



# TEST REPORT

**Reference No.**..... : WTN24N01011999R1Z  
**Applicant**..... : Ningbo Ehome Electronic Co.,Ltd  
**Address**..... : Yonghe Road, Qiaotouhu Industrial Zone,Ninghai,Ningbo,China  
**Manufacturer** ..... : Ningbo Ehome Electronic Co.,Ltd  
**Address**..... : Yonghe Road, Qiaotouhu Industrial Zone,Ninghai,Ningbo,China  
**Product Name**..... : Microwave Sensor  
**Model No.**..... : ST701H, ST701E, ST701F, ST701K, ST701D, ST701MA, ST701MB, ST760  
**Test specification**..... : EN IEC 61058-1:2018  
EN 61058-1-2:2016  
**Date of Receipt sample** .... : 2025-02-10  
**Date of Test**..... : 2025-02-10 to 2025-02-20  
**Date of Issue**..... : 2025-02-20  
**Test Report Form No.** ..... : IEC61058\_1I & IEC61058\_1\_2D  
**Test Result**..... : Pass

**Remarks:**

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of approver.

**Prepared By:**

**Waltek Testing Group (Ningbo) Co., Ltd.**

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Jianzhong Mao/ Manager



**Test report**  
**IEC 61058-1**  
**Switches for appliances**  
**Part 1: General requirements**

**Report reference No.** ..... : WTN24N01011999R1Z

**Date of issue** ..... : See cover page

**Total number of pages** ..... : 60 pages

**Name of Testing Laboratory preparing the Report** ..... : Waltek Testing Group (Ningbo) Co., Ltd.

**Applicant's name** ..... : See cover page

**Address** ..... : See cover page

**Test specification:**

**Standard** ..... : IEC 61058-1:2016

**Test procedure** ..... : Test Report

**Non-standard test method** ..... : N/A

**TRF template used** ..... : IECEE OD-2020-F1:2020, Ed.1.3

**Test Report Form No.** ..... : IEC61058\_1I

**Test Report Form(s) Originator** ..... : Intertek Semko AB

**Master TRF** ..... : 2021-03-05

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Test item description .....	Microwave Sensor
Trademark .....	
Manufacturer.....	See cover page
Model/Type reference .....	ST701H, ST701E, ST701F, ST701K, ST701D, ST701MA, ST701MB, ST760
Ratings .....	Rated voltage: 220-240VAC, 50/60Hz, IP20, ST701H, ST701E, ST701F, ST701K, ST701D, ST701MA, ST701MB: Load: incandescent lamp: 1200W, LED/Energy saving lamp: 300W; ST760: Load: incandescent lamp: 600W, LED/Energy saving lamp: 300W

**Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):**

<input checked="" type="checkbox"/> Testing Laboratory.....	Waltek Testing Group (Ningbo) Co., Ltd.
Testing location/ address .....	Zone 3, 1/F., No.6, Building 011, No.1177, Lingyun Road, Ningbo Hi-Tech Zone, Yinzhou District, Ningbo, Zhejiang, China
Tested by (name, function, signature) .....	See cover page
Approved by (name, function, signature) .....	See cover page

<input type="checkbox"/> Testing procedure: CTF Stage 1:.....	
Testing location/ address .....	
Tested by (name, function, signature) .....	
Approved by (name, function, signature) .....	

<input type="checkbox"/> Testing procedure: CTF Stage 2:.....	
Testing location/ address .....	
Tested by (name, function, signature) .....	
Witnessed by (name, function, signature).....	
Approved by (name, function, signature) .....	

<input type="checkbox"/> Testing procedure: CTF Stage 3:.....	
<input type="checkbox"/> Testing procedure: CTF Stage 4:.....	
Testing location/ address .....	
Tested by (name, function, signature) .....	
Witnessed by (name, function, signature).....	
Approved by (name, function, signature) .....	
Supervised by (name, function, signature) ....	

**List of Attachments:**

- Photo – as required on pages: page 1 to page 4 of Attachment 1: Photo documentation
- National Differences. ☒ Not included. ☐ Included. See pages:
- Other attachments as needed. ☒ Not included. ☐ Included. See pages:

• <input type="checkbox"/> Test report:		for IEC 61058-1-1:2016, mechanical switches, pages:	
• <input checked="" type="checkbox"/> Test report:	WTN24N01011999R1Z	for IEC 61058-1-2:2016, electronic switches, pages:	48 to 60

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

Model ST701H was subjected to tests of all applicable clauses.

**Amendment 1: no testing.**

**Testing location:**

Waltek Testing Group (Ningbo) Co., Ltd.  
Zone 3, 1/F., No.6, Building 011, No.1177, Lingyun Road, Ningbo Hi-Tech Zone, Yinzhou District, Ningbo, Zhejiang, China

**Summary of compliance with National Differences (List of countries addressed):**

EUROPEAN GROUP national differences were considered.

☒ **The product fulfils the requirements of**

IEC 61058-1:2016

IEC 61058-1-2:2016

EN IEC 61058-1:2018

EN 61058-1-2:2016

Remark: EN IEC 61058-1:2018 is equivalent with IEC 61058-1:2016, EN 61058-1-2:2016 is equivalent with IEC 61058-1-2:2016, without any modification.

**Statement concerning the uncertainty of the measurement systems used for the tests**

(may be required by the product standard or client)

☐ **Internal procedure used for type testing through which traceability of the measuring uncertainty has been established:**

**Procedure number, issue date and title:**

Calculations leading to the reported values are on file with the NCB and testing laboratory that conducted the testing.

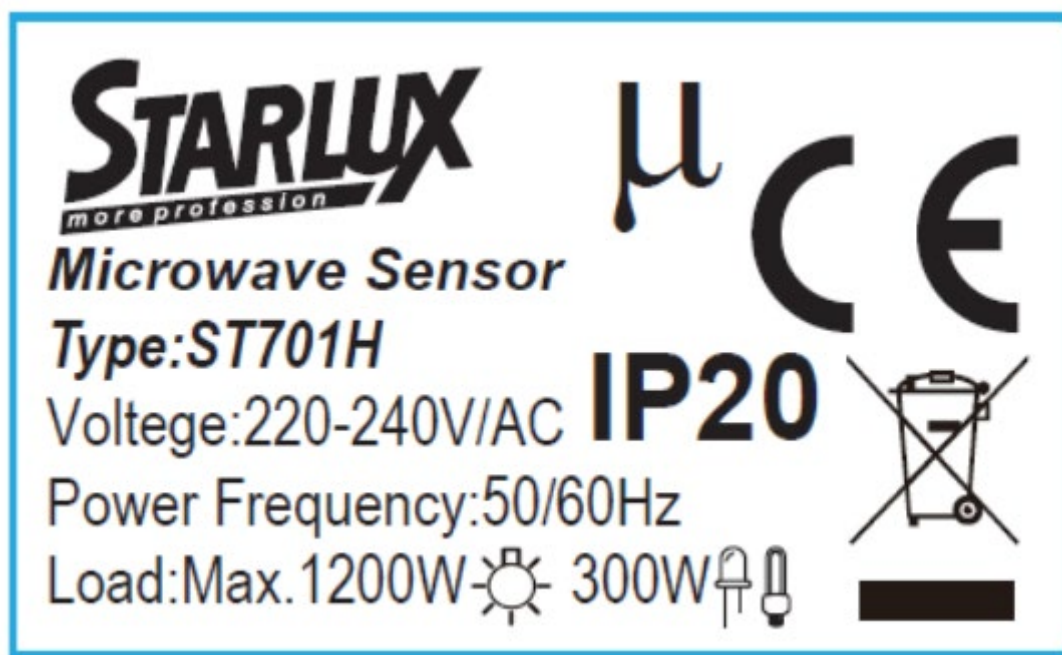
☒ **Statement not required by the standard used for type testing**

(Note: When IEC or ISO standard requires a statement concerning the uncertainty of the measurement systems used for tests, this should be reported above. The informative text in parenthesis should be delete in both cases after selecting the applicable option)



**Copy of marking plate:**

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.

**Remark:**

Manufacturer or/and his importer shall ensure the product fulfil label requirements in article 6 and article 8 of Directive 2014/35/EU related to name, registered trade name or registered trade mark, a single contact postal address, product type, batch or serial number or other element allowing product's identification prior to placing the product into EU market.

Model ST760 had the same copy of marking plate as above, except for model name and rated load.



<b>Test item particulars</b> .....: Sensor switch	
<b>Classification of installation and use</b> .....: Appliance switch	
<b>Supply Connection</b> .....: Terminal block	
.....:	
<b>Possible test case verdicts:</b>	
<b>Test case does not apply to the test object</b> .....: N/A	
<b>Test object does meet the requirement</b> .....: P (Pass)	
<b>Test object does not meet the requirement</b> .....: F (Fail)	
<b>Testing:</b>	
<b>Date of receipt of test item</b> .....: See cover page	
<b>Date(s) of performance of test</b> .....: See cover page	
<b>General remarks:</b>	
"(See Enclosure #)" refers to additional information appended to the report. "(See appended table)" refers to a table appended to the report.	
<b>Throughout this report a <input type="checkbox"/> comma / <input checked="" type="checkbox"/> point is used as the decimal separator.</b>	
<b>Manufacturer's Declaration per sub-clause 4.2.5 of IEC60335-1:</b>	
The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided.....:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> Not applicable
<b>When differences exist; they shall be identified in the General product information section.</b>	
<b>Name and address of factory (ies)</b> .....: Ningbo Ehome Electronic Co.,Ltd Yonghe Road, Qiaotouhu Industrial Zone,Ninghai,Ningbo,China	
<b>General Product Information and other remarks:</b>	
The products are electronic switches for lighting.	
<b>Amendment 1: this test report was based on original test report No. WTN24N01011999Z dated on 2024-02-19 for adding new models, model ST701E, ST701F, ST701K, ST701D, ST701MA and ST701MB were the same as model ST701H only different model name, and model ST760 was the same as model ST701H except for rated load.</b>	



**Test items particulars:**

Type reference (3.1.8 and 3.1.9).....:	<input type="checkbox"/> unique (U.T.) <input checked="" type="checkbox"/> common (C.T.)
Type of switch (3.3.1 to 3.3.9).....:	<input type="checkbox"/> incorporated <input type="checkbox"/> integrated <input type="checkbox"/> rotary <input type="checkbox"/> lever <input type="checkbox"/> rocker <input type="checkbox"/> push-button <input type="checkbox"/> cord-operated <input type="checkbox"/> push-pull <input type="checkbox"/> biased switch <input checked="" type="checkbox"/> other: electronic switch
Operation of the switch (3.4.1 to 3.4.4).....:	<input type="checkbox"/> <b>actuation</b> – by human activity <input checked="" type="checkbox"/> <b>indirect actuation</b> – of the actuating member indirectly <input type="checkbox"/> <b>actuating member</b> – actuated to cause an operation <input type="checkbox"/> <b>actuating means</b> – between the actuating member and the contact mechanism
Connections to the switch (3.5).....:	<input checked="" type="checkbox"/> external conductor <input type="checkbox"/> integrated conductor
Terminals and terminations (3.6.7 to 3.6.8) .....	<b>Tab terminals, see IEC 61210:</b> <input type="checkbox"/> 2.8 x 0.5 mm <input type="checkbox"/> 2.8 x 0.8 mm <input type="checkbox"/> 4.8 x 0.5 mm <input type="checkbox"/> 4.8 x 0.8 mm <input type="checkbox"/> 6.3 x 0.8 mm <input type="checkbox"/> 9.5 x 1.2 mm <b>Female connector, see figure 7:</b> <input type="checkbox"/> 2.3 x 3.8 mm <input type="checkbox"/> 2.9 x 6.0 mm <input type="checkbox"/> 3.5 x 7.8 mm <input type="checkbox"/> 4.0 x 11.1 mm
CTI (V) (3.7.12).....:	N/A
PTI (V) (Annex C).....:	175V
Material group (20.4.11).....:	<input type="checkbox"/> I <input type="checkbox"/> II <input checked="" type="checkbox"/> IIIa <input type="checkbox"/> IIIb
Type of load – A.C. circuits (IEC 61058-1-1:2016, Table 102) .....	<input type="checkbox"/> Substantially resistive <input type="checkbox"/> General purpose load <input type="checkbox"/> Resistive and/or motor <input type="checkbox"/> Circuit for specific load of motor with a locked rotor <input type="checkbox"/> Circuit for an inductive load <input type="checkbox"/> Resistive and capacitive <input checked="" type="checkbox"/> Tungsten filament lamp load <input checked="" type="checkbox"/> Circuit for specific lamp load <input type="checkbox"/> Specific declared
Type of load – D.C. circuits. (IEC 61058-1-1:2016, Table 103) .....	<input type="checkbox"/> Substantially resistive <input type="checkbox"/> Tungsten filament lamp load <input type="checkbox"/> Resistive and capacitive load <input type="checkbox"/> Circuit for specific lamp load <input type="checkbox"/> Declared specific load
Type of circuit (7.16.6 according to code of switch type given in Table 2) .....	<input checked="" type="checkbox"/> 1.2 <input type="checkbox"/> 2.2 [1.2] <input type="checkbox"/> 3.2 <input type="checkbox"/> 4.2 <input type="checkbox"/> 1.3 <input type="checkbox"/> 2.3 <input type="checkbox"/> 3.3 <input type="checkbox"/> 4.3 <input type="checkbox"/> 1.4 [1.2] <input type="checkbox"/> 2.4 [1.3] <input type="checkbox"/> 3.4 <input type="checkbox"/> 4.4 <input type="checkbox"/> 1.5 [1.2] [1.4] <input type="checkbox"/> 2.5 <input type="checkbox"/> 3.5 <input type="checkbox"/> 4.5 <input type="checkbox"/> 1.6 <input type="checkbox"/> 2.6 <input type="checkbox"/> 3.6 <input type="checkbox"/> 1.7 <input type="checkbox"/> 2.7 <input type="checkbox"/> 3.7 [3.3] <input type="checkbox"/> 1.8 <input type="checkbox"/> 2.8 <input type="checkbox"/> 3.8 <input type="checkbox"/> Special <input type="checkbox"/> 2.9 <input type="checkbox"/> 3.9 [3.3]



IEC 61058-1				
Clause	Requirement - Test		Result - Remark	Verdict
6	Rating			P
6.1	The maximum rated voltage .....	220-240	V	—
6.2	The maximum rated current.....		A	—
6.3	Switches with signal indicators .....		V	—
7	Classification			P
7.1	According to nature of supply:			P
7.1.1	<input checked="" type="checkbox"/> switches for AC only .....			—
7.1.2	<input type="checkbox"/> switches for DC only .....			
7.1.3	<input type="checkbox"/> switches for both AC and DC .....			
7.2	According to type of load to be controlled by each circuit of the switch for:			P
7.2.1	<input type="checkbox"/> substantially resistive load with a power factor not $\geq 0,9$ .....			—
7.2.2	<input type="checkbox"/> either a resistive load, a motor load with a power factor $\geq 0,6$ or a combination of both .....			
7.2.3	<input type="checkbox"/> a combination of resistive and capacitive loads .....			
7.2.4	<input checked="" type="checkbox"/> ordinary tungsten filament lamp load.....			
7.2.5	<input type="checkbox"/> a declared specific load .....			
7.2.6	<input type="checkbox"/> a current not exceeding 20 mA.....			
7.2.7	<input checked="" type="checkbox"/> specific lamp load .....			
7.2.8	<input type="checkbox"/> an inductive load with a power factor of $\geq 0,6$ .....			
7.2.9	<input type="checkbox"/> specific load of motor with a locked rotor and with a power factor $\geq 0,6$ .....			
7.2.10	<input type="checkbox"/> general purpose load with a power factor of $\geq 0,75$ .....			
7.3	According to ambient temperature:			P
7.3.1	<input checked="" type="checkbox"/> $0^{\circ}\text{C} \leq T \leq 55^{\circ}\text{C}$ .....			—
7.3.2	<input type="checkbox"/> not classified as 7.3.1 and 7.3.3 .....			
7.3.3	<input type="checkbox"/> accessible member and parts $0^{\circ}\text{C} \leq T \leq 55^{\circ}\text{C}$ and other parts of the switch not within $0^{\circ}\text{C} \leq T \leq 55^{\circ}\text{C}$ .....			
	Ambient temperature, actuating member ( $^{\circ}\text{C}$ ).....	0°C-55°C		—
	Ambient temperature, other parts ( $^{\circ}\text{C}$ ).....	0°C-55°C		—
7.4	According to number of operating cycles:			P
7.4.1 – .8	Operating cycles .....	10000		—
7.4.9	As declared for a specific application .....			—
7.5	Degree of protection against solid foreign objects:			P
7.5.1	<input type="checkbox"/> non-protected against solid foreign objects .....	IP0X:		—
7.5.2	<input type="checkbox"/> against objects of $\geq 50\text{ mm } \varnothing$ .....	IP1X:		
7.5.3	<input checked="" type="checkbox"/> against solid objects of $\geq 12,5\text{ mm } \varnothing$ .....	IP2X:		
7.5.4	<input type="checkbox"/> against solid foreign objects of $\geq 2,5\text{ mm } \varnothing$ .....	IP3X:		
7.5.5	<input type="checkbox"/> against solid foreign objects of $\geq 1,0\text{ mm } \varnothing$ .....	IP4X:		
7.5.6	<input type="checkbox"/> dust-protected .....	IP5X:		
7.5.7	<input type="checkbox"/> dust-tight .....	IP6X:		
7.6	Degree of protection against ingress of water:			P





