

AUREX ELECTRONICS INDUSTRIES, INC

Ganpi Management Sec. Zhenlong Zhen, Hui Zhou City, Guangdong Prvince, China

PHONE : 0752-3956567, FAX : 0752-3956571

ACCORD LVD INSTRUCTION ASSESSMENT REPORT

1. Applicant Company: AUREX INDUSTRIES, INC

Address: 9FL., No.13, Sec.2, Beitou Rd., Beitou, Taipei, 11268, Taiwan

2. Manufacturer Name: AUREX ELECTRONICS INDUSTRIES, INC

Address: Ganpi Management Sec. Zhenlong Zhen, Hui Zhou City, Guangdong Province, China

3. Report Number: 61110701101

Product Name: Motion sensor

Model Number: OS-181C OS-181A OS-181B

Trade Name: AX

4. Test Specification: Low Voltage Directive: 2014/35/EU

And through the report number: 61110701101 Assessment for

Standard: EN60669-1/A2:2008 EN60669-2-1:2004/A12:2010

**5. Assessment result: New standards and testing clauses have no effect
to the product, and no safety problem also.**

Signature: Hu yongrong

Name: Yong Rong Hu

Date: 2016.11.18

TEST REPORT

EN 60669-2-1

Switches for household and similar fixed-electrical installations

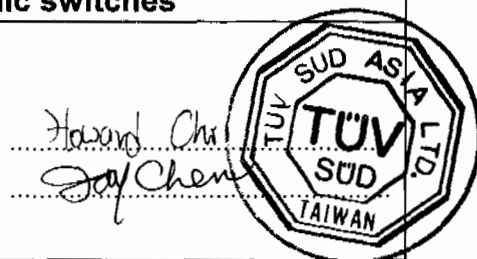
Part 2-1: Particular requirements - Electronic switches

Report Reference No. : <61.110.7.011.01>

Compiled by (+ signature) : Howard Chi

Approved by (name + signature) : Jay Chen

Date of issue : 2007-07-10



CB Testing Laboratory : TÜV SÜD Asia Ltd. - Taiwan Branch

Address : 7F., No. 37, Sec. 2, Zhongyang S., Rd., Beitou District, Taipei City,
11270, Taiwan, R.O.C.

Testing location/ procedure : CBTL ☐ SMT ☐ WMT ☐ TMP ☒

Applicant's name : Aurex Industries, Inc.

Address : 9FL., No. 13, Sec. 2, Beitou Rd., 11268, Beitou, Taipei, Taiwan

Test specification:

Standard : EN 60669-2-1:2004 used in conjunction with EN 60669-1:1999 +
A1:2002

Test procedure : TUV/Bauart mark

Non-standard test method : N/A

Test Report Form No. : EN60669_2_1B

Test Report Form(s) Originator : IMQ

Master TRF : Dated 2005-11

























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The present Test Report is not valid as a Test Report according to a Mutual Recognition Agreement unless signed by an approved Testing Laboratory and appended to a corresponding Certificate issued by a national Certification Body, signatory to the relevant Scheme.

Copy of marking plate:

   <p>OS-181C 230Vac, 50Hz Load: Max. 8A (P.F.=1) 1840W (Incandescent lamp); 1000W (Halogen lamp); 300VA (Low voltage halogen lamp); 400VA (Fluorescent lamp). Operating temperature: -20°C to 45°C</p>     	   <p>OS-181A 230Vac, 50Hz Load: Max. 5A (P.F.=1) 1000W (Incandescent lamp); 500W (Halogen lamp); Operating temperature: -20°C to 45°C</p>     	   <p>OS-181B 230Vac, 50Hz Load: Max. 5A (P.F.=1) 1000W (Incandescent lamp); 500W (Halogen lamp); Operating temperature: -20°C to 45°C</p>     
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Test item particulars:

Type of electronic switch and its function (examples given in Annex AA) Motion detector light control

Pattern number 1

Contact opening (gap) normal gap / mini-gap / **micro-gap** / without contact gap (semiconductor switching device)

Degree of protection against access to hazardous parts and against harmful effects due to the ingress of solid foreign objects IPX0 (To be determined in final installation)

Degree of protection against harmful effects due to the ingress of water IPX0 (To be determined in final installation)

Method of actuating rotary / tumbler / rocker / push-button / cord-operated / momentary contact / touch / proximity / **optical** / acoustic / **other external influences**

Method of mounting **surface-type** / flush-type / semi flush-type / panel-type / architrave-type / **height > 1,7 m**

Method of installation **design A** / design B

Type of terminals **screw-type** / screwless (rigid) / screwless (rigid and flexible)

Flexible cable outlet **without** / with

Rated current (A) / Rated load (VA or W) OS-181A, OS-181B:
Load: Max.5A (P.F.=1)
1000W (Incandescent lamp);
500W (High voltage halogen lamp).
OS-181C:
Load: Max.8A (P.F.=1)
1840W (Incandescent lamp);
1000W (High voltage halogen lamp);
300VA (Low voltage halogen lamp);
400VA (Fluorescent lamp).

Minimum current (A) / Minimum load (VA or W) As above

Kind of load controlled by the switch **incandescent lamp** / **fluorescent lamps** / motors / **declared load**

Rated voltage (V) 110 V / 120 V / 130 V / 220 V / **230 V** / 240 V

Rated frequency (Hz) 50 Hz

Characteristic of fuses None

Possible test case verdicts:

- test case does not apply to the test object N/A
- test object does meet the requirement Pass (P)
- test object does not meet the requirement Fail (F)

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Clause	Requirement + Test	Result - Remark	Verdict

Testing:

Date of receipt of test item: 2007-05-11

Date (s) of performance of tests: 2007-05-11~2007-06-28

General remarks:

The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.

"(see Enclosure #)" refers to additional information appended to the report.

"(see appended table)" refers to a table appended to the report.

Throughout this report a comma (point) is used as the decimal separator.

General product information:

Surface type motion sensor.

All models are identical in construction except the maximum load and number of passive infrared sensor (PIR). The details are as follows:

Model	Number of PIR	MAX. Load
OS-181A	1	1000W (Incandescent lamp); 500W (High voltage halogen lamp); Max.5A (P.F.=1)
OS-181B	2	1000W (Incandescent lamp); 500W (High voltage halogen lamp); Max.5A (P.F.=1)
OS-181C	3	1840W (Incandescent lamp); 1000W (High voltage Halogen lamp); 300VA (Low voltage halogen lamp); 400VA (Fluorescent lamp). Max. 8A (P.F.=1)

All tests are performed on model OS-181C as the representative of all models.

Factory:

Aurex Electronics Industries Inc. (ID No. 30674)

Queen Mana.Sec., Zhenlong Zhen, Hui Yang City, Guangdong, People's Republic of China

Abbreviations that may be used throughout this test report:

pri.	primary	cl.	clearances distance	OL.	overload
sec.	secondary	cr.	creepage distance	o/c.	Opened circuit
w/o.	without	DTI.	distances through insulation		
PCB.	print circuit board	s/c.	short circuit		

EN 60669-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
8	MARKING		
8.1	Switches marked with:		
	- rated voltage (V)	230V	P
	- rated current (A) or rated load (VA or W)	See Page 2	P
	- symbol for nature of supply	~	P
	- manufacturer's or responsible vendor's name, trade mark or identification mark	ax	P
	- type reference	OS-181A, OS-181B, OS-181C	P
	- symbol for mini-gap construction (m)		N
	- symbol for micro-gap construction (μ)	See "Copy of marking plate:"	P
	- symbol for semiconductor switching device (under consideration)		N
	- first IP characteristic numeral, if declared higher than 2, in which case the second characteristic numeral is also marked	IPX0 (To be determined in final installation)	N
	- second IP characteristic numeral, if declared higher than 0, in which case the first characteristic numeral is also marked	IPX0 (To be determined in final installation)	N
	- rated frequency (Hz)	50 Hz	P
	- rating and type of any fuse incorporated	w/o fuse	N
	- symbol for kind of load (see 8.2)		P
	- the term "extension unit", if applicable, followed by the identifying reference		N
	- the minimum height for mounting the switch indicated in the installation instruction if there is a restriction (see 10.1)	It is recommended install the detector at height of 2-3 meter in the installation instruction.	P
	Switches with screwless terminals: marked with an indication of the suitability to accept rigid conductors only (if any)		N
	Flexible cable outlet switches: information of minimum and maximum sizes for which the anchorage is provided put on the switch and/or the packaging unit		N
8.2	Symbols used: as required in the standard		P
	Marking for the nature of supply placed next to the marking for rated current and rated voltage		P

EN 60669-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Other particular symbols used are explained in the installation instructions		P
8.3	Marking of electronic switch placed on the main part:		
	- rated current or rated load, rated voltage, symbol for nature of supply, rated frequency (if any), type of load, rating and type of any incorporated fuse (marked on the fuse-holder or in proximity of the fuse)		P
	- either the name, trade mark, or identification mark of the manufacturer or of the responsible vendor		P
	- length of insulation to be removed, if any	Not a screwless terminal	N
	- symbol for mini-gap construction, micro-gap construction or semiconductor switching device, if applicable	Micro-gap construction	P
	- type reference		P
	Information concerning more than one type of load not already marked on the electronic switch are stated in the accompanying instruction sheet		P
	Minimum and maximum current/load are stated for each type of load		P
	Information of the iron core transformer intended to be used with the electronic switch are given in the instruction sheet		N
	Cover plates necessary for safety purposes and intended to be sold separately: marked with the manufacturer's or responsible vendor's name, trade mark or identification mark and type reference		N
	IP code, when applicable, marked so as to be easily discernible when the switch is mounted and wired as in normal use	IPX0 (To be determined in final installation)	N
	Marking clearly visible and easily legible		P
	Markings not placed on parts removable without the use of a tool		P
8.4	Terminals for phase conductors (supply conductors): identified unless method of connection is of no importance, self evident or indicated on a wiring diagram		P
	Indications not placed on screws or other easily removable part		P

EN 60669-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Terminals associated with any one pole for switches of pattern number 2, 3, 03 and 6/2: similar identification differing from that of terminals associated with other poles	Pattern 1	N
	Switches with more than two terminals: load terminal marked with an arrow pointing away from the terminal or with one of the symbol mentioned in 8.2		P
	Other terminals marked corresponding to the installation instructions		P
	Installation not made clear by the markings: a wiring diagram is provided with each electronic switch		N
8.5	Neutral terminals: N :		P
	Earthing terminals: [earth symbol] : w/o earthing terminals		N
	Markings not placed on screws or other easily removable parts		P
	Terminals for conductors not forming part of the main function of the switch:		
	- clearly identified unless their purpose is self evident, or		P
	- indicated in a wiring diagram fixed to the accessory		N
	Identification of equipment terminals may be achieved by:		
	- their marking with graphical symbols according to IEC 60417 or colours and/or alphanumeric system, or		N
	- their physical dimension or relative location		N
8.6	Switches of pattern numbers 2, 3, 03 and switches with $V_n > 250$ V and $I_n > 16$ A if marked to indicate the switch position: direction of movement of the actuating member to its different positions or the actual switch position, clearly indicated :	Pattern 1	N
	Switches having more than one actuating member: marking indicates the effect achieved by the operation		N
	Marking clearly visible on the front of the switch		N
	Not possible to fix cover, cover plate, or removable actuating members in an incorrect position		N
	Symbols for "on" and "off" not used for indication of switch positions unless clearly indicate the direction of movement of the actuating members		P

