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(JEWA/JSA)

**Switches for household and similar
fixed electrical installations—
Part 2-1: Particular requirements—
Electronic switches**

ICS 29.120.40

Reference number : JIS C 8281-2-1 : 2012 (E)

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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 submitted by Japan Electrical Wiring Devices and Equipment Industries Association (JEWA)/Japanese Standards Association (JSA) with the draft being attached, based on the provision of Article 12 Clause 1 of the Industrial Standardization Law applicable to the case of revision by the provision of Article 14.

Consequently, **JIS C 8281-2-1:2004** is replaced with this Standard.

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Attention is drawn to the possibility that some parts of this Standard may conflict with patent rights, applications for a patent after opening to the public or utility model rights. The relevant Minister and the Japanese Industrial Standards Committee are not responsible for identifying any of such patent rights, applications for a patent after opening to the public or utility model rights.

JIS C 8281 series consists of the following 4 parts under the general title “*Switches for household and similar fixed electrical installations*”:

Part 1: General requirements

Part 2-1: Particular requirements—Electronic switches

Part 2-2: Particular requirements—Electromagnetic remote-control switches (RCS)

Part 2-3: Particular requirements—Time-delay switches (TDS)

Switches for household and similar fixed electrical installations— Part 2-1: Particular requirements— Electronic switches

Introduction

This Japanese Industrial Standard has been prepared based on the fourth edition of **IEC 60669-2-1** published in 2002 and Amendment 1 (2008) with some modifications of the technical contents such as addition of the wire sizes and rated voltage values uniquely applied in Japan. This Standard should be used in conjunction with specifications of other related parts of **JIS C 8281-1**. Clauses, subclauses, figures, tables and notes in this Standard that are to be added to **JIS C 8281-1** are shown with numbers in the 100 s. The Amendment is incorporated into this Standard.

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

1 Scope

Replace clause 1 of **JIS C 8281-1** with the following:

This Standard applies to electronic switches and to associated electronic extension units for household and similar fixed electrical installations for use either indoors or outdoors.

It applies to electronic switches for a.c. only, for the operation of lamp circuits and motor circuits and the control of the brightness of lamps (dimmers) as well as the control of the speed of motors (for example, those used in ventilating fans) and for other purposes (for example, heating controls), with a rated voltage not exceeding 250 V and a rated current not exceeding 16 A.

The operation and/or control as mentioned above are performed by a person via an actuating member, a sensing surface or a sensing unit, by means of touch, proximity, turn, optical, acoustic, thermal or any other influence.

This Standard also applies to general purpose electronic switches with included automatic functions where the operation and/or the control is initiated by a change of a physical quantity, for example, light, temperature, humidity, time, wind velocity, presence of persons, etc.

This Standard also applies to boxes for electronic switches, with the exception of mounting boxes for flush-type electronic switches.

This Standard also applies to electronic RCS (remote controlled switch) and electronic TDS (time delayed switch) with a rated voltage not exceeding 440 V and a rated current not exceeding 25 A, intended for household and similar fixed electrical installation, either indoors or outdoors.

NOTE 1 Switches including only passive components such as resistors, capacitors, inductors, PTC and NTC components, varistors, printed wiring boards and connectors are not considered as electronic switches.

NOTE 2 Electronic switches may have control circuits with a.c. or d.c. rated control voltages.

Electronic switches complying with this Standard are suitable for use at ambient temperature not normally exceeding 25 °C but occasionally reaching 35 °C.

In locations where special conditions prevail, such 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 3 This Standard is not intended to cover devices which are designed to be incorporated in appliances or are intended to be delivered together with a specific appliance and which are within the scope of **JIS C 9730** series or **JIS C 4526-1**.

Examples of designs of electronic switches and functions are shown in Annex AA.

NOTE 4 Electronic switches without a mechanical switch in the main circuit do not provide a “full off-state”. Therefore, the circuit on the load side should be considered to be live.

NOTE 5 The International Standard corresponding to this Standard and the symbol of degree of correspondence are as follows.

IEC 60669-2-1:2002 *Switches for household and similar fixed electrical installations—Part 2-1: Particular requirements—Electronic switches* and Amendment 1:2008 (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 21-1**.

