

INTERNATIONAL STANDARD



Installation couplers intended for permanent connection in fixed installations

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IEC 61535:2019

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**INSTALLATION COUPLERS INTENDED FOR PERMANENT
CONNECTION IN FIXED INSTALLATIONS**

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International Standard IEC 61535 has been prepared by IEC technical committee 23: Electrical accessories.

This second edition cancels and replaces the first edition published in 2009 and Amendment 1:2012. This edition constitutes a technical revision.

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

- a) enlargement of the scope to DC application;
- b) addition of further requirements as regards DC application (marking, etc.), no additional test procedures were deemed necessary; however some modifications were necessary in the normative text;
- c) changes and enhancement of the field of application of installation couplers into outdoor applications;
- d) addition of a suitable temperature range;
- e) updating of the list of normative references, modified to undated references, where possible.

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

CDV	Report on voting
23/792/CDV	23/848/RVC

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.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

In this standard, the following print types are used:

- requirements proper: in roman type;
- *test specifications: in italic type;*
- explanatory matter: in smaller roman type.

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

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INTRODUCTION

AC and DC installation couplers according to this document may be used, for example, in prefabricated buildings, commercial showrooms, installation cavities, such as suspended floors and ceilings, in partition walls and in any similar applications, or cable tray systems, cable ladder systems, cable ducting systems and cable trunking systems or in furniture complying with IEC 60364-7-713.

This document may be used as a guide for installation couplers with additional contacts for voltages other than mains voltages.

Particular requirements for installation couplers, for example, for use at higher ambient temperatures, with higher mechanical durability (e.g. metal housings), with higher fire resistance and for use in control circuits (e.g. SELV), are under consideration.

National rules can have requirements concerning the accessibility of installation couplers.

National rules can specify who is allowed to carry out the connection and disconnection of installation couplers.

National rules can have requirements concerning installation couplers with metal conduits.

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INSTALLATION COUPLERS INTENDED FOR PERMANENT CONNECTION IN FIXED INSTALLATIONS

1 Scope

This document applies to two-wire, up to five-wire installation couplers, including earth, if provided, with a rated voltage up to and including 500 V AC or DC and a rated connecting capacity up to and including 10 mm² for permanent connection in indoor electrical installations. Installation couplers with additional contacts for voltages other than mains voltages are outside the scope of this document.

~~NOTE 1 Installation couplers according to this standard are used e.g. in prefabricated buildings, installation cavities, such as suspended floors and ceilings, or cable tray systems, cable ladder systems, cable ducting systems and cable trunking systems or in commercial show rooms, in partition walls and in any similar application or in furniture complying with IEC 60364-7-713.~~

~~NOTE 2 This standard may be used as a guide for installation couplers with additional contacts for voltages other than mains voltages.~~

~~NOTE 3 In the UK, where installation couplers have more than 5 wires, they shall meet the requirements of IEC 61535 as though they were included in the scope and shall be tested in such a way that all of the mains voltage pins are subjected to the same level of testing.~~

~~NOTE 4 In the USA, these installation couplers are not permitted to be used where they will not be visible after installation.~~

An installation coupler consists of an installation female connector and an installation male connector for permanent connection not intended to be engaged or disengaged under load nor to be engaged or disengaged other than during first installation or during reconfiguration or maintenance of the wiring system in which installation couplers have been installed. This means that installation couplers are only intended for infrequent use.

Installation couplers are not suitable for use in place of socket-outlet systems. Installation couplers are not suitable for use in place of devices for connecting luminaires (DCLs) according to IEC 61995 (all parts) or in place of luminaire supporting couplers (LSCs).

Installation couplers complying with this document are suitable for use at ambient temperatures not normally exceeding +40 °C, but their average over a period does not exceed +35 °C, with a lower limit of the ambient air temperature of –5 °C, either for indoor or outdoor use.

~~NOTE 1 Additional tests for use in cold climates are under consideration.~~

~~NOTE 2 For lower limits of in-service other temperatures, necessary information is can be given in the manufacturer's installation instructions.~~

In locations where special conditions prevail, as in ships, vehicles and the like and in hazardous locations, for example where explosions are liable to occur, special constructions may can be required.

~~NOTE 6 Particular requirements for installation couplers e.g. for use at higher ambient temperatures, with higher mechanical durability (e.g. metal housings), with higher fire resistance and for use in control circuits (e.g. SELV), are under consideration.~~

~~NOTE 7 National rules may have requirements concerning the accessibility of installation couplers.~~

~~NOTE 8 3 Installation couplers are intended to be installed by instructed or skilled persons.~~

~~NOTE 9 National rules may specify who is allowed to carry out the connection and disconnection of installation couplers.~~

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 60068-2-31:2008, *Environmental testing – Part 2-31: Tests – Test Ec: Rough handling shocks, primarily for equipment-type specimens*

IEC 60112:~~2003~~, *Method for the determination of the proof and the comparative tracking indices of solid insulating materials*

~~IEC 60364 (all parts), *Electrical installations of buildings*~~

IEC 60529:~~2004~~1989, *Degrees of protection provided by enclosures (IP Code)*
IEC 60529:1989/AMD1:1999
IEC 60529:1989/AMD2:2013

