


TEST REPORT IEC 60669-1 Switches for household and similar fixed-electrical installations Part 1: General requirements	
Report Reference No.: 15120070HKG-001R1 Tested by (name + signature): Lambert Law Signed on file Approved by (name + signature): Wong Woo Ping Date of issue: 7 Apr 2016	
Testing Laboratory: Intertek Testing Services Hong Kong Ltd. Address: 2/F, Garment Centre, 576 Castle Peak Road, Kowloon, Hong Kong Testing location / address: Same as above	
Applicant's name: TCL-Legrand International Electrical (Huizhou) Co., Ltd. Address: Building B1-B3, East No.39 Hochang 6th Road, HZZK Hi-tech Industrial Development Zone, Huizhou, Guangdong	
Test specification Standard: IEC 60669-1:1998 (Third Edition) + A1:1999 + A2:2006 Test procedure: N/A Non-standard test method: N/A	
Test Report Form No.: IEC60669_1D Test Report Form(s) Originator: IMQ S.p.A. Master TRF: Dated 2009-03 Copyright © 2009 IEC System for Conformity Testing and Certification of Electrical Equipment (IECEE), Geneva, Switzerland. All rights reserved. <small>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.</small>	
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Test item description: (A) (B) Push button with bell symbol big rocker (C) 2G push button	

Trade Mark	legrand
Manufacturer.....	TCL-Legrand International Electrical (Huizhou) Co., Ltd.
Model/Type reference.....	(A) 617011 (B) 617011E (C) 617015
Ratings.....	4A 250V~
Test Conclusion	The submitted samples complied with : <ul style="list-style-type: none"> IEC 60669-1:1998 + A1:1999 + A2:2006 The Safety Authority's requirements stipulated in Chapter 6 and 7 of the Singapore Consumer Protection (Safety Requirements) Registration Scheme Information Booklet 2002 Edition (Revision 03).
Copy of marking plate  (for bell switches only) legrand L 1 4 /250~ (model no.) Made in China (for model 617011E)	
Test item particulars	
Pattern number	1
Contact opening (gap)	normal gap
Degree of protection against access to hazardous parts and against harmful effects due to the ingress of solid foreign objects	IP2X
Degree of protection against harmful effects due to the ingress of water	IPX0
Method of actuating	Rocker, momentary contact

Method of application	flush-type
Method of installation	design B
Type of terminals	screw-type
Flexible cable outlet	without
Rated voltage (V)	250V
Rated current (A).....	4A
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: 29 Apr 2015 to 7 Apr 2016 Date (s) of performance of tests: 30 Apr 2015 to 7 Apr 2016	
General remarks: <p>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.</p> <p>When determining the test result, measurement uncertainty of test has been considered.</p> <p>Remark:</p> <ol style="list-style-type: none"> 1. This report is derived from report no. 15041724HKG-001 dated 30 Jun 2015 and 15111024HKG-001 dated 3 Dec 2015. The difference were additional test to Singapore requirement. All test results were referred to report no. 15041724HKG-001 and 15111024HKG-001. 2. Samples of model in this report have the same basic construction as model 617011. The difference was the marking. Except clause 8 were repeated, all other test results were referred to the 617011. 3. This report supersedes report 15120070HKG-001 dated 8 Dec 2015 due to missing model. 	

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Clause	Requirement + Test	Result - Remark	Verdict
8	MARKING		
8.1	Switches marked with:		—
	- rated current (A) or rated fluorescent load (AX) or a combination of both if the two ratings are different ...:	4	P
	- rated voltage (V)	250	P
	- symbol for nature of supply	~	P
	- manufacturer's or responsible vendor's name, trade mark or identification mark	legrand	P
	- type reference		P
	- symbol for mini-gap construction (m)		N/A
	- symbol for micro-gap construction (μ)		N/A
	- 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	IP	N/A
	- second IP characteristic numeral, if declared higher than 0, in which case the first characteristic numeral is also marked	IP	N/A
	Switches with screwless terminals: marked with an indication of the suitability to accept rigid conductors only (if any)		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		P
8.3	Marking of switches placed on the main part:		—
	- rated current, rated voltage and nature of supply		P
	- either the name, trade mark, or identification mark of the manufacturer or of the responsible vendor		P
	- length of insulation to be removed, if any		N/A
	- symbol for mini-gap construction, micro-gap construction or semiconductor switching device, if any		N/A
	- type reference		P
	Cover plates necessary for safety purposes and intended to be sold separately: marked with the manufacturer's or responsible vendor's name, trade mark or identification mark and type reference		N/A
	IP code, when applicable, marked so as to be easily discernible when the switch is mounted and wired as in normal use		N/A
	Marking clearly visible and easily legible		P
	Markings are placed on parts which cannot be removed without the use of a tool		P

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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		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
8.5	Neutral terminals: N.....:		N/A
	Earthing terminals: [earth symbol]		N/A
	Markings not placed on screws or other easily removable parts		N/A
	Terminals for conductors not forming part of the main function of the switch:		—
	- clearly identified unless their purpose is self evident, or		N/A
	- indicated in a wiring diagram fixed to the accessory		N/A
	Identification of equipment terminals may be achieved by:		—
	- their marking with graphical symbols according to IEC 60417 or colours and/or alphanumeric system, or		N/A
	- their physical dimension or relative location		N/A
8.6	Switches marked to indicate the switch position: they are so marked that the direction of movement of the actuating member to its different positions or the actual position is clearly indicated.....:		N/A
	Switches having more than one actuating member: marking indicates the effect achieved by the operation		N/A
	Marking clearly visible on the front of the switch		N/A
	Not possible to fix cover, cover plate, or removable actuating members in an incorrect position		N/A
	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
8.7	Red colour only for push-button to open the circuit		N/A
8.8	Special precautions necessary to take when installing the switch: details of these and clear information given in an instruction sheet which accompanies the switch		N/A
8.9	Marking durable and easily legible. Test: 15 s with water and 15 s with petroleum spirit	moulded and printing	P

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Clause	Requirement + Test	Result - Remark	Verdict
9	CHECKING OF DIMENSIONS		
	Switches and boxes comply with the appropriate standard sheets, if any	BS 4662	P
10	PROTECTION AGAINST ELECTRIC SHOCK		
10.1	Switches: live parts not accessible		P
	Switches designed to be fitted with pilot lights supplied at voltage other than ELV have means to prevent direct contact with the lamp		N/A
	Test with standard test finger shown in figure 1 of IEC 60529		P
	Switches with thermoplastic or electrometric material: additional test carried out at $35^{\circ}\text{C} \pm 2^{\circ}\text{C}$ with a straight unjointed test finger (75 N for 1 min)		P
	Straight unjointed test finger applied to thin-walled knock-outs with a force of 10 N		P
	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
10.3	Accessible parts of switches which a rated current $\leq 16\text{ A}$ are 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