IEC 61058-1			
Clause	Requirement - Test	Result - Remark	Verdict
7.6.1	<input checked="" type="checkbox"/> non-protected against ingress of water ..... IPX0:		—
7.6.2	<input type="checkbox"/> against vertically falling water drops ..... IPX1:		
7.6.3	<input type="checkbox"/> against vertically falling water drops when enclosure tilted up to 15° ..... IPX2:		
7.6.4	<input type="checkbox"/> against spraying water ..... IPX3:		
7.6.5	<input type="checkbox"/> against splashing water ..... IPX4:		
7.6.6	<input type="checkbox"/> against water jets ..... IPX5:		
7.6.7	<input type="checkbox"/> against powerful water jets ..... IPX6:		
7.6.8	<input type="checkbox"/> against the effects of temporary immersion in water up to 1 m ..... IPX7:		—
7.6.9	<input type="checkbox"/> against the effects of immersion in water greater than 1 m ..... IPX8:		
7.6.10	<input type="checkbox"/> against the effects of high pressure water ..... IPX9:		
7.7	<b>According to degree of protection against electric shock for an incorporated switch for use in appliance of:</b>		P
7.7.1 – .4	<input type="checkbox"/> class 0 <input type="checkbox"/> class I <input checked="" type="checkbox"/> class II <input type="checkbox"/> class III		—
7.8	<b>According to degree of pollution inside the switch:</b>		P
7.8.1	<input type="checkbox"/> Micro-environment pollution degree 1 .....		—
7.8.2	<input checked="" type="checkbox"/> Micro-environment pollution degree 2 .....		
7.8.3	<input type="checkbox"/> Micro-environment pollution degree 3 .....		
7.9	<b>According to degree of pollution outside the switch:</b>		P
7.9.1	<input type="checkbox"/> Macro-environment pollution degree 1 .....		—
7.9.2	<input type="checkbox"/> Macro-environment pollution degree 2 .....		
7.9.3	<input checked="" type="checkbox"/> Macro-environment pollution degree 3 .....		
7.10	<b>According to marking:</b>		P
7.10.1	<input type="checkbox"/> limited marking UT (unique type reference, UT) .....		—
7.10.2	<input checked="" type="checkbox"/> full marking CT (common type reference, CT) .....		
7.11	<b>According to resistance to ignitability by the glow wire temperature:</b>		P
7.11.1 – .4	<input type="checkbox"/> 650 °C <input type="checkbox"/> 750 °C <input checked="" type="checkbox"/> 850 °C <input type="checkbox"/> 960 °C		—
7.12	<b>According to the rated impulse withstand voltage:</b>		P
7.12.1 – .6	<input type="checkbox"/> 330 V <input type="checkbox"/> 500 V <input type="checkbox"/> 800 V <input type="checkbox"/> 1 500 V <input checked="" type="checkbox"/> 2 500 V <input type="checkbox"/> 4 000 V		—
7.13	<b>According to the rated overvoltage category:</b>		P
7.13.1 – .3	<input type="checkbox"/> Category I <input checked="" type="checkbox"/> Category II <input type="checkbox"/> Category III <input type="checkbox"/> See Rated Impulse Voltage U <sub>imp</sub> .		—
7.14	<b>According to type of disconnection</b>		P
7.14.1 – .3	<input type="checkbox"/> electronic <input checked="" type="checkbox"/> micro (μ) <input type="checkbox"/> full		—
7.14.4	<input type="checkbox"/> switches with a combination of disconnections ...:		—
7.15	<b>According to the type of coating for rigid printed board assemblies</b>		N/A
7.15.1 – .2	<input type="checkbox"/> type 1 coating <input type="checkbox"/> type 2 coating		—
7.16	<b>According to type and/or connection of switches</b>		P
7.16.1	Number of poles .....	1	—
7.16.2	Number of ways .....	1	—
7.16.3	Polarity reversal .....		—
7.16.4	All-pole disconnection .....		—



IEC 61058-1			
Clause	Requirement - Test	Result - Remark	Verdict
7.16.5	Number of non-switchable through connections .....		—
7.16.6	According to code of switch type given in Table 2....	Code 1.2	—
<b>7.17</b>	<b>According to configuration of switching device</b>		<b>P</b>
7.17.1	<input type="checkbox"/> electronic switch with SD without mechanical switching device.....		—
7.17.2	<input type="checkbox"/> electronic switch with SD with series mechanical switching device .....		
7.17.3	<input checked="" type="checkbox"/> electronic switch with SD with parallel mechanical switching device .....		
7.17.4	<input type="checkbox"/> electronic switch with SD with series and parallel mechanical switching device ..		
7.17.5	<input type="checkbox"/> electronic switch with only mechanical switching device without SD. SD to be provided in the end application .....		
7.17.6	<input type="checkbox"/> mechanical switch with or without electronics, which does not impact the safety of the switch .....		—
7.17.7	<input type="checkbox"/> mechanical switch with electronics, which impacts the safety of the switch .....		
<b>7.18</b>	<b>According to duty type</b>		<b>P</b>
7.18.1	Continuous duty – S1.....	S1	—
7.18.2	Short-time duty – S2 with defined ON and OFF times.....		—
7.18.3	Intermittent periodic duty – S3 with defined ON and OFF times .....		—
7.18.4	As declared for a specific application .....		—
<b>7.19</b>	<b>According to linkage between contact and actuator speed</b>		<b>N/A</b>
7.19.1	<input type="checkbox"/> contact closure or opening is dependent on the actuator speed.....		—
7.19.2	<input type="checkbox"/> contact closure and opening is independent of the actuator speed .....		
<b>7.20</b>	<b>According to the type of terminals intended for</b>		<b>P</b>
7.20.1	<input checked="" type="checkbox"/> the connection of unprepared conductors .....		—
7.20.2	<input type="checkbox"/> the connection of prepared conductors .....		
7.20.3	<input checked="" type="checkbox"/> the connection of flexible stranded conductors .....		
7.20.4	<input type="checkbox"/> the connection of rigid stranded conductors.....		
7.20.5	<input checked="" type="checkbox"/> the connection of solid conductors .....		
7.20.6	<input checked="" type="checkbox"/> conductor size range according to Table 4.....		
7.20.7	A declared limited conductor size range..... mm <sup>2</sup> :		—
7.20.8	<input checked="" type="checkbox"/> connection of only one conductor.....		—
7.20.9	<input type="checkbox"/> interconnection of two or more conductors.....		
7.20.10	<input type="checkbox"/> assembling one time .....		—
7.20.11	<input checked="" type="checkbox"/> assembling and disassembling more than one time .....		
7.20.12	<input type="checkbox"/> Screw terminals and connections.....		—
7.20.13	<input checked="" type="checkbox"/> Push-in terminals and connections.....		
7.20.14	<input type="checkbox"/> Flat quick-connect termination.....		
7.20.15	<input type="checkbox"/> Solder terminals.....		
7.20.16	<input type="checkbox"/> Welding or ridged terminals.....		
7.20.17	<input type="checkbox"/> Wires for connections .....		
7.20.18	<input type="checkbox"/> Terminals for piercing conductors .....		
7.20.19	Terminals as declared by the manufacturer .....		—
<b>7.21</b>	<b>According to the type of built in protection</b>		<b>P</b>
7.21.1 – .2	<input checked="" type="checkbox"/> Built in protection provided <input type="checkbox"/> None provided		—






IEC 61058-1			
Clause	Requirement - Test	Result - Remark	Verdict
<b>7.22</b>	<b>According to the type of forced cooling</b>		<b>P</b>
7.22.1	<input checked="" type="checkbox"/> Not requiring forced cooling.		—
7.22.2	<input type="checkbox"/> Forced cooling required, with description of forced cooling.		—
<b>7.23</b>	<b>According to the capacitor provided with the switch</b>		<b>P</b>
7.23.1	<input type="checkbox"/> Capacitor class X1 .....		—
7.23.2	<input checked="" type="checkbox"/> Capacitor class X2 .....		
7.23.3	<input type="checkbox"/> Capacitor class X3 .....		
7.23.4	<input type="checkbox"/> Capacitor class Y2 .....		
7.23.5	<input type="checkbox"/> Capacitor class Y4 .....		

<b>8</b>	<b>MARKING AND DOCUMENTATION</b>		<b>P</b>
<b>8.1</b>	<b>Switch information</b>		<b>P</b>
8.1.1	The switch manufacturer provide adequate information to ensure that the:		
	<ul style="list-style-type: none"> <li>• appliance manufacturer can select and install a switch;</li> <li>• end user can use a switch as intended by the switch manufacturer;</li> <li>• corresponding tests can be performed in accordance with this standard</li> </ul>		<b>P</b>
	Information is provided in one or more of the following ways, as in Table 3.		<b>P</b>
8.1.2	By switch marking.	<input checked="" type="checkbox"/> Ma	<b>P</b>
8.1.3	By documentation.	<input checked="" type="checkbox"/> Do	<b>P</b>
	Documentation available in any suitable format.		<b>P</b>

<b>Table 3</b> No.	<b>Switch information</b> Characteristic	Means of information: <input checked="" type="checkbox"/> C.T. <input type="checkbox"/> U.T.			
<b>1</b>	<b>SWITCH IDENTIFICATION</b>				<b>P</b>
1.1	Manufacturer's name or trademark.	See cover page			<b>P</b>
1.2	Type reference.	See cover page			<b>P</b>
<b>2</b>	<b>SWITCH ENVIRONMENT/MOUNTING</b>				<b>P</b>
2.1	Degree of protection provided for the switch when mounted according to documentation.	IP	20	code of IEC 60529	<b>P</b>
2.2	Degree of protection against electric shock, from outside an appliance.	Class II			<b>P</b>
2.3	Method of mounting and actuating the switch.				<b>P</b>
	Method of providing earthing if appropriate.				<b>N/A</b>
	Method(s) of mounting and orientation(s) declared.				<b>P</b>
2.4	Pollution degree micro.	2			<b>P</b>
2.5	Pollution degree macro.	3			<b>P</b>
<b>3</b>	<b>TEMPERATURE</b>				<b>N/A</b>
3.1	Ambient temperature limits if $\neq 0 - 55^{\circ}\text{C}$ .	°C			<b>N/A</b>
<b>4</b>	<b>ELECTRICAL LOAD / CONNECTION</b>				<b>P</b>
4.1	Rated voltage or voltage range.	220-240	V		<b>P</b>








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Clause	Requirement - Test	Result - Remark		Verdict
4.2	Nature of supply.	<input checked="" type="checkbox"/> AC	<input type="checkbox"/> AC and DC	P
		<input type="checkbox"/> Different AC and DC rating.		
4.3	Frequency or frequency range.	50/60	Hz	P
4.4	The rated current and the electrical load type.	See page 2 "Rating".		P
4.5	For switches for more than one circuit, the current applicable to each circuit and to each terminal.	See page 2 "Rating".		N/A
	If these are different from each other, then it shall be made clear to which circuit or which terminal the information applies.			N/A
4.6	Rated impulse withstand voltage.	2500	V	P
4.7	Overvoltage category.	II		P
4.8	Duty-type and relevant (ON/OFF-time)	S1		P
4.9	Type and/or connection of switch.			P
4.10	Configuration of switching device:			P
<b>5</b>	<b>TERMINALS / CONDUCTORS</b>			P
5.1	All terminals suitably identified			P
	<input type="checkbox"/> or their purpose self-evident <input type="checkbox"/> or the switch circuitry visually apparent			N/A
	For terminals intended for the connection of supply conductors, the identification may take the form	<input checked="" type="checkbox"/> of a letter L, <input type="checkbox"/> a number	<input type="checkbox"/> or of an arrow	P
5.2	Terminals for earthing marked with the protective earth symbol			N/A
5.3	The method of connection and disconnection for push-in terminals.			P
5.4	The type of conductor to be connected to the terminal.	<input checked="" type="checkbox"/> solid,	<input checked="" type="checkbox"/> stranded	P
5.5	The suitability of the terminal for connection of conductors indicated:			P
	• maximum conductor diameter .....	1.5	mm	—
	• minimum conductor diameter .....	0.75	mm	—
5.6	Suitability for interconnection of two or more conductors to terminals.			N/A
5.7	The type of solder terminal:	<input type="checkbox"/> mechanical securement before soldering <input type="checkbox"/> iron, <input type="checkbox"/> bath <input type="checkbox"/> etc.:		N/A
5.8	For terminals with specific connection method, such as:			N/A
	<input type="checkbox"/> solder temperatures (°C) .....			—
	<input type="checkbox"/> or process declared .....			—
5.9	Terminals for prepared conductors indicate the method for preparing the conductors.			N/A
5.10	For tabs with dimensions other than those according to IEC 61210:			N/A





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Clause	Requirement - Test	Result - Remark	Verdict
	• the appropriate female connector		N/A
<b>6</b>	<b>OPERATING CYCLES / SEQUENCE</b>		P
6.1	Number of operating cycles.	10000	P
6.2	Operating sequence for switches with more than one circuit.		N/A
6.3	Forces applied to end stops or full travel of actuating member ( <i>optional</i> ).	<input type="checkbox"/> 17.4 IEC 61058-1-1 or <input checked="" type="checkbox"/> 17.4 IEC 61058-1-2	P
<b>7</b>	<b>SIGNAL INDICATORS</b>		N/A
7.1	Maximum power of tungsten filament signal lamps.	W	N/A
	Marking visible when replacing lamp.		N/A
7.2	Intended function or operation of the signal indicator.		N/A
<b>8</b>	<b>CIRCUIT DISCONNECTION</b>		P
8.1 – 8.4	<input type="checkbox"/> Electronic <input checked="" type="checkbox"/> Micro <input type="checkbox"/> Full <input type="checkbox"/> Combination		P
<b>9</b>	<b>INSULATING MATERIALS</b>		P
9.1	Tracking <input checked="" type="checkbox"/> PTI or <input type="checkbox"/> CTI (V) .....	175	P
9.2	Glow-wire temperatures (°C) .....	850	P
9.3	Type of coating for rigid printed board assemblies...		N/A
<b>10</b>	<b>COOLING CONDITION</b>		P
10.1	<input checked="" type="checkbox"/> Not requiring forced cooling.....		P
10.2	<input type="checkbox"/> Requiring cooling .....		
10.3	<input type="checkbox"/> Direction of air for forced cooling .....		
10.4	<input type="checkbox"/> Speed of air for forced cooling .....		
10.5	<input type="checkbox"/> Thermal resistance of heat sink.....		
10.6	<input type="checkbox"/> Incoming temperature, density and other details of the air stream .....		
<b>11</b>	<b>PROTECTIVE DEVICE</b>		P
11.1	Rated current/fusing characteristic/breaking capacity of replaceable built-in protection.		P
11.2	Type/function of non-replaceable built-in protection.		N/A
11.3	External protective device rated current, fusing characteristic, breaking capacity.		N/A
<b>12</b>	<b>TEST CONDITIONS</b>		P
12.1	Test condition for switches having a contact making and breaking speed independent from the speed of actuation		P
12.2	Special requirements for testing such as minimum electric load in 3.2.11, thermal current I <sub>th</sub> (3.2.12)		N/A
<b>8.2</b>	<b>Symbols (<i>when used</i>)</b>		P
	<input type="checkbox"/> Ampere (A) <input checked="" type="checkbox"/> Volt (V) Alternating current ( <i>single-phase</i> ) <input type="checkbox"/> ~ <input type="checkbox"/> a.c. <input type="checkbox"/> ac <input checked="" type="checkbox"/> AC Direct current <input type="checkbox"/> --- <input type="checkbox"/> d.c. <input type="checkbox"/> dc <input type="checkbox"/> DC		P

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Clause	Requirement - Test	Result - Remark	Verdict
	Tungsten filament lamp load:		P
	Protective earth symbol:		N/A
	Hertz – Frequency of supply	Hz	P
	Number of operating cycles	See 8.5	P
	Symbol for micro-disconnection	$\mu$	P
	<input type="checkbox"/> "OFF"-position or the direction of actuation to the "OFF" position <input type="checkbox"/> "ON"-position or the direction of actuation to the "ON" position	 	N/A
	Electronic disconnection	$\varepsilon$	N/A
<b>8.3</b>	<b>Load rating</b>		P
8.3.2	Substantially resistive		N/A
8.3.3	Resistive load and motor load		N/A
8.3.4	Resistive load and capacitive load		N/A
8.3.5	Resistive load and tungsten filament lamp load		P
8.3.6	Declared specific load		P
8.3.7	Inductive loads		N/A
8.3.8	General Purpose loads		N/A
<b>8.4</b>	<b>Temperature rating</b>		P
8.4.1	<input type="checkbox"/> 25 T 85 (-25 °C up to +85 °C) (example) <input type="checkbox"/> T 85 (0 °C up to +85 °C) (example)		N/A
	If no information is given:		P
	<ul style="list-style-type: none"> <li>rated ambient temperature range is 0 – 55 °C</li> </ul>		P
8.4.2	Switches only partially suitable for a rated ambient temperature > 55 °C:		N/A
	<ul style="list-style-type: none"> <li>T65/55 or 25T85/55 (examples)</li> </ul>		N/A
<b>8.5</b>	<b>Operating cycles</b>		P
	Information about rated operating cycles by using symbol "E", indicating exponent.		P
	Switches for 10 000 operating cycles, this information is not necessary		P
<b>8.6</b>	<b>Switches intended for use in Class II equipment or appliances</b>		P
	The symbol  shall not be marked on the switch.		P
<b>8.7</b>	<b>Required marking</b>		P
	Shall preferably be on the body of the switch.		P
	Not on screws, removable washers or other removable.		P
	Marking for replaceable fuse incorporated in a switch shall be placed on the fuse-holder or in the proximity of the fuse.		N/A





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Clause	Requirement - Test	Result - Remark	Verdict
	The characteristics may be indicated by symbols (see IEC 60127).		N/A
<b>8.8</b>	<b>Legibility and durability of marking</b>		P
	Marking is not subjected to this test due to made as: <input type="checkbox"/> impressed <input type="checkbox"/> moulded <input type="checkbox"/> laser or engraved		N/A
	The requirements of 8.1 to 8.8 is checked by inspection and by rubbing the marking:		P
	a) by hand for 15 s with a piece of cotton cloth soaked with water and		P
	b) again for 15 s soaked with aliphatic solvent hexane		P
	After these tests, the marking shall still be legible.		P
<b>8.9</b>	<b>Switches with their own enclosure</b>		P
	• "OFF"-position, clearly indicated		N/A
	Switches with micro-disconnection or electronic disconnection:		P
	• not marked with symbol "O" for the "OFF" position		P
	Switches where marking of switch position is impossible or leads to misunderstanding:		N/A
	• direction of actuation(s) is marked		N/A
	Switches having more than one actuating member:		N/A
	• marking shall indicate, for each of the actuating members, the effect achieved by its operation		N/A
	For switches classified as unique type, 7.10.1, the OFF marking is according to the manufacturer's declaration.		N/A
	For push-button switches with a single button the OFF position is not required to be marked.		N/A
<b>9</b>	<b>PROTECTION AGAINST ELECTRIC SHOCK</b>		P
<b>9.1</b>	Switches shall be constructed so that there is adequate protection against contact with live parts in any position of use when the switch is mounted and operated as in normal use. Checked by inspection and by the following test:		P
	a) applied to accessible parts of the switch when mounted in accordance with the manufacturer's documentation, with any detachable parts, except lamps with caps, removed;		P
	b) The insulating properties of lacquer, enamel, paper, cotton, oxide film on metal parts, beads and sealing compounds which soften in heat:		P
	• shall not be relied upon to give the required protection against contact with live parts		P
	c) Probe B according to IEC 61032 (IEC 60529:1989, Figure 1) jointed test finger is:		P
	• applied without force in every possible position		P
	If Probe B is able to enter the opening:		N/A



