

Prüfbericht-Nr.: <i>Test report no.:</i>	CN21BLMK 001	Auftrags-Nr.: <i>Order no.:</i>	170259209	Seite 1 von 58 Page 1 of 58
Kunden-Referenz-Nr.: <i>Client reference no.:</i>	N/A	Auftragsdatum: <i>Order date:</i>	2020-12-29	
Auftraggeber: <i>Client:</i>	Lumi United Technology Co., Ltd 8th Floor, JinQi Wisdom Valley, No.1 Tangling Road, Liuxian Ave, Taoyuan Residential District, Nanshan District, Shenzhen, Guangdong, China			
Prüfgegenstand: <i>Test item:</i>	Smart Wall Switch			
Bezeichnung / Typ-Nr.: <i>Identification / Type no.:</i>	WS-EUK01, WS-EUK02			
Auftrags-Inhalt: <i>Order content:</i>	Safety Report			
Prüfgrundlage: <i>Test specification:</i>	EN 60669-1:1999+A1+A2 EN 60669-2-1:2004+A1+A12 BS EN 60669-1:1999+A2 BS EN 60669-2-1:2004+A12			
Wareneingangsdatum: <i>Date of sample receipt:</i>	2020-12-31			
Prüfmuster-Nr.: <i>Test sample no.:</i>	A002979252 001-012			
Prüfzeitraum: <i>Testing period:</i>	2020-12-31 – 2021-01-19			
Ort der Prüfung: <i>Place of testing:</i>	TÜV Rheinland (Guangdong) Ltd			
Prüflaboratorium: <i>Testing laboratory:</i>	TÜV Rheinland (Guangdong) Ltd			
Prüfergebnis*: <i>Test result*:</i>	Pass			
geprüft von: <i>tested by:</i>	Vicky Du	genehmigt von: <i>authorized by:</i>	TC	
Datum: <i>Date:</i>	2021-03-18	Ausstellungsdatum: <i>Issue date:</i>	2021-03-18	
Stellung / Position:	PE	Stellung / Position:	TC	
Sonstiges / <i>Other:</i>	Supervisor: Audrey Wang <i>Audrey Wang</i> Attachment 1: EU Group Differences (Total 10 pages) Attachment 2: Photo documents (Total 9 pages)			
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>	Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged</i>			
* Legende:	P(ass) = entspricht o.g. Prüfgrundlage(n)	F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	N/A = nicht anwendbar	N/T = nicht getestet
* Legend:	P(ass) = passed a.m. test specification(s)	F(ail) = failed a.m. test specification(s)	N/A = not applicable	N/T = not tested
<p>Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i></p>				

v05



TEST REPORT IEC 60669-2-1 Switches for household and similar fixed-electrical installations Part 2-1: Particular requirements - Electronic switches	
Report Reference No.	CN21BLMK 001
Date of issue	See cover page
Total number of pages	See cover page
Name of Testing Laboratory	TÜV Rheinland (Guangdong)Ltd.
Address	No.199 Kezhu Road, Guangzhou Science City 510663, Guangzhou, CHINA
Applicant's name	Lumi United Technology Co., Ltd.
Address	8th Floor, JinQi Wisdom Valley, No.1 Tangling Road, Liuxian Ave, Taoyuan Residential District, Nanshan District, Shenzhen, Guangdong, P.R. China
Test specification:	
Standard	IEC 60669-2-1:2002 (Fourth edition) + A1:2008 used in conjunction with IEC 60669-1:1998 (Third edition) + A1:1999 + A2:2006
Test procedure	See cover page
Non-standard test method	N/A
Test Report Form No.	IEC60669_2_1F
Test Report Form(s) Originator	IMQ S.p.A.
Master TRF	Dated 2010-12
Copyright © 2010 IEC System for Conformity Testing and Certification of Electrical Equipment (IECEE), Geneva, Switzerland. All rights reserved. This publication may be reproduced in whole or in part for non-commercial purposes as long as the IECEE is acknowledged as copyright owner and source of the material. IECEE takes no responsibility for and will not assume liability for damages resulting from the reader's interpretation of the reproduced material due to its placement and context. If this Test Report Form is used by non-IECEE members, the IECEE/IEC logo and the reference to the CB Scheme procedure shall be removed.	
Test item description	Smart Wall Switch
Trade Mark	
Manufacturer	The same as client.
Model and/or type reference	WS-EUK01 WS-EUK02
Rating(s)	100-250Vac 50/60Hz Max. 8A (Resistive Load)

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

Attachment 1: EU Group Differences (Total 10 pages)

Attachment 2: Photo documents (Total 5 pages)

Summary of testing:

Tests performed (name of test and test clause) :

Full tests were performed on model WS-EUK02.

All tests results also compliance with BS EN 60669-1:1999+A2:2008 & BS EN 60669-2-1:2004+A12:2010, no additional test is required.

Testing location:

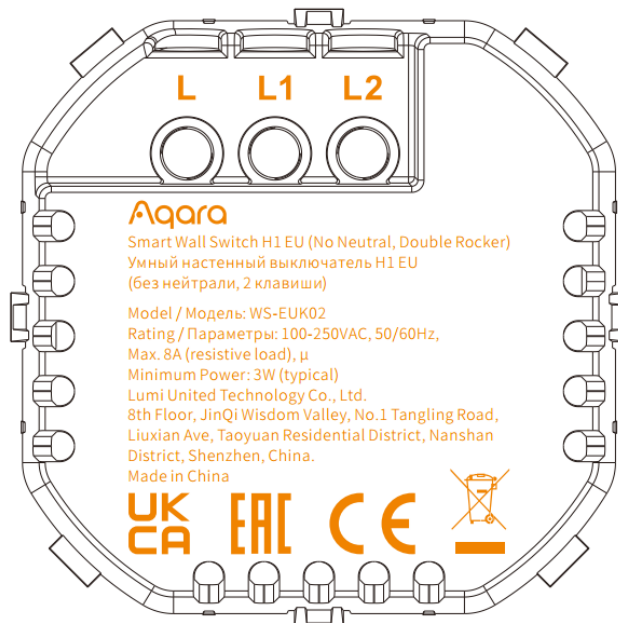
TÜV Rheinland (Guangdong) Ltd.
No.199 Kezhu Road, Guangzhou Science City
510663, Guangzhou, CHINA

Summary of compliance with National Differences:

EU Group Differences.