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Clause	Requirement + Test	Result - Remark	Verdict
10.4	Metal parts of mechanism not insulated from live parts: not protrude from enclosure		P
	Switches operated by means of a removable key or similar device: metal parts of mechanism insulated from live parts		N/A
10.5	Metal parts of mechanism not accessible and insulated from accessible metal parts, unless		P
	- separated from live parts (creepage distances and clearances have at least twice the value specified in clause 23), or		N/A
	- reliably connected to earth		N/A
10.6	Switches operated by means of a removable key or an intermediate part: key or an intermediate part can only touch parts insulated from live parts		N/A
	key or intermediate part: insulated from metal parts of mechanism, unless		N/A
	creepage distances and clearances between live parts and metal parts of mechanism have at least twice the values specified in clause 23		N/A
10.7	Cord-operated switches: impossible to touch live parts when fitting or replacing the pull cord		N/A

11	PROVISION FOR EARTHING		
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 not less than that of 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 In or 25 A (A) :		—
	Resistance ≤ 0,05 Ω (Ω) :		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
12	TERMINALS		
12.1	General		—
	Switches provided with screw-type terminals or with screwless terminals	screw clamping: screw terminal	P
	Clamping means of terminals: not serve to fix any other components		P
	All the test on terminals, with the exception of the test of 12.3 11, made after the test of 15.1		P
12.2	Terminals with screw clamping for external copper conductors		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)	4A	—
	Type of conductor (rigid / flexible)	rigid	—
	Smallest / largest cross-sectional area (mm ²)	0,75mm ² / 1,5mm ²	—
	Diameter of largest conductor (mm)	1,45mm	—
	Figure of terminal	2	—
	Minimum diameter D (minimum dimensions) of conductor space: required (mm); measured (mm) ...	≥ 1,7mm; 2,9mm	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

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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)	4A	—
	- solid rigid copper conductor of the largest cross-sectional area (mm ²) (table 2)	1,5mm ²	—
	- torque (Nm) (table 3 or appropriate figures 1, 2, 3, 4)	2,9mm; 0,5Nm	—
	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) :		N/A
	Mantle terminals: distance g no less than the value specified in figure 5: required (mm); measured (mm) :		N/A
12.2.12	Lug terminals:		—
	- used only for switches having rated current ≥ 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:		—
	- for rigid copper conductors only, or		N/A
	- for both rigid and flexible copper conductors (tests carried out with rigid and then repeated with flexible conductors)		N/A
12.3.2	Screwless terminals provided with clamping units which allow the proper connection of rigid or of rigid and flexible conductors having nominal cross-sectional areas as shown in table 7		N/A
	Rated current (A)		—
	Type of conductor (rigid / flexible)		—
	Smallest / largest cross-sectional area (mm ²)		—
	Diameter of largest rigid conductor (mm)		—
	Diameter of largest flexible conductor (mm)		—

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Clause	Requirement + Test	Result - Remark	Verdict
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:		—
	- 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
	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

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Clause	Requirement + Test	Result - Remark	Verdict
	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		
13.1	Insulating lining, barriers and like: adequate mechanical strength and secured in a reliable manner		P
13.2	Switches constructed so as to permit:		—
	- easy introduction and connection of the conductors in the terminals;		P
	- correct positioning of the conductors		P
	- easy fixing of the switch to a wall or in a box		P
	- adequate space between underside of the base and the surface on which the base is mounted or between the sides of the base and the enclosure (cover or box)		P
	Surface-type switches: fixing means do not damage insulation of the cable		N/A
	Switches classified as design A: permit easy positioning and removal of the cover or cover plate, without displacing the conductors		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
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, e.g. by a screw, provided that they are located by another means (e.g. 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:		—
	to live parts: by the test of 20.4 (verification of the non-removal and the removal)		N/A
	to non-earthed metal parts separated from live parts by creepage distances and clearances according to table 20: by the test of 20.5 (verification of the non-removal and the removal)		N/A
	only to insulating parts, or earthed metal parts, or metal parts separated from live parts by creepage distances and clearances twice those according to table 20, or live parts of SELV circuits not greater than 25 V a.c.: by the test of 20.6 (verification of the non-removal and the removal)		N/A
13.3.3	Covers, cover-plates or actuating members whose fixing is not dependent on screws and whose removal is obtained by using a tool, in accordance with the manufacturer's information given in an instruction sheet or in a catalogue:		P
	Compliance checked, when their removal may give access, with the standard test finger:		—
	to live parts: by the test of 20.4 (verification of the non-removal only)		N/A
	to non-earthed metal parts separated from live parts by creepage distances and clearances according to table 20: by the test of 20.5 (verification of the non-removal only)		N/A

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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 only)		P
13.4	Switches: no free openings in their enclosures according to their IP classification		P
13.5	Knobs of rotary switches securely attached to the shaft or part operating the mechanism		N/A
	- axial pull test: 100 N for 1 min		N/A
	- knob of switches having only one direction of operation: turned 100 times in the reverse direction		N/A
	During the test: knob not become detached		N/A
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		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	Ø mm / mm ²	N/A
	Drain hole: effective		N/A
	Lid springs (if any): of corrosion resistant material (bronze or stainless steel)		N/A
13.10	Switches to be installed in a box: conductor ends can be prepared after the box is mounted in position, but before the switch is fitted in the box		P
	Base have adequate stability when mounted in the box		P

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Clause	Requirement + Test	Result - Remark	Verdict
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
	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 reliably fixed and not displaced by the mechanical and thermal stresses occurring in normal use		N/A
	Test on membranes subjected to the ageing treatment specified in 15.1 and fitted with the switches		N/A
	Switches placed at 40 °C for 2 h. Force of 30 N applied for 5 s by test finger. During the test: no deformation, live parts not accessible		N/A
	Membranes likely to be subjected to an axial pull: axial pull of 30 N applied for 5 s. During the test: membranes not come out		N/A
	After the test: no harmful deformation, cracks or similar damage		N/A
	Test repeated with membranes 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

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Clause	Requirement + Test	Result - Remark	Verdict
	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 12a accepted by the entry:		N/A
	- rated current (A)		—
	- cross-sectional area (mm ²) (min 1,5 mm ²)		—
	Entry shaped to prevent damage to the flexible cable		N/A
	Flexible cable outlet switches: 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
	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

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Clause	Requirement + Test	Result - Remark	Verdict
14	MECHANISM		
14.1	Actuating member of a switch, when released, automatically take up the position corresponding to that of moving contacts		P
14.2	Moving contact of switches can come to rest only in "on" and "off" positions		P
	Intermediate position permissible if:		—
	- it corresponds to the intermediate position of the actuating member, and		N/A
	- the insulation between fixed and moving contacts is adequate. Electric strength test as specified in 16.2: test voltage a.c. for 1 min (V)	500 V / 750 V / 1250 V / 2000 V	N/A
14.3	No undue arcing in slowly operation		P
	Test carried out at the end of the test of clause 19.1: breaking of the circuit 10 times, actuating member moved over a period of 2 s. During the test: no sustained arcing		P
14.4	Switches of pattern numbers 2, 3, 03 and 6/2 make and break all poles substantially simultaneously		N/A
	Neutral pole of switches of pattern numbers 03 not make after or break before the other poles		N/A
14.5	Action of the mechanism: independent of the presence of cover or cover plate. Test: no flicker		N/A
14.6	Cord-operated switches: effecting a change by application and removal a pull not exceeding:		—
	- 45 N applied vertically, and		N/A
	- 65 N applied at 45° ± 5°		N/A