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Clause	Requirement - Test	Result - Remark	Verdict
	<ul style="list-style-type: none"><li>the finger is repeated with an electrical contact indicator to show contact</li></ul>		N/A
	d) Probe 11 according to IEC 61032 straight unjointed test finger is applied:		P
	<ul style="list-style-type: none"><li>with 20 N of force to any opening that prevents the entry of probe B</li></ul>		P
	e) Test pin Probe 13 according to IEC 61032 is applied to:		P
	<ul style="list-style-type: none"><li>openings in insulation materials and unearthed metal parts without force in every possible position</li></ul>		P
	It shall not be possible to touch bare live parts.		P
	For switches which have any parts of double insulation construction:		N/A
	<ul style="list-style-type: none"><li>not possible to touch with the jointed test finger unearthed metal parts separated from live parts by basic insulation, or by the basic insulation itself</li></ul>		N/A
9.1.1	Accessible metal parts which are needed for the operation of a switch may be connected to live parts by means of a protective impedance:		N/A
	The protective impedance shall consist of resistors and/or capacitors comply with one of the following at least:		N/A
	<input type="checkbox"/> a) 2 independent resistors of the same nominal value in series complying with 24.4; <input type="checkbox"/> b) 2 independent capacitors in series, of the same value complying with class Y2 according to IEC 60384-14; <input type="checkbox"/> c) 1 resistor complying with 24.4 and 1 capacitor complying with class Y2 according to IEC 60384-14 in series		N/A
	The removal of protective impedances, or their short-circuiting, possible:		N/A
	<ul style="list-style-type: none"><li>only by destruction of the switch or by rendering the electronic switch obviously unusable</li></ul>		N/A
	The protective impedances so designed and arranged that along their surfaces and between their surfaces:		N/A
	<ul style="list-style-type: none"><li>the requirements according to Clause 20 "<b>Clearances and creepage distances</b>" are met</li></ul>		N/A
9.1.2	If a cover or cover-plate or a fuse can be removed without the use of a tool or if the instruction for use specifies that, for the purpose of maintenance, when replacing the fuse, covers and cover-plates fastened by means of a tool have to be removed:		N/A
	<ul style="list-style-type: none"><li>protection against contact with live parts assured even after removal of the cover or cover-plate</li></ul>		N/A
	Checked with Probe C through the hole, applying up to 20 N of force.		N/A
	The pin shall not touch live parts.		N/A
9.1.3	An actuating member fixed adequately if the removal of the actuating member gives access to live parts.		N/A
9.2	For switches for appliances other than of Class III, actuating members shall be of one of the following types:		N/A





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Clause	Requirement - Test	Result - Remark	Verdict
	<input type="checkbox"/> a) insulating material; <input type="checkbox"/> b) metal separated from basic insulated parts by supplementary insulation; <input type="checkbox"/> c) metal separated from live parts by double or reinforced insulation; <input type="checkbox"/> d) for electronic switches, metal separated from live parts by protective impedances		N/A
	Item d) measurements carried out between either a single accessible metal part or any combination of accessible metal parts and earth, through a non-inductive resistor of 2 k $\Omega$ :		N/A
	<input type="checkbox"/> at rated voltage (and rated load in ON-state) <input type="checkbox"/> in ON- and OFF-state <input type="checkbox"/> and/or at lowest and highest setting value		N/A
	The current not exceed, in any measurement:		N/A
	• 0,7 mA ( <i>peak</i> ) for a.c. $\leq$ 1 kHz or 2 mA for d.c.		N/A
	For frequencies $>$ 1 kHz:		N/A
	• the limit of 0,7 mA is multiplied by the value of the frequency in kHz, but shall not exceed 70 mA		N/A
9.3	Capacitors not connected to unearthed metal parts which are accessible when the switch is mounted.		N/A
	Metal casing of capacitors separated by supplementary insulation from accessible unearthed metal parts, when the switch is mounted.		N/A
10	<b>PROVISION FOR EARTHING</b>		N/A
10.1	Switches for Class II appliances:		P
	• have no provision for earthing the switch or parts thereof		P
	Interconnections for maintaining the earthing circuit are permitted.		N/A
10.2	Earthing terminals, earthing terminations and other earthing means:		N/A
	• not connected electrically to any neutral terminal		N/A
10.3	Accessible metal parts of switches for Class I appliances:		N/A
	• have provision for earthing		N/A
10.3.1	Parts separated from live parts by double or reinforced insulation, and parts screened from live parts by metal parts connected to an earthing terminal, earthing termination, or other earthing means:		N/A
	• not regarded as likely to become live in the event of an insulation fault		N/A
10.3.2	Accessible metal parts of switches connected to earth through their fixing means:		N/A
	• provided the provision is made for clean metallic surfaces at the connection points		N/A
10.4	The connection between an earthing terminal/termination or other earthing means, and parts required to be connected thereto, is of low resistance.		N/A



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Clause	Requirement - Test		Result - Remark	Verdict
	a) a current of $1.5I_R$ but $\geq 25$ A a.c. with $\leq 12$ V, passed between the type of used earthing and each of the parts in turn		A	N/A
	The resistance not exceeding 50 m $\Omega$ .		m $\Omega$	N/A
<b>10.5</b>	Earthing terminals of all types for unprepared conductors:			N/A
	<ul style="list-style-type: none"><li>is of a size <math>\geq</math> required for the corresponding current carrying terminal</li></ul>			N/A
	Not possible to loosen the clamping means without the aid of a tool, and be adequately locked against unintentional loosening.			N/A
10.5.1	Terminals according to 11.1 and 11.2:			N/A
	<ul style="list-style-type: none"><li>provide sufficient resilience for adequate locking against unintentional loosening</li></ul>			N/A
10.5.2	Switch subjected to excessive vibration or temperature cycling:			N/A
	<ul style="list-style-type: none"><li>special provisions are used</li></ul>			N/A
<b>10.6</b>	Thread-cutting and thread-forming screws may be used to provide earthing continuity;			N/A
	<ul style="list-style-type: none"><li>provided it is not necessary to disturb the connection in normal use</li></ul>			N/A
	<ul style="list-style-type: none"><li>and at least 2 screws are used for each connection (<i>see tests in 19.2</i>)</li></ul>			N/A
<b>10.7</b>	All parts of an earthing terminal:			N/A
	<ul style="list-style-type: none"><li>no risk of corrosion</li></ul>			N/A
<b>10.8</b>	The body of an earthing terminal shall be:			N/A
	<input type="checkbox"/> of brass <input type="checkbox"/> or other metal no less resistant to corrosion			N/A
	Unless:			N/A
	<input type="checkbox"/> it is a part of the enclosure when any screws or nuts be of brass plated steel complying with 19.3 <input type="checkbox"/> or other metal no less resistant to corrosion and rusting			N/A
<b>10.9</b>	If the body of an earthing terminal is part of a frame or enclosure of aluminium or aluminium alloy:			N/A
	<ul style="list-style-type: none"><li>precautions taken to avoid risk of corrosion resulting from contact between copper and aluminium or its alloys</li></ul>			N/A
<b>11</b>	<b>TERMINALS AND TERMINATIONS</b>			P
<b>11.1</b>	<b>Common requirements to terminals</b>			P
11.1.1	General Terminals enable a safe and reliable connection for the conductors declared under the conditions of the intended use.			P
	Screws and nuts for clamping the conductors:			N/A





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Clause	Requirement - Test	Result - Remark	Verdict
	<ul style="list-style-type: none"><li>shall not serve to fix any other part</li></ul>		N/A
	<ul style="list-style-type: none"><li>may hold the clamping part in place or prevent it from turning</li></ul>		N/A
	Clamping shall be between metal surfaces.		P
	Except for terminals:		N/A
	<ul style="list-style-type: none"><li>used in circuits carrying a current <math>\leq 0,2</math> A, one of the surfaces may be non-metallic</li></ul>		N/A
11.1.2	Design of terminals so designed that a suitable conductor may be:		P
	<ul style="list-style-type: none"><li>inserted into the aperture to the designed depth without undue force and undue damage to the conductor and terminal</li></ul>		P
11.1.3	Insulation		P
	Terminals shall be designed so that there is no reduction of the insulation strength:		P
	<ul style="list-style-type: none"><li>when the conductor is attached to the terminal as declared by the manufacturer (see clause 20 "Clearances and creepage distances")</li></ul>		P
11.1.4	Connection		P
	A terminal shall be designed so that a conductor cannot slip out while being connected or while the switch is being operated as intended:		P
	<ul style="list-style-type: none"><li>Checked by TT1.</li></ul>		P
11.2	<b>Fixing of terminals</b>		P
11.2.1	Terminals shall be fixed so, that they will not work loose:		P
	<ul style="list-style-type: none"><li>when the conductor is connected or disconnected</li></ul>		P
	The intended removal of a conductor shall require an action other than a pull at the conductor.		P
	Does not preclude floating terminals or terminals mounted on floating elements, used in some stack-type switches.		N/A
	For terminals declared 7.20.14 ( <i>flat quick-connect termination</i> ) the tabs shall allow the application and withdrawal of female connectors without damage to the switch:		N/A
	<ul style="list-style-type: none"><li>Checked by TT2.</li></ul>		P
11.2.2	For terminals declared 7.20.13 ( <i>push in</i> ) in combination with conductors declared unprepared (7.20.1):		P
	<ul style="list-style-type: none"><li>Checked by inspection and 11.8.4.</li></ul>		P
11.3	<b>Location and shielding of terminals</b>		P
11.3.1	Terminals shall be located or shielded so that when wires are connected, there:		P
	<ul style="list-style-type: none"><li>is no reduction of the insulation strength of the terminals, live parts or to accessible metal parts</li></ul>		P
11.3.2	Terminals suitable for the connection of flexible conductors (7.20.3) shall be located or shielded so that:		N/A
	<ul style="list-style-type: none"><li>no risk of contact between live parts and accessible metal parts</li></ul>		N/A



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Clause	Requirement - Test		Result - Remark	
11.3.3	Switches for class II appliances there shall be no risk of contact between live parts and metal parts separated from accessible metal parts by supplementary insulation only. Checked by:			N/A
	• inspection and for stranded wires by test TT3			N/A
11.4	<b>Terminals for interconnection of more than one conductors</b> Terminals to be used for the interconnection of more than one conductor (7.20.9) designed so that the combination of the most onerous sizes connected simultaneously, does not result in a hazard:			N/A
	• Checked by inspection and TT4			N/A
11.5	<b>Thermal stress</b>			P
	Checked according to TE2 in Clause 17 of .....: <input type="checkbox"/> IEC 61058-1-1:2016 or <input checked="" type="checkbox"/> IEC 61058-1-2:2016.			P
11.6	<b>Test sequences</b> – on terminals allowing the connection of prepared or unprepared conductors:			P
	• the tests are conducted according Table 5 in the sequence with increasing TT-number		See table 5.	P
11.7	<b>Conductor escape test (TT1)</b>			P
	<input type="checkbox"/> Conductors as declared by the manufacturer. <input checked="" type="checkbox"/> <b>maximum</b> cross sectional areas in Table 4.	1.5	mm <sup>2</sup>	—
	<input type="checkbox"/> Test is repeated with the terminal fitted with conductors as declared. <input checked="" type="checkbox"/> Or of <b>minimum</b> cross sectional area in Table 4	0.75	mm <sup>2</sup>	—
	Terminals declared suitable for prepared conductors (7.20.2), the declared type used.			N/A
	Terminals declared for rigid conductors (7.20.5), before insertion into the terminal:			P
	• the wires are straightened			P
	Terminals declared for stranded conductors (7.20.3 or 7.20.4), these are twisted:			P
	• in one direction, so a twist of one complete turn in a length of approximately 2 cm is obtained			P
	Terminals declared screw type terminals (7.20.12) these are:			N/A
	• tightened with the torque according to Table 10		See table 10.	N/A
	Terminals declared for the connection of two or more conductors (7.20.9):			N/A
	• the test is repeated with the terminal fitted with the declared numbers of conductors			N/A
	Terminals declared for solder or welding terminals (7.20.15 or 7.20.16) or if the connection is designed so that a slip out is prevented by design:			N/A
	• no test is necessary			N/A
	After the test, the conductor shall not have:			P
	• escaped into or through the gap between the clamping means and retaining device			P
11.8 11.8.1	<b>Terminal displacement test (TT2)</b> Connection test			P





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Clause	Requirement - Test	Result - Remark		Verdict
	A conductor connected and disconnected 10 times using the parameters of TT1, if no test according to 11.8.2 is required. Terminals declared for only onetime connection (7.20.10), test is not required. After the test, the terminal:			P
	• have not displaced from its intended position			P
11.8.2	Screw-type terminal			N/A
	a) is fitted with a conductor of the <input type="checkbox"/> <b>smallest</b> or <input type="checkbox"/> <b>declared</b> cross sectional area as in Table 4		mm <sup>2</sup>	—
	The terminal screw tightened with a torque as in appropriate column of Table 10.	See table 10.		N/A
	b) If the screw has a hexagonal head with a slot, the torque applied as in column III of Table 10.	See table 10.		N/A
	c) The conductor is subjected to a pull force as in Table 6, applied without jerks, for 1 min, in the direction of the axis of the conductor space.	See table 6.		N/A
	d) Repeat a) to c) with the <b>largest</b> wire size.		mm <sup>2</sup>	—
	Terminals declared for the connection of two or more conductors (7.20.9):			N/A
	• the test is repeated with the terminal fitted with the declared number of conductors			N/A
	• pull is applied consecutively to each conductor			N/A
	During the test:			N/A
	• the conductor shall not move noticeably in the terminal			N/A
11.8.3	Flat quick-connect termination For terminals declared 7.20.14 (flat quick-connect termination) compliance is:			N/A
	• checked by applying the axial forces without jerks to the tab equal to those specified in <b>IEC 61210:2010, Table 6 (retention force)</b>		N	—
	No significant displacement or damage shall occur.			N/A
11.8.4	Push in terminals.			P
	<input type="checkbox"/> Conductors as <b>declared</b> by the manufacturer. <input checked="" type="checkbox"/> <b>Maximum</b> cross sectional areas as in Table 4.	1.5	mm <sup>2</sup>	—
	<input type="checkbox"/> test repeated with the terminal fitted with conductors as <b>declared</b> <input checked="" type="checkbox"/> <b>minimum</b> cross sectional area as in Table 4.	0.75	mm <sup>2</sup>	—
	Compliance of the test:			P
	During the application of the pull (see table 6), the conductor shall not come out of the terminal.			P
	After these tests, neither the terminal nor the clamping means shall have worked loose.			P
11.9	<b>Strand escape test (TT3)</b>			N/A



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Clause	Requirement - Test		Result - Remark	Verdict
	The insulation from the end of a stranded conductor having the <b>minimum</b> or <b>declared</b> cross sectional area as in Table 4 is removed for a length of 8 mm.		mm <sup>2</sup>	—
	The free strand shall be bent without tearing the insulation back and without making sharp bends in every possible direction. The free strand of the flexible conductor:			N/A
	• shall not touch relevant parts mentioned in 11.3			N/A
	• connected to an earthing terminal shall not touch any live part			N/A
<b>11.10</b>	<b>Multiple conductors (TT4)</b>			N/A
	<input type="checkbox"/> Conductors as <b>declared</b> by the manufacturer. <input type="checkbox"/> <b>Maximum</b> cross sectional areas as in Table 4		mm <sup>2</sup>	—
	For <b>conductors classified 7.20.13</b> , perform steps a) to c) of TT2 Clause 11.8.4.			N/A
	For <b>conductors classified 7.20.12</b> perform steps a) to c) of TT2 Clause 11.8.2.			N/A
	Compliance of the test:			N/A
	During the application of the pull, the conductor shall not come out of the terminal.			N/A
	After these tests, neither the terminal nor the clamping means shall have worked loose.			N/A
<b>12</b>	<b>CONSTRUCTION</b>			P
<b>12.1</b>	<b>Constructional requirements relating to protection against electric shock</b>			N/A
12.1.1	When double insulation is used the design shall be such that the:			N/A
	• basic and the supplementary tested separately			N/A
	Unless compliance to the properties of both insulations is provided in another way:			N/A
	a) Basic and supplementary insulation cannot be tested separately, the insulation is considered to be reinforced insulation.			N/A
	b) Specially prepared specimens, or specimens of the insulating parts.			N/A
12.1.2	Creepage distances and clearances not reduced, as a result of wear, below values in clause 20.			P
	If any conductive part of the switch becomes loose and moves out of position it:			P
	• cannot get so disposed in normal use that creepage distances or clearances across supplementary or reinforced insulation are reduced			P
	For the purpose of this test:			P





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Clause	Requirement - Test	Result - Remark	
	<input checked="" type="checkbox"/> not expected that two independent fixings will become loose at the same time <input type="checkbox"/> parts fixed by screws or nuts provided with locking washers not liable to become loose <input type="checkbox"/> springs and spring parts not become loose or fall out of position if they do not do so during the tests of Clauses 18 and 19		
12.1.3	Integrated conductors are rigid, fixed or insulated.		
	Creepage distances and clearances not reduced below values in Clause 20 " <b>Clearances and creepage distances</b> ".		
	Insulation, if any, shall be such that it cannot be damaged during mounting or in normal use.		
	If the insulation of a conductor is not at least electrically equivalent to that of cables and cords complying with the appropriate IEC standard or does not comply with the dielectric strength test made between the conductor and the metal foil wrapped around the insulation under the conditions specified in Clause 15:		
	• the conductor is a bare conductor		
12.1.4	Full disconnection or micro-disconnection can only be achieved using a:		
	• series mechanical contact		
12.1.5	Electronic disconnection is formed by any parallel components or path across a series contact		
	• or when no mechanical contact is provided in the switch		
<b>12.2</b>	<b>Constructional requirements relating to safety during mounting and normal operation of the switch</b>		
12.2.1	Covers, cover plates, removable actuators and the like cannot be displaced or removed except by use of a tool.		
	Fixings for a cover or cover plate do not serve to fix any other part except an actuating member.		
	Not possible to mount removable parts, such that indication of switch positions does not correspond with the actual switch position.		
12.2.2	Fixing screws of covers or cover plates captive.		
12.2.3	Switch not damaged when its actuating member is removed as intended.		
12.2.4	Pull-cord insulated from live parts.		
	Possible to fit or to replace it without removing parts causing live parts to become accessible.		
12.2.5	Illuminated indicator incorporated in a switch, provides correct indication as declared by the manufacturer.		
	Checked by connecting the switch to a voltage $\pm 10\%$ of marked $U_L$ or $U_N$ .		V



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Clause	Requirement - Test	Result - Remark	Verdict
<b>12.3</b>	<b>Constructional requirements relating to the mounting of switches and to the attachment of cords</b>		<b>P</b>
12.3.1	Methods of mounting do not adversely affect compliance with this standard.		P
	Switch cannot rotate, or be displaced, and be removed from an appliance without the aid of a tool.		P
	If removal of a part is necessary during the normal use, requirements of clauses 9, 15 and 20 is satisfied before and after such removal.		N/A
12.3.2	A conductor intended to be disconnected shall:		N/A
	• indicate an obvious method for insertion and disconnection of the conductors		N/A
	The intended disconnection of a conductor shall require an operation:		N/A
	• other than a pull at the conductor		N/A
12.3.3	Openings for the use of a tool intended to assist the insertion or disconnection shall:		N/A
	• be clearly distinguishable from the opening for the conductor		N/A
<b>13</b>	<b>MECHANISM</b>		<b>N/A</b>
13.1	For DC switches with a voltage rating above 28 V dc in combination with a current rating above 0,1 A the speed of contact making and breaking:		N/A
	• shall be independent of the speed of actuation		N/A
13.2	A switch with an intermediate position shall:		N/A
	• not create an unintended operation		N/A
13.3	When the actuating member is released		N/A
	<input type="checkbox"/> it take automatically or stay in the position corresponding to the moving contacts <input type="checkbox"/> except only one rest position		N/A
13.4	Cord-operated switch (pull cord) shall be constructed so that, after actuating the switch and releasing the cord:		N/A
	• the relevant parts of the mechanism are in a position allowing the immediate performance of the next movement in the cycle of actuation		N/A
13.5	Multi-pole switches makes and breaks all poles substantially together.		N/A
	Unless otherwise declared according to Table 3 "Operating sequence".		N/A
	The neutral may make before and break after the others.		N/A
<b>14</b>	<b>PROTECTION AGAINST INGRESS OF SOLID FOREIGN OBJECTS, INGRESS OF WATER AND HUMID CONDITIONS</b>		<b>P</b>
14.1	<b>Protection against ingress of solid foreign objects</b>		<b>P</b>





