

|            |                                                                                                                                                                                                                               |                                            |
|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| <b>STN</b> | <b>Konektory pre elektrické<br/>a elektronické zariadenia<br/>Tienené alebo netienené voľné a pevné<br/>konektory pre vyvážený prenos dát<br/>jednopárovým vedením s prúdovou kapacitou<br/>Všeobecné požiadavky a skúšky</b> | <b>STN<br/>EN IEC 63171</b><br><br>35 4621 |
|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|

Connectors for electrical and electronic equipment - Shielded or unshielded free and fixed connectors for balanced single-pair data transmission with current-carrying capacity - General requirements and tests

Táto norma obsahuje anglickú verziu európskej normy.  
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 08/25

Obsahuje: EN IEC 63171:2025, IEC 63171:2025

Oznámením tejto normy sa od 30.06.2028 ruší  
STN EN IEC 63171 (35 4621) z júla 2021

EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN IEC 63171**

June 2025

ICS 31.220.10

Supersedes EN IEC 63171:2021

English Version

**Connectors for electrical and electronic equipment - Shielded or unshielded free and fixed connectors for balanced single-pair data transmission with current-carrying capacity - General requirements and tests  
(IEC 63171:2025)**

Connecteurs pour équipements électriques et électroniques  
- Fiches et embases écrantées ou non écrantées pour transmission de données sur une seule paire symétrique avec courant admissible - Exigences générales et essais  
(IEC 63171:2025)

Steckverbinder für elektrische und elektronische Geräte -  
Geschirmte oder ungeschirmte freie und feste Steckverbinder für symmetrische einpaarige Datenübertragung mit Stromtragfähigkeit - Allgemeine Anforderungen und Prüfungen  
(IEC 63171:2025)

This European Standard was approved by CENELEC on 2025-05-19. 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.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This European Standard exists 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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.



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**

**EN IEC 63171:2025 (E)****European foreword**

The text of document 48B/3150/FDIS, future edition 2 of IEC 63171, prepared by SC 48B "Electrical connectors" of IEC/TC 48 "Electrical connectors and mechanical structures for electrical and electronic equipment" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 63171:2025.

The following dates are fixed:

- latest date by which the document has to be implemented at national (dop) 2026-06-30 level by publication of an identical national standard or by endorsement
- latest date by which the national standards conflicting with the (dow) 2028-06-30 document have to be withdrawn

This document supersedes EN IEC 63171:2021 and all of its amendments and corrigenda (if any).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

Any feedback and questions on this document should be directed to the users' national committee. A complete listing of these bodies can be found on the CENELEC website.

**Endorsement notice**

The text of the International Standard IEC 63171:2025 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standard indicated:

|                     |      |                                               |
|---------------------|------|-----------------------------------------------|
| IEC 60068-2-61:1991 | NOTE | Approved as EN 60068-2-61:1993 (not modified) |
| IEC 60352 series    | NOTE | Approved as EN IEC 60352 series               |
| IEC 60603-7 series  | NOTE | Approved as EN 60603-7 series                 |
| IEC 61076-2-101     | NOTE | Approved as EN IEC 61076-2-101                |
| IEC 61076-2 series  | NOTE | Approved as EN IEC 61076-2 series             |
| IEC 61076-2-104     | NOTE | Approved as EN 61076-2-104                    |
| IEC 61076-3:2008    | NOTE | Approved as EN 61076-3:2008 (not modified)    |
| IEC 63171-1         | NOTE | Approved as EN IEC 63171-1                    |
| IEC 63171-5         | NOTE | Approved as EN IEC 63171-5                    |

## 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 Where 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.cencenelec.eu](http://www.cencenelec.eu).

