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BSI Standards Publication

High voltage test techniques — Measurement of partial discharges by electromagnetic and acoustic methods

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National foreword

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A list of organizations represented on this committee can be obtained on request to its secretary.

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colour inside

High voltage test techniques – Measurement of partial discharges by electromagnetic and acoustic methods

Techniques d'essais à haute tension – Mesurage des décharges partielles par méthodes électromagnétiques et acoustiques

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HIGH VOLTAGE TEST TECHNIQUES – MEASUREMENT OF PARTIAL DISCHARGES BY ELECTROMAGNETIC AND ACOUSTIC METHODS

FOREWORD

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Technical specifications are subject to review within three years of publication to decide whether they can be transformed into International Standards.

IEC TS 62478, which is a technical specification, has been prepared by IEC technical committee 42: High-voltage and high-current test techniques.

The text of this technical specification is based on the following documents:

Enquiry draft	Report on voting
42/325/DTS	42/333/RVC

Full information on the voting for the approval of this technical specification 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.

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

- transformed into an International standard,
- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

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INTRODUCTION

Partial discharges (PDs) generate electromagnetic and acoustic waves, emit light and produce chemical decomposition of insulation materials; these physical and chemical effects can be detected by various diagnostic methods and appropriate sensing elements (sensors). Besides the so-called ‘conventional’, electrical method described in IEC 60270, it is possible to detect and measure PDs with various ‘non-conventional’ methods (see Annexes A and B).

There is a special need to give recommendations for two used non-conventional methods, acoustic and electromagnetic ones, and this document is the first step in this direction.

HIGH VOLTAGE TEST TECHNIQUES – MEASUREMENT OF PARTIAL DISCHARGES BY ELECTROMAGNETIC AND ACOUSTIC METHODS

1 Scope

This document is applicable to electromagnetic (HF/VHF/UHF) and acoustic measurements of PDs which occur in insulation of electrical apparatus.

This specification deals with a large variety of applications, sensors of different frequency ranges and differing sensitivities. The tasks of PD location and measuring system calibration or sensitivity check are also taken into account.

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 TS 60034-27, *Rotating electrical machines – Part 27: Off-line partial discharge measurements on the stator winding insulation of rotating electrical machines*

IEC 60270, *High-voltage test techniques – Partial discharge measurements*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

3.1
partial discharge
PD
complex physical phenomena consisting of a localized electrical discharge caused by partial breakdown of an insulating medium under the influence of the local electrical field stress

3.1.1
partial discharge current pulses
PD current pulses
extremely fast current pulses, whose rise time and pulse width depend on the discharge type, defect type, geometry and gas pressure

3.1.2
electromagnetic effects of PD
PD current pulses resulting in the emission of transient electromagnetic waves at very high frequency ranges