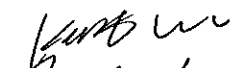
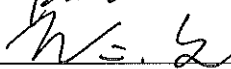


<b>TEST REPORT</b> <b>IEC 60669-2-1</b> <b>Switches for household and similar fixed-electrical installations</b> <b>Part 2-1: Particular requirements - Electronic switches</b>	
<b>Report Reference No.</b> .....	170501036SHA-001
<b>Date of issue</b> .....	2017-09-16
<b>Total number of pages</b> .....	62
<b>Applicant's name</b> .....	TCL-Legrand International Electrical (Huizhou) Co., Ltd.
<b>Address</b> .....	Bldg. B1-B3, East No.39 Hechang 6th Rd., HZZK Hi-tech Industrial Development Zone, Huizhou, Guangdong, China
<b>Test specification:</b>	
<b>Standard</b> .....	IEC 60669-2-1:2002 (Fourth edition) + A1:2008 used in conjunction with IEC 60669-1:1998 (Third edition) + A1:1999 + A2:2006 EN 60669-2-1:2004 + A1: 2009 + A12:2010) (used in conjunction with EN 60669-1:1999 + A1:2002 + A2:2008)
<b>Test procedure</b> .....	Type testing
<b>Non-standard test method</b> .....	N/A
<b>Test Report Form No.</b> .....	IEC60669_2_1E
<b>Test Report Form(s) Originator</b> .....	IMQ S.p.A.
<b>Master TRF</b> .....	Dated 2010-12
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<b>Test item description</b> .....	Dimmer
<b>Trade Mark</b> .....	Legrand
<b>Manufacturer</b> .....	Same as applicant
<b>Model and/or type reference</b> .....	617031, 617331, 617431, 617231, 617032
<b>Rating(s)</b> .....	127V~ or 230V~ 50/60Hz 617031, 617331, 617431, 617231: 60-500W (127V) / 60-1000W (230V) 617032: 60-750W (127V) / 60-1500W (230V)

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<b>Testing procedure and testing location:</b>	
<input checked="" type="checkbox"/> <b>Testing Laboratory:</b>	
Testing location/ address.....:	Intertek Testing Services Shanghai Building No.86, 1198 Qinzhou Road (North), Shanghai 200233, China
<input type="checkbox"/> <b>Associated CB Test Laboratory:</b>	
Testing location/ address.....:	
Tested by (name + signature).....:	Kent Wu 
Approved by (+ signature).....:	William Yu 
<input type="checkbox"/> <b>Testing procedure: TMP</b>	
Tested by (name + signature).....:	
Approved by (+ signature).....:	
Testing location/ address.....:	
<input type="checkbox"/> <b>Testing procedure: WMT</b>	
Tested by (name + signature).....:	
Witnessed by (+ signature).....:	
Approved by (+ signature).....:	
Testing location/ address.....:	
<input type="checkbox"/> <b>Testing procedure: SMT</b>	
Tested by (name + signature).....:	
Approved by (+ signature).....:	
Supervised by (+ signature).....:	
Testing location/ address.....:	
<input type="checkbox"/> <b>Testing procedure: RMT</b>	
Tested by (name + signature).....:	
Approved by (+ signature).....:	
Supervised by (+ signature).....:	
Testing location/ address.....:	

**List of Attachments (including a total number of pages in each attachment):**

Amendment 2 to IEC 60669-2-1: page 53-55

Photo attachment: page 56-62

**Summary of testing:**

1. The device under evaluation is flush-type dimmer switch for fixed installation. Both ON/OFF and dimming function could be obtained by rotating knob. The largest brightness can be reached after knob is rotated to the largest position.
2. There are totally 5 models included in this report: 617031, 617331, 617431, 617231 and 617032. The difference between 31 series and 617032 are rated power, size of heat sink and thermal link, which are listed as below. The only difference among 31 series is colour of cover plate.

Model name	Ratings	Size of cover plate	Ratings of thermal link
617031 617331 617431 617231	127V~ 50/60Hz 60-500W 230V~ 50/60Hz 60-1000W	86x86mm	250VAC 5A 130°C
617032	127V~ 50/60Hz 60-750W 230V~ 50/60Hz 60-1500W	146x86mm	250VAC 10A T <sub>F</sub> : 142°C

Based on above differences, the following models are selected for testing and only the highest temperature rises are recorded in this report.

617032: full test; 617031: (sub) clause 9, 17, 18, 19, 101.1.1.2

Note: after evaluation, tests for lower ratings can be covered by higher ratings.

3. As the request of client, clause 26 (EMC requirements) was not tested, thus they are omitted in this test report.
4. Amendment 2: 2015 to this standard was also checked in this report, and details see the Annex A (page 53 to 55).
5. Determination of the test result includes consideration of measurement uncertainty from the test equipment and methods.
6. We conclude that the product(s) presented in this test report complies (comply) with the standard IEC 60669-2-1:2002 (Fourth edition) + A1:2008 + A2: 2015 used in conjunction with IEC 60669-1:1998 (Third edition) + A1:1999 + A2:2006 according to the test results on the submitted samples, EXCEPT FOR EMC.

**Tests performed (name of test and test clause):**

Full tests except EMC requirements of clause 26

**Testing location:**

Intertek Testing Services Shanghai

**Summary of compliance with National Differences:**

N/A

**Copy of marking plate (617031 as example)**

Note: other modes have the same marking format as 617032 except model name and power.

**Test item particulars:**

Type of electronic switch and its function (examples given in Annex AA) .....	Electronic dimmer
Pattern number .....	6
Contact opening (gap) and switch performance .....	<del>normal gap / mini-gap /</del> <b>micro-gap</b> / <del>without contact gap</del> (semiconductor switching device)
Degree of protection against access to hazardous parts and against harmful effects due to the ingress of solid foreign objects .....	<b>IP2X</b> / <del>IP4X / IP5X</del>
Degree of protection against harmful effects due to the ingress of water .....	<b>IPX0</b> / <del>IPX4 / IPX5</del>
Method of actuating .....	<b>Rotary (potentiometer)</b> / <del>tumbler / rocker / push-button / cord-operated / momentary contact / touch / proximity / optical / acoustic / Electronic RCS / Electronic TDS / other external influences</del>
Method of mounting .....	<del>surface-type /</del> <b>flush-type</b> / <del>semi flush-type / panel-type / architrave-type / height &gt; 1,7 m</del>
Method of installation .....	<b>design A</b> / <del>design B</del>
Type of terminals .....	<b>screw-type</b> / <del>screwless (rigid) / screwless (rigid and flexible)</del>
Flexible cable outlet .....	<b>without</b> / <del>with</del>
Rated current (A) / Rated load (VA or W) .....	<b>31 series: 500W (127V) / 1000W (230V)</b> <b>617032: 750W (127V) / 1500W (230V)</b>
Minimum current (A) / Minimum load (VA or W) .....	60W
Kind of load controlled by the switch .....	<b>incandescent lamp</b> / <del>fluorescent lamps / motors / declared load:</del>
Type of switching mechanism .....	<del>directly operated / sequentially operated / bistable / monostable (only for RCS)</del>
Kind of energization of the control circuit .....	<del>Electronic RCS energized by impulses / Electronics RCS permanently energized</del>
Type of control mechanism .....	<del>mechanical / thermal / pneumatic / hydraulic / electrical / combination(s) of the previous (only TDS)</del>
Rated control voltage (V) .....	<b>a.c.</b> / <del>d.c.</del>
Rated control current (A) .....	<b>a.c.</b> / <del>d.c.</del>
Rated voltage (V) .....	<b>127 / 250V</b>
Rated frequency (Hz) .....	<b>50 / 60</b>
Characteristic of fuses .....	Thermal link
Electronics RCS or TDS having .....	<b>SELV parts</b> / <del>PELV parts</del>

**Possible test case verdicts:**

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

**Testing:**

Date of receipt of test item .....: 2017-05-10

Date (s) of performance of tests .....: 2017-05-15 to 2017-09-08

**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.

**Manufacturer's Declaration per sub-clause 6.2.5 of IEC 60669-2:**


The application for obtaining a CB Test Certificate ☐ Yes  
 includes more than one factory location and a ☒ Not applicable  
 declaration from the Manufacturer stating that the  
 sample(s) submitted for evaluation is (are)  
 representative of the products from each factory  
 has been provided .....

When differences exist; they shall be identified in the General product information section.

Name and address of factory (ies).....: Same as applicant

**General product information:**

Flush-type dimmer for fixed installation.

IEC 60669-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
<b>8</b>	<b>MARKING</b>		
8.1	Switches marked with:		
	- rated voltage (V) .....	127 / 230	P
	- rated control voltage, if different from rated voltage (V) .....		N/A
	- rated current (A) or rated load (VA or W) .....	See page 3	P
	- symbol for nature of supply .....	~	P
	- manufacturer's or responsible vendor's name, trade mark or identification mark .....	Legrand	P
	- type reference .....	See page 3	P
	- symbol for mini-gap construction (m) .....		N/A
	- symbol for micro-gap construction ( $\mu$ ) .....	$\mu$	P
	- symbol for semiconductor switching device ( $\epsilon$ ) .....		N/A
	- first IP characteristic numeral, if declared higher than 2, in which case the second characteristic numeral is also marked .....		N/A
	- second IP characteristic numeral, if declared higher than 0, in which case the first characteristic numeral is also marked .....		N/A
	- rated frequency (Hz) .....	50 / 60	P
	- rating and type of any fuse incorporated .....	-	N/A
	- symbol for kind of load (see 8.2)		P
	- the term "extension unit", if applicable, followed by the identifying reference .....		N/A
	- the minimum height for mounting the switch indicated in the installation instruction if there is a restriction (see 10.1) .....		N/A
	Switches with screwless terminals: marked with an indication of the suitability to accept rigid conductors only (if any) .....		N/A
	General purpose electronic switches with included automatic function, number of operations shall be stated in the accompanying instruction sheet when number of operation is higher than the indicated in sub clause 19.101, 19.102 and 19.104.		N/A
	- symbol for the adjustment of the delay time, if applicable .....		N/A
	- symbol for the positions "Permanent on" and "Permanent off", if applicable .....		N/A
	- symbol for "Delay time" .....		N/A
8.2	Symbols used: as required in the standard		
	Marking for the nature of supply placed next to the marking for rated current and rated voltage		P

IEC 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)	See page 3	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		N/A
	- symbol for mini-gap construction, micro-gap construction or semiconductor switching device, if applicable	μ	P
	- type reference	See page 3	P
	Information concerning more than one type of load not already marked on the electronic switch are stated in the accompanying instruction sheet		N/A
	Minimum and maximum current/load are stated for each type of load		N/A
	Information of the iron core transformer intended to be used with the electronic switch are given in the instruction sheet		N/A
	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/A
	IP code, when applicable, marked so as to be easily discernible when the switch is mounted and wired as in normal use		N/A
	Marking clearly visible and easily legible		P
	Markings are placed on parts which cannot be removed 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	L1, L2	P
	Indications not placed on screws or other easily removable part		P
	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		N/A
	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