The product fulfils the requirements of EN 60669-1:1999+A1+A2 & EN 60669-2-1:2004+A1+A12.

Copy of marking plate



Factory information:

1. Guang Dong SUNRAM Electronic Technology Co.,Ltd Shunde 2nd plant
Building A (Shunde Integration Innovation Industry Park), No.25 Sanle East Rd, BeijiaoTown,
Shunde District, Foshan, Guangdong, P.R. China
2. Guang Dong Sunram Electronic Technology Co.,Ltd
Building A, No.25 Sanle East Rd, Beijiao Town, Shunde District, Foshan, Guangdong, P.R.
China

Test item particulars:	Smart Wall Switch
Type of electronic switch and its function (examples given in Annex AA)	Electronically operated mechanical switching device
Pattern number	1
Contact opening (gap) and switch performance	normal gap / mini-gap / micro-gap / without contact gap (semiconductor switching device)
Degree of protection against access to hazardous parts and against harmful effects due to the ingress of solid foreign objects ..	IP2X / IP44 / IP5X
Degree of protection against harmful effects due to the ingress of water	IPX0 / IPX4 / IPX5
Method of actuating	rotary / tumbler / rocker / push-button / cord-operated / momentary contact / touch / proximity / optical / acoustic / Electronic RCS / Electronic TDS / other external influences
Method of mounting	surface-type / flush-type / semi flush-type / panel-type / architrave-type / height
Method of installation	design A / design B
Type of terminals	screw-type / screwless (rigid) / screwless (rigid and flexible)
Flexible cable outlet	without / with
Rated current (A) / Rated load (VA or W) ...	100-250Vac 50/60Hz Max. 8A (Resistive Load)
Minimum current (A) / Minimum load (VA or W)	N/A
Kind of load controlled by the switch	incandescent lamp / fluorescent lamps / motors / declared load (Resistive Load)
Type of switching mechanism	directly operated / sequentially operated / bistable / monostable (only for RCS)
Kind of energization of the control circuit ...	Electronic RCS energized by impulses / Electronics RCS permanently energized
Type of control mechanism	mechanical / thermal / pneumatic / hydraulic / electrical / combination(s) of the previous (only TDS)
Rated control voltage (V)	a.c. / d.c.
Rated control current (A)	a.c. / d.c.
Rated voltage (V)	100-250Vac
Rated frequency (Hz)	50Hz/60Hz
Characteristic of fuses	T8AH,250V
Electronics RCS or TDS having	SELV parts / PELV parts
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 : 2020-12-31

Date (s) of performance of tests : 2020-12-31 – 2021-01-19

General remarks:

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

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

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


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

General product information:

Smart Wall Switch, with Resistive Load: 100-250Vac 50/60Hz Max. 8A.

The structure and schematic diagram of WS-EUK01 and WS-EUK02 are similar. WS-EUK02 has two control loops, WS-EUK01 has one control loop.

IEC 60669-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
8	MARKING		P
8.1	Switches marked with:		P
	- rated voltage (V)	100-250V	P
	- rated control voltage, if different from rated voltage (V)		N/A
	- rated current (A) or rated load (VA or W)	100-250Vac 50/60Hz Max. 8A (Resistive Load)	P
	- symbol for nature of supply	AC	P
	- manufacturer's or responsible vendor's name, trade mark or identification mark		P
	- type reference		P
	- symbol for mini-gap construction (m)		N/A
	- symbol for micro-gap construction (μ)	μ	P
	- symbol for semiconductor switching device (ϵ) :		N/A
	- first IP characteristic numeral, if declared higher than 2, in which case the second characteristic numeral is also marked	IP2X	N/A
	- second IP characteristic numeral, if declared higher than 0, in which case the first characteristic numeral is also marked	IPX0	N/A
	- rated frequency (Hz)	50/60Hz	P
	- rating and type of any fuse incorporated	T8AH,250V	P
	- 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)	By approved screw terminals	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

IEC 60669-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	- 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		P
	Marking for the nature of supply placed next to the marking for rated current and rated voltage		N/A
	Other particular symbols used are explained in the installation instructions		P
8.3	Marking of electronic switch placed on the main part:		P
	- rated current or rated load, rated voltage, symbol for nature of supply, rated frequency (if any), type of load, rating and type of any incorporated fuse (marked on the fuse-holder or in proximity of the fuse)		P
	- either the name, trade mark, or identification mark of the manufacturer or of the responsible vendor		P
	- length of insulation to be removed, if any	Not applicable for screw terminals	N/A
	- symbol for mini-gap construction, micro-gap construction or semiconductor switching device, if applicable		N/A
	- type reference		P
	Information concerning more than one type of load not already marked on the electronic switch are stated in the accompanying instruction sheet	Refer to UM	N/A
	Minimum and maximum current/load are stated for each type of load	Refer to UM	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	IP20 after installation	P
	Marking clearly visible and easily legible		P
	Markings are placed on parts which cannot be removed without the use of a tool		P

IEC 60669-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
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	L	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	Load terminal marked with L1 and L2	P
	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		P
	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		P
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:		N/A
	- 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:		N/A
	- 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

IEC 60669-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
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		P
	Marking clearly visible on the front of the switch		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		N/A
	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		N/A
	- 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		N/A
	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:		N/A
	- for incandescent lamps:		N/A
	the adjustment of lamp dimmers is made by the manufacturer		N/A
	not possible to reduce the lowest setting without a tool		N/A
	- for fluorescent lamps:		N/A
	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

IEC 60669-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
8.8	Special precautions necessary to take when installing the switch: details of these and clear information given in an instruction sheet which accompanies the switch		P
	Electronic switch containing a viewing window (lens) intended to be mounted at a height greater 1.7 m: information stated in the instruction sheet		N/A
8.9	Marking durable and easily legible. Test: 15 s with water and 15 s with petroleum spirit		P
9	CHECKING OF DIMENSIONS		N/A
	Switches and boxes comply with the appropriate standard sheets, if any		N/A
	Electronic switches with dimensions other than those specified in the standard sheets (if any) if they are supplied with suitable boxes		N/A
10	PROTECTION AGAINST ELECTRIC SHOCK		P
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	See EU Group differences	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)	35 °C, 75N, 1min	P
	Test probe applied to:		P
	- thin-walled knock-outs with a force of 10 N		N/A
	- 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		P
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

