Test report no.: *Prüfbericht-Nr.:*	**CN22T0G5 001 part 1 of 2**	**Order No.:** *Auftragsnr.:*	**180246649**	**Page 1 of 80** *Seite 1 von 80*
Client reference no.: *Kunden-Referenz-Nr.:*	**N/A**	**Order date:** *Auftragsdatum:*	**2022-11-11**	
Client: *Auftraggeber:*	ZHEJIANG AMAN LIGHTING CO., LTD. No. 171 North Star-Bridge Road, Yuhang District, Hangzhou, 311100 Zhejiang P.R. China			
Test item: *Prüfgegenstand:*	Smart Plug			
Identification / Type no.: *Bezeichnung / Typ-Nr.:*	SPL-W-TY-EU-RY-C; SPL-W-TY-PM-EU-RY-C; SPL-W-TY-PM-EU-RY; SPL-W-TY-EU-RY; SPL-W-TY-PM-EU-RY-L; SPL-W-TY-EU-RY-L			
Order content: *Auftrags-Inhalt***:**	Type test			
Test specification *Prüfgrundlage:*	DIN VDE 0620-2-1: 2016+A1:2017 DIN VDE 0620-1: 2016+A1:2017 Clause 10.5 of DIN VDE 0620-1:2021 and DIN VDE 0620-2-1:2021			

Date of sample receipt: *Wareneingangsdatum:*	2022-10-11
Test sample no: *Prüfmuster-Nr.:*	A003232450
Testing period: *Prüfzeitraum:*	2023-10-10 - 2023-11-09
Place of testing: *Ort der Prüfung:*	TÜV Rheinland/CCIC (Ningbo) Co., Ltd.
Testing laboratory: *Prüflaboratorium:*	TÜV Rheinland/CCIC (Ningbo) Co., Ltd.
Test result*: *Prüfergebnis*:*	Pass

tested by: *geprüft von:*
Date: 2023-05-22 *Datum:*
Fan. Xu
Signed by: Fan Xu
Position / *Stellung*: Project Engineer

authorized by: *genehmigt von:*
Issue date: 2023-05-22 *Ausstellungsdatum:*
Jie Zheng
Signed by: Jie Zheng
Position / *Stellung*: Report Authorizer

Other:
Sonstiges: This report was created for the type test of Smart Plug.

Condition of the test item at delivery: *Zustand des Prüfgegenstandes bei Anlieferung:* Test item complete and undamaged / Prüfmuster vollständig und unbeschädigt

* Legend:	P(ass) = passed a.m. test specification(s)	F(ail) = failed a.m. test specification(s)	N/A = not applicable	N/T = not tested
* Legende:	P(ass) = entspricht o.g. Prüfgrundlage(n)	F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	N/A = nicht anwendbar	N/T = nicht getestet

V05

Remarks
Anmerkungen

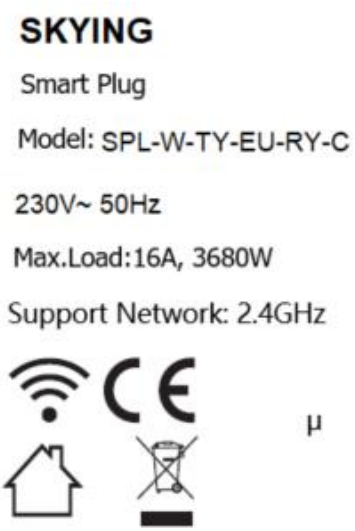
1	The equipment used during the specified testing period was calibrated according to our test laboratory calibration program. The equipment fulfils the requirements included in the relevant standards. The traceability of the test equipment used is ensured by compliance with the regulations of our management system. Detailed information regarding test conditions, equipment and measurement uncertainty is available in the test laboratory and could be provided on request. *Alle eingesetzten Prüfmittel waren zum angegebenen Prüfzeitraum gemäß eines festgelegten Kalibrierungsprogramms unseres Prüfhauses kalibriert. Sie entsprechen den in den Prüfprogrammen hinterlegten Anforderungen. Die Rückverfolgbarkeit der eingesetzten Prüfmittel ist durch die Einhaltung der Regelungen unseres Managementsystems gegeben.* *Detaillierte Informationen bezüglich Prüfkonditionen, Prüfequipment und Messunsicherheiten sind im Prüflabor vorhanden und können auf Wunsch bereitgestellt werden.*
2	As contractually agreed, this document has been signed digitally only. TUV Rheinland has not verified and unable to verify which legal or other pertaining requirements are applicable for this document. Such verification is within the responsibility of the user of this document. Upon request by its client, TUV Rheinland can confirm the validity of the digital signature by a separate document. Such request shall be addressed to our Sales department. An environmental fee for such additional service will be charged. *Wie vertraglich vereinbart, wurde dieses Dokument nur digital unterzeichnet. Der TÜV Rheinland hat nicht überprüft, welche rechtlichen oder sonstigen diesbezüglichen Anforderungen für dieses Dokument gelten. Diese Überprüfung liegt in der Verantwortung des Benutzers dieses Dokuments. Auf Verlangen des Kunden kann der TÜV Rheinland die Gültigkeit der digitalen Signatur durch ein gesondertes Dokument bestätigen. Diese Anfrage ist an unseren Vertrieb zu richten. Eine Umweltgebühr für einen solchen zusätzlichen Service wird erhoben.*
3	Test clauses with remark of * are subcontracted to qualified subcontractors and descripted under the respective test clause in the report. Deviations of testing specification(s) or customer requirements are listed in specific test clause in the report. *Prüfklausel mit der Note * wurden an qualifizierte Unterauftragnehmer vergeben und sind unter der jeweiligen Prüfklausel des Berichts beschrieben. Abweichungen von Prüfspezifikation(en) oder Kundenanforderungen sind in der jeweiligen Prüfklausel im Bericht aufgeführt.*
4	The decision rule for statements of conformity, based on numerical measurement results, in this test report is based on the “Zero Guard Band Rule” and “Simple Acceptance” in accordance with ILAC G8:2019 and IEC Guide 115:2021, unless otherwise specified in the applied standard mentioned on Page 1 of this report or requested by the customer. This means that measurement uncertainty is not taken in account and hence also not declared in the test report. For additional information to the resulting risk based of this decision rule please refer to ILAC G8:2019. *Die Entscheidungsregel für Konformitätserklärungen basierend auf numerischen Messergebnisen in diesem Prüfbericht basiert auf der "Null-Grenzwert-Regel" und der "Einfachen Akzeptanz" gemäß ILAC G8:2019 und IEC Guide 115:2021, es sei denn, in der auf Seite 1 dieses Berichts genannten angewandten Norm ist etwas anderes festgelegt oder vom Kunden gewünscht. Dies bedeutet, dass die Messunsicherheit nicht berücksichtigt wird und daher auch nicht im Prüfbericht angegeben wird. Zu weiteren Informationen bezueglich des Risikos durch diese Entscheidungsregel siehe ILAC G8:2019.*
5	

TEST REPORT
DIN VDE 0620-2-1
Plugs and socket-outlets for household and similar purposes
Part 2-1: General requirements on plugs and portable socket-outlets

