

Australian/New Zealand Standard™

**Installation couplers intended for
permanent connection in fixed
installations
(IEC 61535, Ed.1.0 (2009) MOD)**



AS/NZS 61535:2011

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee EL-004, Electrical Accessories. It was approved on behalf of the Council of Standards Australia on 17 October 2011 and on behalf of the Council of Standards New Zealand on 1 December 2011.

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Consumers Federation of Australia
Electrical Compliance Testing Association
Electrical Regulatory Authorities Council
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Australian/New Zealand Standard™

Installation couplers intended for permanent connection in fixed installations (IEC 61535, Ed.1.0 (2009) MOD)

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee EL-004, Electrical Accessories, to supersede AS/NZS 61535.1:2003, *Installation couplers*, Part 1: *General requirements*. The 2003 edition will remain current for two years from the publication of this Standard. During this period it is anticipated industry will test and certify installation couplers to either Standard.

The objective of this Standard is to provide Australian and New Zealand industry (including manufacturers, test laboratories, regulators and installers) with general and safety requirements and test methods for installation couplers.

This Standard is an adoption with national modifications and has been reproduced from IEC 61535, Ed.1.0 (2009), *Installation couplers intended for permanent connection in fixed installations* and has been varied as indicated to take account of Australian/New Zealand conditions. The modifications are specified in Appendix ZZ.

As this Standard is reproduced from an International Standard, the following applies:

- (a) Its number appears on the cover and title page, while the International Standard number appears only on the cover.
- (b) In the source text 'this Standard' should read 'this Australian/New Zealand Standard'.
- (c) A full point substitutes for a comma when referring to a decimal marker.

References to International Standards should be replaced by references to Australian or Australian/New Zealand Standards, as follows:

<i>Reference to International Standard</i>		<i>Australian/New Zealand Standard</i>	
IEC		AS	
60529	Degrees of protection provided by enclosures (IP Code)	60529	Degrees of protection provided by enclosures (IP Code)
		AS/NZS	
60112	Method for the determination of the proof and the comparative tracking indices of solid insulating materials	60112	Method for the determination of the proof and the comparative tracking indices of solid insulating materials
60695	Fire hazard testing	60695	Fire hazard testing
60695-2-11	Part 2-11: Glowing/hot-wire based test methods—Glow-wire flammability test method for end-products	60695.2.11	Part 2.11: Glowing/hot wire based test methods—Glow-wire flammability test method for end-products

Only international references that have been adopted as Australian or Australian/New Zealand Standards have been listed.

The terms 'normative' and 'informative' have been used in this Standard to define the application of the annex or appendix to which they apply. A 'normative' annex or appendix is an integral part of a Standard, whereas an 'informative' annex or appendix is only for information and guidance.

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FOREWORD

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.

AUSTRALIAN/NEW ZEALAND STANDARD

Installation couplers intended for permanent connection in fixed installations (IEC 61535, Ed.1.0 (2009) MOD)

1 Scope

This standard applies to two up to five wire installation couplers including earth, if provided, with a rated voltage up to and including 500 V a.c. 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 standard.

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 or luminaire supporting couplers (LSCs).

NOTE 5 For lower limits of in-service temperatures the necessary information is 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 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 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 referenced documents are indispensable for the application 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 60529:2001, *Degrees of protection provided by enclosures (IP Code)*

IEC 60664-1:2007, *Insulation co-ordination 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*

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.

Where the terms "voltage" and "current" are used in this standard, they are r.m.s. 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 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 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

3.5.1**installation male connector**

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

3.5.2**installation female connector**

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

3.6**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

3.7**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.

3.8**rewirable installation coupler**

installation coupler so constructed that the cable can be replaced

3.9**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 See also 12.15.

3.9.1**non-rewirable moulded-on installation coupler**

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

3.9.2**non-rewirable non-moulded-on installation coupler**

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

3.10**distribution block**

device intended for branching of circuits

3.11**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 The disengagement may be made by hand or by the use of a tool.