IEC 60669-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	For touch sensitive electronic switches the associated protective impedance does not have to comply with the requirements of clauses 16 and 23		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		P
	- 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 Ω :		N/A
	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: ≤ 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:		N/A
	- cannot be removed without being permanently damaged, or designed that		N/A
	- 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

IEC 60669-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
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		N/A
	- 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:		N/A
	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
10.103	Ventilation openings over live parts:		N/A
	A foreign body introduced into these openings do		N/A

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

	not come into contact with any live parts		
	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

11	PROVISION FOR EARTHING		N/A
	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 ² (mm ²)		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:		N/A
	- 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 _n or 25 A (A)		—
	Resistance ≤ 0,05 Ω (Ω)		N/A

12	TERMINALS		P
12.1	General		P
	Switches provided with screw-type terminals or with screwless terminals		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

IEC 60669-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	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.		P
12.2	Terminals with screw clamping for external copper conductors		P
12.2.1	Switches provided with terminals which allows the proper connection of copper conductors as shows in table 2		P
	Rated current (A)	Max. 8A	—
	Type of conductor (rigid / flexible)	rigid	—
	Smallest / largest cross-sectional area (mm ²)	1,0 mm ² / 2,5 mm ²	—
	Diameter of largest conductor (mm)	2,13 mm	—
	Figure of terminal	1 / 2 / 3 / 4 / 5	—
	Minimum diameter D (minimum dimensions) of conductor space: required (mm); measured (mm)	Required: 3,0mm Measured: 3,92mm	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

IEC 60669-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
12.2.8	Terminals not work loose from their fixing to the switch		P
	Torque test:		P
	- rated current (A)	Max. 8A	—
	- solid rigid copper conductor of the largest cross-sectional area (mm ²) (table 2)	2.5mm ²	—
	- 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
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		N/A
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)	Required: 1,5; Measured: 3,2	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:		N/A
	- 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		N/A
12.3.1	Screwless terminals of the type suitable for:		N/A
	- 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

IEC 60669-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
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 ²)		—
	Diameter of largest rigid conductor (mm)		—
	Diameter of largest flexible conductor (mm)		—
12.3.3	Screwless terminals allow the conductor to be connected without special preparation		N/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
	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:		N/A
	- 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 ²)		N/A
12.3.8	Screwless terminals: adequate insertion obvious and over-insertion prevented		N/A

IEC 60669-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	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
	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
13	CONSTRUCTIONAL REQUIREMENTS		P

IEC 60669-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
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:		P
	- 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:		P
	- held in place at two or more points by effective fixings		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		N/A
13.3.1	Covers, cover plates or actuating members whose fixing is of the screw-type:		P
	Compliance checked by inspection only		P
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:		N/A
	Compliance checked, when their removal may give access, with the standard test finger:		N/A
	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

IEC 60669-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	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:		N/A
	Compliance checked, when their removal may give access, with the standard test finger:		N/A
	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)		N/A
13.4	Switches: no free openings in their enclosures according to their IP classification	No free openings	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		N/A
	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:		N/A
	- axial pull is likely to be applied: 30 N for 1 min		N/A
	- axial pull is unlikely to be applied: 15 N for 1 min		N/A
	- axial push: 30 N for 1 min		N/A
	During and after these tests:		N/A
	- the electronic switch shows no damage		N/A
	- an knob have not moved so as to impair compliance with this standard		N/A

IEC 60669-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
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		N/A
13.9	Surface-type switches with IP > 20 are in according to their classification when fitted with conduits or with sheathed cables	I	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 ² in area with a width and a length not less than 3 mm		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	Install the switch in the wall 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:		N/A
	- 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

IEC 60669-2-1			
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		N/A
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:		N/A
	Electronic switches placed at 40 °C ± 2 °C for 2 h; force of 30 N applied for 5 s by means of the tip of test probe 11 of IEC 61032. During these tests: membranes, lenses and the like are not deformed, live parts not accessible		N/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		N/A
	Switches kept at -5 °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:		N/A
	- rated current (A)		—

IEC 60669-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	- cross-sectional area (mm ²) (min 1,5 mm ²)		—
	Entry shaped to prevent damage to the flexible cable		N/A
	Switches intended to be connected via a flexible cable to an electronic extension unit having a rated current equal to the rated current of the electronic switch: flexible cable complies with 60245 IEC 66 or 60227 IEC 53 with a minimum cross sectional area of 0,75 mm ²		N/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 ² ; 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

IEC 60669-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Test voltage of 2000 V a.c. applied for 1 min between the conductors and the cord anchorage:		N/A
	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		N/A
	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 iron core transformers for extra low-voltage incandescent lamps (for example, halogen): N/A maximum tolerance of the phase-control angle between the positive and negative half-wave of $\pm 2^\circ$		N/A
13.103	TDS shall be of the resetting type		N/A

14	MECHANISM		P
	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		N/A
14.2	Moving contact of switches can come to rest only in "on" and "off" positions		N/A
	Intermediate position permissible if:		N/A
	- 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	Not applicable for pattern number 1 switch	N/A
	Neutral pole of switches of pattern numbers 03 not make after or break before the other poles		N/A

IEC 60669-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
14.5	Action of the mechanism: independent of the presence of cover or cover plate. Test: no flicker		P
14.6	Cord-operated switches: effecting a change by application and removal a pull not exceeding:		N/A
	- 45 N applied vertically, and		N/A
	- 65 N applied at 45° ± 5°		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
15	RESISTANCE TO AGEING, PROTECTION PROVIDED BY ENCLOSURES OF SWITCHES, AND RESISTANCE TO HUMIDITY		P
15.1	Resistance to ageing		P
	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		P
15.2.1	Protection against access to hazardous parts and against harmful effects due to ingress of solid foreign objects		P
	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		P
	Glands: torque (Nm) (2/3 of torque applied in 20.3)		—
	Screws of the enclosure: torque (Nm) (2/3 table 3)		—
15.2.1.1	Protection against access to hazardous parts		P
	Appropriate test according to IEC 60529	IP20	P
15.2.1.2	Protection against harmful effects due to ingress of solid foreign objects		P
	Appropriate test according to IEC 60529	IP20	P

