



National Standards Authority of Ireland

IRISH STANDARD

I.S. HD 428.2.2 S1:1999

ICS 29.180

**THREE-PHASE OIL-IMMERSED
DISTRIBUTION TRANSFORMERS 50 HZ,
FROM 50 TO 2500 KVA WITH HIGHEST
VOLTAGE FOR EQUIPMENT NOT
EXCEEDING 36 KV. PART 2: DISTRIBUTION
TRANSFORMERS WITH CABLE BOXES ON
THE HIGH-VOLTAGE AND/OR
LOW-VOLTAGE SIDE. SECTION 2: CABLE
BOXES TYPE 1 FOR USE ON DISTRIBUTION
TRANSFORMERS MEETING THE
REQUIREMENTS OF HD 428.2.1 S1**

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HARMONIZATION DOCUMENT
DOCUMENT D'HARMONISATION
HARMONISIERUNGSDOKUMENT

HD 428.2.2 S1

May 1997

ICS 29.180

English version

**Three-phase oil-immersed distribution transformers 50 Hz,
from 50 to 2500 kVA with highest voltage for equipment
not exceeding 36 kV**

**Part 2: Distribution transformers with cable boxes on the
high-voltage and/or low-voltage side**

**Section 2: Cable boxes type 1 for use on distribution transformers
meeting the requirements of HD 428.2.1 S1**

Transformateurs triphasés de
distribution immergés dans l'huile 50 Hz
de 50 à 2500 kVA de tension la plus
élevée pour le matériel ne dépassant pas
36 kV

Partie 2: Transformateurs de distribution
avec des boîtes à câbles moyenne
tension et/ou basse tension

Section 2: Boîtes à câbles de type 1
pour utilisation sur transformateurs de
distribution conformes aux exigences du
HD 428.2.1 S1

Drehstrom-Öl-Verteilungs-
transformatoren 50 Hz, 50 bis
2500 kVA, mit einer höchsten
Spannung für Betriebsmittel bis 36 kV
Teil 2: Verteilungstransformatoren mit
Kabelanschlußkästen auf der Ober-
und/oder Unterspannungsseite
Hauptabschnitt 2: Kabelanschlußkästen
Typ 1 für Verteilungstransformatoren
nach HD 428.2.1 S1

This Harmonization Document was approved by CENELEC on 1996-10-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for implementation of this Harmonization Document on a national level.

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

This Harmonization Document exists in three official versions (English, French, German).

CENELEC members are the national electrotechnical committees of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CENELEC

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

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

This Harmonization Document was prepared by the Technical Committee CENELEC TC 14, Power transformers.

The text of the draft was submitted to the formal vote and was approved by CENELEC as HD 428.2.2 S1 on 1996-10-01.

The following dates were fixed:

- latest date by which the existence of the HD
has to be announced at national level (doa) 1997-03-01
 - latest date by which the HD has to be implemented
at national level by publication of a harmonized
national standard or by endorsement (dop) 1997-12-01
 - latest date by which the national standards conflicting
with the HD have to be withdrawn (dow) 1997-12-01
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1 Scope

This document specifies the requirements for cable boxes, Type 1, in which the cable cores are terminated. The cable boxes are suitable for use on transformers defined in HD 428.2.1 S1, Distribution transformers with cable boxes, for side mounted or cover mounted use. The cable boxes are suitable for operation indoors and outdoors under environmental conditions specified in HD 428.1 S1. Important design and construction requirements of the cable boxes are given.

2 Normative references

This Harmonization Document 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 Harmonization Document only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 50180	1997	Bushings above 1 kV up to 36 kV and from 250 A to 3,15 kA for liquid filled transformers
EN 60076 HD 398	series	Power transformers (IEC 76 series, modified)
HD 428.1 S1	1992	Three-phase oil-immersed distribution transformers 50 Hz, from 50 to 2500 kVA with highest voltage for equipment not exceeding 36 kV - Part 1: General requirements and requirements for transformers with highest voltage for equipment not exceeding 24 kV
HD 428.2.1 S1	1994	Part 2: Distribution transformers with cable boxes on the high-voltage and/or low-voltage side - Section 1: General requirements
HD 506 S1 + A1	1989 1992	Bushings for liquid filled transformers above 1 kV up to 36 kV
HD 607 S1	1996	Busbar bushings up to 1 kV and from 1,25 kA to 5 kA, for liquid filled transformers

3 Definitions

For the purpose of this document the following definitions apply:

3.1 fully insulated cable box

A metallic cable box where those parts of the termination and bushing within the enclosure including live metal parts and cable cores are insulated by oil or compound suitable for the appropriate system voltage.

3.2 air filled cable box

A metallic cable box designed to protect the ends of the cables and bushings, providing a weatherproof enclosure with a minimum rating of IP54.

3.2.1 air insulated termination

An air filled cable box within which the cable cores are electrically terminated by stress control appropriate to the cable design and voltage; air being the sole insulation for the terminal connections.

3.2.2 shrouded insulation termination

An air filled cable box within which the cable cores are terminated as in 3.2.1 with additional local insulation enhancement, e.g. bushing protection, taping.

NOTE: Enhancement can be achieved by using insulated phase barriers, however, in this case full creepage distance air bushings are used.

4 Electrical requirements and clearances

4.1 General

The enclosures when in position on the equipment with which they are to be used shall be capable of withstanding the high voltage tests specified in HD 428.1 S1 as well as commissioning tests to be carried out on the connected cable.

4.2 High voltage enclosures

The rated voltage of a box is the highest voltage designated for the equipment and preferred values in use are given in table 1.

Table 1 defines the minimum clearances required between live metal parts, and between live metal parts to earth, and insulator creepage requirements. The fixing flange types are as given in HD 428.2.1 S1, figure 1. However, shorter clearances may be agreed subject to confirmation by test.

Bushings suitable for use in high voltage enclosures are specified in document EN 50180. Other bushings can be used if agreed between manufacturer and purchaser provided the minimum limiting dimensions of table 1 are complied with.

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