Report Reference No.....:	CN22T0G5 001 part 1 of 2
Tested by (name + signature) .....:	See cover page
Approved by (name + signature) .....:	See cover page
Date of issue.....:	See cover page
Total number of pages .....:	See cover page
Testing Laboratory.....:	TÜV Rheinland / CCIC (Ningbo) Co., Ltd.
Address .....:	3F Building C13, R&D Park, No.32 , Lane 299 Guanghua Road, National Hi-Tech Zone, Ningbo, 315048, P. R. China
Applicant's name.....:	ZHEJIANG AMAN LIGHTING CO., LTD.
Address .....:	No. 171 North Star-Bridge Road, Yuhang District, Hangzhou, 311100 Zhejiang P.R. China
Test specification:	
Standard .....:	DIN VDE 0620-2-1: 2016+A1: 2017 in conjunction with DIN VDE 0620-1: 2016+A1: 2017
Test procedure .....:	Type test
Non-standard test method……..:	N/A
Test Report Form No.....:	DIN VDE 0620-2-1_2016 Edition 1.1
Test Report Form(s) Originator .....:	TÜV Rheinland
Master TRF.....:	Dated 2018-10
Test item description .....:	Smart Plug
Trade Mark .....:	**SKYING**
Manufacturer .....:	Same as applicant
Model/Type reference.....:	SPL-W-TY-EU-RY-C; SPL-W-TY-PM-EU-RY-C; SPL-W-TY-PM-EU-RY; SPL-W-TY-EU-RY; SPL-W-TY-PM-EU-RY-L; SPL-W-TY-EU-RY-L
Ratings .....:	16A 230V~, Max. 3680W

Summary of testing: All tests were passed	
Tests performed: Full test. This part is only for adaptor portion, it should be used in conjunction with CN22T0G5 001 part 2 of 2 for switch portion Appendix 1: Additional requirements according to DIN VDE 0620-1/-2-1: 2021 Clause 10.5. Appendix 2 :Photo documentation	**Testing location:** TÜV Rheinland / CCIC (Ningbo) Co., Ltd. 3F Building C13, R&D Park, No.32 , Lane 299 Guanghua Road, National Hi-Tech Zone, Ningbo, 315048, P. R. China

Copy of marking plate:



Remark: All models have the same marking plate except the model name.

Following information will added in the smallest package:

Warning:

Nicht hintereinander stecken

Nicht abgedeckt betreiben

Spannungsfrei nur bei gezogenem Stecker

Nicht hintereinander stecken

Factory: Hangzhou Sky-Lighting Co., Ltd.

Address: No.161 North Star-Bridge Road, Linping, Hangzhou, Zhejiang, 311100 China

Importer: xxxxxxx

Test item particulars .....:	Adaptor
Standard Sheet .....:	Socket part: DIN 49440-1
	Plug part: DIN 49441-R2
Rated current (A) / Rated voltage (V) .....:	16A/230V~
Degree of protection against access to hazardous parts and against harmful ingress of solid foreign objects .....:	IP2X / ~~IP4X / IP5X~~
Degree of protection against harmful ingress of water .....:	IPX0 / ~~IPX4 / IPX5~~
Provision for earthing .....:	~~without earthing contact~~ / with earthing contact
Method of connecting the cable .....:	~~rewirable / non-rewirable~~
Type of cable .....:	N/A
Nominal cross-sectional areas (mm^2) .....:	N/A
Type of terminals .....:	~~screw-type(flexible)~~
Type of connections .....:	soldered / welded / crimped / ~~riveted / other~~
Socket-outlets:	
Degree of protection against electric shock ..:	normal protection / ~~increased protection~~
Existence of enclosures .....:	~~unenclosed~~ / enclosed
Existence of shutters .....:	~~without shutters~~ / with shutters
Method of application / mounting of the socket-outlet .....:	portable type / ~~table-type (single/multiple) / appliance type~~
Method of installation .....:	N/A
Plugs:	
Class of equipment .....:	~~0~~ / I / ~~II~~
Possible test case verdicts:	
- test case does not apply to the test object.....:	N/A
- test object does meet the requirement .....:	P (Pass)
- test object does not meet the requirement .....:	F (Fail)
Testing .....:	
Date of receipt of test item .....:	See cover page
Date (s) of performance of tests .....:	See cover page

General remarks:

The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.
"(see Enclosure #)" refers to additional information appended to the report.
"(see appended table)" refers to a table appended to the report.

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

The decision rule for statements of conformity in this test report is based on the “Zero Guard Band Rule” and “Simple Acceptance” in accordance with ILAC G8:2019 and IEC Guide 115:2021, unless otherwise specified in the applied standard mentioned on Page 1 of this report or requested by the customer. This means that measurement uncertainty is not taken in account and hence also not declared in the test report.

General product information:

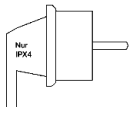
Smart plug,16A 230V~,50Hz, IP20,two poles with earthing contact, with shutter, with non-solid plug pins, output of socket-outlet controlled by single pole switch which can be controlled by button or WI-FI remote. All models of adaptor part are completely the same except the enclosure shape. SPL-W-TY-PM-EU-RY-C; SPL-W-TY-PM-EU-RY and SPL-W-TY-PM-EU-RY-L was designed with Power consumption statistics function, while other models without this function.

Critical components and material list

Part	Manufacturer	Type	Technical data	Standard	Approval
Enclosure and Shutter box	SABIC INNOVATIVE PLASTICS B V	PC1003R	PC V-2; Min.1,5mm thickness	DIN VDE 0620-1 DIN VDE 0620-2-1	Test with appliance
alternative	FORMOSA PLASTICS CORP	Yungsox 1080	PP	DIN VDE 0620-1 DIN VDE 0620-2-1	Test with appliance
Shutter	CHANG CHUN PLASTICS CO LTD	4130	PBT	DIN VDE 0620-1 DIN VDE 0620-2-1	Test with appliance
PCB	KINGBOARD LAMINATES HOLDINGS LTD	KB-6160C	V-0;130°C, 1,2mm thickness	EN 61058	Test with appliance
Alternative	GOLDENMAX INTERNATIONAL TECHNOLOGY (ZHUHAI) LTD	GDM-R1	V-0;130°C, 1,2mm thickness	EN 61058	Test with appliance
Relay	Ningbo Yinzhou Jie ying Electrical Parts Co., Ltd	JY32FNH-SH-DC3V-A	20A, 250V,T85	EN 61810-1	TUV
Internal wire	Cixi Haosheng Wire & Cable Co., Ltd	H07V-K	1,5mm^2	EN 50525-2-31	VDE
Alternative	Ningbo Ruichua Electronic Technology Co., Ltd	H05VV-F	1,5mm^2	EN 50525-2-11	VDE
Fusing resistor	Shenzhen GREAT Electronics Co., Ltd	RXF	10R;1W	EN 61058	Test with appliance
Thermal-link	ZHANGZHOU AUPO EECTRONICS CO.,LTD	A2-1A-F	1A, 115°C	DIN VDE 0620-1 DIN VDE 0620-2-1	Test with appliance
Alternative	XIAMEN SET ELECTRONICS CO.,LTD	F2	1A, 115°C	DIN VDE 0620-1 DIN VDE 0620-2-1	Test with appliance
Varistor	Hongzhi Enterprises Ltd	HEL7D471K	470V	IEC 61051-1 IEC 61051-2 IEC 61051-2-2	VDE

Alternative	Shantou High-New Technology Dev, Zone Songtian Enterprise Co., Ltd	07D471K	470V	IEC 61051-1 IEC 61051-2 IEC 61051-2-2	VDE
Alternative	Xiamen Set electronics Co., Ltd	SFV7D471K	470V	IEC 61051-1 IEC 61051-2 IEC 61051-2-2	TUV RHJ
Contacts for L/N	CIXI HANDE ELECTRIC APPLIANCE CO., LTD	H62	Copper content>58 %	DIN VDE 0620-1 DIN VDE 0620-2-1	Test with appliance
Contacts for PE	CIXI HANDE ELECTRIC APPLIANCE CO.,LTD	H62	Copper content>58 %	DIN VDE 0620-1 DIN VDE 0620-2-1	Test with appliance
Pins of plug	Cixi Yinsheng Electronic Components Factory	H62	Copper content>58 %	DIN VDE 0620-1 DIN VDE 0620-2-1	Test with appliance