EN 60669-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Off-state not marked with an "O" if the circuit on the load side is considered as live		P
8.6.101	Actual state of electronic switches intended to control the brightness of lamps is indicated	Not such switch	N
	- marking on the on-/off-state position		N
	- indicator lamp		N
	- adjusting the lamp dimmer in the lowest control state and at rated voltage minus 10%: light still visible		N
	When the indication of the electronic switch state is given only by the lamp, adjustment of the lamp at the lowest control state is made as specified in the following:		
	- for incandescent lamps:		
	the adjustment of lamp dimmers is made by the manufacturer	Not such switch	N
	not possible to reduce the lowest setting without a tool		N
	- for fluorescent lamps:		
	the adjustment of lamp dimmers is made by the manufacturer	Not such switch	N
	it is possible for the installer to alter the lowest setting if indicated in an installation instruction		N

EN 60669-2-1			
Clause	Requirement + Test	Result - Remark	Verdict

8.7	Red colour only for push-button to open the circuit	w/o red colour push-button	N
8.8	Special precautions necessary to take when installing the switch: details of these and clear information given in an instruction sheet which accompanies the switch		P
	Electronic switch containing a viewing window (lens) intended to be mounted at a height greater 1.7 m: information stated in the instruction sheet		P
8.9	Marking durable and easily legible. Test: 15 s with water and 15 s with petroleum spirit		P

9	CHECKING OF DIMENSIONS		
	Switches and boxes comply with the appropriate standard sheets, if any		N
	Type of boxes in which switches are to be mounted: specified in manufacturer's catalogue		N
	Electronic switches with dimensions other than those specified in the standard sheets (if any) if they are supplied with suitable boxes		N

10	PROTECTION AGAINST ELECTRIC SHOCK		
10.1	Switches: live parts not accessible		P
	Switches designed to be fitted with pilot lights supplied at voltages other than ELV have means to prevent direct contact with the lamp		P
	Test with standard test finger shown in figure 1 of IEC 60529		P
	Switches with thermoplastic or elastomeric material: additional test carried out at 35 °C ± 2 °C with the test probe 11 of IEC 61032 (75 N for 1 min)		P
	Test probe applied to:		
	- thin-walled knock-outs with a force of 10 N	w/o knock-out	N
	- viewing windows or the like on electronic switches intended to be mounted at a height > 1,7 m with a force of 30 N		P
	During the test: switches not deform and no live parts accessible		P

EN 60669-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
10.2	Knobs, operating levers, push buttons, rockers and the like: of insulating material, unless:	w/o such constructions	N
	- accessible metal parts separated from metal parts of mechanism by double or reinforced insulation, or	w/o accessible metal parts	N
	- reliably connected to earth		N
	For touch sensitive electronic switches the associated protective impedance does not have to comply with the requirements of clauses 16 and 23	Not such switches	N
	Accessible parts (for example, sensing surface) of electronic switches with IPX0 are connected to live parts by means of a protective impedance that:		N
	- consists of at least two independent resistors or independent capacitors in series of the same nominal value, or a combination of both		N
	- resistors comply with 102.3		N
	- capacitors comply with 102.2		N
	The removal of protective impedance is only possible by destruction of the electronic switch or by rendering it unusable	w/o protective impedance	N
	Test carried out between accessible metal parts and earth, through a non-inductive resistor of 2 k Ω :		
	current measured: $\leq 0,7$ mA (peak value), for a.c. up to 1 kHz		N
	current measured: $\leq 0,7$ mA multiplied by the value of frequency in kHz, but not exceed 70 mA, for a.c. above 1 kHz		N
	current measured: ≤ 2 mA, for d.c.		N
10.3	Accessible parts of switches: made of insulating material	Plastic enclosure	P
10.3.1	Metal covers, cover plates or other parts of enclosure protected by supplementary insulation made by insulating linings or insulating barriers	Ditto	N
	Insulating linings or insulating barriers:		
	- cannot be removed without being permanently damaged, or designed that		N

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Clause	Requirement + Test	Result - Remark	Verdict
	- cannot be replaced in an incorrect position; if they are omitted, accessories are rendered inoperable or manifestly incomplete; there is no risk of accidental contact between live parts and metal covers or cover plates; precautions are taken to prevent creepage distances or clearances becoming less than the values specified in clause 23		N
10.3.2	Earthing of metal covers, cover plates or other parts of enclosure: connection of low resistance	w/o metal covers	N
10.4	Metal parts of mechanism not insulated from live parts: not protrude from enclosure	w/o such constructions	N
	Switches operated by means of a removable key or similar device: metal parts of mechanism insulated from live parts		N
10.5	Metal parts of mechanism not accessible and insulated from accessible metal parts, unless		N
	- separated from live parts (creepage distances and clearances have at least twice the value specified in clause 23), or		N
	- reliably connected to earth		N
10.6	Switches operated by means of a removable key or an intermediate part: key or an intermediate part can only touch parts insulated from live parts	w/o such construction	N
	key or intermediate part: insulated from metal parts of mechanism, unless		N
	creepage distances and clearances between live parts and metal parts of mechanism have at least twice the values specified in clause 23		N
10.7	Cord-operated switches: impossible to touch live parts when fitting or replacing the pull cord		N
10.101	If a cover or cover-plate or a fuse can be removed without a tool or if the installation instructions for the user indicate that, for the purpose of maintenance, when replacing the fuse, covers and cover plates fastened by means of a tool have to be removed, the protection against contact with live parts is assured even after removal of cover or cover-plate (this requirement does not apply when the electronic switch must be dismounted from its supporting means for the replacement of the fuse-link)	w/o such construction	N
	Compliance is checked with the test probe B of IEC 61032 (10 N); test probe does not touch live parts		N

EN 60669-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
10.102	Hole in electronic switches for adjusting the setting:		
	The adjustment does not involve the risk of an electric shock		N
	Compliance is checked by applying a test pin according to figure 101 through the hole; test pin does not touch live parts		N
10.103	Ventilation openings over live parts:		
	A foreign body introduced into these openings do not come into contact with any live parts	w/o ventilation openings	N
	Compliance is checked by applying the test probe 13 of IEC 61032 through the openings; pin of test probe does not touch live parts		N

11	PROVISION FOR EARTHING		
	Clause not applicable to SELV electronic switches	Class II device	N
11.1	Accessible metal parts: provided with, or permanently and reliably connected to, an earthing terminal		N
11.2	Earthing terminals: with screw clamping or screwless terminals and comply with clause 12		N
	Capacity of earthing terminals of the same size as the corresponding terminals for the supply conductors		N
11.3	Surface-type switches with an enclosure of insulating material, with IP > X0 and more than one cable inlet, are provided for the continuity of the earthing circuit with:		
	- an internal fixed earthing terminal, or		N
	- adequate space for a floating terminal allowing the connection of an incoming and outgoing conductor		N
11.4	Connection between earthing terminal and accessible metal parts: of low resistance		N
	Test current equal to 1,5 In or 25 A (A)		
	Resistance $\leq 0,05 \Omega$ (Ω)		N

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Clause	Requirement + Test	Result - Remark	Verdict

12	TERMINALS		
12.1	General		
	Switches provided with screw-type terminals or with screwless terminals	Approved pillar type terminal	P
	Clamping means of terminals: not serve to fix any other components		P
	All the test on terminals, with the exception of the test of 12.3 11, made after the test of 15.1		P
12.2	Terminals with screw clamping for external copper conductors		
12.2.1	Switches provided with terminals which allows the proper connection of copper conductors as shows in table 2		P
	Rated current (A)	5A (OS-181A, OS-181B) / 8A (OS-181C)	
	Type of conductor (rigid / flexible)	Both	
	Smallest / largest cross-sectional area (mm ²)	0.75-1.5mm ² / 1.0-2.5 mm ²	
	Diameter of largest conductor (mm)	1.45mm / 2.13mm	
	Figure of terminal	1 / 2 / 3 / 4 / 5	
	Minimum diameter D (minimum dimensions) of conductor space: required (mm); measured (mm) ...	Required: 2.5mm X 4.5mm; Measured: 3.0 mm X 4.5mm	P
12.2.2	Terminals allow the conductor to be connected without special preparation		P
12.2.3	Terminals have adequate mechanical strength		P
	Screws and nut for clamping the conductors have metric ISO thread or a comparable thread		P
	Screws not of soft metal such as zinc or aluminium		P
12.2.4	Terminals resistant to corrosion		P
12.2.5	Screw-type terminals clamp the conductor(s) without undue damage	Pillar type terminal is used	N
	During the test: conductor not slip out, no break near clamping unit and no damage		N
12.2.6	Terminals clamp the conductor reliably between metal surfaces	See appended table 12.2.6	P
	During the test: conductor not move noticeably		P

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Clause	Requirement + Test	Result - Remark	Verdict
12.2.7	Terminals designed or placed that the conductor cannot slip out while the clamping screws or nuts are tightened	See appended table 12.2.7	P
	After the test: no wire of the conductor escaped outside the clamping unit thus reducing creepage distances and clearances to values lower than those indicated in clause 23		P
12.2.8	Terminals not work loose from their fixing to the switch		P
	Torque test:		
	- rated current (A)	5A (OS-181A, OS-181B)/ 8A (OS-181C)	
	- solid rigid copper conductor of the largest cross-sectional area (mm ²) (table 2)	1.5 mm ² / 2.5mm ²	
	- torque (Nm) (table 3 or appropriate figures 1, 2, 3, 4)	0.4 Nm	
	Screws and nuts tightened and loosened 5 times. During the test: terminals not work loose and show no damage		P
12.2.9	Clamping screws or nuts of earthing terminals: adequately locked against accidental loosening, not possible to loosen them without the aid of a tool	w/o earthing terminals	N
12.2.10	Earthing terminals: no risk of corrosion	Class II device	N
	Body of brass or other metal no less resistant to corrosion		N
	If the body is a part of a frame or enclosure of aluminium alloy, precautions are taken to avoid the risk of corrosion		N
12.2.11	Pillar terminals: distance g no less than the value specified in figure 1: required (mm); measured (mm)	Required: 1.5mm; Measured: 1.7mm	P
	Mantle terminals: distance g no less than the value specified in figure 5: required (mm); measured (mm)		N
12.2.12	Lug terminals:		
	- used only for switches having rated current ≥ 40 A	Not such terminals	N
	- fitted with spring washers or equally effective locking means		N
12.3	Screwless terminals for external copper conductors		