| <u>Publication</u> | <u>Year</u> | <u>Title</u>                                                                                                                                                                       | <u>EN/HD</u>      | <u>Year</u> |
|--------------------|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-------------|
| IEC 60050-581      | -           | International Electrotechnical Vocabulary - Part 581: Electromechanical components for electronic equipment                                                                        | -                 | -           |
| IEC 60068-1        | 2013        | Environmental testing - Part 1: General and guidance                                                                                                                               | EN 60068-1        | 2014        |
| IEC 60068-2-38     | -           | Environmental testing - Part 2-38: Tests - Test Z/AD: Composite temperature/humidity cyclic test                                                                                   | EN IEC 60068-2-38 | -           |
| IEC 60512-1        | -           | Connectors for electrical and electronic equipment - Tests and measurements - Part 1: Generic specification                                                                        | EN IEC 60512-1    | -           |
| IEC 60512-1-1      | -           | Connectors for electronic equipment - Tests and measurements - Part 1-1: General examination - Test 1a: Visual examination                                                         | EN 60512-1-1      | -           |
| IEC 60512-1-2      | -           | Connectors for electronic equipment - Tests and measurements - Part 1-2: General examination - Test 1b: Examination of dimension and mass                                          | EN 60512-1-2      | -           |
| IEC 60512-2-1      | -           | Connectors for electronic equipment - Tests and measurements - Part 2-1: Electrical continuity and contact resistance tests - Test 2a: Contact resistance - Millivolt level method | EN 60512-2-1      | -           |
| IEC 60512-2-5      | -           | Connectors for electronic equipment - Tests and measurements - Part 2-5: Electrical continuity and contact resistance tests - Test 2e: Contact disturbance                         | EN 60512-2-5      | -           |
| IEC 60512-3-1      | -           | Connectors for electronic equipment - Tests and measurements - Part 3-1: Insulation tests - Test 3a: Insulation resistance                                                         | EN 60512-3-1      | -           |

**EN IEC 63171:2025 (E)**

| <u>Publication</u> | <u>Year</u> | <u>Title</u>                                                                                                                                     | <u>EN/HD</u>      | <u>Year</u> |
|--------------------|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-------------|
| IEC 60512-4-1      | -           | Connectors for electronic equipment - Tests and measurements - Part 4-1: Voltage stress tests - Test 4a: Voltage proof                           | EN 60512-4-1      | -           |
| IEC 60512-5-2      | -           | Connectors for electronic equipment - Tests and measurements - Part 5-2: Current-carrying capacity tests - Test 5b: Current-temperature derating | EN 60512-5-2      | -           |
| IEC 60512-6-3      | -           | Connectors for electronic equipment - Tests and measurements - Part 6-3: Dynamic stress tests - Test 6c: Shock                                   | EN 60512-6-3      | -           |
| IEC 60512-6-4      | -           | Connectors for electronic equipment - Tests and measurements - Part 6-4: Dynamic stress tests - Test 6d: Vibration (sinusoidal)                  | EN 60512-6-4      | -           |
| IEC 60512-9-1      | -           | Connectors for electronic equipment - Tests and measurements - Part 9-1: Endurance tests - Test 9a: Mechanical operation                         | EN 60512-9-1      | -           |
| IEC 60512-9-2      | -           | Connectors for electronic equipment - Tests and measurements - Part 9-2: Endurance tests - Test 9b: Electrical load and temperature              | EN 60512-9-2      | -           |
| IEC 60512-11-1     | -           | Connectors for electrical and electronic equipment - Tests and measurements - Part 11-1: Climatic tests - Test 11a - Climatic sequence           | EN IEC 60512-11-1 | -           |
| IEC 60512-11-3     | -           | Connectors for electronic equipment - Tests and measurements - Part 11-3: Climatic tests - Test 11c: Damp heat, steady state                     | EN 60512-11-3     | -           |
| IEC 60512-11-4     | -           | Connectors for electronic equipment - Tests and measurements - Part 11-4: Climatic tests - Test 11d: Rapid change of temperature                 | EN 60512-11-4     | -           |
| IEC 60512-11-7     | -           | Connectors for electronic equipment - Tests and measurements - Part 11-7: Climatic tests - Test 11g: Flowing mixed gas corrosion test            | EN 60512-11-7     | -           |
| IEC 60512-11-9     | -           | Connectors for electronic equipment - Tests and measurements - Part 11-9: Climatic tests - Test 11i: Dry heat                                    | EN 60512-11-9     | -           |
| IEC 60512-13-2     | -           | Connectors for electronic equipment - Tests and measurements - Part 13-2: Mechanical operation tests - Test 13b: Insertion and withdrawal forces | EN 60512-13-2     | -           |
| IEC 60512-13-5     | -           | Connectors for electronic equipment - Tests and measurements - Part 13-5: Mechanical operation tests - Test 13e: Polarizing and keying method    | EN 60512-13-5     | -           |

