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Photoelectric controls for public lighting

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Foreword

This Japanese Industrial Standard has been revised by the Minister of Economy, Trade and Industry based on the provision of Article 14, paragraph (1) of the Industrial Standardization Act applied mutatis mutandis pursuant to the provision of Article 16 of the said Act in response to a proposal for revision of Japanese Industrial Standard with a draft being attached, submitted by Japanese Standards Association (JSA), an accredited standards development organization. This edition replaces the previous edition (**JIS C 8369**: 2012), which has been technically revised.

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Photoelectric controls for public lighting

1 Scope

This Japanese Industrial Standard specifies the requirements for the photoelectric controls for public lighting (hereafter referred to as a PC switch) of an integral system or a separate system with a rated voltage 100 V or 200 V, intended for use as a single unit in general outdoor places under a.c. single-phase two-wire system.

Herein, general places do not include the following.

- a) Places where corrosive gases exist
- b) Places where salt damage is anticipated such as seashore
- c) Places where it is always high temperature or high humidity

2 Normative references

Part or all of the provisions of the following standards, through reference in this text, constitute provisions of this Standard. For standards with the year indication, only the editions of the indicated year shall be applied and the revisions (including amendments) made thereafter shall not be applied. For those without the indication of the year, the most recent editions (including amendments) shall be applied.

JIS B 7507 *Vernier, dial and digital callipers*

JIS C 0920 : 2003 *Degrees of protection provided by enclosures (IP Code)*

JIS C 1302 *Insulation resistance testers*

JIS C 1609-1 *Illuminance meters Part 1 : General measuring instruments*

JIS C 3307 *600 V Polyvinyl chloride insulated wires*

JIS C 3317 *600 V Grade heat-resistant polyvinyl chloride insulated wires*

JIS C 3612 *600 V Flame retardant polyethylene insulated wires*

JIS C 7501 *Tungsten filament lamps for domestic and similar general lighting purposes*

JIS C 7527 *Tungsten halogen lamps (non-vehicle) — Performance specifications*

JIS C 7601 *Fluorescent lamps for general lighting service*

JIS C 7604 *High-pressure mercury vapour lamps — Performance specifications*

JIS C 8300 : 2019 *General safety requirements for wiring devices*

JIS C 8303 : 2007 *Plugs and receptacles for domestic and similar general use*

JIS C 8306 : 1996 *Testing methods for wiring devices*

JIS C 8330 *Fittings for rigid metal conduits*

JIS H 8610 *Electroplated coatings of zinc on iron or steel*

JIS H 8625 *Chromate conversion coatings on electroplated zinc and cadmium coatings*

JIS Z 8601 *Preferred numbers*

JIS Z 9112 *Classification of fluorescent lamps and light emitting diodes by chromaticity and colour rendering property*

3 Terms and definitions

For the purpose of this Standard, the following terms and definitions apply.

3.1

photoelectric control for public lighting (PC switch)

switch using photoconductive cell or the like to control put-on and put-out of the light source automatically by means of relay or semiconductor switch

3.2

photoconductive cell

cell which causes variation in its electric conductivity when it receives light

3.3

integral system

system having a terminal that attaches a lead wire or an electric wire to a PC switch, which is used by mounting a PC switch alone on a utility pole or other structures

3.4

separate system

system consisting of a receptacle that attaches a lead wire or an electric wire and a PC switch that is mating with the receptacle to be connected, which is used by mounting a receptacle on a utility pole or other structures

3.5

time-delay property

performance to avoid an incorrect operation of PC switch by lightning

3.6

switching illuminance

illuminance of natural light which causes switching of the load electrically when a PC switch is mounted outdoors as in its service condition

3.7

put-on illuminance

switching illuminance at which the load circuit closes

3.8**put-out illuminance**

switching illuminance at which the load circuit opens

3.9**light-receiving plane**

plane perpendicular to the maximum sensitive direction in which the illuminance required for put-on/put-out becomes minimum

3.10**current consumption**

current consumed in a PC switch when the rated voltage is applied to the power source side

4 Classification and designation of products**4.1 Classification**

The PC switches are classified into two types of the integral system as specified in Table 1 and of the separate system as specified in Table 2. For the integral system, the type is determined according to the switching illuminance (see Table 3), rated voltage, rated current and endurance of switching operation. For the separate system, the type is determined according to the switching illuminance (see Table 3), rated voltage, rated current, symbol indicating the combination of rated voltage and inner diameter of skirt, and endurance of switching operation.

