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**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**

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Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of Economy, Trade and Industry through deliberations at the Japanese Industrial Standards Committee as the result of proposal for revision of Japanese Industrial Standard based on the Industrial Standardization Law.

Consequently, JIS C 2814-2-3:2001 is replaced with this Standard.

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JIS C 2814 series consists of the following 5 parts under the general title “*Connecting devices for low-voltage circuits for household and similar purposes*”

Part 1: General requirements

Part 2-1: Particular requirements for connecting devices as separate entities with screw-type clamping units

Part 2-2: Particular requirements for connecting devices as separate entities with screwless-type clamping units

Part 2-3: Particular requirements for connecting devices as separate entities with insulation-piercing clamping units

Part 2-4: Particular requirements for twist-on connecting devices

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

Introduction

This Japanese Industrial Standard has been prepared based on the second edition of IEC 60998-2-3 published in 2002 with some modifications of the technical contents to conform to the power distribution situation in Japan. This Standard shall be used together with JIS C 2814-1 : 2009.

The portions given dotted underlines are the matters in which the contents of the original International Standard have been modified. A list of modifications with the explanations is given in Annex JC.

1 Scope

Scope given in clause 1 of JIS C 2814-1 and the following shall apply.

This Standard applies to connecting devices with insulation-piercing clamping units primarily suitable for connecting unprepared conductors.

In the connecting operation, the insulation of the conductor is made ineffective by piercing, boring through, cutting through, removing, displacing or some other manners at the point(s) of contact.

NOTE 1 In this Standard, connecting devices with insulation-piercing clamping units are referred to as IPCDs (Insulation-Piercing Connecting Devices).

NOTE 2 The International Standard corresponding to this Standard is as follows.

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* (MOD)

In addition, symbols which denote the degree of correspondence in the contents between the relevant International Standard and JIS are IDT (identical), MOD (modified), and NEQ (not equivalent) according to ISO/IEC Guide 21.

2 Normative references

Normative references given in clause 2 of JIS C 2814-1 and the following shall apply.

JIS C 2814-1 : 2009 *Connecting devices for low-voltage circuits for household and*

similar purposes — Part 1 : General requirements

NOTE : Corresponding International Standard : IEC 60998-1 : 2002 *Connecting devices for low-voltage circuits for household and similar purposes — Part 1 : General requirements* (MOD)

3 Terms and definitions

For the purposes of this Standard, the terms and definitions given in clause 3 of JIS C 2814-1 and the following shall apply.

3.101 insulation-piercing connecting device (IPCD)

connecting device for the connection and possible disconnection of one conductor or the interconnection of two or more conductors with the insulation being made ineffective by piercing, boring through, cutting through, removing, displacing or some other manners without previous stripping at the point(s) of contact

NOTE 1 The removal of the sheath of the cable, if necessary, is not considered as a previous stripping.

NOTE 2 Examples of IPCDs are given in figure 103.

3.102 reusable IPCD

IPCD that can be used more than once

3.103 non-reusable IPCD

IPCD that can be used only once

3.104 non-removable IPCD

IPCD that can be used only once and can only be removed by cutting conductors only

4 General

The general shall be in accordance with clause 4 of JIS C 2814-1.

5 General notes on tests

General notes on tests shall be in accordance with clause 5 of JIS C 2814-1, provided that 5.3 and 5.4 shall be in accordance with this Standard.

5.3 The tests shall be carried out in the sequence shown in Annex AA for each set.

5.4 The necessary number of new samples to be submitted to the tests shall be divided into sets as shown in Annex AA, and this Standard is conformed if all the tests are met.

6 Main characteristics

Main characteristics shall be in accordance with clause 6 of JIS C 2814-1.

7 Classification

Classification shall be in accordance with clause 7 of JIS C 2814-1 and the following apply.

7.101 Classification according to reusability and removability

- reusable IPCD
- non-reusable IPCD
- non-removable IPCD

7.102 Classification according to method of making connection

- with a general purpose tool
- with a special tool
- by hand

7.103 Classification according to conductor type

- IPCD for solid conductors only
- IPCD for rigid (solid or stranded) conductors only
- IPCD for flexible conductors only
- IPCD for rigid (solid and/or stranded) and flexible conductors

7.104 Classification according to conductor insulation

- IPCD for polyvinyl electric wires
- IPCD for rubber electric wires
- IPCD for special conductors designated by manufacturer

7.105 Classification according to number of cores in conductor to be connected

- IPCD for one-core conductors
- IPCD for multi-core cables or cords

8 Marking

Marking given in clause 8 of JIS C 2814-1 and the following shall apply.