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Clause	Requirement + Test	Result - Remark	Verdict
12.3.1	Screwless terminals of the type suitable for:		
	- for rigid copper conductors only, or	Not such terminals	N
	- for both rigid and flexible copper conductors (tests carried out with rigid and then repeated with flexible conductors)		N
12.3.2	Screwless terminals provided with clamping units which allow the proper connection of rigid or of rigid and flexible conductors having nominal cross-sectional areas as shown in table 7	Not such terminals	N
	Rated current (A)		
	Type of conductor (rigid / flexible)		
	Smallest / largest cross-sectional area (mm ²)		
	Diameter of largest rigid conductor (mm)		
	Diameter of largest flexible conductor (mm)		
12.3.3	Screwless terminals allow the conductor to be connected without special preparation		N
12.3.4	Parts of screwless terminals intended for carrying current of materials as specified in 22.5		N
12.3.5	Screwless terminals clamp specified conductors with sufficient contact pressure without undue damage to the conductor		N
	Conductor clamped between metal surfaces		N
12.3.6	It is clear how the connection and disconnection of the conductors is to be made		N
	Disconnection of a conductor require an operation, other than a pull, so that can be made manually with or without a general-purpose tool		N
	It is not possible to confuse the opening for the use of a tool with the opening intended for the conductor		N
12.3.7	Screwless terminals intended for the interconnection of two or more conductors:		
	- during insertion, operation of clamping means of one of the conductors is independent of operation of that for the other conductor(s);		N
	- during disconnection, conductors can be disconnected either at the same time or separately;		N
	- each conductor introduced in a separate clamping unit.		N

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Clause	Requirement + Test	Result - Remark	Verdict
	It is possible clamp securely any number of conductors up to the maximum as designed. Number of conductors; Nominal cross-sectional area (mm ²)		N
12.3.8	Screwless terminals: adequate insertion obvious and over-insertion prevented	Not such terminals	N
	Screwless terminals of switches: undue insertion of the conductor prevented by a stop if further insertion is liable to reduce creepage distances and/or clearances required in table 20 or to influence the mechanism		N
12.3.9	Screwless terminals properly fixed to the switch	Not such terminals	N
	Not work loose when conductors are connected or disconnected		N
	Self-hardening resins used to fix terminals not subject to mechanical stress		N
12.3.10	Screwless terminals withstand mechanical stresses occurring in normal use	Not such terminals	N
	During application of the pull conductor not come out of the terminal		N
	Test with apparatus shown in figure 10		N
	During the test conductors not move noticeably in the clamping unit		N
	After these tests: neither terminals nor clamping means have worked loose and conductors show no deterioration		N
12.3.11	Screwless terminals withstand electrical and thermal stresses occurring in normal use	Not such terminals	N
	After the test: inspection show no changes		N
	Repetition of test according to 12.3.10: screwless terminals withstand mechanical stresses occurring in normal use		N
	During application of the pull conductor not come out of the terminal		N
	Test with apparatus shown in figure 10		N
	During the test conductors not move noticeably in the clamping unit		N

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Clause	Requirement + Test	Result - Remark	Verdict
	After these tests: neither terminals nor clamping means have worked loose and conductors show no deterioration		N
12.3.12	Screwless terminals: connected rigid solid conductor remains clamped, even when deflected during normal installation	Not such terminals	N
13	CONSTRUCTIONAL REQUIREMENTS		
13.1	Insulating lining, barriers and like: adequate mechanical strength and secured in a reliable manner		P
13.2	Switches constructed so as to permit:		
	- easy introduction and connection of the conductors in the terminals;		P
	- correct positioning of the conductors		P
	- easy fixing of the switch to a wall or in a box		P
	- adequate space between underside of the base and the surface on which the base is mounted or between the sides of the base and the enclosure (cover or box)		P
	Surface-type switches: fixing means do not damage insulation of the cable		P
	Switches classified as design A: permit easy positioning and removal of the cover or cover plate, without displacing the conductors		P
13.3	Covers, cover-plates and actuating members or parts of them intended to ensure protection against electric shock:		
	- held in place at two or more points by effective fixings		N
	- fixed by means of a single fixing, for example by a screw, provided that they are located by another means (for example by a shoulder)	By screws	P
	Fixings of covers, cover-plates or actuating members of switches of design A serves to fix the base: there is means to maintain the base in position, even after removal of the covers, cover-plates or actuating members		N
13.3.1	Covers, cover plates or actuating members whose fixing is of the screw-type:		
	Compliance checked by inspection only		P

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Clause	Requirement + Test	Result - Remark	Verdict
13.3.2	Covers, cover plates or actuating members whose fixing is not dependent on screws and whose removal is obtained by applying a force in a direction approximately perpendicular to the mounting/supporting surface:		
	Compliance checked, when their removal may give access, with the standard test finger:		
	to live parts: by the test of 20.4 (verification of the non-removal and the removal)	By a screw	N
	to non-earthed metal parts separated from live parts by creepage distances and clearances according to table 20: by the test of 20.5 (verification of the non-removal and the removal)		N
	only to insulating parts, or earthed metal parts, or metal parts separated from live parts by creepage distances and clearances twice those according to table 20, or live parts of SELV circuits not greater than 25 V a.c.: by the test of 20.6 (verification of the non-removal and the removal)		N
13.3.3	Covers, cover-plates or actuating members whose fixing is not dependent on screws and whose removal is obtained by using a tool, in accordance with the manufacturer's information given in an instruction sheet or in a catalogue:		
	Compliance checked, when their removal may give access, with the standard test finger:		
	to live parts: by the test of 20.4 (verification of the non-removal only)	By a screw	N
	to non-earthed metal parts separated from live parts by creepage distances and clearances according to table 20: by the test of 20.5 (verification of the non-removal only)		N
	only to insulating parts, or earthed metal parts, or metal parts separated from live parts by creepage distances and clearances twice those according to table 20, or live parts of SELV circuits not greater than 25 V a.c.: by the test of 20.6 (verification of the non-removal only)		N
13.4	Switches: no free openings in their enclosures according to their IP classification	IPX0 (To be determined in final installation)	P
	Free openings according to 10.102 and 10.103 are accepted	No openings	N

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Clause	Requirement + Test	Result - Remark	Verdict
13.5	Knobs of electronic switches are securely fixed in a reliable manner	w/o such constructions	N
	knobs used to indicate the position of switches: not possible to fix them in a wrong position, if this may result in a hazard		N
	Pull and push tests:		
	- axial pull is likely to be applied: 30 N for 1 min		N
	- axial pull is unlikely to be applied: 15 N for 1 min		N
	- axial push: 30 N for 1 min		N
	During and after these tests:		
	- the electronic switch shows no damage		N
	- an actuating member have not moved so as to impair compliance with this standard		N
13.6	Screws or other means for mounting the switch on a surface or in a box or enclosure: easily accessible from the front.		P
	Fixing means not serve any other fixing purpose		P
13.7	Combinations of switches, or of switches and socket-outlets, comprising separate bases: correct position of each base ensured	w/o such constructions	N
	Fixing of each base independent of the fixing of the combination to the mounting surface		N
13.8	Accessories combined with switches: comply with their standard		P
13.9	Surface-type switches with IP > 20 are in according to their classification when fitted with conduits or with sheathed cables	IPX0 (To be determined in final installation)	N
	Surface-type switches with IPX4 or IPX5 have provisions for opening a drain hole	IPX0 (To be determined in final installation)	N
	Switches provided with a drain hole: it is not less than 5 mm in diameter, or 20 mm ² in area with a width and a length not less than 3 mm	Circle drain hole: 14.8mm	P
	Drain hole: effective		P
	Lid springs (if any): of corrosion resistant material (bronze or stainless steel)		P

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Clause	Requirement + Test	Result - Remark	Verdict
13.10	Switches to be installed in a box: conductor ends can be prepared after the box is mounted in position, but before the switch is fitted in the box	Not such switches	N
	Base have adequate stability when mounted in the box		N
13.11	Surface-type switches with IP > X0, pattern numbers 1, 5 and 6, with more than one inlet opening, provided with:		
	- fixed additional terminal complying with the requirements of clause 12, or	IPX0 (To be determined in final installation)	N
	- adequate space for a floating terminal		N
13.12	Inlet openings: allow the introduction of the conduit or the sheath of the cable		P
	Surface-type switches: intended conduit or protective covering can enter at least 1 mm into the enclosure		P
	Inlet openings for conduit entries of surface-type switches: capable of accepting conduit sizes of 16, 20, 25 or 32 or a combination of at least two of these sizes not excluding two of the same size		N
	Inlet openings for cable entries of surface-type switches: capable of accepting cables having the dimensions specified in table 12 or be as specified by the manufacturer: rated current (A); limits of external diameter of cables min/max (mm)	Rated current: MAX. 8A; Limits of external diameter of cables: 7.6/15.5 mm	P
13.13	Surface-type switches: provision for back entry (if are intended)	IPX0 (To be determined in final installation)	N
13.14	Membranes or the like (if provided): replaceable	w/o membranes	N
13.15	Requirements for membranes in inlet openings		
13.15.1	Membranes, lenses and the like reliably fixed and not displaced by the mechanical and thermal stresses occurring in normal use	No membrane used in inlet opening	N
	Test on electronic switches fitted with membranes, lenses and the like subjected to the ageing treatment specified in 15.1:		
	Electronic switches placed at 40 °C ± 2 °C for 2 h; force of 30 N applied for 5 s by means of the tip of test probe 11 of IEC 61032. During these tests: membranes, lenses and the like are not deformed, live parts not accessible		N

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Clause	Requirement + Test	Result - Remark	Verdict
	Membranes, lenses and the like likely to be subjected to an axial pull: axial pull of 30 N applied for 5 s. During this test: membranes, lenses and the like not come out		N
	Test repeated on membranes, lenses and the like not subjected to any treatment		N
13.15.2	Membranes in inlet openings: introduction of the cables into the accessory permitted when the ambient temperature is low	No membrane used in inlet opening	N
	Test on membranes not subjected to the ageing treatment specified in 15.1 and fitted with the switches		
	Switches kept at -5 °C for 2 h: possibility to introduce cables of the heaviest type through the membranes		N
	After the test: no harmful deformation, cracks or similar damage		N
13.16	Flexible cable outlet switches: flexible cable (60245 IEC 66 or 60227 IEC 52/53, or as specified by the manufacturer) may enter the switch through a suitable hole, groove or gland	Not such switches	N
	Maximum dimension of flexible cable having conductors specified in table 12a accepted by the entry:		
	- rated current (A)		
	- cross-sectional area (mm ²) (min 1,5 mm ²)		
	Entry shaped to prevent damage to the flexible cable		N
	Switches intended to be connected via a flexible cable to an electronic extension unit having a rated current equal to the rated current of the electronic switch: flexible cable complies with 60245 IEC 66 or 60227 IEC 53 with a minimum cross sectional area of 0,75 mm ²		N
	Switches intended to be connected via a flexible cable to an electronic extension unit having a rated current lower than the rated current of the electronic switch: flexible cable complies with the requirements of 13.103		N
	Switches with flexible cable outlet: provided with cable anchorage		N
	Cable anchorage: contains the sheath, of insulating material or provided with an insulating lining fixed to the metal parts		N