2 Normative references

Clause 2 of **JIS C 8281-1** applies except as follows.

JIS C 0922 *Protection of persons and equipment by enclosures for electrical apparatus—Probes for verification*

NOTE : Corresponding International Standard: IEC 61032 *Protection of persons and equipment by enclosures—Probes for verification* (IDT)

JIS C 2814-2-1 *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*

NOTE : Corresponding International Standard: IEC 60998-2-1 *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)

JIS C 3215-0-1:1999 *Specifications for particular types of winding wires—Part 0: General requirements—Section 1: Enamelled round copper wire*

NOTE : Corresponding International Standard: IEC 60317-0-1:1997 *Specifications for particular types of winding wires—Part 0: General requirements—Section 1: Enamelled round copper wire* (MOD)

JIS C 3662-1:2009 *Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V—Part 1: General requirements*

JIS C 3662-5:2009 *Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V—Part 5: Flexible cables (cords)*

NOTE : Corresponding International Standard: IEC 60227-5:1997 *Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V—Part 5: Flexible cables (cords)* (MOD)

JIS C 3663-1:2010 *Rubber insulated cables—Rated voltages up to and including 450/750 V—Part 1: General requirements*

JIS C 4003:2010 *Electrical insulation—Thermal evaluation and designation*

NOTE : Corresponding International Standard: IEC 60085:1984 *Thermal evaluation and classification of electrical insulation* (MOD)

JIS C 5101-14:2009 *Fixed capacitors for use in electronic equipment—Part 14: Sectional specification: Fixed capacitors for electromagnetic interference suppression and connection to the supply mains*

NOTE : Corresponding International Standard: IEC 60384-14:1993 *Fixed capacitors for use in electronic equipment—Part 14: Sectional specification: Fixed capacitors for electromagnetic interference suppression and connection to the supply mains* (IDT)

JIS C 6065:2009 *Audio, video and similar electronic apparatus—Safety requirements*

NOTE : Corresponding International Standard: IEC 60065:2001 *Audio, video and similar electronic apparatus—Safety requirements* (MOD)

JIS C 6575 (series) *Miniature fuses*

NOTE : Corresponding International Standard: IEC 60127 (all parts) *Miniature fuses* (MOD)

JIS C 8281-1:2011 *Switches for household and similar fixed-electrical installations—Part 1: General requirements*

NOTE : Corresponding International Standard: IEC 60669-1:2007 *Switches for household and similar fixed-electrical installations—Part 1: General requirements* (MOD)

JIS C 8281-2-2:2012 *Switches for household and similar fixed electrical installations—Part 2-2: Particular requirements—Electromagnetic remote-control switches (RCS)*

NOTE : Corresponding International Standard: IEC 60669-2-2:2006 *Switches for household and similar fixed electrical installations—Part 2-2: Particular requirements—Electromagnetic remote-control switches (RCS)* (MOD)

JIS C 8281-2-3:2012 *Switches for household and similar fixed electrical installations—Part 2-3: Particular requirements—Time-delay switches (TDS)*

NOTE : Corresponding International Standard: IEC 60669-2-3:2006 *Switches for household and similar fixed electrical installations—Part 2-3: Particular requirements—Time-delay switches (TDS)* (MOD)

JIS C 9730 (series) *Automatic electrical controls for household and similar use*

NOTE : Corresponding International Standard: IEC 60730 (all parts) *Automatic electrical controls for household and similar use* (MOD)

JIS C 60664-1:2009 *Insulation coordination for equipment within low-voltage systems—Part 1: Principles, requirements and tests*

NOTE : Corresponding International Standard: IEC 60664-1:2007 *Insulation coordination for equipment within low-voltage systems—Part 1: Principles, requirements and tests* (IDT)

JIS C 60664-3:2009 *Insulation coordination for equipment within low-voltage systems—Part 3: Use of coating, potting or moulding for protection against pollution*

NOTE : Corresponding International Standard: IEC 60664-3 *Insulation coordination for equipment within low-voltage systems—Part 3: Use of coating, potting or moulding for protection against pollution* (IDT)

