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Mineral oil-filled electrical equipment in service -  
Guidance on the interpretation of dissolved and free  
gases analysis

## EESTI STANDARDI EESSÕNA

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|   |  |
|---|--|
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ICS 17.220.99, 29.040.10, 29.180

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English Version

Mineral oil-filled electrical equipment in service - Guidance on  
the interpretation of dissolved and free gases analysis  
(IEC 60599:2015)

Matériels électriques remplis d'huile minérale en service -  
Lignes directrices pour l'interprétation de l'analyse des gaz  
dissous et des gaz libres  
(IEC 60599:2015)

In Betrieb befindliche, mit Mineralöl befüllte elektrische  
Geräte - Leitfaden zur Interpretation der Analyse gelöster  
und freier Gase  
(IEC 60599:2015)

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European Committee for Electrotechnical Standardization  
Comité Européen de Normalisation Electrotechnique  
Europäisches Komitee für Elektrotechnische Normung

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## European foreword

The text of document 10/967/FDIS, future edition 3 of IEC 60599, prepared by IEC/TC 10 "Fluids for electrotechnical applications" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 60599:2016.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2016-07-21
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2018-10-21

This document supersedes EN 60599:1999.

EN 60599:2016 includes the following significant technical changes with respect to EN 60599:1999:

- a) revision of 5.5, 6.1, 7, 8, 9, 10, A.2.6, A.3, A.7;
- b) addition of new subclause 4.3;
- c) expansion of the Bibliography;
- d) revision of Figure 1;
- e) addition of Figure B.4.

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## Endorsement notice

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## Annex ZA (normative)

### Normative references to international publications with their corresponding European publications

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.

NOTE 1 When an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: [www.cenelec.eu](http://www.cenelec.eu).

| <u>Publication</u> | <u>Year</u> | <u>Title</u>  | <u>EN/HD</u> | <u>Year</u> |
|--------------------|-------------|---|--------------|-------------|
| IEC 60050-191      | 1990        | International Electrotechnical Vocabulary - Chapter 191: Dependability and quality of service                                 | -            | -           |
| IEC 60050-192      | 2015        | International electrotechnical vocabulary - Part 192: Dependability   | -            | -           |
| IEC 60050-212      | 2010        | International Electrotechnical Vocabulary - Part-212: Electrical insulating solids, liquids and gases                         | -            | -           |
| IEC 60050-604      | 1987        | International Electrotechnical Vocabulary - Chapter 604: Generation, transmission and distribution of electricity - Operation | -            | -           |
| IEC 60475          | -           | Method of sampling insulating liquids   | EN 60475     | -           |
| IEC 60567          | 2011        | Oil-filled electrical equipment - Sampling of gases and analysis of free and dissolved gases - Guidance                       | EN 60567     | 2011        |
| IEC 61198          | -           | Mineral insulating oils - Methods for the determination of 2-furfural and related compounds                                   | EN 61198     | -           |

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## INTRODUCTION

Dissolved and free gas analysis (DGA) is one of the most widely used diagnostic tools for detecting and evaluating faults in electrical equipment filled with insulating liquid. However, interpretation of DGA results is often complex and should always be done with care, involving experienced insulation maintenance personnel.

This International Standard gives information for facilitating this interpretation. The first edition, published in 1978, has served the industry well, but had its limitations, such as the absence of a diagnosis in some cases, the absence of concentration levels and the fact that it was based mainly on experience gained from power transformers. The second edition attempted to address some of these shortcomings. Interpretation schemes were based on observations made after inspection of a large number of faulty oil-filled equipment in service and concentrations levels deduced from analyses collected worldwide.

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