

INTERNATIONAL STANDARD



Installation couplers intended for permanent connection in fixed installations
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[IEC 61535:2023](#)

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

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

This third edition cancels and replaces the second edition published in 2019. This edition constitutes a technical revision.

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

- a) inclusion of a definition for "live part" based on IEC 61140;
- b) additional optional cross medial documentation, e.g. marking with QR-Code;
- c) corrections on the consistent use of the expressions "earth", "earthing contact", "earthing circuit" and "protective earth(ing)" throughout the document;
- d) addition of missing compliance provisions to 13.3;
- e) update of Figure D.1 of Annex D;
- f) inclusion of new Annex F for cold climate requirements.

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

Draft	Report on voting
23/1062/FDIS	23/1066/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.

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.

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. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

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

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

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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 or lower 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~~ with or without earthing contact, if provided, with a rated voltage up to and including 500 V AC or 500 V DC and a rated connecting capacity up to and including 10 mm² and a rated current not exceeding 32 A for permanent connection in electrical installations. Installation couplers with additional contacts for voltages other than mains voltages are outside the scope of this document.

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 intended for infrequent use only.

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 of 24 h 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~~ shown in Annex F, which is normative in following countries: FI. Necessary information can be given in the manufacturer's installation instructions.

NOTE 2 For other temperatures, necessary information 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 can be required.

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

NOTE 4 As a guide to using installation coupler systems, see Annex D.

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, *Method for the determination of the proof and the comparative tracking indices of solid insulating materials*

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

IEC 60664-1:2007/2020, *Insulation coordination for equipment within low-voltage supply systems – Part 1: Principles, requirements and tests*

IEC 60695-2-11, *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, *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 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>

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" in this case, is "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

[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 12.15.

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, adj

accessibility accessible 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]

3.22

live part

conductive part intended to be energized in normal conditions, including a neutral conductor or mid-point conductor, but by convention not a PEN conductor or PEM conductor or PEL conductor

Note 1 to entry: This concept does not necessarily imply a risk of electric shock.

[SOURCE: IEC 61140:2016, 3.4]

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 in this document.

NOTE In ~~the USA, these~~ some countries, installation couplers are not permitted to be used where they will not be visible after installation: CA, US.

5 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.

Where the value of the temperature is of importance, the test shall be carried out at 20 °C ± 5 °C.

5.3 Tests on non-rewirable installation couplers

For testing purposes, non-rewirable installation couplers shall be provided with cables of at least 1 m length unless otherwise specified in this document.

5.4 Order of tests

If not otherwise specified in this document, the tests shall be carried out in the order of the clauses/subclauses as specified in Annex C, Table C.1.

5.5 Specification of tests

Installation male connectors, caps, installation female connectors and distribution blocks shall be tested in connection with their matching counterparts complying with this document.

The sets of test specimens shall undergo the tests as specified in Annex C, Table C.1.

5.6 Compliance requirements

Specimens are deemed not to comply with this document if there is more than one specimen failure in any one of the tests.

If one specimen of a given set fails in a test due to an assembly or manufacturing fault, that test and those preceding it, which may have influenced the result of that test, are repeated on another set of specimens of the same set number as specified in Annex C, Table C.1, all of which shall then comply with the repeated tests.

NOTE The applicant can submit, together with the specified number of specimens, the additional set of specimens which can be required ~~should~~ if one specimen fails. The testing station will then, without further request, test additional specimens and will reject only if a further failure occurs. If the additional set of specimens is not submitted at the same time as the specified number of specimens, the failure of one specimen will entail rejection.