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Clause	Requirement + Test	Result - Remark	Verdict
	Cable anchorage: anchor the flexible cable securely to the switch		N
	Cable anchorage cannot be released from the outside		N
	Use of a special purpose tool not required		N
	Screws: not serve to fix any other component, unless		N
	- switch is rendered manifestly incomplete if component omitted or replaced in an incorrect position, or		N
	- component cannot be removed without further use of a tool		N
	Pull test (30 N, 25 times): cable 60227 IEC 53, cross-sectional area 1,5 mm ² ; torque (Nm) (2/3 table 3)		N
	Torque test: torque 0,15 Nm for 1 min, cable not displaced > 2 mm		N
	Pull test (60 N, 25 times): cable 60245 IEC 66, diameter (mm) of cable; torque (Nm) (2/3 table 3) ..		N
	Torque test: torque 0,35 Nm for 1 min, cable not displaced > 2 mm		N
	Test voltage of 2000 V a.c. applied for 1 min between the conductors and the cord anchorage:		
	During the test: insulation of flexible cable not damaged (no breakdown or flashover)		N
	Flexible cable outlet switches:		
	- clear how relief from strain and prevention of twisting is intended to be effected		N
	- cord anchorage, or at least part of it, integral with or permanently fixed to one of the component parts of the switch		N
	- makeshift methods not used		N

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Clause	Requirement + Test	Result - Remark	Verdict

	- cord anchorages suitable for different type of flexible cables		N
	Rewirable switches with earthing connection: designed with ample space for slack of the earthing conductor		N
13.101	Automatic protective devices incorporated in electronic switches for lamp circuits have at least micro-disconnection	w/o such devices	N
	Cut-outs in electronic switches for motor speed control circuits: non-self-resetting		N
13.102	Electronic switches for the control of the voltage of iron core transformers for extra low-voltage incandescent lamps (for example, halogen): maximum tolerance of the phase-control angle between the positive and negative half-wave of $\pm 2^\circ$:		N
13.103	A cable is considered as a bare conductor if the insulation is not at least electrically equivalent to that of flexible cable according IEC standard or the insulation does not comply with the electric strength test carried out between the conductor and a metallic foil wrapped around the cable under the conditions specified in 16.2	Complied with the electric strength test	P

14	MECHANISM		
	Clause only applicable to electronic switches provided with mechanical switching devices		P
14.1	Actuating member of a switch, when released, automatically take up the position corresponding to that of moving contacts		P
14.2	Moving contact of switches can come to rest only in "on" and "off" positions		P
	Intermediate position permissible if:		
	- it corresponds to the intermediate position of the actuating member, and		N
	- the insulation between fixed and moving contacts is adequate. Electric strength test as specified in 16.2: test voltage a.c. for 1 min (V)	500 V / 750 V / 1250 V / 2000 V	N
14.3	No undue arcing in slowly operation	Relay is used	N

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Clause	Requirement + Test	Result - Remark	Verdict
	Test carried out at the end of the test of clause 19.1: breaking of the circuit 10 times, actuating member moved over a period of 2 s. During the test: no sustained arcing		N
14.4	Switches of pattern numbers 2, 3, 03 and 6/2 make and break all poles substantially simultaneously	Pattern 1	N
	Neutral pole of switches of pattern numbers 03 not make after or break before the other poles		N
14.5	Action of the mechanism: independent of the presence of cover or cover plate. Test: no flicker	Relay is used	N
14.6	Cord-operated switches: effecting a change by application and removal a pull not exceeding:		
	- 45 N applied vertically, and	Not such switch	N
	- 65 N applied at $45^\circ \pm 5^\circ$		N

15	RESISTANCE TO AGEING, PROTECTION PROVIDED BY ENCLOSURES OF SWITCHES, AND RESISTANCE TO HUMIDITY		
15.1	Resistance to ageing		
	Switches and boxes placed for 7 days (168 h) in a heating cabinet at $70^\circ\text{C} \pm 2^\circ\text{C}$		P
	- no crack visible after test with normal or corrected vision without additional magnification		P
	- no sticky or greasy material as a result of heat		P
	- no trace of cloth (forefinger pressed with 5 N)		P
	- no other damage as a result of heat		P
15.2	Protection provided by enclosures of switches		
15.2.1	Protection against access to hazardous parts and against harmful effects due to ingress of solid foreign objects		
	Enclosure of the switch provides a degree of protection against access to hazardous parts and against harmful effects due to ingress of solid foreign objects in accordance with the IP classification of the switch	IPX0 (To be determined in final installation)	N
	Glands: torque (Nm) (2/3 of torque applied in 20.3) :		
	Screws of the enclosure: torque (Nm) (2/3 table 3)		
15.2.1.1	Protection against access to hazardous parts		

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Clause	Requirement + Test	Result - Remark	Verdict
	Appropriate test according to IEC 60529 : IPX0 (To be determined in final installation)		N
15.2.1.2	Protection against harmful effects due to ingress of solid foreign objects		
	Appropriate test according to IEC 60529 : IPX0 (To be determined in final installation)		N
	Dust not penetrate in quantity to interfere with satisfactory operation or to impair safety		N
15.2.2	Protection against harmful effects due to ingress of water		
	Enclosure of switches provide a degree of protection against harmful effects due to ingress of water in accordance with their IP classification	IPX0 (To be determined in final installation)	N
	Appropriate test according to IEC 60529 : IPX0 (To be determined in final installation)		N
	Flush-type and semi-flush-type switches fixed:	* Not a flush type switch	
	- in a test wall using an appropriate box in accordance with the manufacturer's instructions		N
	- in a test wall according to figure 27		N
	Screws of the enclosure: torque (Nm) (2/3 table 3) :		
	Glands: torque (Nm) (2/3 of torque applied in table 19) :		
	Specimens withstand an electric strength test specified in 16.2 which is started within 5 min of completion of the test		N
15.3	Resistance to humidity		
	Switches proof against humidity which may occur in normal use		P
	Compliance checked by a humidity treatment carried out in a humidity cabinet containing air with relative humidity maintained between 91 % and 95 %. Specimens kept in the cabinet for:		
	- 2 days (48 h) for switches with IPX0		P
	- 7 days (168 h) for switches with IP>X0		N
	After this treatment: specimens show no damage		P

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Clause	Requirement + Test	Result - Remark	Verdict

16	INSULATION RESISTANCE AND ELECTRIC STRENGTH		
16.1	The insulation resistance measured 1 min after application of 500 V d.c.	See appended table 16.1	P
16.2	Electric strength: a.c. test voltage applied for 1 min	See appended table 16.2	P

17	TEMPERATURE RISE		
17.1	Switches so constructed that the temperature rise in normal use is not excessive		P
	No oxidation or any other deterioration of contacts, if any		P
	Material and components of electronic switch are not adversely effected by the temperature rise in normal use		P
	During the test:		
	- electronic switch state not change		P
	- fuses and other protective devices not operate		P
	- permissible temperature rises determined in table 102, column concerning clause 17, not exceeded	See appended table 17	P
	After the test, electronic switch is in operating condition		P
	Sealing compounds, if any, have not flowed		P

18	MAKING AND BREAKING CAPACITY		
	Electronic switches have adequate making and breaking capacity		P
	Test carried out only on electronic switches provided with mechanically or electromechanically operated contact mechanisms		P
	Contact mechanisms have adequate making and breaking capacity		P
	Test made on three new specimens of the complete contact mechanism		P
	Model/type reference	OS-181A, OS-181B, OS-181C	—
	Pattern number	Pattern 1	—

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Clause	Requirement + Test	Result - Remark	Verdict

	Rated current (A) / Rated load (W or VA)	See Page 2	
	Rated voltage (V)	230V	
	Test for electronics switches for the control of:		
	- fluorescent lamp loads, as specified in 18.1 of part 1;		P
	- motor speed control circuits, as specified in 18.1 of part 1 and, additionally, in 18.101;		N
	- voltage of iron core transformers for extra low-voltage incandescent lamps, as specified in 18.1, 18.2 of part 1 and, additionally, in 18.102;		P
	- voltage of electronic step-down converters for extra low-voltage incandescent lamps, as specified in 18.2 of part 1;		N
	- other types of load, as specified in 18.1 and 18.2 of part 1.		P
	Rate of operation (operation per minute)	30	
	Electronic switches whose cycle of operation limited by their application: rate of operation specified by the manufacturer (operation per minute)	--	
	Electronic switches fitted with conductors having nominal cross-sectional area as for the test of clause 17 (mm ²)	2.5mm ²	
18.1	Test with cos ϕ 0,3 alternating current		
	- test voltage (1,1 V _n) (V)	1.1 X 230V	
	- test current (1,25 I _n) (cos ϕ 0,3) (A)	Approx. 10A	
	- 200 operations; rate (operations per minute)	30	
	- electronic switches whose rate of operation is limited by their application (for example, heat and light sensors): electronic switch is set to the shortest cycle time possible and re-activated at the end of each cycle within a time of (2 \pm 0,5) s	200 operations	
	- samples number	3	
	During the test: no sustained arcing		P
	After the test: specimens show no damage		P
18.2	Test with tungsten filament lamps load (switches with I _n \leq 16 A / V _n \leq 250 V and switches of pattern numbers 3 and 03 with V _n > 250 V)		

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Clause	Requirement + Test	Result - Remark	Verdict

	- test voltage (Vn) (V)	230V	—
	- test current ($\geq 1,2 I_n$) (A)	1.2 X 8A	—
	- number of 200 W tungsten filament lamps	11	—
	- 200 operations; rate (operations per minute)	30 operations per minute	—
	- samples number	1	—
	During the test: no sustained arcing nor welding of the contacts		P
	After the test: specimens show no damage		P
18.101	Additional test for electronic switches for the control of motor speed control circuits:		
	Rated current I_n (A) of electronic switch ($\cos\phi$ 0.6) :	Not for speed control	—
	Making: 50 cycles with: test current: $9 I_n$ (A); test voltage: V_n (V); $\cos\phi$ 0.8 ± 0.05		N
	Breaking: 50 cycles with: test current: $6 I_n$ (A); test voltage: V_n (V); $\cos\phi$ 0.6 ± 0.05		N
	During the test: no sustained arcing		N
	After the test: specimens show no damage		N
18.102	Additional test for electronic switches for the control of the voltage of iron core transformers for extra low-voltage incandescent lamps (for example, halogen):		
	- test voltage (Vn) (V)	--	—
	- 50 making operations in a test circuit adjusted to a test current 10 times I_n (A) for one half-cycle of the power supply frequency		—
	During the test: no sustained arcing		N
	After the test: specimens show no damage		N

