SLOVENSKI STANDARD
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Communication cables - Specifications for test methods - Part 1-2: Electrical test methods - DC resistence

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Kommunikationskabel - Spezifikation für Prüfverfahren -- Teil 1-2: Elektrische Prüfverfahren - Gleichstromwiderstand

Câbles de communication - Spécifications des méthodes d'essai -- Partie 1-2: Méthodes d'essais électriques - Résistance continue

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English version

Communication cables - Specifications for test methods Part 1-2: Electrical test methods - DC resistance

Câbles de communication -
Spécifications des méthodes d'essai
Partie 1-2: Méthodes d'essais électriques -
Résistance continue

Kommunikationskabel -
Spezifikation für Prüfverfahren
Teil 1-2: Elektrische Prüfverfahren -
Gleichstromwiderstand

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

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Foreword

This European Standard was prepared by SC 46XC, Multicore, Multipair and Quad Data communication cables, of Technical Committee CENELEC TC 46X, Communication cables.

The text of the draft was submitted to the formal vote and was approved by CENELEC as EN 50289-1-2 on 2000-12-01.

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)	2002-01-01
- latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2004-01-01

This European Standard has been prepared under the European Mandate M/212 given to CENELEC by the European Commission and the European Free Trade Association.

Contents

1 Scope

This Part 1-2 of EN 50289 details the test methods to determine the DC resistance characteristics of the conductors of cables used in analogue and digital communication systems. These characteristics are described by the conductor resistance, loop resistance and resistance unbalance.

It is to be read in conjunction with Part 1-1 of EN 50289, which contains essential provisions for its application.

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 50289-1-1	2001	Communication cables – Specifications for tests methods Part 1-1: Electrical test methods – General requirements
EN 50290-1-2[1)]		Communication cables -- Part 1-2: Definitions

3 Definitions

For the purposes of this European Standard the definitions of EN 50290-1-2 apply in addition to the following ones.

3.1
resistance
the resistance describes the electrical DC resistance of a conductor or a screen. In a finished twisted pair additional resistance due to the twisting of the conductors is included

3.2
loop resistance
the loop resistance specifies the electrical DC resistance of the two conductors including the additional resistance caused by the twisting of any

3.3
resistance unbalance
the resistance unbalance R_{ub}, in percent, is the difference value of two symmetrically applied conductors

4 Test method

4.1 Equipment

The resistance shall be measured by means of equipment capable of measuring accurately to within ± 0,5 % of the values to be determined.

[1)] At draft stage

4.2 Test sample

The length of the cable under test (CUT) shall be known to within an accuracy better than ≤ 1 %. Both ends of the CUT shall be prepared, such that the current flows through all elements of the circuit under test and that the contact resistance can be neglected with respect to the result.

4.3 Procedure

For the evaluation of the conductor resistance and the resistance unbalance both ends of the test sample shall be connected to the terminals of the measuring device. To determine the value of the loop resistance, each pair/side of a quad or inner/outer conductor shall be measured from one end, with the other end short-circuited. Alternatively the loop resistance can be determined by the addition of the two individual conductor values.

The current density shall not exceed 1 A/mm² of conductor to avoid any significant increase of temperature during the test.

The ambient temperature shall be recorded.

5 Expression of test results

5.1 Expression

The test results should be normalized to the reference length N.

$$R = \frac{R_m}{L} \times N \qquad (\Omega/\mathrm{N}) \tag{1}$$

where

R = resistance of reference length at measuring temperature;

R_m = measured resistance value of the CUT in Ω;

L = length of sample in m;

N = reference length in m.

The resistance unbalance between conductors of pair or in the same side of a quad is

$$R_{ub} = \frac{R_{max} - R_{min}}{R_{max} + R_{min}} \times 100\ \% \tag{2}$$

where

R_{ub} = resistance unbalance;

R_{max} = resistance in ohms (Ω) for the conductor with the higher resistance value;

R_{min} = resistance in ohms (Ω) for the conductor with the lower resistance value.

5.2 Temperature correction

The measured value, shall be corrected to the standard temperature of 20 °C. For copper conductors the resistance shall be corrected to the standard temperature by multiplying the measured value by the factor *k*:

$$k = \frac{1}{1 + 0{,}00393(T - 20)} \quad (3)$$

where

T = temperature in degrees Celsius of the CUT during the measurement.

For other conductor materials factor *k* shall be indicated in the relevant cable specification.

6 Test report

The test report shall give the test conditions:

- temperature,
- sample length,

and record the corrected values for the reference length

- conductor(s) resistance,
- loop resistance,
- resistance unbalance,

as required in the relevant cable specification.