Table 1 Types of integral system

Switching il- luminance	Rated voltage	Type					Classification by endurance of switching op- eration	
		Rated current A						
	V	1	3	6	10	15		
Type 1P	100	111P	131P	161P	1101P	1151P	General type a)	
	200	211P	231P	261P	2101P	2151P		
Type 1L	100	111L	131L	161L	1101L	1151L	Long-life type b)	
	200	211L	231L	261L	2101L	2151L		
Type 2	100	112	132	162	1102	1152		
	200	212	232	262	2102	2152		
Type 3	100	113	133	163	1103	1153		
	200	213	233	263	2103	2153		
Note a) Type to which the tests of 2 000 switching times as specified in 8.8 a) 2) and of 10 days as specified in 8.8 b) apply.								
Note b) Type to which the tests of 4 000 switching times as specified in 8.8 a) 2) and of 20 days as specified in 8.8 b) apply.								

The type of integral system shall be expressed as follows.

- First figure : rated voltage 1 : 100 V 2 : 200 V
- Second figure : rated current 1 : 1 A 3 : 3 A 6 : 6 A 10 : 10 A 15 : 15 A
- End symbol : switching illuminance 1P : Type IP 1L : Type 1L 2 : Type 2 3 : Type 3

An example of the type of integral system is shown below.

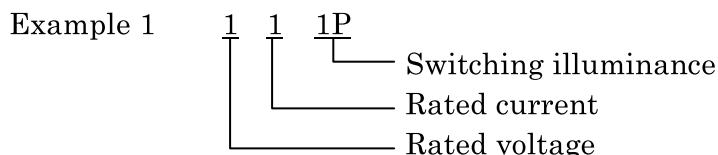


Table 2 Types of separate system

Switching illuminance	Sym- bol ^{a)}	Rated voltage V	Type					Classifica- tion by endurance of switch- ing opera- tion	
			Rated current						
			A						
			1	3	6	10	15		
Type 1P	S	100	11S1P	13S1P	16S1P	—	—	General type ^{b)}	
	M	100	11M1P	13M1P	16M1P	110M1P	115M1P		
	L	200	21L1P	23L1P	26L1P	210L1P	215L1P		
Type 1L	S	100	11S1L	13S1L	16S1L	—	—	Long-life type ^{c)}	
	M	100	11M1L	13M1L	16M1L	110M1L	115M1L		
	L	200	21L1L	23L1L	26L1L	210L1L	215L1L		
Type 2	S	100	11S2	13S2	16S2	—	—		
	M	100	11M2	13M2	16M2	110M2	115M2		
	L	200	21L2	23L2	26L2	210L2	215L2		
Type 3	S	100	11S3	13S3	16S3	—	—		
	M	100	11M3	13M3	16M3	110M3	115M3		
	L	200	21L3	23L3	26L3	210L3	215L3		
Note ^{a)} Indicates a combination of rated voltage and inner diameter of skirt.									
Note ^{b)} Type to which the tests of 2 000 switching times as specified in 8.8 a) 2) and of 10 days as specified in 8.8 b) apply.									
Note ^{c)} Type to which the tests of 4 000 switching times as specified in 8.8 a) 2) and of 20 days as specified in 8.8 b) apply.									

The type of separate system shall be expressed as follows.

- First figure : rated voltage 1 : 100 V 2 : 200 V
- Second figure : rated current 1 : 1 A 3 : 3 A 6 : 6 A 10 : 10 A 15 : 15 A
- Symbol following second figure : combination of rated voltage and inner diameter (d_p) of skirt shown in Figure 1, as follows.