IEC 60669-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Other terminals marked corresponding to the installation instructions		N/A
	Installation not made clear by the markings: a wiring diagram is provided with each electronic switch		N/A
	Terminals for the control circuit of a priority RCS with a current sensitive coil or voltage sensitive coil are marked with the appropriate symbol indicated in 8.2		N/A
	Terminals for the control circuit: marked according to IEC 60445 and/or with the symbols according to 8.2		N/A
8.5	Neutral terminals: N .....		N/A
	Earthing terminals: [earth symbol] .....		N/A
	Markings not placed on screws or other easily removable parts		N/A
	Terminals for conductors not forming part of the main function of the switch:		
	- clearly identified unless their purpose is self evident, or		N/A
	- indicated in a wiring diagram fixed to the accessory		N/A
	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/A
	- their physical dimension or relative location		N/A
8.6	Switches marked to indicate the switch position: they are so marked that the direction of movement of the actuating member to its different positions or the actual position is clearly indicated.....		P
	Switches having more than one actuating member: marking indicates the effect achieved by the operation		N/A
	Marking clearly visible on the front of the switch	Printed on the cover plate	P
	Not possible to fix cover, cover plate, or removable actuating members in an incorrect position		P
	Symbols for "on" and "off" not used for indication of switch positions unless clearly indicate the direction of movement of the actuating members		P
	Off-state not marked with an "O" if the circuit on the load side is considered as live		N/A
8.6.101	Actual state of electronic switches intended to control the brightness of lamps is indicated		P
	- marking on the on-/off-state position		N/A
	- indicator lamp		N/A
	- adjusting the lamp dimmer in the lowest control state and at rated voltage minus 10%: light still visible		P



IEC 60669-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	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		P
	not possible to reduce the lowest setting without a tool		P
	- for fluorescent lamps:		
	the adjustment of lamp dimmers is made by the manufacturer		N/A
	it is possible for the installer to alter the lowest setting if indicated in an installation instruction		N/A
8.7	Red colour only for push-button to open the circuit		N/A
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		N/A
	Electronic switch containing a viewing window (lens) intended to be mounted at a height greater 1.7 m: information stated in the instruction sheet		N/A
8.9	Marking durable and easily legible. Test: 15 s with water and 15 s with petroleum spirit		P

<b>9</b>	<b>CHECKING OF DIMENSIONS</b>		
	Switches and boxes comply with the appropriate standard sheets, if any	Checked with BS 4662 as a reference (*BS)	P
	Electronic switches with dimensions other than those specified in the standard sheets (if any) if they are supplied with suitable boxes		N/A

<b>10</b>	<b>PROTECTION AGAINST ELECTRIC SHOCK</b>		
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		N/A
	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		N/A

IEC 60669-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	- viewing windows or the like on electronic switches intended to be mounted at a height > 1,7 m with a force of 30 N		N/A
	During the test: switches not deform and no live parts accessible		N/A
10.2	Knobs, operating levers, push buttons, rockers and the like: of insulating material, unless:		P
	- accessible metal parts separated from metal parts of mechanism by double or reinforced insulation, or		N/A
	- reliably connected to earth		N/A
	For touch sensitive electronic switches the associated protective impedance does not have to comply with the requirements of clauses 16 and 23	No protective impedance provided	N/A
	Accessible parts (for example, sensing surface) of electronic switches with IPX0 are connected to live parts by means of a protective impedance that:		N/A
	- consists of at least two independent resistors or independent capacitors in series of the same nominal value, or a combination of both		N/A
	- resistors comply with 102.3		N/A
	- capacitors comply with 102.2		N/A
	The removal of protective impedance is only possible by destruction of the electronic switch or by rendering it unusable		N/A
	Test carried out between accessible metal parts and earth, through a non-inductive resistor of 2 k $\Omega$ :		
	current measured: $\leq 0,7$ mA (peak value), for a.c. up to 1 kHz .....		N/A
	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/A
	current measured: $\leq 2$ mA, for d.c. ....		N/A
10.3	Accessible parts of switches with $I_n \leq 16$ A: made of insulating material		P
10.3.1	Metal covers or cover plates protected by supplementary insulation made by insulating linings or insulating barriers		N/A
	Insulating linings or insulating barriers:		
	- cannot be removed without being permanently damaged, or designed that		N/A

IEC 60669-2-1			
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/A
10.3.2	Earthing of metal covers or cover plates: connection of low resistance		N/A
10.4	Metal parts of mechanism not insulated from live parts: not protrude from enclosure		N/A
	Switches operated by means of a removable key or similar device: metal parts of mechanism insulated from live parts		N/A
10.5	Metal parts of mechanism not accessible and insulated from accessible metal parts, unless		P
	- separated from live parts (creepage distances and clearances have at least twice the value specified in clause 23), or		N/A
	- reliably connected to earth		N/A
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		N/A
	key or intermediate part: insulated from metal parts of mechanism, unless		N/A
	creepage distances and clearances between live parts and metal parts of mechanism have at least twice the values specified in clause 23		N/A
10.7	Cord-operated switches: impossible to touch live parts when fitting or replacing the pull cord		N/A
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 dismantled from its supporting means for the replacement of the fuse-link)		N/A
	Compliance is checked with the test probe B of IEC 61032 (10 N); test probe does not touch live parts		N/A
10.102	Hole in electronic switches for adjusting the setting:		
	The adjustment does not involve the risk of an electric shock		N/A
	Compliance is checked by applying a test pin according to figure 101 through the hole; test pin does not touch live parts		N/A

IEC 60669-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
10.103	Ventilation openings over live parts:		
	A foreign body introduced into these openings do not come into contact with any live parts		N/A
	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/A

<b>11</b>	<b>PROVISION FOR EARTHING</b>		
	Clause not applicable to SELV electronic switches		N/A
11.1	Accessible metal parts: provided with, or permanently and reliably connected to, an earthing terminal		N/A
11.2	Earthing terminals: with screw clamping or screwless terminals and comply with clause 12		N/A
	Capacity of earthing terminals of the same size as the corresponding terminals for the supply conductors		N/A
	Any additional external earthing terminal has a size suitable for conductors of at least 6 mm <sup>2</sup> (mm <sup>2</sup> ) .....		N/A
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/A
	- adequate space for a floating terminal allowing the connection of an incoming and outgoing conductor		N/A
11.4	Connection between earthing terminal and accessible metal parts: of low resistance		N/A
	Test current equal to 1,5 I <sub>n</sub> or 25 A (A) .....		—
	Resistance ≤ 0,05 Ω (Ω) .....		N/A

<b>12</b>	<b>TERMINALS</b>		
12.1	General		
	Switches provided with screw-type terminals or with screwless terminals .....	Screw-type	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
	Terminals having screw clamping complying with IEC 60998-2-1 are considered to be in compliance with the requirements and the tests of Subclause 12.2, except those of 12.2.6 and 12.2.7 and 12.2.8, provided they are chosen according Table 2.		N/A
12.2	Terminals with screw clamping for external copper conductors		

IEC 60669-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
12.2.1	Switches provided with terminals which allows the proper connection of copper conductors as shows in table 2		P
	Rated current (A) .....	6,5A (230V/1500W)	—
	Type of conductor (rigid / flexible) .....	Rigid	—
	Smallest / largest cross-sectional area (mm <sup>2</sup> ) .....	0,75 / 1,5	—
	Diameter of largest conductor (mm) .....	1,45	—
	Figure of terminal .....	1 / 2 / 3 / 4 / 5	—
	Minimum diameter D (minimum dimensions) of conductor space: required (mm); measured (mm) ...:	2,5; 3,4	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	See appended table 12.2.5	P
	During the test: conductor not slip out, no break near clamping unit and no damage		P
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
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) .....	6,5A (230V/1500W)	—
	- solid rigid copper conductor of the largest cross-sectional area (mm <sup>2</sup> ) (table 2) .....	1,5	—
	- torque (Nm) (table 3 or appropriate figures 1, 2, 3, 4) .....	0,5	—
	Screws and nuts tightened and loosened 5 times. During the test: terminals not work loose and show no damage		P

IEC 60669-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
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		P
12.2.10	Earthing terminals: no risk of corrosion		N/A
	Body of brass or other metal no less resistant to corrosion		N/A
	If the body is a part of a frame or enclosure of aluminium alloy, precautions are taken to avoid the risk of corrosion		N/A
12.2.11	Pillar terminals: distance g no less than the value specified in figure 1: required (mm); measured (mm) : 1,5; >1,8		P
	Mantle terminals: distance g no less than the value specified in figure 5: required (mm); measured (mm) :		N/A
12.2.12	Lug terminals:		
	- used only for switches having rated current $\geq 40$ A		N/A
	- fitted with spring washers or equally effective locking means		N/A
12.3	Screwless terminals for external copper conductors		
12.3.1	Screwless terminals of the type suitable for:		
	- for rigid copper conductors only, or		N/A
	- for both rigid and flexible copper conductors (tests carried out with rigid and then repeated with flexible conductors)		N/A
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		N/A
	Rated current (A) .....		—
	Type of conductor (rigid / flexible) .....		—
	Smallest / largest cross-sectional area (mm <sup>2</sup> ) .....		—
	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/A
12.3.4	Parts of screwless terminals intended for carrying current of materials as specified in 22.5		N/A
12.3.5	Screwless terminals clamp specified conductors with sufficient contact pressure without undue damage to the conductor		N/A
	Conductor clamped between metal surfaces		N/A
12.3.6	It is clear how the connection and disconnection of the conductors is to be made		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	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/A
	It is not possible to confuse the opening for the use of a tool with the opening intended for the conductor		N/A
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/A
	- during disconnection, conductors can be disconnected either at the same time or separately;		N/A
	- each conductor introduced in a separate clamping unit.		N/A
	It is possible clamp securely any number of conductors up to the maximum as designed. Number of conductors; Nominal cross-sectional area (mm <sup>2</sup> ) .....		N/A
12.3.8	Screwless terminals: adequate insertion obvious and over-insertion prevented		N/A
	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/A
12.3.9	Screwless terminals properly fixed to the switch		N/A
	Not work loose when conductors are connected or disconnected		N/A
	Self-hardening resins used to fix terminals not subject to mechanical stress		N/A
12.3.10	Screwless terminals withstand mechanical stresses occurring in normal use	See appended table 12.3.10	N/A
	During application of the pull conductor not come out of the terminal		N/A
	Test with apparatus shown in figure 10	See appended table 12.3.10	N/A
	During the test conductors not move noticeably in the clamping unit		N/A
	After these tests: neither terminals nor clamping means have worked loose and conductors show no deterioration		N/A
12.3.11	Screwless terminals withstand electrical and thermal stresses occurring in normal use	See appended table 12.3.11	N/A
	After the test: inspection show no changes		N/A
	Repetition of test according to 12.3.10: screwless terminals withstand mechanical stresses occurring in normal use	See appended table 12.3.11	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	During application of the pull conductor not come out of the terminal		N/A
	Test with apparatus shown in figure 10	See appended table 12.3.11	N/A
	During the test conductors not move noticeably in the clamping unit		N/A
	After these tests: neither terminals nor clamping means have worked loose and conductors show no deterioration		N/A
12.3.12	Screwless terminals: connected rigid solid conductor remains clamped, even when deflected during normal installation	See appended table 12.3.12	N/A

<b>13</b>	<b>CONSTRUCTIONAL REQUIREMENTS</b>		
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		N/A
	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	Cover plate fixed through snap-in structure	P
	- 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)		N/A
	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		P
13.3.1	Covers, cover plates or actuating members whose fixing is of the screw-type:		
	Compliance checked by inspection only		N/A



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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)		N/A
	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/A
	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/A
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)		N/A
	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/A
	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)	Cover plate removed	P
13.4	Switches: no free openings in their enclosures according to their IP classification		P
	Free openings according to 10.102 and 10.103 are accepted		N/A
13.5	Knobs of electronic switches are securely fixed in a reliable manner		P
	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/A
	Pull and push tests:		
	- axial pull is likely to be applied: 30 N for 1 min		P
	- axial pull is unlikely to be applied: 15 N for 1 min		N/A
	- axial push: 30 N for 1 min		P

