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National Standards
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**OUTDOOR BUSHINGS FOR 24 KV AND 36 KV
AND FOR 5 KA AND 8 KA, FOR LIQUID
FILLED TRANSFORMERS**

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EUROPÄISCHE NORM

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English version

**Outdoor bushings for 24 kV and 36 kV and for 5 kA and 8 kA,
for liquid filled transformers**

Traversées d'extérieur pour
24 kV et 36 kV et pour 5 kA et 8 kA,
pour transformateurs
à remplissage de liquide

Durchführungen für Freiluft,
24 kV und 36 kV sowie 5 kA und 8 kA,
für flüssigkeitsgefüllte Transformatoren

This European Standard was approved by CENELEC on 2001-10-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

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CENELEC

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

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Contents

| | Page |
|--|-----------|
| Foreword | 3 |
| Introduction | 4 |
| 1 Scope | 4 |
| 2 Normative references | 4 |
| 3 Definitions | 5 |
| 4 Requirements | 5 |
| 4.1 Application | 5 |
| 4.2 Standard values of highest voltage for equipment (U_m) | 5 |
| 4.3 Standard values of rated current (I_r) | 5 |
| 4.4 Compliance | 5 |
| 4.5 Common dimensions and creepage distances of bushings type A and type B | 5 |
| 4.6 Parts list according to bushing type A | 8 |
| 4.7 Parts list according to bushing type B | 9 |
| Annex A (normative) Detail drawings of components | 10 |
| A.1 Insulator (Item N° 1) | 10 |
| A.2 Conductor tube (Item N° 2) | 13 |
| A.3 Upper cap (Item N° 4) | 14 |
| A.4 Lower cap (Item N° 6) | 14 |
| A.5 Nut (Item N° 3) | 15 |
| A.6 Sealing ring (Item N° 5) | 15 |
| A.7 Flat gasket (Item N° 9) | 15 |
| A.8 Flat gasket (Item N° 18) | 15 |
| A.9 Clamping ring (Item N° 16) | 16 |
| A.10 Interlayer (Item N° 13) | 16 |
| A.11 Compression ring (Item N° 11) | 17 |
| A.12 Retaining ring (Item N° 12) | 17 |
| A.13 Flat gasket (Item N° 10) | 18 |
| A.14 Clamping paw (Item N° 17) | 18 |

Foreword

This European Standard was prepared by the Technical Committee CENELEC TC 36A, Insulated bushings.

The text of the draft was submitted to the formal vote and was approved by CENELEC as EN 50243 on 2001-10-01.

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) 2003-02-01
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 2005-02-01

Annexes designated "normative" are part of the body of the standard.
In this standard, annex A is normative.

Introduction

The object of this standard is to specify the requirements of outdoor bushings for highest voltages for equipment 24 kV and 36 kV and for rated currents 5 kA and 8 kA.

1 Scope

This standard is applicable to ceramic insulated outdoor bushings for highest voltages for equipment of 24 kV and 36 kV, with rated currents of 5 kA and 8 kA and frequencies from 15 Hz up to 60 Hz for insulating liquid filled transformers.

This standard establishes dimensions to ensure interchangeability and adequate mounting of bushings.

Two types of construction are specified, type A and type B, both types for highest voltages for equipment 24 kV and 36 kV and rated currents of 5 kA and 8 kA. The mechanical stresses of the conductor tube make the difference between type A and type B. The conductor tube of type A is axially and radially fixed in the top of the bushing. The inner line terminal of the transformer can be flexible and without any special support for the lower end of the conductor tube.

In case of type B, the conductor tube is only radially fixed in the top of the bushing. In that case, a rigid support has to be mounted to fix the lower end of the conductor tube (for example, in combination with a drip proofed sealing end). The drip proofed sealing end is often required in the service requirements. In this case, it is not possible to use type A because of the existing double fixation. Therefore, both bushing types A and B have to be specified.

The condition for the usage of type B is that the drip proofed sealing end is able to withstand the mechanical stress in axial direction.

2 Normative references

This European Standard incorporates, by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references, the latest edition of the publication referred to applies (including amendments).

| | | |
|------------|------|--|
| EN 60137 | 1996 | Insulated bushings for alternating voltages above 1 kV (IEC 60137:1995) |
| EN 60672-3 | 1997 | Ceramic and glass-insulating materials - Part 3: Specifications for individual materials (IEC 60672-3:1997) |
| HD 329 S1 | 1977 | Tests on hollow insulators for use in electrical equipment (IEC 60233:1974) |
| IEC 60815 | 1986 | Guide for the selection of insulators in respect of polluted conditions |
| ISO 261 | | ISO general-purpose metric screw threads - General plan |
| ISO 286-2 | | ISO system of limits and fits - Part 2: Tables of standard tolerance grades and limit deviations for holes and shafts |
| ISO 1101 | | Technical drawings - Geometrical tolerancing - Tolerancing of form, orientation, location and run-out - Generalities, definitions, indications on drawings |
| ISO 1302 | | Technical drawings - Method of indicating surface texture |
| ISO 2768 | | General tolerances |

3 Definitions

For the purposes of this standard, the following definitions apply:

3.1

bushing type A

a bushing with a conductor tube which is axially and radially fixed in the top of the bushing

3.2

bushing type B

a bushing with a conductor tube which is only radially fixed in the top of the bushing

4 Requirements

4.1 Application

The open type bushings covered by this standard shall be suitable for operation with one end fully immersed in an insulating liquid and with the other in air.

4.2 Standard values of highest voltage for equipment (U_m)

The value of U_m of a bushing shall be chosen from the standard values given below, in kilovolts:

24 - 36

4.3 Standard values of rated current (I_r)

The value of I_r of a bushing shall be chosen from the standard values given below, in amperes:

5 000 - 8 000

4.4 Compliance

The bushings shall meet the requirements of EN 60137.

4.5 Common dimensions and creepage distances of bushings type A and type B

The common dimensions of bushings type A and type B shall be as specified in Figure 1 and Table 1.

The details of the components are given in Annex A.

The provisions for arcing horns should be made if required.

In case of environmental conditions, which do not require pollution level II or more according to IEC 60815, an insulator with a reduced creepage distance can be agreed between the purchaser and the manufacturer without changing the common dimensions.

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