JIS C 61000-3-2:2011 *Electromagnetic compatibility (EMC)—Part 3-2: Limits—Limits for harmonic current emissions (equipment input current ≤ 20 A per phase)*

NOTE : Corresponding International Standard: IEC 61000-3-2:2000 *Electromagnetic compatibility (EMC)—Part 3-2: Limits—Limits for harmonic current emissions (equipment input current 16 A per phase)* (MOD)

JIS C 61000-4-2:1999 *Electromagnetic compatibility (EMC)—Part 4-2: Testing and measurement techniques—Electrostatic discharge immunity test*

NOTE : Corresponding International Standard: IEC 61000-4-2:1995 *Electromagnetic compatibility (EMC)—Part 4: Testing and measurement techniques—Section 2: Electrostatic discharge immunity test* (IDT)

JIS C 61000-4-3:2005 *Electromagnetic compatibility (EMC)—Part 4-3: Testing and measurement techniques—Radiated, radio-frequency, electromagnetic field immunity test*

NOTE : Corresponding International Standard: IEC 61000-4-3:2002 *Electromagnetic compatibility (EMC)—Part 4-3: Testing and measurement techniques—Radiated, radio-frequency, electromagnetic field immunity test* (IDT)

JIS C 61000-4-4:2007 *Electromagnetic compatibility (EMC)—Part 4-4: Testing and measurement techniques—Electrical fast transient/burst immunity test*

NOTE : Corresponding International Standard: IEC 61000-4-4:1995 *Electromagnetic compatibility (EMC)—Part 4: Testing and measurement techniques—Section 4: Electrical fast transient/burst immunity test—Basic EMC Publication* (IDT)

JIS C 61000-4-5:2009 *Electromagnetic compatibility (EMC)—Part 4-5: Testing and measurement techniques—Surge immunity test*

NOTE : Corresponding International Standard: IEC 61000-4-5:1995 *Electromagnetic compatibility (EMC)—Part 4: Testing and measurement techniques—Section 5: Surge immunity test* (IDT)

JIS C 61000-4-6:2006 *Electromagnetic compatibility (EMC)—Part 4-6: Testing and measurement techniques—Immunity to conducted disturbances, induced by radio-frequency fields*

NOTE : Corresponding International Standard: IEC 61000-4-6:1996 *Electromagnetic compatibility (EMC)—Part 4: Testing and measurement techniques—Section 6: Immunity to conducted disturbances, induced by radio-frequency fields* (MOD)

JIS C 61000-4-8:2003 *Electromagnetic compatibility (EMC)—Part 4: Testing and measurement techniques—Section 8: Power-frequency magnetic field immunity test*

NOTE : Corresponding International Standard: IEC 61000-4-8:1993 *Electromagnetic compatibility (EMC)—Part 4: Testing and measurement techniques—Section 8: Power frequency magnetic field immunity test* (MOD)

JIS C 61000-4-11:2008 *Electromagnetic compatibility (EMC)—Part 4-11: Testing and measuring techniques—Voltage dips, short interruptions and voltage variations immunity tests*

NOTE : Corresponding International Standard: IEC 61000-4-11:1994 *Electromagnetic compatibility (EMC)—Part 4: Testing and measurement techniques—Section 11: Voltage dips, short interruptions and voltage variations immunity tests* (IDT)

JIS C 61558-2-6:2012 *Safety of transformers, reactors, power supply units and similar products for supply voltages up to 1 100 V—Part 2-6: Particular requirements and tests for safety isolating transformers and power supply units incorporating safety isolating transformers*

NOTE : Corresponding International Standard: IEC 61558-2-6 *Safety of power transformers, power supply units and similar—Part 2: Particular requirements for safety isolating transformers for general use* (MOD)

JIS K 7206:1999 *Plastics—Thermoplastic materials—Determination of Vicat softening temperature (VST)*

NOTE : Corresponding International Standard: ISO 306:1994 *Plastics—Thermoplastic materials—Determination of Vicat softening temperature (VST)* (MOD)

IEC 60317 (all parts) *Specifications for particular types of winding wires*

IEC 61000-2-2:2002 *Electromagnetic compatibility (EMC)—Part 2-2: Environment—Compatibility levels for low-frequency conducted disturbances and signalling in public low-voltage power supply systems*

IEC 61000-3-3:1994 *Electromagnetic compatibility (EMC)—Part 3: Limits—Section 3: Limitation of voltage fluctuations and flicker in low-voltage supply systems for equipment with rated current 16 A*

3 Terms and definitions

For the purpose of this Standard, the terms and definitions given in **JIS C 8281-1** and the following apply.