DIN VDE 0620-2-1			
Clause	Requirement + Test	Result - Remark	Verdict

8	**MARKING**		P
	The legal requirements for the marking of products are to be considered. (ProdSG)		P
8.1	Plugs and portable socket outlets marked with:		—
	- rated current (A) .....:	16	P
	- rated voltage (V) .....:	230	P
	- symbol for nature of supply.....:	~	P
	- manufacturer's or responsible vendor's name or trade mark .....:	**SKYING**	P
	- type reference, that may be a catalogue number..:	See page 2	P
	- symbol for degree of protection (first digit) .....:	IP2X	N/A
	- symbol for degree of protection (second digit) .....:	IPX0	N/A
	- Rated value and type of replaceable fuse.....		N/A
	Plugs or socket-outlets, that is part of an equipment need not carry this marking if the equipment is marked with the rating, manufacturer and type.		N/A
8.2	Symbols used: as required in the standard		P
	Marking for the nature of supply placed next to the marking for rated current and rated voltage		P
8.3	Not apply		—
8.4	Plugs and portable socket-outlets: marking specified in 8.1, other than the type reference, easily discernible when assembled and wired.		P
	Plugs and portable socket-outlets for equipment of class II not marked with the symbol for class II construction		N/A
	Portable socket outlets with IP-Code IPX4 shall be marked with the following symbol .....:		N/A
8.5	Neutral terminals: N.....:		N/A
	Earthing terminals: [earth symbol 8.2] .....:		N/A
	Markings not placed on screws or other easily removable parts		N/A
	Terminals for conductors not forming part of the main function of the portable socket-outlet:		—
	- clearly identified unless their purpose is self evident, or		N/A

DIN VDE 0620-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	- indicated in a wiring diagram fixed to the accessory		N/A
	Identification of accessory terminals may be achieved by:		—
	- their marking with graphical symbols according to EN 60147 or colours and/or alphanumeric system, or		N/A
	- their physical dimension or relative location		N/A
	Leads of indicator lamps are not to be considered conductors for the purpose of this clause.		N/A
8.6	Not apply		—
8.7	Not apply		—
8.8	Marking shall be durable and if possible not smaller than 3 mm. Clearly readable without visual aids. Test: 15 s with water and 15 s with petroleum spirit.		P
8.9	Portable Multiple socket-outlets and adaptors must have the following warnings on the equipment or in the package (Text or pictograms):		P
	-For portable multiple outlets: - Do not connect after each other (Nicht hintereinander stecken) - Do not cover when in use. (Nicht abgedeckt betreiben)		P
	-For portable multiple outlets with functional switch, additionally: - To disconnect Voltage pull the plug. (Spannungsfrei nur bei gezogenem Stecker)		P
	For intermediate adaptors: - Do not connect after each other (Nicht hintereinander stecken)		P
	- Portable multiple outlets and extensions cords shall be provided with information about the intended environment		N/A
8.10	Units intended for installation shall be marked on the smallest closed selling unit with the note according to Appendix E		N/A
8.11	The installation instructions for the professionals, which are not presumed to be known to the professionals, are required to be added to the smallest sales unit.		N/A

DIN VDE 0620-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	The name and contact address of the manufacturer or, if not established in the European Economic Area, the name and contact address of the authorized representative or importer shall be indicated on the smallest sales unit.	Will be added before enter into EU market	P
9	**CHECKING OF DIMENSIONS**		P
9.1	Plugs and portable socket-outlets comply with the appropriate standard sheets:		P
	DIN49406(series),DIN49437, DIN49440-1, DIN49440-2, DIN49440-3, DIN49440-4, DIN49440-6, DIN49441(series), DIN49442, DIN 49443, DIN 49445, DIN49446, DIN 49447, DIN 49448, DIN 49464.	DIN 49440-1; DIN 49441-R2	P
	Insertion of plugs into fixed or portable socket-outlets ensured by their compliance with the relevant standard sheets		P
	Compliance checked by measurement and/or by means of gauges with manufacturing tolerances as shown in table 2, unless otherwise specified. The most unfavourable dimension of the standard sheets shall be used for the gauges.		P
	Plugs and portable socket outlets to the standard sheets in 9.1 shall be tested with the gauges L1 to L9.		P
	Portable socket-outlets are subjected, before the above checking, to 10 insertions and withdrawals of a plug complying with the corresponding standard sheet having the maximum pin dimensions.		P
9.2	It shall not be possible to engage a plug with:		—
	- a socket-outlet or portable socket-outlet having a higher voltage rating or a lower current rating;		P
	- a socket-outlet or portable socket-outlet with a different number of live poles is permissible for socket-outlets specially designed for engagement with plugs of a lower number of poles provided that no dangerous situation can arise;		P
	- a socket-outlet or portable socket-outlet with earthing contact (plug for class 0 equipment).		P
	Engagement of a plug for class 0 or class I equipment with a portable socket-outlet designed to accept plugs for class II equipment, not possible		P

DIN VDE 0620-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Test: inspection or testing with gauges according to the dimensions in the standard sheets.		P
	Impossibility of insertion checked by applying the gauge L11, for 1 min, with a force of:		—
	- 150 N (rated current ≤ 16A);		P
	- 250 N (rated current > 16A)		N/A
	Accessories with elastomeric or thermoplastic material: test carried out at 35 ± 2 °C		P
9.3	Plugs or portable socket outlets, building a part of a product (for example timer, lawn mower mounted plugs, direct plug-in power supplies and so on) shall comply with the dimensions of the standard sheets.		N/A
	Additional parts that affect the dimensions of the standard sheets (e.g. flat stick in disk) are not allowed.		N/A
10	**PROTECTION AGAINST ELECTRIC SHOCK**		P
10.1	Portable socket-outlets: live parts not accessible		P
	Live parts of plugs: not accessible when the plug is in partial or complete engagement with a portable socket-outlet		P
	Test with standard test finger shown in figure 2 of DIN 61032(VDE0470-2).		P
	Portable socket-outlets with elastomeric or thermoplastic material: additional test carried out at 35 °C ± 2 °C with a straight unjointed test finger (75 N for 1 min)		P
	During the test: portable socket-outlets not deform and no live parts accessible		P
	Plugs and portable socket-outlets pressed with a force of 150 N for 5 min as shown in figure 8: specimens not show deformation 15 min after.		P
10.2	Accessible parts (with exception of small screws and the like for fixing bases and covers or cover plates and grounding): made of insulating material		P
	Cover or cover plates and accessible part of plugs and table-outlets: made of metal if the requirements of 10.2.1 or 10.2.2 are fulfilled		N/A
10.2.1	Metal covers or cover plates protected by supplementary insulation made by insulating linings or insulating barriers		N/A

DIN VDE 0620-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Insulating linings or insulating barriers cannot be removed without being permanently damaged		N/A
	Insulating linings or insulating barriers cannot be replaced in an incorrect position and, if they are omitted, accessories are rendered inoperable or manifestly incomplete		N/A
	There is no risk of accidental contact between live parts and metal covers or cover plates		N/A
	For the case of single pole insertion the requirement in 10.3 applies.		N/A
10.2.2	Metal covers or cover plates automatically connected, through a low-resistance connection, to the earth during fixing.		N/A
	The Creepage distances and the clearances between the live pins of a plug when fully inserted and the earthed metal cover of a portable socket-outlet shall comply with item 2 and 7 of table 23 respectively; in addition for single pole insertion the requirements of 10.3 apply.		N/A
	Compliance shall be checked by the test of 11.5		N/A
10.3	Connection between a pin of a plug and a live socket-contact of a portable socket-outlet not possible while any other pin is accessible.		P
	Checked by manual test and by means of gauges L10 & L12		P
	Accessories with elastomeric or thermoplastic material: test carried out at 35 °C ± 2 °C		P
	Portable socket-outlets with enclosure or bodies of rubber or polyvinyl chloride: test carried out with gauge 10 with a force of 75 N for 1 min		N/A
10.4	External parts of plugs and portable socket-outlets made of insulating material. Exception is plugs and table socket-outlets		P
	Overall dimensions of rings around pins not exceed 8 mm concentric with respect to the pin		N/A
10.5	Shuttered portable socket-outlets: live parts not accessible, without a plug in engagement, with the gauge 13.		P
	Live contacts automatically screened when the plug is withdrawn		P

