SIST

SLOVENSKI STANDARD
SIST IEC 60076-5:1997/AMD2:1997

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Power transformers - Part 5: Ability to withstand short circuit - Amendment 2

Power transformers - Part 5: Ability to withstand short circuit

Transformateurs de puissance - Partie 5: Tenue au court-circuit

Ta slovenski standard je istoveten z: IEC 60076-5

ICS:

29.180 Transformatorji. Dušilke Transformers. Reactors

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NORME INTERNATIONALE

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AMENDEMENT 2
AMENDMENT 2

1994-02

Amendement 2

Transformateurs de puissance –

Partie 5:
Tenue au court-circuit

Amendment 2

Power transformers –

Part 5:
Ability to withstand short circuit

Bureau Central de la Commission Electrotechnique Internationale 3, rue de Varembé Genève, Suisse

IEC

Commission Electrotechnique Internationale
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Международная Электротехническая Комиссия

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FOREWORD

This amendment has been prepared by IEC technical committee 14: Power transformers.

The text of this amendment is based on the following documents:

DIS	Report on voting
14(CO)92	14(CO)93

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

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2.1.4 Maximum permissible value of the highest average temperature θ_1

Replace the text of this subclause by the following new text:

On the basis of an initial winding temperature θ_0, derived from the sum of the maximum permissible ambient temperature and the relevant temperature rise at rated conditions measured by resistance (or, if this temperature rise is not available, the temperature rise for the relevant temperature class of the insulation of the winding), the highest average temperature θ_1 of the winding, after loading with a symmetrical short-circuit current I of a value and duration as described in subclauses 2.1.2 and 2.1.3, shall not exceed the value stated in table III on any tapping position.

Table III – Maximum permissible values of the average temperature of the winding after short circuit θ_1

Transformer type	Insulation system temperature (°C) (in brackets: thermal class)	Maximum value of θ_1 (°C)	
		Copper	Aluminium
Oil-immersed	105 (A)	250	200*
Dry	105 (A)	180	180
	120 (E)	250	200*
	130 (B)	350	200*
	155 (F)	350	200*
	180 (H)	350	200*
	220	350	200*

NOTE – Values marked "*" may be increased to a value not exceeding 250 °C, subject to agreement between manufacturer and purchaser, when either:

a) the winding conductor is an aluminium alloy and evidence is available as to its mechanical properties with regard to resistance to annealing, or

b) the mechanical strength of the winding construction is adequate with a fully annealed conductor.

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2.1.5 Calculation of the temperature θ_1

Replace the text of this subclause (except table IV) by the following:

The highest average temperature θ_1 attained by the winding after short circuit shall be calculated by the formulae:

$$\theta_1 = \theta_0 + \frac{2\,(\theta_0 + 235)}{\dfrac{101\,000}{J^2 t} - 1} \quad \text{(copper)} \qquad (4a)$$

$$\theta_1 = \theta_0 + \frac{2\,(\theta_0 + 225)}{\dfrac{43\,600}{J^2 t} - 1} \quad \text{(aluminium)} \qquad (4b)$$

where

θ_0 is the initial temperature, in degrees Celsius;

J is the short-circuit current density, in amperes per square millimetre;

t is the duration, in seconds.

NOTE – These equations give an approximation which takes into account the increase of resistivity with temperature. No account is taken of heat absorption of insulation material or oil in contact with the metal.