Caractéristiques des câbles de connexion	49
4.4.6 Caractéristiques des circuits de charge	49
4.4.7 Mise à la terre du circuit d'essai	54
4.4.8 Tension d'essai	54
4.4.9 Séquences d'essais	54
Annexe A (normative) Calcul des valeurs de t_3	58
Bibliographie	60
Figure 1 – Circuit d'essai d'établissement et de coupure de moteur et résumé des paramètres	39
Figure 2 – Représentation des tensions transitoires lors de la coupure de courant inductif pour une première phase coupée dans un circuit triphasé dont le neutre n'est pas mis effectivement à la terre	44
Figure 3 – Circuit d'essai d'établissement et de coupure de bobine d'inductance – Circuit d'essai triphasé pour les configurations de circuits de charge en service 1 et 2 (Tableau 2)	47
Figure 4 – Circuit d'essai d'établissement et de coupure de bobine d'inductance – Circuit d'essai monophasé pour configurations de circuits de charge en service 1, 2 et 4 (Tableau 2)	48
Figure 5 – Circuit d'essai d'établissement et de coupure de bobine d'inductance – Circuit d'essai triphasé pour les configurations de circuits de charge en service 3 (Tableau 2)	49

Figure 6 – Représentation des tensions transitoires lors de la coupure de courant inductif pour un essai monophasé	57
Tableau 1 – Séquences d’essais d’établissement et de coupure de courants de moteurs	41
Tableau 2 – Configurations de circuits de charge en service	45
Tableau 3 – Valeurs des tensions transitoires de rétablissement présumées – Tensions assignées comprises entre 12 kV et 170 kV pour les réseaux à neutre directement à la terre et non directement à la terre – Établissement et coupure de bobines d’inductance shunt avec neutres isolés (Tableau 2: configuration de circuit de charge en service 1)	50
Tableau 4 – Valeurs des tensions transitoires de rétablissement présumées – Tensions assignées comprises entre 100 kV et 1 200 kV pour les réseaux à neutre directement à la terre – Établissement et coupure de bobines d’inductance shunt avec neutres mis à la terre (Voir Tableau 2: configuration de circuit de charge en service 2)	51
Tableau 5 – Valeurs des tensions transitoires de rétablissement présumées – Tensions assignées comprises entre 12 kV et 52 kV pour les réseaux à neutre directement à la terre et non directement à la terre – Établissement et coupure de bobines d’inductance shunt avec neutres isolés (Voir Tableau 2: configuration de circuit de charge en service 3)	52
Tableau 6 – Valeurs des tensions transitoires de rétablissement présumées – Tensions assignées comprises entre 12 kV et 52 kV pour les réseaux à neutre directement à la terre et non directement à la terre – Établissement et coupure de bobines d’inductance shunt avec neutres reliés à la terre (Voir Tableau 2: configuration de circuit de charge en service 4)	53
Tableau 7 – Courants d’essai pour circuit de charge 1	54
Tableau 8 – Courants d’essai pour circuit de charge 2	54
Tableau 9 – Séquences d’essais d’établissement et de coupure de courant de bobine d’inductance	55

COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

APPAREILLAGE À HAUTE TENSION –

Partie 110: Manœuvre de charges inductives

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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.

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 1 000 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*