



# SLOVENSKI STANDARD SIST EN IEC 60599:2022

01-september-2022

Nadomešča:  
SIST EN 60599:2016

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**Električna oprema, polnjena z mineralnim oljem, v delovanju - Vodilo za  
tolmačenje rezultatov analize raztopljenih in prostih plinov**

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

In Betrieb befindliche, mit Mineralöl befüllte elektrische Geräte - Leitfaden zur  
Interpretation der Analyse gelöster und freier Gase

Matériels électriques remplis d'huile minérale en service - Lignes directrices pour  
l'interprétation de l'analyse des gaz dissous et des gaz libres

**Ta slovenski standard je istoveten z: EN IEC 60599:2022**

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**ICS:**

29.040.10	Izolacijska olja	Insulating oils
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<b>SIST EN IEC 60599:2022</b>	<b>en</b>
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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN IEC 60599**

July 2022

ICS 17.220.99; 29.040.10; 29.180

Supersedes EN 60599:2016

English Version

**Mineral oil-filled electrical equipment in service - Guidance on  
the interpretation of dissolved and free gases analysis  
(IEC 60599:2022)**

Matériels électriques remplis d'huile minérale en service -  
Recommandations relatives à l'interprétation de l'analyse  
des gaz dissous et des gaz libres  
(IEC 60599:2022)

In Betrieb befindliche, mit Mineralöl befüllte elektrische  
Geräte - Leitfaden zur Interpretation der Analyse gelöster  
und freier Gase  
(IEC 60599:2022)

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European Committee for Electrotechnical Standardization  
Comité Européen de Normalisation Electrotechnique  
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**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

**EN IEC 60599:2022 (E)****European foreword**

The text of document 10/1164/FDIS, future edition 4 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 IEC 60599:2022.

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- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2025-06-29

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## Annex ZA (normative)

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

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.

NOTE 1 Where 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 60475	-	Method of sampling insulating liquids	-	-
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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# INTERNATIONAL STANDARD

## NORME INTERNATIONALE

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

**Matériels électriques remplis d'huile minérale en service – Recommandations relatives à l'interprétation de l'analyse des gaz dissous et des gaz libres**

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## CONTENTS

FOREWORD .....	5
INTRODUCTION .....	7
1 Scope .....	8
2 Normative references .....	8
3 Terms, definitions and abbreviated terms .....	8
3.1 Terms and definitions .....	8
3.2 Abbreviated terms .....	10
3.2.1 Chemical names and formulae .....	10
3.2.2 General abbreviated terms .....	10
4 Mechanisms of gas formation .....	11
4.1 Decomposition of oil .....	11
4.2 Decomposition of cellulosic insulation .....	12
4.3 Stray gassing of oil .....	12
4.4 Other sources of gas .....	12
5 Identification of faults .....	12
5.1 General .....	12
5.2 Dissolved gas compositions .....	13
5.3 Types of faults .....	13
5.4 Basic gas ratios .....	13
5.5 CO <sub>2</sub> /CO ratio .....	15
5.6 O <sub>2</sub> /N <sub>2</sub> ratio .....	15
5.7 C <sub>2</sub> H <sub>2</sub> /H <sub>2</sub> ratio .....	16
5.8 C <sub>3</sub> hydrocarbons .....	16
5.9 Evolution of faults .....	16
5.10 Graphical representations .....	16
6 Conditions for calculating ratios .....	17
6.1 Examination of DGA values .....	17
6.2 Uncertainty on gas ratios .....	17
7 Application to free gases in gas relays .....	17
8 Gas concentration levels in service .....	19
8.1 Probability of failure in service .....	19
8.1.1 General .....	19
8.1.2 Calculation methods .....	20
8.2 Typical concentration values .....	20
8.2.1 General .....	20
8.2.2 Calculation methods .....	20
8.2.3 Choice of normality percentages .....	20
8.2.4 Alarm concentration values .....	20
8.3 Rates of gas increase .....	21
9 Recommended method of DGA interpretation .....	21
10 Report of results .....	22
Annex A (informative) Equipment application notes .....	24
A.1 General warning .....	24
A.2 Power transformers .....	24



