

Bushings for d.c. application

The European Standard EN 62199:2004 has the status of a
British Standard

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National foreword

This British Standard is the official English language version of EN 62199:2004. It is identical with IEC 62199:2004.

The UK participation in its preparation was entrusted by Technical Committee PEL/36, Insulators for power systems, to Subcommittee PEL/36/1, Bushing insulators, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

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(IEC 62199:2004)

Traversées pour application
en courant continu
(CEI 62199:2004)

Durchführungen für
Gleichspannungsanwendungen
(IEC 62199:2004)

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CENELEC

European Committee for Electrotechnical Standardization
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Foreword

The text of document 36A/117/FDIS, future edition 1 of IEC 62199, prepared by SC 36A, Insulated bushings, of IEC TC 36, Insulators, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 62199 on 2004-07-01.

The following dates were fixed:

- | | | |
|--|-------|------------|
| – latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement | (dop) | 2005-04-01 |
| – latest date by which the national standards conflicting with the EN have to be withdrawn | (dow) | 2007-07-01 |

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 62199:2004 was approved by CENELEC as a European Standard without any modification.

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INTRODUCTION

In this first edition of IEC 62199, service experiences as well as established market requirements have been harmonized with existing IEC standards, primarily:

IEC 60137, "Insulated bushings for alternating voltages above 1 000 V".

Where applicable, reference is also made to the following standards:

IEC 61462, "Composite insulators – Hollow insulators for use in outdoor and indoor electrical equipment" and

IEC 62155, "Hollow pressurized and unpressurized ceramic and glass insulators for use in electrical equipment with rated voltages greater than 1 000 V".

The amount of type tests and routine tests has been carefully planned, considering that HVDC (high voltage direct current) power transmission is a mature technology, but still with limited service experience compared to AC systems.

Non-ceramic bushing insulators are widely used in d.c. applications and this standard applies to similar qualification procedures on all types of insulators, except for the artificial pollution test. Preparation of a bushing for an artificial pollution test destroys the surface of a composite insulator and therefore cannot be performed on such bushings.

BUSHINGS FOR DC APPLICATION

1 Scope

This International Standard applies to outdoor and indoor bushings of any voltage used on d.c. systems, of capacitance graded or gas insulated types for use as components of oil-filled converter transformers and smoothing reactors, as well as air-to-air d.c. bushings. This standard does not apply to the following:

- cable terminations (potheads);
- bushings for instrument transformers;
- bushings for test transformers;
- bushings applied with gaseous insulation (other than air at atmospheric pressure) external to the bushing;
- bushings for industrial application;
- bushings for traction application.

This standard makes reference to IEC 60137 for general terms and conditions and defines the special terms used, operating conditions, ratings, test procedures as well as general mechanical and electrical requirements for bushings for d.c. application. Where applicable, reference can also be made to IEC 61462 for composite insulators – hollow insulators for use in outdoor and indoor electrical equipment and to IEC 62155 for hollow pressurized and unpressurized ceramic and glass insulators for use in electrical equipment with rated voltages greater than 1 000 V.

2 Normative references

The following referenced documents are indispensable for the application 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 60050(471):1984, *International Electrotechnical Vocabulary (IEV) – Chapter 471: Insulators*

IEC 60060-1:1989, *High-voltage test techniques – Part 1: General definitions and test requirements*

IEC 60071-1:1993, *Insulation co-ordination – Part 1: Definitions, principles and rules*

IEC 60137:2003, *Insulated bushings for alternating voltages above 1000 V*

IEC 60270:2000, *High-voltage test techniques – Partial discharge measurements*

IEC 61245:1993, *Artificial pollution tests on high-voltage insulators to be used on d.c. systems*

IEC 61462:1998, *Composite insulators – Hollow insulators for use in outdoor and indoor electrical equipment – Definitions, test methods, acceptance criteria and design recommendations*

IEC 62155:2003, *Hollow pressurized and unpressurized ceramic and glass insulators for use in electrical equipment with rated voltages greater than 1 000 V*

3 Terms and definitions

For the purposes of this document, the terms and definitions of IEC 60137 and IEC 60050(471) apply. Where applicable, reference is also made to IEC 61462 and to IEC 62155.

3.1

wall (roof) bushing

bushing intended to be mounted on the wall (roof) of a building such as a converter valve hall

3.2

bushing for combined voltage application

d.c. bushing subject to a large a.c. voltage superimposed on a d.c. bias voltage, such as a bushing applied to the valve winding side of a converter transformer

3.3

bushing for pure d.c. application

d.c. bushing subject to a d.c. voltage with only a small a.c. voltage ripple, such as applied on the high voltage side of a d.c. converter valve

4 Ratings

4.1 Rated voltages

4.1.1 Rated continuous d.c. voltage

The rated continuous d.c. voltage is the maximum continuous d.c. voltage assigned to the bushing by the manufacturer for specified operating conditions.

4.1.2 Rated peak voltage

The rated peak voltage is the maximum value of the combination of d.c. voltage plus peak a.c. voltage that the bushing is required to withstand under the specified operating conditions.

4.2 Insulation levels

The insulation levels for bushings used in d.c. applications do not generally follow the standard values of insulation level in accordance with IEC 60071-1. The purchaser shall specify the insulation levels. The methods of calculation for test voltages are given in the relevant clauses of this standard.