

# INTERNATIONAL STANDARD



Appliance couplers for household and similar general purposes –  
Part 2-4: Couplers dependent on appliance weight for engagement

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# INTERNATIONAL STANDARD



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**Appliance couplers for household and similar general purposes –  
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INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**APPLIANCE COUPLERS FOR HOUSEHOLD  
AND SIMILAR GENERAL PURPOSES –****Part 2-4: Couplers dependent on appliance  
weight for engagement**

## FOREWORD

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**This redline version of the official IEC Standard allows the user to identify the changes made to the previous edition. A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text.**

International Standard IEC 60320-2-4 has been prepared by subcommittee 23G: Appliance couplers, of IEC technical committee 23: Electrical accessories.

This second edition cancels and replaces the first edition published in 2005 and Amendment 1:2009. This edition constitutes a technical revision.

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

- a) IEC 60320-2-4 is aligned with IEC 60320-1:2015.
- b) IEC 60320-2-4 is aligned with IEC 60335-1 and IEC 60335-2-15. IEC 60320-2-4 appliance couplers are incorporated into appliances designed and manufactured to these standards. To this end, particular attention is drawn to 14.2 and Clause 20.
- c) It also now proposes that appliance couplers with auxiliary contacts be considered.

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

| FDIS         | Report on voting |
|--------------|------------------|
| 23G/402/FDIS | 23G/404/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.

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

This Part 2-4 is to be used in conjunction with IEC 60320-1: *Appliance couplers for household and similar general purposes – Part 1: General requirements*. It was established on the basis of the third edition of that standard (2015).

The clauses of this standard supplement or modify the corresponding clauses of IEC 60320-1. When a particular subclause or annex of Part 1 is not mentioned in this Part 2-4, the subclause or annex of IEC 60320-1 applies without modification as far as is reasonable. Where this standard states “addition”, “modification” or “replacement”, the relevant requirement, test specification or explanatory matter in IEC 60320-1 should be adapted accordingly.

Subclauses, figures or tables which are additional to those in Part 1 are numbered starting from 101. Additional annexes are lettered AA, BB, etc.

In this particular standard the following print types are used:

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

A list of all parts in the IEC 60320 series, published under the general title *Appliance couplers for household and similar general purposes*, can be found on the IEC website.

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

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

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# APPLIANCE COUPLERS FOR HOUSEHOLD AND SIMILAR GENERAL PURPOSES –

## Part 2-4: Couplers dependent on appliance weight for engagement

### 1 Scope

This clause of IEC 60320-1 is replaced as follows:

This part of IEC 60320 is applicable to two-pole appliance couplers for alternating current only, with or without earthing contact, with a rated voltage not exceeding 250 V and a rated current not exceeding 16 A, for household and similar general purposes and intended for incorporation or integration within electric appliances or other electric equipment of multi-part construction for 50 Hz or 60 Hz supply which depend on the weight of the appliance to ensure correct engagement.

This document is also applicable to appliance couplers with auxiliary contacts rated for alternating current, direct current or both, with a total rated current not exceeding 16 A.

This document is also valid for appliance inlets/appliance outlets integrated or incorporated in appliances.

NOTE 1 Appliance couplers complying with this document are suitable for use in appliances which are used in an ambient temperature not normally exceeding 25 °C but occasionally reaching 35 °C. However the ambient temperature surrounding the appliance coupler ~~may~~ can exceed these figures and ~~is to~~ can be declared by the manufacturer. It is possible that the maximum working ambient temperature for the appliance inlet and for the connector ~~may~~ can be different.

NOTE 2 Appliance couplers dependent on appliance weight for engagement ~~may~~ can be subject to spillage of liquid in normal use. They are classified according to whether protection against ~~water~~ liquid spillage is provided, when installed in accordance with the manufacturer's installation instructions.

NOTE 3 If appliance inlets according to this document are used with appliances or other equipment which ~~may~~ can be subject to spillage of liquid affecting the appliance inlet when the functioning part of the appliance or equipment is seated on its power base, then protection against moisture is ~~to be~~ provided by the equipment.

NOTE 4 References to standard sheets within IEC 60320-1 do not apply to appliance couplers dependent on appliance weight for engagement.

NOTE 5 Special constructions ~~may~~ can be required:

- in locations where special conditions ~~may~~ can prevail, for example, in ships, vehicles and the like;
- in hazardous locations, for example, where explosions are likely to occur.

NOTE 6 Additional auxiliary contacts can be used as part of the appliance coupler. An example of an auxiliary contact is a contact used to supply a low power device or used to transmit signals for sensors and to/from a microprocessor.

