

SLOVENSKI STANDARD
oSIST prEN IEC 61238-1-2:2019
01-januar-2019

Stisljivi in vijačni konektorji za elektroenergetske kable - 1-2. del: Preskusne metode in zahteve za prebodne konektorje za elektroenergetske kable z naznačenimi napetostmi do 1 kV ($U_m = 1,2$ kV), preskušene na izoliranih vodnikih (IEC 61238-1-2:2018)

Compression and mechanical connectors for power cables - Part 1-2: Test methods and requirements for insulation piercing connectors for power cables for rated voltages up to 1 kV ($U_m = 1,2$ kV) tested on insulated conductors (IEC 61238-1-2:2018)

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Raccords sertis et à serrage mécanique pour câbles d'énergie - Partie 1-2: Méthodes et exigences d'essai relatives aux raccords à perforation d'isolant pour câbles d'énergie de tensions assignées inférieures ou égales à 1kV ($U_m = 1,2$ kV) soumis à essai sur des conducteurs isolés (IEC 61238-1-2:2018)

Ta slovenski standard je istoveten z: prEN IEC 61238-1-2:2018

ICS:

| | | |
|-----------|-----------------|--------------------|
| 29.060.20 | Kabli | Cables |
| 29.120.20 | Spojni elementi | Connecting devices |

oSIST prEN IEC 61238-1-2:2019 en

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prEN IEC 61238-1-2

November 2018

ICS

English Version

**Compression and mechanical connectors for power cables -
Part 1-2: Test methods and requirements for insulation piercing
connectors for power cables for rated voltages up to 1 kV ($U_m =$
1,2 kV) tested on insulated conductors
(IEC 61238-1-2:2018)**

Raccords sertis et à serrage mécanique pour câbles
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d'énergie de tensions assignées inférieures ou égales à
1kV ($U_m = 1,2$ kV) soumis à essai sur des conducteurs
isolés
(IEC 61238-1-2:2018)

To be completed
(IEC 61238-1-2:2018)

This draft European Standard is submitted to CENELEC members for enquiry.
Deadline for CENELEC: 2019-02-15.

The text of this draft consists of the text of IEC 61238-1-2:2018 (20/1789/FDIS).

If this draft becomes a European Standard, 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.

This draft European Standard was established by CENELEC 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 CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Warning : This document is not a European Standard. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a European Standard.



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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

prEN IEC 61238-1-2:2018 (E)**European foreword**

This document (prEN IEC 61238-1-2:2018) consists of the text of IEC 61238-1-2:2018 prepared by IEC/TC 20 "Electric cables".

This document is currently submitted to the enquiry.

The following dates are proposed:

- latest date by which the existence of this document has to be announced at national level (doa) dor + 6 months
- latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) dor + 12 months
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) dor + 36 months (to be confirmed or modified when voting)

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Annex ZA

(normative)

Normative references to international publications with their corresponding European publications

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE 1 When an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

| <u>Publication</u> | <u>Year</u> | <u>Title</u> | <u>EN/HD</u> | <u>Year</u> |
|--------------------|-------------|--|--------------|-------------|
| IEC 60050-461 | - | International Electrotechnical Vocabulary - Part 461: Electric cables | - | - |
| IEC 60228 | - | Conductors of insulated cables | EN 60228 | - |
| IEC 60493-1 | - | Guide for the statistical analysis of ageing test data - Part 1: Methods based on mean values of normally distributed test results | - | - |
| IEC 60949 | 1988 | Calculation of thermally permissible short-circuit currents, taking into account non-adiabatic heating effects | - | - |
| + A1 | 2008 | | - | - |

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IEC 61238-1-2

Edition 1.0 2018-05

INTERNATIONAL STANDARD

**Compression and mechanical connectors for power cables –
Part 1-2: Test methods and requirements for insulation piercing connectors for
power cables for rated voltages up to 1 kV ($U_m = 1,2$ kV) tested on insulated
conductors**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMPRESSION AND MECHANICAL CONNECTORS FOR POWER CABLES –

Part 1-2: Test methods and requirements for insulation piercing connectors for power cables for rated voltages up to 1 kV ($U_m = 1,2$ kV) tested on insulated conductors

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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International Standard IEC 61238-1-2 has been prepared by IEC technical committee 20: Electric cables.

This first edition, together with IEC 61238-1-1 and IEC 61238-1-3, cancels and replaces IEC 61238-1:2003.

This edition includes the following significant technical changes with respect to IEC 61238-1:2003:

- a) The scope has been widened to cover connectors for conductors from 10 mm² down to 2,5 mm² and has been limited to 300 mm² for copper conductors and 500 mm² for aluminium conductors because test experience and applications for IPC are rare for conductors of larger cross-sectional areas.

- b) A new mechanical class has been introduced to satisfy the demand for connectors subjected to no mechanical force.
- c) The electrical test method has been updated in order to take into consideration the temperature of the insulated reference conductors.
- d) For the short-circuit test, the method of calculation and requirements have been updated.
- e) For the mechanical test, the methods and requirements have been updated.
- f) Different test proposals for multicore connector testing have been introduced.
- g) A test proposal for pre-conditioning using live load pickup for insulation piercing connectors has been introduced.