15	RESISTANCE TO AGEING, PROTECTION PROVIDED BY ENCLOSURES OF SWITCHES, AND RESISTANCE TO HUMIDITY	
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	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
15.2.1	Protection against access to hazardous parts and against harmful effects due to ingress of solid foreign objects		N/A
	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		N/A
	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		N/A
	Appropriate test according to IEC 60529: IP		N/A
15.2.1.2	Protection against harmful effects due to ingress of solid foreign objects		N/A
	Appropriate test according to IEC 60529: IP		N/A
	Dust not penetrate in quantity to interfere with satisfactory operation or to impair safety		N/A
15.2.2	Protection against harmful effects due to ingress of water		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: IP		N/A
	Flush-type and semi-flush-type switches fixed:		—
	- in a test wall using an appropriate box in accordance with the manufacturer's instructions		N/A
	- in a test wall according to figure 27		N/A
	Screws of the enclosure: torque (Nm) (2/3 table 3)		—
	Glands: torque (Nm) (2/3 of torque applied in table 19)		—
	Specimens withstand an electric strength test specified in 16.2 which is started within 5 min of completion of the test		N/A
15.3	Resistance to humidity		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		P
	- 7 days (168 h) for switches with IP>X0		N/A
	After this treatment: specimens show no damage		P

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Clause	Requirement + Test	Result - Remark	Verdict
16	INSULATION RESISTANCE AND ELECTRIC STRENGTH		
16.1	The insulation resistance measured 1 min after application of 500 V d.c.	See appended table 16.1	P
16.2	Electric strength: a.c. test voltage applied for 1 min	See appended table 16.2	P
17	TEMPERATURE RISE		
17.1	Switches so constructed that the temperature rise in normal use is not excessive	See appended table 17	P
	No oxidation or any other deterioration of contacts		P
17.2	Switches incorporating or intended to incorporate pilot lights are designed that in normal use temperature of the accessible surface is not excessive	See appended table 17	N/A
18	MAKING AND BREAKING CAPACITY		
	Switches have adequate making and breaking capacity		P
	- model/type reference	617011	—
	- pattern number	1	—
	- rated voltage (V)	250V	—
	- rated current (A)	4A	—
	- nominal cross-sectional area as for the test of clause 17 (mm ²)	1,0mm ²	—
18.1	Test with cos ϕ 0,3 alternating current		P
	- test voltage (1,1 V _n) (V)	275V	—
	- test current (1,25 I _n) (cos ϕ 0,3) (A)	5A	—
	- 200 operations; rate (operations per minute)	30 operations per minute	—
	- samples number	7, 8, 9	—
	During the test: no sustained arcing		P
	After the test: specimens show no damage		P
18.2	Test with tungsten filament lamps load (switches with I _n ≤ 16 A / V _n ≤ 250 V and switches of pattern numbers 3 and 03 with V _n > 250 V)		N/A
	- test voltage (V _n) (V)		—
	- test current (≥ 1,2 I _n) (A)		—
	- number of 200 W tungsten filament lamps		—
	- 200 operations; rate (operations per minute)		—
	- samples number		—
	During the test: no sustained arcing nor welding of the contacts		N/A
	After the test: specimens show no damage		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
19	NORMAL OPERATION		
19.1	Switches withstand without excessive wear or other harmful effect, the mechanical, electrical and thermal stresses occurring in normal use		P
	- model/type reference	617011	—
	- pattern number	1	—
	- nominal cross-sectional area per clause 18 (mm ²)	1,0mm ²	—
	- test voltage (Vn) (V)	250V	—
	- test current (In) (cos φ 0,6) (A)	4A	—
	- number of operations per table 17	40 000 operations	—
	- rate (operations per minute)	30 operations per minute	—
	- samples number	7, 8, 9	—
	Reduced electric strength per clause 16	See appended table 19.1	P
	Temperature rise test per clause 17 after normal operation	See appended table 19.1	P
	After the tests the specimens not show:		—
	- wear impairing their further use;		P
	- discrepancy between the position of the actuating member (if indicated) and that of the moving contacts		P
	- deterioration of enclosures, insulating lining or barriers;		P
	- seepage of sealing compound		N/A
	- loosening of electrical or mechanical connections;		P
	- 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)		P
19.2	Switches intended for fluorescent lamp load withstand, without excessive wear or other harmful effect, the electrical and thermal stresses occurring when controlling fluorescent lamp circuits		N/A
	- model/type reference		—
	- pattern number		—
	- nominal cross-sectional area per clause 18 (mm ²)		—
	- rate (operations per minute)		—
	- test voltage (Vn); test current (In) (cos φ 0,9); number of operations with load A		—
	- test voltage (Vn); 100 operations with load B		—
	- samples number		—

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Clause	Requirement + Test	Result - Remark	Verdict
	During the test: copper wire F not melt, specimens function correctly, no sustained arcing or welding of contacts		N/A
	Temperature rise test per clause 17 after normal operation	See appended table 19.2	N/A
	After the tests it is possible to make and break the switch by hand, and specimen not show:		—
	- wear impairing their further use;		N/A
	- discrepancy between the position of the actuating member (if indicated) and that of the moving contacts		N/A
	- deterioration of enclosures, insulating lining or barriers;		N/A
	- loosening of electrical or mechanical connections;		N/A
	- seepage of sealing compound		N/A
	- displacement of moving contacts of switches pattern number 2, 3 or 6/2		N/A

20	MECHANICAL STRENGTH		
	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)		—
	During and after the test: bases show no damage		N/A
20.3	Screwed glands of switches with that have IP code higher than IP20: 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)		N/A
20.4.1	Verification of the non-removal of covers, cover-plates or actuating member		N/A
	Force applied for 1 min in direction perpendicular to the mounting surface	40 N / 80 N	—

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Clause	Requirement + Test	Result - Remark	Verdict
	Covers, cover-plates or actuating members not come off		N/A
	Test repeated on new specimens with a sheet of hard material, 1 mm \pm 0,1 mm thick, fitted around the supporting frame (fig. 19)		N/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 \pm 0,1 mm thick, fitted around the supporting frame (fig. 19)		N/A
	Covers, cover-plates or actuating members come off		N/A
	After the test: no damage		N/A
20.5	Force necessary for covers, cover-plates or actuating members to come off or not to come off (accessibility with the test finger to non-earthed metal parts separated from live parts by creepage distances and clearances according to table 20)		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 \pm 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 \pm 0,1 mm thick, fitted around the supporting frame (fig. 19)		N/A
	Covers, cover-plates or actuating members come off		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	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 \pm 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 \pm 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	—
20.8	Test with gauge according to figure 23 applied as shown in figure 24 (1 N): gauge not enter more than 1mm	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

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Clause	Requirement + Test	Result - Remark	Verdict
21	RESISTANCE TO HEAT		
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		P
	After the test: no access to live parts, markings still legible		P
21.2	Parts of insulating material necessary to retain current-carrying parts and parts of the earthing circuit in position: ball-pressure test (1 h, 125 °C)	See appended table 21.2	P
21.3	Parts of insulating material not necessary to retain current-carrying parts and parts of the earthing circuit in position, even though in contact with them: ball-pressure test (1 h)	See appended table 21.3	P