**EN IEC 63171:2025 (E)**

| <u>Publication</u> | <u>Year</u> | <u>Title</u>                                                                                                                                                                                                                     | <u>EN/HD</u>        | <u>Year</u> |
|--------------------|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|-------------|
| IEC 60512-15-6     | -           | Connectors for electronic equipment - Tests and measurements - Part 15-6: Connector tests (mechanical) - Test 15f: Effectiveness of connector coupling devices                                                                   | EN 60512-15-6       | -           |
| IEC 60512-15-7     | -           | Connectors for electronic equipment - Tests and measurements - Part 15-7: Connector tests (mechanical) - Test 15g: Robustness of protective cover attachment                                                                     | EN 60512-15-7       | -           |
| IEC 60512-25-9     | -           | Connectors for electronic equipment - Tests and measurements - Part 25-9: Signal integrity tests - Test 25i: Alien crosstalk                                                                                                     | EN 60512-25-9       | -           |
| IEC 60512-26-100   | -           | Connectors for electronic equipment - Tests and measurements - Part 26-100: Measurement setup, test and reference arrangements and measurements for connectors according to IEC 60603-7 - Tests 26a to 26g                       | EN 60512-26-100     | -           |
| IEC 60512-28-100   | -           | Connectors for electrical and electronic equipment - Tests and measurements - Part 28-100: Signal integrity tests up to 2 000 MHz - Tests 28a to 28g                                                                             | EN IEC 60512-28-100 | -           |
| IEC 60664-1        | -           | Insulation coordination for equipment within low-voltage supply systems - Part 1: Principles, requirements and tests                                                                                                             | EN IEC 60664-1      | -           |
| IEC 61156          | series      | Multicore and symmetrical pair/quad cables for digital communications                                                                                                                                                            | -                   | -           |
| IEC 61984          | -           | Connectors - Safety requirements and tests                                                                                                                                                                                       | EN 61984            | -           |
| IEC 62153-4-9      | -           | Metallic communication cable test methods - Part 4 - 9: Electromagnetic compatibility (EMC) - Coupling attenuation of screened balanced cables, triaxial method                                                                  | -                   | -           |
| IEC 62153-4-15     | -           | Metallic cables and other passive components test methods - Part 4-15: Electromagnetic compatibility (EMC) - Test method for measuring transfer impedance and screening attenuation - or coupling attenuation with triaxial cell | EN IEC 62153-4-15   | -           |
| ISO/IEC 11801-1    | -           | Information technology - Generic cabling for customer premises - Part 1: General requirements                                                                                                                                    | -                   | -           |



IEC 63171

Edition 2.0 2025-04

# INTERNATIONAL STANDARD

## NORME INTERNATIONALE

**Connectors for electrical and electronic equipment – Shielded or unshielded free and fixed connectors for balanced single-pair data transmission with current-carrying capacity – General requirements and tests**

**Connecteurs pour équipements électriques et électroniques – Fiches et embases écrantées ou non écrantées pour transmission de données sur une seule paire symétrique avec courant admissible – Exigences générales et essais**

**THIS PUBLICATION IS COPYRIGHT PROTECTED****Copyright © 2025 IEC, Geneva, Switzerland**

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

Droits de reproduction réservés. Sauf indication contraire, aucune partie de cette publication ne peut être reproduite ni utilisée sous quelque forme que ce soit et par aucun procédé, électronique ou mécanique, y compris la photocopie et les microfilms, sans l'accord écrit de l'IEC ou du Comité national de l'IEC du pays du demandeur. Si vous avez des questions sur le copyright de l'IEC ou si vous désirez obtenir des droits supplémentaires sur cette publication, utilisez les coordonnées ci-après ou contactez le Comité national de l'IEC de votre pays de résidence.

IEC Secretariat  
3, rue de Varembe  
CH-1211 Geneva 20  
Switzerland

Tel.: +41 22 919 02 11  
[info@iec.ch](mailto:info@iec.ch)  
[www.iec.ch](http://www.iec.ch)

**About the IEC**

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

**About IEC publications**

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigendum or an amendment might have been published.

**IEC publications search - [webstore.iec.ch/advsearchform](http://webstore.iec.ch/advsearchform)**

The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee, ...). It also gives information on projects, replaced and withdrawn publications.

**IEC Just Published - [webstore.iec.ch/justpublished](http://webstore.iec.ch/justpublished)**

Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and once a month by email.

**IEC Customer Service Centre - [webstore.iec.ch/csc](http://webstore.iec.ch/csc)**

If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: [sales@iec.ch](mailto:sales@iec.ch).

**IEC Products & Services Portal - [products.iec.ch](http://products.iec.ch)**

Discover our powerful search engine and read freely all the publications previews, graphical symbols and the glossary. With a subscription you will always have access to up to date content tailored to your needs.