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Clause	Requirement + Test	Result - Remark	Verdict
	During and after these tests:		
	- the electronic switch shows no damage		P
	- an knob have not moved so as to impair compliance with this standard	No hazard occurred	P
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		N/A
	Fixing of each base independent of the fixing of the combination to the mounting surface		N/A
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		N/A
	Surface-type switches with IPX4 or IPX5 have provisions for opening a drain hole		N/A
	Switches provided with a drain hole: it is not less than 5 mm in diameter, or 20 mm <sup>2</sup> in area with a width and a length not less than 3 mm .....	Ø mm / mm <sup>2</sup>	N/A
	Drain hole: effective		N/A
	Lid springs (if any): of corrosion resistant material (bronze or stainless steel)		N/A
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		P
	Base have adequate stability when mounted in the box		P
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		N/A
	- adequate space for a floating terminal		N/A
13.12	Inlet openings: allow the introduction of the conduit or the sheath of the cable		N/A
	Surface-type switches: intended conduit or protective covering can enter at least 1 mm into the enclosure		N/A
	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/A

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Clause	Requirement + Test	Result - Remark	Verdict
	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) .....		N/A
13.13	Surface-type switches: provision for back entry (if are intended)		N/A
13.14	Membranes or the like (if provided): replaceable		N/A
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		N/A
	Test on electronic switches fitted with membranes, lenses and the like subjected to the ageing treatment specified in 15.1:		
	Electronic switches placed at $40\text{ °C} \pm 2\text{ °C}$ 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/A
	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/A
	Test repeated on membranes, lenses and the like not subjected to any treatment		N/A
13.15.2	Membranes in inlet openings: introduction of the cables into the accessory permitted when the ambient temperature is low		N/A
	Test on membranes not subjected to the ageing treatment specified in 15.1 and fitted with the switches		
	Switches kept at $-5\text{ °C}$ for 2 h: possibility to introduce cables of the heaviest type through the membranes		N/A
	After the test: no harmful deformation, cracks or similar damage		N/A
13.16	Flexible cable outlet switches: flexible cable (60245 IEC 66 or 60227 IEC 53, or as specified by the manufacturer) may enter the switch through a suitable hole, groove or gland .....		N/A
	Maximum dimension of flexible cable having conductors specified in table B.1 accepted by the entry:		
	- rated current (A) .....		—
	- cross-sectional area (mm <sup>2</sup> ) (min 1,5 mm <sup>2</sup> ) .....		—
	Entry shaped to prevent damage to the flexible cable		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	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 <sup>2</sup> .....		N/A
	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/A
	Switches with flexible cable outlet: provided with cable anchorage		N/A
	Cable anchorage: contains the sheath, of insulating material or provided with an insulating lining fixed to the metal parts		N/A
	Cable anchorage: anchor the flexible cable securely to the switch		N/A
	Cable anchorage cannot be released from the outside		N/A
	Use of a special purpose tool not required		N/A
	Screws: not serve to fix any other component, unless		N/A
	- switch is rendered manifestly incomplete if component omitted or replaced in an incorrect position, or		N/A
	- component cannot be removed without further use of a tool		N/A
	Pull test (30 N, 25 times): cable 60227 IEC 53, cross-sectional area 1,5 mm <sup>2</sup> ; torque (Nm) (2/3 table 3) .....		N/A
	Torque test: torque 0,15 Nm for 1 min, cable not displaced > 2 mm .....		N/A
	Pull test (60 N, 25 times): cable 60245 IEC 66, diameter (mm) of cable; torque (Nm) (2/3 table 3) ...		N/A
	Torque test: torque 0,35 Nm for 1 min, cable not displaced > 2 mm .....		N/A
	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/A
13.101	Automatic protective devices incorporated in electronic switches for lamp circuits have at least micro-disconnection		P
	Cut-outs in electronic switches for motor speed control circuits: non-self-resetting		N/A
13.102	Electronic switches for the control of the voltage of		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	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 $\pm 2^\circ$ :		
13.103	TDS shall be of the resetting type		N/A

<b>14</b>	<b>MECHANISM</b>		
	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/A
	- 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/A
14.3	No undue arcing in slowly operation		P
	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		P
14.4	Switches of pattern numbers 2, 3, 03 and 6/2 make and break all poles substantially simultaneously		N/A
	Neutral pole of switches of pattern numbers 03 not make after or break before the other poles		N/A
14.5	Action of the mechanism: independent of the presence of cover or cover plate. Test: no flicker		N/A
14.6	Cord-operated switches: effecting a change by application and removal a pull not exceeding:		
	- 45 N applied vertically, and		N/A
	- 65 N applied at $45^\circ \pm 5^\circ$		N/A
14.101	Position indicator used in RCS equipped with an incorporated hand-operated device indicates the position of the switching circuit clearly and without ambiguity		N/A
	TDS equipped with an incorporated hand-operated device and a position indicator is used indicates the position of the switching circuit clearly and without ambiguity		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
<b>15</b>	<b>RESISTANCE TO AGEING, PROTECTION PROVIDED BY ENCLOSURES OF SWITCHES, AND RESISTANCE TO HUMIDITY</b>		
15.1	Resistance to ageing		
	Switches and boxes placed for 7 days (168 h) in a heating cabinet at 70 °C ± 2 °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	IP 20	P
	Glands: torque (Nm) (2/3 of torque applied in 20.3) :	No glands used	—
	Screws of the enclosure: torque (Nm) (2/3 table 3) .....	No screws used	—
15.2.1.1	Protection against access to hazardous parts		
	Appropriate test according to IEC 60529 .....	IP2X	P
15.2.1.2	Protection against harmful effects due to ingress of solid foreign objects		
	Appropriate test according to IEC 60529 .....	IP2X	N/A
	Dust not penetrate in quantity to interfere with satisfactory operation or to impair safety		N/A
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	N/A
	Appropriate test according to IEC 60529 .....		N/A
	Flush-type and semi-flush-type switches fixed:		
	- in a test wall using an appropriate box in accordance with the manufacturer's instructions		N/A
	- in a test wall according to figure 27		N/A
	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/A
15.3	Resistance to humidity		

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Clause	Requirement + Test	Result - Remark	Verdict

	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/A
	After this treatment: specimens show no damage		P

<b>16</b>	<b>INSULATION RESISTANCE AND ELECTRIC STRENGTH</b>		
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

<b>17</b>	<b>TEMPERATURE RISE</b>		
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		N/A

<b>18</b>	<b>MAKING AND BREAKING CAPACITY</b>		
	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 .....	617031 / 617032	—

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Clause	Requirement + Test	Result - Remark	Verdict
	Pattern number .....	6	—
	Rated current (A) / Rated load (W or VA) .....	617031: 4,3A (230V / 1000W) 617032: 6,5A (230V / 1500W)	—
	Rated voltage (V) .....	230V	—
	Test for electronics switches for the control of:		
	- fluorescent lamp loads, as specified in 18.1 of part 1;		N/A
	- motor speed control circuits, as specified in 18.1 of part 1 and, additionally, in 18.101;		N/A
	- 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;		N/A
	- voltage of electronic step-down converters for extra low-voltage incandescent lamps, as specified in 18.2 of part 1;		N/A
	- other types of load, as specified in 18.1 and 18.2 of part 1.		P
	Rate of operation (operation per minute) .....	30 operations per minute	—
	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 <sup>2</sup> ) .....	1,5	—
18.1	Test with cos $\phi$ 0,3 alternating current		
	- test voltage (1,1 V <sub>n</sub> ) (V) .....	253	—
	- test current (1,25 I <sub>n</sub> ) (cos $\phi$ 0,3) (A) .....	617031: 5,4A 617032: 8,1A	—
	- 200 operations; rate (operations per minute) .....	30 operations per minute	—
	- 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 .....		—
	- samples number .....	A, B, C	—
	During the test: no sustained arcing		P
	After the test: specimens show no damage		P
	Test with cos $\phi$ 0,3 alternating current for electronics TDS		N/A
	- test voltage (1,1 V <sub>n</sub> ) (V) .....		—
	- test current (1,25 I <sub>n</sub> ) (cos $\phi$ 0,3) (A) .....		—
	- 200 operations; rate (operations per minute) .....		—
	- electronic TDS whose rate of operation is limited		—



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Clause	Requirement + Test	Result - Remark	Verdict
	by their application (for example, heat and light sensors): electronic TDS 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 .....		
	- samples number .....		—
	During the test: no sustained arcing		N/A
	After the test: specimens show no damage		N/A
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)		
	- test voltage ( $V_n$ ) (V) .....	240	—
	- test current ( $\geq 1,2 I_n$ ) (A) .....	617031: 5,2A 617032: 7,8A	—
	- number of 200 W tungsten filament lamps .....	617031: 7 617032: 10	—
	- 200 operations; rate (operations per minute) .....	30 operations per minute	—
	- samples number .....	A, B, C	—
	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) :		—
	Making: 50 cycles with: test current: $9 I_n$ (A); test voltage: $V_n$ (V); $\cos\phi$ $0.8 \pm 0.05$ .....		N/A
	Breaking: 50 cycles with: test current: $6 I_n$ (A); test voltage: $V_n$ (V); $\cos\phi$ $0.6 \pm 0.05$		N/A
	During the test: no sustained arcing		N/A
	After the test: specimens show no damage		N/A
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 ( $V_n$ ) (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/A
	After the test: specimens show no damage		N/A
19	<b>NORMAL OPERATION</b>		
	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		—