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Clause	Requirement - Test		Result - Remark	Verdict
	Degree of protection as in 13.3 of IEC 60529.		IP20	P
	Detachable parts are removed.			N/A
	Switch which relies on mounting for the declared degree of protection:			P
	<ul style="list-style-type: none"> <li>mounted in or on a closed box to simulate the appliance</li> <li>tests performed using this simulated assembly</li> </ul>			P
	For numerals 5 and 6 test carried out according to:			N/A
	<ul style="list-style-type: none"> <li>category 2 with the specimen in the most unfavourable position to the manufacturer's declarations for a period of 8 h, loaded 1 h with the rated <math>I_R</math> and 1 h without current</li> </ul>		A (4 cycles)	—
	For the test for first characteristic numeral 5, the switch comply if:			N/A
	<ul style="list-style-type: none"> <li>all actions function as declared</li> </ul>			N/A
	<ul style="list-style-type: none"> <li><math>\Delta t</math> at the terminals <math>\leq 55</math> K tested as in 16.2 at <math>I_R</math> and at <math>25 \pm 10^\circ\text{C}</math></li> </ul>		K	—
	<ul style="list-style-type: none"> <li>dielectric strength of 15.3 with no humidity treatment before application of test voltage 75 % of the test voltage in 15.3</li> </ul>		V	—
	<ul style="list-style-type: none"> <li>no transient fault between live parts and earth metal, accessible metal parts, or actuating members has occurred</li> </ul>			N/A
	Test for 1 <sup>st</sup> characteristic numeral 6, no deposit of dust is inside the switch at the end of the test.			N/A
<b>14.2</b>	<b>Protection against ingress of water</b>			N/A
	Degree of protection against ingress of water when mounted and used as declared. Checked by tests in IEC 60529 with the switch placed in any position of normal use.			
	Switches kept 24 h at $25 \pm 10^\circ\text{C}$ before the test.		$^\circ\text{C}$	—
	The test is carried out according to IEC 60529 as follows:			N/A
	<input type="checkbox"/> IPX1 – IPX2 switches as in 14.2.1 – 14.2.2 with <b>the drain holes open</b> <input type="checkbox"/> IPX3 – IPX9 switches as in 14.2.3 – 14.2.9 with <b>the drain holes closed</b>			N/A
	a) Switch not electrically loaded during these tests.			N/A
	The water temperature shall not differ from that of the switch by more than 5 K.		K	—
	b) Detachable parts are removed.			N/A
	c) Switches incorporating separate gaskets, screwed glands, membranes or other sealing means, manufactured from rubber or thermoplastic materials are:			N/A
	<ul style="list-style-type: none"> <li>aged in a heating cabinet with an atmosphere having the composition and pressure of the ambient air and ventilated by natural circulation</li> </ul>			N/A
	d) Switches <b>without T-rating</b> (7.3.1), kept in the cabinet at a temperature of $70 \pm 2^\circ\text{C}$ for 240 h		$^\circ\text{C}$	—
	Switches <b>with T-rating</b> (7.3.2), kept in the cabinet at a temperature of $T + 30^\circ\text{C}$ for 240 h		$^\circ\text{C}$	—



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Clause	Requirement - Test	Result - Remark		Verdict
	Switch rated as 7.3.3, the "T" equals the lower of the two values following the letter T in 8.4.2.		°C	—
	Switches with glands or membranes are fitted and connected with conductors as in clause 11.			N/A
	Glands tightened with a torque as in Table 11.			N/A
	Fixing screws for enclosures are tightened with a torque as in Table 10.			N/A
	e) Immediately after ageing, the parts are taken out of the cabinet and left at $25 \pm 10$ °C, avoiding direct daylight, for at least 16 h		°C	—
	f) Switch which relies on mounting for the declared degree of protection:			N/A
	• mounted in or on a closed box to simulate the appliance			N/A
	• tests performed using this simulated assembly			N/A
	g) For tests of 2 <sup>nd</sup> characteristic numerals 3 and 4, hand-held spray in IEC 60529 used.			N/A
	After the test, the switch shall withstand the dielectric strength test specified in 15.3.		V	—
	And inspection show no trace of water on insulation which could result in a reduction of creepage and clearance below the values specified in clause 20			N/A
<b>14.3</b>	<b>Protection against humid conditions</b>			P
	Cable inlet openings and drain-holes left open. Drain-hole for a water-tight switch is opened.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A		
	a) Before being placed in the humidity cabinet, the specimens are brought to a temperature between t and t + 4 °C.	25	°C	—
	b) Detachable parts removed and subjected to the humidity treatment with the main part.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A		
	c) Humidity treatment carried out in a humidity cabinet containing air maintained between 20 °C and 30 °C, with a relative humidity above 91 %.	93	%	—
	The specimens kept in the cabinet for 96 h.	96	h	—
	d) After removing the specimens from the cabinet, the testing of 15.2 and 15.3:			P
	• completed within 2 h under ambient conditions			P
	The switch does not show any damage			P
<b>15</b>	<b>INSULATION RESISTANCE AND DIELECTRIC STRENGTH</b>			P
<b>15.1</b>	<b>General requirements.</b>			P
	Checked by the tests of 15.2 and 15.3, immediately after test of 14.3.			P





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Clause	Requirement - Test		Result - Remark	
	The foils not pressed into openings but are pushed into corners and the like by means of the jointed test finger (test probe B according to IEC 61032).		P	
	Basic insulation and supplementary insulation cannot be tested separately:		N/A	
	• The insulation is subjected to the test voltages specified for reinforced insulation.		N/A	
	The tests are not carried out across protective impedances and poles interconnected by components.		N/A	
<b>15.2</b>	<b>Measurement of insulation resistance</b>		P	
	The insulation resistance is measured with a DC voltage of ~ 500 V applied 60 s after application of the voltage.		P	
	The insulation resistance not less than in Table 7.		See table 7.	
<b>15.3</b>	<b>Insulation test voltage</b>		P	
	The test voltage raised uniformly from a value not greater than the rated $U_n$ to the value specified in Table 8, $\leq 5$ s and held at that value for 60 s.		See table 8.	
<b>16</b>	<b>HEATING</b>		P	
<b>16.1</b>	<b>General requirements</b> – Switches shall be constructed so that they do not attain excessive temperatures in normal use.		P	
<b>16.2</b>	<b>Contacts and terminals</b> – The material and design of the contacts and terminals shall be such that the operation and performance of the switch is not adversely affected by their oxidation or other deterioration.		P	
	Compliance is checked by Clause 17.		P	
<b>16.3</b>	<b>Other parts</b>		P	
16.3.1	Switch parts other than the contacts and terminals, in normal use shall not attain temperatures which impair the performance or operation of the switch or create a hazard to the user:			
	Checked by Clauses 17 and 21		P	
16.3.2	Insulation for conductors provided with the switch shall be rated not less than the relevant maximum temperature rating of the switch:		N/A	
	Checked / verified on data provided by switch manufacturer.		N/A	
<b>16.4</b>	<b>Heating test</b> – Unless declared otherwise, the test is carried out on 3 specimens mounted as declared by the manufacturer.		P	
	a) Conductors of an approximate length of 1 m, are fitted to the terminals or leads.		P	
	<input checked="" type="checkbox"/> The cross-sectional area as declared. <input type="checkbox"/> Or specified in Table 4 “medium”.		0.75	mm <sup>2</sup>
	b) Connected conductors when provided are joined to conductors in item a) per the manufacturer's instructions.		N/A	



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Clause	Requirement - Test	Result - Remark		Verdict
	c) Screw terminals and/or nuts are tightened with a torque equal to 2/3 of the appropriate column of Table 10.		Nm	—
	d) Heating cabinets for testing switches without forced convection or a draught free condition.			P
	e) The temperature of the air in the heating cabinet is measured as near as possible to the center of the space occupied by the specimens and at a distance not closer than 50 mm to the specimen.			P
	f) Switches declared as 7.3.2 or 7.3.3, are placed in a heating cabinet and the temperature is raised to the maximum T-rating of the switch.		°C	—
	The temperature of the cabinet maintained at $T \pm 5^\circ\text{C}$ or $T \pm 5\%$ ( $T \pm 0,05T$ ), whichever is greater.		°C	—
	g) Partially suitable rated switches as 7.3.3, with accessible parts rated 0 to $55^\circ\text{C}$ , exposed to a temperature $\leq 55^\circ\text{C}$ .		°C	—
	The internal switch enclosure with a T rating is tested as described for "all parts".		°C	—
	h) The temperature of mounting surfaces of the test equipment is between T and $20^\circ\text{C}$ .	25	°C	—
	i) The specimens are subjected to 20 operating cycles with no current flowing.			N/A
	The actuating member is left in the most unfavourable "ON" position.			N/A
	If more "ON" positions, the verification shall be realized at the most unfavourable one			N/A
	Actuating members of biased switches are fixed in the declared "ON" position.			N/A
	j) Multi-way switches are loaded as specified in 5.3 resulting in the maximum heating.			N/A
	k) Switches for DC or AC and DC voltage where no polarity is given, the test with DC voltage is performed in both polarities and an average value calculated.			N/A
	l) During the test, the switch state does not change.			P
	Fuses and other protective devices not operate.			P
	m) Any convenient AC or DC voltage may be used for the test circuit as far as the result is not affected.			P
	n) The load is adjusted to allow the maximum rated current $I_r$ if not other declared.			P
	o) Switch provided with components generating heat in addition to the heat generated by the contacts, are operated in the most unfavourable mode.			P





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Clause	Requirement - Test		Result - Remark	Verdict
	p) The ON period is maintained with the test current until a constant temperature at the terminals is attained.			P
	A temperature considered constant when 3 successive readings taken at intervals of 5 min indicate no change greater than $\pm 2^{\circ}\text{C}$ .			P
	For a cycling load, after 1 h, the maximum temperature of the cycle is measured.			P
	q) Thermocouples measure the temperature of the surfaces of the switch.			P
	During the test, the temperatures necessary to perform the ball pressure test of 21.1 measured.			P
	The non-metallic surfaces likely to attain the highest temperature are measured without disassembling the switch.			P
17	<b>ENDURANCE</b>			P
	<input type="checkbox"/> IEC 61058-1-1 for mechanical switch testing. <input checked="" type="checkbox"/> IEC 61058-1-2 for electronic switch testing.			—
18	<b>MECHANICAL STRENGTH</b>			P
18.1	<b>General requirements</b> – Accessible parts shall have adequate mechanical strength to withstand a minimum level of force during normal use.			P
18.2	<b>Impact</b> – Switches rated;			P
	• $\geq 0^{\circ}\text{C}$ are tested at $25^{\circ}\text{C} \pm 10^{\circ}\text{C}$	25	$^{\circ}\text{C}$	—
	• $< 0^{\circ}\text{C}$ , are cooled to the minimum rated temperature $T + 0/-5^{\circ}\text{C}$ for 2 h prior to testing		$^{\circ}\text{C}$	—
	The impact is delivered using the spring hammer test apparatus of IEC 60068-2-75 and is equal to:			P
	• $0,5\text{ Nm} \pm 0,04\text{ Nm}$ ,			P
	• for foot operated switches: $1,0\text{ Nm} \pm 0,05\text{ Nm}$			N/A
	One specimen is mounted in the test plate of Figure 11.			P
	Remove the mounting device and specimen from the cold cabinet, when required.			P
	Immediately apply 3 blows, in a direction perpendicular to the switch.			P
18.3	<b>Pull</b>			N/A
18.3.1	Cord-operated switches are submitted to an additional pull test as follows:			N/A



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Clause	Requirement - Test	Result - Remark	Verdict
	<ul style="list-style-type: none"> <li>mounted as declared by the manufacturer</li> <li>the pull-cord is subjected to a force, without jerks</li> <li>first for 60 s in the normal direction</li> <li>then for 60 s in a direction 45° maximum from the normal direction</li> <li>minimum values of the pull force as in Table 9 or three times the values of the normal operating force if that is greater</li> </ul>		N/A
	The sample shall not be damaged in a way that reduces the electrical safety.	See table 9.	N/A
18.3.2	Pull (switches other than cord operated switches).		N/A
	Testing is completed at 25 °C ± 10 C.	°C	—
	A pull force is applied for 60 s to try to pull off the actuating member.		N/A
	The pull to be applied is 15 N.		N/A
	But if the actuating member is intended to be pulled in normal use,		N/A
	The pull force is increased to 30 N.		N/A
18.4	<b>Push</b> A push force of 30 N, using a switch not subjected to the pull force, shall be applied:		N/A
	<ul style="list-style-type: none"> <li>for 60 s to try to push in the actuating members</li> </ul>		N/A
	The sample shall not be damaged in a way that reduces the electrical safety.		N/A
19	<b>SCREWS, CURRENT-CARRYING PARTS AND CONNECTIONS</b>		P
19.1	<b>General requirements for electrical connections</b> Contact pressure is not transmitted through insulating material other than		P
	<input type="checkbox"/> ceramic <input type="checkbox"/> pure mica <input type="checkbox"/> other material no less suitable <input type="checkbox"/> there is visual evidence of sufficient resiliency in the metallic parts to compensate for any possible shrinkage or distortion of the insulating material		N/A
	The suitability of the material is considered in respect to the stability of the dimensions within the temperature range applicable to the switch.		N/A
	Not applicable to connections internal to a switch where the connection is used for:		N/A
	<input type="checkbox"/> lamps for indicating purposes <input type="checkbox"/> the current in this circuit is ≤ 20 mA		N/A
19.2	<b>Screwed connections</b>		N/A
19.2.1	Screwed connections, not tested in Clause 11, electrical or other, withstand:		N/A
	<ul style="list-style-type: none"> <li>the mechanical stresses occurring in normal use</li> </ul>		N/A
19.2.2	Screws transmitting contact pressure		N/A
	<ul style="list-style-type: none"> <li>is in engagement with a metal thread</li> </ul>		N/A
	Such screws not be of metal which is		N/A
	<ul style="list-style-type: none"> <li>soft or liable to creep, as zinc or aluminium</li> </ul>		N/A





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Clause	Requirement - Test	Result - Remark	Verdict
19.2.3	Mechanical connections used during installation of switches may be made of using thread-forming or thread-cutting tapping screws:		P
	<ul style="list-style-type: none"><li>only if the screws are supplied together with the piece in which they are intended to be inserted</li></ul>		P
	Thread-cutting tapping screws intended to be used during installation:		P
	<ul style="list-style-type: none"><li>captive with the relevant part of the switch</li></ul>		P
19.2.4	Thread-forming ( <i>metal sheet</i> ) screws not used:		P
	<input checked="" type="checkbox"/> for the connection of current-carrying parts <input type="checkbox"/> unless they clamp directly in contact with each other and are provided with means of locking		P
	Thread-cutting ( <i>self-tapping</i> ) screws not used:		P
	<input checked="" type="checkbox"/> for electrical connection of current-carrying parts <input type="checkbox"/> unless they generate a full metric ISO thread or a thread of equivalent effectiveness		P
	Such screws not used:		P
	<input checked="" type="checkbox"/> if likely to be operated by the user or installer <input type="checkbox"/> unless the thread is formed by a swaging action		P
	The screws or nuts are tightened and loosened:		N/A
	<input type="checkbox"/> 10 times with thread of insulating material; <input type="checkbox"/> 5 times in all other cases		N/A
	Nuts concentric with the button or lever are tightened and loosened 5 times. Thread:		N/A
	<input type="checkbox"/> of insulating material $\Rightarrow$ the torque is 0.8 Nm <input type="checkbox"/> of metal $\Rightarrow$ the torque is 1.8 Nm		N/A
	The torque applied equal to appropriate column of Table 10, if not otherwise specified.	See table 10.	N/A
	During the test:		N/A
	<ul style="list-style-type: none"><li>terminals shall not work loose</li><li>and damage that could impair the further use of the screwed connection</li></ul>		N/A
19.2.5	Switches having screwed glands are submitted to the following test. Screwed glands fitted with a cylindrical metal rod having a diameter equal to the nearest integer value less than the internal diameter of the packing, in millimetres		N/A
	The glands tightened by means of a spanner, with torque specified in Table 11 applied for 60 s.		N/A
19.2.6	Correct introduction of the screws which are operated during mounting or connection of the switch into the screw holes or nuts shall be ensured.		N/A
	Compliance checked by inspection and manual test.		N/A
19.2.7	Screws which make a mechanical connection between different parts of the switch shall be locked against loosening if the connection carries current. Rivets used for current carrying connections shall be secured against loosening:		N/A
	<ul style="list-style-type: none"><li>if connections are subject to torsion in normal use</li></ul>		N/A
	Sealing compound which softens in heat provides adequate locking:		N/A



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Clause	Requirement - Test	Result - Remark	Verdict
	<ul style="list-style-type: none"><li>only for screw connections not being subject to torsion in normal use</li></ul>		N/A
19.2.8	Screws and nuts for clamping the conductors shall have:		N/A
	<ul style="list-style-type: none"><li>a metric ISO standard thread or a thread comparable in pitch and mechanical strength</li></ul>		N/A
19.3	<b>Current-carrying parts</b> Current-carrying parts and parts in an earthing path:		P
	<ul style="list-style-type: none"><li>have adequate mechanical strength and resistance to corrosion</li></ul>	<input checked="" type="checkbox"/> inspection <input type="checkbox"/> checked by Clause 22	P
20	<b>CLEARANCES, CREEPAGE DISTANCES, SOLID INSULATION AND COATINGS OF RIGID PRINTED BOARD ASSEMBLIES</b>		P
20.1	<b>Generally requirements</b> Compliance is checked:		P
	<input type="checkbox"/> with detachable parts removed <input type="checkbox"/> movable parts which can be assembled in different orientations placed in the most unfavourable position		N/A
	Distances through slots or openings in surfaces of insulating material are measured:		N/A
	<ul style="list-style-type: none"><li>to a metal foil in contact with the surface</li></ul>		N/A
	The foil is pushed into comers and the like by means of:		N/A
	<ul style="list-style-type: none"><li>the jointed test finger of IEC 61032 Probe B but is not pressed into openings</li></ul>		N/A
	A force is applied to bare conductors and accessible surfaces in order to attempt to reduce clearances when making the measurement. The force is:		P
	<input type="checkbox"/> 2 N for bare conductors. <input checked="" type="checkbox"/> 30 N for accessible surfaces.		P
	When applied to openings as specified in 9.1, the distance through insulation between live parts and the metal foil:		N/A
	<ul style="list-style-type: none"><li>not reduced below the specified values</li></ul>		N/A
20.2	<b>Clearances</b>		P
20.2.1	General – The clearances shall be dimensioned to withstand the rated impulse voltage declared by the manufacturer according to 7.12 considering the:		
	<ul style="list-style-type: none"><li>rated <math>U_n</math> and overvoltage category in annex E</li></ul>		P
	<ul style="list-style-type: none"><li>pollution degree declared by the manufacturer</li></ul>		P
20.2.2	<input checked="" type="checkbox"/> Clearances for basic insulation $\geq$ the values given in Table 12.	See table 12.	P
20.2.3	<input checked="" type="checkbox"/> Clearances for functional insulation $\geq$ the values for basic insulation in 20.2.2.		
20.2.4	<input type="checkbox"/> Clearances for supplementary insulation $\geq$ the values given in Table 12.		
20.2.5	<input type="checkbox"/> Clearances for reinforced insulation $\geq$ the values for basic insulation in 20.2.2 but using the next higher step for the rated $U_{imp}$ in Table 12.		





