SLOVENSKI STANDARD
SIST HD 538.2 S1:1997

01-oktober-1997

Three-phase dry-type distribution transformers 50 Hz, from 100 to 2500 kVA, with highest voltage for equipment not exceeding 36 kV - Part 2: Supplementary requirements for transformers with highest voltage for equipment equal to 36 kV

Three-phase dry-type distribution transformers 50 Hz, from 100 to 2500 kVA, with highest voltage for equipment not exceeding 36 kV -- Part 2: Supplementary requirements for transformers with highest voltage for equipment equal to 36 kV

Drehstrom-Trocken-Verteilungstransformatoren 50 Hz, 100 bis 2500 kVA, mit einer höchsten Spannung für Betriebsmittel bis 36 kV -- Teil 2: Ergänzende Festlegungen für Transformatoren mit einer höchsten Spannung für Betriebsmittel von 36 kV

Transformateurs triphasés du type sec à 50 Hz, à partir de 100 à 2500 kVA, avec la tension la plus élevée pour le matériel non supérieur à 36 kV -- Partie 2: Prescriptions supplémentaires pour transformateurs avec la tension la plus élevée pour le matériel égale à 36 kV

Ta slovenski standard je istoveten z: **HD 538.2 S1:1995**

ICS:

29.180 Transformatorji. Dušilke Transformers. Reactors

SIST HD 538.2 S1:1997 **en**

HARMONIZATION DOCUMENT

DOCUMENT D'HARMONISATION

HARMONISIERUNGSDOKUMENT

HD 538.2 S1

March 1995

ICS 29.180

Descriptors: Transformer, low power transformer, three-phase transformer, design, electrical characteristic, dimension

English version

Three-phase dry-type distribution transformers 50 Hz, from 100 to 2500 kVA, with highest voltage for equipment not exceeding 36 kV Part 2: Supplementary requirements for transformers with highest voltage for equipment equal to 36 kV

Transformateurs triphasés du type sec à 50 Hz, à partir de 100 à 2500 kVA, avec la tension la plus élevée pour le matériel non supérieur à 36 kV
Partie 2: Prescriptions supplémentaires pour transformateurs avec la tension la plus élevée pour le matériel égale à 36 kV

Drehstrom-Trocken-Verteilungstransformatoren 50 Hz, 100 bis 2500 kVA, mit einer höchsten Spannung für Betriebsmittel ≤ 36 kV
Teil 2: Ergänzende Festlegungen für Transformatoren mit einer höchsten Spannung für Betriebsmittel von 36 kV

This Harmonization Document was approved by CENELEC on 1994-12-06. 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

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Foreword

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

The text of the draft was submitted to the Unique Acceptance Procedure and was approved by CENELEC as HD 538.2 S1 on 1994-12-06.

The following dates were fixed:

- latest date by which the existence of the HD has to be announced at national level (doa) 1995-06-01
- latest date by which the amendment has to be implemented at national level by publication of a harmonized national standard or by endorsement (dop) 1995-12-01
- latest date by which the national standards conflicting with the HD have to be withdrawn (dow) 1995-12-01

Annexes designated "normative" are part of the body of the standard.
In this standard, annexes A (special national conditions) and B (normative references) are normative.

1 General

1.1 *Scope*

This Harmonization Document covers transformers from 100 kVA to 2 500 kVA intended for operation in three-phase distribution networks. It applies to three-phase dry-type transformers for continuous service, 50 Hz, natural cooling, with two windings:

- a primary (high-voltage) winding with the highest voltage for equipment equal to 36 kV;
- a secondary (low-voltage) winding with the highest voltage for equipment not exceeding 1,1 kV.

1.2 *Object*

The object of this document is to lay down requirements related to the electrical characteristics, dimensions and design. Other requirements may be specified in a National Standard.

1.3 *Compliance with current Harmonization Documents*

Transformers shall be in accordance with HD 464 S1.

Unless here-in otherwise indicated the requirements specified in HD 538.1 S1 apply also to this document.

2 Electrical characteristics

2.1 *Rated power*

See HD 538.1.

2.2 *Highest voltage for equipment U_m*

The values of the highest voltage for equipment are:

a) for the high-voltage winding: 36 kV;
b) for the low-voltage winding: 1,1 kV.

2.3 *Rated voltages of windings*

a) For the high-voltage winding: The preferred ranges of values of the rated voltage U_r together with the relevant highest voltage for equipment U_m are given in table I.

Table I

U_m (kV)	36
U_r (kV)	25 to 34,5

b) For the low-voltage winding: see HD 538.1.

2.4 *Tappings*

The high-voltage winding is normally provided with tappings corresponding to a tapping range of ± 2,5 % or ± 2 x 2,5 % to be specified by the purchaser.

These tappings shall be connected by means of links.

2.5 *Connections*

See HD 538.1.

2.6 *Dimensioning of neutral connection of the low-voltage winding*

See HD 538.1.

2.7 *Losses, sound power level and impedance voltage*

Subclause 2.7 of HD 538.1 is valid, except for table II which is replaced by the following:

Table II

U_m	S_r	P_k [1]	P_o	L_w [2]	Short-circuit impedance %
36	160	2 900	960	66	6
	250	4 000	1 280	67	6
	400	5 700	1 650	69	6
	630	8 000	2 200	71	6
	1 000	11 500	3 100	73	6 or 7
	1 600	17 000	4 200	76	6 or 8
	2 500	25 000	5 800	81	6 or 8
Comments and notes: see HD 538.1.					

2.8 *Partial discharge*

For transformers having encapsulated windings, PD measurements shall be according to HD 464 S1, clause 20.

2.9 *Insulation levels and dielectric tests*

See HD 538.1.

3 Design requirements

See subclauses 3.1 to 3.4 of HD 538.1.

4 Dimensional characteristics

4.1 *Dimensions and rollers*

Subclause 4.1 of HD 538.1 is valid, except for table III which is replaced by the following:

Table III: Maximum dimensions (without enclosures)

Related power kVA	a_1 mm	b_1 mm	h_1 mm	d mm	e mm	Remarks
160	1 750	950	1 800			rollers optional (changeable through 90°)
250	1 800	1 100	1 850			
400	1 900	1 150	2 000			
630	1 950	1 150	2 100			
1 000	2 100	1 300	2 300			
1 600	2 350	1 350	2 550			
2 500	2 650	1 450	2 750			
Comments: see HD 538.1.						

5 Accessories

See HD 538.1.

Annex A (normative)

Special national conditions

Special national condition: National characteristic or practice that cannot be changed even over a long period, e.g. climatic conditions, electrical earthing conditions. If it affects harmonization, it forms part of the European Standard or Harmonization Document.

For the countries in which the relevant special national apply these provisions are normative, for other countries they are informative.

Clause	Special national condition
General	In **Belgium**, the national standard also covers U_m = 41,5 kV.

Annex B (normative)

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.

HD 464 S1 + A2 + A3 + A4	1988 1991 1992 1995	Dry-type power transformers (IEC 726:1982 + A1:1986, modified)
HD 538.1 S1 + A1	1989 1995	Three-phase, dry-type, distribution transformers, 50 Hz, from 100 to 2 550 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
IEC 616 Report	1978	Terminal and tapping marking for power transformers

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