**Electropedia - [www.electropedia.org](http://www.electropedia.org)**

The world's leading online dictionary on electrotechnology, containing more than 22 500 terminological entries in English and French, with equivalent terms in 25 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

**A propos de l'IEC**

La Commission Electrotechnique Internationale (IEC) est la première organisation mondiale qui élabore et publie des Normes internationales pour tout ce qui a trait à l'électricité, à l'électronique et aux technologies apparentées.

**A propos des publications IEC**

Le contenu technique des publications IEC est constamment revu. Veuillez vous assurer que vous possédez l'édition la plus récente, un corrigendum ou amendement peut avoir été publié.

**Recherche de publications IEC -****[webstore.iec.ch/advsearchform](http://webstore.iec.ch/advsearchform)**

La recherche avancée permet de trouver des publications IEC en utilisant différents critères (numéro de référence, texte, comité d'études, ...). Elle donne aussi des informations sur les projets et les publications remplacées ou retirées.

**IEC Just Published - [webstore.iec.ch/justpublished](http://webstore.iec.ch/justpublished)**

Restez informé sur les nouvelles publications IEC. Just Published détaille les nouvelles publications parues. Disponible en ligne et une fois par mois par email.

**Service Clients - [webstore.iec.ch/csc](http://webstore.iec.ch/csc)**

Si vous désirez nous donner des commentaires sur cette publication ou si vous avez des questions contactez-nous: [sales@iec.ch](mailto:sales@iec.ch).

**IEC Products & Services Portal - [products.iec.ch](http://products.iec.ch)**

Découvrez notre puissant moteur de recherche et consultez gratuitement tous les aperçus des publications, symboles graphiques et le glossaire. Avec un abonnement, vous aurez toujours accès à un contenu à jour adapté à vos besoins.

**Electropedia - [www.electropedia.org](http://www.electropedia.org)**

Le premier dictionnaire d'électrotechnologie en ligne au monde, avec plus de 22 500 articles terminologiques en anglais et en français, ainsi que les termes équivalents dans 25 langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International (IEV) en ligne.





IEC 63171

Edition 2.0 2025-04

# INTERNATIONAL STANDARD

## NORME INTERNATIONALE

**Connectors for electrical and electronic equipment – Shielded or unshielded free and fixed connectors for balanced single-pair data transmission with current-carrying capacity – General requirements and tests**

**Connecteurs pour équipements électriques et électroniques – Fiches et embases écrantées ou non écrantées pour transmission de données sur une seule paire symétrique avec courant admissible – Exigences générales et essais**

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

COMMISSION  
ELECTROTECHNIQUE  
INTERNATIONALE

ICS 31.220.10

ISBN 978-2-8327-0337-3

**Warning! Make sure that you obtained this publication from an authorized distributor.**  
**Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.**

## CONTENTS

|                                                                                             |    |
|---------------------------------------------------------------------------------------------|----|
| FOREWORD.....                                                                               | 4  |
| INTRODUCTION.....                                                                           | 6  |
| 1 Scope.....                                                                                | 8  |
| 2 Normative references .....                                                                | 8  |
| 3 Terms and definitions .....                                                               | 10 |
| 4 Common features and typical connector pair .....                                          | 10 |
| 5 Characteristics .....                                                                     | 11 |
| 5.1 General.....                                                                            | 11 |
| 5.2 Pin assignment .....                                                                    | 11 |
| 5.3 Temperature-related tests.....                                                          | 11 |
| 5.3.1 Classification into climatic category .....                                           | 11 |
| 5.3.2 Rapid change of temperature.....                                                      | 12 |
| 5.3.3 Creepage and clearance distances .....                                                | 12 |
| 5.3.4 Voltage proof.....                                                                    | 12 |
| 5.3.5 Current-temperature derating.....                                                     | 13 |
| 5.3.6 Interface contact resistance – initial only .....                                     | 14 |
| 5.3.7 Input to output DC resistance .....                                                   | 14 |
| 5.3.8 Input to output DC resistance unbalance .....                                         | 15 |
| 5.3.9 Insulation resistance.....                                                            | 15 |
| 5.4 Transmission characteristics (data transmission portion for a combined connector) ..... | 15 |
| 5.4.1 General .....                                                                         | 15 |
| 5.4.2 Insertion loss .....                                                                  | 16 |
| 5.4.3 Return loss .....                                                                     | 16 |
| 5.4.4 Propagation delay.....                                                                | 17 |
| 5.4.5 Transverse conversion loss (unshielded only).....                                     | 17 |
| 5.4.6 Transverse conversion transfer loss (unshielded only).....                            | 18 |
| 5.4.7 Transfer impedance (shielded only) .....                                              | 18 |
| 5.4.8 Coupling attenuation (shielded only).....                                             | 18 |
| 5.4.9 Power sum alien (exogenous) NEXT.....                                                 | 19 |
| 5.4.10 Power sum alien (exogenous) FEXT .....                                               | 20 |
| 5.5 Mechanical characteristics (data transmission portion for a combined connector) .....   | 20 |
| 5.5.1 General .....                                                                         | 20 |
| 5.5.2 Mechanical operation.....                                                             | 20 |
| 5.5.3 Effectiveness of connector coupling devices .....                                     | 21 |
| 5.5.4 Insertion and withdrawal forces .....                                                 | 22 |
| 5.5.5 Polarizing method.....                                                                | 22 |
| 5.5.6 Vibration.....                                                                        | 22 |
| 5.5.7 Shock .....                                                                           | 22 |
| 6 Tests and test schedule.....                                                              | 23 |
| 6.1 General.....                                                                            | 23 |
| 6.2 Example of an arrangement for input to output DC resistance measurement.....            | 24 |
| 6.3 Example of an arrangement for interface contact resistance measurement .....            | 25 |
| 6.4 Arrangement for vibration test (test phase DP).....                                     | 26 |
| 6.5 Test procedures and measuring methods.....                                              | 26 |
| 6.6 Preconditioning .....                                                                   | 26 |