8.101 The following shall be marked on the smallest package unit.

- Whether IPCD is non-reusable or non-removable (7.101) (Absence of marking indicates IPCD is reusable.)

- Connection and disconnection procedure, if necessary (including handling after disconnection) (for example, when the clamping torque value is higher than that in table 102)
- Combinations of cross-sectional areas and types of conductors according to 7.103, 7.104 and 7.105 for which IPCD is designed (method of connection according to 7.102, if necessary)

The manufacturer shall describe the suitable cable and insulation type of the conductor, if the contact pressure is being transmitted via the conductor insulation of that product.

8.102 IPCD classified according to 7.103 shall be marked as follows.

- The letter "s" or "sol", or the explanation shall be provided for terminals declared for solid conductors; however, this marking may be omitted when ϕ marking is provided.
- The letter "r" or the explanation shall be provided for terminals declared for rigid conductors.
- The letter "f" or the explanation shall be provided for terminals declared for flexible conductors.
- Terminals declared for rigid (solid and/or stranded) conductors and flexible conductors need not be marked.

This marking shall appear where it is practical on the end product or on the smallest package unit, or in technical information and/or catalogues.

NOTE : In the "marking by the explanation" above, "for solid conductors", "for rigid conductors", "for flexible conductors", etc. are included.

9 Protection against electric shock

Protection against electric shock shall be in accordance with clause 9 of JIS C 2814-1.

10 Connection of conductors

Connection of conductors given in clause 10 of JIS C 2814-1 and the following shall apply.

10.101 IPCD shall accept one or more unprepared conductors of the same or of different nominal cross-sectional areas of rigid (solid or stranded) and flexible designated by the manufacturer.

10.102 The relationship between the rated connecting capacity of clamping units of Type 1 and connectable conductors as well as data on the diameters of conductors are given in table 101.

Each terminal for connecting devices of Type 2 shall be capable of reliably clamping the conductors having the cross-sectional area which is marked or designated in the instruction manual by the manufacturer.

Table 101 Rated connecting capacity and connectable conductors (Type 1)

Rated connecting capacity mm ²	Connectable conductors and theoretical diameters thereof				
	Metric				
	Rigid conductors			Flexible conductors	
	mm ²	Solid ϕ mm	Stranded d ^{b)} mm	mm ²	d ^{b)} mm
0.2	0.2	0.51	0.53	0.2	0.61
0.34	0.34	0.63	0.66	0.34	0.8
0.5	0.5	0.9	1.1	0.5	1.1
0.75	0.75	1.0	1.2	0.75	1.3
1.0	1.0	1.2	1.4	1.0	1.5
1.5	1.5	1.5	1.7	1.5	1.8
2.5	2.5	1.9	2.2	2.5	2.4 ^{a)}
4.0	4.0	2.4	2.7	4.0	3.0 ^{a)}
6.0	6.0	2.9	3.3	4.0	3.0 ^{a)}
10.0	10.0	3.7	4.2	6.0	3.9
16.0	16.0	4.6	5.3	10.0	5.1
25.0	25.0	—	6.6	16.0	6.3
35.0	35.0	—	7.9	25.0	7.8
NOTE 1 Correspondence with AWG is given in table BB.2.					
NOTE 2 The maximum diameters of rigid and flexible conductors shall be in accordance with table C.1 of JIS C 3664 and IEC 60344.					
Notes a) (This Note in the corresponding International Standard is deleted.)					
b) d indicates the maximum outside diameter.					

10.103 The disconnection of a conductor from a reusable or non-reusable IPCD shall require an operation other than a pull on the conductor only. It shall be necessary to take deliberate action to disconnect it by hand or with a suitable tool.

Compliance shall be checked by the tests of 10.106 and 10.107.

10.104 IPCD shall be adequately locked against unintended loosening.

Compliance shall be checked by visual inspection and by the tests of 10.106 and 10.107.

10.105 If IPCD uses screws for wire connection, the following shall be carried out before each test.

Screws of reusable IPCD are tightened and loosened 5 times by means of an appropriate tool applying the torque value according to table 102. An end of new conductor shall be used each time the screw shall be loosened and subsequently re-tightened.

Screws of non-reusable and non-removable IPCD are tightened by applying the torque value according to table 102.