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**Connecting devices for low-voltage
circuits for household and similar
purposes — Part 2-1 : Particular
requirements for connecting de-
vices as separate entities with
screw-type 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 2814-2-1** : 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 2-1 : Particular requirements for connecting devices as separate entities with screw-type clamping units

Introduction

This Japanese Industrial Standard has been prepared based on the second edition of **IEC 60998-2-1** 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 sidelines or 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 screw-type clamping units primarily suitable for connecting unprepared conductors.

NOTE : The International Standard corresponding to this Standard and the symbol of degree of correspondence are as follows.

IEC 60998-2-1 : 2002 *Connecting devices for low-voltage circuits for household and similar purposes—Part 2-1 : Particular requirements for connecting devices as separate entities with screw-type 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 screw-type terminal

terminal for the connection of two or more conductors by means of screw-type clamping units

3.101.1 pillar terminal

terminal in which the conductors are inserted into a hole or cavity, where they are clamped under the shank of a screw(s)

The clamping pressure shall be applied directly by the shank of the screw, or through an intermediate part to which pressure is applied by the shank of the screw.

NOTE : Examples of pillar terminals are given in figure 101.

3.101.2 screw terminal

terminal in which the conductors are clamped under the head of one or more screws

The clamping pressure may be applied directly by the head of a screw or through an intermediate part such as a washer, a clamping plate or an anti-spread device.

NOTE : Examples of screw terminals are given in figure 102.

3.101.3 stud terminal

terminal in which the conductors are clamped under a nut

The clamping pressure may be applied directly by a suitably shaped nut or through an intermediate part such as a washer, clamping plate or an anti-spread device.

NOTE : Examples of stud terminals are given in figure 102.

3.101.4 saddle terminal

terminal in which the conductors are clamped under a saddle by means of two or more screws or nuts

NOTE : Examples of saddle terminals are given in figure 103.

3.101.5 mantle terminal

terminal in which the conductors are clamped against the base of a slot in a threaded stud by a nut, by a suitably shaped washer placed under the nut, by a central peg if the nut is a cap nut, or by an equally effective means for transmitting the pressure from the nut to the conductors within the slot

NOTE : Examples of mantle terminals are given in figure 104.

4 General

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 BB for each set.

5.4 In accordance with **5.4** of **JIS C 2814-1**, provided that the first sentence shall be as follows.

The necessary number of new samples to be submitted to the tests shall be divided into sets as shown in Annex BB, 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**.

8 Marking

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

8.1 As given in **8.1** of **JIS C 2814-1**, and the following shall apply.

The terminal shall be marked according to **10.103**, if applicable.

8.101 If the manufacturer declares that the performance of connecting devices exceeds the minimum requirements of **10.101** and **10.102**, the types, the maximum cross-sectional area and minimum cross-sectional area of connectable conductors and the maximum number of conductors simultaneously connectable to each clamping unit shall be indicated in data sheets or catalogue, or on the packaging.

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 The connecting device shall accept two or more conductors of the same or different nominal cross-sectional areas or compositions. Terminals shall accept rigid and/or flexible unprepared conductors.

10.101A Terminals for connecting devices of Type 1 shall be fitted with conductors of the type and the cross-sectional area according to table 101 and whose core composition complies with table CC.1 (in line with **JIS C 3664**).

For connecting devices of Type 2, conductors designated by the manufacturer shall be fitted.

Before insertion into the terminal, rigid conductors of stranded wires and flexible conductors shall be reshaped. The use of a tool is permitted.

It shall be possible to fit the conductor into the terminal without undue force. See also table 101A.

The conductor shall be inserted into the terminal until it just projects from the far side of the terminal, if possible, and in the position most likely to allow the wire to escape.

The clamping screw(s) shall then be clamped with a torque as indicated in **10.103**.

After the test, no wire of the conductor shall have escaped from the terminal.

10.102 Each terminal for connecting devices of Type 1 shall accept conductors of cross-sectional areas and types as indicated in table 101 for the relevant values of the rated connecting capacity. In addition, terminals shall provide appropriate connection of at least the two successive smaller cross-sectional areas exemplified as follows.

- a) A terminal having the rated connecting capacity of 1 mm² shall be capable of clamping reliably rigid and/or flexible conductors of 0.5 mm², 0.75 mm² and 1 mm².
- b) A terminal having the rated connecting capacity of 10 mm² shall be capable of clamping reliably rigid conductors of 4 mm², 6 mm² and 10 mm² and/or flexible conductors of 4 mm² and 6 mm².
- c) A terminal having the rated connecting capacity of 25 mm² shall be capable of clamping reliably rigid conductors of 10 mm², 16 mm² and 25 mm² and/or flexible conductors of 6 mm², 10 mm² and 16 mm².
- d) A terminal for flexible conductors only having a rated connecting capacity of 25 mm² shall be capable of clamping reliably flexible conductors of 10 mm², 16 mm² and 25 mm².