IEC 60669-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Dust not penetrate in quantity to interfere with satisfactory operation or to impair safety		P
15.2.2	Protection against harmful effects due to ingress of water		N/A
	Enclosure of switches provide a degree of protection against harmful effects due to ingress of water in accordance with their IP classification		N/A
	Appropriate test according to IEC 60529		N/A
	Flush-type and semi-flush-type switches fixed:		N/A
	- 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		P
	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:		P
	- 2 days (48 h) for switches with IPX0	25 °C, 93%, 48h	P
	- 7 days (168 h) for switches with IP>X0		N/A
	After this treatment: specimens show no damage		P
16	INSULATION RESISTANCE AND ELECTRIC STRENGTH		P
16.1	The insulation resistance measured 1 min after application of 500 V d.c.	See appended table 16.1	P
16.2	Electric strength: a.c. test voltage applied for 1 min	See appended table 16.2	P
17	TEMPERATURE RISE		P
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

IEC 60669-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Material and components of electronic switch are not adversely effected by the temperature rise in normal use		P
	During the test:		P
	- 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

18	MAKING AND BREAKING CAPACITY		P
	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	WS-EUK02	—
	Pattern number	1	—
	Rated current (A) / Rated load (W or VA)	Max. 8A (Resistive Load)	—
	Rated voltage (V)	100-250Vac	—
	Test for electronics switches for the control of:		P
	- 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

IEC 60669-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	- 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)	30 operations per minute	—
	Electronic switches fitted with conductors having nominal cross-sectional area as for the test of clause 17 (mm ²)	2,5 mm ²	—
18.1	Test with cos φ 0,3 alternating current		P
	- test voltage (1,1 V _n) (V)	275	—
	- test current (1,25 I _n) (cos φ 0,3) (A)	1.25*8A=10A	—
	- 200 operations; rate (operations per minute)	30	—
	- electronic switches whose rate of operation is limited by their application (for example, heat and light sensors): electronic switch is set to the shortest cycle time possible and re-activated at the end of each cycle within a time of (2 ± 0,5) s :		—
	- samples number	1, 2, 3	—
	During the test: no sustained arcing		P
	After the test: specimens show no damage		P
	Test with cos φ 0,3 alternating current for electronics TDS		N/A
	- test voltage (1,1 V _n) (V)		—
	- test current (1,25 I _n) (cos φ 0,3) (A)		—
	- 200 operations; rate (operations per minute)		—
	- electronic TDS whose rate of operation is limited 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 ± 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 ≤ 16 A / V _n ≤ 250 V and switches of pattern numbers 3 and 03 with V _n > 250 V)		P
	- test voltage (V _n) (V)	250	—
	- test current (≥ 1,2 I _n) (A)	1.2X*8A=9.6A	—
	- number of 200 W tungsten filament lamps	12	—

IEC 60669-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	- 200 operations; rate (operations per minute)	30	—
	- samples number	1,2,3	—
	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:		N/A
	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 ± 0.05		N/A
	Breaking: 50 cycles with: test current: $6 I_n$ (A); test voltage: V_n (V); $\cos\phi$ 0.6 ± 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):		N/A
	- 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	NORMAL OPERATION		P
	Electronic switches withstand the mechanical, electrical and thermal stresses occurring in normal use		P
	Electronic switches whose cycle of operation is limited by their application: rate of operation specified by the manufacturer (operation per minute)		—
	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		—

IEC 60669-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	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 ²)		—
	- test voltage (V _n) (V)		—
	- test current (I _n) (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:		N/A
	- 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:		N/A
	- 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
	- control circuit supplied as specified in clause 18 for the remaining 90 % of the operations		N/A

IEC 60669-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	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 ²)		—
	- test voltage (V _n) (V)		—
	- test voltage applied to control circuit (rated control voltage) (V)		—
	- test current (I _n) (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)		—
	TDS equipped with an incorporated hand-operated device acting directly on the switching circuit:		N/A
	- 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:		N/A
	- 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

IEC 60669-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	- 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
19.101	Contact mechanisms intended for incandescent lamp circuits and dimmers for step-down converter; number of operations 40.000:		P
	Rate of operation (operation per minute)	30 operations per minute	—
	Rated current (A) / Rated load (W or VA)	Max. 8A	—
	Rated voltage (V)	100-250V	—
	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:		N/A
	Making: test current: 6 In (A); test voltage: Vn (V); $\cos\phi 0.65 \pm 0.05$		N/A
	Breaking: test current In (A); test voltage Vn (V); $\cos\phi 0.65 \pm 0.05$		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:		N/A
	- rate of operation (operation per minute)		—
	- test voltage (Vn); test current (In) ($\cos\phi 0,9$); number of operations with load A		N/A
	- test voltage (Vn);		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:		N/A
	Rated current (A) / Rated load (W or VA)		—
	Rated voltage (V)		—

IEC 60669-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Test voltage: 1.1 Vn (V)		—
	Switch state changed 10 times by means of the sensing surface or unit, or/and		N/A
	Setting value altered 10 times from min to max and back to min by means of the sensing surface or unit		N/A
	Additional test, where appropriate:		N/A
	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		N/A
19.104	Mechanical control units incorporate in electronic switches:		P
	Type of mechanical control unit	push button / potentiometer / other requiring manual operation	—
	Rated current (A) / Rated load (W or VA)	Max. 8A	—
	Rated voltage (V)	100-250V	—
	Test voltage: 1.1 Vn (V)	275V	—
	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	—
	During the test: specimens function correctly		P
19.105	Electronic switches for which a minimum load or current is specified by the manufacturer:		P
	Test current: rated minimum current (A) / rated minimum load (W or VA)	3W	—
	Test voltage: 0,9 Vn (V)	90V	—
	Switch state changed 10 times over the whole range from min to max and back to min, and/or	10 times	P
	Setting value altered 10 times over the whole range from min to max and back to min		P
	Additional test, where appropriate:		P
	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		P
	Setting value altered 10 times over the whole range from min to max and back to min by means of an electronic extension unit		P