The text of this International Standard is based on the following documents:

| FDIS | Report on voting |
|--------------|------------------|
| 20/1789/FDIS | 20/1804/RVD |

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

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts in the IEC 61238 series, published under the general title *Compression and mechanical connectors for power cables*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

INTRODUCTION

The IEC 61238 series has been divided into the following parts:

- Part 1-1: Test methods and requirements for compression and mechanical connectors for power cables for rated voltages up to 1 kV ($U_m = 1,2$ kV) tested on non-insulated conductors
- Part 1-2: Test methods and requirements for insulation piercing connectors for power cables for rated voltages up to 1 kV ($U_m = 1,2$ kV) tested on insulated conductors
- Part 1-3: Test methods and requirements for compression and mechanical connectors for power cables for rated voltages above 1 kV ($U_m = 1,2$ kV) up to 30 kV ($U_m = 36$ kV) tested on non-insulated conductors

This Part 1-2 of IEC 61238-1 deals with type tests for insulation piercing connectors for use on copper or aluminium conductors of power cables for rated voltages up to 1 kV ($U_m = 1,2$ kV).

When a design of connector meets the requirements of this document, then it is expected that in service:

- a) the resistance of the connection will remain stable within specified limits;
- b) the temperature of the connector will be of the same order or less than that of the insulated conductor during current heating;
- c) if the intended use demands it, application of short-circuit currents will not affect a) and b);
- d) independently from the electrical performance, conforming axial tensile strength will ensure an acceptable mechanical performance for the connections to the cable conductors, when applicable.

It should be stressed that, although the object of the electrical and mechanical tests specified in this document is to prove the suitability of connectors for most operating conditions, they do not necessarily apply to situations where a connector may be raised to a high temperature by virtue of connection to a highly rated plant, to corrosive conditions, where the connector is subjected to external mechanical stresses such as excessive vibration, shock and large displacement after installation, where the connector is exposed to low temperature during assembly or where the connector is installed in live conditions. In these instances, the tests in this document may need to be supplemented by special tests agreed between supplier and purchaser.

This document does not invalidate existing approvals of products achieved on the basis of national standards and specifications and/or the demonstration of satisfactory service performance. However, products approved according to such national standards or specifications cannot directly claim approval to this document.

Once successfully completed, these tests are not repeated unless changes are made in material, manufacturing process and design which might adversely change the connector performance characteristics.

COMPRESSION AND MECHANICAL CONNECTORS FOR POWER CABLES –

Part 1-2: Test methods and requirements for insulation piercing connectors for power cables for rated voltages up to 1 kV ($U_m = 1,2$ kV) tested on insulated conductors

1 Scope

This part of IEC 61238 applies to insulation piercing connectors for power cables for rated voltages up to 1 kV ($U_m = 1,2$ kV), for example according to IEC 60502-1 or other buried cables and cables installed in buildings, having

- a) conductors complying with IEC 60228 having nominal cross-sectional areas between 2,5 mm² and 300 mm² for copper and between 16 mm² and 500 mm² for aluminium,
- b) a maximum continuous cable temperature not exceeding the insulation material properties.

This document is not applicable to connectors for overhead line conductors nor to connectors with a sliding contact.

The object of this document is to define the type test methods and requirements, which apply to insulation piercing connectors for power cables with copper or aluminium conductors. The reference method is to perform the tests on unused insulated conductors.

2 Normative references

[SIST EN IEC 61238-1-2:2019](https://standards.iteh.ai/catalog/standards/sist/1645d655-0a2e-443a-9779-)

<https://standards.iteh.ai/catalog/standards/sist/1645d655-0a2e-443a-9779->

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60050-461, *International Electrotechnical Vocabulary – Part 461: Electric cables* (available at <http://www.electropedia.org>)

IEC 60228, *Conductors of insulated cables*

IEC 60493-1, *Guide for the statistical analysis of ageing test data – Part 1: Methods based on mean values of normally distributed test results*

IEC 60949:1988, *Calculation of thermally permissible short-circuit currents, taking into account non-adiabatic heating effects*

IEC 60949:1988/AMD1:2008

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60050-461 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1

connector

<of cables> device for connecting a conductor to an equipment terminal or for connecting two or more conductors to each other

[SOURCE: IEC 60050-461:2008, 461-17-03, modified – the definition has been revised.]

3.2

through connector

device for connecting two consecutive lengths of conductor together

[SOURCE: IEC 60050-461:2008, 461-17-04, modified – the term "joint ferrule" has been deleted and the definition revised.]

3.3

branch connector

device for connecting a branch conductor to a main conductor at an intermediate point on the latter

[SOURCE: IEC 60050-461:2008, 461-17-05, modified – the term "branch ferrule" has been deleted and in the definition "metallic" has been deleted.]

3.4

reference conductor

length of unjointed insulated conductor or conductor with the insulation rebuilt, which is included in the test loop and which enables the reference temperature and reference resistance to be determined

3.5

equalizer

arrangement used in the test loop to ensure a point of equipotential and uniform current distribution in a stranded conductor

3.6

compression jointing

method of securing a connector to a conductor by using a special tool to produce permanent deformation of the connector and the conductor

3.7

mechanical jointing

method of securing a connector to a conductor, for example by means of a bolt or screw acting on the latter or by alternative methods

3.8

median connector

connector which during the first heat cycle records the third highest temperature of the six connectors in the test loop

3.9

insulation piercing connector

IPC

connector in which electrical contact with the conductor is made by metallic protrusions which pierce the insulation of the cable core

[SOURCE: IEC 60050-461:2008, 461-11-08]