DIN VDE 0620-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Means cannot easily be operated by anything other than a plug and not depend upon parts which are liable to be lost		P
	Gauge 13 applied to the entry holes corresponding to live contacts with a force up to 1 N in three straight movements shall not touch live parts; portable socket-outlets with a plug partially inserted are checked with the test finger.		P
	Accessories with elastomeric or thermoplastic material: test carried out at 35 °C ± 2 °C		P
	Shutters shall not interfere the insertion of a plug in an unacceptable way. The opening force of the shutter shall not exceed 30N. Testing is done with the gauges of 19a or 19b. The gauge is to arrange movable		P
10.6	Earthing contacts of a portable socket-outlet designed that they cannot be deformed by the insertion of a plug		P
10.6.1	The portable socket-outlet is placed with the outlet contacts in vertical position. Gauge 14 inserted into the portable socket-outlet with a force of 150 N for 1 min. This test is conducted on new samples		—
	After this test: portable socket-outlet still comply with the requirements of clause 9		P
10.6.2	Side PE contacts are loaded with a torque of 100Ncm) 1 min. With the device figure 43. After this tests probe 4 must be possible to insert. This test is conducted on new samples		P
10.7	Portable socket-outlet with increased protection live parts not accessible		N/A
	Gauge 13 applied with a force of 1 N on all accessible surfaces shall not touch live parts		N/A
	Accessories with elastomeric or thermoplastic material: test carried out at 35 °C ± 2 °C		N/A
11	**PROVISION FOR EARTHING**		P
11.1	Earth connection made before the current-carrying contacts of the plug become live		P
	Current-carrying pins shall separate before the earth connection is broken		P
11.2	Earthing terminals of rewirable plugs and portable socket-outlets comply with clause 12		N/A

DIN VDE 0620-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Earthing terminals of the same size as the corresponding terminals for the supply conductors		N/A
	Earthing terminals of rewirable plugs and portable socket-outlets: internal		N/A
	Parts of earthing circuit in one piece or reliably connected by riveting, welding, or the like		P
11.3	Not apply		—
11.4	Not apply		—
11.5	Connection between earthing terminal and accessible metal parts: of low resistance		N/A
	Test:		—
	Test current equal to 1,5 times the rated current or 25 A a.c.(A) ..... :	A	—
	Resistance not exceed 0,05 Ω (Ω) ..... :	Ω	—
12	**TERMINALS AND TERMINATIONS**		P
12.1	General		—
12.1.1	Rewirable plugs and portable socket-outlets provided with terminals with screw clamping ..... :		N/A
	Pre-soldered flexible conductors used: pre-soldered area outside the squeezed area of screw-type terminals		N/A
	Clamping means of terminals: not serve to fix any other components.		N/A
12.1.2	Non-rewirable plug and portable socket-outlet provided with soldered, welded, crimped or equally effective permanent connections ..... :	Solder, crimped, riveted	P
	Screwed or snap-on connections not used		P
	Connections made by crimping a pre-soldered flexible conductor not permitted		P
12.1.3	Compliance is checked by inspection and the tests in 12.2 or 12.3 as applicable.		N/A
12.2	Terminals with screw clamping for external copper conductors		—
12.2.1	Plug and portable socket-outlet provided with terminals which allows the proper connection of copper conductors as shows in table 3.		N/A
	The space for conductors must at least be as fig. 2,3,4 or 5.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Rated current (A); Type of accessories ..... :		—
	Smallest / largest cross-sectional area (mm^2) ..... :		—
	Diameter of the largest conductor (mm) ..... :		—
	Figure of terminal ..... :		—
	Minimum diameter D (minimum dimensions) of conductor space: required (mm); measured (mm). :		N/A
12.2.2	Terminals allow the conductor to be connected without special preparation		N/A
12.2.3	Terminals have adequate mechanical strength		N/A
	Screws and nut for clamping the conductors have metric ISO thread or a thread comparable in pitch and strength		N/A
	Screws not of soft metal or metals that yield such as zinc or aluminium		N/A
12.2.4	Terminals resistant to corrosion		N/A
	Terminals with a body of copper or copper alloy according to 26.5 are considered to comply with this requirement.		N/A
12.2.5	Screw-type terminals clamp the conductor(s) without undue damage		N/A
	Test with apparatus shown in figure 9:		—
	- number of conductors ..... :		—
	- smallest cross-sectional area (mm^2) (table 3); diameter of bushing hole (mm); height H (mm); mass (kg) ..... :		—
	- largest cross-sectional area (mm^2) (table 3); diameter of bushing hole (mm); mass (kg) ..... :		—
	The length of the test wire must be 75 mm longer than the height (H) given in table 9. H (mm)		—
	- nominal diameter of thread (mm); torque according to table 6 (Nm) ..... :		—
	During the test: conductor not slip out, no break near clamping unit and no damage		N/A
	The test shall be repeated with rigid solid conductors if they exist in the relevant standard, if the first test has been made with rigid stranded conductors.		N/A
12.2.6	Terminals clamp the conductor reliably between metal surfaces		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Pull test (1 min):		N/A
	- number of conductors ..... :		—
	- smallest cross-sectional area (mm²) (table 3); pull (N) ..... :		—
	- largest cross-sectional area (mm²) (table 3); pull (N) ..... :		—
	- torque (Nm) (2/3 table 6) ..... :		—
	During the test: conductor not move noticeably		N/A
12.2.7	Terminals designed or placed that the conductor cannot slip out while the clamping screws or nuts are tightened		N/A
	- largest cross-sectional area (mm²) (table 3) ..... :		—
	- number of wires and nominal diameter of wires (table 5):		—
	plugs and portable socket-outlets: flexible conductors ..... :		—
	- terminals intended for looping-in 2 or 3 conductors: permissible number of conductors..... :		—
	- torque (Nm) (2/3 table 6) ..... :		—
	After the test: no wire of the conductor escaped outside the clamping unit		N/A
12.2.8	Terminals not work loose from their fixing to accessories		N/A
	Torque test:		—
	- flexible copper conductor of the largest cross-sectional area (mm²) (table 3) ..... :		—
	- torque (Nm) (table 6 or appropriate figures 2,3,4) :		—
	Screws and nuts tightened and loosened 5 times. During the test: terminals not work loose and show no damage		N/A
	Where a screw has a hexagonal head with a slot, only the test with the screwdriver is made with the torque values given in column 2.		N/A
12.2.9	Clamping screws or nuts of earthing terminals: adequately locked against accidental loosening, not possible to loosen them without the aid of a tool		N/A
12.2.10	Earthing terminals: no risk of corrosion		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Body of brass, according 26.5 or other metal no less resistant to corrosion		N/A
	If the body is a part of a frame or enclosure of aluminium alloy, precautions shall be taken to avoid the risk of corrosion		N/A
12.2.11	Pillar terminals: distance *g* no less than the value specified in figure 2: required (mm); measured (mm) ..... :	Required: mm; Measured: mm	N/A
	Mantle terminals: distance *g* no less than the value specified in figure 5: required (mm); measured (mm) ..... :		N/A
12.3	Not Apply		N/A
12.4	Crimp connections of non-rewirable plugs and portable socket-outlets shall have sufficient electrical and mechanical properties. Photo documentation from 3 sides shall be made from in total 3 contact points, consisting of side view, top view and perspectively view. The manufacturer has to determine and to document the values of crimping height, withdrawal force or voltage drop (lower and upper limit), these values are the basis of the ongoing production control.		N/A
13	**CONSTRUCTION OF SOCKET-OUTLETS**		P
	The Part 1 of this standard is changed as follows:		—
	The tests described in this clause, if applicable, are also performed on the plugs and portable socket-outlet (see clauses 14.16 & 14.25)		—
13.5	Socket-outlets designed that full engagement of associated plugs is not prevented by any projection from their engagement face		P
	Gap between the engagement face of the socket-outlet and the plug: not exceed 1 mm		P
13.22	Membranes (grommets) in inlet openings: reliably fixed and not displaced by the mechanical and thermal stresses occurring in normal use		N/A
	Test on membranes subjected to the ageing treatment specified in 16.1 and assembled in the accessories		—
	Accessories placed at 40 ± 2°C for 2 h. Force of 30 N applied for 5 s by test finger (fig.7 DIN EN 61032). During the test: no deformation		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Membranes likely to be subjected to an axial pull: axial pull of 30 N applied for 5 s. During the test: membranes not come out		N/A
	After the test: no harmful deformation, cracks or similar damage		N/A
	Test repeated with membranes not subjected to any treatment		N/A
13.23	Membranes in inlet openings: introduction of the cables into the accessory permitted when the ambient temperature is low		N/A
	Test on membranes not subjected to the ageing treatment specified in 16.1 and assembled in the accessories		—
	Accessories kept at -15 ±2°C for 2 h: possibility to introduce cables of the largest diameter through membranes		N/A
	After the test: no harmful deformation, cracks or similar damage		N/A
14	**CONSTRUCTION OF PLUGS AND PORTABLE SOCKET-OTLETS**		P
14.1	Non-rewirable plug or non-rewirable portable socket-outlet:		P
	flexible cable cannot be separated from the plug and portable socket-outlet without making it permanently useless		N/A
	plug and portable socket-outlet cannot be opened by hand or by using a general purpose tool, for example a screwdriver used as such		P
14.2	Pins of plugs and portable socket-outlets: adequate mechanical strength		P
	Test for pins not solid (made after clause 21): force of 100 N exerted on the pin for 1 min by means of a steel rod Ø 4,8 mm		—
	During the application of the force: reduction of the dimension of the pin not exceed 0,15 mm	Max. 0,03 mm	P
	After removal of the rod: dimensions of the pin not changed by more than 0,06 mm	Max. 0,01 mm	P
14.3	Pins of plugs:		—
	- locked against rotation		P
	- not removable without dismantling the plug		P
	- adequately fixed in the body of the plug when the plug is wired and assembled as in normal use		P