3.12

cap

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

3.13

routine test

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

3.14

type test

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

3.15

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 See IEC 60364-4-41 Annex B.

3.16

terminal

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

3.17

termination

part of an accessory to which a conductor is permanently attached

[IEV 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.

5 General notes on tests

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

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 standard.

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

5.2 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 $\pm$ 5 °C.

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

5.4 If not otherwise specified in this standard, the tests shall be carried out in the order of the clauses as specified in Table C.1. Installation male connectors, caps, installation female connectors and distribution blocks shall be tested in connection with their matching counterparts complying with this standard.

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

5.6 Specimen are deemed not to comply with this standard 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, which may have influenced the result of that test, are repeated on another set of specimens of the same set number as specified in Table C.1, all of which shall then comply with the repeated tests.

NOTE The applicant may submit, together with the specified number of specimens, the additional set of specimens, which may be required, should one specimen fail. 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, the failure of one specimen will entail rejection.

5.7 Routine tests for non-rewirable installation couplers are specified in Annex A.

6 Ratings

6.1 Installation couplers should preferably have a rated voltage chosen from Table 1.

All components of the same installation coupler system shall have the same phase to neutral voltage rating.

Table 1 – Voltage rating for installation couplers

Nominal voltage of power supply system V	Rated voltage V	Rated impulse voltage kV
100	125	2,5
100/200	125/250	2,5
230	250	4,0
230/400	250/400	4,0
277/480	320/500	4,0

6.2 Installation couplers should preferably have a rated current chosen from the following values:

- 10 A
- 16 A
- 20 A
- 25 A
- 32 A

6.3 The preferred values for rated connecting capacities are 1,5 mm², 2,5 mm², 4 mm², 6 mm², 10 mm².

Compliance of 6.1, 6.2 and 6.3 is checked by inspection of markings according to Clause 8.

7 Classification

Installation couplers are classified according to the

7.1 rated impulse voltage:

- 7.1.1 rated impulse voltage of 2,5 kV;
- 7.1.2 rated impulse voltage of 4 kV.

7.2 method of connecting the cable:

- 7.2.1 rewirable installation couplers;
- 7.2.2 non-rewirable installation couplers.

7.3 degree of protection against ingress of foreign solid objects and ingress of water according to IEC 60529 (IP-Code)

7.4 location where installation couplers will be installed:

- 7.4.1 readily accessible installation couplers;
- 7.4.2 non-readily accessible installation couplers.

NOTE 1 Installation couplers for readily accessible areas can also be used in non-readily accessible areas.

7.5 existence of an earthing contact:

- 7.5.1 installation couplers with earthing contact;
- 7.5.2 installation couplers without earthing contact.

7.6 type of conductor to be connected:

- 7.6.1 solid conductor only;
- 7.6.2 rigid (solid and stranded) conductor only;
- 7.6.3 flexible conductor only;
- 7.6.4 both rigid (solid and stranded) and flexible conductors.

7.7 type of terminals for rewirable installation couplers only:

- 7.7.1 installation couplers with screw-type terminals;
- 7.7.2 installation couplers with screwless terminals;
- 7.7.3 installation couplers with insulation piercing terminals.

8 Marking and documentation

8.1 Installation couplers shall be marked with

- a) rated current in amperes (A);
- b) rated voltage in volts (V);
- c) manufacturer's or responsible vendor's name, trade mark or identification mark;
- d) IP-code if higher than IP43 as follows:

The first characteristic numeral for the degree of protection against access to hazardous parts and against harmful effects due to ingress of solid foreign objects shall be marked if declared to be higher than 4, in which case the second characteristic numeral shall also be marked.

The second characteristic numeral for the degree of protection against harmful effects due to ingress of water shall be marked if declared to be higher than 1, in which case the first characteristic numeral shall also be marked.

- e) type reference;
- f) rated connecting capacity for rewirable installation coupler in mm²;
- g) connected conductor size in mm² for non-rewirable installation coupler.