### 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.

This clause of IEC 60320-1 applies with the following additions:

IEC TR 60083, *Plugs and socket-outlets for domestic and similar general use standardized in member countries of IEC*

IEC 60320-1:~~2004~~ 2015, *Appliance couplers for household and similar general purposes – Part 1: General requirements*

~~IEC 60320-2-2, Appliance couplers for household and similar general purposes – Part 2-2: Interconnection couplers for household and similar equipment~~

~~IEC 60320-2-3, Appliance couplers for household and similar general purposes – Part 2-3: Appliance couplers with a degree of protection higher than IPX0~~

IEC 60335-1:~~2004~~ 2010, *Household and similar electrical appliances – Safety – Part 1: General requirements*

IEC 60335-1:2010/AMD1:2013

IEC 60335-1:2010/AMD2:2016

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

IEC 60664-1:~~1992~~ 2007, *Insulation coordination for equipment within low-voltage systems<sup>4)</sup> – Part 1: Principles, requirements and tests*

~~Amendment 1 (2000)~~

IEC 60695-11-5:2016, *Fire hazard testing – Part 11-5: Test flames – Needle-flame test method – Apparatus, confirmatory test arrangement and guidance*

IEC 60695-11-10, *Fire hazard testing, – Part 11-10: Test flames – 50 W horizontal and vertical flame test methods*

IEC 60730-(all parts), *Automatic electrical controls*

~~IEC 61032, Protection of persons and equipment by enclosures – Probes for verification~~

ISO 9772, *Cellular plastics – Determination of horizontal burning characteristics of small specimens subjected to a small flame*

### 3 Terms and definitions

This clause of IEC 60320-1 applies with the following additions:

#### 3.101

##### **weight-engaged coupler**

coupler that relies on the weight of the functioning part of the appliance, in which it is incorporated or integrated, to ensure correct engagement

Note 1 to entry: The weight-engaged coupler is used in an appliance which is in two parts, in order to supply the part that performs the function of the appliance (the functioning part) from the power base which is connected to the power supply.

<sup>4)</sup> ~~A consolidated edition (1.2) exists containing IEC 60664-1:1992 and its Amendment 1 (2000) and Amendment 2 (2002).~~

**3.102****weight-engaged connector**

component part of the weight-engaged coupler which carries the power connections, and engages with the corresponding appliance inlet

**3.103****weight-engaged appliance inlet**

component part of a weight-engaged coupler intended for integration or incorporation in the functioning part of the appliance

**3.104****rewirable weight-engaged connector**

weight-engaged connector so constructed that the supply cord can be replaced

Note 1 to entry: The method of attachment of the supply cord, when installed in accordance with the manufacturer's installation instructions, is classified according to type X or type Y attachment requirements of the appliance standards.

Note 2 to entry: The requirements for type X or type Y attachment methods are given in IEC 60335-1.

**3.105****type X attachment**

method of attachment of the supply cord such that it can easily be replaced

Note 1 to entry: The supply cord may be specially prepared and only available from the manufacturer or its service agent. A specially prepared cord may include a part of the appliance.

**3.106****type Y attachment**

method of attachment of the supply cord such that any replacement is intended to be made by the manufacturer, its service agent or similar qualified person

**3.107****type Z attachment**

method of attachment of the supply cord such that it cannot be replaced without breaking or destroying the appliance

**3.108****auxiliary contact**

contact included in the appliance coupler to operate an auxiliary circuit as part of the normal operation of the appliance, with a maximum allowable current rating of 2 A

Note 1 to entry: An example of an auxiliary contact is a pole used to supply a low current device, used to transmit signals for sensors and to/from a microprocessor.

**3.109****non-polarized**

designed so that the inlet and connector auxiliary contact poles are interchangeable

**4 General requirements**

This clause of IEC 60320-1 applies.

**5 General notes on tests**

This clause of IEC 60320-1 applies amended as follows:

## 5.2 Replacement:

The specimens are tested as delivered and under normal conditions of use, in accordance with the installation instructions of the manufacturer. For alternating current they are tested ~~with a.c.~~ at 50 Hz or 60 Hz.

Non-rewirable weight-engaged connectors shall be submitted with a cord at least 1 m long.

For those clauses requiring the tests to be carried out on weight-engaged connectors and ~~weight-engaged~~ appliance inlets installed in accordance with the manufacturer's instructions, representative appliances or appliance parts shall be supplied.

## ~~5.5 Replacement:~~

~~For weight-engaged appliance inlets three specimens are required, to be subjected to the tests specified.~~

~~For weight-engaged connectors six specimens are required:~~

- ~~— set 1 of three specimens is subjected to the tests specified, with the exception of those of Clauses 14, 15, 16, 19, 20 and 21, and of 24.2;~~
- ~~— set 2 of three specimens is subjected to the tests of 14.1 and of Clauses 15, 16, 19, 20 and 21 (including the repetition of Clause 16).~~

~~For weight-engaged connectors which are declared as providing protection against water spillage, three additional specimens are required, which are subjected to the test of 14.2.~~

~~For weight-engaged connectors of elastomeric or thermoplastic material, two additional specimens are required which are subjected to the tests of 24.2.1 or 24.2.2, whichever is applicable.~~

~~For non-rewirable weight-engaged connectors with indicators, three additional specimens with one pole of the indicator disconnected are required for the tests of Clause 15.~~

## 6 Standard ratings

This clause of IEC 60320-1 is replaced as follows:

**6.1** The standard rated voltage is 250 V. Other rated voltages may be declared by the manufacturer provided they do not exceed 250 V.