22	SCREWS, CURRENT-CARRYING PARTS AND CONNECTIONS		
22.1	Connections withstand mechanical stresses		P
	Thread-forming or thread-cutting screws used only if supplied together with the piece in which they are intended to be inserted		P
	thread-cutting screws intended to be used during installation are captive with the relevant part of the accessory		P
	Screws and nuts which transmit contact pressure: in engagement with a metal thread		P
	Threaded part torque test	See appended table 22.1	P
22.2	Screws in engagement with a thread of insulating material: correct introduction into the screw hole or nut ensured		P
22.3	Contact pressure: not transmitted through insulating material other than ceramic, pure mica or other material no less suitable unless there is sufficient resiliency in metallic parts		P
22.4	Screws and rivets locked against loosening or turning		P
22.5	Current-carrying parts of metal having mechanical strength, electrical conductivity and resistance to corrosion adequate:		P
	- copper;		P
	- 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

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Clause	Requirement + Test	Result - Remark	Verdict
	- 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
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		P
	Thread-forming screws and thread-cutting screws used to provide earthing continuity: not necessary to disturb the connection and at least two screws are used for each connection		N/A

23	CREEPAGE DISTANCES, CLEARANCES AND DISTANCES THROUGH SEALING COMPOUND	
23.1	Creepage distances, clearances and distances through sealing compound no less than the values shown in table 20	See appended table 23.1
23.2	Insulating compound: not protrude above the edge of the cavity in which it is contained	N/A

24	RESISTANCE OF INSULATING MATERIAL TO ABNORMAL HEAT, TO FIRE AND TO TRACKING	
24.1	Parts of insulating material which might be exposed to thermal stresses due to electric effects and the deterioration of which might impair the safety are not unduly affected by abnormal heat and fire	P
24.1.1	Glow-wire test according to IEC 60695-2-1	See appended table 24.1.1
24.2	Parts of insulating material retaining live parts in position of switches with IP>X0: of material resistant to tracking	N/A
	Tracking test with solution A of IEC 60112	See appended table 24.2

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Clause	Requirement + Test	Result - Remark	Verdict
25	RESISTANCE TO RUSTING		
	Ferrous parts protected against rusting		P
	Test: 10 min in carbontetrachloride, trichloroethane or equivalent degreasing agent, 10 min 10 % solution of ammonium chloride, 10 min in a box with air saturated with moisture and 10 min at 100 °C ± 5 °C:		P
	No signs of rust		P
26	EMC REQUIREMENTS		
26.1	Immunity		—
	No immunity tests necessary		N/A
26.2	Emission		—
	No emission tests necessary		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

12.2.5	TABLE: test with apparatus shown in figure 10 (screw terminals)		P
	rated current (A)	4A	—
	type of conductors	rigid solid / rigid stranded	—
	smallest/largest cross-sectional area per table 2 (mm ²)	0,75mm ² / 1,5mm ²	—
	number of conductors.....	1	—
	nominal diameter of thread (mm); torque per table 3 (Nm)	2,9mm; 0,5Nm	—

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

supplementary information:

12.2.6	TABLE: pull test (screw terminals)		P
	rated current (A)	4A	—
	smallest/largest cross-sectional area per table 2 (mm ²)	0,75mm ² / 1,5mm ²	—
	nominal diameter of thread (mm); torque 2/3 per table 3 (Nm)	2,9mm; 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
0,75	1	rigid solid	30	
1,5	1	rigid solid	40	

supplementary information:

12.2.7	TABLE: tightening test (screw terminals)		P
	rated current (A)	4A	—
	nominal diameter of thread (mm); torque 2/3 per table 3 (Nm)	2,9mm; 0,5Nm	—

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
1,5	1	rigid solid	1 x 1,38	
1,5	1	rigid stranded	7 x 0,52	

supplementary information:

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

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

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Clause	Requirement + Test	Result - Remark	Verdict

Test b)	Temperature cycles test) carried out on terminals subjected to Test a):					
	test current per table 8 (A)					—
	nominal cross-sectional area (mm ²)					—
	allowed voltage drop (mV)	≤ 22,5 mV or 2 times 24 th cycle value (mV)				—
Screwless terminal number	1	2	3	4	5	Remarks
voltage drop after 24 th cycle						
voltage drop after 48 th cycle						
voltage drop after 72 th cycle						
voltage drop after 96 th cycle						
voltage drop after 120 th cycle						
voltage drop after 144 th cycle						
voltage drop after 168 th cycle						
voltage drop after 192 th cycle						

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

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Clause	Requirement + Test	Result - Remark	Verdict

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

16.1	TABLE: insulation resistance			P
Item per table 14	test voltage applied between:	measured (MΩ)	required (MΩ)	
1	between all poles connected together and the body, with the switch in the “on” position	> 1000MΩ	≥ 5 MΩ	
3	between the terminals which are electrically connected together when the switch is in the “on” position, the switch being in the “off” position	> 1000MΩ	≥ 2 MΩ	
supplementary information:				

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Clause	Requirement + Test	Result - Remark	Verdict

16.2	TABLE: electric strength		P
	rated voltage (V)	250V	—
item per table 14	test voltage applied between:	test voltage (V)	flashover / breakdown (Yes/No)
1	between all poles connected together and the body, with the switch in the “on” position	2000V	No
3	between the terminals which are electrically connected together when the switch is in the “on” position, the switch being in the “off” position	2000V	No
supplementary information:			

17	TABLE: temperature rise measurements		P
	rated current (A)	10A	—
	nominal cross-sectional area (mm ²)	1,0mm ²	—
	terminal screws: torque (Nm) (2/3 table 3)	0,33Nm	—
	test current per table 15 passed for 1 h (A)	5A	—
	rated voltage of pilot light (V)	250V	—
	samples number	7, 8, 9	—
thermocouple locations		max. measured temperature rise (K)	allowed temperature rise (K)
Terminals		19K	45K
Insulation material		1K	45K
supplementary information:			

19.1	TABLE: reduced electric strength after normal operation (clause 19.1)		P
item per table 14	test voltage applied between:	test voltage (V)	flashover / breakdown (Yes/No)
1	between all poles connected together and the body, with the switch in the “on” position	1500V	No
3	between the terminals which are electrically connected together when the switch is in the “on” position, the switch being in the “off” position	1500V	No
	TABLE: temperature rise measurements at terminals after normal operation (clause 19.1)		P
	test current (I _n) passed for 1 h (A)	4A	—
thermocouple locations		max. measured temperature rise (K)	allowed temperature rise (K)
Terminals		30K	45K
supplementary information:			

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Clause	Requirement + Test	Result - Remark	Verdict
19.2	TABLE: temperature rise measurements at terminals after test with fluorescent lamp load (clause 19.2)		N/A
	test current (In) passed for 1 h (A)		—
	thermocouple locations	max. measured temperature rise (K)	allowed temperature rise (K)
			45K
supplementary information:			

20.1	TABLE: impact test			P
	part of enclosure tested per table 18 (A, B, C, D)	blows per part	height of fall (mm)	comments
	A	5	100	no damage
	B	4	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)
	base	-	125	1,1

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)
	front plate	-	70	0,6
supplementary information:				
⁽¹⁾ 70 °C / 40 °C + highest temperature rise determined during the test of clause 17				

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Clause	Requirement + Test	Result - Remark	Verdict