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Clause	Requirement - Test		Result - Remark	Verdict
<b>20.3</b>	<b>Clearances for disconnection</b>			P
20.3.1	Electronic disconnection.			
	No clearances specified for electronic disconnection.			N/A
20.3.2	Micro disconnection			P
	Clearances between terminals and terminations fulfil functional insulation according to 20.2.3.			N/A
	No clearances are specified for the distance across the contacts.			P
	For switches with a rated impulse withstand voltage < 1,5 kV, clearances between other current-carrying parts which are separated by the action of the switch:			N/A
	• ≥ the actual value of the distance between the relevant contacts			N/A
	Switches with a rated impulse withstand voltage of 1,5 kV the clearance of the other current carrying parts which are separated by action of the switch:			N/A
	• shall be at least 0,5 mm			N/A
20.3.3	Full disconnection			N/A
	Clearances ≥ the values in Table 12.	See table 12.		N/A
	Switches provided by two or more breaks in series:			N/A
	• the separation is the sum of the distances of the breaks			N/A
	Each break ≥ 1/3 of the prescribed distance.			N/A
<b>20.4</b>	<b>Creepage distances</b>			P
20.4.1	General – The creepage distances shall be dimensioned for the voltage expected to occur in normal use taking into account the pollution degree declared by the manufacturer according to 7.8 and 7.9 and the material group. Relationship between material group and proof tracking index (PTI) values:			
	Material group .....	IIIa	⇒ PTI: 175V	P
	PTI values obtained in accordance with annex C.			P
	CTI (Comparative tracking index) may be substituted for PTI in Clause 20.....		V	N/A
	Creepage distances for:			P
20.4.2	<input checked="" type="checkbox"/> basic insulation ≥ the values in Table 13 <input checked="" type="checkbox"/> functional insulation ≥ the values in Table 14 <input type="checkbox"/> supplementary insulation ≥ the values for basic insulation in 20.4.2 <input type="checkbox"/> reinforced insulation ≥ double the values for basic insulation in 20.4.2 <input type="checkbox"/> disconnection ≥ the values for functional insulation in 20.4.3	See table 13 and 14.		P
20.4.3				
20.4.4				
20.4.5				
20.4.6				
<b>20.5</b>	<b>Solid insulation</b> – withstanding electrical and mechanical stresses, thermal and environmental influences which may occur during the anticipated life of the switch:			N/A
	• checked during tests of clauses 14, 15, 16 and 17 in IEC 61058-1-1:2016 or IEC 61058-1-2:2016			N/A



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Clause	Requirement - Test		Verdict
	Distance through accessible supplementary solid insulation		N/A
	• have a minimum value of 0.8 mm		N/A
	Distances through accessible reinforced solid insulation have minimum values:		N/A
	<input type="checkbox"/> for rated $U_{imp} \leq 1500$ V: $\geq 0.8$ mm; <input type="checkbox"/> for rated $U_{imp} \geq 2500$ V: $\geq 1.5$ mm.		N/A
<b>20.6</b>	<b>Coatings of rigid printed board assemblies.</b>		N/A
20.6.2	<b>Type 1 coating:</b> The insulation distances of a printed board assembly with type 1 coating declared:		N/A
	• comply with pollution degree 1 of clearances in Table 12 and of creepage distances in Table 14		N/A
	Test specimens:		N/A
	<input type="checkbox"/> as in 5.1 and 5.2 of IEC 60664-3 <input type="checkbox"/> or any representative rigid printed board assemblies as in 5.3 of IEC 60664-3		N/A
20.6.3	<b>Type 2 coating:</b> A printed board assembly with type 2 coating declared shall comply with the requirements for solid insulation as specified in 20.5. Checked by the relevant test:		N/A
	• of Clause 6 of IEC 60664-3:2003 with the test levels or conditions as given in Table 15 and the test specimens as in 20.6.2		N/A
<b>21</b>	<b>FIRE HAZARD</b>		P
<b>21.1</b>	<b>Resistance to heat</b>		P
21.1.2	Compliance is checked with new samples using the ball pressure test according to IEC 60695-10-2 at the temperatures using either the:		P
	<input checked="" type="checkbox"/> (A) heating test results (see 21.1.3) or <input type="checkbox"/> (B) calculated temperatures (see 21.1.4)		P
	The $\varnothing$ of the impression by the ball not > 2 mm.	See table "Fire hazard"	P
	Insulation external to the switch (such as non-detachable conductors) $\geq$ the T value of the switch.	°C	N/A
	Coil windings $\geq$ the T value of the switch.	°C	N/A
<b>21.2</b>	<b>Resistance to abnormal heat</b>		P
	Parts of non-metallic material shall be resistant to abnormal heat	See table "Resistance to abnormal heat"	P
<b>22</b>	<b>Resistance to rusting</b>		N/A
	Ferrous parts, the rusting of which might impair safety, adequately protected against rusting.		N/A
<b>23</b>	<b>ABNORMAL OPERATION AND FAULT CONDITIONS FOR ELECTRONIC SWITCHES.</b>		P
	<input type="checkbox"/> IEC 61058-1-1 for mechanical switch testing. <input checked="" type="checkbox"/> IEC 61058-1-2 for electronic switch testing.		P
<b>24</b>	<b>Components for switches</b>		P





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Clause	Requirement - Test	Result - Remark	Verdict
24.1	<b>General requirements</b> Components which, if they fail, may cause risk of electric shock or fire shall comply <ul style="list-style-type: none"> <li>• either with the requirements of this standard</li> <li>• or with the relevant IEC component standard as far as they reasonably apply</li> </ul>		P
24.2	<b>Protective devices</b> General Protective devices shall be in accordance with the relevant IEC publications and/or the additional requirements specified in the following sub-clauses: <ul style="list-style-type: none"> <li><input type="checkbox"/> fuses;</li> <li><input type="checkbox"/> cut-outs;</li> <li><input checked="" type="checkbox"/> protective devices which only decrease the current;</li> <li><input type="checkbox"/> fusing resistors</li> </ul>		P
24.2.1			
24.2.2			
24.2.3			
24.2.7			
24.2.8			
24.2.2	Fuses:		N/A
	<input type="checkbox"/> comply with IEC 60127 or IEC 60269-3 and have a rated breaking capacity $\geq 1\,500\text{ A}$ <input type="checkbox"/> unless any fault current through the fuse is limited to the breaking capacity of the fuse		N/A
24.2.3	Cut-outs – have adequate making and breaking capacity. If the cut-out in the switch is subjected to a reference temperature outside the range $0\text{ }^{\circ}\text{C}$ to $35\text{ }^{\circ}\text{C}$ or $55\text{ }^{\circ}\text{C}$ :		N/A
	<ul style="list-style-type: none"> <li>• samples tested at this reference temperature</li> </ul>	$^{\circ}\text{C}$	N/A
	During the test:		N/A
	<ul style="list-style-type: none"> <li>• the other conditions shall be similar to those occurring in the switch</li> </ul>		N/A
	<ul style="list-style-type: none"> <li>• no sustained arcing shall occur</li> </ul>		N/A
	After the test:		N/A
	<ul style="list-style-type: none"> <li>• the specimens show no damage impairing their further use or the safety of the switch</li> </ul>		N/A
24.2.4	Non-resettable cut-outs: <input type="checkbox"/> thermal links in accordance with IEC 60691 <input type="checkbox"/> or bi-metallic single operation devices (SOD) according to IEC 60730-2-9 Compliance checked by the tests according to 24.2.3. After the test the supply shall:		N/A
	<ul style="list-style-type: none"> <li>• be cut out and the temperature neither exceed the maximum temperatures specified by the manufacturer for abnormal conditions</li> </ul>	See table “Non-resettable cut-outs – After the test”	N/A
24.2.5	Resettable, non-self-resetting cut-outs shall be:		N/A
	<ul style="list-style-type: none"> <li>• in accordance with IEC 60730-1 and appropriate parts of IEC 60730-2</li> </ul>		N/A
	<ul style="list-style-type: none"> <li>• checked by the tests according to 24.2.3 and the following additional tests</li> </ul>		N/A
	Resettable, non-self-resetting cut-outs in the load circuit of the switch:		N/A
	<ul style="list-style-type: none"> <li>• tested at <math>1.1U_N</math> of the switch and with loads as specified below</li> </ul>	V	N/A
	The cut-outs are reset after each operation and caused to operate 10 times:		N/A



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Clause	Requirement - Test	Result - Remark		Verdict
	<ul style="list-style-type: none"> <li>Cut-outs in switches for incandescent lamps tested in a non-inductive circuit and loaded with the conventional fusing current of the protecting fuse</li> </ul>		A	N/A
	<ul style="list-style-type: none"> <li>Cut-outs in switches for speed control circuits, subjected to 2 series of 10 operations.</li> </ul>			N/A
	<ul style="list-style-type: none"> <li>1<sup>st</sup> series the cut-out closes a circuit with <math>9I_N</math> (<math>\cos \varphi = 0.8 \pm 0.05</math>).</li> </ul>		A	N/A
	<ul style="list-style-type: none"> <li>2<sup>nd</sup> series, the circuit <math>6I_N</math> (<math>\cos \varphi = 0.6 \pm 0.05</math>).</li> </ul>		A	N/A
	<ul style="list-style-type: none"> <li>Cut-outs for other types of load are tested with the opening and closing current as declared</li> </ul>		A	N/A
24.2.6	Self-resetting cut-outs – shall be in compliance with IEC 60730 series. Checked by the tests according to 24.2.3 and the following additional tests:			N/A
	<ul style="list-style-type: none"> <li>Self-resetting cut-outs in the load circuit of the switch tested at <math>1.1U_N</math>:</li> </ul>		V	N/A
	<ul style="list-style-type: none"> <li>Cut-outs in switches for incandescent lamps operated automatically for 200 cycles in a non-inductive circuit and loaded with conventional fusing current of the protecting fuse.</li> </ul>		A	N/A
24.2.7	Protective devices which only decrease the current (for example PTC resistors) be:			N/A
	<input type="checkbox"/> of a thermistor type according to Annex J in IEC 60730-1:2013 <input type="checkbox"/> or PTC-S thermistors according to IEC 60738-1			N/A
	Checked by the tests according to 24.2.3 and the following additional tests. For PTC-S thermistors, with power dissipation > 15 W for the rated zero-power resistance at an ambient temperature of 25 °C, the encapsulation/tubing comply:			N/A
	<ul style="list-style-type: none"> <li>with flammability category V-1 or better according to IEC 60695-11-10 and IEC 60695-11-20</li> </ul>			N/A
24.2.8	Fusing resistors:			N/A
	<ul style="list-style-type: none"> <li>have adequate breaking capacity and does not cause emission of flames or burning particles</li> </ul>			N/A
24.3	<b>Capacitors</b>			N/A
	<ul style="list-style-type: none"> <li>comply with Table 16 or as declared (7.23)</li> </ul>	<input type="checkbox"/> See table 16. <input type="checkbox"/> as declared (7.23)		N/A
24.4	<b>Resistors</b> – for protective impedances according to 9.1.1 and resistors the short-circuiting or disconnecting of which would cause an infringement of the requirements for operation under fault conditions (see Clause 23):			N/A
	<ul style="list-style-type: none"> <li>have an adequate stable resistance value under overload and complies with the requirements of 14.1 of IEC 60065:2014</li> </ul>			N/A
25	<b>EMC REQUIREMENTS</b>			N/A
25.1	<b>General</b> Tests in Clause 25:			N/A
	<ul style="list-style-type: none"> <li>carried out on requested by the manufacturer</li> </ul>			N/A





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Clause	Requirement - Test		Verdict
	Electronic switches for appliances		N/A
	<ul style="list-style-type: none"> <li>fulfil the requirements for immunity and emission when used in accordance with the manufacturer's specification</li> </ul>		N/A
	Electronic switches intended to be built in or incorporated in an appliance.		N/A
	<ul style="list-style-type: none"> <li>comply with the requirements for immunity and emission as evaluated in the end product</li> </ul>		N/A
<b>25.2</b>	<b>Immunity</b>		N/A
25.2.1	General – Electronic switches so designed that the switch state (ON or OFF) and/or setting value is protected against electromagnetic interference.		N/A
	The electronic switch is mounted as in normal use		N/A
	Loaded as specified in clause 17 at $U_N$	V	N/A
	Each electronic switch is tested, if applicable, in the following states:		N/A
	<input type="checkbox"/> ON, highest setting; <input type="checkbox"/> ON, lowest setting; <input type="checkbox"/> OFF, highest setting; <input type="checkbox"/> OFF, lowest setting.		N/A
25.2.2	Voltage dips and short interruptions		N/A
	<ul style="list-style-type: none"> <li>Electronic switch tested as in 25.2.1 with Table 17 using the test equipment specified in IEC 61000-4-11, 3 dips/interruptions with <math>\geq 10</math> s minimum (between each test event).</li> </ul>		—
	<ul style="list-style-type: none"> <li>Abrupt changes in supply voltage occurs at zero crossings.</li> </ul>		—
	<ul style="list-style-type: none"> <li>The change between the test voltage <math>U_T</math> and the changed voltage is abrupt.</li> </ul>		—
	<ul style="list-style-type: none"> <li>100 % <math>U_T</math> = to the rated voltage.</li> </ul>		—
	<ul style="list-style-type: none"> <li>Test level of 0 % = to a total supply voltage interruption.</li> </ul>		—
	During the test, the electronic switch state and/or setting may alter.		N/A
	After the test, the electronic switch:		N/A
	<ul style="list-style-type: none"> <li>be in the original state and the setting unchanged</li> </ul>	See table 17.	N/A
25.2.3	Surge immunity test – Tests carried out according to IEC 61000-4-5 with an open-circuit test voltage of 1 kV ( <i>level 2</i> ).		N/A
	During the tests, the switch state and/or setting shall not alter.		N/A
	After the tests the electronic switch is in the original state and the setting is unchanged.		N/A
25.2.4	Electrical fast transient test – The electronic switch subjected to repetitive fast transients ( <i>bursts</i> ) on supply and control terminals / terminations. The test is carried out according to IEC 61000-4-4 with the following specification:		N/A
	Level of the repetitive fast transients of bursts is in accordance with Table 18.		N/A
	<input type="checkbox"/> Supply terminals/terminations 1 kV ( <i>level 2</i> ) <input type="checkbox"/> Control terminals/terminations 0,5 kV ( <i>level 2</i> )		N/A
	The duration of the test $\geq 1$ min.		N/A
	During the test, the electronic switch state and/or setting may alter.		N/A



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Clause	Requirement - Test	Result - Remark	Verdict
	After the test, the switch shall remain in its original state.		N/A
25.2.5	Electrostatic discharge test		N/A
	The electronic switch mounted as in normal use.		N/A
	The following levels apply:		N/A
	<input type="checkbox"/> test voltage of contact discharge: 4 kV; <input type="checkbox"/> test voltage of air discharge: 8 kV.		N/A
	During the test, the electronic switch state and/or setting may alter.		N/A
	After the test, the switch shall remain in its original state.		N/A
25.2.6	Radiated electromagnetic field test Electronic switch subjected to electromagnetic fields tested as follows:		N/A
	Test carried out according to IEC 61000-4-3, applying a field strength of 3 V/m.		N/A
	After the test, the electronic switch is in the original state and the setting is unchanged.		N/A
	During the test, the electronic switch state and/or setting may alter:		N/A
	• no other changes acceptable		N/A
25.2.7	Power-frequency magnetic field test		N/A
	• carried out according to IEC 61000-4-8 by applying a magnetic field of 3 A/m, 50 Hz.		N/A
	During the test, the state of the electronic switch shall not change.		N/A
	Occasional flickering of lamps or irregular running of motors during the test <b>does not</b> occur.		N/A
25.3	<b>Emission</b>		N/A
25.3.1	Low frequency emission		N/A
	Checked by tests according to IEC 61000-3-2 and IEC 61000-3-3 or IEC 61000-3-5.		N/A
25.3.2	Radio-frequency emission		N/A
	Electronic cord switches and independently mounted switches shall be so designed that they do not cause excessive radio interference.		N/A
	The electronic switch complies with the requirements of .....: <input type="checkbox"/> CISPR 14-1 <input type="checkbox"/> CISPR 15		N/A
	Electronic switch used for electrical lighting application, complies with CISPR 15.		N/A
Annex C	<b>PROOF TRACKING TEST (PTI) (normative)</b>		P
	Proof tracking test made according to IEC 60112.		P
Annex E	<b>RELATION BETWEEN RATED IMPULSE WITHSTAND VOLTAGE <math>U_{IMP}</math>, RATED VOLTAGE <math>U_N</math> AND OVERVOLTAGE CATEGORY (normative)</b>		P





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Clause	Requirement - Test	Result - Remark	Verdict

<b>Table E1</b>	<b>Rated impulse withstand voltage for switches energized directly from the low voltage mains</b>					P
	Nominal voltage of the supply system based on IEC 60038 (V) Three phase Single phase	Voltage line to neutral derived from nominal voltages a.c. or d.c. up to including (V)	U <sub>imp</sub> <sup>2) 3)</sup> (kV) Overvoltage category			—
			I	II	III	—
		250	300	2500		P

<b>Annex G</b>	<b>IMPULSE VOLTAGE TEST</b> ( <i>normative</i> )				N/A
	To verify that clearances will withstand specified transient overvoltage.				N/A
	Impulse withstand voltage test U <sub>imp</sub> is carried out with a voltage having a 1.2/50 μs wave-form as in IEC 60060-1 and is intended to simulate overvoltage of atmospheric origin.		V		N/A
	The test is conducted for a minimum of 3 impulses of each polarity with an interval > 1 s between pulses.				N/A
	When surge suppression is provided inside the specimen, the impulse have the following characteristics: Waveform				N/A
	<input type="checkbox"/> 1.2/50 μs for the no-load voltage with amplitudes equal to the values in Table G1; <input type="checkbox"/> 8/20 μs for an appropriate surge current.				N/A

<b>Table G1</b>	<b>Test voltages for verifying clearances at sea level</b>			N/A
	Rated impulse withstand voltage $\hat{U}$ (kV)	Impulse test voltage at sea level $\hat{U}$ (kV)		—

<b>Annex H</b>	<b>ALTITUDE CORRECTION FACTORS</b> ( <i>normative</i> )				N/A
	Dimensions given in Table 22 are valid for altitudes ≤ 2000 m above sea level, clearances for altitudes > 2000 m sea level is multiplied by the altitude correction factor specified as follows:				N/A

<b>Table H.1</b>	<b>Altitude correction factors</b>				N/A
	Altitude (m)	Normal barometric pressure (kPa)	Multiplication factor for clearances		—

<b>Annex I</b>	<b>TYPES OF COATINGS FOR RIGID PRINTED BOARD ASSEMBLIES</b> ( <i>normative</i> )				N/A
	<b>Type 1 coating:</b>				N/A
	Provides only protection against pollution by coating to pollution degree 1.				N/A