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Clause	Requirement + Test	Result - Remark	Verdict
	specified by the manufacturer (operation per minute) .....		
	For general purpose electronic switches with included automatic function the number of operations for tests of subclauses 19.101, 19.102 and 19.104 is that specified in the relevant subclause.		—
	If a manufacturer declares a number of operation higher than those indicated in the relevant subclause, the tests shall be made according to declared value.		—
	Electronic RCS withstand without excessive wear or other harmful effect, the mechanical, electrical and thermal stresses occurring in normal use		N/A
	- model/type reference .....		—
	- pattern number .....		—
	- nominal cross-sectional area per clause 18 (mm <sup>2</sup> ) .....		—
	- test voltage (Vn) (V) .....		—
	- test current (In) (cos φ 0,6) (A) .....		—
	- number of operations per table 17 .....		—
	- rate (operations per minute) .....		—
	- samples number .....		—
	Reduced electric strength per clause 16	See appended table 19.1	N/A
	Temperature rise test per clause 17 after normal operation	See appended table 19.1	N/A
	After the tests the specimens not show:		
	- wear impairing their further use;		N/A
	- discrepancy between the position of the actuating member (if indicated) and that of the moving contacts		N/A
	- deterioration of enclosures, insulating lining or barriers;		N/A
	- seepage of sealing compound		N/A
	- loosening of electrical or mechanical connections;		N/A
	- displacement of moving contacts of switches pattern number 2, 3, 03 or 6/2		N/A
	No sustained arcing in slowly operation (sub-clause 14.3)		N/A
	RCS equipped with an incorporated hand-operated device acting directly on the switching circuit:		
	- 10 % of operations indicated in table 17 made by hand or in an equivalent manner .....		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- no sustained arcing in slowly operation (sub-clause 14.3 for a.c. only) .....		N/A
	- control circuit supplied as specified in clause 18 for the remaining 90 % of the operations .....		N/A
	During normal operation test: failures allowed within 1 %; no more than three consecutive failures allowed		N/A
	Electronics TDS withstand without excessive wear or other harmful effect, the mechanical, electrical and thermal stresses occurring in normal use		N/A
	- model/type reference .....		—
	- pattern number .....		—
	- nominal cross-sectional area per clause 18 (mm <sup>2</sup> ) .....		—
	- test voltage (Vn) (V) .....		—
	- test voltage applied to control circuit (rated control voltage) (V) .....		—
	- test current (In) (cos φ 0,6) (A) .....		—
	- adjustable TDS: adjusted delay time (s) .....		—
	- adjusted switching time interval between off and on (s) .....		—
	- number of operations indicated in table 17 (maximum test duration for adjustable and non-adjustable TDS: 1000 h) .....	40000 / 20000 / 10000 / 5000	—
	TDS equipped with an incorporated hand-operated device acting directly on the switching circuit:		
	- 10 % of operations indicated in table 17 made by hand or in an equivalent manner .....		N/A
	- no sustained arcing in slowly operation (sub-clause 14.3 for a.c. only) .....		N/A
	During normal operation test: failures allowed within 1 %; no more than three consecutive failures allowed		N/A
	- samples number .....		—
	Reduced electric strength per clause 16	See appended table 19.1	N/A
	Temperature rise test per clause 17 after normal operation	See appended table 19.1	N/A
	After the tests the specimens not show:		
	- wear impairing their further use;		N/A
	- discrepancy between the position of the actuating member (if indicated) and that of the moving contacts		N/A
	- deterioration of enclosures, insulating lining or barriers;		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- seepage of sealing compound		N/A
	- loosening of electrical or mechanical connections;		N/A
	- displacement of moving contacts of switches pattern number 2, 3, 03 or 6/2		N/A
	No sustained arcing in slowly operation (sub-clause 14.3)		
19.101	Contact mechanisms intended for incandescent lamp circuits and dimmers for step-down converter; number of operations 40.000:		
	Rate of operation (operation per minute) .....	30 operations per minute	—
	Rated current (A) / Rated load (W or VA) .....	617031: 4,3A 617032: 6,5A	—
	Rated voltage (V) .....	230V	—
	During the test: specimens function correctly		P
	No sustained arcing in slowly operation (sub-clause 14.3)		P
	Contact mechanism intended for motor speed control circuits; number of operations 40000:		
	Making: test current: 6 I <sub>n</sub> (A); test voltage: V <sub>n</sub> (V); cosφ 0.65 ± 0.05 .....		N/A
	Breaking: test current I <sub>n</sub> (A); test voltage V <sub>n</sub> (V); cosφ 0.65 ± 0.05 .....		N/A
	During the test: specimens function correctly		N/A
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 converter tested according 19.101:		
	- rate of operation (operation per minute) .....		—
	- test voltage (V <sub>n</sub> ); test current (I <sub>n</sub> ) (cos φ 0,9); number of operations with load A .....		N/A
	- test voltage (V <sub>n</sub> ); 100 operations with load B		N/A
	During the test: copper wire F not melt, specimens function correctly, no sustained arcing or welding of contacts		N/A
19.103	Semiconductor switching devices and/or electronic regulating units incorporated in electronic switches:		
	Rated current (A) / Rated load (W or VA) .....	617031: 1000W 617032: 1500W	—
	Rated voltage (V) .....	230	—
	Test voltage: 1.1 V <sub>n</sub> (V) .....	253	—
	Switch state changed 10 times by means of the sensing surface or unit, or/and		P

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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		P
	Additional test, where appropriate:		
	Switch state changed 10 times by means of an electronic extension unit, and/or		N/A
	Setting value altered 10 times from min to max and back to min by means of an electronic extension unit		N/A
	During the test: specimens operate correctly		P
19.104	Mechanical control units incorporate in electronic switches:		
	Type of mechanical control unit .....	<del>push button</del> / <b>potentiometer</b> / <del>other requiring manual operation</del>	—
	Rated current (A) / Rated load (W or VA) .....	617031: 1000W 617032: 1500W	—
	Rated voltage (V) .....	230	—
	Test voltage: 1.1 V <sub>n</sub> (V) .....	253	—
	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 .....	30 operations per minute	—
	During the test: specimens function correctly		P
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) .....	60W	—
	Test voltage: 0,9 V <sub>n</sub> (V) .....	207V	—
	Switch state changed 10 times over the whole range from min to max and back to min, and/or		P
	Setting value altered 10 times over the whole range from min to max and back to min		P
	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/A
	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/A
	During the test: electronic switch functions correctly		P
	Reduced electric strength per clause 16	See appended table 19	P
	Temperature rise test after normal operation per clause 17:		
	- electronic switch state not change		P
	- fuses and other protective devices not operate	Thermal link	P

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Clause	Requirement + Test	Result - Remark	Verdict
	- permissible temperature rises determined in table 102, column concerning clause 17, not exceeded	See appended table 19	P
	After the test, electronic switch is in operating condition		P
	Sealing compounds, if any, have not flowed		N/A
	Evaluation of compliance after the normal operation: after the tests the specimens shall not show:		
	- wear impairing their further use;		P
	- discrepancy between the position of the actuating member (if indicated) and that of the moving contacts;		P
	- deterioration of enclosures, insulating lining or barriers;		P
	- loosening of electrical or mechanical connections;		P
	- seepage of sealing compound;		N/A
	- displacement of the moving contacts of electronic switches of pattern number 2		N/A
19.106	Test for electronic RCS energized by impulses (under no-load conditions):		
	RCS operate as intended at a control voltage between 0,9 and 1,1 times the rated value	See appended table 19.106	N/A
	Electronic TDS operate as intended at the control voltage between 0,9 and 1,1 times the rated value		
	Test (under no-load conditions):		
	- rated control voltage (V) .....		—
	- 20 operations with a control voltage of 0,9 times the rated value (V) .....		—
	- 20 operations with a control voltage of 1,1 times the rated value (V) .....		—
	TDS operated as intended (differences in delay time permitted according to 19.102)		N/A
19.107	Electronic TDS have an adequate repetitive accuracy of delay time		N/A
	Test (under no-load conditions):		
	- rated control voltage (applied ten times) (V) .....		—
	- adjustable TDS: delay time set 2,5 min approximately if possible, otherwise, test made with the delay time specified by the manufacturer (s) .....		—
	Mean value of delay times measured (s) .....	- s	—
	Maximum / minimum values of delay time measured (s) .....	- s / - s	—
	Maximum / minimum values of delay time do not deviate by more than 15 % from the mean value .....	- % / - %	—

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Clause	Requirement + Test	Result - Remark	Verdict
19.108	Electronic TDS revert to the full delay time when the operating means is actuated during the delay time period		N/A
	Adjustable TDS: three specimens initiated at rated control voltage and after 1 min initiated again at rated control voltage:		
	- rated control voltage (V) .....		—
	- delay time adjusted between 2 min and 3 min (s) (V) .....		—
	Total delay time resulting for each specimens is between 3 min and 4 min (min) .....		N/A
	Non-adjustable TDS: three specimens initiated at rated control voltage and after 1 min initiated again at rated control voltage:		
	- rated control voltage (V) .....		—
	- delay time (declared by the manufacturer) (min) ...		—
	Total delay time is the delay time (declared by the manufacturer) $\pm 5\%$ plus 1 min (min) .....		N/A
	Non-adjustable TDS when the delay time is less than 1 min: three specimens initiated at rated control voltage and after half the delay time declared by the manufacturer initiated again at rated control voltage:		
	- rated control voltage (V) .....		—
	- delay time (declared by the manufacturer) (min) ...		—
	Total delay time is 1,5 times the delay time (declared by the manufacturer) $\pm 5\%$ (min) .....		N/A

<b>20</b>	<b>MECHANICAL STRENGTH</b>		
	Switches, boxes and screwed glands have adequate mechanical strength		P
20.1	For all types of switches and for boxes: 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) .....		N/A
	Bases then fixed to a flat steel sheet		N/A
	Torque applied to fixing screws (Nm) .....	0,5 Nm / 1,2 Nm	—
	During and after the test: bases show no damage		N/A
20.3	Screwed glands of switches other than ordinary: torque test		
	- diameter of cylindrical metal test rod (mm) .....		—
	- type of material .....	metal / moulded material	—
	- torque for 1 min (table 19) (Nm) .....		—

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Clause	Requirement + Test	Result - Remark	Verdict
	After the test: no damage of glands and enclosure of the specimens		N/A
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 .....: 40 N / 80 N		—
	Covers, cover-plates or actuating members not come off		N/A
	Test repeated on new specimens with a sheet of hard material, 1 mm ± 0,1 mm thick, fitted around the supporting frame (fig. 19)		N/A
	Covers, cover-plates or actuating members not come off		N/A
	After the test: no damage		N/A
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/A
	Test repeated on new specimens with a sheet of hard material, 1 mm ± 0,1 mm thick, fitted around the supporting frame (fig. 19)		N/A
	Covers, cover-plates or actuating members come off		N/A
	After the test: no damage		N/A
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 .....: <b>10 N</b> / 20 N		—
	Covers or cover-plates not come off		P
	Test repeated on new specimens with a sheet of hard material, 1 mm ± 0,1 mm thick, fitted around the supporting frame (fig. 19)		P
	Covers, cover-plates or actuating members not come off		P
	After the test: no damage		P
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		P



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Clause	Requirement + Test	Result - Remark	Verdict
	Test repeated on new specimens with a sheet of hard material, 1 mm ± 0,1 mm thick, fitted around the supporting frame (fig. 19)		P
	Covers, cover-plates or actuating members come off		P
	After the test: no damage		P
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 ≤ 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/A
	Test repeated on new specimens with a sheet of hard material, 1 mm ± 0,1 mm thick, fitted around the supporting frame (fig. 19)		N/A
	Covers, cover-plates or actuating members not come off		N/A
	After the test: no damage		N/A
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/A
	Test repeated on new specimens with a sheet of hard material, 1 mm ± 0,1 mm thick, fitted around the supporting frame (fig. 19)		N/A
	Covers, cover-plates or actuating members come off		N/A
	After the test: no damage		N/A
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 .....: <b>complying</b> / <del>not complying</del>		—
20.8	Test with gauge according to figure 23 applied as shown in figure 24 (1 N): gauge not enter more than 1mm .....: <b>complying</b> / <del>not complying</del>		—
20.9	Operating members of cord-operated switch have adequate strength		N/A
	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/A
	- operating member not broken and cord-operated switch still operate		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

<b>21</b>	<b>RESISTANCE TO HEAT</b>		
21.1	Switches kept for 1 h in a heating cabinet at a temperature of 100 °C ± 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

<b>22</b>	<b>SCREWS, CURRENT-CARRYING PARTS AND CONNECTIONS</b>		
22.1	Connections withstand mechanical stresses		P
	Thread-forming or thread-cutting screws used only if supplied together with the piece in which they are intended to be inserted	Not used	N/A
	Screws and nuts which transmit contact pressure: in engagement with a metal thread		P
	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		N/A
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	PCB	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;		N/A
	- alloy with at least 58 % copper for parts made from cold-rolled sheet or with at least 50 % copper for other parts;	> 58%	P
	- stainless steel with at least 13 % chromium and not more than 0,12 % carbon		N/A
	- steel with electroplated coating of zinc (ISO 2081): service condition ISO no. (1/2/3); IP (X0/X4/X5); thickness (µm) .....		N/A
	- steel with electroplated coating of nickel and chromium (ISO 1456): service condition ISO no. (2/3/4); IP (X0/X4/X5); thickness (µm) .....		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- steel with electroplated coating of tin (ISO 2093): service condition ISO no. (2/3/4); IP (X0/X4/X5); thickness (µm) .....		N/A
	Current-carrying parts subjected to mechanical wear: not of steel with electroplated coating		N/A
	Metals having a great difference of electrochemical potential: not used in contact with each other		N/A
22.6	Contacts subjected to sliding action: of metal resistant to corrosion		N/A
22.7	Thread-forming screws and thread-cutting screws not used for the connection of current-carrying parts	Not used	P
	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/A