19	NORMAL OPERATION		
	Electronic switches withstand the mechanical, electrical and thermal stresses occurring in normal use		P
	Electronic switches whose cycle of operation is limited by their application: rate of operation specified by the manufacturer (operation per minute)		—

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Clause	Requirement + Test	Result - Remark	Verdict
19.101	Contact mechanisms intended for incandescent lamp circuits; number of operations 40.000:		
	Rate of operation (operation per minute)	40 000 (30 operations per minute)	—
	Rated current (A) / Rated load (W or VA)	Approx. 8A	—
	Rated voltage (V)	230V	—
	During the test: specimens function correctly	3 specimens	P
	No sustained arcing in slowly operation (sub-clause 14.3)		N
	Contact mechanism intended for motor speed control circuits; number of operations 40000:		
	Making: test current: 6 In (A); test voltage: Vn (V); cosφ 0.65 ± 0.05	Not for motor speed control circuit	N
	Breaking: test current In (A); test voltage Vn (V); cosφ 0.65 ± 0.05		N
	During the test: specimens function correctly		N
19.102	Contact mechanisms incorporated in electronic switches, intended for fluorescent lamp circuits or other capacitive loads (for example, electronic ballast) tested according to modified sub-clause 19.2 of part 1 (not applicable to dimmers for step-down converters as these accessories are tested according to 19.101):		
	- rate of operation (operation per minute)	30 (up to and including 10 A) / 15 (10 A to 20 A)	—
	- test voltage (Vn); test current (In) (cos φ 0,9); number of operations with load A	230 V; Approx. 8 A; 10000 (up to and including 10 A) / 5000 (10 A to 20 A)	P
	- test voltage (Vn); 100 operations with load B	230 V	P
	During the test: copper wire F not melt, specimens function correctly, no sustained arcing or welding of contacts		P
19.103	Semiconductor switching devices and/or electronic regulating units incorporated in electronic switches:		
	Rated current (A) / Rated load (W or VA)	Not such device	—
	Rated voltage (V)	--	—
	Test voltage: 1.1 Vn (V)	--	—
	Switch state changed 10 times by means of the sensing surface or unit, or/and		N

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Clause	Requirement + Test	Result - Remark	Verdict
	Setting value altered 10 times from min to max and back to min by means of the sensing surface or unit		N
	Additional test, where appropriate:		
	Switch state changed 10 times by means of an electronic extension unit, and/or		N
	Setting value altered 10 times from min to max and back to min by means of an electronic extension unit		N
	During the test: specimens operate correctly		N
19.104	Mechanical control units incorporate in electronic switches:		
	Type of mechanical control unit	--	---
	Rated current (A) / Rated load (W or VA)	--	---
	Rated voltage (V)	--	---
	Test voltage: 1.1 Vn (V)	--	---
	Setting altered 10000 times from min to max and back to min by means of its control unit; rate of operation between 10 and 15 operations per minute.....	--	---
	During the test: specimens function correctly		N
19.105	Electronic switches for which a minimum load or current is specified by the manufacturer:		
	Test current: rated minimum current (A) / rated minimum load (W or VA)	Not specified the minimum load	---
	Test voltage: 0,9 Vn (V)	--	---
	Switch state changed 10 times over the whole range from min to max and back to min, and/or		N
	Setting value altered 10 times over the whole range from min to max and back to min		N
	Additional test, where appropriate:		
	Switch state changed 10 times over the whole range from min to max and back to min by means of an electronic extension unit, and/or		N
	Setting value altered 10 times over the whole range from min to max and back to min by means of an electronic extension unit		N

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Clause	Requirement + Test	Result - Remark	Verdict

	During the test: electronic switch functions correctly		N
	Reduced electric strength per clause 16	See appended table 19	N
	Temperature rise test after normal operation per clause 17:		
	- electronic switch state not change		N
	- fuses and other protective devices not operate		N
	- permissible temperature rises determined in table 102, column concerning clause 17, not exceeded	See appended table 19	N
	After the test, electronic switch is in operating condition		N
	Sealing compounds, if any, have not flowed		N
	Evaluation of compliance after the normal operation: after the tests the specimens shall not show:		
	- wear impairing their further use;		N
	- discrepancy between the position of the actuating member (if indicated) and that of the moving contacts;		N
	- deterioration of enclosures, insulating lining or barriers;		N
	- loosening of electrical or mechanical connections;		N
	- seepage of sealing compound;		N
	- displacement of the moving contacts of electronic switches of pattern number 2		N

20	MECHANICAL STRENGTH		
	Switches, boxes and screwed glands have adequate mechanical strength		P
20.1	All types of switches and their dedicated boxes, where applicable: impact test (9 blows)	See appended table 20.1	P
	After the test: no damage, live parts no become accessible		P
20.2	Bases of surface-type switches first fixed to a cylinder of rigid steel sheet of radius equal to 4,5 times the distance between fixing holes (mm)		P
	Bases then fixed to a flat steel sheet		P
	Torque applied to fixing screws (Nm) : <u>0,5 Nm</u> / 1,2 Nm		

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Clause	Requirement + Test	Result - Remark	Verdict
	During and after the test: bases show no damage		P
20.3	Screwed glands of switches other than ordinary: torque test		
	- diameter of cylindrical metal test rod (mm) : w/o screw gland		
	- type of material : metal / moulded material		
	- torque for 1 min (table 19) (Nm) : --		
	After the test: no damage of glands and enclosure of the specimens		N
20.4	Force necessary for covers, cover-plates or actuating members to come off or not to come off (accessibility with the test finger to live parts)		--
20.4.1	Verification of the non-removal of covers, cover-plates or actuating member		--
	Force applied for 1 min in direction perpendicular to the mounting surface :		
	Covers, cover-plates or actuating members not come off		N
	Test repeated on new specimens with a sheet of hard material, 1 mm \pm 0,1 mm thick, fitted around the supporting frame (fig. 19)		N
	Covers, cover-plates or actuating members not come off		N
	After the test: no damage		N
20.4.2	Verification of the removal of covers, cover-plates or actuating members		
	Force not exceeding 120 N applied 10 times in direction perpendicular to the mounting / supporting surface: covers, cover-plates or actuating members come off		N
	Test repeated on new specimens with a sheet of hard material, 1 mm \pm 0,1 mm thick, fitted around the supporting frame (fig. 19)		N
	Covers, cover-plates or actuating members come off		N
	After the test: no damage		N
20.5	Force necessary for covers, cover-plates or actuating members to come off or not to come off (accessibility with the test finger to non-earthed metal parts separated from live parts by creepage distances and clearances according to table 20)		
20.4.1	Verification of the non-removal of covers, cover-plates or actuating members		
	Force applied for 1 min in direction perpendicular to the mounting surface :	--	

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Clause	Requirement + Test	Result - Remark	Verdict
	Covers or cover-plates not come off		N
	Test repeated on new specimens with a sheet of hard material, 1 mm \pm 0,1 mm thick, fitted around the supporting frame (fig. 19)		N
	Covers, cover-plates or actuating members not come off		N
	After the test: no damage		N
20.4.2	Verification of the removal of covers, cover-plates or actuating members		
	Force not exceeding 120 N applied 10 times in direction perpendicular to the mounting / supporting surface: covers, cover-plates or actuating members come off		N
	Test repeated on new specimens with a sheet of hard material, 1 mm \pm 0,1 mm thick, fitted around the supporting frame (fig. 19)		N
	Covers, cover-plates or actuating members come off		N
	After the test: no damage		N
20.6	Force necessary for covers, cover-plates or actuating members to come off or not to come off (accessibility to insulating parts, earthed metal parts, live parts of SELV \leq 25 V a.c. or metal parts separated from live parts by creepage distances twice those according to table 20)		
20.4.1	Verification of the non-removal of covers, cover-plates or actuating members		
	Force 10 N applied for 1 min in direction perpendicular to the mounting surface: covers, cover-plates or actuating members not come off		N
	Test repeated on new specimens with a sheet of hard material, 1 mm \pm 0,1 mm thick, fitted around the supporting frame (fig. 19)		N
	Covers, cover-plates or actuating members not come off		N
	After the test: no damage		N
20.4.2	Verification of the removal of covers, cover-plates or actuating members		
	Force not exceeding 120 N applied 10 times in direction perpendicular to the mounting / supporting surface: covers, cover-plates or actuating members come off		N

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Clause	Requirement + Test	Result - Remark	Verdict
	Test repeated on new specimens with a sheet of hard material, 1 mm \pm 0,1 mm thick, fitted around the supporting frame (fig. 19)		N
	Covers, cover-plates or actuating members come off		N
	After the test: no damage		
20.7	Test with gauge of figure 20 applied according to figure 21 for verification of the outline of covers, cover-plates or actuating members: distances between face C of gauge and outline of side under test, not decrease	--	---
20.8	Test with gauge according to figure 23 applied as shown in figure 24 (1 N): gauge not enter more than 1mm	--	---
20.9	Operating members of cord-operated switch have adequate strength		N
	Pull test: pull 100 N for 1 min (normal use); pull of 50 N for 1 min (unfavourable direction). After the test:		--
	- switch show no damage		N
	- operating member not broken and cord-operated switch still operate		N

21	RESISTANCE TO HEAT		
21.1	Switches kept for 1 h in a heating cabinet at a temperature of 100 °C \pm 2 °C		
	During the test: no change impairing their further use and sealing compound, if any, not flow		P
	After the test: no access to live parts, markings still legible		P
21.2	Parts of insulating material necessary to retain current-carrying parts and parts of the earthing circuit in position: ball-pressure test (1 h, 125 °C)	See appended table 21.2	P
21.3	Parts of insulating material not necessary to retain current-carrying parts and parts of the earthing circuit in position, even though in contact with them: ball-pressure test (1 h)	See appended table 21.3	P