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Clause	Requirement + Test	Result - Remark	Verdict
	Earthing contacts and neutral pins of plugs: not possible to insert in an incorrect position		P
14.4	Earthing contacts and neutral contacts of portable socket-outlets :		—
	- locked against rotation		P
	- removable only with the aid of a tool, after dismantling the socket-outlet		P
14.5	Socket-contact assemblies: sufficient resiliency		P
	Parts of socket-contact assemblies, which with an inserted plug will be in contact with the pin and complete the circuit must be of metal. And		P
	-shall ensure metallic opposing contacts at least on two sides of each pin.		P
	These requirements also apply to socket-outlets where the contact pressure relies on insulating material		N/A
	Insulating material where the contact pressure relies on the insulating material shall have such a charateristic as to ensure a safe and permanent contact in any condition of normal use with regard to shrinking, ageing and abrasion		N/A
	The contact pressure of the contact tube shall not depend on soldered connection only.		P
14.6	Pins and portable socket-contacts: resistant to corrosion and abrasion		P
	Resistant to abrasion according clauses 20 and 21		P
	Resistant to corrosion by inspection and test according clause 26.5		P
14.7	Enclosures of rewirable plugs and portable socket-outlets: completely enclose terminals and ends of flexible cable.		N/A
	Construction of rewirable plugs and portable socket-outlets:		—
	- conductors can be properly connected		N/A
	- cores not pressed against each other		N/A
	- cores of live conductor not in contact with accessible metal parts		N/A
	- core of earthing conductor not in contact with live parts		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
14.8	Rewirable plugs and portable socket-outlets: terminal screws or nuts cannot become loose and fall out of position and establish an electrical connection between live parts and earthing terminal or metal parts		N/A
14.9	Rewirable plugs and portable socket-outlets with earthing contact: ample space for slack of earthing (test)		N/A
	Non-rewirable non-moulded-on plugs and portable socket-outlets with earthing contact: current-carrying conductors stressed before the earthing conductor if the flexible cable slips in its anchorage		N/A
14.10	Terminals of rewirable plugs and portable socket-outlets and terminations of non-rewirable accessories: located and shielded that loose wires not present a risk of electric shock		P
14.10.1	Rewirable plugs and portable socket-outlets: test with 6 mm free wire		—
	free wire of a conductor connected to a live terminal not touch any accessible metal part or able to emerge from the enclosure		N/A
	free wire of a conductor connected to an earthing terminal not touch a live part		N/A
14.10.2	Non-rewirable, non-moulded-on plugs and portable socket-outlets: test with a free wire of length equivalent to the maximum designed stripping length declared by the manufacturer plus 2 mm		—
	free wire of a conductor connected to a live termination not touch any accessible metal part or reduce creepage and clearance below 1,5 mm to the external surface		P
	free wire of a conductor connected to an earth termination not touch any live part		P
14.10.3	Non-rewirable, moulded-on plugs and portable socket-outlets:		—
	Verification of means to prevent stray wires reducing the minimum distance through insulation to external accessible surface below 1,5 mm		N/A
14.11	Rewirable plugs and rewirable portable socket-outlets:		—
	- clear how relief from strain and prevention of twisting is intended to be effected		N/A
	- cord anchorage, or at least part of it, integral with or permanently fixed to one of the component parts of the plug or portable socket-outlet		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- makeshift methods not used		N/A
	- cord anchorage suitable for the different types of flexible cable which may be connected; screws, if any: not serve to fix any other component		N/A
	- cord anchorages: of insulating material or provided with an insulating lining fixed to the metal parts		N/A
	- metal parts of cord anchorages, including clamping screws: insulated from the earthing circuit		N/A
14.12	Insulating parts which keep live parts in position: reliably fixed together; not possible to dismantle the accessory without the aid of a tool		P
	Checked according to 24.14.		N/A
14.13	Covers of portable socket-outlets: bushings for entry holes for the pins not removable from the outside or detachable inadvertently from the inside		N/A
14.14	Screws intended to allow access to interior of the accessory: captive		N/A
14.15	Engagement face of plugs: no projections		P
14.16	Engagement face of portable socket-outlets: no projection		P
	Checked by the test of clause 13.5		P
14.17	Plugs and portable socket-outlets other than IP20: provided with gland(s) or the like		N/A
	Plugs other than IP20: adequately enclosed		N/A
	Portable socket-outlets other than ordinary: adequately enclosed without a plug in engagement		N/A
	Lid springs (if any): of corrosion resistant material (bronze or stainless steel)		N/A
14.18	Portable Socket outlets with means for mounting on a wall or other surfaces must be so constructed that the means for mounting does not permit access to live parts and so that no fault during testing expose live parts.		N/A
	Portable Socket-outlets with means for permanent mounting shall be tested to 28.1.1 (as stationary outlet) and to 24.1		N/A
	No free openings between space intended for suspension means fixed to the wall and live parts		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
14.19	Combinations of plugs and portable socket-outlets with circuit-breakers or other protective devices comply with relevant standards, if any .....:		N/A
14.20	Movable accessories not integral part of lampholders.		P
	Adaptors without interposed auxiliaries (Switches, regulators, timers etc.) shall comply with DIN 49437.		N/A
	Multiple outlets with earthing contact and with stiffly mounted plug are not allowed.		N/A
14.21	- Plugs must be non-rewirable if exclusively for class II		N/A
	- Extension cords must have PE.		N/A
	- Class II Plugs incorporated in a cord set shall be provided with a connector for equipment of class II.		N/A
14.22	Components (switches and fuses) incorporated in plugs and portable socket-outlets: comply with the relevant standard		P
14.23	Plug-in equipment: not cause overheating of the pins or impose undue strain		N/A
	Plugs with rating above 16 A and 250 V: not integral part of other equipment		N/A
	Tests for two-pole plugs, with or without earthing contact, with rating up to and including 16 A and 250 V (plug of equipment inserted into a fixed socket-outlet complying with this standard):		—
14.23.1	Socket-outlet connected to a supply voltage equal to 1,1 times the highest rated voltage of the equipment (V) .....:		N/A
	Temperature rise of the pins after 1 h not exceed 45 K (K) .....:		N/A
14.23.2	Additional torque applied to the socket-outlet to maintain the engagement face in the vertical plane not exceed 0,25 Nm (Nm) .....:		N/A
14.24	Plugs: can easily withdrawn by hand from the relevant socket-outlet		P
	Gripping surfaces: so designed that the plug can be withdrawn without pull on the flexible cable and comply with one of:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	-The plug has a gripping surface length of at least 55 [mm] in axial direction (cable and cable protection is not counted) or		N/A
	-The plug has a grove that permit a 12±0.1 [mm] ball to enter 2 [mm] from each side or 4 [mm] from one side. or		N/A
	-The plug has a special device for pulling it out, e.g. a hook or ring		N/A
14.25	Membranes in inlet openings: meet the requirements of 13.22 and 13.23		N/A
14.26	Adaptors shall comply with DIN 49440 and DIN 49441		P
	Adaptors must be so constructed and the connection of the cord so manufactured that the efficacy of the protective measures is assured.		N/A
	One constructive unit may only accommodate one plug and one socket outlet.		P
	Cords connected to adapters shall be at least 1.40 [m] long.		N/A
	Adaptors shall not impose undue strain on the socket outlet. (0.25 [Nm])		P
14.27	The length of the cord for portable socket-outlets shall be at least 1.40 [m]. Length is measured between outsides, if any, of entry bushings for cords.		N/A
	For cords in spiral form the length is measured when stretched under own weight.		N/A
14.28	Portable socket-outlets with self-closing lids for securing the protection degree higher or equal to IPX4 shall be constructed that the correct functioning of the self-closing lid is ensured during intended use. Compliance on portable socket-outlet with self-closing lid is checked by inspection and test according to 24.20.		N/A
	In case of non-self-closing lids, the lid shall be fixed sufficiently to the portable socket-outlet. Compliance on portable socket-outlet with non-self-closing lid is checked by inspection and test according to 24.21.		N/A