A.2.1	Specific subtypes.....	24
A.2.2	Typical faults .....	24
A.2.3	Identification of faults by DGA .....	25
A.2.4	Typical concentration values.....	25
A.2.5	Typical rates of gas increase .....	26
A.2.6	Specific information to be added to the DGA report .....	27
A.3	Industrial and special transformers .....	27
A.3.1	Specific subtypes.....	27
A.3.2	Typical faults .....	27
A.3.3	Identification of faults by DGA .....	28
A.3.4	Typical concentration values.....	28
A.4	Instrument transformers .....	29
A.4.1	Specific subtypes.....	29
A.4.2	Typical faults .....	29
A.4.3	Identification of faults by DGA .....	29
A.4.4	Typical concentration values.....	30
A.5	Oil-impregnated paper bushings .....	30
A.5.1	Specific subtypes.....	30
A.5.2	Typical faults .....	30
A.5.3	Identification of faults by DGA .....	31
A.5.4	Typical concentration values.....	31
A.6	Oil-filled cables .....	32
A.6.1	Typical faults .....	32
A.6.2	Identification of faults by DGA .....	32
A.6.3	Typical concentration values.....	32
A.7	Switching equipment.....	33
A.7.1	Specific subtypes.....	33
A.7.2	Normal operation .....	33
A.7.3	Typical faults .....	33
A.7.4	Identification of faults by DGA .....	33
A.8	Equipment filled with non-mineral fluids .....	34
Annex B (informative)	Graphical representations of gas ratios .....	35
Bibliography.....		39
Figure 1 – Flow chart .....		23
Figure B.1 – Graphical representation 1 of gas ratios.....		35
Figure B.2 – Graphical representation 2 of gas ratios.....		36
Figure B.3 – Graphical representation 3 of gas ratios – Duval's triangle 1 for transformers, bushings and cables.....		37
Figure B.4 – Graphical representation 4 of gas ratios – Duval's triangle 2 for OLTCs (see A.7.2).....		38
Table 1 – DGA interpretation table.....		14
Table 2 – Simplified scheme of interpretation.....		14
Table 3 – Ostwald solubility coefficients for various gases in mineral insulating oils.....		19
Table A.1 – Typical faults in power transformers .....		25
Table A.2 – Ranges of 90 % typical gas concentration values observed in power transformers .....		26

Table A.3 – Ranges of 90 % typical rates of gas increase observed in power transformers (all types) .....	26
Table A.4 – Examples of 90 % typical concentration values observed on individual networks .....	28
Table A.5 – Ranges of 90 % typical concentration values observed in WTTs .....	28
Table A.6 – Typical faults in instrument transformers .....	29
Table A.7 – Ranges of 90 % typical concentration values observed in instrument transformers .....	30
Table A.8 – Maximum admissible values for sealed instrument transformers.....	30
Table A.9 – Typical faults in bushings .....	31
Table A.10 – Simplified interpretation scheme for bushings .....	31
Table A.11 – Ranges of 90 % typical concentration values in bushings.....	32
Table A.12 – Ranges of 95 % typical concentration values observed on cables .....	33
Table A.13 – Typical faults in switching equipment .....	33

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

# MINERAL OIL-FILLED ELECTRICAL EQUIPMENT IN SERVICE – GUIDANCE ON THE INTERPRETATION OF DISSOLVED AND FREE GASES ANALYSIS

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IEC 60599 has been prepared by IEC technical committee 10: Fluids for electrotechnical applications. It is an International Standard.

This fourth edition cancels and replaces the third edition published in 2015. This edition constitutes a technical revision.

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

- a) revision of Clause A.5 on bushings, at the request of IEC subcommittee 36A, in order to transfer to IEC 60599 the corresponding contents of IEC TR 61464 [1]<sup>1</sup> relating to DGA in bushings and include the new information on DGA in bushings available in CIGRE Technical Brochure 771 (2019) [2];

<sup>1</sup> Numbers in square brackets refer to the Bibliography.

- b) revision of Clause A.3 on wind turbine transformers, in order to include in IEC 60599 the new information on DGA in wind turbine transformers available in CIGRE Technical Brochure 771 (2019) [2].

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

Draft	Report on voting
10/1164/FDIS	10/1174/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at [www.iec.ch/members\\_experts/refdocs](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are described in greater detail at [www.iec.ch/publications](http://www.iec.ch/publications).

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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 document 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 (2015) 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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