IEC 61076-8-109

Edition 1.0 2023-05

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Connectors for electrical and electronic equipment – Product requirements – Part 8-109: Power connectors – Detail specification for 2P 130 A, 1 000 V plus 2P 5 A 50 V rectangular housing shielded connectors with IP65/IP68 degree of protection when mated and locked, and IPXXB when unmated

Connecteurs pour équipements électriques et électroniques – Exigences de produit –
Partie 8-109: Connecteurs d'alimentation – Spécification particulière pour les connecteurs blindés rectangulaires à 2 pôles de 130 A et 1 000 V plus 2 pôles de 5 A et 50 V, avec un degré de protection IP65/IP68 lorsqu'ils sont accouplés et verrouillés, et IPXXB lorsqu'ils sont désaccouplés, logés dans un boîtier



IEC 61076-8-109:2023-05(en-fr)



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Connecteurs pour équipements électriques et électroniques – Exigences de produit – Partie 8-109: Connecteurs d'alimentation – Spécification particulière pour les connecteurs blindés rectangulaires à 2 pôles de 130 A et 1 000 V plus 2 pôles de 5 A et 50 V, avec un degré de protection IP65/IP68 lorsqu'ils sont accouplés et verrouillés, et IPXXB lorsqu'ils sont désaccouplés, logés dans un boîtier

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CONNECTORS FOR ELECTRICAL AND ELECTRONIC EQUIPMENT – PRODUCT REQUIREMENTS –

Part 8-109: Power connectors – Detail specification for 2P 130 A, 1 000 V plus 2P 5 A 50 V rectangular housing shielded connectors with IP65/IP68 degree of protection when mated and locked, and IPXXB when unmated

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Draft	Report on voting
48B/2949/CDV	48B/2996/RVC

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.

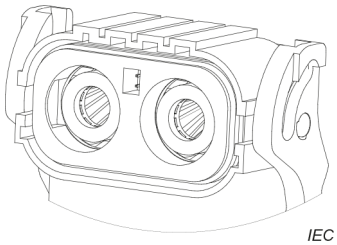
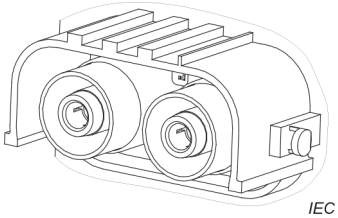
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Future standards in this series will carry the new general title as cited above. Titles of existing standards in this series will be updated at the time of the next edition.

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The International Electrotechnical Commission **IEC SC 48B – Electrical connectors**		**IEC 61076-8-109**
Detail specification in accordance with IEC 61076-8		
Free connector	 *IEC* Free connector	For rated current of 130 A DC; 2P power plus 2P signal; Female contacts for power; First break last make male contacts for signal; Straight insertion and withdrawal; 360° shielding; Four codings.
Fixed connector	 *IEC* Fixed connector	For rated current of 130 A DC; 2P power plus 2P signal; Male contacts for power; Female contacts for signal; Straight insertion and withdrawal; 360°shielding; Four codings.

CONNECTORS FOR ELECTRICAL AND ELECTRONIC EQUIPMENT – PRODUCT REQUIREMENTS –

Part 8-109: Power connectors – Detail specification for 2P 130 A, 1 000 V plus 2P 5 A 50 V rectangular housing shielded connectors with IP65/IP68 degree of protection when mated and locked, and IPXXB when unmated

1 Scope

This part of IEC 61076-8 describes free and fixed rectangular connectors with:

– 2P power plus 2P signal contacts;
– plastic housing with locking lever and four possible codings;
– 130 A rated current, 1 000 V DC rated voltage on the power section;
– 5 A rated current, 50 V DC rated voltage on the signal section;
– individual shielding around each power contact with relevant shielding termination;
– IP65/IP68 degree of protection when mated and locked and IPXXB on both plug, and receptacle parts when unmated;

hereinafter referred to as a connector, for use in electrical and electronic equipment, including overall dimensions, interface dimensions, technical characteristics, performance requirements and test methods.

Connectors according to this document are intended for use in class II equipment. Hence, they are not equipped with PE contact.

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 60050-581:2008, *International Electrotechnical Vocabulary (IEV) – Part 581: Electromechanical components for electronic equipment*

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

IEC 60228:2004, *Conductors of insulated cables*

IEC 60352-1, *Solderless connections – Part 1: Wrapped connections – General requirements, test methods and practical guidance*

IEC 60352-2, *Solderless connections – Part 2: Crimped connections – General requirements, test methods and practical guidance*

IEC 60352-3, *Solderless connections – Part 3: Accessible insulation displacement (ID) connections – General requirements, test methods and practical guidance*

IEC 60352-4, *Solderless connections – Part 4: Non-accessible insulation displacement (ID) connections – General requirements, test methods and practical guidance*

IEC 60352-5, *Solderless connections – Part 5: Press-in connections – General requirements, test methods and practical guidance*

IEC 60352-6, *Solderless connections – Part 6: Insulation piercing connections – General requirements, test methods and practical guidance*

IEC 60352-7, *Solderless connections – Part 7: Spring clamp connections – General requirements, test methods and practical guidance*