DIN VDE 0620-2-1			
Clause	Requirement + Test	Result - Remark	Verdict

15	**INTERLOCKED PORTABLE SOCKET-OUTLETS**		N/A
	This clause of Part 1 is replaced by:		—
	Portable socket-outlet interlocked with a switch:		—
	Plug cannot be inserted into or completely withdrawn from portable socket-outlet while portable socket-contacts are live		N/A
	Socket-contacts of portable socket-outlet cannot be made live until a plug is almost completely in engagement		N/A

16	**RESISTANCE TO AGEING, PROTECTION PROVIDED BY ENCLOSURES, AND RESISTANCE TO HUMIDITY**		P
16.1	Resistance to ageing		—
	Plugs and portable socket-outlets shall be resistant to ageing		P
	Plugs and portable sockets with an IP code higher than IP X0 are tested after being mounted and connected according to 16.2		N/A
	Plugs and portable socket-outlets subjected to a test in a heating cabinet at 70 °C ± 2 °C for seven days (168 h)		P
	After the tests (96 h at 45-55%RH), samples shall show:		—
	- no crack visible with normal or corrected vision without additional magnification		P
	- no sticky or greasy material		P
	- no trace of cloth (forefinger pressed with 5 N)		P
	- no damage		P
16.2	Protection by enclosure		P
	Enclosure of plugs and portable socket-outlets shall provide a degree of protection against harmful ingress of solids and water in accordance with the IP classification.		P
	Plugs and portable socket-outlets with glands or membranes are fitted with a cord according to 12.2.1. Glands are tightened with a torque 2/3 of the torque for the test in Clause 24.6.		N/A
	Mounting screws for housings are tightened with 2/3 of the torque in table 6 of 12.2.8.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Parts that can be removed without tools are removed.		N/A
	Plugs and portable socket-outlets tested on a plain, horizontal surface in a position as in normal use and fitted with flexible cables according to table 17 having the largest and smallest cross-sectional area given in table 3:		N/A
	- largest cross-sectional area (mm^2); type of cable (table 17) .....:		—
	- smallest cross-sectional area (mm^2); type of cable (table 17) .....:		—
	Mounting screws tightened with a torque equal to 2/3 of the torque given in table 6 (Nm) .....:		—
	Glands tightened with a torque equal to 2/3 of the torque applied during the test of 24.6 (Nm) .....:		—
	Parts that can be removed without tools are removed.		N/A
	Portable socket outlets are tested with and without plug (or Gauge DIN 49440-4) in engagement.		N/A
	Plugs are tested engaged with an outlet of the same system and with the same degree of protection.		N/A
	High voltage test according to clause 17.2 immediately after the IP test.		N/A
16.2.1	Protection against access to hazardous parts and ingress of solids.		P
16.2.1.1	Protection against contact with hazardous parts		P
	Appropriate test performed as specified in EN 60529 (VDE 0470-1) (see also clause 10)		P
16.2.1.2	Protection against ingress of solids.		P
	Appropriate test performed as specified EN 60529 (VDE 0470-1)		P
	Test on plugs and portable socket-outlets with IP5X (considered to be of category 2): dust not penetrated in a quantity to interfere with satisfactory operation or to impair safety.		N/A
	Drain holes remain closed.		N/A
16.2.2	Protection against ingress of water		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	The enclosure of plugs and portable sockets shall provide protections against ingress of water according to their IP classification (test to EN 60529).		N/A
	Directly after this test the High voltage test 17.2 must be passed. No water may penetrate in between the insulation and the strands.		N/A
16.3	Resistance to humidity		—
	Plugs and portable socket-outlets proof against humidity which may occur in normal use		P
	Compliance checked by a humidity treatment carried out in a humidity cabinet containing air with relative humidity maintained between 91 % and 95 %	95%	P
	Parts that can be removed without a tool are removed.		N/A
	Specimens kept in the cabinet for:		—
	- two days (48 h) for IPX0 accessories		P
	- seven days (168 h) for accessories higher than IP X0		N/A
	After this treatment the specimens show no damage		P
17	**INSULATION RESISTANCE AND ELECTRIC STRENGTH**		—
17.1.1	For portable socket-outlets: insulation resistance (500 V d.c. after 1 min application):		—
	a) between all poles connected together and the body, with a plug in engagement ≥ 5 MΩ .....:	>500 MΩ	P
	b) between each pole in turn and all others connected to the body, with a plug in engagement ≥ 5 MΩ .....:	>500 MΩ	P
	c) between any metal enclosures and metal foil in contact with the inner surface of its insulating linings, if any ≥ 5 MΩ .....:		N/A
	d) between any metal part of the cord anchorage, including clamping screws, and earthing terminal or earthing contact, if any, of portable socket-outlets ≥ 5 MΩ .....:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	e) between any metal part of the cord anchorage of portable socket-outlets and a metal rod of the maximum diameter of the flexible cable inserted in its place (see table 17) ≥ 5 MΩ .....:		N/A
17.1.2	For plugs: insulation resistance (500 V d.c. after 1 min application):		—
	a) between all poles connected together and the body ≥ 5 MΩ .....:	>500 MΩ	P
	b) between each pole in turn and all others connected to the body ≥ 5 MΩ .....:	>500 MΩ	P
	c) between any metal part of the cord anchorage, including clamping screws, and earthing terminal or earthing contact, if any ≥ 5 MΩ .....:	MΩ	N/A
	d) between any metal part of the cord anchorage and a metal rod of the maximum diameter of the flexible cable inserted in its place ≥ 5 MΩ .....:	MΩ	N/A
17.2	Portable socket-outlets: electric strength, test voltage (a.c.,full value for 1 min):		—
	a) test voltage (V) .....:	~~1250 V~~ / 2000 V	P
	b) test voltage (V) .....:	~~1250 V~~ / 2000 V	P
	c) test voltage (V) .....:	1250 V / 2000 V	N/A
	d) test voltage (V) .....:	1250 V / 2000 V	N/A
	e) test voltage (V) .....:	1250 V / 2000 V	N/A
	Plugs: electric strength, test voltage (a.c., full value for 1 min):		—
	a) test voltage (V) .....:	~~1250 V~~ / 2000 V	P
	b) test voltage (V) .....:	~~1250 V~~ / 2000 V	P
	c) test voltage (V) .....:	1250 V / 2000 V	N/A
	d) test voltage (V) .....:	1250 V / 2000 V	N/A
	During the test no flashover or breakdown		P
18	**OPERATION OF EARTHING CONTACTS**		P
18.1	Earthing contacts provide adequate contact pressure and not deteriorate in normal use. The contact pressure of the earthing side-contact of portable socket-outlets complying with DIN 49440 and DIN 49442 is tested with suitable test equipment. The equipment in figure 14 is an example of such equipment.		P