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	
Terminal	2,9	III	0,5	5		
supplementary information:						

23.1	TABLE: creepage distances, clearances and distances through sealing compound							P
	rated voltage (V)			250V				—
item per table 20	creepage distance dcr, clearance cl and distance through sealing compound dtsc at/of:	required cl (mm)	cl (mm)	required dcr (mm)	dcr (mm)	required dtsc (mm)	dtsc (mm)	
1	between live parts which are separated when the contacts are open	≥	-	≥ 3,0	6,0	≥	-	
3	between live parts and accessible surfaces of parts of insulating material	≥	-	≥ 3,0	>10	≥	-	
3	between live parts and screw for fixing bases, cover or cover plate	≥	-	≥ 3,0	>10	≥	-	
6	between live parts which are separated when the contacts are open	≥ 3,0	4,0	≥	-	≥	-	
8	between live parts and accessible surfaces of parts of insulating material	≥ 3,0	>10	≥	-	≥	-	
9	between live parts and metal boxes	≥ 4,5	>5	≥	-	≥	-	
supplementary information:								

24.1.1	TABLE: glow-wire test			P
part under test	material designation / manufacturer	test temperature (°C)	remarks	
base	-	850	Flames and glowing extinguish within 30 s	
front plate	-	650	No visible flame and no sustained glowing	
supplementary information:				

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

Singapore Consumer Protection (Safety Requirements) Registration Scheme 2002 Ed. Ch. 6 & 7			
Clause	Requirement + Test	Result – Remark	Verdict
6	Controlled Goods and their Applicable Safety Standards		—
	Air cooler		N/A
	Adaptor		N/A
	Any other audio products		N/A
	Cooking range		N/A
	Coffee maker, slow cooker, steam boat and similar appliances		N/A
	Decorative lighting fixture		N/A
	Hair dryer		N/A
	Home computer system (inclusive of monitor, printer, speaker and other mains operated accessories)		N/A
	High-fidelity set		N/A
	Iron		N/A
	Immersion water heater		N/A
	Kettle		N/A
	Laser disc set		N/A
	Microwave oven		N/A
	Mobile split air-conditioner		N/A
	Mixer, blender, mincer and similar appliances		N/A
	Refrigerator		N/A
	Rice cooker		N/A
	Room air-conditioner		N/A
	Television / video display unit		N/A
	Table / standing fan		N/A
	Table lamp/ standing lamp		N/A
	Toaster, grill, roaster, hot plate, deep fryer, wok and similar appliances		N/A
	Video cassette recorder		N/A
	Vacuum cleaner		N/A
	Washing machine		N/A
	Wall fan / Ceiling fan		N/A
	Components of the LPG gas system – Hose		N/A
	Components of the LPG gas system – Regulator		N/A
	Components of the LPG gas system – Valve		N/A
	Gas cooker		N/A
	Gas canister		N/A
	Portable cooking gas appliance		N/A
	3-pin rectangular type 13-amp plug		N/A

Singapore Consumer Protection (Safety Requirements) Registration Scheme 2002 Ed. Ch. 6 & 7			
Clause	Requirement + Test	Result – Remark	Verdict
	- A portable fused device having projecting pins designed to engage with the contacts of a corresponding socket-outlet. A plug also incorporates means for the electrical connection and the mechanical retention of a suitable flexible cord.	SS 145: Part 1: 2010	N/A
	Fuse (≤ 13 amperes) for use in plug		N/A
	- A device that, by the fusion of one or more of its specially designed and proportioned components, opens the circuit in which it is inserted and breaks the current when this exceeds a given value for a sufficient time. The fuse comprises all the parts that form the complete device	SS 167: 1977	N/A
	3-pin round type 15-amp plug		N/A
	- A device carrying three metallic plug pins substantially cylindrical in form intended for engagements with corresponding socket contacts arranged for connection to a suitable flexible cord.	SS 472: 1999	N/A
	Multi-way Adaptor		N/A
	- An Adaptor having more than one set of socket contacts (the socket contacts may or may not be of the same type or rating as the plug pin portion)	SS 246:2004	N/A
	3-pin portable socket-outlet		N/A
	- An accessory having a set of three socket-contacts designed to engage with the pins of a corresponding plug and having means for the electrical connection of appropriate cables or flexible cords, for connection to, or integral with, a flexible cord, and which can be easily moved from one place to another while connected to the supply.	SS 145: Part 2: 2010	N/A
	Portable cable reel		N/A
	- A device comprising a flexible cable or cord attached to a reel so constructed that the flexible cable may be completely wound onto the reel, and provided with a plug and one or more socket outlets.	SS 307: 1996	N/A
	Instantaneous electric water heater		N/A
	Mains pressure electric storage water heater		N/A
	Residual Current Circuit Breaker (RCCB)		N/A
	3-pin 13-amp socket-outlet		N/A

Singapore Consumer Protection (Safety Requirements) Registration Scheme 2002 Ed. Ch. 6 & 7			
Clause	Requirement + Test	Result – Remark	Verdict
	- 3-pin 13-amp socket-outlet namely a 13A shuttered socket-outlet in single or multiple arrangement with associated controlling switches, for flush mounting in suitable box or for surface or panel mounting. The socket-outlet is suitable for the connection of portable appliances, sound-vision equipment, luminaires, etc, in a.c. circuits only operating at voltage not exceeding 250 V r.m.s. at 50 Hz.	SS 145: Part 2: 2010 BS 4177: 1992 (cooker control unit) BS 7288: 1990 (socket-outlet with RCD)	N/A
	3-pin round type 15-amp socket-outlet		N/A
	- 3-pin round type 15-amp socket-outlet namely a 15A shuttered socket-outlet which contains switch connected between the current carrying contact of the socket-outlet and the relevant supply terminal for flush mounting in suitable box or for surface or panel mounting. The socket-outlet is suitable for the connection of electrical appliances in a.c. circuits only operating at voltage not exceeding 250 V r.m.s. at 50 Hz.	SS 472: 1999	N/A
	Domestic electric wall switch		P
	- Domestic electric wall switch namely a manually operated general purpose switch for a.c. only with a rated voltage not exceeding 440V and a rated current not exceeding 63A, intended for household and similar fixed-electric installations, either indoors or outdoors.	IEC 60669-1: 1998	P
	Ballast for tubular fluorescent lamp		N/A
	Isolating transformer for downlight fitting		N/A
7	Safety Authority's Requirements		—
	Applicable to all products		—
No. 1	Test certificate / Test report		P
	Test certificate / Test report more than three (3) years old shall be rejected.		P
No. 2	The additional function must be tested to its applicable safety standard.		N/A
	Applicable to all electrical products		—
No. 3	All appliances must be tested to 230 VAC.		P
No. 4	Voltage selector (voltage mis-match test)		N/A
No. 5	Tropical condition test		N/A
No. 6	Class I appliances (3-pin mains plug)		N/A
No. 7	Class II appliances (mains plug)		N/A
No. 8	Appliances rated ≥ 3 kW or connected to fixed wiring		N/A