IEC 60664-1:2007, *Insulation coordination for equipment within low-voltage systems – Part 1: Principles, requirements and tests*

IEC 60695-2-11:~~2000~~, *Fire hazard testing – Part 2-11: Glowing/hot-wire based test methods – Glow-wire flammability test method for end-products (GWEPT)*

IEC 60998-2-3:~~2002~~, *Connecting devices for low-voltage circuits for household and similar purposes – Part 2-3: Particular requirements for connecting devices as separate entities with insulation-piercing clamping units*

IEC 60999-1:1999, *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 mm² up to 35 mm² (included)*

IEC 61032:1997, *Protection of persons and equipment by enclosures – Probes for verification*

3 Terms and definitions

For the purposes of this document, the following terms and definitions 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>

Where the terms "voltage" and "current" are used in this document, they are RMS values, unless otherwise specified.

3.1

rated voltage

voltage assigned to the installation coupler by the manufacturer

3.2

rated current

maximum current assigned to the installation coupler by the manufacturer

Note 1 to entry: Rated current refers to the installation coupler itself and not to an electric circuit.

3.3

rated connecting capacity

cross-sectional area of the largest conductor(s) to be connected as stated by the manufacturer of the installation coupler

3.4

permanent connection

connecting method in an installation which is only opened for maintenance or wiring system re-configuration

Note 1 to entry: The expression "permanent connection" is to be understood as a connection which is maintained as long as an installation exists.

3.5 installation coupler

connecting device consisting of an installation female connector and an installation male connector provided with retaining means for permanent connection not intended to be engaged or disengaged under load nor to be engaged or disengaged other than during first installation, during maintenance of the wiring system or during re-configuration of the wiring system

3.6 installation male connector

load side portion of an installation coupler which contains the male contacts

3.7 installation female connector

supply side portion of an installation coupler which contains the female contacts

3.8 installation coupler system

family of installation couplers consisting of one or more installation female connectors compatible by mechanical coding features with one or more installation male connectors, with the same ratings produced according to the specification of one manufacturer

Note 1 to entry: The meaning of one manufacturer is in this case of one and the same manufacturer.

3.9 wiring system

assembly made up of a cable or cables or busbars and the parts which secure and if necessary enclose the cables or busbars

NOTE See IEC 60364-5-52.

[SOURCE: IEC 60364-5-52:2009, 520.3.1, modified – "bare or insulated conductors" has been replaced with "a cable".]

3.10 rewirable installation coupler

installation coupler so constructed that the cable can be replaced

3.11 non-rewirable installation coupler

installation coupler so constructed that it forms a complete unit with the cable after connection and assembly by the manufacturer

Note 1 to entry: See also 12.4.5.14.

3.12 non-rewirable moulded-on installation coupler

non-rewirable installation coupler so constructed that the contacts, terminals or connections and the attached cable ends are surrounded by insulating material manufactured by a moulding process

3.13 non-rewirable non-moulded-on installation coupler

non-rewirable installation coupler so constructed that the contacts, terminals or connections and the attached cable ends are surrounded by separate parts of insulating material

3.14 distribution block

device intended for branching of circuits

3.15 retaining means

arrangement by which an installation female connector and an installation male connector are held in position when they are properly engaged and prevents unintentional disengagement

Note 1 to entry: The disengagement may be done by hand or by the use of a tool.

3.16**cap**

removable barrier to prevent ready accessibility to an unused installation female connector

3.17**routine test**

test to which each device is subjected during and/or after manufacture to ascertain whether it complies with certain criteria

3.18**type test**

test of one or more devices made to a certain design to show that the design meets certain requirements

3.19**readily accessible**

accessibility to touch extending from any point on a surface where persons usually stand or move about to the limits which a person can reach with the hand, in any direction without assistance

Note 1 to entry: See IEC 60364-4-41:2005, Annex B.

3.20**terminal**

part of an accessory to which a conductor is attached, providing a reusable connection

3.21**termination**

part of an accessory to which a conductor is permanently attached

[SOURCE: IEC 60050-442:1998, 442-06-06]

4 General requirements

Installation couplers shall be so designed and constructed that, in normal use, their performance is reliable and without danger to the user or damage to the surroundings.

Compliance is checked by carrying out all the relevant tests specified.

NOTE In the USA, these installation couplers are not permitted to be used where they will not be visible after installation.

5 General notes on Conditions for tests**5.1 General**

Tests shall be carried out to check compliance with the relevant requirements of this document.

Only connectors (male and female) of one installation coupler system according to the specification of one and the same manufacturer shall be mated together for carrying out the test.

Tests are as follows:

- type tests shall be made on representative specimens of each type of installation coupler;
- routine tests shall be made on each installation coupler as required in this document.

Tests of 5.2 to 5.6 are applicable to type tests and 5.7 to routine tests.

NOTE In the UK, where installation couplers have more than 5 wires, they shall meet the requirements of IEC 61535 as though they were included in the scope and shall be tested in such a way that all of the mains voltage pins are subjected to the same level of testing.

5.2 Test conditions

Unless otherwise specified, the tests shall be carried out on specimens as delivered and under conditions of normal use at an ambient temperature between 15 °C and 35 °C.