22	SCREWS, CURRENT-CARRYING PARTS AND CONNECTIONS		
22.1	Connections withstand mechanical stresses		P

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Clause	Requirement + Test	Result - Remark	Verdict
	Thread-forming or thread-cutting screws used only if supplied together with the piece in which they are intended to be inserted		P
	Screws and nuts which transmit contact pressure: in engagement with a metal thread		N
	Threaded part torque test	See appended table 22.1	P
22.2	Screws in engagement with a thread of insulating material: correct introduction into the screw hole or nut ensured		P
22.3	Contact pressure: not transmitted through insulating material other than ceramic, pure mica or other material no less suitable unless there is sufficient resiliency in metallic parts		P
22.4	Screws and rivets locked against loosening or turning		P
22.5	Current-carrying parts of metal having mechanical strength, electrical conductivity and resistance to corrosion adequate:		
	- copper;		P
	- alloy with at least 58 % copper for parts made from cold-rolled sheet or with at least 50 % copper for other parts;		P
	- stainless steel with at least 13 % chromium and not more than 0,12 % carbon		N
	- steel with electroplated coating of zinc (ISO 2081): service condition ISO no. (1/2/3); IP (X0/X4/X5); thickness (µm)		N
	- steel with electroplated coating of nickel and chromium (ISO 1456): service condition ISO no. (2/3/4); IP (X0/X4/X5); thickness (µm)		N
	- steel with electroplated coating of tin (ISO 2093): service condition ISO no. (2/3/4); IP (X0/X4/X5); thickness (µm)		N
	Current-carrying parts subjected to mechanical wear: not of steel with electroplated coating		N
	Metals having a great difference of electrochemical potential: not used in contact with each other		N
22.6	Contacts subjected to sliding action: of metal resistant to corrosion		N
22.7	Thread-forming screws and thread-cutting screws not used for the connection of current-carrying parts		P

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Clause	Requirement + Test	Result - Remark	Verdict
	Thread-forming screws and thread-cutting screws used to provide earthing continuity: not necessary to disturb the connection and at least two screws are used for each connection		N
23	CREEPAGE DISTANCES, CLEARANCES AND DISTANCES THROUGH SEALING COMPOUND		
	Values of items 1, 2, 6 and 7 of table 20 applied to terminals for external wiring and not applied to other live parts which are protected by a directly associated fuse with adequate breaking capacity or other current-limiting means, under the provision that the requirements of 101 are fulfilled		P
	Electronic switches without directly associated fuse or other current-limiting means: comply with table 20		P
23.1	Creepage distances, clearances and distances through sealing compound no less than the values shown in table 20	See appended table 23.1	P
23.2	Insulating compound: not protrude above the edge of the cavity in which it is contained		N
23.3	Ordinary surface-type switches: not have bare current-carrying strips at the back		P
24	RESISTANCE OF INSULATING MATERIAL TO ABNORMAL HEAT, TO FIRE AND TO TRACKING		
24.1	Parts of insulating material which might be exposed to thermal stresses due to electric effects and the deterioration of which might impair the safety are not unduly affected by abnormal heat and fire		P
24.1.1	Glow-wire test according to IEC 60695-2-1	See appended table 24.1.1	P
24.2	Parts of insulating material retaining live parts in position of switches with IP>X0: of material resistant to tracking	IPX0 (To be determined in final installation)	N
	Tracking test with solution A of IEC 60112	See appended table 24.2	N

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Clause	Requirement + Test	Result - Remark	Verdict

25	RESISTANCE TO RUSTING		
	Ferrous parts protected against rusting		N
	Test: 10 min in carbontetrachloride, trichloroethane or equivalent degreasing agent, 10 min 10 % solution of ammonium chloride, 10 min in a box with air saturated with moisture and 10 min at 100 °C ± 5 °C:		
	No signs of rust		N

26	EMC REQUIREMENTS		
	Electronic switches designed to operate correctly under the conditions of electromagnetic environment in which they are intended to be used	See EMC report	P
26.1	Immunity		
	Electronic switches designed so that the switch state (ON or OFF) and/or the setting value are protected against interference		P
	Type of load	See Page 2	
	Test current: In (A) / Rated load (W or VA)	See Page 2	
	Test voltage: Vn (V)	230V	
	Variation of less than ± 10 % of the value of the output power (rms) is not considered to be a change of setting		P
	Electronic switches tested, if applicable, in the following states (test parameters referred to table 104):		
	a) in the ON state, highest setting		P
	b) in the ON state, lowest setting		N
	c) in the OFF state		P
26.1.1	Voltage dips and short interruptions		
	Electronic switch tested using the equipment specified in IEC 61000-4-11 in accordance with table 105: sequence: 3 dips/interruptions (duration: 10 cycles at rated frequency) with interval of 10 s minimum between each test event:		
	Test level: 0 % U _T		P
	Test level: 40 % U _T		P
	Test level: 70 % U _T		P
	After the test: electronic switch is in the original state and the setting is unchanged		P

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Clause	Requirement + Test	Result - Remark	Verdict
26.1.2	Surge immunity test for 1,2/50 μ s wave impulses		
	Test carried out according to IEC 61000-4-5 applying two positive discharges and two negative discharges at each of the following angles 0°, 90°, 270°, at a repetition rate of (60 \pm 5) s, with an open-circuit test voltage of 1 kV (level 2)		
	After the test: electronic switch is in the original state and the setting is unchanged		P
26.1.3	Electrical fast transient/burst test		
	Test carried out according to IEC 61000-4-4 in accordance with table 106, duration of the test 1 min +5/0 s for each positive and negative polarities: open-circuit output test voltage (\pm 10 %):		
	Supply terminals/terminations: 1 kV		P
	Control terminals/terminations: 0,5 kV		P
	After the test: electronic switch is in the original state and the setting is unchanged		P
26.1.4	Electrostatic discharge test		
	Electronic switch not intended to operate incandescent lamp: test carried out with only one load of the loads specified within the manufacturer's instructions		P
	Test carried out according to EN 61000-4-2 applying 10 positive and 10 negative discharge:		
	- contact discharge to the conductive surface and to coupling planes (test voltage: 4 kV)		P
	- air discharge at insulating surfaces (test voltage: 8 kV)		P
	After the test: electronic switch is in the original switch state and the setting is unchanged		P
	Alter in the state and/or setting of electronic switches with a sensing surface intended to be operated by touch: possibility to operate the electronic switch as intended		P

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Clause	Requirement + Test	Result - Remark	Verdict
26.1.5	Radiated electromagnetic field test		
	Test applicable only to electronic switches containing infra-red (IR) receivers, radio frequency receivers, passive infra-red (PIR) devices, devices containing microprocessors or similar		P
	Test carried out according to IEC 61000-4-3 applying a field strength of 3 V/m in the frequency range 80 MHz to 1000 MHz:		
	During the test: state of electronic switch is not changed		P
	After the test: electronic switch is in the original state and the setting is unchanged		P
	Time delay switches (TDS): switch is in the original state after the time delay		P
26.1.6	Radio-frequency voltage test		
	Test applicable only to electronic switches containing infra-red (IR) receivers, radio frequency receivers, passive infra-red (PIR) devices, devices containing microprocessors or similar		P
	Test carried out according to IEC 61000-4-6 applying a conducted radio-frequency voltage of 3 V r.m.s. on supply lines and control lines:		
	During the test: state of electronic switch is not changed		P
	After the test: electronic switch is in the original state and the setting is unchanged		P
26.1.7	Power-frequency magnetic field test		
	Test applicable only to electronic switches containing devices susceptible to magnetic fields, for example, Hall elements, electrodynamic microphones, etc.		P
	Test carried out according to IEC 61000-4-8 applying a magnetic field of 3 A/m, 50 Hz:		
	During the test: state of electronic switch is not changed		P
	After the test: electronic switch is in the original state and the setting is unchanged		P
26.2	Emission		
26.2.1	Low-frequency emission		

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Clause	Requirement + Test	Result - Remark	Verdict
	Electronic switches designed that they do not cause excessive disturbances in the network		P
	Electronic switch complies with IEC 61000-3-2 and IEC 61000-3-3		P
	Electronic switches with electromechanically operated contact mechanism (for example, a relay) are deemed to meet the requirements of IEC 61000-3-2 without need for testing		P
26.2.2	Radio-frequency emission		
	Electronic switches designed that they do not cause excessive radio interference		P
	Electronic switch complies with the requirements of CISPR 14		P
	Electronic switch complies with the requirements of CISPR 15 (modified on sub-clauses 8.1.3.1 and 8.1.3.2)		P

101	ABNORMAL CONDITIONS		
	Electronic switches do not create hazard under abnormal conditions		P
101.1.1.1	Fault conditions test: temperature rises not exceed the values given in table 102, column concerning clause 101		P
	Temperature limited by a fuse: additional test carried out in case of doubt	See appended table 101.1.1.1	P
101.1.1.2	Electronic switches without incorporated temperature-limiting devices and without incorporated fuses:		
	Test current: conventional tripping current I_f (A) for 1h of the fuse which, in the installation, will protect the electronic switch	$1.45 \times 16 \text{ A} = 23.2 \text{ A}$	
	Temperature rise measured after steady state or after 4 h	The PCB trace opened before temperature steady (See appended table 101.1.1.2)	P
	Electronic switches protected by automatic protective devices (including fuses):		
	Current with which the protecting device releases after 1 h (A)	--	
	Test current: 0.95 times the current with which the protecting device releases after 1 h (A)	--	
	Temperature rise measured after steady state or	See appended table 101.1.1.2	N

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Clause	Requirement + Test	Result - Remark	Verdict
	after 4 h		
	Electronic switches protected by incorporated fuses complying with IEC 60127:		
	Rated current of incorporated fuse (A)	--	
	Test current: 2.1 I _n (A)	--	
	Temperature rise measured after 30 min	See appended table 101.1.1.2	N
101.2	Protection against electric shock even during fault conditions		P
	Electronic switches tested according to clause 10 immediately following the test of 101.1		P
101.3	Short circuit test: prospective short circuit of the supply: 1500 A; I ² t: 15000 A ² s:		
	Test voltage V _n (V)	230V	
	Type of fuse recommended by the manufacturer ...	--	
	N° of short circuits; N° of specimens used	6	
	During the test: emission of flames or burning particles not occur		P
	After the test:		
	- accessible metal parts not live		N
	- contacts of any incorporated automatic protective device not welded, unless the electronic switch is obviously useless		N
102	COMPONENTS		
	Components which, if they fail, may impair the safety of the electronic switch comply with the relevant IEC standards, as far as applicable		P
	Components marked with their operating characteristics used in accordance with these markings		P
102.1	Fuses comply with:		
	- IEC 60127	w/o fuses	N
	- other relevant IEC publications		N
	Rated breaking capacity (A): 1500 A or 35 A		N

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Clause	Requirement + Test	Result - Remark	Verdict
102.2	Capacitors: the short-circuiting or disconnection of which cause an infringement of the requirements under fault conditions with regard to shock or fire hazard:		
	Trade mark; article of capacitor		
	Capacitor complies with IEC 60384-14		N
	Capacitor passing the damp heat steady-state test specified in 4.12 of IEC 60384-14 with a duration of not less than 21 days are considered acceptable		N
	Capacitor in accordance with table 107: approved type of capacitor required by table 107 according to the application in the electronic switch; observed :		N
	Capacitor marked with:		
	- rated voltage (V)		N
	- rated capacitance (μF)		N
	- reference temperature ($^{\circ}\text{C}$)		N
	Capacitors: the short-circuiting of which cause a current = 0,5 A through the terminals of the capacitor:		
	Trade mark; article of capacitor	See the separated C.D.F	
	Capacitor complies with IEC 60384-14		P
	Capacitor passing the damp heat steady-state test specified in 4.12 of IEC 60384-14 with a duration of not less than 21 days are considered acceptable		P
	Capacitor in accordance with table 107: approved type of capacitor required by table 107 according to the application in the electronic switch; observed ...:		P
	Capacitor marked with:		
	- rated voltage (V)	275V	P
	- rated capacitance (μF)	0.47 μF	P
	- reference temperature ($^{\circ}\text{C}$)	100	P
	Capacitors: for suppression of electromagnetic interference:		
	Trade mark; article of capacitor	--	
	Capacitor complies with IEC 60384-14		N