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Clause	Requirement + Test	Result - Remark	Verdict
	The test equipment fig. 14 is inserted in the portable socket-outlet and secured by the screw C that presses the three screws B against the inner sides of the outlet. The equipment shall be positioned with distance pieces so that the tip of the point F is in contact with the point where the contact to the plug normally is made.		P
	Then the force is measured on each hook that is required to bring the markings in line: [N,N]….	22,0N; 19,0N	P
	The test is repeated with the test equipment turned 180 degrees [N,N]……..	22,0N; 19,0N	P
	The average force for each contact shall not be less than 5 [N]…….(Average [N,N])	22,0N; 19,0N	P
	Other outlets are tested according to clause 19 and 21.		N/A
18.2	Earthing contacts (plug with side earthing contacts) provide adequate contact pressure and not deteriorate in normal use. (test equipment according to figure 15)		—
	The test is conducted with the equipment in figure 15 at 35 ±2 C with a force of 50 [N] applied in 168 [h]. The force must be applied where the contact takes place with the fully inserted plug.		P
	Compliance checked by measuring the change in the contact 30 seconds after the force is withdrawn. The change shall not deviate more than 1 [mm] from the measurement determined in clause 9.	Max. 0,05mm	P
19	**TEMPERATURE RISE**		P
	Plugs and portable socket-outlets shall be so constructed that they comply with the following temperature rise test.		P
	Testing shall be performed at a draught-free location.		P
	For plugs and portable socket-outlets having three poles or more, the current during the test shall be passed through the phase contacts, where applicable.		P
	In addition, separate tests shall be made passing the current through the neutral contact, if any, and the adjacent phase contact and through the earthing contact, if any, and the nearest phase contact.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	For the purpose of this test, earthing contacts, irrespective of their number, are considered as one pole		P
	The temperature is determined by means of thermo couples selected and attached in a way that their influence on the temperature to be measured is negligible.		P
	Accessible metal part shall not exceed 40K		N/A
	Accessible non-metal part shall not exceed 60K	Max. 17,3K	P
	Note: For the purpose of the test of 25.3, the temperature rise of external parts of insulating material not necessary to retain current-carrying parts and parts of the earthing circuit in position, even though they are in contact with them, is also determined (K) ..... :	Max. 17,3K	P
	Table 15 applies for the assignment of nominal cross-sectional areas of copper conductors		—
	- rated current of accessory ..... :		—
	- nominal cross-sectional area (mm^2) ..... :		—
	Terminal screws or nuts tightened with a torque equal to 2/3 of that specified in 12.2.8 (Nm) ..... :		—
19.1	Remains free		—
19.2	Portable socket-outlets		—
	Portable socket-outlets provided with cords are tested as delivered..... :		N/A
	Rewirable portable socket-outlets without cables are fitted with polyvinyl chloride insulated conductors having a nominal cross-sectional area as shown in table 15.		N/A
	Portable socket-outlets are tested using a test plug according to Figure 16.		N/A
	Non-rewirable plug for cord extension set and multiple socket-outlet are tested with a current according to table 20 for rewirable or non-rewirable portable socket-outlets.	Test current: Measured values on plug:	N/A
19.2.1	Portable socket-outlets without additional function		N/A
	test for 1 h with a alternating current as specified in Table 20	Test current:	N/A
	The temperature rise of the terminals and internal connections shall not exceed 45 K		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	The temperature rise of contact tube shall not exceed 45K (EK1 510-11).		N/A
19.2.2	Portable socket-outlets with additional function		N/A
	1) socket-outlets are tested at rated current for 1 h,	Rated current:	N/A
	The temperature rise of terminals and internal connections for additional function shall not exceed the limits given in appropriate regulations		N/A
	All other terminals and internal connections and sockets contact as well as terminals for external conductor shall not exceed 45K		N/A
	2)socket-outlets are tested with an alternating current as specified in table 20 for 1 h		N/A
	In case of tripping of the integrated protection device the test will be repeated with 0,95 times of the tripping current.		N/A
	In case of cartridge fuse-link according to EN 60127-2 the accessory are tested with 1,5 times of the rated current of the fuse-link. The testing time is 1 h for fuse-links with a rated current up to 6.3 A or 30 min for fuse-links with a rated current exceeding 6.3 A.		N/A
	The temperature rise of all terminals and connections shall not exceed 70K.		N/A
	The temperature rise of contact tube shall not exceed 45K.		N/A
19.3	Plugs		—
	Plugs provided with cords are tested as delivered.:		N/A
	Rewirable plugs without cables are fitted with polyvinyl chloride insulated conductors having a nominal cross-sectional area as shown in table 15.		N/A
	The plugs are tested as follows:		N/A
	A suitable test apparatus is mounted on each live pin or protective contact of the plug together with a thermo couple in the lower part. (NOTE A commercially available socket-outlet can be used as a suitable test apparatus.)		N/A
19.3.1	Plugs without additional function		N/A
	test for 1 h with a alternating current as specified in Table 20		N/A
	The temperature rise of clamping units and internal connections shall not exceed 45 K.		N/A
	The temperature rise of contact tube shall not exceed 45K (EK1 510-11).		N/A

DIN VDE 0620-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
19.3.2	Plugs with additional function		N/A
	1) rewirable plugs are tested at rated current for 1 h	Rated current:	N/A
	Non-rewiable plug are tested with an alternating current as specified in table 20 for 1 h	Test current:	N/A
	The temperature rise of terminals and connections points of additional function shall not exceed the values given in relevant standards		N/A
	All other terminals and internal connections and contact as well as terminals for external conductor shall not exceed 45K		N/A
	2)plugs are tested with an alternating current as specified in table 20 for 1 h		N/A
	In case of tripping of the integrated protection device the test will be repeated with 0,95 times of the tripping current.		N/A
	In case of cartridge fuse-link according to EN 60127-2 the accessory are tested with 1,5 times of the rated current of the fuse-link. The testing time is 1 h for fuse-links with a rated current up to 6.3 A or 30 min for fuse-links with a rated current exceeding 6.3 A.		N/A
	The temperature rise of all terminals and connections shall not exceed 70K.		N/A
	The temperature rise of contact tube shall not exceed 45K.		N/A
19.4	Adaptors		—
	Socket-outlets are tested using a test plug according to Figure 16.		P
	Plug part is tested as follows:		P
	A suitable test apparatus is mounted on each live pin or protective contact of the plug together with a thermo couple in the lower part. (NOTE A commercially available socket-outlet can be used as a suitable test apparatus.)		P
19.4.1	Adaptor without additional function (DIN49437 adaptor)		N/A
	test for 1 h with a alternating current as specified in Table 20	Test current:	N/A
	The temperature rise of the terminals and internal connection points shall not exceed 45 K:		N/A
	The temperature rise of contact tube shall not exceed 45K (EK1 510-11).		N/A
19.4.2	adaptor with additional function		P
	1) adaptor are tested at rated current for 1 h,	Rated current:16A	P

