NATIONAL STANDARD OF CANADA
NORME NATIONALE DU CANADA

CAN/ULC-61481-1-15
(IEC 61481-1:2014 MOD)

La norme internationale **IEC 61481-1:2014, (première édition, 2014-10),** a été adoptée avec les exigences propres au Canada (MOD), et porte la désignation **CAN/ULC-61481-1-15** la première édition. Elle a été approuvée comme Norme nationale du Canada par le Conseil canadien des normes.

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International Standard **IEC 61481-1:2014 (First Edition, 2014-10),** has been adopted with Canadian deviations (MOD) as the First Edition of **CAN/ULC-61481-1-15**, which has been approved as a National Standard of Canada by the Standards Council of Canada.

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June 2015

Travaux sous tension – Comparateurs de phase – Partie 1: Type capacitif pour usage sur des tensions alternatives de plus de 1 kV

ICS 13.260, 29.240.20, 29.260.99

Live working – Phase comparators – Part 1: Capacitive type to be used for voltages exceeding 1 kV a.c.

ICS 13.260, 29.240.20, 29.260.99

Numéro de référence
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IEC 61481-1:2014

Commission Electrotechnique Internationale
International Electrotechnical Commission

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Le but premier visé par cette norme est énoncé au paragraphe qui en définit le domaine d'application. Il importe de préciser qu'il incombe à l'utilisateur de décider si la norme convient à ses besoins particuliers.

The intended primary application of this Standard is stated in its scope. It is important to note that it remains the responsibility of the user of the Standard to judge its suitability for this particular application.

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NORME NATIONALE DU CANADA

CAN/ULC-61481-1-15
(IEC 61481-1:2014, MOD)

Travaux sous tension – Comparateurs de phase – Partie 1: Type capacitif pour usage sur des tensions alternatives de plus de 1 kV

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NATIONAL STANDARD OF CANADA

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Live working – Phase comparators – Part 1: Capacitive type to be used for voltages exceeding 1 kV a.c.

ICS 13.260, 29.240.20, 29.260.99

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Standards Council of Canada
Conseil canadien des normes

PREMIÈRE ÉDITION / FIRST EDITION ..... **JUIN 2015 / JUNE 2015**

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Il s'agit de la liste des membres du comite au moment de l'approbation de présent document. La composition du comite peut avoir change depuis ce temps-la.

This list represents the membership at the time the Committee balloted on the final text of this edition. Since that time, changes in the membership may have occurred.

CAN/ULC-61481-1-15
(IEC 61481-1:2014, MOD)

Travaux sous tension – Comparateurs de phase – Partie 1: Type capacitif pour usage sur des tensions alternatives de plus de 1 kV

PRÉFACE NORMES ULC

Ce document constitue la première édition de la norme, CAN/ULC-61481-1-15 (IEC 61481-1:2014, MOD), Travaux sous tension – Comparateurs de phase – Partie 1: Type capacitif pour usage sur des tensions alternatives de plus de 1 kV, laquelle constitue une adoption, avec les exigences propres au Canada, de la norme internationale de la Commission Électrotechnique Internationale, IEC 61481-1 (première édition, 2014-10).

Au Canada, il y a deux langues officielles, le français et l'anglais. Tous les avertissements de sécurité doivent être en français et en anglais. Il importe de signaler que certaines autorités canadiennes peuvent exiger que des marquages et/ou des directives d'installation supplémentaires soient dans les deux langues officielles.

La première édition de cette norme ULC était fondée sur la première édition du document CAN/ULC-D61481 et le remplaçait.

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La présente norme est destinée à être utilisée à des fins d'évaluation de la conformité.

Une grande partie du financement nécessaire au processus d’adoption de cette Norme nationale du Canada a été assurée par l’association canadienne de l’électricité (ACE) que nous tenons à remercier.

Juin 2015

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CAN/ULC-61481-1-15
(IEC 61481-1:2014, MOD)

Live working – Phase comparators – Part 1: Capacitive type to be used for voltages exceeding 1 kV a.c.

ULC STANDARDS PREFACE

This is the First Edition of the Standard CAN/ULC-61481-1-15 (IEC 61481-1:2014, MOD), Live working – Phase comparators – Part 1: Capacitive type to be used for voltages exceeding 1 kV a.c., with Canadian Deviations, of the international standard by International Electrotechnical Commission, IEC 61481-1:2014 (First Edition, 2014-10).

In Canada there are two official languages, English and French. All safety warnings must be in French and English. Attention is drawn to the possibility that some Canadian authorities may require additional markings and/or installation instructions to be in both official languages.