|                                                                                                         |                                     |    |
|---------------------------------------------------------------------------------------------------------|-------------------------------------|----|
| 6.7                                                                                                     | Test schedules.....                 | 26 |
| 6.7.1                                                                                                   | General .....                       | 26 |
| 6.7.2                                                                                                   | Basic (minimum) test schedule ..... | 26 |
| 6.7.3                                                                                                   | Full test schedule .....            | 26 |
| Annex A (informative) Current product detail specifications.....                                        |                                     | 35 |
| Annex B (informative) Relationship between connector categories and application references of IEEE..... |                                     | 39 |
| Bibliography.....                                                                                       |                                     | 40 |
|                                                                                                         |                                     |    |
| Figure 1 – Relationship between the IEC 63171 series and their related references.....                  |                                     | 7  |
| Figure 2 – Example of front view of fixed connector pin assignment.....                                 |                                     | 11 |
| Figure 3 – Level I connector derating curve .....                                                       |                                     | 13 |
| Figure 4 – Level II connector derating curve .....                                                      |                                     | 14 |
| Figure 5 – Example of an arrangement for input to output DC resistance measurement.....                 |                                     | 24 |
| Figure 6 – Example of arrangement for contact resistance measurement.....                               |                                     | 25 |
|                                                                                                         |                                     |    |
| Table 1 – Climatic categories – selected values .....                                                   |                                     | 11 |
| Table 2 – Maximum insertion loss .....                                                                  |                                     | 16 |
| Table 3 – Minimum return loss .....                                                                     |                                     | 17 |
| Table 4 – Minimum transverse conversion loss (unshielded only) .....                                    |                                     | 17 |
| Table 5 – Minimum transverse conversion transfer loss (unshielded only).....                            |                                     | 18 |
| Table 6 – Maximum transfer impedance (shielded only).....                                               |                                     | 18 |
| Table 7 – Minimum coupling attenuation (shielded only) .....                                            |                                     | 19 |
| Table 8 – Minimum power sum alien near end crosstalk (PS ANEXT) .....                                   |                                     | 19 |
| Table 9 – Minimum power sum alien far end crosstalk (PS AFEXT) .....                                    |                                     | 20 |
| Table 10 – Preferred values for the number of mating cycles .....                                       |                                     | 21 |
| Table 11 – Minimum pull-out force .....                                                                 |                                     | 21 |
| Table 12 – Test group P .....                                                                           |                                     | 27 |
| Table 13 – Test group AP .....                                                                          |                                     | 28 |
| Table 14 – Test group BP .....                                                                          |                                     | 30 |
| Table 15 – Test group CP .....                                                                          |                                     | 31 |
| Table 16 – Test group DP .....                                                                          |                                     | 32 |
| Table 17 – Test group EP .....                                                                          |                                     | 33 |
| Table 18 – Test group FP .....                                                                          |                                     | 33 |
| Table 19 – Test group GP.....                                                                           |                                     | 34 |
| Table A.1 – Overview of current product detail specifications.....                                      |                                     | 36 |
| Table B.1 – Overview of connector categories and application references of IEEE.....                    |                                     | 39 |

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**CONNECTORS FOR ELECTRICAL AND ELECTRONIC EQUIPMENT –  
SHIELDED OR UNSHIELDED FREE AND FIXED CONNECTORS FOR  
BALANCED SINGLE-PAIR DATA TRANSMISSION WITH CURRENT-  
CARRYING CAPACITY – GENERAL REQUIREMENTS AND TESTS**

## 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.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) IEC draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). IEC takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, IEC had not received notice of (a) patent(s), which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at <https://patents.iec.ch>. IEC shall not be held responsible for identifying any or all such patent rights.