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Clause	Requirement + Test	Result - Remark	Verdict
	Capacitor passing the damp heat steady-state test specified in 4.12 of IEC 60384-14 with a duration of not less than 21 days are considered acceptable		N
	Capacitor in accordance with table 107: approved type of capacitor required by table 107 according to the application in the electronic switch; observed :		N
	Capacitor marked with:		
	- rated voltage (V)		N
	- rated capacitance (μ F)		N
	- reference temperature ($^{\circ}$ C)		N
102.3	Resistors: the short-circuiting or interruption of which cause an infringement of the requirements with regard to the protection against fire and electric shock in case of a defect:		
	Manufacturer / characteristics of resistor	--	
	- constant value under overload conditions		N
	reference temperature of the resistor according to clause 17 ($^{\circ}$ C)	--	
	- comply with sub-clause 14.1 of IEC 60065		N
102.4	Automatic protective devices (other than fuses)		
	Automatic protective devices comply with IEC 60730 as far as applicable		N
102.4.1	Automatic protective devices which switch off the current (cut-outs):		
	Adequate making and breaking capacity		N
	Reference temperature above 55 $^{\circ}$ C: specimens tested at reference temperature according to clause 17 ($^{\circ}$ C)		N
102.4.1.1	Non-self-resetting cut-outs in the load circuit of the electronic switch:		
	Test voltage: 1.1 V _n (V)	--	
	Cut-outs in electronic switches for incandescent or fluorescent lamps:		
	10 cycles; test current: 2.1 I _n (A) of the protecting fuse (IEC 60127) or the conventional fusing current (other fuses)	--	
	During the test: no sustained arcing		N
	After the test: specimens show no damage		N

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Clause	Requirement + Test	Result - Remark	Verdict
	Electric strength between open contacts: test voltage 500 V a.c. for 1 min		N
	Cut-outs in electronic switches for speed control circuits:		
	In (A) of electronic switch ($\cos\phi$ 0.6)	--	
	Making: 10 operations with: test current: 9 In (A); $\cos\phi$ 0.8 \pm 0.05	--	
	Breaking: 10 operations with: test current: 6 In (A); $\cos\phi$ 0.6 \pm 0.05	--	
	During the test: no sustained arcing		N
	After the test: specimens show no damage		N
	Electric strength between open contacts: test voltage (V): 1200 V a.c. ($V_n \leq 130$ V) or 2000 V ($V_n > 130$ V) for 1 min:	--	N
102.4.1.2	Self-resetting cut-outs in the load circuit of the electronic switch:		
	Test voltage: 1.1 V_n (V)	--	
	Cut-outs in electronic switches for incandescent lamps:		
	200 cycles; test current: 2.1 In (A) of the protecting fuse (IEC 60127) or conventional fusing current (other fuses)		
	During the test: no sustained arcing		N
	After the test: specimens show no damage		N
	Electric strength between open contacts: test voltage 500 V a.c. for 1 min		N
	Cut-outs in electronic switches for fluorescent lamps: tests carried out in the same way as for electronic switches for incandescent lamps		N
102.4.2	Automatic protective devices which only decrease current to the electronic switch (10 cycles):		
	Test current per clause 17 for 4 h (A)	--	
	Test current increased to 2.1 In (A) of the protecting fuse (IEC 60127) or the conventional fusing current (other fuses) for 30 min	--	
	After the test: specimens function correctly		N
	Temperature rise test per clause 17:		
	- electronic switch state not change		N

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Clause	Requirement + Test	Result - Remark	Verdict
	- fuses and other protective devices not operate		N
	- permissible temperature rises determined in table 102, column concerning clause 17, not exceeded	See appended table 102.4.2	N
	After the test, electronic switch is in operating condition		N
	Sealing compounds, if any, have not flowed		N

Annex ZB	Special national conditions		
7.1.7	BELGIUM, CZECH REPUBLIC, FINLAND, GERMANY, NETHERLANDS, NORWAY, SWEDEN: Design B: not used due to installation practice	Germany	P
8.1	DENMARK: Symbol for earth for any space provided for an earthing terminal	Not checked	N
	UNITED KINGDOM: Marking of type reference not used	Not checked	N
8.3	UNITED KINGDOM: Marking of type reference not used	Not checked	N
10.2	DENMARK, NORWAY: Due to the lack of an earthing conductor in many existing old buildings: accessories requiring earth connection cannot normally be used	Not checked	N
10.3	DENMARK: Enclosures, including covers and cover plates, may be made of metal:		
	- for ordinary switches which comply with 10.3.1	Not checked	N
	- for switches with IP > X0 which comply with 10.3.1 or 10.3.2	Not checked	N
10.3.2	DENMARK, NORWAY: Due to the lack of an earthing conductor in many existing old buildings: accessories requiring earth connection cannot normally be used	Not checked	N
10.5	DENMARK, NORWAY: Due to the lack of an earthing conductor in many existing old buildings: accessories requiring earth connection cannot normally be used	Not checked	N
12.2.5	DENMARK, FINLAND, NORWAY, SWEDEN: - Additional test with rigid solid conductors (if exist in relevant IEC standard), if the first test has been made with rigid stranded conductors	Not checked	N

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Clause	Requirement + Test	Result - Remark	Verdict
	- In the case rigid stranded conductors do not exist, the test may be made with rigid solid conductors only		N
12.2.6	DENMARK, FINLAND, NORWAY, SWEDEN: Additional test with one rigid solid conductor and one rigid stranded conductor with same cross-sectional areas connected at same time is required for terminals for two conductors	Not checked	N
13.15.2	DENMARK, FINLAND, NORWAY, SWEDEN, SWITZERLAND: Sub-clause mandatory	Not checked	N
101.1.1.2	BELGIUM, FRANCE, SPAIN, SWITZERLAND: Electronic switches designed without an associated incorporated protection are loaded for one hour with the conventional tripping current of the associated protection of the lighting circuit (10 A for fuses and 16 A for CB's).	Not checked	N
102.1	UNITED KINGDOM: Fuses according to BS 646 and BS 1362 are deemed to satisfy this requirement	Not checked	N
13.103	DENMARK, FINLAND, NORWAY, SWEDEN, SWITZERLAND, UNITED KINGDOM: Flexible cables complying with electrical strength test only are not allowed for external use	Not checked	N

Annex ZC	A-Deviations		
11.2	BELGIUM: earthing terminals have a capacity not less than that of corresponding terminals for the supply conductors except that any additional external earthing terminal shall be of a size suitable for conductors of at least 4 mm ²	Not checked	N
13.103	DENMARK, FINLAND: The insulation of external flexible cable complies with or is at least electrically and mechanically equivalent to that of flexible cables according to HD 21 or HD 22	Not checked	N
	NORWAY, SWEDEN: Cables with basic insulation are not accepted as wiring external to the switch. The insulation of external flexible cable complies with or is at least electrically and mechanical equivalent to that of flexible cables according to HD 21 or HD 22. Cables complying with the electric strength test only are regarded as internal cables and are accepted to be installed in enclosures, conduits, ducting and trunking systems and the like	Not checked	N

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Clause	Requirement + Test	Result - Remark	Verdict

12.2.6	TABLE: pull test (screw terminals)			P
	rated current (A)	8A (OS-181C)		—
	smallest/largest cross-sectional area per table 2 (mm ²)	1.0-2.5mm ²		—
	nominal diameter of thread (mm); torque 2/3 per table 3 (Nm)	0.26 Nm		—
Cross-sectional area (mm ²)	Number of conductors	Type of conductors (rigid solid / rigid stranded)	Pull per table 5 applied for 1 min (N)	Remarks
2.5	1	Both	50	
supplementary information:				

12.2.7	TABLE: tightening test (screw terminals)			P
	rated current (A)	8A		—
	nominal diameter of thread (mm); torque 2/3 per table 3 (Nm)	0.26 Nm		—
Largest cross-sectional area per table 2 (mm ²)	Permissible number of conductors	Type of conductors (rigid solid / rigid stranded)	Number of wires and nominal diameter of wires per table 6	Remarks
2.5	2	Both	1X1.78 / 7X0.67	
supplementary information:				

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Clause	Requirement + Test	Result - Remark	Verdict

12.3.10	TABLE: mechanical stresses occurring in normal use			N
	rated current (A)	--		
	largest/smallest cross-sectional area per table 7 (mm ²)	--		
Number of connection (after that conductor subjected to a pull of 30 N for 1 min) / disconnection		Type of conductor (solid / rigid stranded / flexible)	Cross-sectional area (mm ²)	Remarks
--		--	-	--
--		--	--	--
	TABLE: test with apparatus shown in figure 10			N
	rated current (A)	--		
	type of conductors	rigid solid / rigid stranded		
	smallest/largest cross-sectional area per table 7 (mm ²)	--		
	number of conductors	--		
Cross-sectional area (mm ²)	Diameter of bushing hole per table 4 (mm)	Height H per table 4 (mm)	Mass (kg)	Remarks
--	--	--	--	--
--	--	--	--	--
supplementary information:				

12.3.11	TABLE: electrical and thermal stresses occurring in normal use			N
Test a)	Test carried out for 1 h connecting rigid solid conductors:			
	test current per table 8 (A)	--		
	nominal cross-sectional area (mm ²)	--		
	Screwless terminal number	Voltage drop (mV)	Required voltage drop	
	1	--	≤ 15 mV	
	2	--	≤ 15 mV	
	3	--	≤ 15 mV	
	4	--	≤ 15 mV	
	5	--	≤ 15 mV	