IEC 60669-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	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:		P
	- 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 19	P
	After the test, electronic switch is in operating condition		P
	Sealing compounds, if any, have not flowed		P
	Evaluation of compliance after the normal operation: after the tests the specimens shall not show:		P
	- 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;		P
	- displacement of the moving contacts of electronic switches of pattern number 2		P
19.106	Test for electronic RCS energized by impulses (under no-load conditions):		N/A
	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		N/A
	Test (under no-load conditions):		N/A
	- 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

IEC 60669-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
19.107	Electronic TDS have an adequate repetitive accuracy of delay time		N/A
	Test (under no-load conditions):		N/A
	- 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 :	—% / —%	—
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:		N/A
	- 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:		N/A
	- rated control voltage (V)		—
	- delay time (declared by the manufacturer) (min)		—
	Total delay time is the delay time (declared by the manufacturer) ±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:		N/A
	- 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) ±5 % (min)		N/A
20	MECHANICAL STRENGTH		P

IEC 60669-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	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		N/A
	- diameter of cylindrical metal test rod (mm)		—
	- type of material	metal / moulded material	—
	- torque for 1 min (table 19) (Nm)		—
	After the test: no damage of glands and enclosure of the specimens		N/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)		P
20.4.1	Verification of the non-removal of covers, cover-plates or actuating member		P
	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		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		P
	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
	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

IEC 60669-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Covers, cover-plates or actuating members come off		P
	After the test: no damage		P
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)		N/A
20.4.1	Verification of the non-removal of covers, cover-plates or actuating members		N/A
	Force applied for 1 min in direction perpendicular to the mounting surface	10 N / 20 N	—
	Covers or cover-plates 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		N/A
	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
20.6	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)		N/A
20.4.1	Verification of the non-removal of covers, cover-plates or actuating members		N/A
	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

IEC 60669-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	After the test: no damage		N/A
20.4.2	Verification of the removal of covers, cover-plates or actuating members		N/A
	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	complying / not complying	—
20.8	Test with gauge according to figure 23 applied as shown in figure 24 (1 N): gauge not enter more than 1mm	complying / not complying	—
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:		N/A
	- switch show no damage		N/A
	- operating member not broken and cord-operated switch still operate		N/A

21	RESISTANCE TO HEAT		P
21.1	Switches kept for 1 h in a heating cabinet at a temperature of 100 °C ± 2 °C		P
	During the test: no change impairing their further use and sealing compound, if any, not flow	100 °C for 1h	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

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

22	SCREWS, CURRENT-CARRYING PARTS AND CONNECTIONS		P
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		N/A
	Screws and nuts which transmit contact pressure: in engagement with a metal thread	screws of fixing plate	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		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:		N/A
	- 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;		N/A
	- 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
	- 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

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

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		N/A
	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

23	CREEPAGE DISTANCES, CLEARANCES AND DISTANCES THROUGH SEALING COMPOUND		P
	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		N/A
	Electronic switches without directly associated fuse or other current-limiting means: comply with table 20		P
23.1	Creepage distances, clearances and distances through sealing compound no less than the values shown in table 20	See appended table 23.1	P
23.2	Insulating compound: not protrude above the edge of the cavity in which it is contained		N/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

IEC 60669-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
24	RESISTANCE OF INSULATING MATERIAL TO ABNORMAL HEAT, TO FIRE AND TO TRACKING		P
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	IP20	P
	Tracking test with solution A of IEC 60112	See appended table 24.2	P
25	RESISTANCE TO RUSTING		N/A
	Ferrous parts protected against rusting		N/A
	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:		N/A
	No signs of rust		N/A
26	EMC REQUIREMENTS		P
	Electronic switches designed to operate correctly under the conditions of electromagnetic environment in which they are intended to be used	See TÜV Rheinland EMC test report No. 50319600 001	P
101	ABNORMAL CONDITIONS		P
	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:		N/A
	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

IEC 60669-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Electronic switches protected by automatic protective devices (including fuses):		P
	Current with which the protecting device releases after 1 h (A)	11.14*0.95=10.58A	—
	Test current: 0.95 times the current with which the protecting device releases after 1 h (A)		—
	Temperature rise measured after steady state or after 4 h		P
	Electronic switches protected by incorporated fuses complying with IEC 60127:		N/A
	Rated current of incorporated fuse (A)		—
	Test current: 2.1 I _n (A)		—
	Temperature rise measured after 30 min	See appended table 101.1.1.2	N/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 ² t: 15000 A ² s:		P
	Test voltage V _n (V)	250V	—
	Type of fuse recommended by the manufacturer :	N/A	—
	N° of short circuits; N° of specimens used	6 times	—
	During the test: emission of flames or burning particles not occur		P
	After the test:		P
	- 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:		N/A

IEC 60669-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	- 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:		N/A
	Electronic RCS withstand a dielectric test (sub-clause 16.2), test voltage (a.c., for 1 min), between switching and control circuits:		N/A
	- 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:		N/A
	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		N/A
	Test made on three additional specimens of electronic TDS meeting with requirements of clauses 15 and 16:		N/A
	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:		N/A
	- 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, ≤ 75 K (K)		N/A

IEC 60669-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	- 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 TDS did not emit flames, melted material, glowing particles or burning drops of insulating material		N/A
	After cooling down to ambient temperature:		N/A
	Electronic TDS withstand a dielectric test (sub-clause 16.2), test voltage (a.c., for 1 min), between switching and control circuits:		N/A
	- test voltage (V)		—
	During the test: no flashover or breakdown		N/A
	Electronic TDS still meet the requirements of 10.1		N/A

102	COMPONENTS		P
	Components which, if they fail, may impair the safety of the electronic switch comply with the relevant IEC standards, as far as applicable		P
	Components marked with their operating characteristics used in accordance with these markings		P
102.1	Fuses comply with:		P
	- IEC 60127	T8AH,250V	P
	- other relevant IEC publications		N/A
	Rated breaking capacity (A): 1500 A or 35 A	1500 A	P
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:		N/A
	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:		N/A
	- rated voltage (V)		N/A
	- rated capacitance (μ F)		N/A

