

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Connectors for electrical and electronic equipment –
Part 6: Detail specification for 2-way and 4-way (data/power), shielded, free
and fixed connectors for power and data transmission with frequencies
up to 600 MHz**

IEC 63171-6:2020

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**Connecteurs pour équipements électriques et électroniques –
Partie 6: Spécification particulière pour les fiches et les embases écrantées
à 2 voies et 4 voies (données/puissance) pour la transmission de données
et de puissance à des fréquences jusqu'à 600 MHz**



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

CONNECTORS FOR ELECTRICAL AND ELECTRONIC EQUIPMENT –

**Part 6: Detail specification for 2-way and 4-way (data/power),
shielded, free and fixed connectors for power and data
transmission with frequencies up to 600 MHz**

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

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48B/2764/FDIS	48B/2777/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.

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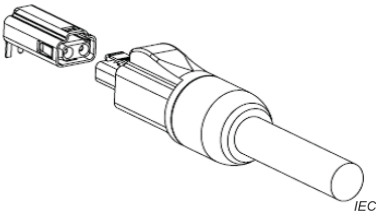
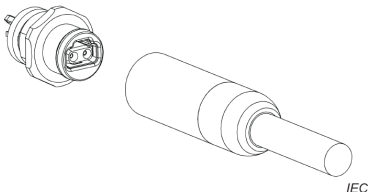
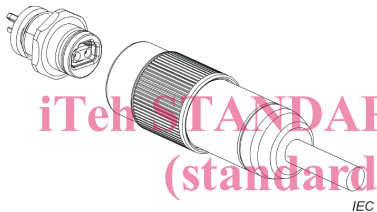
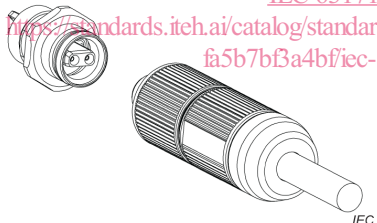
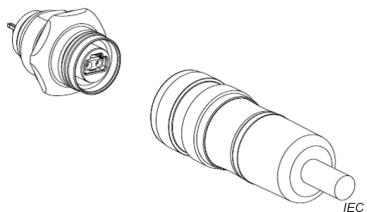
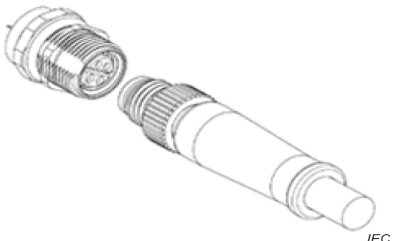
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<p>IEC SC 48B – Electrical connectors</p> <p>Specification available from: IEC General secretariat or from the addresses shown on the inside cover.</p>	<p>IEC 63171-6 Ed. 1</p>
<p>DETAIL SPECIFICATION in accordance with IEC 61076-1</p>	
 <p>IEC</p>	<p>2-way data IP20, latch locking</p>
 <p>IEC</p>	<p>2-way data IP65/IP67, snap-in locking</p>
 <p>IEC</p>	<p>2-way data IP65/IP67, push-pull locking</p>
 <p>IEC</p>	<p>2-way data IP65/IP67, M8 screw locking</p>
 <p>IEC</p>	<p>2-way data IP65/IP67, M12 screw locking or push-pull locking (or both)</p>
 <p>IEC</p>	<p>4-way (2 power + 2 data) IP65/IP67, M8 screw locking</p>

CONNECTORS FOR ELECTRICAL AND ELECTRONIC EQUIPMENT –

Part 6: Detail specification for 2-way and 4-way (data/power), shielded, free and fixed connectors for power and data transmission with frequencies up to 600 MHz

1 Scope

This part of IEC 63171 covers 2-way and 4-way (data/power) shielded free and fixed connectors for data transmission with frequencies up to 600 MHz and specifies the common dimensions, mechanical, electrical and transmission characteristics and environmental requirements as well as test specifications respectively.

This document specifies several properties overlapping with specifications in the IEC 63171 series which have been drafted later. In case of conflict the specifications within this document prevail.

NOTE The connectors are intended to be used for single-pair Ethernet (SPE) according to the following IEEE Standards: 10BaseT1 (IEEE 802.3cg), 100Base-T1 (IEEE 802.3bw), 1000Base-T1 (IEEE 802.3bp), and optionally with Power over Data line (PoDL) power supply according to IEEE 802.3bu.