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Clause	Requirement - Test	Result - Remark	Verdict
	Clearance and creepage distance of 20.1, 20.2 and 20.4 apply to the rigid printed board assembly under the coating		N/A
	<b>Type 2 coating:</b>		N/A
	Provides protection against pollution and insulation that the clearance and creepage distance of 20.1, 20.2 and 20.4 are not applicable between conductors under the coating.		N/A

11.1.1	General			P
<b>Table 4</b>	<b>Resistive current carried by the terminal and related cross-sectional areas of terminals for unprepared conductors</b>			P
	<b>Flexible conductors</b>			P
	Terminal size.....	0		—
	Resistive current carried by the terminal .....	5.45	A	—
	Cross-sectional areas .....	0.5-1.0	mm <sup>2</sup>	—
	Supplementary information:			N/A
	<b>Rigid conductors</b>			P
	Terminal size.....	1		—
	Resistive current carried by the terminal .....	5.45	A	—
	Cross-sectional areas .....	0.75-1.5	mm <sup>2</sup>	—
	Supplementary information:			





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Clause	Requirement - Test	Result - Remark	Verdict

11.6	Test sequences							P
Table 5	Terminal test sequence							P
	Reconnection	Conductor	TT1	TT2	TT3	TT4	Examples of terminals	—
	Possible (7.20.11)	Unprepared (7.20.1).	X	X			<input type="checkbox"/> Screw 7.20.12, <input type="checkbox"/> Piercing 7.20.18, <input checked="" type="checkbox"/> Push in 7.20.13	P
	Possible (7.20.11)	Prepared (7.20.2)					<input type="checkbox"/> Screw 7.20.12, <input type="checkbox"/> Piercing 7.20.18, <input type="checkbox"/> Push in 7.20.13, <input type="checkbox"/> Quick connect	N/A
	Not possible (7.20.10)	unprepared (7.20.1).					<input type="checkbox"/> Solder 7.20.15 <input type="checkbox"/> Welding 7.20.16	N/A
	Not possible (7.20.10)	Prepared (7.20.2)					<input type="checkbox"/> Fixed wires (7.20.17) and terminations in general	N/A
	Supplementary information:							

<b>11.8.4</b>	<b>Push in terminals</b>						P
<b>Table 6</b>	<b>Pulling forces for screw-type terminals</b>						P
	Terminal size .....	1					—
	Pulling force (N) .....	40					P
	Supplementary information:						

<b>15.2</b>	<b>Measurement of insulation resistance</b>						P
	The insulation resistance measured with a DC voltage ~ 500 V, the measurement being made 60 s after application of the voltage.						P
<b>Table 7</b>	<b>Minimum insulation resistance</b>						P
	Insulation to be tested	Insulation resistance					P
	Functional	≥ 2 MΩ	>100 MΩ□				P
	Basic	≥ 2 MΩ	>100 MΩ□				P
	Supplementary	≥ 5 MΩ					N/A
	Reinforced	≥ 7 MΩ					N/A
	Across disconnections	≥ 2 MΩ					N/A
	Supplementary information:						



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Clause	Requirement - Test		Result - Remark	Verdict
<b>15.3</b>	<b>Insulation test voltage</b>			<b>P</b>
	The insulation is subjected to a voltage of substantially sine wave form, 50 or 60 Hz.			<b>P</b>
<b>Table 8</b>	<b>Dielectric strength</b>	Rated voltage (V)	240	<b>P</b>
	Insulation or disconnection to be tested	Test voltage (V)		<b>P</b>
	Functional	1500		—
	Basic	1500		—
	Supplementary			—
	Reinforced			—
	Electronic disconnection			—
	Micro-disconnection			—
	Full disconnection			—
	No flash over or breakdown occurs.			<b>P</b>
	Supplementary information:			

<b>16.3</b>	<b>Heating test</b> <i>Compliance is checked by Clauses 17 and 21.</i>			<b>P</b>
	Test voltage .....	220	V	—
	Resistive or declared current .....	5.45	A	—
	Cross-sectional areas .....	0.75	mm <sup>2</sup>	—
Thermocouple locations			Max. temperature measured, (°C)	
Printed circuit board			70.6	—
Terminal block			67.4	
Ambient of relay			64.9	
X2 capacitor			64.9	
Enclosure			50.2	
Inside of enclosure			57.5	—
Ambient			25	
	Supplementary information:			

<b>18.3</b>	<b>Pull</b>			<b>N/A</b>
<b>Table 9</b>	<b>Minimum values of pull force</b>			<b>N/A</b>
	Rated current	Force (N)		—
	A	Normal direction	45° from normal direction	—
	<input type="checkbox"/> ≤ 4 <input type="checkbox"/> > 4	<input type="checkbox"/> 50 <input type="checkbox"/> 100	<input type="checkbox"/> 25 <input type="checkbox"/> 50	
	Supplementary information:			





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Clause	Requirement - Test			Result - Remark	Verdict
<b>19.2</b>	<b>Screwed connections</b>				N/A
<b>Table 10</b>	<b>Torque values</b>				N/A
	Type of screw	Nominal thread Ø (mm)	Torque (Nm)		—
	Terminal:				N/A
	Assembly:				N/A
	Cord anchorages:				N/A
	Other:				N/A
19.2.5	Switches having screwed glands are submitted to the following test.				
<b>Table 11</b>	<b>Torque values for screwed glands</b>				N/A
	Ø of the test rod (mm)	Torque for glands of			—
		Metal		Nm	N/A
	10.94	Insulating material		Nm	N/A
	After the test neither the glands nor the enclosure of the specimen shall show any damage.				N/A
	Supplementary information:				
<b>20</b>	<b>CLEARANCES, CREEPAGE DISTANCES, SOLID INSULATION AND COATINGS OF RIGID PRINTED BOARD ASSEMBLIES</b>				P
	Working voltage (V):	240			—
	Degree of pollution, micro:	<input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3			—
	Degree of pollution, macro:	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input checked="" type="checkbox"/> 3			—
<b>Table 12 – 14</b>	<b>Creepage distance Cd and clearance Cl across:</b>	required Cd (mm)	Cd (mm)	required Cl (mm)	Cl (mm)
	Functional, sealed or incapsulated	N/A	N/A	N/A	N/A
	Functional,	2.4	2.98	1.5	2.98
	Basic	2.4	2.65	1.5	2.65
	Supplementary	N/A	N/A	N/A	N/A
	Reinforced	N/A	N/A	N/A	N/A
	Full disconnection	N/A	N/A	N/A	N/A
	Micro disconnection	N/A	N/A	N/A	N/A
	Supplementary information:				
<b>20.6</b>	<b>Coatings of rigid printed board assemblies.</b>				N/A
<b>Table 15</b>	<b>Test levels and conditions (Type 2 coating)</b>				N/A
	IEC 60664-3 sub-clause	Test levels and conditions			—
	6.6.1 cold storage	- 25°C			
	6.6.3 Rapid change of temperature	Degree of severity 2 (- 25°C to 125°C)			



IEC 61058-1			
Clause	Requirement - Test	Result - Remark	Verdict

	Supplementary information:	
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<b>21</b>	<b>Fire hazard</b>		<b>P</b>
<b>21.1</b>	<b>Resistance to heat</b>		<b>P</b>
21.1.2	Ball pressure test according to IEC 60695-10-2 at the temperatures using: <input checked="" type="checkbox"/> 21.1.3 (A) heating test results ( <i>clause 16</i> ) <input type="checkbox"/> 21.1.4 (B) calculated temperatures		<b>P</b>
Non-metallic materials to be tested:		Ball pressure temperature (°C)	Max 2.0 mm impression
Plastic enclosure		78	1.12
PCB		125	1.02
Terminal block		125	1.78
	Supplementary information:		

<b>21.2</b>	<b>Resistance to abnormal heat</b>		<b>P</b>
Non-metallic materials to be tested:		Test temperature (°C)	<ul style="list-style-type: none"> <li>extinguish within 30 s</li> <li>no ignition of the layer of wrapping tissue</li> </ul>
Plastic enclosure		650	Yes
PCB		850	Yes
Terminal block		850	Yes
	Supplementary information:		

24.2.4	Non-resettable cut-outs – After the test:		<b>N/A</b>
Thermocouple locations		Max. temperature measured, (°C)	Max permitted (°C) declared
	Supplementary information:		

<b>24.3</b>	<b>Capacitors</b>			<b>N/A</b>
<b>Table 16</b>	<b>Requirements for capacitors</b>			
	Application of capacitors	Type(s) of capacitors ( <i>according IEC 60384-14</i> )		—
	Between live conductor	$U_N \leq 130V$	$130V < U_N \leq 480V$ Over-current protection	—
	<b>(Z = impedance)</b>		Without <sup>1)</sup>	With <sup>1)</sup>
	L or N and earth (PE)	<input type="checkbox"/> Y4	<input type="checkbox"/> Y2	<input type="checkbox"/> Y2
	L and N or L1 and L2			
	• without Z in series	<input type="checkbox"/> X2	<input type="checkbox"/> X2	<input type="checkbox"/> X2





IEC 61058-1				
Clause	Requirement - Test		Result - Remark	
	With Z in series, by short-circuiting of capacitor, limits the current to			
	• $\geq 0.5$ A	<input type="checkbox"/> X3	<input type="checkbox"/> X2	<input type="checkbox"/> X3
	• $< 0.5$ A	No special requirement		
	1) Fusing resistor (built in or external).			
	Supplementary information:			

<b>25</b>	<b>EMC REQUIREMENTS</b>			N/A
<b>Table 17</b>	<b>Test levels and duration for voltage dips and short interruptions</b>			
	<b>Test level % <math>U_T</math></b>	<b>Voltage dip / interruptions % <math>U_T</math></b>	<b>Duration number of cycles at rated frequency Cycles</b>	
	0	100	10	
	40	60	10	
	70	30	10	
	Supplementary information:			

# WALTEK



IEC 61058-1			
Clause	Requirement - Test	Result - Remark	Verdict

TABLE: List of critical components						P
Object/part No.	Manufacturer/ trademark	Type/model	Technical data	Standard (Edition / year)	Mark(s) of conformity <sup>1)</sup>	
Terminal block	Dongguan Changhe Electronics Co., Ltd.	CS350-00-500	250V, 10A, 0.2-1.5mm <sup>2</sup> , T110	EN 60998-1 EN 60998-2-2	VDE 40022503	
PCB	WENZHOU BOXUN SCIENCE & TECHNOLOGY CO LTD	BOUNCE	V-0,130°C	EN IEC 61058-1 EN 61058-1-2	UL E321346 Tested with appliance	
Alternative	WENZHOU JUYI ELECTRONIC TECHNOLOGY CO., LTD.	JY-D	V-0,130°C	EN IEC 61058-1 EN 61058-1-2	UL E492597 Tested with appliance	
Alternative	Anhui Dongou Electronic Technology Co Ltd	SY-S	V-0,130°C	EN IEC 61058-1 EN 61058-1-2	UL E473856 Tested with appliance	
Enclosure plastic	SABIC JAPAN L L C	940 (f1)	V-0	EN IEC 61058-1 EN 61058-1-2	UL E207780 Tested with appliance	
Relay	Tianchang City Tianrui Precision Elect. Co., Ltd.	HRW-124LM	250V~, 10A, T85, 1E5	IEC/EN 61810-1	TUV R 50151826	
Alternative	Ningbo Lishun Relay Co., Ltd.	SHD-24VDC-y-z LS-T73	250V~, 10A, T85, 1E5	IEC/EN 61810-1	TUV R 50131151	
Alternative	SHENZHEN GOLDEN ELECTRICAL APPLIANCES CO.,LTD.	GH-1A-24L	250V~, 12A, T100, 1E4	IEC/EN 61810-1	TUV R 50158866	
Alternative	NINGBO TIANBO GANGLIAN ELECTRONICS CO., LTD.	HJR-3FF-S-H	240V~, 10A, T85, 1E5	IEC/EN 61810-1	TUV R 50116163	
Alternative	NINGBO HUI LONG CANG ELECTRONICS CO., LTD.	973-24VDC-SL-A	10A, 250VAC, T85, 5E4	IEC/EN 61810-1	TUV R 50156096	





IEC 61058-1					
Clause	Requirement - Test			Result - Remark	Verdict
Fuse resistor	Yageo Components (Suzhou) Co. Ltd.	FKN series	2W 100 $\Omega$	EN IEC 61058-1 EN 61058-1-2	UL E323780 Tested with appliance
X2 capacitor	DAIN Electronics Co., Ltd.	MPX	0.56 $\mu$ F, 275Vac, X2 type, 40/100/21	IEC/EN 60384-14	VDE 40018798
Alternative	Ningbo Jiangbei Zhenhua Electronic Co., Ltd	CBB62	0.56 $\mu$ F, 330Vac, X2 type, 40/100/21	IEC/EN 60384-14	VDE 40006458
Alternative	Jimson Electronics (Xiamen)Co., Ltd.	MKP - Radial Type	0.56 $\mu$ F, 275Vac, X2 type, 40/100/21	IEC/EN 60384-14	VDE 40000463
Alternative	Tenta Electric Industrial Co. Ltd.	MEX	0.56 $\mu$ F, 275Vac, X2 type, 40/100/21	IEC/EN 60384-14	VDE 119119
Supplementary information: 1) Provided evidence ensures the agreed level of compliance. See OD-2039.					



**Test report**  
**IEC 61058-1-2**  
**Switches for appliances**  
**Part 1: Requirements for electronic switches**

**Report reference No.** ..... : WTN24N01011999R1Z

**Date of issue** ..... : See cover page

**Total number of pages** ..... : 13 pages

**Name of Testing Laboratory preparing the Report** ..... : Waltek Testing Group (Ningbo) Co., Ltd.

**Applicant's name** ..... : See cover page

**Address** ..... : See cover page

**Test specification:**

**Standard** ..... : IEC 61058-1-2:2016

**Test procedure** ..... : Test Report

**Non-standard test method** ..... : N/A

**TRF template used** ..... : IECEE OD-2020-F1:2020, Ed.1.3

**Test Report Form No.** ..... : IEC61058\_1\_2D

**Test Report Form(s) Originator** ... : Intertek Semko AB

**Master TRF** ..... : 2021-03-05

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Test item description .....	See test report: WTN24N01011999R1Z for IEC61058_1I
Trademark .....	
Manufacturer.....	See cover page
Model/type reference .....	See cover page
Rating .....	Rated voltage: 220-240VAC, 50/60Hz, IP20, ST701H, <b>ST701E, ST701F, ST701K, ST701D, ST701MA, ST701MB:</b> Load: incandescent lamp: 1200W, LED/Energy saving lamp: 300W; <b>ST760:</b> Load: incandescent lamp: 600W, LED/Energy saving lamp: 300W

**Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):**

<input checked="" type="checkbox"/> Testing Laboratory.....	Waltek Testing Group (Ningbo) Co., Ltd.
Testing location/ address .....	Zone 3, 1/F., No.6, Building 011, No.1177, Lingyun Road, Ningbo Hi-Tech Zone, Yinzhou District, Ningbo, Zhejiang, China
Tested by (name, function, signature) .....	See cover page
Approved by (name, function, signature) .....	See cover page

<input type="checkbox"/> Testing procedure: CTF Stage 1:.....	
Testing location/ address .....	
Tested by (name, function, signature) .....	
Approved by (name, function, signature) .....	

<input type="checkbox"/> Testing procedure: CTF Stage 2:.....	
Testing location/ address .....	
Tested by (name, function, signature) .....	
Witnessed by (name, function, signature).....	
Approved by (name, function, signature) .....	

<input type="checkbox"/> Testing procedure: CTF Stage 3:.....	
<input type="checkbox"/> Testing procedure: CTF Stage 4:.....	
Testing location/ address .....	
Tested by (name, function, signature) .....	
Witnessed by (name, function, signature).....	
Approved by (name, function, signature) .....	
Supervised by (name, function, signature) ....	

**List of Attachments:**

- Photo – as required. See test report: WTN24N01011999R1Z for IEC61058\_1I
- National Differences. See test report: for IEC61058\_1I
- Other attachments as needed. ☒ Not included. ☐ Included. See pages:

**See test report for IEC61058\_1I for:**

- Summary of testing.
- Tests performed (name of test and test clause).
- Testing location.
- Summary of compliance with National Differences (List of countries addressed).
- ☒ The product fulfils the requirements of  
IEC 61058-1:2016  
IEC 61058-1-2:2016  
EN IEC 61058-1:2018  
EN 61058-1-2:2016
- Copy of marking plate.

- **Test item particulars:**.....See also test report: WTN24N01011999R1Z for IEC61058\_1I

**Classification of installation and use** .....: See test report WTN24N01011999R1Z

**Supply Connection** .....: See test report WTN24N01011999R1Z

**Possible test case verdicts:**

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

**Testing:**

Date of receipt of test item .....: See cover page

Date(s) of performance of test .....: See cover page

**General remarks:**

"(See Enclosure #)" refers to additional information appended to the report.  
"(See appended table)" refers to a table appended to the report.

Throughout this report a ☐ comma / ☒ point is used as the decimal separator.

**Manufacturer's Declaration per sub-clause 4.2.5 of IEC61058-1:**

The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided.....