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 specified 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 The maximum diameters of rigid and flexible conductors shall be in accordance with table C.1 or of JIS C 3664 and IEC 60344.					
NOTE 2 Correspondence with AWG is given in table DD.2.					
Notes a) (This Note in the corresponding International Standard is deleted.)					
b) d indicates the maximum outside diameter.					

Table 101A Reference table for rated connecting capacity and connectable conductors (Type 1)

Rated connecting capacity mm ²	Connectable conductors mm ²		
	Rigid conductors	Flexible conductors for rigid/ flexible common terminal	Flexible conductors only
	Marking r/no marking	No marking	Marking f
0.2	0.2	0.2	0.2
0.34	0.2, 0.34	0.2, 0.34	0.2, 0.34
0.5	0.2, 0.34, 0.5	0.2, 0.34, 0.5	0.2, 0.34, 0.5
0.75	0.34, 0.5, 0.75	0.34, 0.5, 0.75	0.34, 0.5, 0.75
1.0	0.5, 0.75, 1.0	0.5, 0.75, 1.0	0.5, 0.75, 1.0
1.5	0.75, 1.0, 1.5	0.75, 1.0, 1.5	0.75, 1.0, 1.5
2.5	1.0, 1.5, 2.5	1.0, 1.5, 2.5	1.0, 1.5, 2.5
4.0	1.5, 2.5, 4.0	1.5, 2.5, 4.0	1.5, 2.5, 4.0
6.0	2.5, 4.0, 6.0	2.5, 4.0	2.5, 4.0, 6.0
10.0	4.0, 6.0, 10.0	4.0, 6.0	4.0, 6.0, 10.0
16.0	6.0, 10.0, 16.0	4.0, 6.0, 10.0	6.0, 10.0, 16.0
25.0	10.0, 16.0, 25.0	6.0, 10.0, 16.0	10.0, 16.0, 25.0
35.0	16.0, 25.0, 35.0	10.0, 16.0, 25.0	—

10.103 Unless otherwise specified by the manufacturer, terminals shall accept rigid and flexible conductors indicated in the connectable conductors column of table 101 corresponding to their rated connecting capacities; in this case no markings are necessary. If a terminal can accept only one type of conductor (for example, rigid or flexible), this shall either be clearly marked on the end product for connecting purposes by the letter "r", "f" or the explanation, or indicated on the smallest package unit or in technical information and catalogues.

NOTE 1 In the "marking by the explanation" above, "for rigid conductors", "for flexible conductors", etc. are included.

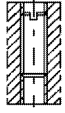
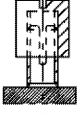
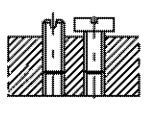
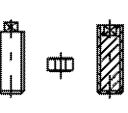
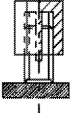
Compliance with the requirements of **10.101** to **10.103** shall be checked by visual inspection and by the following test.

The test shall be carried out on terminals with copper conductors in accordance with **10.102**, or by placing the smallest and largest diameter conductors in each clamping unit alternatively.

Screws and nuts shall be clamped and loosened 5 times by means of a suitable screwdriver or spanner, and the clamping torque shall be in accordance with the appropriate column of table 102 or alternatively in accordance with the higher torque value indicated by the manufacturer.

A new conductor end shall be used each time the screw or nut is loosened.

Table 102 Clamping torque corresponding to nominal diameter of thread

Nominal diameter of thread mm		Torque Nm				
		I	II	III	IV	V
Over	Up to and including					
—	1.6	0.05	—	0.1	0.1	—
1.6	2.0	0.1	—	0.2	0.2	—
2.0	2.8	0.2	—	0.4	0.4	—
2.8	3.0	0.25	—	0.5	0.5	—
3.0	3.2	0.3	—	0.6	0.6	—
3.2	3.6	0.4	—	0.8	0.8	—
3.6	4.1	0.7	1.2	1.2	1.2	1.2
4.1	4.7	0.8	1.2	1.8	1.8	1.8
4.7	5.3	0.8	1.4	2.0	2.0	2.0
5.3	6.0	1.2	1.8	2.5	3.0	3.0
6.0	8.0	2.5	2.5	3.5	6.0	4.0
8.0	10.0	—	3.5	4.0	10.0	6.0
10.0	12.0	—	4.0	—	—	8.0
12.0	15.0	—	5.0	—	—	10.0

Column I applies to screws without heads if the screw does not protrude from the hole when clamped, and to other screws which cannot be clamped by means of a screwdriver with a blade wider than the diameter of the screw.

Column II applies to nuts of mantle terminals which are clamped by means of a screwdriver.

Column III applies to other screws of terminals which are clamped by means of a screwdriver.

Column IV applies to screws and nuts other than nuts of mantle terminals which are clamped by means other than a screwdriver.

Column V applies to nuts of mantle terminals which are clamped by means other than a screwdriver.