IEC 63171 has been prepared by subcommittee 48B: Electrical connectors, of IEC technical committee 48: Electrical connectors and mechanical structures for electrical and electronic equipment. It is an International Standard.

This second edition cancels and replaces the first edition published in 2021. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) added requirements related to multipole and combined connectors (that are connectors including multiple data modules of this series, or connectors including one data module and additional signal or power contacts);
- b) alignment of transmission requirements with ISO/IEC 11801-1;

c) updating and reorganising of test groups.

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

| Draft         | Report on voting |
|---------------|------------------|
| 48B/3150/FDIS | 48B/3157/RVD     |

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

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at [www.iec.ch/members\\_experts/refdocs](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are described in greater detail at [www.iec.ch/publications](http://www.iec.ch/publications).

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

- reconfirmed,
- withdrawn, or
- revised.

## INTRODUCTION

This document, identified as IEC 63171, provides the general requirements and general tests (general specification) of the whole IEC 63171 series, a set of International Standards covering shielded or unshielded free and fixed connectors for balanced single-pair data transmission with current-carrying capacity.

It provides the signal integrity requirements, common to the whole series.

Subsequent parts, identified as IEC 63171 followed by a dash and a progressive number starting with 1, are the product detail specifications of this series; see Annex A, and do not duplicate information given in this document, but list only additional requirements.

Each subsequent part is identified by a type of connector – or a set of connectors – covered with the same number identifying the part. Some parts can describe more connector geometries (rectangular, circular), sharing the core element and the relevant features.

Other requirements, which are necessary to describe e.g., additional power portion – if any – of that connector, can be covered by referencing requirements provided by other relevant documents, e.g.: IEC 61076-2 series, IEC 61076-3, or IEC 61984, as applicable.

For the complete specifications regarding a connector of this series, as well as of other series calling up this document for the signal integrity requirements, both this product general specification and the relevant product detail specification, see Annex A, as well as any other sectional specification or safety requirement document referenced in the relevant subsequent part of this series or in the relevant product detail specification, see Annex A, are therefore required.

For the qualification of a connector of this series, all the requirements according to this general specification and the relevant product detail specification, see Annex A, – including the references made therein, if any, to other sectional specification or other safety-related documents – are met.

Figure 1 shows the interrelation of the standards within this series:

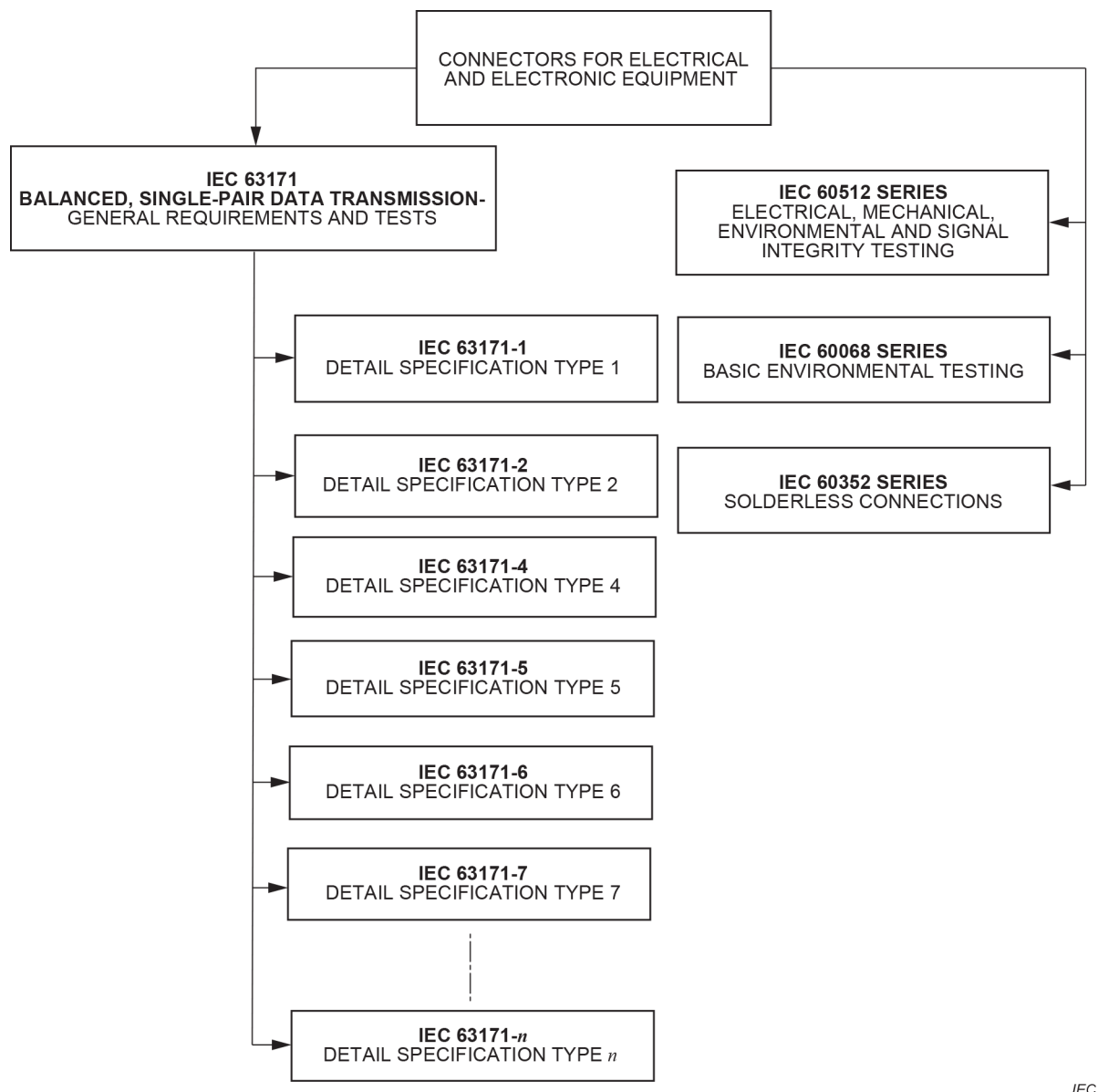


Figure 1 – Relationship between the IEC 63171 series and their related references

# **CONNECTORS FOR ELECTRICAL AND ELECTRONIC EQUIPMENT – SHIELDED OR UNSHIELDED FREE AND FIXED CONNECTORS FOR BALANCED SINGLE-PAIR DATA TRANSMISSION WITH CURRENT- CARRYING CAPACITY – GENERAL REQUIREMENTS AND TESTS**

## **1 Scope**

This document covers shielded or unshielded free and fixed connectors, circular or rectangular, for balanced single-pair data transmission, with current-carrying capacity.

It also covers the portion for balanced single-pair data transmission of combined, shielded or unshielded, free and fixed connectors, circular or rectangular, having additional contacts for power transmission, whose performance requirements are described in a product detail specification, see Annex A, of the IEC 63171-X series, (type X connectors), or in a separate document, either an IEC product detail specification, see Annex A, or manufacturer's specification.

This document does not describe a specific mating interface. It specifies the IEC 63171 series – or other documents referencing it – common mechanical, electrical and transmission characteristics and environmental requirements, as well as required test specifications.

Within their own type, the shielded and unshielded connectors are interoperable for their transmission performance and can be exchanged, although the shielded version has improved alien crosstalk and coupling attenuation properties.

Single-pair connectors of this series can be grouped to one body of multipole connectors or combined with other connectors, e.g., power connectors, also known as combined (data or signal, and power) connectors.

## **2 Normative references**

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 60050-581, *International Electrotechnical Vocabulary (IEV) – Part 581: Electromechanical components for electronic equipment*

IEC 60068-1:2013, *Environmental testing – Part 1: General and guidance*

IEC 60068-2-38, *Environmental testing – Part 2-38: Tests – Test Z/AD: Composite temperature/humidity cyclic test*

IEC 60512-1, *Connectors for electrical and electronic equipment – Tests and measurements – Part 1: Generic specification*

IEC 60512-1-1, *Connectors for electronic equipment – Tests and measurements – Part 1-1: General examination – Test 1a: Visual examination*