<b>23</b>	<b>CREEPAGE DISTANCES, CLEARANCES AND DISTANCES THROUGH SEALING COMPOUND</b>		
	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		N/A
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/A
23.101	Electronic switches having control circuit suitable for connection to a SELV supply, the switching circuit being supplied with a voltage greater than the SELV: creepage distances and clearances between the control and switching circuits are not less than 5,5 mm (mm) .....		N/A
	In case of electronic RCS and electronic TDS classified according to 7.103, see the relevant requirements in IEC 60669-2-2 and IEC 60669-2-3 for clearance and creepage between SELV and mains. (mm) .....		N/A
23.102	Wire enamel at least grade 1 according to IEC 60317: clearances between the wire of the control coil, live parts of different polarity and exposed conductive parts may be reduced to a value equal to two-thirds the clearances required in absence of enamel		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

<b>24</b>	<b>RESISTANCE OF INSULATING MATERIAL TO ABNORMAL HEAT, TO FIRE AND TO TRACKING</b>		
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		N/A
	Tracking test with solution A of IEC 60112	See appended table 24.2	N/A

<b>25</b>	<b>RESISTANCE TO RUSTING</b>		
	Ferrous parts protected against rusting		P
	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		P

<b>26</b>	<b>EMC REQUIREMENTS</b>	Not tested	
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<b>101</b>	<b>ABNORMAL CONDITIONS</b>		
	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	See appended table 101.1.1.1	P
	Temperature limited by a fuse: additional test carried out in case of doubt	See appended table 101.1.1.1	N/A
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 .....		—
	Temperature rise measured after steady state or after 4 h .....	See appended table 101.1.1.2	N/A
	Electronic switches protected by automatic protective devices (including fuses):		
	Current with which the protecting device releases after 1 h (A) .....	617031: 12,8A 617032: 15A	—
	Test current: 0.95 times the current with which the protecting device releases after 1 h (A) .....	617031: 12,2A 617032: 14,3A	—
	Temperature rise measured after steady state or after 4 h .....	See appended table 101.1.1.2	P
	Electronic switches protected by incorporated fuses complying with IEC 60127:		

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Clause	Requirement + Test	Result - Remark	Verdict
	Rated current of incorporated fuse (A) .....		—
	Test current: 2.1 I <sub>n</sub> (A) .....		—
	Temperature rise measured after 30 min .....	See appended table 101.1.1.2	N/A
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 <sup>2</sup> t: 15000 A <sup>2</sup> s:		
	Test voltage V <sub>n</sub> (V) .....	250	—
	Type of fuse recommended by the manufacturer ....	Not recommended	—
	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/A
	- contacts of any incorporated automatic protective device not welded, unless the electronic switch is obviously useless		P
101.4	Abnormal operation of the control circuit (only for electronic RCS energized by impulses)		N/A
	Behaviour of electronic RCS during abnormal operation of the control circuit is not dangerous		N/A
	Test made on three additional specimens of electronic RCS meeting with requirements of clauses 15 and 16:		N/A
	Control circuit continuously energized at its rated voltage (V) .....		—
	Switching circuit loaded for 1 h with rated current (A) at rated voltage (V) .....	- A; - V	—
	After this test:		
	- RCS still operate		N/A
	- temperature rise of any part of the electronic RCS enclosure and plywood support, which may be touched by the standard test finger, test probe B of IEC 61032, ≤ 75 K (K) .....		N/A
	- temperature rise of the plywood support which cannot be touched by the standard test finger, test probe B of IEC 61032, ≤ 100 K (K) .....		N/A
	- electronic RCS did not emit flames, melted material, glowing particles or burning drops of insulating material		N/A
	After cooling down to ambient temperature:		
	Electronic RCS withstand a dielectric test (sub-clause 16.2), test voltage (a.c., for 1 min), between switching and control circuits:		

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Clause	Requirement + Test	Result - Remark	Verdict
	- test voltage (V) .....		—
	During the test: no flashover or breakdown		N/A
	Electronic RCS still meet the requirements of 10.1		N/A
	Electronic RCS coil is then intermittently energized for 1 h using a voltage equal to its rated control voltage, the switching circuit being supplied with rated current at rated voltage:		
	class of insulating material .....		—
	temperature-rise limit (IEC 60085) (K) .....		—
	temperature-rise measured (K) .....		N/A
	Behaviour of electronic TDS during abnormal operation of the control circuit is not dangerous		
	Test made on three additional specimens of electronic TDS meeting with requirements of clauses 15 and 16:		
	Control circuit continuously energized at its rated voltage (V) .....		—
	Switching circuit loaded for 6 h with rated current (A) at rated voltage (V) .....	- A; - V	—
	Adjustable electronic TDS: adjusted to the shortest delay time (s) .....		—
	After this test:		
	- electronic TDS still operate		N/A
	- temperature rise of any part of the electronic TDS enclosure and plywood support, which may be touched by the standard test finger, test probe B of IEC 61032, $\leq 75$ K (K) .....		N/A
	- temperature rise of the plywood support which cannot be touched by the standard test finger, test probe B of IEC 61032, $\leq 100$ K (K) .....		N/A
	- electronic TDS did not emit flames, melted material, glowing particles or burning drops of insulating material		N/A
	After cooling down to ambient temperature:		
	Electronic TDS withstand a dielectric test (sub-clause 16.2), test voltage (a.c., for 1 min), between switching and control circuits:		
	- test voltage (V) .....		—
	During the test: no flashover or breakdown		N/A
	Electronic TDS still meet the requirements of 10.1		N/A
<b>102</b>	<b>COMPONENTS</b>		
	Components which, if they fail, may impair the safety of the electronic switch comply with the relevant IEC standards, as far as applicable	See appended table 102	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Components marked with their operating characteristics used in accordance with these markings		P
102.1	Fuses comply with:		
	- IEC 60127		N/A
	- other relevant IEC publications		N/A
	Rated breaking capacity (A): 1500 A or 35 A .....		N/A
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/A
	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/A
	Capacitor in accordance with table 107: approved type of capacitor required by table 107 according to the application in the electronic switch; observed :		N/A
	Capacitor marked with:		
	- rated voltage (V) .....		N/A
	- rated capacitance (μF) .....		N/A
	- reference temperature (°C) .....		N/A
	Capacitors: the short-circuiting of which cause a current = 0,5 A through the terminals of the capacitor:		
	Trade mark; article of capacitor .....		—
	Capacitor complies with IEC 60384-14		N/A
	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/A
	Capacitor in accordance with table 107: approved type of capacitor required by table 107 according to the application in the electronic switch; observed .. :		N/A
	Capacitor marked with:		
	- rated voltage (V) .....		N/A
	- rated capacitance (μF) .....		N/A
	- reference temperature (°C) .....		N/A
	Capacitors: for suppression of electromagnetic interference:		
	Trade mark; article of capacitor .....		—
	Capacitor complies with IEC 60384-14		N/A
	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/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Capacitor in accordance with table 107: approved type of capacitor required by table 107 according to the application in the electronic switch; observed :		N/A
	Capacitor marked with:		
	- rated voltage (V) .....		N/A
	- rated capacitance ( $\mu\text{F}$ ) .....		N/A
	- reference temperature ( $^{\circ}\text{C}$ ) .....		N/A
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 ..... / $\Omega$		—
	- constant value under overload conditions		N/A
	reference temperature of the resistor according to clause 17 ( $^{\circ}\text{C}$ ) .....		—
	- comply with sub-clause 14.1 of IEC 60065		N/A
102.4	Automatic protective devices (other than fuses)		
	Automatic protective devices comply with IEC 60730 as far as applicable		N/A
102.4.1	Automatic protective devices which switch off the current (cut-outs):		
	Adequate making and breaking capacity		N/A
	Reference temperature above 55 $^{\circ}\text{C}$ : specimens tested at reference temperature according to clause 17 ( $^{\circ}\text{C}$ ) .....		N/A
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/A
	After the test: specimens show no damage		N/A
	Electric strength between open contacts: test voltage 500 V a.c. for 1 min		N/A
	Cut-outs in electronic switches for speed control circuits:		
	$I_n$ (A) of electronic switch ( $\cos\phi$ 0.6) .....		—
	Making: 10 operations with: test current: 9 $I_n$ (A); $\cos\phi$ 0.8 $\pm$ 0.05 .....		—
	Breaking: 10 operations with: test current: 6 $I_n$ (A); $\cos\phi$ 0.6 $\pm$ 0.05 .....		—
	During the test: no sustained arcing		N/A
	After the test: specimens show no damage		N/A



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Clause	Requirement + Test	Result - Remark	Verdict
	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/A
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 $I_n$ (A) of the protecting fuse (IEC 60127) or conventional fusing current (other fuses) .....		—
	During the test: no sustained arcing		N/A
	After the test: specimens show no damage		N/A
	Electric strength between open contacts: test voltage 500 V a.c. for 1 min		N/A
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 $I_n$ (A) of the protecting fuse (IEC 60127) or the conventional fusing current (other fuses) for 30 min .....		—
	After the test: specimens function correctly		N/A
	Temperature rise test per clause 17:		
	- electronic switch state not change		N/A
	- fuses and other protective devices not operate		N/A
	- permissible temperature rises determined in table 102, column concerning clause 17, not exceeded	See appended table 102.4.2	N/A
	After the test, electronic switch is in operating condition		N/A
	Sealing compounds, if any, have not flowed		N/A
102.5	Transformer		
	Transformers intended for SELV circuits shall be of the safety isolating type and shall comply with the relevant requirements of IEC 61558-2-6.		N/A
12.2.5	<b>TABLE: test with apparatus shown in figure 10 (screw terminals)</b>		P
	rated current (A) .....	Max. 6,5	—
	type of conductors .....	Rigid solid / rigid stranded	—
	smallest/largest cross-sectional area per table 2 ( $\text{mm}^2$ ) .....	0,75 / 1,5	—
	number of conductors .....	1	—
	nominal diameter of thread (mm); torque per table 3 (Nm) .....	Terminal: 2,9; 0,5	—

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Clause	Requirement + Test	Result - Remark	Verdict

Cross-sectional area (mm <sup>2</sup> )	Diameter of bushing hole per table 4 (mm)	Height H per table 4 (mm)	Mass (kg)	Remarks
0,75	6,5	260	0,4	Pass
1,5	6,5	260	0,4	Pass

supplementary information:

12.2.6	<b>TABLE: pull test (screw terminals)</b>			P
	rated current (A) .....	Max. 6,5		—
	smallest/largest cross-sectional area per table 2 (mm <sup>2</sup> ) .....	0,75 / 1,5		—
	nominal diameter of thread (mm); torque 2/3 per table 3 (Nm) .....	Terminal: 2,9; 0,33		—

Cross-sectional area (mm <sup>2</sup> )	Number of conductors	Type of conductors (rigid solid / rigid stranded)	Pull per table 5 applied for 1 min (N)	Remarks
0,75	1	Rigid solid / rigid stranded	40	Pass
1,5	1	Rigid solid / rigid stranded	40	Pass

supplementary information:

12.2.7	<b>TABLE: tightening test (screw terminals)</b>			P
	rated current (A) .....	Max. 6,5		—
	nominal diameter of thread (mm); torque 2/3 per table 3 (Nm) .....	Terminal: 2,9; 0,33		—

Largest cross-sectional area per table 2 (mm <sup>2</sup> )	Permissible number of conductors	Type of conductors (rigid solid / rigid stranded)	Number of wires and nominal diameter of wires per table 6	Remarks
1,5	1	Rigid solid / rigid stranded	1x1,38 / 7x 0,52	Pass

supplementary information:

12.3.10	<b>TABLE: mechanical stresses occurring in normal use</b>			N/A
	rated current (A) .....			—
	largest/smallest cross-sectional area per table 7 (mm <sup>2</sup> ) .....			—

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 <sup>2</sup> )	Remarks

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Clause	Requirement + Test	Result - Remark	Verdict

	<b>TABLE: test with apparatus shown in figure 10</b>			
	rated current (A) .....			—
	type of conductors .....	rigid solid / rigid stranded		—
	smallest/largest cross-sectional area per table 7 (mm <sup>2</sup> ) .....			—
	number of conductors .....			—
Cross-sectional area (mm <sup>2</sup> )	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/A
Test a)	Test carried out for 1 h connecting rigid solid conductors:						
	test current per table 8 (A) .....						—
	nominal cross-sectional area (mm <sup>2</sup> ) .....						—
Screwless terminal number		Voltage drop (mV)			Required voltage drop		
1					≤ 15 mV		
2					≤ 15 mV		
3					≤ 15 mV		
4					≤ 15 mV		
5					≤ 15 mV		
Test b)	Temperature cycles test) carried out on terminals subjected to Test a):						N/A
	test current per table 8 (A) .....						—
	nominal cross-sectional area (mm <sup>2</sup> ) .....						—
	allowed voltage drop (mV) .....			≤ 22,5 mV or 2 times 24 <sup>th</sup> cycle value (mV)			—
Screwless terminal number		1	2	3	4	5	Remarks
voltage drop after 24 <sup>th</sup> cycle							
voltage drop after 48 <sup>th</sup> cycle							
voltage drop after 72 <sup>th</sup> cycle							
voltage drop after 96 <sup>th</sup> cycle							
voltage drop after 120 <sup>th</sup> cycle							
voltage drop after 144 <sup>th</sup> cycle							
voltage drop after 168 <sup>th</sup> cycle							

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Clause	Requirement + Test			Result - Remark			Verdict
voltage drop after 192 <sup>th</sup> cycle							
12.3.10	<b>TABLE: mechanical stresses occurring in normal use</b>						N/A
	rated current (A) .....						—
	largest/smallest cross-sectional area per table 7 (mm <sup>2</sup> ) .....						—
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 <sup>2</sup> )		Remarks	
	<b>TABLE: test with apparatus shown in figure 10</b>						N/A
	rated current (A) .....						—
	type of conductors .....			rigid solid / rigid stranded			—
	smallest/largest cross-sectional area per table 7 (mm <sup>2</sup> ) .....						—
	number of conductors .....						—
Cross-sectional area (mm <sup>2</sup> )		Diameter of bushing hole per table 4 (mm)		Height H per table 4 (mm)		Mass (kg)	
supplementary information:							

12.3.12	<b>TABLE: deflection test (principle of test apparatus shown in figure 11a)</b>							N/A		
	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 <sup>2</sup> )										
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 <sup>st</sup> deflection (mV)										
voltage drop 2 <sup>nd</sup> deflection (mV)										
voltage drop 3 <sup>rd</sup> deflection (mV)										
voltage drop 4 <sup>th</sup> deflection (mV)										
voltage drop 5 <sup>th</sup> deflection (mV)										

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Clause	Requirement + Test				Result - Remark		Verdict
voltage drop 6 <sup>th</sup> deflection (mV)							
voltage drop 7 <sup>th</sup> deflection (mV)							
voltage drop 8 <sup>th</sup> deflection (mV)							
voltage drop 9 <sup>th</sup> deflection (mV)							
voltage drop 10 <sup>th</sup> deflection (mV)							
voltage drop 11 <sup>th</sup> deflection (mV)							
voltage drop 12 <sup>th</sup> deflection (mV)							
supplementary information:							

16.1	<b>TABLE: insulation resistance</b>			P
item per table 20	test voltage applied between:	measured (MΩ)	required (MΩ)	
1)	All poles connected together and the body	199	≥ 5	
2)	Between the terminals which are electrically connected together when the switch is in the "on" position, the switch being in the "off" position: -mini-gap construction	199	≥ 2	
supplementary information:				

16.2	<b>TABLE: electric strength</b>			P
	rated voltage (V) .....	230		—
item per table 20	test voltage applied between:	test voltage (V)	flashover / breakdown (Yes/No)	
1)	All poles connected together and the body	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	750	No	
supplementary information:				

17	<b>TABLE: temperature rise measurements</b>			P
	cross-sectional area of conductor not less than 1,5 mm <sup>2</sup> (mm <sup>2</sup> ) (table 15) .....	1,5		—
	terminal screws: torque (Nm) (2/3 table 3 or appropriate figures 1, 2, 3, 4) .....	0,33		—
	type of load .....	Incandescent lamp		—
	rated current (A) / rated load (W or VA) .....	617031: 1000W 617032: 1500W		—

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Clause	Requirement + Test	Result - Remark	Verdict
	rated voltage (V) .....	230	—
	test voltage between 0,9 and 1,1 V <sub>n</sub> (V), whichever is the more unfavourable .....	253	—
parts of the electronic switch		max. measured temperature rise (K)	permissible temperature rise (K)
Non metallic parts: knobs, handles, sensing surfaces, etc.		1,4 max.	40
Non metallic parts: cover plate		6,8 max.	50
Inside of insulating material enclosure		26,2 max.	100 <sup>(1)</sup>
Other insulation's (except thermoplastic): - Laminates bonded with epoxy resins		41,2 max.	130
Terminals and parts which may come into contact with cable insulation		8,3 max.	55
supplementary information: <sup>(1)</sup> The client declared the softening temperature of enclosure material is 145 °C. This test is under the T <sub>a</sub> = 35 °C.			

19	<b>TABLE: reduced electric strength after normal operation</b>			P
item per table 20	test voltage applied between:	test voltage (V)	flashover / breakdown (Yes/No)	
1)	All poles connected together and the body	1500	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: -mini-gap construction	750	No	
	<b>TABLE: temperature rise measurements after normal operation</b>			P
	cross-sectional area of conductor not less than 1,5 mm <sup>2</sup> (mm <sup>2</sup> ) (table 15) .....	1,5	—	
	terminal screws: torque (Nm) (2/3 table 3 or appropriate figures 1, 2, 3, 4) .....	0,33	—	
	type of load .....	Incandescent lamp	—	
	rated current (A) / rated load (W or VA) .....	1500W	—	
	rated voltage (V) .....	230	—	
	test voltage between 0,9 and 1,1 V <sub>n</sub> (V), whichever is the more unfavourable .....	253	—	
parts of the electronic switch		max. measured temperature rise (K)	permissible temperature rise (K)	
Non metallic parts: knobs, handles, sensing surfaces, etc.		1,7	40	
Non metallic parts: cover plate		6,9	50	

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Clause	Requirement + Test	Result - Remark	Verdict
Inside of insulating material enclosure		27,5	100 <sup>(1)</sup>
Other insulation's (except thermoplastic): Laminates bonded with epoxy resins		42,2	130
Terminals and parts which may come into contact with cable insulation		8,9	55
supplementary information: <sup>(1)</sup> The client declared the softening temperature of enclosure material is 145 °C. This test is under the T <sub>a</sub> = 35 °C.			

19.106	<b>TABLE: Test for RCS energized by impulses (under no-load conditions):</b>					N/A
	impulse duration declared by the manufacturer .....					—
n. specimen	rated control voltage (V)	control voltage of 0,9 times the rated value (V)	20 operations: RCS operates as intended (Yes/No)	control voltage of 1,1 times the rated value (V)	20 operations: RCS operates as intended (Yes/No)	
supplementary information:						

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	
A	5 blows	100	Pass	
D	4 blows	200	Pass	
supplementary information:				

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)	
PCB	FR-4 / Huizhou Shengmao Hardware Co., Ltd.	125	1,2	
Body of potentiometer	PBT+15%G / Dongguan Jinglun Electronic Technology Co., Ltd.	125	1,6	
Wheel of potentiometer	PA66+10%G / Dongguan Jinglun Electronic Technology Co., Ltd.	125	1,6	
Carbon film support of potentiometer	Epoxy resins / Dongguan Jinglun Electronic Technology Co., Ltd.	125	1,2	
supplementary information:				

IEC 60669-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
21.3	<b>TABLE: ball pressure test of thermoplastic materials</b>		P
	allowed impression diameter (mm) .....: $\leq 2$ mm		—
part under test	material designation / manufacturer	test temperature (°C) <sup>(1)</sup>	impression diameter (mm)
Knob, cover, cover plate and mounting plate	PC / TCL-Legrand International Electrical(Huizhou) Co., Ltd.	70	1,2
Insulation pad of winding	PCB / Huizhou Shengmao Hardware Co., Ltd.	70	1,2
Rod of potentiometer	PC / Dongguan Jinglun Electronic Technology Co., Ltd.	70	1,2
Bottom box	PP / TCL-Legrand International Electrical (Huizhou) Co., Ltd.	70	1,3
supplementary information:			
<sup>(1)</sup> 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	
Pillar terminal	2,9	III	0,5	5	Pass	
supplementary information:						

23.1	<b>TABLE: creepage distances, clearances and distances through sealing compound</b>							P
	rated voltage (V) .....: 230							—
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: <b>terminals</b>	$\geq 3$	3,4	$\geq 3$	3,4	-	-	
	Between live parts which are separated when the contacts are open: <b>across contacts of potentiometer</b>	-	> 1,0 by gauge	$\geq 3$	3,1	-	-	
3) / 8)	Between live parts and accessible surfaces of parts of insulating material	$\geq 3$	> 4,0 by gauge	$\geq 3$	> 4,0 by gauge	-	-	
	Between live parts and screws or devices for fixing bases, covers or cover-plates	$\geq 3$	>4,0 by gauge	$\geq 3$	>4,0 by gauge	-	-	
supplementary information:								

24.1.1	TABLE: glow-wire test			P
part under test	material designation / manufacturer	test temperature (°C)	remarks	



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Clause	Requirement + Test	Result - Remark	Verdict
PCB	FR-4 / Huizhou Shengmao Hardware Co., Ltd.	850	P
Body of potentiometer	PBT+15%G / Dongguan Jinglun Electronic Technology Co., Ltd.	850	P
Knob, cover, cover plate and mounting plate	PC / TCL-Legrand International Electrical(Huizhou) Co., Ltd.	650	P
Insulation pad of winding	PCB / Huizhou Shengmao Hardware Co., Ltd.	650	P
Rod of potentiometer	PC / Dongguan Jinglun Electronic Technology Co., Ltd.	650	P
Bottom box	PP / TCL-Legrand International Electrical (Huizhou) Co., Ltd.	650	P
supplementary information:			

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

101.1.1.1	<b>TABLE: fault conditions test</b>			P
	cross-sectional area of conductor not less than 1,5 mm <sup>2</sup> (mm <sup>2</sup> ) (table 15) .....	1,5		—
	terminal screws: torque (Nm) (2/3 table 3 or appropriate figures 1, 2, 3, 4) .....	0,33		—
	type of load .....	Incandescent lamp		—
	rated current (A) / rated load (W or VA) .....	617031: 1000W 617032: 1500W		—
	rated voltage (V) .....	230		—
	test voltage between 0,9 and 1,1 V <sub>n</sub> (V), whichever is the more unfavourable .....	253		—
fault conditions simulated		remarks	verdict	
a. Short circuit C3 capacitor		Not work and no hazard observed	P	
b. Short circuit T1-T2 of triac		Always on and no hazard observed	P	
c. Short circuit T1-G of triac		Still work and no hazard observed	P	
d. Short circuit T2-G of triac		Not work and no hazard observed	P	
	<b>TABLE: temperature rise measurements</b>			P
See above	temperature measured after (min) .....	Steady state reached		—

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Clause	Requirement + Test	Result - Remark	Verdict

parts of the electronic switch		max. measured temperature rise (K)	permissible temperature rise (K)
Non metallic parts: knobs, handles, sensing surfaces, etc.		1,9 max.	75
Non metallic parts: cover plate		7,4 max.	75
Inside of insulating material enclosure		26,5 max.	110 <sup>(1)</sup>
Other insulation's (except thermoplastic): - Laminates bonded with epoxy resins		40,7 max.	160
Terminals and parts which may come into contact with cable insulation		8,2 max.	110
	<b>TABLE: additional temperature rise measurements in case of temperature limited by a fuse</b>		N/A
	current under the relevant fault conditions measured with the fuse short-circuited (A) .....		—
	type of fuse as specified by IEC 60127 .....		—
	test duration corresponding to the maximum fusing time corresponding to the current measured (min) ..		—
parts of the electronic switch		max. measured temperature rise (K)	permissible temperature rise (K)
supplementary information: <sup>(1)</sup> The client declared the softening temperature of enclosure material is 145 °C. This test is under the T <sub>a</sub> = 35 °C.			