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IEC 60050-581, *International Electrotechnical Vocabulary (IEV) – Chapter 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 60352 (all parts), *Solderless connections*

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 60512-3-1, *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 60512-11-3, *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 60512-11-10, *Connectors for electronic equipment – Tests and measurements – Part 11-10: Climatic tests – Test 11j: Cold*

IEC 60512-11-12, *Connectors for electronic equipment – Tests and measurements – Part 11-12: Climatic tests – Test 11m: Damp heat, cyclic*

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 60512-25-7, *Connectors for electronic equipment – Tests and measurements – Part 25-7: Test 25g – Impedance, reflection coefficient, and voltage standing wave ratio (VSWR)*

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 electronic equipment – Tests and measurements – Part 28-100: Signal integrity tests up to 1000 MHz on 60603-7 and 61076-3 series connectors – Tests 28a to 28g*

IEC 60529, *Degrees of protection provided by enclosures (IP code)*

IEC 60603-7:2008, *Connectors for electronic equipment – Part 7: Detail specification for 8-way, unshielded, free and fixed connectors*

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

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*

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

IEC 61984, *Connectors – Safety requirements and tests*

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

3 Terms and definitions

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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/>
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4 Technical information

4.1 Systems of levels – Compatibility levels, according to IEC 61076-1

4.1.1 Performance level

Connectors according to this document are classified by mating performance level (MPL). See 6.4.2 for details.

4.1.2 Compatibility levels according to IEC 61076

a) Intermateability

Intermateability (level 2 of IEC 61076-1) standardizes only dimensions of electrical and mechanical interfaces. Intermateability shall be ensured by application of the “Go” and “No-Go” gauge requirements in the standards that may be referenced, and adherence to the dimensional requirements within.

b) Interoperability

Interoperability of different connectors shall be ensured by compliance with the specified interface dimensions and by compliance with the requirement in 6.3 and 6.5 proven by the respective testing sequences in Clause 7.

4.2 Classification into climatic categories

See 6.2.

4.3 Clearance and creepage distances

See 6.3.1.

4.4 Current carrying capacity

See 6.3.4

4.5 Marking

The marking of the connector and the packaging shall be in accordance with 2.7 of IEC 61076-1:2006.

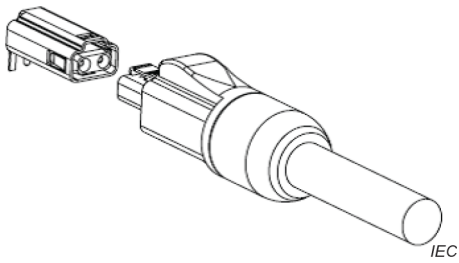
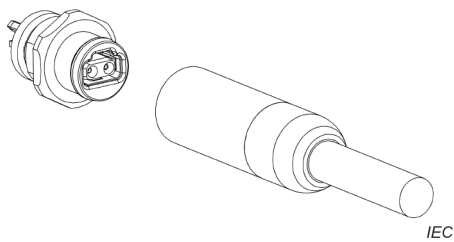
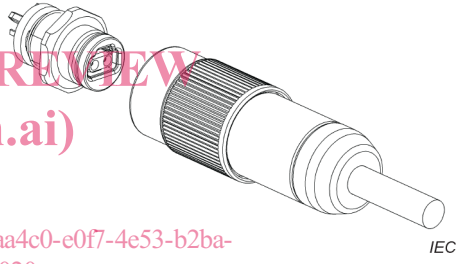
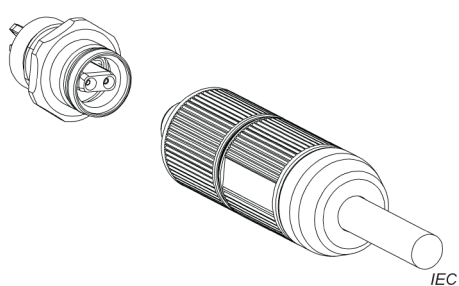
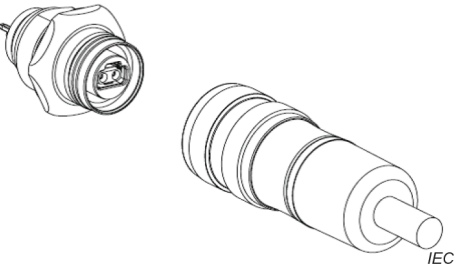
5 Dimensional information**5.1 General**