- ☐ Yes  
☒ Not applicable

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

**Name and address of factory (ies)** .....: WTN24N01011999R1Z for IEC61058\_1I  
See test report .....:

**General Product Information and other remarks** ..: WTN24N01011999R1Z for IEC61058\_1I  
See test report ..:





IEC 61058-1-2				
Clause	Requirement - Test		Result - Remark	Verdict
	For following clauses, see part 1, IEC 61058-1:2016.			
6	RATING			P
9	PROTECTION AGAINST ELECTRIC SHOCK			P
10	PROVISION FOR EARTHING			N/A
12	CONSTRUCTION			P
13	MECHANISM			N/A
14	PROTECTION AGAINST SOLID FOREIGN OBJECTS, INGRESS OF WATER AND HUMID CONDITIONS			P
16	HEATING			P
18	MECHANICAL STRENGTH			P
19	SCREWS, CURRENT-CARRYING PARTS AND CONNECTIONS			P
20	CLEARANCES, CREEPAGE DISTANCES, SOLID INSULATION AND COATINGS OF RIGID PRINTED BOARD ASSEMBLIES			P
21	FIRE HAZARD			P
22	Resistance to rusting			P
24	COMPONENTS			P
25	EMC REQUIREMENTS			N/A
7	CLASSIFICATION			P
	This clause of part 1 is applicable with the following addition.			P
7.24	Operating cycles with mechanical switching device only (TC7)			N/A
7.25	Endurance method			P
7.25.1	Electrical endurance method "a" (Table 103)	SD with parallel contact		N/A
7.25.2	Electrical endurance method "b" (Table 103)			N/A
7.26	Minimum load for electronic switches			P
7.27	According to test conditions for electronic switches:			P
7.27.1	Functional test conditions for electronic switches with thermal current or maximum rated resistive current.	5.45	A	P
7.27.2	Simulated test conditions for electronic switches with type of load as classified in 7.2.			N/A
7.27.3	Specific test conditions of end application for electronic switches, i.e. in or together with the appliance and under the cooling conditions of the appliance.			N/A
8	MARKING AND DOCUMENTATION			P
	This clause of part 1 is applicable with exceptions as below.			P
	Table 3 is applicable with the following addition.			P

IEC 61058-1-2				
Clause	Requirement - Test		Result - Remark	Verdict
<b>Table 102</b>	<b>Switch information and the loads placed in groups.</b>			P
No.	Characteristic	Means of information: <input checked="" type="checkbox"/> C.T. <input type="checkbox"/> U.T.		P
12.3	Thermal current if defined.		A	N/A
12.4	Number of cycles with electronic control failed (TC 7).			N/A
12.5	Endurance method "a" or "b".			N/A
12.6	Minimum test load if required.			N/A
12.7	Test conditions.	<input checked="" type="checkbox"/> functional <input type="checkbox"/> simulated		P
12.8	Cooling conditions.			N/A
<b>11</b>	<b>TERMINALS AND TERMINATIONS</b>			P
	This clause of part 1 is applicable with the following addition.			P
	Add the to 11.5. Compliance is checked according to TE2 in Clause 17.			P
	For electronic switches rated for less than 1E4 cycles:			N/A
	• the TE2 test performed on the complete switch			N/A
<b>15</b>	<b>INSULATION RESISTANCE AND DIELECTRIC STRENGTH</b>			P
	This clause of part 1 is applicable with the following addition. Add the following to 15.1. For electronic switches, the test:			P
	• is carried out across full disconnection and micro disconnection only on electronic switches with mechanical switching devices connected in series with the semiconductor switching device			P
	• are not carried out across protective impedances and poles interconnected by components			N/A
<b>17</b>	<b>ENDURANCE</b>			P
<b>17.1</b>	<b>General requirements</b>			P
17.1.1	Switches shall withstand without excessive wear or other harmful effect the electrical, thermal and mechanical stresses that occur in normal use.			
17.1.2	Electronic switches tested in an increasing TC order as specified in Table 103.			
<b>17.2</b>	<b>Electrical conditions</b>			P
	The switch loaded as specified in Table 103 and connected in accordance with the test circuit in 61058-1:2016, Table 2.			
a)	Where in Table 2 an auxiliary switch (A) is symbolised in the test circuit,			N/A
	• tests for two ON-positions of the specimen (S) performed on 2 separate sets of test samples			N/A
b)	Multiway switches loaded according to 61058-1:2016, Table 1.	See table 1.		N/A
c)	For specific lamp load (7.2.7),			N/A





IEC 61058-1-2			
Clause	Requirement - Test	Result - Remark	Verdict
	<ul style="list-style-type: none"><li>the connection and test load as specified by the manufacturer using the maximum occurring inrush current at room temperature</li></ul>	<input type="checkbox"/> used <input checked="" type="checkbox"/> not used	N/A
	<ul style="list-style-type: none"><li>the specimen operated with loads that are used in the field rather than with synthetic loads</li></ul>	<input type="checkbox"/> used <input checked="" type="checkbox"/> not used	N/A
	<ul style="list-style-type: none"><li>forced cooling of the specific lamp load applied in order to ensure cold resistance for each operating cycle and shorten the test time</li></ul>	<input type="checkbox"/> used <input checked="" type="checkbox"/> not used	N/A
d)	No electrical endurance tests applied for switches rated $\leq 20$ mA load as classified to 7.2.6		N/A
e)	Electronic switches		P
	<ul style="list-style-type: none"><li>test circuit as shown in figure 16</li><li>the declared load set at rated voltage before the electronic switch is inserted into the circuit</li></ul>		P
<b>17.3</b>	<b>Thermal conditions</b> ( <i>air temperatures</i> )		P
17.3.1	Switches according to 7.3.2 during tests in 17.5.8 (TC8) all parts exposed to:		
	<input type="checkbox"/> 1 <sup>st</sup> half of test at maximum T-rating (+5 / 0) °C		°C
	<input type="checkbox"/> 2 <sup>nd</sup> half of test at 25 °C $\pm$ 10 °C <input type="checkbox"/> or at the minimum T-rating (0 / -5) °C if T < 0 °C		°C
17.3.2	Switches according to 7.3.3, during tests in 17.5.8, (TC8) parts declared for 0 °C to 55 °C:		N/A
	<ul style="list-style-type: none"><li>exposed to a temperature within this range for the complete test period</li></ul>		N/A
	<input type="checkbox"/> 1 <sup>st</sup> half of test, the remainder of the switch maintained at (T +5/0) °C		°C
	<input type="checkbox"/> 2 <sup>nd</sup> half of test, carried out at 25 °C $\pm$ 10 °C <input type="checkbox"/> or at the minimum T-rating (T 0/-5) °C		°C
17.3.3	Switches according to 7.3.1, during the tests in 17.5.8 (TC8):		P
	<ul style="list-style-type: none"><li>the switch exposed to 25 °C <math>\pm</math> 10 °C</li></ul>		P
<b>17.4</b>	<b>Actuating conditions</b>		N/A
17.4.1	The operating speed for the operating cycles shall be as follows:		
	a) For very slow speed actuation approximately:	<input type="checkbox"/> 1°/s for rotary; <input type="checkbox"/> 0,5 mm/s for linear.	N/A
	b) For slow speed actuations approximately:	<input type="checkbox"/> 9°/s for rotary <input type="checkbox"/> 5 mm/s for linear	N/A
	c) For high speed actuating member actuated by:	<input type="checkbox"/> hand as fast as possible	N/A
	d) For accelerated speed actuations approximately:	<input type="checkbox"/> 45°/s for rotary; <input type="checkbox"/> 20 – 25 mm / s for linear	N/A
17.4.2	For biased switches, the actuating member is moved to the limit of travel of the opposite position.		N/A
17.4.3	During the testing, care is taken that the test apparatus drives the actuating member, without impeding the designed movements of the switch.		N/A
17.4.4	During the accelerated speed test:		N/A



IEC 61058-1-2			
Clause	Requirement - Test	Result - Remark	Verdict
	a) Care taken that test apparatus allows actuating member to operate freely.		N/A
	b) Switches for a rotary actuation where movement is not limited in either direction		N/A
	• 3/4 of operating cycles made in a clockwise and 1/4 in an anti-clockwise direction		N/A
	c) Switches for rotary actuation in one direction only, test is performed in the designed direction.		N/A
	d) Additional lubrication not applied during tests.		N/A
	e) Forces applied to the end stops of the actuating members do not exceed declared values.		N/A
17.4.5	Switches are operated with the following conditions. Table 106:		P
	<input checked="" type="checkbox"/> $I_R \leq 10 \text{ A}$ ; 1 (s) ON and 3 (s) OFF <input type="checkbox"/> $I_R > 10 \text{ A but } < 25 \text{ A}$ ; 2 (s) ON and 6 (s) OFF <input type="checkbox"/> $I_R \geq 25 \text{ A}$ ; 4 (s) ON and 12 (s) OFF		P
	Capacitive and simulated lamp load (IEC 61058-1:2016, Figures 8 and 9);		N/A
	• 2 (s) ON and 15 (s) OFF		N/A
	Tungsten lamp loads:		N/A
	• Minimum 1 (s) ON and Minimum 55 (s) OFF		N/A
	Very slow speed TC10:		N/A
	• Minimum 2 (s) ON and Minimum 6 (s) OFF		N/A
	Locked rotor (TC9):		N/A
	• 1 (s) ON and 30 (s) OFF		N/A
	Switches with test circuit as in Table 2 for codes 2.3, 2.5, 2.7 or 2.9:		N/A
	• the ON periods is approximately 50 %		N/A
	Multi-way switches comply with the table 106	(s) ON	(s) OFF
	• or be actuated with the speed indicated in 17.4.1 and a minimum ON period of 25 %		N/A
17.5	Type of test condition (TC)	See table TC.	P
17.5.2	Increased-voltage test at accelerated speed (TC1): • Electrical conditions as in Table 104 and 105, 1.15 $U_n$ and 1.0 $I_n$ . • Capacitive and simulated lamp load 1.0 $U_n$ and 1.15 $I_n$ . • Thermal conditions $25 \pm 10 \text{ }^\circ\text{C}$ . • Method of operation as in 17.4. • 100 operating cycles.		N/A
17.5.2	Test at slow speed (TC2): • Electrical conditions as in 17.2. • Thermal conditions $25 \pm 10 \text{ }^\circ\text{C}$ . • Actuating speed as in 17.4 slow speed. • 100 operating cycles		N/A





IEC 61058-1-2			
Clause	Requirement - Test	Result - Remark	Verdict
17.5.3	Test at high speed (TC3) (only switches with more than one pole and with reversal polarity): <ul style="list-style-type: none"><li>Electrical conditions as in 17.2.</li><li>Thermal conditions <math>25 \pm 10</math> °C.</li><li>Actuating speed as in 17.4 high speed.</li><li>100 operating speed.</li></ul>		N/A
17.5.4	Test at accelerated speed (TC4): <ul style="list-style-type: none"><li>Electrical conditions as in 17.2.</li><li>Thermal conditions as in 17.3.</li><li>Actuating speed as in 17.4 accelerated.</li><li>Operating cycles as declared in (7.4) reduced with the number already tested in 17.5.1, 17.5.2 and 17.5.3.</li></ul>		N/A
17.5.5	Locked-rotor test (TC5): <ul style="list-style-type: none"><li>Electrical conditions as in 17.2.</li><li>Thermal conditions <math>25 \pm 10</math> °C.</li><li>Actuating speed as in 17.4 accelerated.</li><li>10 operating cycles across the full range of the device</li></ul>		N/A
17.5.6	Functional test at minimum load (TC6) – optional: <ul style="list-style-type: none"><li>Electrical conditions with minimum load or current at <math>0,9 U_n</math>.</li><li>Thermal conditions <math>25 \pm 10</math> °C.</li><li>Actuating speed with manually actuated follow the correct operation.</li><li>10 operating cycles across the full range of the device</li></ul>		N/A
	Electronic switches with minimum load or minimum current specified by the manufacturer:		N/A
	<ul style="list-style-type: none"><li>the characteristic is additionally tested with the specified conditions</li></ul>		N/A
17.5.7	Test with limited number of operations (TC7): <ul style="list-style-type: none"><li>Electrical conditions as in 17.2</li><li>Thermal conditions <math>25 \pm 10</math> °C.</li><li>Actuating speed as in 17.4 accelerated.</li><li>1 000 operating or the declared number.</li></ul>		N/A
17.5.8	Endurance complete switch (TC8): <ul style="list-style-type: none"><li>Electrical conditions as in 17.2.</li><li>Thermal conditions as in 17.3.</li><li>Actuating speed as in 17.4 accelerated.</li><li>Total number of operating cycles declared in 7.4.</li></ul>		P
17.5.9	Locked-rotor test (TC9): <ul style="list-style-type: none"><li>Electrical conditions as in 17.2.</li><li>Thermal conditions <math>25 \pm 10</math> °C.</li><li>Actuating speed as in 17.4 accelerated.</li><li>50 operating cycles.</li></ul>		N/A
17.5.10	Test at very slow speed (TC10): <ul style="list-style-type: none"><li>Electrical conditions as in 17.2.</li><li>Thermal conditions <math>25 \pm 10</math> °C.</li><li>Actuating speed, very slow as in 17.4.</li><li>100 operating cycles.</li></ul>		N/A
17.6	Evaluation of compliance	See table TE1 – TE3.	P



IEC 61058-1-2			
Clause	Requirement - Test	Result - Remark	Verdict
<b>23</b>	<b>ABNORMAL OPERATION AND FAULT CONDITIONS FOR ELECTRONIC SWITCHES.</b>		<b>P</b>
<b>23.1</b>	<b>Switch construction</b> – Switches shall be constructed so that the risk of fire, mechanical damage impairing safety or protection against electric shock as a result of abnormal operation/use is prevented.		<b>P</b>
<b>23.2</b>	<b>Test set-up</b>		<b>P</b>
23.2.1	A circuit analysis of the switch completed to determine points for testing.		<b>P</b>
23.2.2	The abnormal conditions are applied in a sequence which is the most convenient for testing.		<b>P</b>
23.2.3	The tests are made on switches mounted as declared by the manufacturer and connected according to Clause 16.		<b>P</b>
23.2.4	Switches are connected to allow current flow through in the critical path during simulated fault condition		<b>P</b>
	The load according to the maximum declared current connected		<b>P</b>
	Test performed at ambient temperature $25 \pm 10$ °C.		<b>P</b>
	The current flow is continued for 1 h.		<b>P</b>
	Or if no current flow is observed after the fault:		<b>P</b>
	• the current flow duration is 15 min		<b>P</b>
<b>23.3</b>	<b>Abnormal testing</b>		<b>P</b>
23.3.1	Each of the abnormal conditions:		<b>P</b>
	• is applied in turn, one at a time (single fault)		<b>P</b>
23.3.2	When agreed upon by the manufacturer:		<b>P</b>
	• damaged components, including fuses replaced provided the switch is equivalent to a new specimen		<b>P</b>
23.3.3	Cumulative stress as a result of sequential testing avoided.		<b>P</b>
	Additional specimens used.		<b>P</b>
23.3.4	The following abnormal conditions, identified by the circuit analysis, simulated:		<b>P</b>
	Short circuit:		<b>P</b>
	a) across creepage distances and clearances that do not comply with the required distances of IEC61058-1:2016, Tables 12 to 14		<b>P</b>
	b) across insulating coating consisting of lacquer or enamel etc., ignored in assessing the creepage distances and clearances		<b>P</b>
	c) and interruption of semiconductor devices		<b>P</b>
	d) and interruption of capacitors and resistors which do not comply with 24.3 and 24.4.		<b>P</b>





IEC 61058-1-2			
Clause	Requirement - Test	Result - Remark	Verdict
23.3.5	During the test the complete switch enclosure are:		P
	<ul style="list-style-type: none"> <li>visually monitored, and emission of flames, molten metals or charring of the tissue paper are reported</li> </ul>		P
<b>23.4</b>	<b>Compliance</b>		P
23.4.1	The simulated fault, the final state of the specimen compliant with the following:		
	a) no ignition of the tissue paper;		P
	b) no access of live parts checked by Clause 9		P
<b>23.5</b>	<b>Protection in case of failure of forced cooling</b>		N/A
23.5.1	Switches declared with forced cooling according to 7.22.2, so constructed that the risk of fire, mechanical damage impairing safety or protection against electric shock as a result of failing of forced cooling is prevented Checked by the following test:		
23.5.2	The switch is mounted as in Clause 16, but without forced cooling during the test.		N/A
23.5.3	The switch is loaded according to Table 103 TL2, and continued:		N/A
	<ul style="list-style-type: none"> <li>until steady state temperatures are achieved</li> </ul>		N/A
	<ul style="list-style-type: none"> <li>or the switch disconnects the load circuit</li> </ul>		N/A
23.5.4	During the test the complete switch enclosure are:		N/A
	<ul style="list-style-type: none"> <li>visually monitored, and emission of flames, molten metals or charring of the tissue paper are reported</li> </ul>		N/A
23.5.5	Compliance:		N/A
	a) no ignition of the tissue paper;		N/A
	b) no access of live parts checked by Clause 9		N/A

Results of endurance testing in clause 17					P
<b>Type:</b>		<b>Tested for:</b>	1#, 2#, 3#	<b>Circuit code:</b>	1.2
<b>Table 1</b>	<b>Test loads for multi way switches</b>				N/A
	Cycles of operations	Switch position of	Circuit $\Rightarrow$ Load (A) $\Downarrow$		—
	1st half	Highest load	$I_R$		
		Next lower load	$0.8 I_R$		
		Further next lower load	$0.533 I_R$		
	2nd half	Highest load	$I_R$		
		Next lower load	$0.5 I_R$		
		Further next lower load	$0.333 I_R$		
	Supplementary information:				



IEC 61058-1-2			
Clause	Requirement - Test		Verdict
<b>Table 103</b>	<b>Electrical endurance tests for electronic switches.</b>		<b>P</b>
	<b>Complete switch.</b>		<b>P</b>
	SD <b>without</b> electrical contact(s).		N/A
	<input type="checkbox"/> Functional test: <input type="checkbox"/> Simulated test: <input type="checkbox"/> Specific test condition	TL1 TC5, TC6, TC8 TE1, TE3 TL3 TC5, TC6, TC8 TE1, TE3 TL4 TC5, TC6, TC8 TE1, TE3	N/A
	SD <b>with serial</b> contact(s).		N/A
	<input type="checkbox"/> Functional: <input type="checkbox"/> Simulated a): <input type="checkbox"/> Simulated b): <input type="checkbox"/> Specific:	TL1 TC5, TC6, TC8 TE1, TE3 TL1 TC5, TC6, TC8 TE1, TE3 TL3 TC5, TC6, TC8 TE1, TE3 TL4 TC5, TC8 TE1, TE3	N/A
	SD <b>with parallel</b> contact(s).		<b>P</b>
	<input checked="" type="checkbox"/> Functional: <input type="checkbox"/> Simulated: <input type="checkbox"/> Specific:	TL1 TC5, TC6, TC8 TE1, TE3 TL3 TC5, TC6, TC8 TE1, TE3 TL4 TC5, TC8 TE1, TE3	<b>P</b>
	SD <b>with serial and parallel</b> contact(s).		N/A
	<input type="checkbox"/> Functional: <input type="checkbox"/> Simulated a): <input type="checkbox"/> Simulated a): <input type="checkbox"/> Specific condition:	TL1 TC5, TC6, TC8 TE1, TE3 TL1 TC5, TC6, TC8 TE1, TE3 TL3 TC5, TC6, TC8 TE1, TE3 TL4 TC5, TC8 TE1, TE3	N/A
	<b>Contacts only.</b>		N/A
	SD <b>without</b> electrical contact(s).	<b>No testing.</b>	N/A
	SD <b>with serial</b> contact(s).		N/A
	<input type="checkbox"/> Functional: <input type="checkbox"/> Simulated a): <input type="checkbox"/> Simulated b): <input type="checkbox"/> Specific:	TC1, TC4 with TL2 TE1 to TE3 TL3, TC1, TC4 TE1 to TE3 TL3, TC1, TC7 TE1 to TE3 TC7 with TL4 TE1 to TE3	N/A
	SD <b>with parallel</b> contact(s).		N/A
	<input type="checkbox"/> Functional: <input type="checkbox"/> Simulated: <input type="checkbox"/> Specific:	TC1, TC4 with TL2 TE1 to TE3 TL3, TC1, TC4 TE1 to TE3 TC7 with TL4 TE1 to TE3	N/A
	SD <b>with serial and parallel</b> contact(s).		N/A
	<input type="checkbox"/> Functional. <input type="checkbox"/> <b>Serial</b> , <input type="checkbox"/> <b>Parallel</b> : <input type="checkbox"/> Simulated. <input type="checkbox"/> <b>Serial</b> contact a): <input type="checkbox"/> Simulated. <input type="checkbox"/> <b>Serial</b> contact b): <input type="checkbox"/> Simulated. <input type="checkbox"/> <b>Parallel</b> contact a and b) <input type="checkbox"/> Specific. <input type="checkbox"/> <b>Serial</b> contact: <input type="checkbox"/> <b>Parallel</b> contact:	TC1, TC4 with TL2 TE1 to TE3 TL3, TC1, TC4 TE1 to TE3 TL3, TC1, TC7 TE1 to TE3 TL3, TC1, TC7 TE1 to TE3 TC7 with TL4 TE1 to TE3 TC7 with TL4 TE1 to TE3	N/A
	Supplementary information:		