This First Edition National Standard of Canada is based on, and supercedes, the First Edition of CAN/ULC-D61481.

Attention is drawn to the possibility that some of the elements of this Canadian standard may be the subject of patent rights. ULC Standards shall not be held responsible for identifying any or all such patent rights.

The initiation of the review of this Standard will commence within 5 years of the date of publication, unless the Standard is identified as fitting within a stabilized category, whereby the review will commence within the appropriate time frame set out by ULC Standards

This Standard is intended to be used for conformity assessment.

Major funding in support of the adoption process of this National Standard of Canada was provided by the Canadian Electricity Association (CEA), whose assistance is acknowledged with thanks.

June 2015

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Exigences propres au Canada

GÉNÉRALITÉS

[Remplacez tous les références « IEC 61318 » dans le document avec « CAN/ULC-61318 »]

[Remplacez tous les références « IEC 61477 » dans le document avec « CAN/ULC-61477 »]

2 RÉFÉRENCES NORMATIVES

[Reviser les références IEC 61318 et IEC 61477 comme suit:

« CAN/ULC-61318-08, Travaux sous tension – Évaluation de la conformité applicable à l'outillage, au matériel et aux dispotifs (CEI/IEC 61318:2007, IDT)»

« CAN/ULC-61477-11, Travuax sous tension – Exigences minimales pour l'utilisation des outils, dispotifs et équipments (CEI/IEC 61477:2009, MOD)»]

4.5 MARQUAGE

[Supprimer la dixième point « - symbole IEC 60417-5216:2002-10…» et la REMARQUE connexe]

[Réviser le onzième point avec tiret comme suit :
« –numéro de la norme CAN/ULC applicable (CAN/ULC-61481-1). »]

[Réviser le deuxième et troisième paragraphes comme suit:

« Pour être marqué du numéro de la présente norme CAN/ULC, le produit doit satisfaire à toutes les exigences qui y sont spécifiées. »

« Avec chaque comparateur de phase ou avec chaque lot de comparateurs de phase à livrer, le fabricant doit fournir l'information relative au numéro de la norme CAN/ULC. »]

ANNEXE B

[Supprimer l'annexe B.]

Canadian Deviations

GENERAL

[Change all “IEC 61318” references in the document to read “CAN/ULC-61318”]

[Change all “IEC 61477” references in the document to read “CAN/ULC-61477”]

2 NORMATIVE REFERENCES

[Revise IEC 61318 and IEC 61477 to read:

“CAN/ULC-61318-08, Live Working – Conformity assessment applicable to tools, devices and equipment (CEI/IEC 61318:2007, IDT)”

“CAN/ULC-61477-11, Live Working – Minimum requirements for the utilizations of tools, devices and equipment (CEI/IEC 61477:2009, MOD)”]

4.5 MARKING

[Delete the tenth dash item regarding “- symbol IEC 60417-5216:2002-10…” and accompanying NOTE]

[Revise the eleventh dash item to state:
“– number of the relevant CAN/ULC standard (CAN/ULC-61481-1).”]

[Amend the second and third paragraph to reference CAN/ULC Standard:

“To be marked with the number of this CAN/ULC standard, the product shall satisfy all the requirements specified herein.”

“With every phase comparator or with every batch of phase comparators to be delivered, the manufacturer shall provide information related to the number of the CAN/ULC standard.”]

ANNEX B

[Delete Annex B]

IEC 61481-1

Edition 1.0 2014-10

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Live working – Phase comparators – Part 1: Capacitive type to be used for voltages exceeding 1 kV a.c.

Travaux sous tension – Comparateurs de phase – Partie 1: Type capacitif pour usage sur des tensions alternatives de plus de 1 kV



IEC 61481-1:2014-10(en-fr)



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IEC Central Office
3, rue de Varembé
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
Fax: +41 22 919 03 00
info@iec.ch
www.iec.ch

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IEC 61481-1

Edition 1.0 2014-10

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Live working – Phase comparators – Part 1: Capacitive type to be used for voltages exceeding 1 kV a.c.

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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LIVE WORKING – PHASE COMPARATORS –

Part 1: Capacitive type to be used for voltages exceeding 1 kV a.c.

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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International Standard IEC 61481-1 has been prepared by IEC technical committee 78: Live working.

This first edition, together with the first edition of IEC 61481-2, cancels and replaces the first edition of IEC 61481 published in 2001, Amendment 1:2002 and Amendment 2:2004. This edition constitutes a technical revision.