Add the following after the first paragraph of clause **3** of **JIS C 8281-1**.

The term “electronic switch” is used as a general term to cover both electronic switching and control devices.

Add the following new definitions after **3.22**:

3.101 rated load

load assigned to the electronic switch by the manufacturer

3.102 minimum load

minimum load at which the electronic switch still operates correctly

3.103 minimum current

permissible minimum current at which the electronic switch still operates correctly

3.104 electromechanically operated contact mechanism

component which operates the parts used to open and close the circuit electromechanically

3.105 semiconductor switching device

switching device designed to make or break the current in an electric circuit by means of the controlled conductivity of a semiconductor in that circuit

NOTE 1 In a circuit where the current passes through zero (periodically or otherwise) the effect of “not making” the current following such a zero value is equivalent to breaking the current.

NOTE 2 Typical examples of semiconductor switching devices are

- electronic switching devices using the phase-cut-on principle to control the load by electronic switching on the current at any phase angle at or after zero crossing in each half-wave, e.g. by a thyristor;
- electronic switching using the phase-cut-off principle to control the load by switching off the current at any phase angle after zero crossing half-wave, e.g. by a transistor in a diode bridge.

3.106 electronic momentary contact switch

electronic switch with an electromechanical switching mechanism or a semiconductor switching device which returns automatically to the initial state after operation.

3.107 mechanical control unit

unit directly adjustable by mechanical means (e.g. potentiometer) which controls the output via electronic components

3.108 electronic output control unit

unit adjustable by other than mechanical means (e.g. sensing unit), containing electronic components and controlling the output via electronic components.

3.109 electronic extension unit

unit permitting the control of an electronic switch from a remote position

3.110 protective impedance

impedance connected between live parts and accessible conductive parts, of such value that the current, in normal use and under likely fault conditions in the electronic switch, is limited to a safe value, and which is so constructed that the reliability is maintained throughout the life of the electronic switch

3.111 external flexible cable

cable, a part of which is external to the electronic output control unit

NOTE : Such cable may either be a supply cable or a connecting cable between separate parts of an accessory

3.112 remote controlled switch (RCS)

switch intended to be operated from a distance

3.112.1 electromagnetic RCS

RCS provided with a coil which is operated by means of impulses or which may be permanently energized by means of a control circuit

NOTE : These devices are covered by **JIS C 8281-2-2**.

3.112.2 electronic RCS

electronic switch providing the function, markings and connection configuration of an RCS according to **JIS C 8281-2-2**, but containing electronic components and/or a combination of electronic components and a coil or coils, which is operated by means of an electronic extension unit or units

NOTE : This electronic RCS may for example be used as a look alike replacement for RCS according to **JIS C 8281-2-2**.

3.113 rated control voltage

the voltage assigned to the external control circuit by the manufacturer

3.114 switching circuit

the circuit which contains the parts which allow the rated current to flow through the electronic switch

3.115 control circuit

the circuit which includes electrical parts to actuate the switching mechanism

3.116 control mechanism

mechanism which includes all the parts which are intended for the operation of the electronic switch

3.117 incorporated hand-operated device

device incorporated in the switch which allows the switching circuit to be operated, directly or indirectly

This device is not intended for the normal operation of the electronic switch.