IEC 61058-1-2									
Clause	Requirement - Test					Result - Remark			Verdict
	Results of endurance testing in clause 17								P
Type:		Tested for: 1#, 2#, 3#				Circuit code:		1.2	
Table TC									
Sub-clause	TC test	Volt (V)	Test load (A) Make Break		Cos (φ) Make Break		Time constant (ms)	Cycles	
17.5.1	TC1								N/A
17.5.2	TC2								N/A
17.5.3	TC3								N/A
17.5.4	TC4								N/A
17.5.5	TC5								N/A
17.5.6	TC6								N/A
17.5.7	TC7								N/A
17.5.8	TC8	220	5.45	5.45				10000	P
17.5.9	TC9								N/A
17.5.10	TC10								N/A
TE1 – TE3									P
17.6.1	Functional compliance (TE1). Switch complies if								P
	<input checked="" type="checkbox"/> all actions function as declared <input checked="" type="checkbox"/> no loosening of electrical / mechanical connections occur; <input type="checkbox"/> sealing compound does not flow to such an extent that live parts are exposed								P
17.6.2	Thermal compliance (TE2) • Δt at the terminals < 55K tested in accordance with 16.2 at I <sub>R</sub> and 25°C ± 10 °C								P
	Test current						5.45	A	—
	Samples 1, 2, 3:					1) 41.2 2) 42.4 3) 40.9	K K K		
17.6.3	Insulating compliance (TE3) • test voltage 75 % of the corresponding test voltage specified in sub-clause 15.3:								P
	<input type="checkbox"/> Over contact gap(s) <input checked="" type="checkbox"/> Between live parts of different polarity <input type="checkbox"/> Between live parts and earth metal <input checked="" type="checkbox"/> Between live parts and accessible metal parts or actuating members etc. Samples 1, 2, 3: No transient fault occurred								P
	Supplementary information:								



IEC 61058-1-2			
Clause	Requirement - Test	Result - Remark	Verdict
<b>23</b>	<b>Abnormal operation and fault conditions for switches</b>		<b>P</b>
	Short circuit test across:		
	C 104P	No working, no hazards	P
	C 105P	No working, no hazards	P
	Q J3 PIN b-e	No abnormal phenomena	P
	Q J3 PIN b-c	No abnormal phenomena	P
	Q J3 PIN c-e	No working, no hazards	P
	Q 2T PIN b-e	No working, no hazards	P
	Q 2T PIN b-c	No working, no hazards	P
	Q 2T PIN c-e	No abnormal phenomena	P
	MB6S PIN 1-3	No working, no hazards	P
	Interruption of:		
	Supplementary information:		
	Thermocouple locations:	Max. temperature measured, (°C)	N/A
	Supplementary information:		

===== End of Report =====



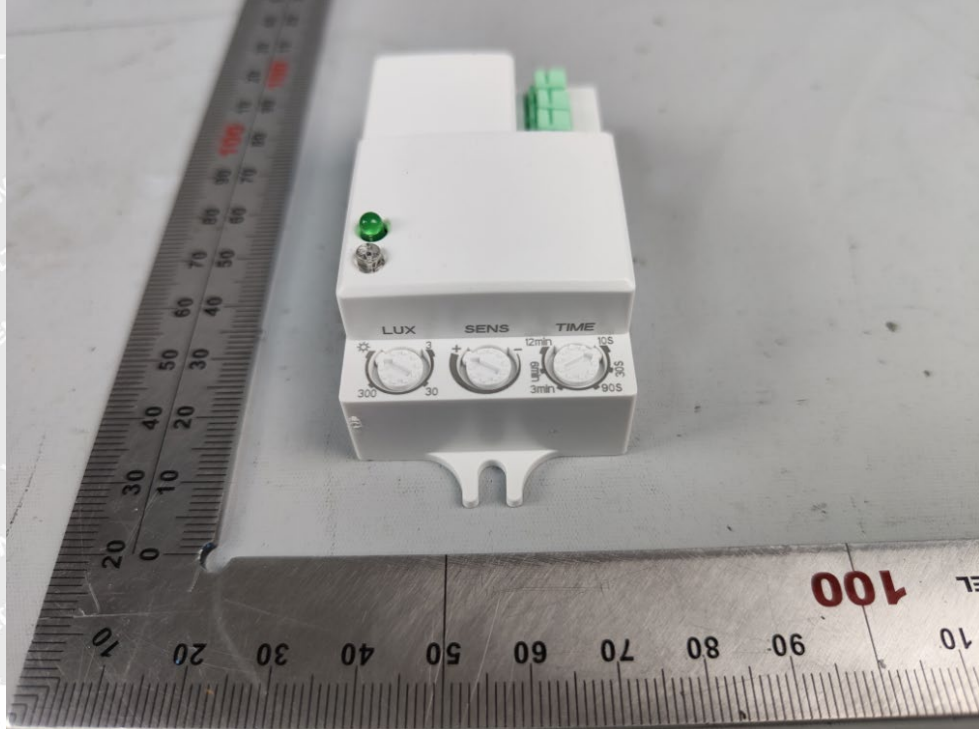


## Attachment 1: Photo Documentation

**Model:** ST701H

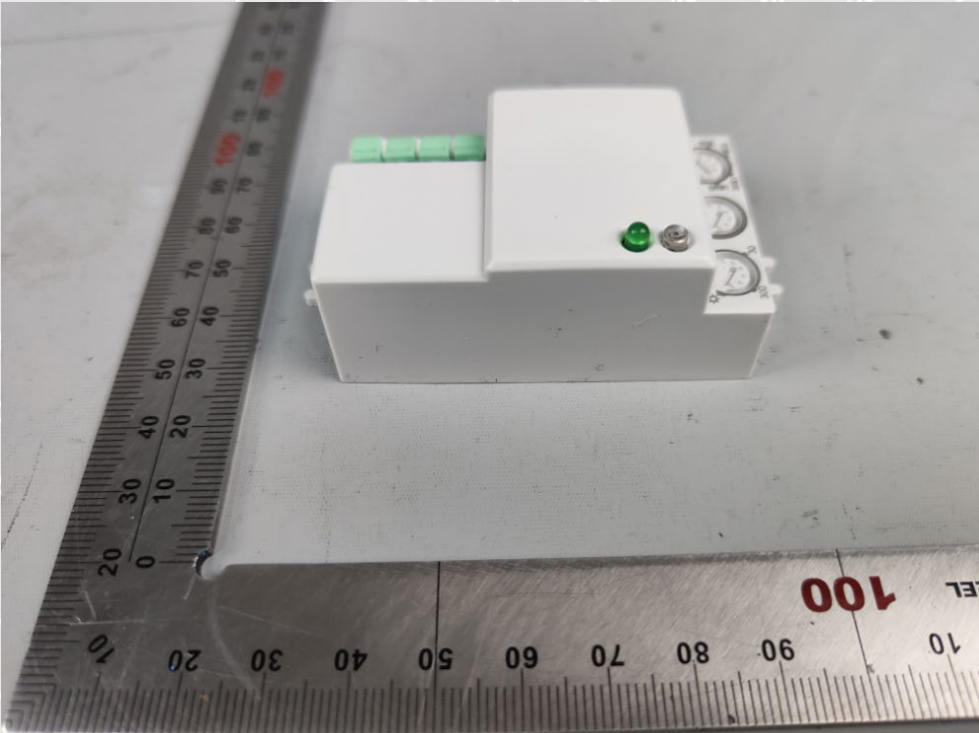
**Photo 1**

**Description:** Over view



**Photo 2**

**Description:** Over view





## Attachment 1: Photo Documentation

Photo 3

Description: Over view

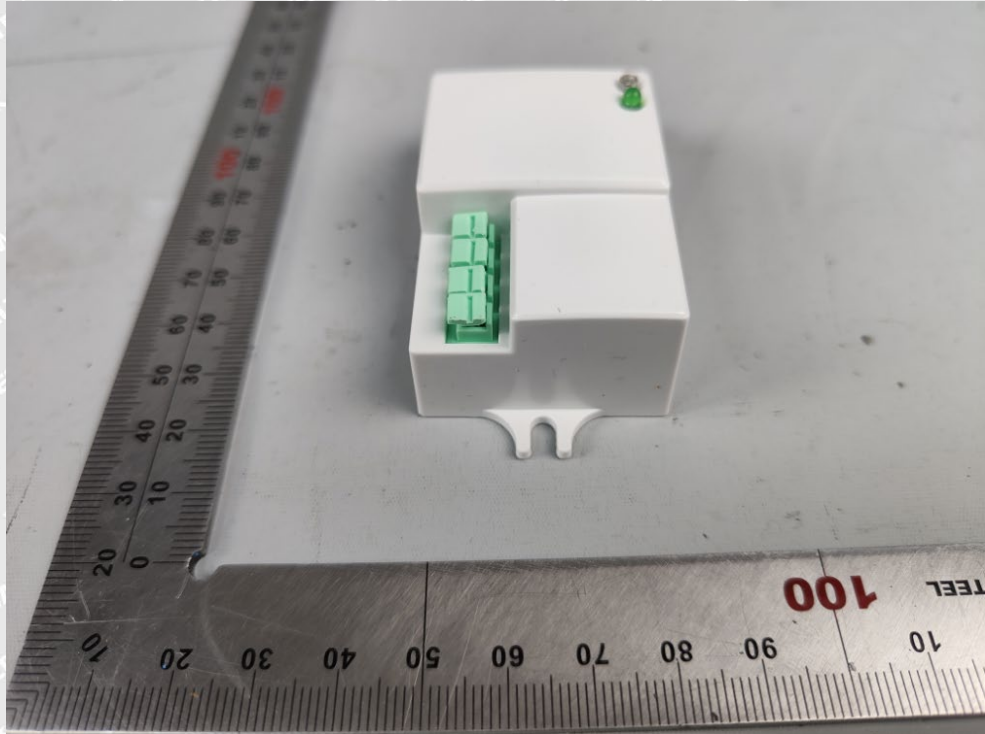
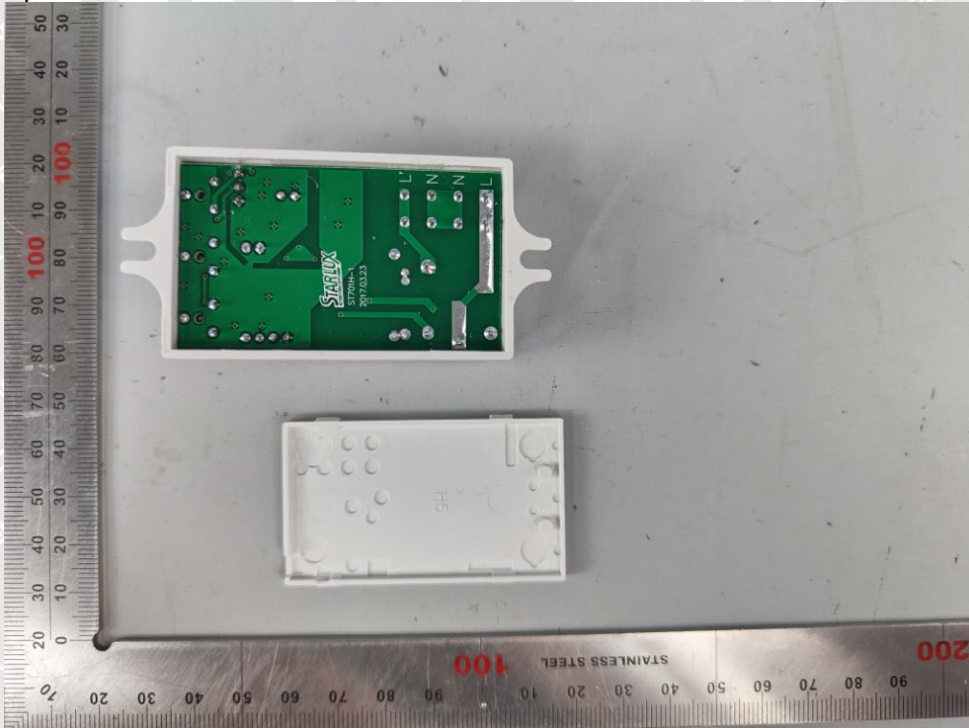


Photo 4

Description: open view







## Attachment 1: Photo Documentation

Photo 5

Description: PCB

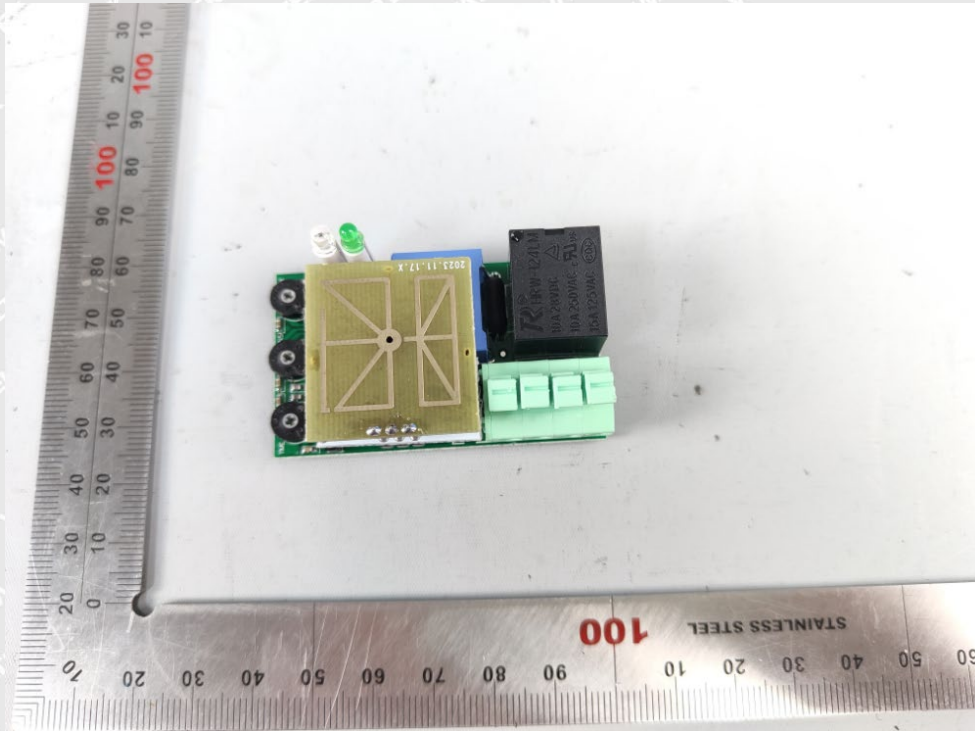
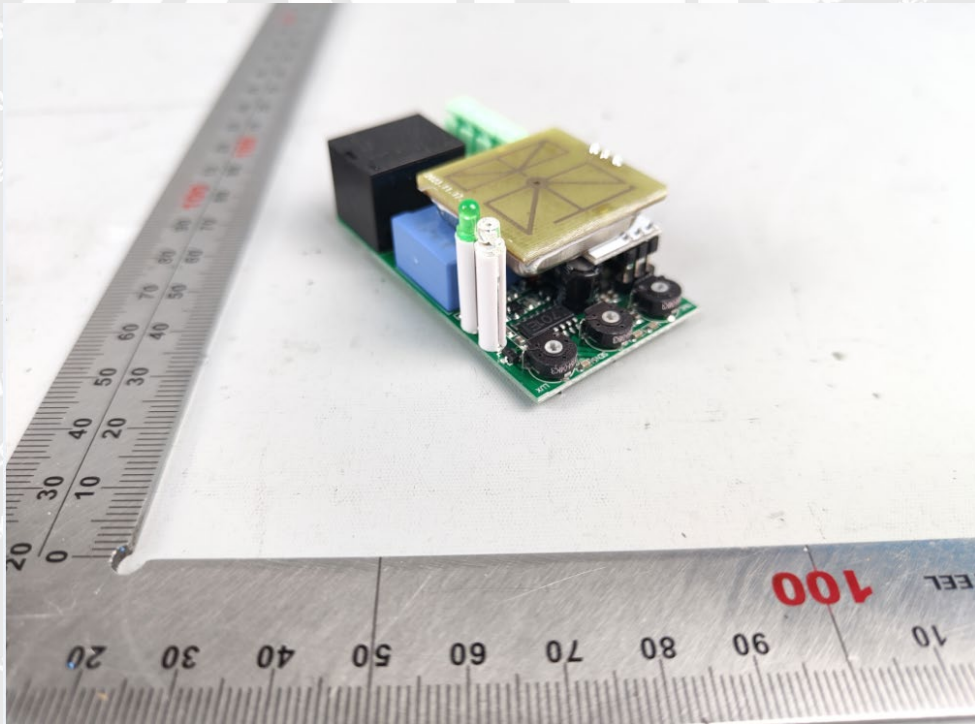


Photo 6

Description: PCB

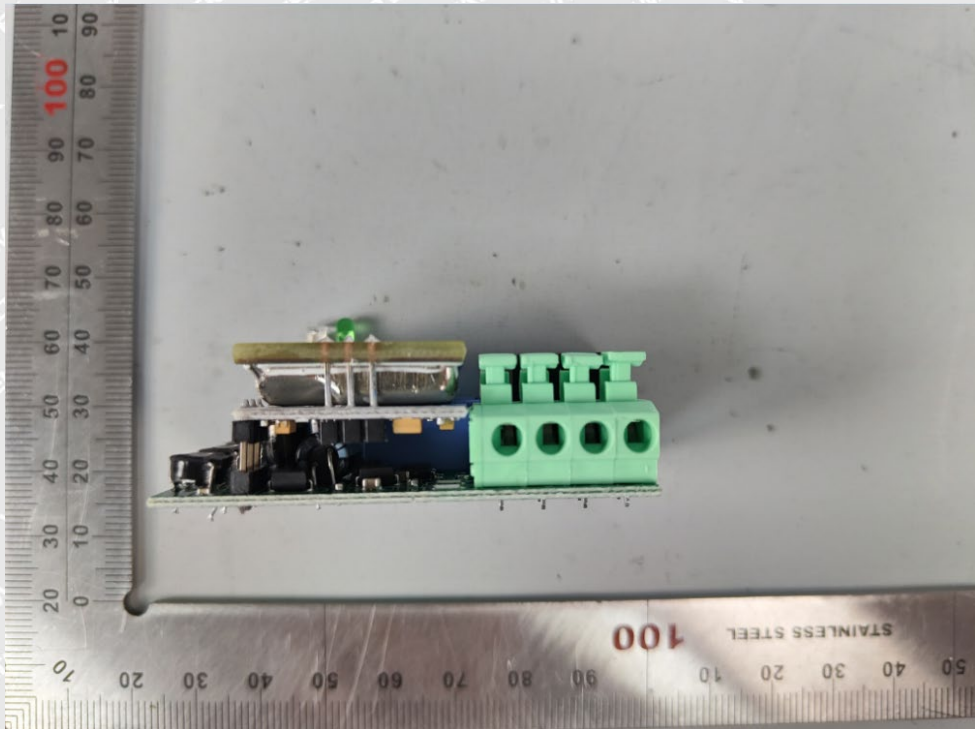




## Attachment 1: Photo Documentation

Photo 7

Description: PCB



=====End of Attachment 1=====