8.2 When symbols or letters are used, they shall be as follows:

rated connecting capacity in square millimetres	mm ² or □
volts	V
amperes	A
alternating current	~ or AC
neutral	N
earth	 or PE

8.3 Markings on the installation coupler according to items in 8.1 shall be readily visible before installation.

8.4 Terminal markings shall be L1, L2, L3 or 1, 2, 3 or equivalent. Earthing terminals in rewirable installation couplers shall have the relevant marking. Neutral terminals shall be marked with N. These markings shall not be placed on screws, removable washers or any other easily removable parts.

If terminals are designed to accept only one type of conductor, e.g. flexible, or rigid (stranded or solid), this shall either be clearly marked on the installation coupler by the letter "f" for flexible or "r" for rigid or "s" for solid or shall be indicated on the smallest packaging unit or in the technical information and catalogue.

8.5 Markings shall be durable and clearly legible.

Compliance is checked by inspection and by the following test:

The marking is rubbed by hand for 15 s with a piece of cloth soaked with water and again for 15 s with a piece of cloth soaked with petroleum spirit.

NOTE Petroleum spirit is defined as an aliphatic solvent hexane with a content of aromatics of maximum 0,1 volume percentage, a kauri-butanol value of 29, an initial boiling point of approximately 65 °C, a dry-point of approximately 69 °C and a density of approximately 0,68 g/cm³.

Markings made by impression, moulding, pressing or engraving or the alike are not subjected to this test.

8.6 The manufacturer's catalogue or installation instructions shall contain the following information:

- a) installation couplers are intended for connection and disconnection without load, only;
- b) types of cables intended to be fitted into the installation couplers;
- c) if the installation coupler is not suitable for installation in readily accessible areas;
- d) if additional parts or precautions are necessary for use in readily accessible areas;
- e) an appropriate marking indicating the length of insulation to be removed before the insertion of the conductor into the screwless terminal;
- f) length of slack of a PE-conductor for rewirable installation couplers (see 12.14);
- g) warning advising the installer that the dangerous compatibility between different manufacturer installation coupler systems is not automatically prevented by compliance with IEC 61535;
- h) statement that installation coupler systems are not replacements for the national domestic plug and socket outlet-system;
- i) if looping-in is intended, wiring instructions shall be specified in the manufacturer's technical documentation.

The installation instructions shall be available in the manufacturer's catalogue, in the technical documentation or in or on the smallest packaging unit.

9 Dangerous compatibility

9.1 An installation coupler system shall be designed and constructed so that unintended or improper connection is prevented.

NOTE Unintended or improper connection includes single-pole connection, except for earth-to-earth connection.

Compliance is checked by inspection and the following test.

It shall not be possible to insert the installation male connector into the installation female connector resulting in a dangerous situation.

Engagement of the installation male and installation female connector is attempted in any unintended configuration using a force of 80 N for installation couplers marked as "10 A", "16 A" and "20 A" or 120 N for installation couplers marked as 25 A and 32 A. The force shall be applied on the same axis of the connection for 1 min during which time the installation male and installation female connector contacts shall not engage.

Where the use of elastomeric or thermoplastic material is likely to influence the results of the test, it shall be carried out at an ambient temperature of the 35 °C ± 2 °C, all parts installation coupler being at this temperature.

During the test no contact shall occur.

9.2 It shall not be possible, within a given installation coupler system, to engage an installation male connector with an installation female connector:

- with a different number of live poles; exceptions may be admitted for installation female connectors which are specially constructed for the purpose of allowing engagement with installation male connectors of a lower number of poles, provided that no dangerous situation can arise;
- without earthing contact if the installation male connector is an installation male connector with earthing contact;
- with different phase to neutral voltage ratings.

Compliance is checked by the test according to 9.1.

9.3 Installation couplers of different systems from the same manufacturer shall not be dangerously compatible.

Compliance is checked by the test according to 9.1.

9.4 Installation couplers according to this standard shall not be compatible with systems specified in standard sheets of IEC 60309, IEC 60320, IEC 60906 and with the national household plug and socket-outlet systems of the country where the product is placed on the market.