IEC 60669-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	- reference temperature (°C)		N/A
	Capacitors: the short-circuiting of which cause a current = 0,5 A through the terminals of the capacitor:		N/A
	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:		N/A
	- rated voltage (V)		N/A
	- rated capacitance (µF)		N/A
	- reference temperature (°C)		N/A
	Capacitors: for suppression of electromagnetic interference:		N/A
	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:		N/A
	- rated voltage (V)		N/A
	- rated capacitance (µF)		N/A
	- reference temperature (°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:		P
	Manufacturer / characteristics of resistor	22Ω/1W	—
	- constant value under overload conditions		P
	reference temperature of the resistor according to clause 17 (°C)		—

IEC 60669-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	- comply with sub-clause 14.1 of IEC 60065		P
102.4	Automatic protective devices (other than fuses)		N/A
	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):		N/A
	Adequate making and breaking capacity		N/A
	Reference temperature above 55 °C: specimens tested at reference temperature according to clause 17 (°C)		N/A
102.4.1.1	Non-self-resetting cut-outs in the load circuit of the electronic switch:		N/A
	Test voltage: 1.1 Vn (V)		—
	Cut-outs in electronic switches for incandescent or fluorescent lamps:		N/A
	10 cycles; test current: 2.1 In (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:		N/A
	In (A) of electronic switch (cosφ 0.6)		—
	Making: 10 operations with: test current: 9 In (A); cosφ 0.8 ± 0.05		—
	Breaking: 10 operations with: test current: 6 In (A); cosφ 0.6 ± 0.05		—
	During the test: no sustained arcing		N/A
	After the test: specimens show no damage		N/A
	Electric strength between open contacts: test voltage (V): 1200 V a.c. (Vn ≤ 130 V) or 2000 V (Vn > 130 V) for 1 min:		N/A
102.4.1.2	Self-resetting cut-outs in the load circuit of the electronic switch:		N/A
	Test voltage: 1.1 Vn (V)		—
	Cut-outs in electronic switches for incandescent lamps:		N/A
	200 cycles; test current: 2.1 In (A) of the protecting fuse (IEC 60127) or conventional fusing current (other fuses)		—
	During the test: no sustained arcing		N/A
	After the test: specimens show no damage		N/A

IEC 60669-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	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):		N/A
	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:		N/A
	- 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		N/A
	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	TABLE: test with apparatus shown in figure 10 (screw terminals)			P	
	rated current (A)	Max.8A		—	
	type of conductors	rigid solid / rigid stranded		—	
	smallest/largest cross-sectional area per table 2 (mm ²)	1, 0 mm ² /2,5 mm ²		—	
	number of conductors	1		—	
	nominal diameter of thread (mm); torque per table 3 (Nm)	0,5 Nm		—	
	Cross-sectional area (mm ²)	Diameter of bushing hole per table 4 (mm)	Height H per table 4 (mm)	Mass (kg)	Remarks
	1,0	6,5	260	0,4	P
	2,5	9,5	280	0,7	P
supplementary information:					

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

12.2.6	TABLE: pull test (screw terminals)			P
	rated current (A)	Max.8A		—
	smallest/largest cross-sectional area per table 2 (mm ²)	1, 0 mm ² /2,5 mm ²		—
	nominal diameter of thread (mm); torque 2/3 per table 3 (Nm)	0,33Nm		—
Cross-sectional area (mm ²)	Number of conductors	Type of conductors (rigid solid / rigid stranded)	Pull per table 5 applied for 1 min (N)	Remarks
1,0	1	Rigid solid	30	P
1,0	1	Rigid stranded	30	P
2,5	1	Rigid solid	50	P
2,5	1	Rigid stranded	50	P
supplementary information:				

12.2.7	TABLE: tightening test (screw terminals)			P
	rated current (A)	Max.8A		—
	nominal diameter of thread (mm); torque 2/3 per table 3 (Nm)	0,33Nm		—
Largest cross-sectional area per table 2 (mm ²)	Permissible number of conductors	Type of conductors (rigid solid / rigid stranded)	Number of wires and nominal diameter of wires per table 6	Remarks
2,5	1	Rigid solid	1x1,78	P
2,5	1	Rigid stranded	7x0,67	P
supplementary information:				

16.1	TABLE: insulation resistance			P
item per table 14	test voltage applied between:	measured (MΩ)	required (MΩ)	
	Between all poles connected together and the body, with the switch in the "on" position	9999	>5	
	Between each pole in turn and all other poles connected to the body, with the switch in the "on" position	9999	>2	
	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	9999	>2	

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

supplementary information:

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

supplementary information:

17	TABLE: temperature rise measurements		P
	cross-sectional area of conductor not less than 1,5 mm ² (mm ²) (table 15)	1, 5 mm ²	—
	terminal screws: torque (Nm) (2/3 table 3 or appropriate figures 1, 2, 3, 4)	0,33 Nm	—
	type of load	Resistive Load	—
	rated current (A) / rated load (W or VA)	Max. 8A	—
	rated voltage (V)	100-250 V	—
	test voltage between 0,9 and 1,1 V _n (V), whichever is the more unfavourable	275 V	—
	parts of the electronic switch	max. measured temperature rise (K)	permissible temperature rise (K)
	External parts :Non-metallic parts__ Enclosure	10.1	70
	input wire	17.2	70
	output wire	13.7	70
	PCB	26.5	130
	U1	13.5	95
	L terminal	24.7	55

IEC 60669-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	CH1 terminal	27.2	55
	CH2 terminal	2.0	55
	J1	17.8	for refer
	J2	15.3	for refer
	C3	12.9	for refer
	MOV1	10.7	for refer
	MOV2	12.0	for refer
	Q6	39.3	for refer
	U7	28.2	for refer
	Ambient temperature	20.6	for refer
	cross-sectional area of conductor not less than 1,5 mm ² (mm ²) (table 15)	1, 5 mm ²	—
	terminal screws: torque (Nm) (2/3 table 3 or appropriate figures 1, 2, 3, 4)	0,33 Nm	—
	type of load	Resistive Load	—
	rated current (A) / rated load (W or VA)	Max. 8A	—
	rated voltage (V)	100-250 V	—
	test voltage between 0,9 and 1,1 Vn (V), whichever is the more unfavourable	110V	—
	parts of the electronic switch	max. measured temperature rise (K)	permissible temperature rise (K)
	External parts :Non-metallic parts__ Enclosure	11,6	70
	input wire	17.6	70
	output wire	15,1	70
	PCB	27,2	130
	U1	14,1	95
	L terminal	25,2	55
	CH1 terminal	22,2	55
	CH2 terminal	2,5	55
	J1	18,3	for refer
	J2	16,2	for refer