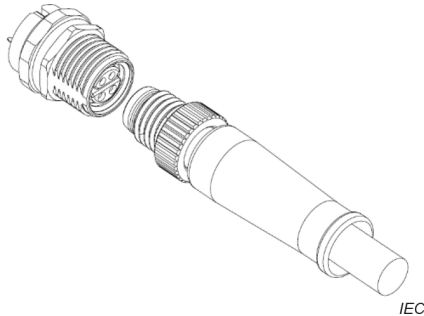
Drawings are shown in the first angle projection. The shape of connectors may deviate from those shapes given in the following figures as long as the specified dimensions are not influenced. Coordination dimensions are dimensions without tolerances which indicate the boundary or centre-line references in order to allow for (modular) arrangement.

5.2 Isometric view and common features**5.2.1 Connector styles**

Table 1 shows an overview of connector styles specified within this document.

Table 1 – Connector styles

Style	Description	Picture
2P-L	PLUG ¹ – Free 2-way IP20 connector with male contacts, latch locking	
2J-L	JACK ¹ – Fixed 2-way IP20 connector with female contacts, latch locking, intended for PCB mounting	
6P-S8	PLUG ¹ – Free 2-way IP65/IP67 connector with male contacts, size 8 ² , snap-in locking	
6J-S8	JACK ¹ – Fixed 2-way IP65/IP67 connector with female contacts, size 8 ² , snap-in locking, intended for single hole mounting.	
6P-P8	PLUG ¹ – Free 2-way IP65/IP67 connector with male contacts, size 8 ² , push pull locking	
6J-P8	JACK ¹ – Fixed 2-way IP65/IP67 connector with female contacts, size 8 ² , push pull locking, intended for single hole mounting	
6P-M8	PLUG ¹ – Free 2-way IP65/IP67 connector with male contacts, size 8 ² , M8-screw locking	
6J-M8	JACK ¹ – Fixed 2-way IP65/IP67 connector with female contacts, size 8 ² , M8 thread locking, intended for single hole mounting.	
6P-P12	PLUG ¹ – Free 2-way IP65/IP67 connector with male contacts, size 12 ² , push pull locking	
6P-M12	PLUG ¹ – Free 2-way IP65/IP67 connector with male contacts, size 12 ² , M12 thread locking,	
6J-P12	JACK ¹ – Fixed 2-way IP65/IP67 connector with female contacts, size 12 ² , push pull locking, intended for single hole mounting	
6J-M12	JACK ¹ – Identical to 6J-P12 but with M12 thread locking instead of push pull, intended for single hole mounting	
6J-C12	JACK ¹ – Combination of 6J-P12 and 6J-M12: With both, M12 thread and push pull locking, intended for single hole mounting	

Style	Description	Picture
6P-M8C	PLUG ¹ – Free 4-way IP65/IP67 connector with male contacts, size 8 ² , M8 thread locking	
6J-M8C	JACK ¹ – Fixed 4-way IP65/IP67connector with female contacts, size 8, M8 thread locking, intended for single hole mounting	

¹ The terms PLUG and JACK are used only for easier reading since they are widely used.

² The designation "size 8" and "size 12" indicates roughly the diameter of the jack in millimetres.

5.2.2 Common features

Not applicable.

5.2.3 Reference system

Not applicable.

5.3 Overall and mating dimensions

5.3.1 2-way connectors

5.3.1.1 Overall dimensions of styles 2J-L and 2P-L

5.3.1.1.1 2J-L

Figure 1 shows the fixed 2-way IP20 connector with female contacts, latch locking, intended for PCB mounting.

Dimensions in millimetres

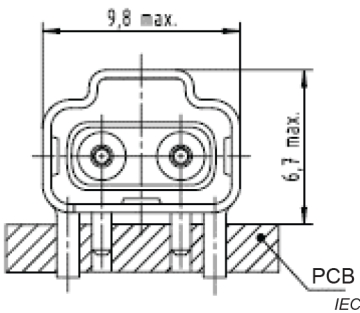


Figure 1 – Style 2J-L overall dimensions

NOTE The PCB is shown only for illustration purposes.

5.3.1.1.2 2P-L

Figure 2 shows the free, 2-way IP20 connector with male contacts, latch locking.