NOTE Some national plug and socket-outlet systems are shown in IEC/TR 60083.

Compliance is checked by manual test and in case of doubt by examination of drawings.

10 Protection against electric shock

10.1 An engaged installation coupler shall comply with the requirements for IP 2XC. The installation coupler shall be so designed that live parts are not accessible if the installation male and installation female connector are partially or completely engaged. The installation female connector shall be so designed that live parts are not accessible when disengaged and shall comply with the requirements for IP 2X. The earthing contact and any metal parts connected to the earthing contact shall not be accessible when the installation coupler is completely engaged.

Installation couplers for use in readily accessible areas shall comply with IP 2XD both engaged and unengaged.

If the engagement face of the installation female connector for readily accessible areas does not comply with IP 2XD the manufacturer shall make caps available. These caps shall only be removable with the aid of a tool.

Compliance is checked after the removal of parts which can be removed without the use of a tool by using the test probe C according to Figure 3 of IEC 61032, the test probe D according to Figure 4 of IEC 61032 and the test probe 11 according to Figure 7 of IEC 61032 respectively.

Test probes are applied according to IEC 60529.

10.2 It shall not be possible to access live parts without the aid of a tool.

Bushes, if any, in the entry holes for the male contacts shall be adequately fixed and it shall not be possible to remove them without dismantling the installation coupler.

Compliance is checked by inspection and by manual test.

10.3 External parts of installation couplers, with the exception of assembly screws and the like, shall be of insulating material.

Compliance is checked by inspection.

11 Terminals, terminations and connectable conductors

11.1 Terminals and terminations

For installation couplers with clamping units, IEC 60999-1 applies as applicable with the exception of the test of 9.10.

NOTE The test of 9.10 of IEC 60999-1 is covered by the cycling ageing test according to 21.5 of this standard.

11.1.1 Rewirable installation couplers shall be provided with screw-type terminals, with screwless terminals or reusable insulation piercing terminals.

Terminals with screw clamping means shall allow the conductor to be connected without any special preparation but shall also allow prepared conductors if specified.

Insulation piercing terminals shall comply with IEC 60998-2-3.

11.1.2 Non-rewirable installation couplers shall be provided with soldered, welded, crimped terminations or means for insulation piercing or screwless clamping units or equally effective permanent means.

Screwless terminals and insulation piercing terminals are not allowed for non-rewirable moulded-on installation couplers with the exception that means are included which prevent the moulding material from penetrating into the clamping unit.

Solder type terminations shall be provided with means for mechanically fixing the conductor in position which are independent of the solder.

Compliance is checked by inspection, measurement and the test of 22.1.

11.2 Connectable conductors

Terminals for the rewirable installation female connector and installation male connector shall not have smaller rated connecting capacities than as follow:

- 1,5 mm² for installation couplers marked 10 A according to the maximum current rating;
- 1,5 mm² for installation couplers marked 16 A according to the maximum current rating;
- 2,5 mm² for installation couplers marked 20 A according to the maximum current rating;
- 4 mm² for installation couplers marked 25 A according to the maximum current rating;
- 4 mm² for installation couplers marked 32 A according to the maximum current rating.

NOTE National wiring rules determine the rating of the circuit in which the relevant installation coupler is allowed to be used.

Compliance is checked by the following test:

Conductors with the indicated cross-sectional areas and types shall be connected and screws shall be tightened with the torque values specified in Table 4. For installation couplers classified according to 7.6.3 and 7.6.4, the test is carried out in conjunction with the test of 12.8.

12 Construction

12.1 Installation couplers shall be so constructed that when inserting the installation male connector the earth connection, if any, is made at least 1 mm before the current-carrying contacts of the installation male connector become live.

When withdrawing the installation male connector, the current-carrying male contacts shall separate before the earth connection is broken.

Compliance is checked by inspection of the manufacturing drawings taking into account the effect of tolerances and the most unfavourable positions and by checking the specimens against these drawings and/or by manual test.

12.2 Contacts of installation male connectors shall be locked against rotation if male contacts can be touched without the aid of tool.