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

C3		13,9	for refer
MOV1		11,9	for refer
MOV2		12,9	for refer
Q6		38,7	for refer
U7		28.2	for refer
Ambient temperature		20.6	for refer

19	TABLE: reduced electric strength after normal operation		P
item per table 20	test voltage applied between:	test voltage (V)	flashover / breakdown (Yes/No)
	Between all poles connected together and the body, with the switch in the "on" position	1500	No
	Between each pole in turn and all other poles connected to the body, with the switch in the "on" position	1500	No
	TABLE: temperature rise measurements after normal operation		
	cross-sectional area of conductor not less than 1,5 mm ² (mm ²) (table 15)	1,5 mm ²	—
	terminal screws: torque (Nm) (2/3 table 3 or appropriate figures 1, 2, 3, 4)	0,33 Nm	—
	type of load	Resistive Load	—
	rated current (A) / rated load (W or VA)	Max. 8A	—
	rated voltage (V)	100-250 V	—
	test voltage between 0,9 and 1,1 V _n (V), whichever is the more unfavourable	275 V	—
	parts of the electronic switch	max. measured temperature rise (K)	permissible temperature rise (K)
	External parts :Non-metallic parts__ Enclosure	13.6	70
	input wire	19.2	70
	output wire	16.1	70
	PCB	28.4	130
	U1	14.4	95
	L terminal	27.3	55

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

CH1 terminal		28.8	55
CH2 terminal		1.0	55
J1		15.8	for refer
J2		17.7	for refer
C3		14.2	for refer
MOV1		12.1	for refer
MOV2		13.1	for refer
Q6		38.7	for refer
U7		28.8	for refer
Ambient temperature		20.5	for refer

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	100	No damage	
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	KB-6160, KB-6160A / Kingboard Laminates Holdings Limited	125	Max.0,7	
PCB	S1150G/Shengyi Technology Co., Ltd.	125	Max.0,7	
PCB	S1000H/Shengyi Technology Co., Ltd.	125	Max.0,7	
PCB	KB6165F/Kingboard Laminates Holdings Limited	125	Max.0,7	
PCB	EM-825/ELITE MATERIAL CO LTD	125	Max.0,7	
supplementary information:				

21.3	TABLE: ball pressure test of thermoplastic materials			P
	allowed impression diameter (mm) :	≤ 2 mm		—
part under test	material designation / manufacturer	test temperature (°C) (1)	impression diameter (mm)	

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

Enclosure	LUPOY EF-1006F(m)/ LG CHEM LTD	70	0,8
supplementary information: (1) 70 °C / 40 °C + highest temperature rise determined during the test of clause 17			

22.1	TABLE: threaded part torque test					P
threaded part identification	diameter of thread (mm)	column number (I, II, or III)	applied torque (Nm)	times (5/10)	no damage	
Screw for terminal	2,92mm	II	0,5	5	P	
supplementary information:						

23.1	TABLE: creepage distances, clearances and distances through sealing compound							P
	rated voltage (V)						—	
item per table 20	creepage distance dcr, clearance cl and distance through sealing compound dtsc at/of:	required cl (mm)	cl (mm)	required dcr (mm)	dcr (mm)	required dtsc (mm)	dtsc (mm)	
	Between live parts of different polarity	≥ 3	3,30	≥ 3	3,30	-	-	
	Between live parts and accessible surfaces of parts of insulating material	≥ 3	>10.00	≥ 3	>10.00			
	Between live parts and screws or devices for fixing bases, covers or cover-plates	≥ 3	>10.00	≥ 3	>10.00	-	-	
supplementary information:								

24.1.1	TABLE: glow-wire test			P
part under test	material designation / manufacturer	test temperature (°C)	remarks	
PCB	KB-6160, KB-6160A / Kingboard Laminates Holdings Limited	850	No flame	
PCB	S1150G/Shengyi Technology Co., Ltd.	850	No flame	
PCB	S1000H/Shengyi Technology Co., Ltd.	850	No flame	
PCB	KB6165F/Kingboard Laminates Holdings Limited	850	No flame	
PCB	EM-825/ELITE MATERIAL CO LTD	850	No flame	
Enclosure	LUPOY EF-1006F(m)/ LG CHEM LTD	650	No flame	
supplementary information:				

24.2	TABLE: resistance to tracking	N/A
------	--------------------------------------	-----

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

	number of drops	50		—
part under test	material designation / manufacturer	test voltage (V)	flashover / breakdown (Yes/No)	
supplementary information:				

101.1.1.1	TABLE: fault conditions test		P
	cross-sectional area of conductor not less than 1,5 mm ² (mm ²) (table 15)	1.5 mm ²	—
	terminal screws: torque (Nm) (2/3 table 3 or appropriate figures 1, 2, 3, 4)	0,33 Nm	—
	type of load	Resistive Load	—
	rated current (A) / rated load (W or VA)	Max. 8A	—
	rated voltage (V)	100-250 V	—
	test voltage between 0,9 and 1,1 V _n (V), whichever is the more unfavourable	1,1x250 V	—
fault conditions simulated		remarks	verdict
Load SC		F1 opened No hazards	P
U2 SC		Unit worked normally, No damage, No hazard	P
U5 SC		Unit worked normally, No damage, No hazard	P
U4 Pin5,6-4 SC		Unit worked normally, No damage, No hazard	P
U6 Pin3-8 SC		Unit worked normally, No damage, No hazard	P
C1 SC		Unit worked normally, No damage, No hazard	P
C13 SC		Unit worked normally, No damage, No hazard	P

	TABLE: temperature rise measurements		P
	temperature measured after (min)		—
parts of the electronic switch		max. measured temperature rise (K)	permissible temperature rise (K)
External parts :Non-metallic parts__ Enclosure		16.0	70

