

# INTERNATIONAL STANDARD



**Connectors for electrical and electronic equipment –  
Part 7: Detail specification for up to 7 ways including PE or FE (data/power) and  
shield pin, free and fixed circular connectors for balanced single-pair data  
transmission with current-carrying capacity – Mechanical mating information,  
pin assignment and additional requirements for type 7**



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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)

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**CONNECTORS FOR ELECTRICAL AND ELECTRONIC EQUIPMENT –****Part 7: Detail specification for up to 7 ways including PE or FE  
(data/power) and shield pin, free and fixed circular connectors for  
balanced single-pair data transmission with current-carrying capacity –  
Mechanical mating information, pin assignment and additional  
requirements for type 7**

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IEC 63171-7 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.

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

| Draft         | Report on voting |
|---------------|------------------|
| 48B/3033/FDIS | 48B/3044/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.

A list of all parts in the IEC 63171 series, published under the general title *Connectors for electrical and electronic equipment*, can be found on the IEC website.

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).

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INTRODUCTION

IEC 63171 is the base specification of the whole series. Subsequent specifications do not duplicate information given in the base document, but list only additional requirements. For the complete specification regarding connectors described in this Part of the IEC 63171 series, read this document in conjunction with IEC 63171.

A general overview about the connectors in this document is shown in Figure 1.

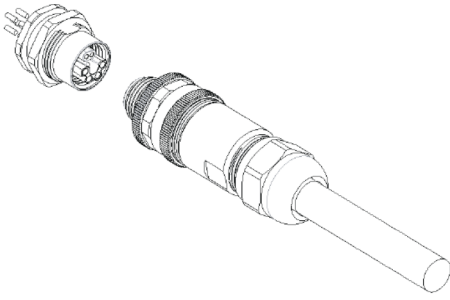
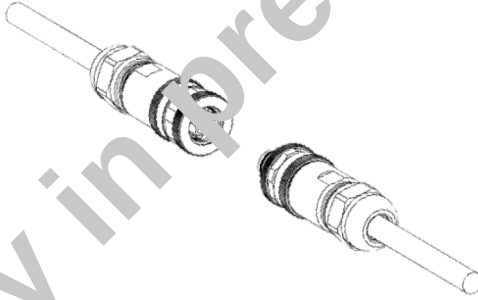
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| <p><b>IEC SC 48B – Electrical connectors</b></p> <p><b>Specification available from:</b></p> <p><b>IEC General secretariat or from the addresses shown on the inside cover.</b></p> | <p><b>IEC 63171-7 Ed. 1</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <p>DETAIL SPECIFICATION in accordance with IEC 61076-1</p>                                                                                                                          | <p>M12 screw locking or push-pull locking (or both)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                                                                                                   | <p>Circular connectors, size 12, with 4 up to 7 ways including PE or FE (according to coding, for power and data transmission, either</p> <ul style="list-style-type: none"><li>– with M12 screw-locking mechanism (styles with M12 in the name), or</li><li>– with a quick locking push-pull mechanism with a size derived from that (styles with P12 in the name), or</li><li>– with both mechanisms combined (styles with C12 in the name).</li></ul> <p>Multiple mating interfaces, each associated with a coding referred to as "type I" through "type V", differing by power transmission capabilities and contents.</p> <p>2 ways + additional shield pin (to be connected to the cable sheath) support balanced differential data transmission with frequencies up to 600 MHz, Category B as per IEC 63171.</p> <p>Free cable connectors:</p> <ul style="list-style-type: none"><li>– male or female,</li><li>– straight connectors,</li><li>– rewirable or non-rewirable.</li></ul> |
|                                                                                                  | <p>Fixed connectors:</p> <ul style="list-style-type: none"><li>– male or female,</li><li>– single-hole mounting.</li></ul> <p>With circular mounting orientation</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

Figure 1 – Type 7 connector overview

## CONNECTORS FOR ELECTRICAL AND ELECTRONIC EQUIPMENT –

### **Part 7: Detail specification for up to 7 ways including PE or FE (data/power) and shield pin, free and fixed circular connectors for balanced single-pair data transmission with current-carrying capacity – Mechanical mating information, pin assignment and additional requirements for type 7**

#### **1 Scope**

This part of IEC 63171 covers shielded free and fixed circular connectors with 1 way up to 7 ways for power and data transmission and specifies the common dimensions, mechanical, electrical and transmission characteristics and environmental requirements as well as test specifications respectively.

The connectors described in this document are either equipped with an M12 screw-locking mechanism (styles with M12 in the name) or a quick-locking push-pull mechanism with a size derived from that (styles with P12 in the name) or both mechanisms combined (styles with C12 in the name). For the sake of simplicity, the connectors' sizes are denoted as "size 12" in this document.

This document provides multiple mating interfaces each of which is associated with a coding preventing the mating of incompatible male and female connectors. These codings are referred to as "Type x", where "x" is represented by a Roman numeral.

For all codings, two ways and the additional shield pin, which is intended to be connected to the cable screen, support differential data transmission with frequencies up to 600 MHz by meeting the requirements of Category B, as defined in IEC 63171.

NOTE 1 Connecting the shield pin to the cable sheath is also required for data transmission with 20 MHz (IEC 63171, Category A).

NOTE 2 The connectors are intended to be used for single-pair Ethernet (SPE) according to the following IEEE Standards: 10BASE-T1 (IEEE 802.3ac), 100BASE-T1 (IEEE 802.3bw), 1000BASE-T1 (IEEE 802.3bp).

NOTE 3 Power over Data Line (PoDL) power supply according to IEEE 802.3bu can be optionally used for the two ways intended for data transmission, even in addition to the power supply provided through the dedicated power ways.

The individual codings differ by their power transmission capabilities and intents. The additional ways provide for DC power transmission with up to 63 V/16 A and 600 V/16 A or AC power transmission with rated voltage and rated current up to 600 V/16 A (single-phase) or 480 V/8 A (three-phase). See Table 11 and Table 12 for the voltage and current ratings, and Table 5 for the pin assignments for the individual codings.

Some codings feature a PE pin for safety purposes.

The PE pin needs to be connected to all accessible metal parts.

#### **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.