The major changes are:

- split of the standard in two parts;
- extension of the scope to include two-pole phase comparators operating with a wireless connection up to 245 kV a.c.;
- review of the requirements for indication;
- introduction of a requirement for a new marking “LU” for limited use;
- addition of requirements and tests for two-pole phase comparators operating with a wireless connection;
- clarification of the test procedures in case of additional contact electrodes, accessories and combination of accessories, as well as in case of family of phase comparators;
- addition of requirements and tests for electromagnetic compatibility (EMC);
- clarification of the test provisions for the function tests;
- clarification of the test procedure for clear perceptibility of audible indication;
- preparation of the elements of evaluation of defects, and general application of IEC 61318:2007;
- revision of existing annexes;
- change of existing normative Annex C in two new Annexes D and F giving the classification of defects (normative) and the rationale for the classification of defects (informative);
- deletion of existing Annex D, no longer needed following the specification of IEC 60068-2-75;
- deletion of existing Annex F, not applicable according to IEC 61318:2007;
- addition of a new informative Annex E giving additional information on the use of the limit mark and of a contact electrode extension.

The text of this standard is based on the following documents:

FDIS	Report on voting
78/1051/FDIS	78/1087/RVD

Full information on the voting for the approval of this standard 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.

In this standard terms defined in Clause 3 appear in *italics*.

A list of all parts of the IEC 61481 series, published under the general title *Live working – Phase comparators,* can be found on the IEC website.

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.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

This International Standard has been prepared in accordance with the requirements of IEC 61477.

Taking into consideration the two different functioning principles of portable *phase comparators* of capacitive type available on the market, the maximum a.c. *nominal voltage* to be associated with each of them has been considered for delimiting the scope of this standard.

The following table presents the rationale for the resulting maximum *nominal voltage* to be associated with each functioning principle of *phase comparator of capacitive type*.

Functioning principle	**Maximum nominal voltage** kV rms	**Rationale**
Single-pole *phase comparators* operating with a memory system	36	– With this principle of functioning, the *clear indication* of the *phase comparator* is limited by the *memory holding time*. With higher *nominal voltage*s, the distance between phases of the installation increases and the time necessary to move the pole of the *phase comparator* between the two parts to be compared becomes the limitation.
Two-pole *phase comparators* operating with a wireless connection	245	– With this principle of functioning, there is no theoretical limit for the maximum *nominal voltage*. – The definition of 245 kV corresponds to the present limit of validation of the electric test set-up.

The product covered by this standard may have an impact on the environment during some or all stages of its life cycle. These impacts can range from slight to significant, be short-term or long-term, and occur at the global, regional or local level.

In terms of environmental improvement, this standard includes neither requirements nor test provisions for the manufacturers of the product nor recommendations to the users of the product. However, all parties intervening in its design, manufacture, packaging, distribution, use, maintenance, repair, reuse, recovery and disposal are invited to take account of environmental considerations.

LIVE WORKING – PHASE COMPARATORS –

Part 1: Capacitive type to be used for voltages exceeding 1 kV a.c.

1 Scope

This part of IEC 61481 is applicable to portable *phase comparators* of capacitive type to be used on electrical systems for voltages exceeding 1 kV a.c. and frequencies of 50 Hz and/or 60 Hz.

This standard is applicable to:

- single-pole *phase comparators* of capacitive type operating with a memory system up to 36 kV a.c.,
- two-pole *phase comparators* of capacitive type operating with a wireless connection up to 245 kV a.c.

This standard is applicable to *phase comparators* of capacitive type used in contact with the bare conductive parts to be compared:

- as a complete device including its *insulating element* or
- as a separate device, adaptable to an *insulating stick* which, as a separate tool, is not covered by this standard.

NOTE Some parts such as the *contact electrode* or the *insulating element* of a *phase comparator* as a complete device may be dismantled.

Some restrictions on their use are applicable in the case of factory-assembled switchgear and on overhead systems of electrified railways (see Annex A).

A device that is designed to provide other functions than phase comparison is a different device and is not covered by this standard. For example a device designed to be also used as a voltage detector is not covered by this standard (see Annex A).

Products designed and manufactured according to this standard contribute to the safety of users provided they are used by persons trained for the work, in accordance with the hot stick working method and the instructions for use.

Except when otherwise specified, all the voltages defined in this standard refer to phase-to-phase voltages of three-phase systems. In other systems, the applicable phase-to-phase or phase-to-earth (ground) voltages should be used to determine the operating voltage.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

CISPR 11, *Industrial, scientific and medical equipment – Radio-frequency disturbance characteristics – Limits and methods of measurement*