

PUBLICLY AVAILABLE SPECIFICATION

PRE-STANDARD



**Connectors for electronic equipment – Product requirements –
Part 3-124: Detail specification for 10-way, shielded, free and fixed connectors
for I/O and Gigabit transmission capability for industrial applications**



THIS PUBLICATION IS COPYRIGHT PROTECTED

Copyright © 2016 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.

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

Tel.: +41 22 919 02 11
Fax: +41 22 919 03 00
info@iec.ch
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 corrigenda or an amendment might have been published.

IEC Catalogue - webstore.iec.ch/catalogue

The stand-alone application for consulting the entire bibliographical information on IEC International Standards, Technical Specifications, Technical Reports and other documents. Available for PC, Mac OS, Android Tablets and iPad.

IEC publications search - www.iec.ch/searchpub

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 It also gives information on projects, replaced and withdrawn publications.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

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

Electropedia - www.electropedia.org

The world's leading online dictionary of electronic and electrical terms containing 20 000 terms and definitions in English and French, with equivalent terms in 15 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

IEC Glossary - std.iec.ch/glossary

65 000 electrotechnical terminology entries in English and French extracted from the Terms and Definitions clause of IEC publications issued since 2002. Some entries have been collected from earlier publications of IEC TC 37, 77, 86 and CISPR.

IEC Customer Service Centre - 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: csc@iec.ch.

PUBLICLY AVAILABLE SPECIFICATION PRE-STANDARD



**Connectors for electronic equipment – Product requirements –
Part 3-124: Detail specification for 10 way, shielded, free and fixed connectors
for I/O and Gigabit transmission capability for industrial applications**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 31.220.10

ISBN 978-2-8322-3723-6

Warning! Make sure that you obtained this publication from an authorized distributor.

CONTENTS

FOREWORD	4
1 Scope	6
2 Normative references	6
3 Terms and definitions	6
4 Technical information	7
4.1 Systems of levels – Compatibility levels, according to IEC 61076-1	7
4.2 Classification into climatic categories	7
4.3 Current-carrying capacity	7
4.4 Marking	7
5 Common features and typical connector pair	8
5.1 View showing typical fixed and free connectors	8
5.2 Mating information	8
5.2.1 General	8
5.2.2 Contacts – mating conditions (see Figure 2 and Table 2)	8
5.2.3 Fixed connector (see Figures 3 and 4 and Tables 3 and 4)	9
5.2.4 Free connector (see Figures 5 and 6 and Tables 5 and 6)	13
6 Characteristics	16
6.1 General	16
6.2 Pin and pair grouping assignment	16
6.3 Classification into climatic category	18
6.4 Electrical characteristics	18
6.4.1 Voltage proof	18
6.4.2 Voltage rating	18
6.4.3 Current-carrying capacity	18
6.4.4 Initial insulation resistance	19
6.5 Mechanical characteristics	19
6.5.1 Mechanical operation	19
6.5.2 Insertion and withdrawal forces	19
6.6 Transmission performance	20
6.6.1 General	20
6.6.2 Insertion loss	20
6.6.3 Return loss	20
6.6.4 Near end cross talk	20
6.6.5 Far end cross talk	20
6.6.6 Transverse conversion loss	21
6.6.7 Transverse conversion transfer loss	21
6.6.8 Transfer impedance	21
6.6.9 Propagation delay	21
6.6.10 Delay skew	21
7 Test schedule	21
7.1 General	21
7.1.1 Overview	21
7.1.2 Arrangement for contact resistance measurement	22
7.1.3 Arrangement for dynamic stress tests	22
7.2 Test schedules	23
7.2.1 Basic (minimum) test schedule	23

7.2.2	Full test schedule	23
7.3	Test procedures and measuring methods.....	30
7.4	Mounting of specimens	30
Figure 1	View showing typical fixed and free connectors.....	8
Figure 2	Contact interface dimensions with terminated free connector	8
Figure 3	Fixed connector Type A (Projection method 3)	9
Figure 4	Fixed connector Type B (Projection method 3)	11
Figure 5	Free connector Type A (Projection method 3)	13
Figure 6	Free connector Type B (Projection method 3)	15
Figure 7	Connector pin assignment for Type A, front view of connector	17
Figure 8	Connector pin assignment for Type B, front view of connector	17
Figure 9	Current de-rating diagram	19
Figure 10	Contact resistance arrangement.....	22
Figure 11	Arrangement for vibration test	23
Table 1	Climatic category.....	7
Table 2	Dimensions for Figure 2	9
Table 3	Dimensions for Figure 3	10
Table 4	Dimensions for Figure 4	12
Table 5	Dimensions for Figure 5	14
Table 6	Dimensions for Figure 6	16
Table 7	Climatic category.....	18
Table 8	Test group P	24
Table 9	Test group AP	25
Table 10	Test group BP	26
Table 11	Test group CP	27
Table 12	Test group DP	28
Table 13	Test group EP	29
Table 14	Test group FP	30

INTERNATIONAL ELECTROTECHNICAL COMMISSION

CONNECTORS FOR ELECTRONIC EQUIPMENT – PRODUCT REQUIREMENTS –

Part 3-124: Detail specification for 10 way, shielded, free and fixed connectors for I/O and Gigabit transmission capability for industrial applications

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

A PAS is a technical specification not fulfilling the requirements for a standard, but made available to the public.

IEC PAS 61076-3-124 has been prepared by subcommittee 48B: Electrical connectors, of IEC technical committee 48: Electrical connectors and mechanical structures for electrical and electronic equipment.

The text of this PAS is based on the following document:

This PAS was approved for publication by the P-members of the committee concerned as indicated in the following document

Draft PAS	Report on voting
48B/2508/PAS	48B/2528/RVC

Following publication of this PAS, which is a pre-standard publication, the technical committee or subcommittee concerned may transform it into an International Standard.

A list of all parts of IEC 61076 series, under the general title *Connectors for electronic equipment – Product requirements*, can be found on the IEC website.

This PAS shall remain valid for an initial maximum period of 3 years starting from the publication date. The validity may be extended for a single period up to a maximum of 3 years, at the end of which it shall be published as another type of normative document, or shall be withdrawn.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

CONNECTORS FOR ELECTRONIC EQUIPMENT – PRODUCT REQUIREMENTS –

Part 3-124: Detail specification for 10 way, shielded, free and fixed connectors for I/O and Gigabit transmission capability for industrial applications

1 Scope

This part of IEC 61076 covers 10-way shielded free and fixed connectors and specifies the common dimensions, mechanical, electrical and transmission characteristics and environmental requirements as well as test specifications respectively.

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 – Part 581: Electromechanical components for electronic equipment*

IEC 60068-1, *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 (all parts), *Connectors for electronic equipment – Tests and measurements*

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

IEC 61076-1:2006, *Connectors for electronic equipment – Product requirements – Part 1: Generic specification*

IEC 61076-3:2008, *Connectors for electronic equipment – Product requirements – Part 3: Rectangular connectors – Sectional specification*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60050-581, IEC 61076-1, IEC 61076-3 and IEC 60512-1 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>