3.118 rated control current

current required for the initiation of the electronic RCS assigned to the control circuit by the manufacturer

3.119 bistable electronic RCS

electronic RCS containing a control mechanism which, when not initiated electrically or actuated mechanically, remains stable in its operating position and will change its operating position on initiation or actuation

3.120 monostable electronic RCS

electronic RCS containing a control mechanism which, on electrical initiation or mechanical actuation, changes the operating position of the switch which remains in this condition while the electronic RCS is initiated or actuated, and returns to the position prior to initiation or actuation of the electronic RCS after initiation or actuation is discontinued

3.121 priority electronic RCS

electronic RCS used to operate directly or indirectly a first load circuit or group of load circuits the use of which at times can be dispensed with, and where the control circuit of the electronic RCS is influenced by or connected to a second circuit or group of circuits (priority or circuits) which when energized will thus initiate the control circuit of the electronic RCS to de-energize the first load circuit or circuits for the time during which the second circuit or group of circuits is energized

NOTE : The electronic RCS may have a means for adjusting the sensitivity of the electronic RCS control circuit to initiate the electronic RCS depending on the total load or current delivered to any part of the circuits (priority switch with current coil) or be sensitive to the voltage (priority switch with voltage coil) applied to the second load or group of loads.

3.122 time delayed switch (TDS)

switch provided with a time-delay device which operates for a certain time (the delay time)

It may be either manually actuated and/or remotely electrically initiated.

3.123 electronic TDS

electronic switch providing the function, markings and connection configuration of a TDS according to **JIS C 8281-2-3**, but containing electronic components

NOTE : This electronic TDS may for example be used a look alike replacement for TDS according to **JIS C 8281-2-3**.

3.124 delay time

period during which the switching circuit(s) is (are) kept closed

Any time taken for the decreasing of the voltage (e.g. to reduce the light) at the end of the delay period is included within the delay time

3.125 delay device

all components which have an influence on the delay time

The delay time may be adjustable.

3.125A infrared sensor switch

switch with a built-in sensor that detects infrared rays etc. generated from a human body and is automatically opened or closed

As a similar switch, there are some switches etc. that operate by generating infrared rays, ultrasonic waves, etc. and detecting the distance displacement of a human body.

4 General requirements

Clause 4 of **JIS C 8281-1** applies.

5 General notes on tests

Clause 5 of **JIS C 8281-1** applies except as follows.

Add the following to 5.4 of **JIS C 8281-1**:

The number of test specimens is shown in table 101.

Table 101 Number of specimens

Type of electronic switch	Number for general tests	Number of additional specimens for clause or subclause					
		18.2	19.101	19.102	Clause 24	Clause 26	Clause 101, clause 102
Marked with one rated current and — one rated voltage	3	3 ^{a)}	3 ^{a)}	3 ^{a)}	3	3	3 ^{c)}
— two rated voltages	6	6 ^{a)}	6 ^{a)}	6 ^{a)}	6	6	6 ^{b), c)}
Notes ^{a)} Only for electronic switches with mechanical and electromechanical switching devices; only the complete contact mechanism may be submitted. ^{b)} It may be necessary to provide three additional specimens for the test of 101.3 . ^{c)} Specimens which have been accepted in the test in clause 26 may be used for these tests.							

Add the following after **5.5** of **JIS C 8281-1**:

5.101 All measurements shall be carried out by methods which are suitable for the purpose, which do not appreciably affect the values to be measured and which are not affected by factors such as waveform.

NOTE : Care should be taken to use instruments giving true r.m.s. indications.

5.102 If the electronic circuitry is so enclosed that the short-circuiting or disconnecting of components is impossible or difficult, the manufacturer shall provide one additional test specimen with leads connected for measurements, short-circuiting, etc. It is not necessary to connect leads to the interior of hybrid and monolith integrated circuits.

5.103 It may be necessary to disconnect electronic components for tests.

5.104 For electronic switches equipped with cut-outs (for protecting switches), it may be necessary to provide three additional specimens for the test of **102.4.1**.

5.105 If an electronic RCS or electronic TDS is provided with an incorporated hand-operated device, it shall be tested as specified in clause **19**.

NOTE 1 During the making and breaking capacity tests and the normal operation tests, switching at the same phase angle should be avoided, as this may give misleading results.

NOTE 2 Precautions should be taken when using combinations equipped with synchronous motors and similar operating devices.

5.106 In the case of an electronic TDS for which the control and the switching circuits have no common point, the test is made with the circuits supplied with the rated voltages which are declared by the manufacturer.