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Clause	Requirement + Test				Result - Remark		Verdict
Test b)	Temperature cycles test) carried out on terminals subjected to Test a):						N
	test current per table 8 (A)				--		---
	nominal cross-sectional area (mm ²)				--		---
	allowed voltage drop (mV)				≤ 22,5 mV or 2 times 24 th cycle value(mV)		---
Screwless terminal number	1	2	3	4	5	Remarks	
voltage drop after 24 th cycle	--	--	--	--	--		
voltage drop after 48 th cycle	--	--	--	--	--		
voltage drop after 72 th cycle	--	--	--	--	--		
voltage drop after 96 th cycle	--	--	--	--	--		
voltage drop after 120 th cycle	--	--	--	--	--		
voltage drop after 144 th cycle	--	--	--	--	--		
voltage drop after 168 th cycle	--	--	--	--	--		
voltage drop after 192 th cycle	--	--	--	--	--		
12.3.10	TABLE: mechanical stresses occurring in normal use						N
	rated current (A)				--		---
	largest/smallest cross-sectional area per table 7 (mm ²)				--		---
Number of connection (after that conductor subjected to a pull of 30 N for 1 min) / disconnection		Type of conductor (solid / rigid stranded / flexible)		Cross-sectional area (mm ²)		Remarks	
--		--		--			
	TABLE: test with apparatus shown in figure 10						N
	rated current (A)				--		---
	type of conductors				rigid solid / rigid stranded		---
	smallest/largest cross-sectional area per table 7 (mm ²)				--		---
	number of conductors				--		---
Cross-sectional area (mm ²)	Diameter of bushing hole per table 4 (mm)		Height H per table 4 (mm)		Mass (kg)		Remarks
--	--		--		--		

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Clause	Requirement + Test	Result - Remark	Verdict

supplementary information:

12.3.12	TABLE: deflection test (principle of test apparatus shown in figure 11a)						N
	Test carried out for 1 h connecting rigid solid conductors:						
	test current (A) (equal rated current) : --						
	required voltage drop (mV) : ≤ 25 mV						
Type of conductor	Smallest			Largest			Remarks
cross-sectional area per table 9 (mm ²)							
force per table 10 (N)							
screwless terminal number	1	2	3	1	2	3	
starting point (X = deflection original point)	X	X+10°	X+20°	X	X+10°	X+20°	
voltage drop 1 st deflection (mV)	--	--	--	--	--	--	
voltage drop 2 nd deflection (mV)	--	--	--	--	--	--	
voltage drop 3 rd deflection (mV)	--	--	--	--	--	--	
voltage drop 4 th deflection (mV)	--	--	--	--	--	--	
voltage drop 5 th deflection (mV)	--	--	--	--	--	--	
voltage drop 6 th deflection (mV)	--	--	--	--	--	--	
voltage drop 7 th deflection (mV)	--	--	--	--	--	--	
voltage drop 8 th deflection (mV)	--	--	--	--	--	--	
voltage drop 9 th deflection (mV)	--	--	--	--	--	--	
voltage drop 10 th deflection (mV)	--	--	--	--	--	--	
voltage drop 11 th deflection (mV)	--	--	--	--	--	--	
voltage drop 12 th deflection (mV)	--	--	--	--	--	--	
supplementary information:							

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Clause	Requirement + Test	Result - Remark	Verdict

16.1	TABLE: insulation resistance		P
item per table 14	test voltage applied between:	measured (MΩ)	required (MΩ)
1	Between all poles connected together and the body, with the switch in the "on" position	>20	5
3	Between the terminals which are electrically connected together when the switch is in the "on" position, the switch being in the "off" position: - micro-gap construction;	>20	2
supplementary information:			

16.2	TABLE: electric strength		P
	rated voltage (V)	230V	—
item per table 14	test voltage applied between:	test voltage (V)	flashover / breakdown (Yes/No)
1	Between all poles connected together and the body, with the switch in the "on" position	2000	No
3	Between the terminals which are electrically connected together when the switch is in the "on" position, the switch being in the "off" position: - micro-gap construction;	1250	No
supplementary information:			

17	TABLE: temperature rise measurements		<Model: OS-181C>	P
	cross-sectional area of conductor not less than 1,5 mm ² (mm ²) (table 15)	2.5mm ²	—	—
	terminal screws: torque (Nm) (2/3 table 3 or appropriate figures 1, 2, 3, 4).....	0.26Nm	—	—
	type of load	1840W (Incandescent lamp); 1000W (Halogen lamp); 300VA (Low voltage halogen lamp); 400VA (Fluorescent lamp).	—	—
	rated current (A) / rated load (W or VA)	See above	—	—
	rated voltage (V)	230V	—	—
	test voltage between 0,9 and 1,1 V _n (V), whichever is the more unfavourable	1.1 X 230V	—	—

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Clause	Requirement + Test	Result - Remark	Verdict

parts of the electronic switch	max. measured temperature rise (K)	permissible temperature rise (K)
Relay 1	38.0/9.4/13.3/10.3	85-45=40.0
X2 capacitor (C1)	38.3/20.7/20.2/21.3	—
Terminal block	28.1/6.3/9.2/7.5	35.0
Varistor (MOV)	23.5/18.2/17.5/18.7	—
E capacitor (C2)	35.5/25.6/26.6/27.3	105-45=60
PWB under R1	41.7/17.6/16.0/17.9	130-45=90
Supporting surface	7.8/1.0/1.6/1.7	—
Enclosure (External part)	11.3/1.4/1.1/1.8	55
supplementary information:		

19	Normal Operation	P
Condition		No. of Operation
For resistive load: test load : 9 A (refer to 60669-2-1) test voltage 1,1 Vn (V): 253V		40000
Contact mechanism for motor speed control: test current, making 6 In (A), breaking In (A); cos phi 0,65		N/A
During the test and after the test, specimen function correctly.		

20.1	TABLE: impact test			P
part of enclosure tested per table 18 (A, B, C, D)		blows per part	height of fall (mm)	comments
D		Top cover	250	No crack
supplementary information:				

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Clause	Requirement + Test	Result - Remark	Verdict

21.2	TABLE: ball pressure test of thermoplastic materials			P
	allowed impression diameter (mm) : ≤ 2 mm			—
part under test	material designation / manufacturer	test temperature (°C)	impression diameter (mm)	
Terminal	Type PA9F / Heavypower	125	1.1	
Enclosure	PC L-1250Y / Teijin	125	0.85	
supplementary information:				

21.3	TABLE: ball pressure test of thermoplastic materials			N
	allowed impression diameter (mm) : ≤ 2 mm			—
part under test	material designation / manufacturer	test temperature (°C) ⁽¹⁾	impression diameter (mm)	
Enclosure	PC L-1250Y / Teijin	70	0.5	
supplementary information:				
⁽¹⁾ 70 °C / 40 °C + highest temperature rise determined during the test of clause 17				

22.1	TABLE: threaded part torque test					P
threaded part identification	diameter of thread (mm)	column number (I, II, or III)	applied torque (Nm)	times (5/10)	no damage	
Screw of terminal	3.0	III	0.4	5	No damage	
Assembly screw	3.0	III	0.5	10	No damage	
supplementary information:						

23.1	TABLE: creepage distances, clearances and distances through sealing compound								P
	rated voltage (V) :								—
item per table 20	creepage distance dcr, clearance cl and distance through sealing compound dtsc at/of:	required cl (mm)	cl (mm)	required dcr (mm)	dcr (mm)	required dtsc (mm)	dtsc (mm)		
1, 6	Between live parts which are separated when the contacts are open	—	—	≥ 3.0	3.4	—	—		
2, 7	Between live parts of different polarity	≥ 3.0	3.2	≥ 3.0	3.2	—	—		

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Clause	Requirement + Test	Result - Remark				Verdict	
3, 8	Between live parts and accessible surfaces of parts of insulation material	≥ 3.0	>10	≥ 3.0	>10	--	--
supplementary information: built-in type motion sensor; Other items shall be evaluated at end-use product							

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Clause	Requirement + Test	Result - Remark	Verdict

24.1.1	TABLE: glow-wire test			P
part under test		material designation / manufacturer	test temperature (°C)	remarks
Enclosure		PC L-1250Y / Teljin	650	Flames and glowing extinguish within 30 s after removal of the glow wire and no ignition of the wrapping tissue
Terminal		Type PA9F / Heavypower	850	No visible flame and sustained glowing and no ignition of the wrapping tissue
supplementary information:				

24.2	TABLE: resistance to tracking			N
	number of drops	50		
part under test	material designation / manufacturer		test voltage (V)	flashover / breakdown (Yes/No)
			175	
supplementary information:				

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Clause	Requirement + Test	Result - Remark	Verdict
101.1.1.1	TABLE: fault conditions test		P
	cross-sectional area of conductor not less than 1,5 mm ² (mm ²) (table 15)	2.5 mm ²	—
	terminal screws: torque (Nm) (2/3 table 3 or appropriate figures 1, 2, 3, 4)	0.26Nm	—
	type of load	Incandescent lamp	—
	rated current (A) / rated load (W or VA)	8A / 1840W	—
	rated voltage (V)	230V	—
	test voltage between 0,9 and 1,1 Vn (V), whichever is the more unfavourable	1.1 X 230 V	—
fault conditions simulated		remarks	verdict
Diode (D1): s/c		Shut down immediately; No hazards	P
ZD1: s/c		Shut down immediately; No hazards	P
Q1 (C-E): s/c		PCB trace opened immediately; No hazards	P
Q1 (C-B): s/c		Normal operation; No hazards	P
R3: s/c		Normal operation; No hazards	P
R1:o/c		Shut down immediately; No hazards	P

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Clause	Requirement + Test	Result - Remark	Verdict

101.1.1.2	TABLE: temperature rise measurements during overload tests		P
	cross-sectional area of conductor not less than 1,5 mm ² (mm ²) (table 15)	2.5 mm ²	—
	terminal screws: torque (Nm) (2/3 table 3 or appropriate figures 1, 2, 3, 4).....	0.26Nm	—
	rated voltage (V)	230V	—
	test voltage between 0,9 and 1,1 Vn (V), whichever is the more unfavourable	1.1 X 230V	—
parts of the electronic switch		max. measured temperature rise (K)	permissible temperature rise (K)
Relay 1		67.1	115-45=70
X2 capacitor (C1)		39.4	—
Terminal block		72.7	90
Varistor (MOV)		26.7	—
E capacitor (C2)		53.4	—
PWB under R1		58.8	140
Supporting surface		14.2	55
Enclosure (External part)		15.1	20
supplementary information:			

102	TABLE: components					P
object/part No.	manufacturer/ trademark	type/model	technical data	compliance to standard	mark(s) of conformity ¹⁾	
		<Refer to separate CDF>				

¹⁾ an asterisk indicates a mark which assures the agreed level of surveillance

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Clause	Requirement + Test	Result - Remark	Verdict
102.4.2	TABLE: temperature rise measurements after test for automatic protective devices which only decrease current to the electronic switch		N
	cross-sectional area of conductor not less than 1,5 mm ² (mm ²) (table 15)	--	---
	terminal screws: torque (Nm) (2/3 table 3 or appropriate figures 1, 2, 3, 4).....	--	---
	type of load	--	---
	rated current (A) / rated load (W or VA)	--	---
	rated voltage (V)	--	---
	test voltage between 0,9 and 1,1 V _n (V), whichever is the more unfavourable	--	---
parts of the electronic switch		max. measured temperature rise (K)	permissible temperature rise (K)
--		--	--
supplementary information:			