Compliance is checked by the following tests:

A torque with a value of 0,4 Nm is applied to the contacts for 60 s in one direction and for 60 s in the opposite direction. The contact parts shall not rotate more than an angle of 30° in total.

NOTE Terminal screws may be used to prevent the contacts from rotating.

12.3 Contacts shall be securely fixed and shall have sufficient mechanical strength. They shall not be removable without the aid of a tool.

NOTE This requirement does not exclude floating contacts.

Compliance is checked by inspection and by the following test.

The installation coupler shall be mounted as for normal use and with all contacts installed. Any accessory or cover which is not essential for the contact retaining system may be loosened or removed.

The installation coupler shall be placed in a heating cabinet for 1 h at a temperature of $(70 \pm 2) ^\circ\text{C}$.

Immediately after the heating period an axial force of 40 N shall be applied to each contact of the installation female connector and installation male connector in both directions consecutively. This force shall be reached by gradual increase at a rate not exceeding 20 N/s until the specified value is reached.

The maximum value shall be maintained for 60 s.

After the test the installation coupler is allowed to cool to room temperature and then no contact shall have been displaced in the body of the installation coupler by more than 1 mm.

12.4 The housing of rewirable installation couplers shall completely enclose the terminals and the ends of cable sheaths. It shall be possible to arrange each conductor such that its insulation cannot come into contact with live parts having another polarity.

Compliance is checked by inspection and manual test.

12.5 The housing of non-rewirable installation couplers shall completely enclose the terminations and the ends of cable sheaths. The conductors shall be so arranged that their insulation cannot come into contact with live parts having another polarity.

Compliance is checked by inspection and manual test.

12.6 Rewirable installation coupler housings shall be reliably fixed and it shall not be possible to dismantle the installation coupler without the aid of a tool.

For rewirable installation couplers there shall be independent means for fixing and locating the parts of the installation coupler with respect to each other, at least one of which shall be operated with the aid of a tool for opening.

Compliance is checked by inspection and by manual test.

12.7 If the earthing contact and the earthing terminal are not in one piece, the various parts shall be connected together by a reliable manner.

NOTE 1 Clamping units complying with IEC 60999-1, riveting and welding are considered as a reliable manner.

NOTE 2 Clamping screws or the spring of screwless type clamping units are not considered to be part of the contact.

Compliance is checked by inspection and test according to Clause 16.

12.8 Rewirable installation couplers classified according to 7.6.3 or 7.6.4 shall be so designed that loose conductor strands in the installation coupler will not present a risk of electric shock.

For non-rewirable installation couplers means shall be provided to prevent loose conductor strands from reducing the minimum clearance and creepage distance requirements and the distance through solid insulation between conductors and all accessible external surfaces of the installation coupler with the exception of the engagement face of the installation male connector of the installation coupler.

Compliance is checked by the following:

- *for rewirable installation couplers the test of 12.8.1;*
- *for non-rewirable non-moulded-on installation couplers the test of 12.8.2;*
- *for non-rewirable moulded-on installation couplers by verification and inspection according to 12.8.3.*

12.8.1 A length of 6 mm of insulation is removed from the end of a flexible conductor, having a minimum cross-sectional area specified by the manufacturer. One strand of the flexible conductor is left free and the remaining strands are fully inserted into and clamped in the terminal, as for normal use.

The free strand is bent, without tearing the insulation back in every possible direction but without making sharp bends around barriers.

NOTE The prohibition against making sharp bends around barriers does not imply that the free strand has to be kept straight during the test. Sharp bends are, moreover, made if it is considered likely that such bends can occur during the normal assembly of the installation coupler, for example when the cover is pushed on.

It shall not be possible for a free strand of a conductor connected to a live terminal to touch any accessible metal part, be able to emerge from the enclosure or touch an earthing terminal when the installation coupler has been assembled.

It shall not be possible for a free strand of a conductor connected to an earthing terminal to touch a live part.

If necessary the test is repeated with the free strand in another position.