6 Rating

Clause **6** of **JIS C 8281-1** applies except as follows.

Add the following at the end of clause **6** of **JIS C 8281-1**:

For electronic RCS, clause **6** of **JIS C 8281-2-2** applies.

For electronic TDS, clause **6** of **JIS C 8281-2-3** applies.

Replace **6.1** to **6.3** of **JIS C 8281-1** with **6.1** to **6.3A** in the following:

6.1 Preferred rated voltages are 100 V, 110 V, 120 V, 130 V, 200 V, 220 V, 230 V and 240 V.

6.2 This clause of **JIS C 8281-1** does not apply.

6.3 The preferred rated supply frequencies are 50 Hz and/or 60 Hz.

6.3A The rated current of an infrared sensor switch shall be 3 A or less for the switches for lighting equipment, an alarming device (including an interphone), audio equipment, a ventilation fan and a hot-air type heater. However, it shall be 15 A or less for the switches for lighting equipment and a ventilation fan with a manually forced opening function.

7 Classification

7.1 Subclause **7.1** of **JIS C 8281-1** applies except as follows.

Add the following to **7.1.1** of **JIS C 8281-1**.

For electronic TDS, **7.1.1** of **JIS C 8281-2-3** applies.

Add the following to **7.1.5** of **JIS C 8281-1**:

- touch;
- proximity;
- optical;
- acoustic;
- other external influences.

NOTE 101 Actuating the switch includes on/off operation, and/or regulating the brightness of lamps or speed of motors.

For electronic RCS, **7.1.5** of **JIS C 8281-2-2** applies.

For electronic TDS, **7.1.5** of **JIS C 8281-2-3** applies.

Add the following to **7.1.6** of **JIS C 8281-1**:

- Switches only intended to be mounted at a height greater than 1.7 m.

Add the following after **7.1.9B** of **JIS C 8281-1**:

7.1.101 Classification according to the kind of load intended to be controlled by the electronic switch:

- incandescent lamps;
- fluorescent lamps;
- motors;
- declared load.

The kind of load intended to be controlled may be a combination of two or more of the above.

7.2 This subclause of **JIS C 8281-1** does not apply.

Add the following at the end of clause **7** of **JIS C 8281-1**:

7.101 For electronic RCS, **7.101** of **JIS C 8281-2-2** applies.

7.102 For electronic RCS, **7.102** of **JIS C 8281-2-2** applies.

7.103 For electronic RCS or electronic TDS having a safety extra-low voltage (hereafter referred to as “SELV”) circuit or protective extra-low voltage (hereafter referred to as “PELV”) circuit.

8 Marking

Clause 8 of **JIS C 8281-1** applies except as follows.

Replace 8.1 of **JIS C 8281-1** with the following:

8.1 Electronic switches shall be marked with

- rated voltage (V);
- rated current (A) or rated load (VA or W);
- symbol for nature of supply;
- manufacturer's or responsible vendor's name, trademark or identification mark;
- type reference, which may be a catalogue number;
- symbol for mini-gap construction, if applicable (only for electronic switches to which table 20 is applied);
- symbol for micro-gap construction, if applicable (only for electronic switches to which table 20 is applied);
- symbol for semiconductor switching device, if applicable (only for electronic switches to which table 20 is applied);
- in IPXX marking, if the first characteristic numeral for the degree of protection against access to hazardous parts or against harmful effects due to ingress of solid objects is declared higher than 2, the second characteristic numeral (degree of protection against harmful effects due to ingress of water) shall also be marked;
- in IPXX marking, if the second characteristic numeral for the degree of protection against harmful effects due to ingress of water is declared higher than 0, the first characteristic numeral (degree of protection against access to hazardous parts or against harmful effects due to ingress of solid objects) shall also be marked.

NOTE 1 Marking of the pattern number given in 7.1.1 is recommended if the connections are not clear from an inspection of the electronic switch. This pattern may be part of the type reference.

NOTE 2 If a base carries two or more electronic switches with separate operating devices, marking with the pattern numbers is recommended. For example, "1 + 6", "1 + 1 + 1".

NOTE 3 For electronic switches suitable for more than one type of rated load, see 8.3.