S : separate system of 100 V in rated voltage and 58 mm or over to and excluding 70 mm in inner diameter of skirt (d_p)

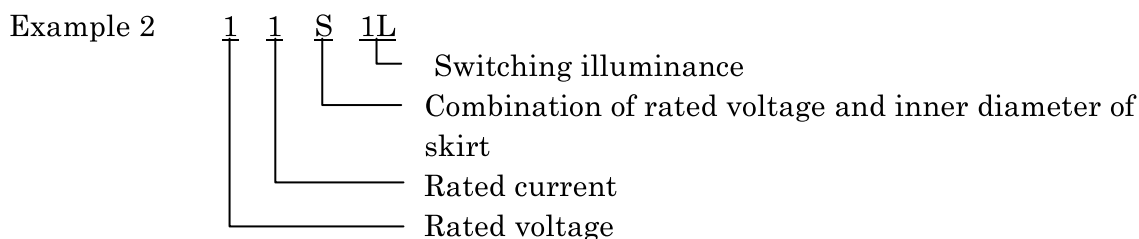
M : separate system of 100 V in rated voltage and 70 mm or over in inner diame-

ter of skirt (d_p)

L : separate system of 200 V in rated voltage and 70 mm or over in inner diameter of skirt (d_p)

- End of symbol : switching illuminance 1P : Type IP 1L : Type 1L 2 : Type 2
3 : Type 3

An example of the type of separate system is shown below.



4.2 Designation of products

A product shall be designated by the name or its abbreviation and/or the type. Examples are shown below.

Example 1 Photoelectric control for public lighting, separate system, 100 V, 3 A, Type 1P

Example 2 PC switch 13S1P

5 Performances

5.1 Insulation resistance

The insulation resistance shall be not less than 10 MΩ when tested in accordance with 8.3.

5.2 Dielectric withstand voltage

The PC switches shall withstand the voltage when tested in accordance with 8.4.

5.3 Switching operation

The switching operation of PC switch shall be as follows.

- a) When a PC switch is tested in accordance with 8.5.2, the switching illuminance shall comply with Table 3.

Table 3 Switching illuminance

Voltage condition	Temperature condition °C	Switching illuminance	Put-on illuminance lx	Put-out illuminance lx
Rated voltage	20 ± 5	Type 1P, Type 1L	10 to 80	Not more than +14 levels (5 times) ^{a)} of the measured value of put-on illuminance for Type 1P and Type 1L.
		Type 2	50 to 100	
		Type 3	5 to 20	
	–10 ± 5	PC switch is required to be put-on in the illuminance range of ±8 levels (0.4 times to 2.5 times) ^{a)} of the measured value mentioned above.		Not more than the measured value (1 time) of put-on illuminance for Type 2.
	40 ± 5			
110 % of rated voltage	20 ± 5			Not more than +8 levels (2.5 times) ^{a)} of the measured value of put-on illuminance for Type 3.
90 % of rated voltage				
Note ^{a)} The "level" herein means the level corresponding to the illuminance shown in Figure 4, and "times" in parentheses means the numeral calculated from the illuminance corresponding to the level.				

- b) When a PC switch is tested in accordance with **8.5.3**, it shall be operated within 2 min in the put-on level and the put-out level respectively, and shall not be activated at the illuminance in the non-put-on level. For the PC switches constructed to have special time-delay between the put-on operation and the put-out operation, the test of **8.5.3** shall not apply.

The special time-delay shall be as agreed between the parties concerned with delivery.

5.4 Current consumption

The current consumption of PC switch shall comply with Table 4 when tested in accordance with **8.6**.

Table 4 Current consumption

Switching illuminance	Rated current A	Current consumption at illuminance of 1 000 lx or over mA	Current consumption at illuminance of 1 lx or under mA
Type 1P, Type 1L, Type 2	3 or under	Under 20	Under 20
Type 3		Under 10	
Type 1P, Type 1L, Type 2, Type 3	6 or over up to and incl. 15	Under 50	Under 50

5.5 Waterproofness

The waterproofness of PC switch shall comply with **5.1** and **5.2** without ingress of