IEC 60512-1-2, *Connectors for electronic equipment – Tests and measurements – Part 1-2: General examination – Test 1b: Examination of dimension and mass*



IEC 60512-2-1, *Connectors for electronic equipment – Tests and measurements – Part 2-1: Electrical continuity and contact resistance tests – Test 2a: Contact resistance – Millivolt level method*

IEC 60512-2-5, *Connectors for electronic equipment – Tests and measurements – Part 2-5: Electrical continuity and contact resistance tests – Test 2e: Contact disturbance*

IEC 60512-3-1, *Connectors for electronic equipment – Tests and measurements – Part 3-1: Insulation tests – Test 3a: Insulation resistance*

IEC 60512-4-1, *Connectors for electronic equipment – Tests and measurements – Part 4-1: Voltage stress tests – Test 4a: Voltage proof*

IEC 60512-5-2, *Connectors for electronic equipment – Tests and measurements – Part 5-2: Current-carrying capacity tests – Test 5b: Current-temperature derating*

IEC 60512-6-3, *Connectors for electronic equipment – Tests and measurements – Part 6-3: Dynamic stress tests – Test 6c: Shock*

IEC 60512-6-4, *Connectors for electronic equipment – Tests and measurements – Part 6-4: Dynamic stress tests – Test 6d: Vibration (sinusoidal)*

IEC 60512-9-1, *Connectors for electronic equipment – Tests and measurements – Part 9-1: Endurance tests – Test 9a: Mechanical operation*

IEC 60512-9-2, *Connectors for electronic equipment – Tests and measurements – Part 9-2: Endurance tests – Test 9b: Electrical load and temperature*

IEC 60512-11-1, *Connectors for electrical and electronic equipment – Tests and measurements – Part 11-1: Climatic tests – Test 11a – Climatic sequence*

IEC 60512-11-3, *Connectors for electronic equipment – Tests and measurements – Part 11-3: Climatic tests – Test 11c: Damp heat, steady state*

IEC 60512-11-4, *Connectors for electronic equipment – Tests and measurements – Part 11-4: Climatic tests – Test 11d: Rapid change of temperature*

IEC 60512-11-7, *Connectors for electronic equipment – Tests and measurements – Part 11-7: Climatic tests – Test 11g: Flowing mixed gas corrosion test*

IEC 60512-11-9, *Connectors for electronic equipment – Tests and measurements – Part 11-9: Climatic tests – Test 11i: Dry heat*

IEC 60512-13-2, *Connectors for electronic equipment – Tests and measurements – Part 13-2: Mechanical operation tests – Test 13b: Insertion and withdrawal forces*

IEC 60512-13-5, *Connectors for electronic equipment – Tests and measurements – Part 13-5: Mechanical operation tests – Test 13e: Polarizing and keying method*

IEC 60512-15-6, *Connectors for electronic equipment – Tests and measurements – Part 15-6: Connector tests (mechanical) – Test 15f: Effectiveness of connector coupling devices*

IEC 60512-15-7, *Connectors for electronic equipment – Tests and measurements – Part 15-7: Connector tests (mechanical) – Test 15g: Robustness of protective cover attachment*

IEC 60512-25-9, *Connectors for electronic equipment – Tests and measurements – Part 25-9: Signal integrity tests – Test 25i: Alien crosstalk*

IEC 60512-26-100, *Connectors for electronic equipment – Tests and measurements – Part 26-100: Measurement setup, test and reference arrangements and measurements for connectors according to IEC 60603-7 – Tests 26a to 26g*

IEC 60512-28-100, *Connectors for electrical and electronic equipment – Tests and measurements – Part 28-100: Signal integrity tests up to 2 000 MHz – Tests 28a to 28g*

IEC 60664-1, *Insulation coordination for equipment within low-voltage supply systems – Part 1: Principles, requirements and tests*

IEC 61156 (all parts), *Multicore and symmetrical pair/quad cables for digital communications*

IEC 61984, *Connectors – Safety requirements and tests*

IEC 62153-4-9, *Metallic communication cable test methods – Part 4-9: Electromagnetic compatibility (EMC) – Coupling attenuation of screened balanced cables, triaxial method*

IEC 62153-4-15, *Metallic cables and other passive components test methods – Part 4-15: Electromagnetic compatibility (EMC) – Test method for measuring transfer impedance and screening attenuation or coupling attenuation with triaxial cell*

ISO/IEC 11801-1, *Information technology – Generic cabling for customer premises – Part 1: General requirements*

**koniec náhľadu – text ďalej pokračuje v platenej verzii STN**