In addition, electronic switches shall be marked with:

- rated frequency (Hz) unless the electronic switch is designed for both 50 Hz and 60 Hz;
- rating and type of replaceable fuse equipped with a fuse holder incorporated in the electronic switch;
- symbol (see 8.2) or explanation of kind of load;

- the term “extension unit” if applicable, shall be marked following to the identifying reference, in the language(s) understandable in the country in which the product is to be sold;
- the minimum height for mounting the electronic switch shall be indicated in the installation instruction of the manufacturer if there is a restriction (see **10.1**);
- type of electric wire to be connected. This information shall be given in the catalogue and/or on the body.

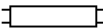
The electronic switches with screwless terminals shall be marked with an indication of the suitability to accept solid wires or rigid conductors only, for those electronic switches having this restriction. This information may be put on the electronic switch and/or on the packaging unit.

For general purpose electronic switches with included automatic function the number of operations shall be stated in the accompanying instruction sheet when the manufacturer declares the number of operations is higher than indicated in **19.101**, **19.102** and **19.104**.

For electronic RCS, **8.1** of **JIS C 8281-2-2** applies.

For electronic TDS, **8.1** of **JIS C 8281-2-3** applies.

8.2 Add the following before NOTE 1 to **8.2** of **JIS C 8281-1**:

Volt-ampere	VA
Watt	W
Hertz	Hz
Terminal for regulated load	
Type of load:	
Incandescent lamps	
Fluorescent lamps	
Motors	
Electronic step-down converter for extra low-voltage incandescent lamps (for example, halogen)	
Iron core transformer for extra low-voltage incandescent lamps (for example, halogen)	

Add the following after NOTE 5:

NOTE 101 The rating and type of any fuse may be marked with symbols (see **JIS C 6575** series).

If other particular symbols are used, they shall be explained in the installation instructions.

For electronic RCS, **8.2** of **JIS C 8281-2-2** applies.

For electronic TDS, **8.2** of **JIS C 8281-2-3** applies.

8.3 Subclause **8.3** of **JIS C 8281-1** applies except as follows.

Replace the first paragraph with the following:

The following marking shall be placed on the main part of the electronic switch:

- the rated current or rated load, rated voltage, symbol for nature of supply, rated frequency (if required by **8.1**), one or more types of (connectable) load, the rating and type of any incorporated fuse which is replaceable (intended with exchange of fuses) and is provided with a fuse-holder (this shall be marked on the fuse-holder or in the proximity of the fuse),
- either the name, trade mark or identification mark of the manufacturer or of the responsible vendor,
- length of insulation to be removed before the insertion of the conductor into the screwless terminal, if any,
- symbol for mini-gap construction, micro-gap construction or semiconductor device, if applicable (only for electronic switches to which table 20 of **JIS C 8281-1** is applied),
- the type reference.

NOTE 1 The type reference may be the series reference only.

Add the following to the end of **8.3** of **JIS C 8281-1**:

Where an electronic switch is suitable for more than one type of load if not already marked on the electronic switch, the information concerning these shall be stated in the accompanying instruction sheet. In addition, the minimum and the maximum current or the minimum and the maximum load in volt-ampere or watt shall be stated for each type of load.

If an electric switch is intended to be used together with an iron core transformer, information shall be given in the instruction sheet that only a transformer intended to be used with an electronic switch shall be used.

8.4 Add the following to the end of **8.4** of **JIS C 8281-1**:

If there are more than two terminals, the load terminal shall be marked with an arrow pointing away from the terminal or with one of the symbols mentioned in **8.2** and any other terminals shall be marked corresponding to the installation instructions. However, for these other terminals, corresponding terminals may be marked on the equipment.

Unless the installation of the electronic switch is made clear by the markings of the terminals, a wiring diagram shall be provided with each electronic switch.

For electronic RCS, **8.4** of **JIS C 8281-2-2** applies.

For electronic TDS, **8.4** of **JIS C 8281-2-3** applies.

8.6 Add the following at the end of **8.6** of **JIS C 8281-1**:

The off-state shall not be marked with an “O” if the circuit on the load side is considered as live, in accordance with clause **10**.