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 – Test 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 60512-2-2, *Connectors for electronic equipment – Tests and measurements – Part 2-2: Electrical continuity and contact resistance tests – Test 2b: Contact resistance – Specified test current 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 60512-2-6*, Connectors for electronic equipment – Tests and measurements – Part 2-6: Electrical continuity and contact resistance tests – Test 2f: Housing (shell) electrical continuity*

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 60512-7-1*, Connectors for electronic equipment – Tests and measurements – Part 7-1: Impact tests (free connectors) – Test 7a: Free fall (repeated)*

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 60512-11-6*, Connectors for electronic equipment – Tests and measurements – Part 11-6: Climatic tests – Test 11f: Corrosion, salt mist*

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 60512-11-11*, Connectors for electronic equipment – Tests and measurements – Part 11-11: Climatic tests – Test 11k: Low air pressure*

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

IEC 60512-13-1*, Connectors for electronic equipment – Tests and measurements – Part 13-1: Mechanical operation tests – Test 13a: Engaging and separating 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 60512-15-1*, Connectors for electronic equipment – Tests and measurements – Part 15-1: Connector tests (mechanical) – Test 15a: Contact retention in insert*

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 60512-16-5*, Connectors for electronic equipment – Tests and measurements – Part 16-5: Mechanical tests on contacts and terminations – Test 16e: Gauge retention force (resilient contacts)*

IEC 60529:1989, *Degrees of protection provided by enclosures (IP Code)*
IEC 60529:1989/AMD1:1999
IEC 60529:1989/AMD2:2013

IEC 60695-2-11:2021, *Fire hazard testing – Part 2-11: Glowing/hot-wire based test methods – Glow-wire flammability test method for end products (GWEPT)*

IEC 60999-1, *Connecting devices – Electrical copper conductors – Safety requirements for screw-type and screwless-type clamping units – Part 1: General requirements and particular requirements for clamping units for conductors from 0,2 mm^2 up to 35 mm^2 (included)*

IEC 60999-2, *Connecting devices – Electrical copper conductors – Safety requirements for screw-type and screwless-type clamping units – Part 2: Particular requirements for clamping units for conductors above 35 mm^2 up to 300 mm^2 (included)*

IEC 61076-1:2006, *Connectors for electronic equipment – Product requirements – Part 1: Generic specification*
IEC 61076-1:2006/AMD1:2019

IEC 61984:2008, *Connectors – Safety requirements and tests*

IEC 62153-4-6, *Metallic cables and other passive components test methods – Part 4-6: Electromagnetic compatibility (EMC) – Surface transfer impedance – Line injection method*

IEC 62430:2019, *Environmentally conscious design (ECD) – Principles, requirements and guidance*

IEC Guide 109, *Environmental aspects – Inclusion in electrotechnical product standards*

ISO 6508-1:2015, *Metallic materials – Rockwell hardness test – Part 1: Test method*

ISO 11469:2000, *Plastics – Generic identification and marking of plastics products*

ISO 21920-1:2021, *Geometrical product specifications (GPS) – Surface texture: Profile – Part 1: Indication of surface texture*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60050-581 apply.

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

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

4 Technical information

4.1 Recommended method of termination

4.1.1 General

According to IEC 60352 series, IEC 60999-1 or IEC 60999-2.

4.1.2 Number of contacts and contact cavities

Number of contacts: power contacts: 2, shielding contacts: 2 (surrounding each power contact), signal contacts: 2.

Number of contact cavities (for removable contacts): 4.

Suitable wire: cross-sectional area for power contacts: 50 mm^2, cross-sectional area for signal contacts: 0,5 mm^2. The core of each power wire is deemed to be individually shielded, each shielding requiring a dedicated termination.

4.2 Ratings and characteristics

Connectors according this specification are connectors without breaking capacity (COC) according to IEC 61984, therefore they are not intended to be engaged or disengaged in normal use when live or under load.

Rated voltage: power contacts: 1 000 V DC, signal contacts: 50 V DC.

Voltage proof of power contacts: 4 000 V AC, voltage proof of signal contacts: 500 V AC.

Pollution degree: 2.

Rated current (at 85 °C): power contacts: 130 A, signal contacts: 5 A. See derating diagram in Figure 9.

Insulation resistance: 5 000 MΩ min.

Climatic category : 55/125/10.

4.3 Systems of levels

4.3.1 Performance levels

Performance level for these connectors is 1.

4.3.2 Compatibility levels

The compatibility levels of the products specified by this document shall comply with 2.2.3.3 of IEC 61076-1:2006 (level 2 – intermateable).

4.4 Classification into climatic categories

Conditions: according to IEC 60068-1 and Table 1.

Table 1 – Climatic category

Climatic category	Lower temperature °C	Upper temperature °C	Damp heat, steady state days
55/125/10	-55	+125	10

4.5 Clearance and creepage distance

Clearance and creepage distances shall be measured according to IEC 60512-1-2 with the following additional requirements.

For these connectors clearance and creepage distances shall be measured only in mated condition (connector without breaking capacity as defined in IEC 61984).

Power contacts: clearance 5,5 mm min., creepage distance 10 mm min.

Signal contacts: clearance 0,8 mm min., creepage distance 1,2 mm min.

Between any power contact and the most adjacent signal contact: clearance 5,5 mm min., creepage distance 10 mm min.

4.6 Current-carrying capacity

The current-carrying capacity shall be measured according to IEC 60512-5-2, test 5b and comply with 6.2.6.