101.1.1.2	<b>TABLE: temperature rise measurements during overload tests</b>		P
	cross-sectional area of conductor not less than 1,5 mm <sup>2</sup> (mm <sup>2</sup> ) (table 15) .....	1,5	—
	terminal screws: torque (Nm) (2/3 table 3 or appropriate figures 1, 2, 3, 4) .....	0,33	—
	rated voltage (V) .....	230	—
	test voltage between 0,9 and 1,1 V <sub>n</sub> (V), whichever is the more unfavourable .....	253	—
parts of the electronic switch		max. measured temperature rise (K)	permissible temperature rise (K)
Non metallic parts: knobs, handles, sensing surfaces, etc.		3,7	75
Non metallic parts: cover plate		16,8	75
Inside of insulating material enclosure		85,4	110 <sup>(1)</sup>
Other insulation's (except thermoplastic):		109	160

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Clause	Requirement + Test	Result - Remark	Verdict
- Laminates bonded with epoxy resins			
Terminals and parts which may come into contact with cable insulation		24	110
supplementary information: <sup>(1)</sup> The client declared the softening temperature of enclosure material is 145 °C. This test is under the T <sub>a</sub> = 35 °C.			

102	TABLE: components					P
object/part No.	manufacturer/ trademark	type/model	Technical data	compliance to standard	mark(s) of conformity <sup>1)</sup>	
Knob, cover, cover plate and mounting plate	TCL-Legrand International Electrical(Huizhou) Co., Ltd.	PC	Thickness≥1,2mm	IEC 60669-1 IEC 60669-2-1	Test in appliance	
Bottom box	TCL-Legrand International Electrical(Huizhou) Co., Ltd.	PP	Thickness≥1,1mm	IEC 60669-1 IEC 60669-2-1	Test in appliance	
PCB	Huizhou Shengmao Hardware Co., Ltd.	FR-4	Thickness≥1,6mm	IEC 60669-1 IEC 60669-2-1	Test in appliance	
Insulation pad for winding	Huizhou Shengmao Hardware Co., Ltd.	FR-4	Thickness≥0,6mm	IEC 60669-1 IEC 60669-2-1	Test in appliance	
Winding	Dongguan Xin You Lian Copper Co., Ltd.	2UEW	1.1mm (OD) 80uH±20% Class A	IEC 60669-1 IEC 60669-2-1	Test in appliance	
Triac	Renesas Technology Corp.	BCR16LM- 14LB	600V 16A	IEC 60669-1 IEC 60669-2-1	Test in appliance	
Potentiometer	Dongguan Jinglun Electronic Technology Co., Ltd.	DRW-504K	250V~ 10A Rod: PC Carbon film support: epoxy resins Body: PBT+15%G Wheel: PA66+10%G	IEC 60669-1 IEC 60669-2-1	Test in appliance	
Thermal link (31 series)	Zhangzhou Aupo Electronics Co., Ltd.	A4-5A-F	250VAC 5A 130°C	IEC 60691	VDE 40001155	
Thermal link (617032)	Zhangzhou Aupo Electronics Co., Ltd.	BF142	250VAC 10A T <sub>F</sub> : 142°C	IEC 60691	VDE 40045328	
Capacitor (C1)	Strong Components Co. Ltd.	MPX	X2 0.1μF 275VAC 40/110/56/B	IEC 60384-14	VDE 40005451	
<sup>1)</sup> an asterisk indicates a mark which assures the agreed level of surveillance						

102.4.2	TABLE: temperature rise measurements after test for automatic protective devices which only decrease current to the electronic switch			N/A
	cross-sectional area of conductor not less than 1,5 mm <sup>2</sup> (mm <sup>2</sup> ) (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 <sub>n</sub> (V), whichever is the more unfavourable .....			—

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Clause	Requirement + Test	Result - Remark	Verdict
parts of the electronic switch		max. measured temperature rise (K)	permissible temperature rise (K)
supplementary information:			

**Annex A: Amendment 2: 2015 to IEC 60669-2-1:2002 (Fourth edition) + A1:2008**

<b>IEC 60669-2-1/A2</b>			
Clause	Requirement + Test	Result - Remark	Verdict
<b>8</b>	<b>MARKING</b>		
8.1	For electronic switches with included automatic function if the manufacturer's declared number of operations is higher than that indicated in subclauses 19.101, 19.102, 19.104 and 19.109, then this shall be stated in the accompanying instruction sheet.		N/A
8.3	Information of the iron core transformer intended to be used with the electronic switch dimmer are given in the manufacturer's instruction sheet		N/A

<b>11</b>	<b>PROVISION FOR EARTHING</b>		
11.101	The printed conductors of printed circuit boards may be used to provide protective earthing continuity only under the following conditions:		
	- at least two tracks are used each having independent soldering points which will withstand a single short circuit test similar to 101.3 and immediately after the switch shall fulfill the requirements of 11.4, or		N/A
	- a single track is used with two independent means of connection on each end which will withstands a single short circuit test similar to 101.3 and immediately after the switch shall fulfill the requirements of 11.4.		N/A
	- the material of the printed circuit board shall consist of epoxide woven glass fabric copperclad laminated sheet and		N/A
	- the printed circuit board shall comply with the overload test according to 101.1.1.2.		N/A

<b>19</b>	<b>NORMAL OPERATION</b>		
	For electronic switches with included automatic function the number of operations for tests of subclauses 19.101, 19.102, 19.104 and 19.109 is that specified in the relevant subclause.		N/A
	If a manufacturer declares a number of operations higher than those indicated in the relevant subclause, the tests shall be made according to the declared value.		N/A
	Sticking of the contacts, which does not prevent the next operation of the switch, is not regarded as welding.		N/A
	Sticking of contacts is permitted if the contacts can be separated with a force applied to the actuator of a value which does not damage the switch mechanically.		N/A
	Electronic switches including electronic circuits which close the contact of the contact mechanism always at zero-crossing $\pm 20^\circ$ phase angle, shall be tested together with their electronic circuit.		N/A

IEC 60669-2-1/A2			
Clause	Requirement + Test	Result - Remark	Verdict

19.101	Contact mechanisms intended for incandescent lamp circuits with or without step down converts; number of operations 40.000:		
	For other rotary electronic switches intended to be operated in either direction, half of the total number of operations is effected in the clockwise direction and the remainder in the reverse direction.		N/A
	During the test: specimens function correctly		N/A
19.102	Contact mechanisms incorporated in electronic switches, intended for externally ballasted lamps (e.g. fluorescent lamps, CFL, LED) are checked by the test circuit indicated in Figure 103 Load A		N/A
	The number of operations is as follows.		
	For electronic switches with a rated fluorescent lamp current up to and including 10 A:		—
	- 10 000 operations with 30 operations per minute.		N/A
	For electronic switches with rated current above 10 A up to and including 16 A:		—
	- 5 000 operations with 15 operations per minute.		N/A
19.109	Contact mechanisms incorporated in electronic switches intended for self ballasted lamps are tested as in 19.102		N/A
	Compliance is checked by connecting the load B as given in Figure 103		N/A
	- For electronic switches with rated power for SBL lamps up to and including 250 W: 40 000 operations with 30 operations per minute.		N/A
	- For electronic switches with rated power for SBL lamps higher than 250 W: 40 000 operations with 15 operations per minute.		N/A

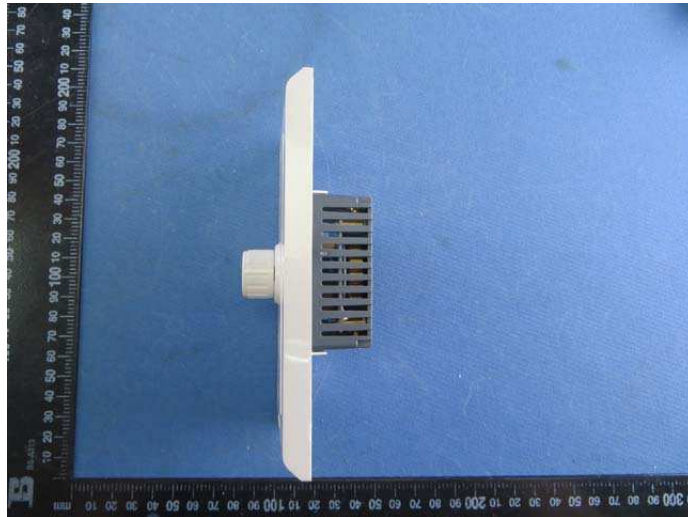
<b>101</b>	<b>ABNORMAL CONDITIONS</b>		
	If in case of failure the maximum power taken by the electronic switches is less than 0,5 W, the requirements of the abnormal conditions are deemed to be met.		N/A
101.1.1.2	If any of the tests specified above turn off the electronic switch before the temperature has been steady state, the following additional test shall be performed on a new set of specimens:		
	- The electronic switch shall be loaded to 1,1 times the rated current.		N/A
	- The current is then increased by 10 % and then the temperature is allowed to stabilize.		N/A
	This is repeated until the conventional tripping current of the protective device is reached or the electronic switch is destroyed (no longer functioning properly or safety is impaired within the meaning of this standard).		