Singapore Consumer Protection (Safety Requirements) Registration Scheme 2002 Ed. Ch. 6 & 7			
Clause	Requirement + Test	Result – Remark	Verdict
No. 9	Detachable power cord set (consists of mains plug, mains cord and appliance connector)		N/A
No. 10	Circuit diagrams		N/A
No. 11	Circuit diagrams of electronic modules in electrical appliances		N/A
No. 12	Controlled goods likely to be treated as toy by children		N/A
No. 13	Controlled goods with rated voltage that are not suitable for local supply voltage		N/A
No. 14	Controlled Goods with direct plug-in 3pin		N/A
No. 15	Controlled Goods with direct plug-in 2-pin		N/A
	Applicable to electric airpot		—
No. 16	Reboil switch		N/A
	Applicable to AC adaptor		—
No. 17	Detachable power supply cord set not supplied by Registered Supplier		N/A
No. 18	AC Adaptor incorporated with 13A socket-outlet		N/A
	Applicable to computer products		—
No. 19	CD/DVD ROM (used in personal computer)		N/A
No. 20	Modem Card (used in personal computer)		N/A
No. 21	Powerline Ethernet Adaptor incorporated with 13A socket-outlet		N/A
	Applicable to ceiling fan and cycle fan		—
No. 22	Ceiling fan and cycle fan		N/A
No. 23	Decorative ceiling fan		N/A
	Applicable to portable/wall socket-outlet and portable cable reel		—
No. 24	Portable/wall socket-outlet and portable cable reel		N/A
	a) If residual current device (RCD) is incorporated, its tripping current must be less than 30mA and operating time must be less than 0.1 second and testing to sub-clauses 9.9.2.1, 9.9.2.2, 9.9.2.3 and 9.16 of SS 97: Part 1: 2000 are required		N/A
	b) The shutters screening the current-carrying socket contacts shall not be opened by the insertion of any corresponding SINGLE pin of the plug into any current-carrying socket aperture.		N/A
No. 25	Wall switched socket-outlet (2 x single socket-outlet)		N/A
	Single socket-outlet with 2-gang faceplate/frame must be fulfilled with the test requirements as 2-gang socket-outlet		N/A

Singapore Consumer Protection (Safety Requirements) Registration Scheme 2002 Ed. Ch. 6 & 7			
Clause	Requirement + Test	Result – Remark	Verdict
No. 26	Remote controlled portable/wall portable socket-outlet		N/A
	Remote controlled portable/wall socket-outlet shall not be allowed for registration		N/A
	Applicable to Roaster		—
No. 27	Roaster		N/A
	Applicable to gas appliances		—
No. 28	Test pressure of town gas for gas appliances		N/A
No. 29	Specifications of LPG and Town Gas		N/A
No. 30	Gas appliances tested to EN 30-1-1: 1998		N/A
No. 31	Flame failure device (FFD) incorporated in gas appliances		N/A
No. 32	Gas oven		N/A
No. 33	Toughened glass gas hob		N/A
No. 34	Gasket for elbow joint of gas cooker		N/A
No. 35	Glass-ceramic gas hob (simulated gas explosion test)		N/A
No. 36	Material of gas hob cook top		N/A
No. 37	Gas canister		N/A
No. 38	Installation manual or installation instructions for gas cookers		N/A
	Applicable to Residual Current Circuit Breaker (RCCB)		—
No. 39	RCCB		N/A
	Applicable to electric instantaneous and storage water heater		N/A
No. 40	Instantaneous electric water heater and mains pressure electric storage water heater		N/A
No. 41	Water heater incorporated with residual current device(RCD)		N/A
No. 42	Pressure-relief device (for closed storage water heater)		N/A
No. 43	Thermal cut-out (for closed instantaneous and storage water heater)		N/A
	Applicable to multiway adaptor		—
No. 44	Multiway adaptor with 3-pin socket-outlets or combination of 3-pin and 2-pin socket-outlets		N/A
	a) The socket contacts of the adaptor shall only accept 13A 3-pin mains plug complying with SS 145 and/or 2.5A 2-pin mains plug complying with EN 50075.	SS 145 / EN 50075	N/A
	b) The shutters screening the current-carrying socket contacts shall not be opened by the insertion of any corresponding SINGLE pin of the plug into any current-carrying socket aperture.		N/A

Singapore Consumer Protection (Safety Requirements) Registration Scheme 2002 Ed. Ch. 6 & 7			
Clause	Requirement + Test	Result – Remark	Verdict
	c) A barrier or other acceptable means shall be provided on the engagement surface of the 2.5A 2-pin socket-outlet of the adaptor to PREVENT entry of any types of 2-pin mains plugs except those complying with EN 50075. (note: shutters cannot be regarded as barriers)		N/A
	d) Adaptor incorporates with switch would require additional test to sub-clauses 13.11, 17.1.3 and 18.1.3 of SS 145: Part 2: 1997		N/A
	Applicable to plasma/LCD display monitor		—
No. 45	Plasma/LCD display monitor with TV tuner		N/A
	Applicable to table lamp / standing lamp		—
No. 46	Child appealing table lamp/standing lamp		N/A
	Applicable to hot/warm & cold water dispenser		—
No. 47	Hot/warm & cold water dispenser		N/A
	Applicable to high risk Controlled Goods		—
No. 48	Renewal of registration for high risk Controlled Goods	Renewal of registration of high risk Controlled Goods supported with a valid new test report that is within 3 years	N/A

Photo:



Photo 1: Front view of model 617011

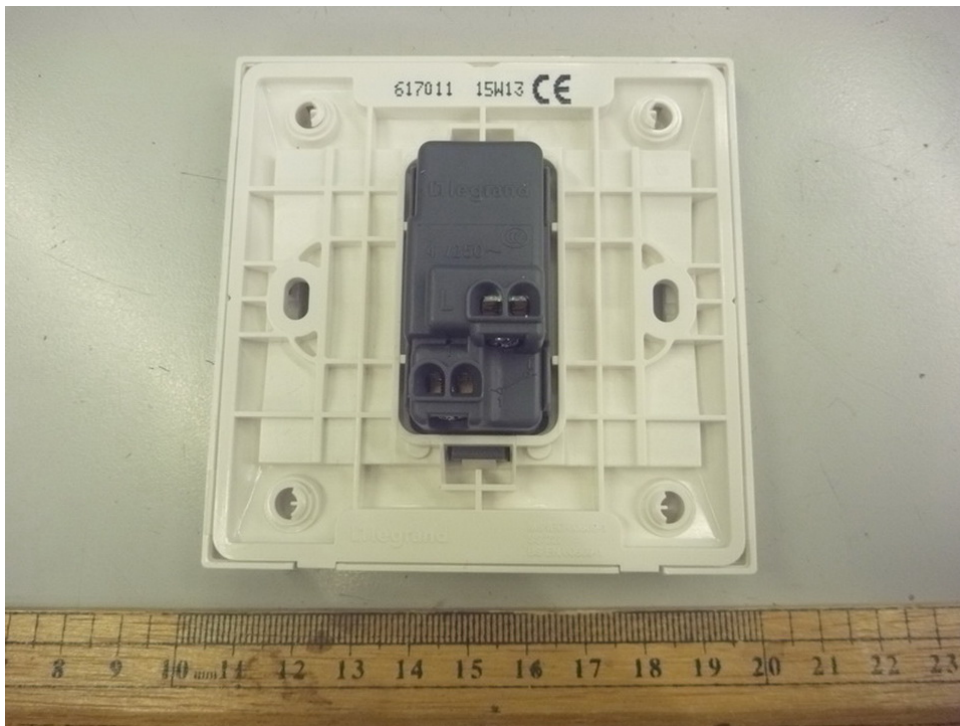


Photo 2: Back view of model 617011

Photo:



Photo 3: Front view of model 617011E

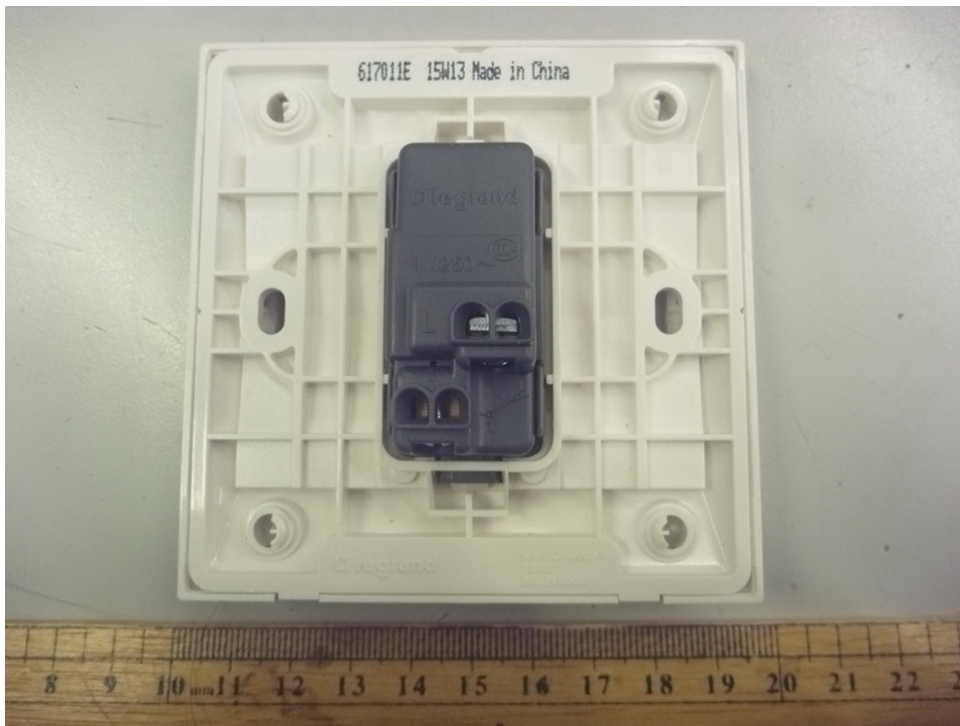


Photo 4: Back view of model 617011E

Photo:

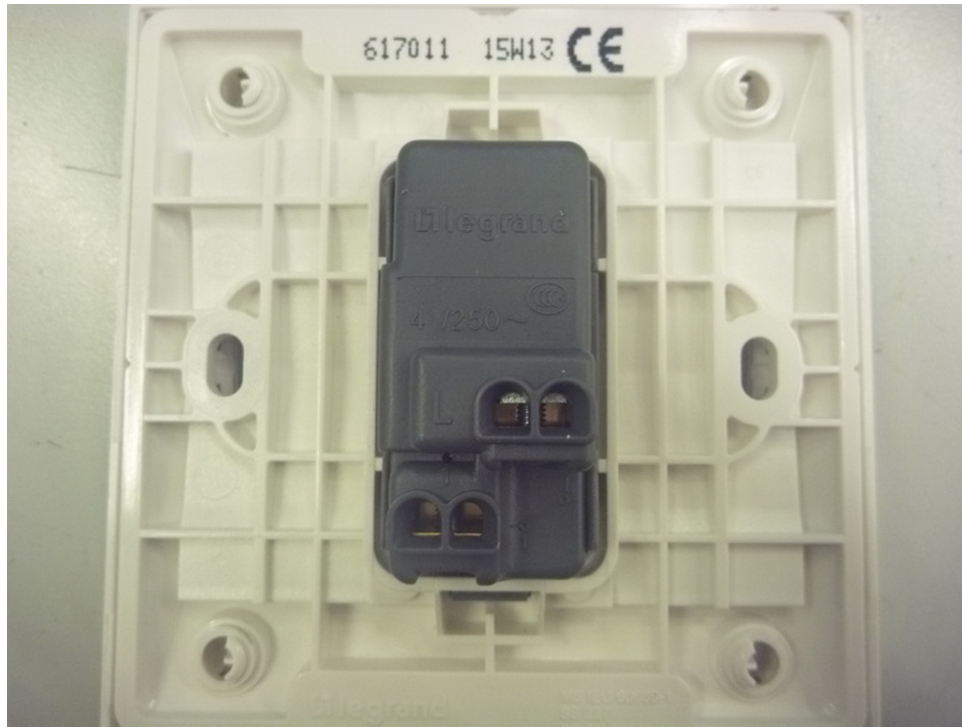


Photo 5: Marking of model 617011

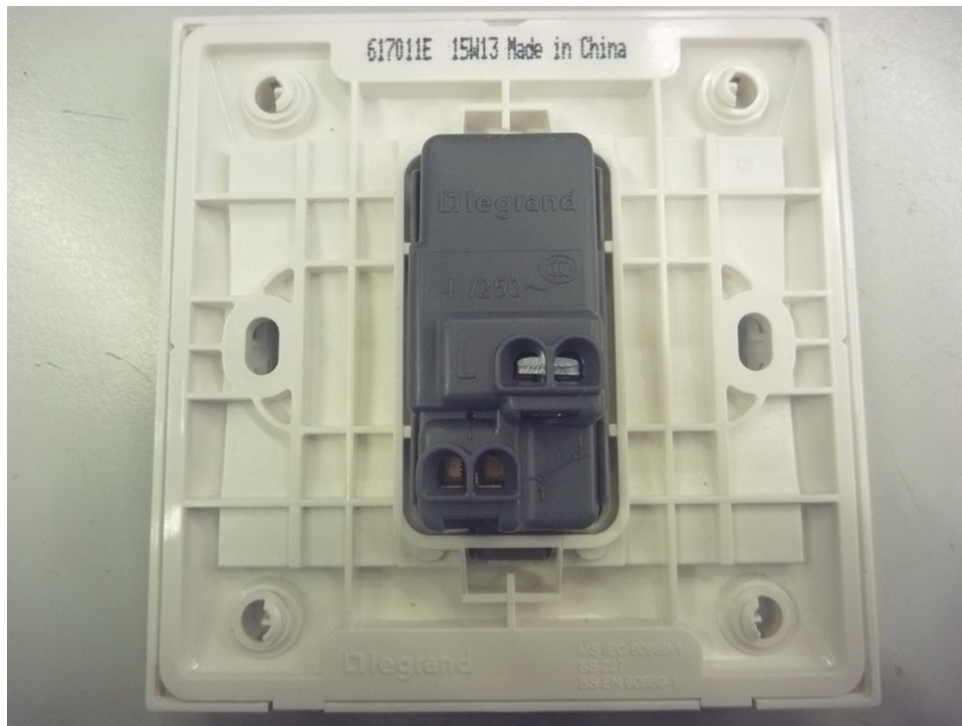


Photo 6: Marking of model 617011E

Photo:



Photo 7: Internal view 1 of model 617011 and 617011E

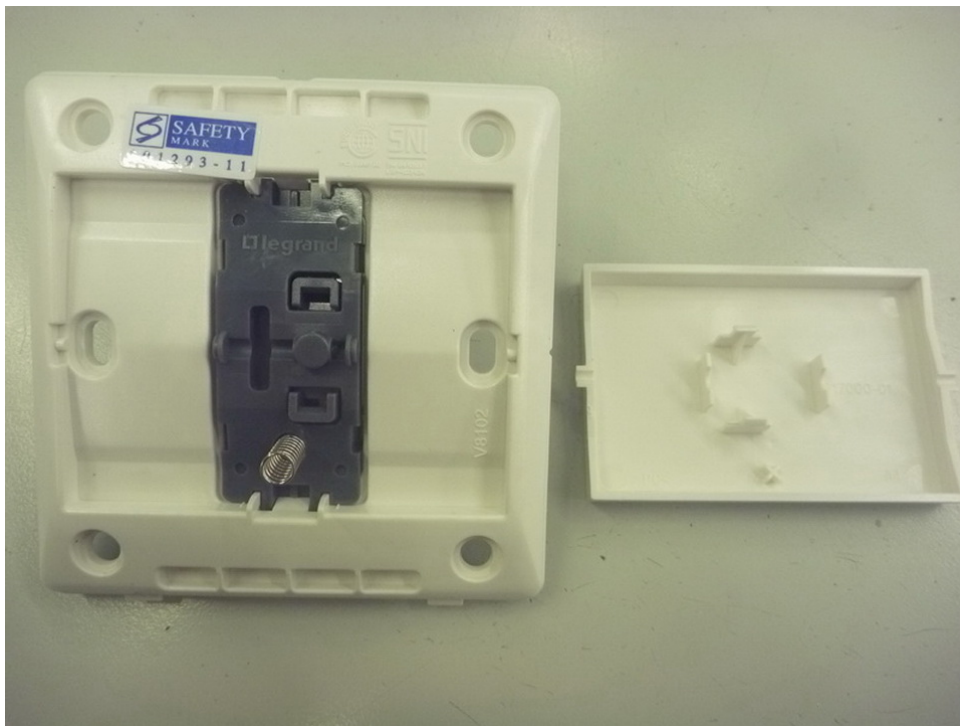


Photo 8: Internal view 2 of model 617011 and 617011E

Photo:

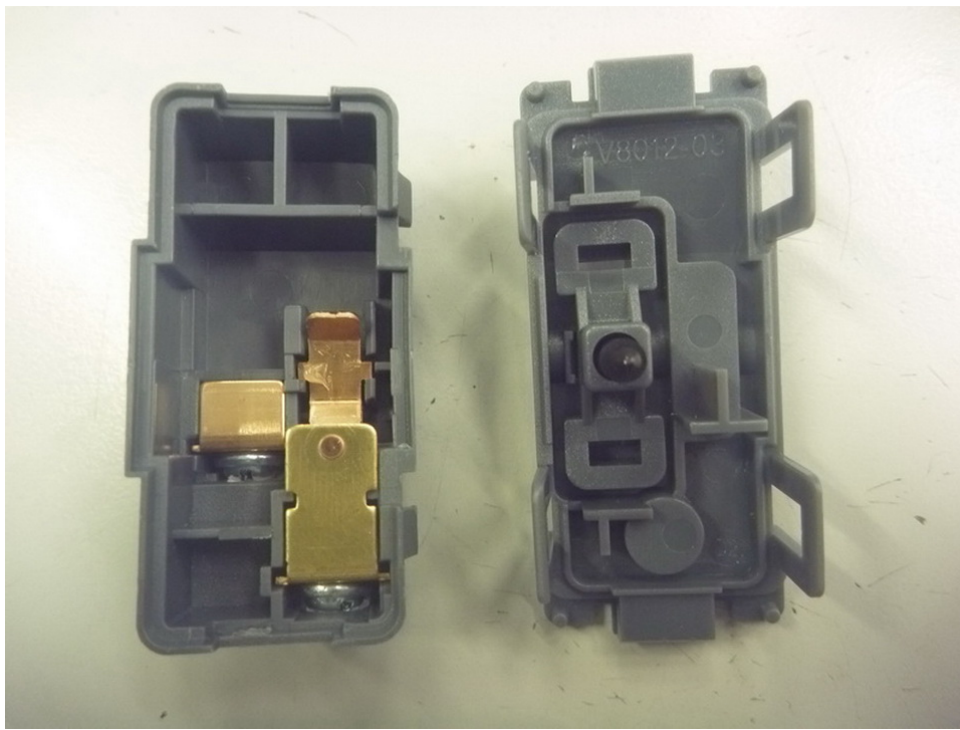


Photo 9: Internal view 3

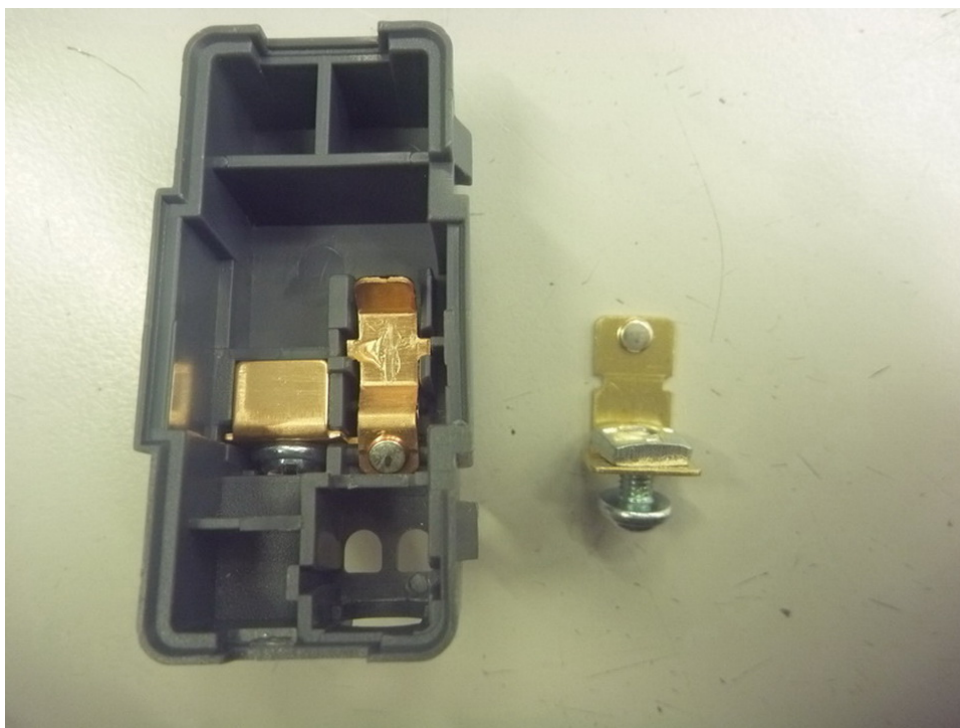


Photo 10: Internal view 4

Photo:



Photo 11: Front view of 617015



Photo 12: Back view of 617015