**6.2** The rated current shall be declared by the manufacturer. A coupler may have different current ratings dependent on use within specified applications. The rated current shall not in any case exceed 16 A.

*Compliance with the requirements of 6.1 and 6.2 is checked by visual inspection of the marking or the manufacturer's instructions for installation and use.*

## 7 Classification

This clause of IEC 60320-1 ~~applies amended~~ is replaced as follows:

~~7.1 Replacement:~~

~~7.1 Weight-engaged couplers are classified:~~

~~7.1.1 According to whether or not protection against water spillage is provided when the connector is installed according to the manufacturer's instructions.~~

7.1 According to maximum temperature of the corresponding appliance inlet:

- a) appliance couplers for cold conditions, appliance inlet temperature not exceeding 70 °C;
- b) appliance couplers for hot conditions, appliance inlet temperature not exceeding 120 °C;
- c) appliance couplers for very hot conditions, appliance inlet temperature not exceeding 155 °C.

NOTE Appliance couplers for hot conditions can also be used under cold conditions; appliance couplers for very hot conditions can also be used under cold or hot conditions.

~~7.1.2~~ 7.2 According to the type of equipment to be connected:

- a) appliance couplers for class I equipment;
- b) appliance couplers for class II equipment.

NOTE For a description of the classes, see IEC 61140

~~7.1.3 According to whether or not the coupler is intended to be engaged and disengaged with current flowing.~~

7.3 According to protection against liquid spillage when the connector is installed according to the manufacturer's instructions:

- a) protected;
- b) not protected.

7.4 According to breaking capacity:

- a) the coupler is intended to be engaged and disengaged with current flowing;
- b) the coupler is intended to be engaged and disengaged without current flowing.

~~7.1.4~~ 7.5 According to the maximum ambient working temperature of the coupler

NOTE The maximum ambient working temperature of the connector and appliance inlet ~~may~~ can be different.

~~7.1.5~~ 7.6 According to the number of cycles to be performed in the test of Clause 20. Preferred values are:

- ~~7.1.5.1~~ ● 100 000
- ~~7.1.5.2~~ ● 60 000
- ~~7.1.5.3~~ ● 30 000
- ~~7.1.5.4~~ ● 20 000
- ~~7.1.5.5~~ ● 10 000
- ~~7.1.5.6~~ ● 6 000

NOTE Different numbers of endurance cycles ~~may~~ can be declared for different current ratings of the same coupler. A cycle is two strokes as defined in Clause 19, that is, one connection followed by one disconnection.

~~7.2 This subclause of IEC 60320-1 does not apply.~~

~~NOTE The notes at the end of this subclause in IEC 60320-1 are also not applicable.~~

**7.7** The following information is recorded to cover required tests:

- a) The specified minimum cross-sectional area of cord.
- b) The maximum allowable terminal temperature rise.
- c) The maximum allowable termination temperature rise.
- d) The maximum allowable contact temperature rise.
- e) The minimum appliance weight required for correct engagement.
- f) The minimum base weight required for correct disengagement.
- g) The end equipment standard.
- h) The type of load to be connected:
  - resistive load
  - inductive load
  - capacitive load
  - specific load
  - direct current (auxiliary contacts)
- i) Type of cord to be connected (e.g. IEC type 52).
- j) Function of the connector:
  - connectors which normally make the connected load
  - connectors which do not normally make the connected load
  - connectors which normally break the connected load
  - connectors which do not normally break the connected load

NOTE Connectors which carry a current of 200 mA or less are considered to be off-load.

- k) For connectors with auxiliary contacts,
  - number of auxiliary contacts
  - maximum current rating of auxiliary contacts
  - maximum voltage rating of auxiliary contacts
  - specified for use in DC applications the contacts shall be classified as
    - i) polarized or
    - ii) non-polarized
  - the insulation classification between the auxiliary circuit and primary circuit

NOTE For SELV and PELV refer to the appropriate intended product standard.

## 8 Marking

This clause of IEC 60320-1 applies amended as follows:

### ~~8.1 Replacement:~~

~~Weight-engaged connectors shall be marked with the name, trademark or identification mark of the maker or of the responsible vendor and a type reference.~~

### 8.2 Replacement:

Weight-engaged appliance inlets shall be marked with the name, trademark or identification mark of the maker or of the responsible vendor and a type reference.