IEC 60669-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	input wire	21.8	70
	output wire	20.5	70
	PCB	36.3	130
	U1	17.6	95
	L terminal	31.5	110
	CH1 terminal	32.6	110
	CH2 terminal	1.4	110
	J1	19.7	for refer
	J2	20.9	for refer
	C3	17.8	for refer
	MOV1	15.3	for refer
	MOV2	16.5	for refer
	Q6	44.4	for refer
	U7	34.2	for refer
	Ambient temperature	20.6	for refer
	TABLE: additional temperature rise measurements in case of temperature limited by a fuse		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:			

101.1.1.2	TABLE: temperature rise measurements during overload tests		P
	cross-sectional area of conductor not less than 1,5 mm ² (mm ²) (table 15)	1.5 mm ²	—
	terminal screws: torque (Nm) (2/3 table 3 or appropriate figures 1, 2, 3, 4)	0,33 Nm	—
	rated voltage (V)	100-250V	—

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

	test voltage between 0,9 and 1,1 Vn (V), whichever is the more unfavourable	275V	—
	parts of the electronic switch	max. measured temperature rise (K)	permissible temperature rise (K)
	External parts :Non-metallic parts__ Enclosure	21.4	70
	input wire	30.0	70
	output wire	24.2	70
	PCB	42.6	130
	U1	21.6	95
	L terminal	44.1	110
	CH1 terminal	48.1	110
	CH2 terminal	1.6	110
	J1	23.9	for refer
	J2	27.7	for refer
	C3	21.2	for refer
	MOV1	18.1	for refer
	MOV2	19.5	for refer
	Q6	59.6	for refer
	U7	44.3	for refer
	Ambient temperature	23.4	for refer

102	TABLE: components					P
object/part No.	manufacturer/ trademark	type/mode	technical data	standard	Mark	
Enclosure(Bas e/Cover/Button)	LG CHEM LTD	LUPOY EF-1006F(m)	PC,V-0, 120°C, Min. thickness: 1.0mm	UL 94,	Tested with appliance UL E67171	
Terminal	GuoHong Electronics Technology Company Co., Ltd	C3604	11.5*5.5, Brass content:58.3%	EN 60669-1, EN 60669-2-1	Tested with appliance	

IEC 60669-2-1					
Clause	Requirement + Test			Result - Remark	Verdict
	shenzhen weiliang Precision Component Co.,Ltd	C3604	11.5*5.5, Brass content:58.1%	EN 60669-1, EN 60669-2-1	Tested with appliance
Fuse (F1)	Honghu Bluelight Electronic Co., Ltd.	L5CT	T8AH,250V	DIN EN 60127-1 EN/ IEC 60127-1 EN/ IEC 60127-2 DIN EN 60127-2	VDE 40034207
	Suzhou Walter Electronic Co. Ltd.	TSC+P	T8AH,250V	DIN EN 60127-1 EN/ IEC 60127-1 EN/ IEC 60127-2 DIN EN 60127-2	VDE 40016670
Heat-shrinkable tube for Fuse	SHENZHEN WOER HEAT-SHRINKABLE MATERIAL CO LTD	RSFR-H	600V,125°C, VW-1, φ4.5mm	UL 224	UL E203950
	SHENZHEN WOER HEAT-SHRINKABLE MATERIAL CO LTD	RSFR(CB)	300V,125°C, VW-1,φ4.5mm	UL 224	UL E203950
Thermal-link (RF1,RF2)	Xiamen Set Electronics Co., Ltd.	TRXF1S-510RJ07LA	1 W,510 Ω ± 5%,145°C,	EN 60691:2003+A1 +A2	TUV R 50279979
Relay (J1,J2)	Xiamen Hongfa Electroacoustic Co., Ltd.	HF182F-L/3-HL2TF	16A ,277VAC, 105°C	IEC 61810-1:2015 EN 61810-1:2015	TUV R 50455116
PCB	Kingboard Laminates Holdings Limited	KB-6160 KB-6160A	FR-4 ,V-0	DIN EN 60695-11-10 (VDE 0471-11-10):2014-10; EN 60695-11-10:2013	VDE 40047968
	Shengyi Technology Co., Ltd.	S1150G	FR-4 ,V-0	DIN EN 60695-11-10 (VDE 0471-11-10):2014-10; EN 60695-11-10:2013	VDE 40010780

IEC 60669-2-1					
Clause	Requirement + Test			Result - Remark	Verdict
	Shengyi Technology Co., Ltd.	S1000H	FR-4 ,V-0	DIN EN 60695-11-10 (VDE 0471-11-10):2014-10; EN 60695-11-10:2013	VDE 40010780
	Kingboard Laminates Holdings Limited	KB6165F	FR-4 ,V-0	DIN EN 60695-11-10 (VDE 0471-11-10):2014-10; EN 60695-11-10:2013	VDE 40047968
	ELITE MATERIAL CO LTD	EM-825	130°C ,V-0	UL 746	UL E150504
Varistor(MOV1 ,MOV2)	Huizhou Songlongxindian Electronics Technology Co. Ltd.	10D471K	300V ,85°C ,3.0KA	IEC 61051-1 IEC 61051-2 IEC 61051-2-2	VDE 40040037
	Shantou High-New Technology Dev. Zone Songtian Enterprise Co., Ltd	10D471K	300V ,125°C ,2.5KA	IEC 61051-1 IEC 61051-2 IEC 61051-2-2	VDE 40023049
	Guangxi New Future Information Industry Co., Ltd.	10D471K	300V ,85°C ,1.5KA	IEC 61051-1 IEC 61051-2 IEC 61051-2-2	VDE 40030322
Transformer(U1)	SHENZHEN ZHENYADA ELECTRONICS CO LTD	EE8.3-1.2mH	1.2mH	--	Tested with appliance
-Bobbin	CHANG CHUN PLASTICS CO LTD	T375HF, T375J(G5)(G6)	150°C ,V-0,min thickness 0.45mm	UL 94 UL 746	UL E59481
-Magnet wire	Sihui henghui electric appliance co., LTD	UEW/155	155°C , MW 79-C	UL 1446	UL E337948

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

-Insulation tape	SUZHOU MAILADUONA ELECTRIC MATERIAL CO LTD	JY312#	130°C	UL 510	UL E188295
-Varnish	ZHUHAI CHANGXIAN NEW MATERIALS TECHNOLOGY CO LTD	E962	130°C, MW 28- C	UL 1446	UL E335405

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