IEC 60669-2-1/A2			
Clause	Requirement + Test	Result - Remark	Verdict
101.3	The automatic overcurrent protective device including fuses, if any, incorporated or not incorporated in the electronic switch, recommended by the manufacturer, is inserted into the circuit which is loaded.....:	Not recommended	—
	During the test: emission of flames or burning particles if any, shall not occur be dangerous to the environment.		P
	After the test:		
	- accessible metal parts shall no be live		P
	- emissions of flames or burning particles have not visibly perforated the film when examined by normal or corrected vision without additional magnification and the film shall be in one piece;		P
	- the conductors, the flush mounting box and the mounting surface shall not show traces of burns. Traces which can be cleaned and do not prevent the further use of the cables or housing are ignored.		P
	After the short circuit test the specimen is re-energized in its normal operating position, incorporated fuses if any being replaced, and its behaviour is monitored for 4 hours.		P
	The specimen shall show no dangerous behaviour during this period such as smoke or excessive heat. In case of doubt the maximum temperature rise values given in table 102 shall not be exceeded.		P
	Overcurrent protective devices which can be manually reset shall be switched on before the test.		P
101.4	For electronic RCS, Clause 101 of IEC 60669-2-2 applies.		N/A
	For electronic TDS, Clause 101 of IEC 60669-2-3 applies.		N/A
101.5	Dimmers classified for incandescent and/or self ballasted lamps shall be so designed that no part shall reach such a temperature that there is danger of fire to the surroundings of the dimmer when non-dimmable self ballasted lamps are installed in the load circuit.		—
	The tests are made on dimmers mounted and connected as specified in Clause 17.		N/A
	The dimmer is loaded with a number of lamp simulation circuits as given in Figure 103 Load B providing the rated self ballasted lamp load of the dimmer. The simulation circuit represents a 25 W non dimmable self ballasted lamp.		N/A
	In case of dimmers not classified for self ballasted lamps the dimmer is loaded with a number of lamp simulation circuits as given in Load B of Figure 103 having a total power equivalent to 1/5th of the declared incandescent lamp load.		N/A
	Compliance is checked by subjecting the electronic switches to a heating test.		N/A

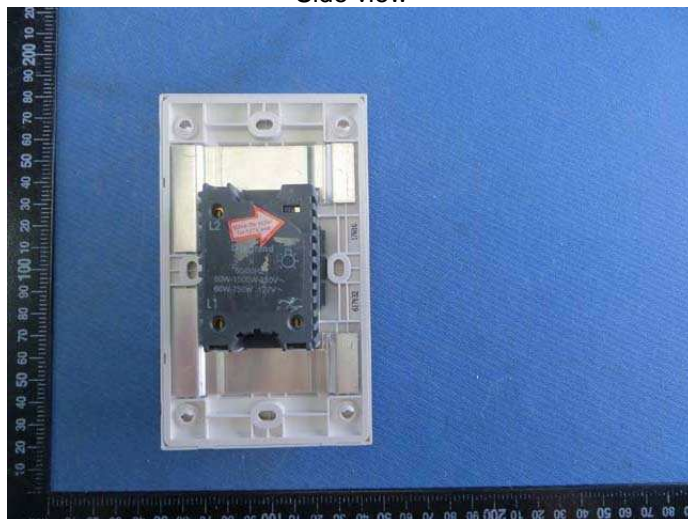
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Front view



Side view



Back view



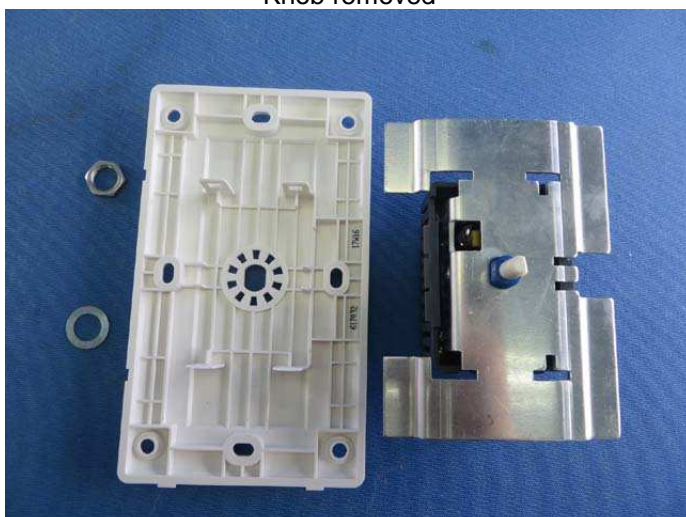
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Cover plate removed

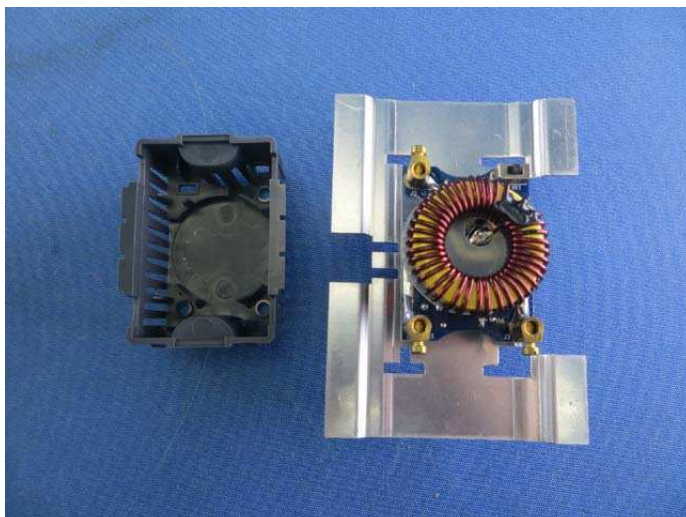


Knob removed

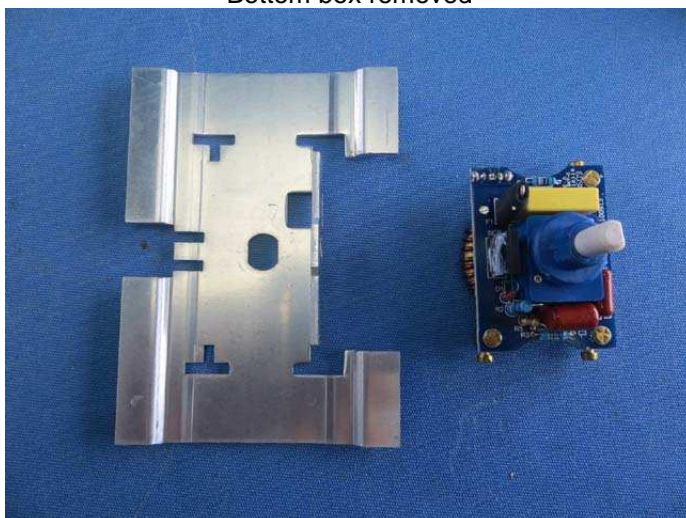


Mounting plate removed

Photo attachment (model 617032)



Bottom box removed



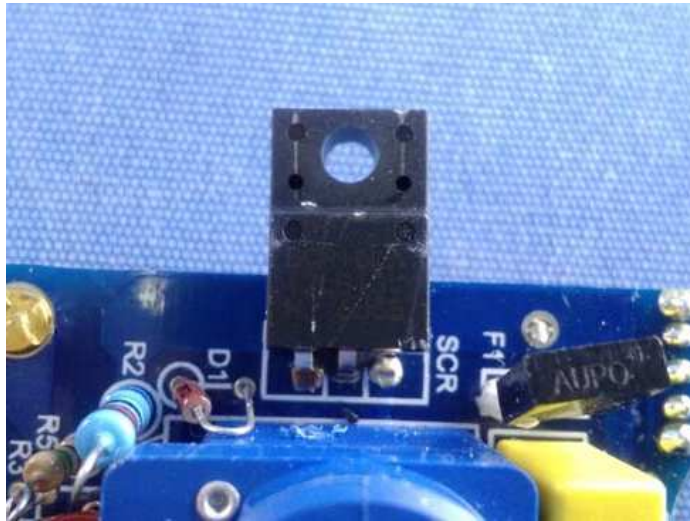
Heat sink removed



X2 capacitor



Photo attachment (model 617032)



Triac



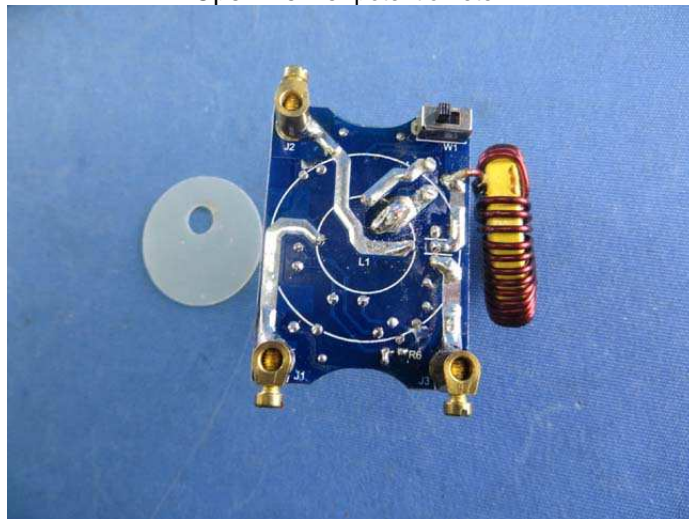
Thermal link



Triac



Open view of potentiometer

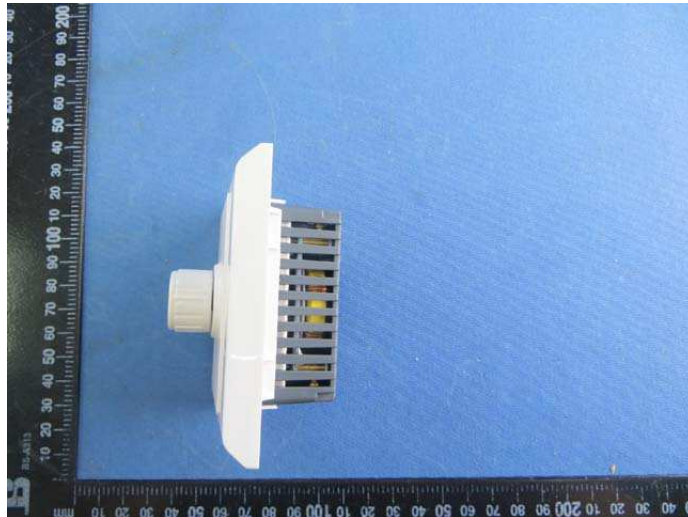


Bottom view of PCB

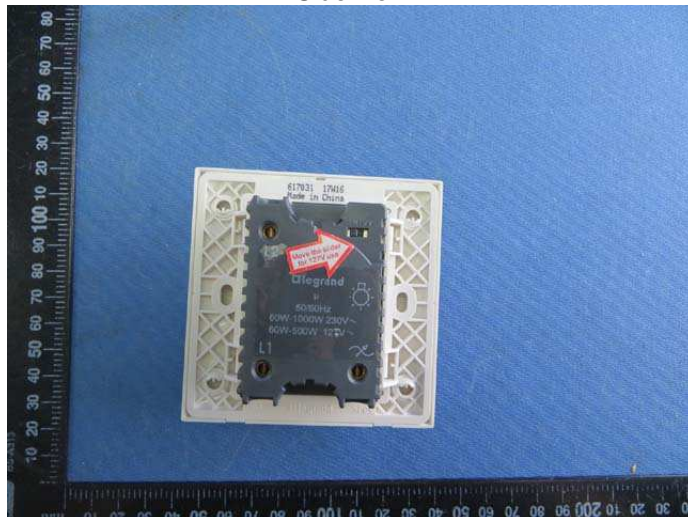
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Front view



Side view



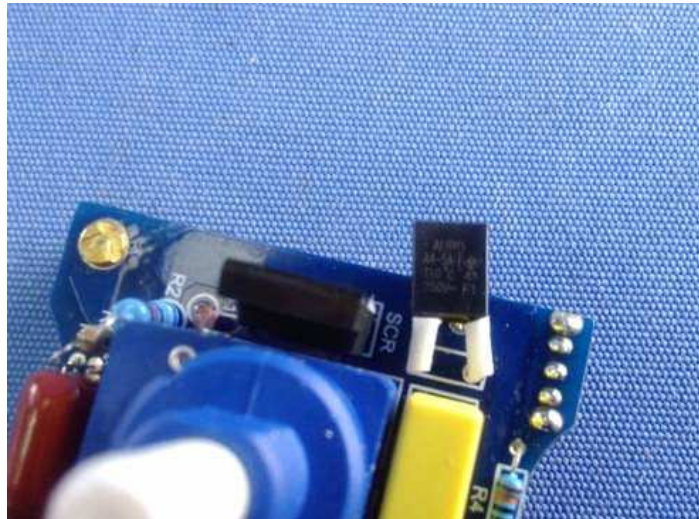
Back view



Photo attachment (model 617031)



Heat sink removed



Thermal link