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Clause	Requirement + Test	Result - Remark	Verdict
	The temperature rise of terminals and internal connections for additional function shall not exceed the limits given in appropriate regulations		P
	All other terminals and internal connections and sockets contact as well as terminals for external conductor shall not exceed 45K	Max. 41,0K	P
	2)adaptor are tested with an alternating current as specified in table 20 for 1 h		N/A
	In case of tripping of the integrated protection device the test will be repeated with 0,95 times of the tripping current.	Tripping current : 18A Test current:17,5A	P
	In case of cartridge fuse-link according to EN 60127-2 the accessory are tested with 1,5 times of the rated current of the fuse-link. The testing time is 1 h for fuse-links with a rated current up to 6,3 A or 30 min for fuse-links with a rated current exceeding 6,3 A.		N/A
	The temperature rise of all terminals and connections shall not exceed 70K.	Max. 52,3K	P
	The temperature rise of contact tube shall not exceed 45K.	Max. 42,2K	P
19.5	Plug-in equipment		—
	Plug-in equipment are tested according to appropriate product standards		N/A
	For the testing of the plug see 14.23		N/A
20	**BREAKING CAPACITY**		P
	Plugs and portable socket-outlets shall have adequate breaking capacity		P
	The test is made with connections shown in figure 18		P
	Compliance checked by testing:		—
	- Portable socket-outlets;		P
	- plugs with pins which are not solid		P
	Test conditions:		—
	- 100 strokes; rate of operation ..... :	30 ~~(15)~~ strokes per minute	—
	- test voltage (1,1 Vn) ..... :	275V	—
	- test current (1,25 In) (power factor 0,6) ..... :	20A	—

DIN VDE 0620-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Portable socket-outlets are tested with a test plug with brass pins in good condition. Diameter 4,8 +0,06/0 [mm] respective 4,0+0.06/0 [mm]. Distance between pins 19 +0,05/0 [mm]. The pin ends shall comply with DIN 49441, DIN 49446, DIN 49448, or VDE 0620-101		P
	Plugs tested using a socket-outlet complying with the standard VDE 0620-1 and having as near to average characteristics.		N/A
	Accessible metal parts and metal supports are connected via a fuse to ground. The fuse shall be a Cu wire 0,1 [mm] diameter and at least 50 [mm] long. The fuse shall not burn out.		N/A
	During the test: no sustained arcing occur		P
	After the test:		—
	- specimens show no damage impairing their further use;		P
	- entry holes for the pins not show any damage which may impair the safety		P
21	**NORMAL OPERATION**		P
	Plugs and portable socket-outlets shall withstand without excessive wear or other harmful effect, the mechanical, electrical and thermal stresses occurring in normal use		P
	Compliance for portable socket-outlets as well as plugs with resilient earthing contacts or non solid pins is checked by testing:		—
	- portable socket-outlets;		P
	- plugs with resilient earthing socket-contacts;		P
	- plugs with pins which are not solid		P
	Test performed on:		—
	- complete portable socket-outlets (with shutters if any)	10000 strokes	P
	- if shutter fail, test repeated under same condition but with operations made by hand as in normal use (Remark: Start point 2 as shown in Figure 43 of IEC 60884-1 is not permitted)	10000 strokes	N/A
	Test conditions:		P
	- 10000 strokes; rate of operation ..... :	30 ~~(15)~~ strokes per minute	—
	- test voltage Vn (V) ..... :	250	—

DIN VDE 0620-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	- test current (as specified in table 20 (A) (power factor 0,8 ±0,05) ..... :	16A	—
	Test current passed:		—
	- during each insertion and withdrawal of the plug (In ≤ 16A)		P
	- during alternate insertion and withdrawal, the other insertion and withdrawal being made without current flowing (In > 16A)		N/A
	Multiple portable socket-outlets: test carried out on one portable socket-outlet of each type and current rating		N/A
	During the test: no sustained arcing occur		P
	After the test the specimens shall not show:		—
	- wear impairing their further use;		P
	- deterioration of enclosures, insulating lining or barriers;		P
	- damage to the entry holes for the pins, that might impair proper working;		P
	- loosening of electrical or mechanical connections;		P
	- seepage of sealing compound		N/A
	Shuttered portable socket-outlets: the following gauges not touch live parts when they remain under the relevant forces:		—
	- gauge 15 applied with a force up to 20 N		P
	- gauge13 applied with a force up to 1 N		P
	Comply with the requirements of clause 19 with test current equal to rated current	Test current: 16A	P
	Temperature rise of terminals not exceed 45 K when tested with a current specified in table 20	Max. 40,5K	P
	The force to open the shutter shall not exceed 50N when tested with Gauge 19a or 19b		P
	Portable socket-outlets: electric strength (sub-clause 17.2), test voltage (a.c., for 1 min):		—
	a) test voltage (V) .....:	~~1000 V~~ / 1500 V	P
	b) test voltage (V) .....:	~~1000 V~~ / 1500 V	P
	c) test voltage (V) .....:	1000 V / 1500 V	N/A
	d) test voltage (V) .....:	1000 V / 1500 V	N/A
	e) test voltage (V) .....:	1000 V / 1500 V	N/A

DIN VDE 0620-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Plugs: electric strength (sub-clause 17.2), test voltage (a.c., for 1 min):		—
	a) test voltage (V) .....:	1000 V / ~~1500 V~~	P
	b) test voltage (V) .....:	1000 V / ~~1500 V~~	P
	c) test voltage (V) .....:	1000 V / 1500 V	N/A
	d) test voltage (V) .....:	1000 V / 1500 V	N/A
	During the test: no flashover or breakdown		P
	Portable socket-outlets with side earthing contacts: the contacts are pressed as far as possible apart, but not more than 35 [mm]. Kept in this position for 48 h.		P
	Test according to Clause 18. The average force necessary to bring the contact in the required position shall be at least 60% of the original value. The mean value of the force shall be at least 5 N.	19,5N; 17,0N	P
	Test in clause 14.2 are carried out in compliance with the tests of this clause.		P
22	**FORCE NECESSARY TO WITHDRAW THE PLUG**		P
	Construction of portable socket-outlets shall allow the easy insertion and withdrawal of the plug, and prevent the plug from working out of the socket-outlet in normal use		P
	Portable socket outlets:		P
	Rated current (A) ..... :	16A	—
	Number of poles ..... :	2P+E	—
	Plugs with resilient earthing contact		P
	Rated current (A) ..... :	16A	—
	Number of poles ..... :	2P+E	—
22.1	Verification of the maximum withdrawal force		—
22.1.1	Test for portable socket outlets		—
	- Maximum withdrawal force (used Gauge 16a,16b,16c or 16d, force according to table 16) (N) ..... :	54N	—
	Before each test the test pin is wiped free from grease with a chemical degreaser		P
	The plug not remain in the socket-outlet		P

DIN VDE 0620-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
22.1.2	Test for plugs with resilient earthing contact		—
	- Maximum withdrawal force (used Gauge 16e, force according to table 16) (N) ..... :	18N	—
	Before each test the test pin is wiped free from grease with a chemical degreaser		P
	The test pin not remain in the earthing contact		P
22.2	Verification of the minimum withdrawal force		—
	- Minimum withdrawal force (used Gauge 2A, 2B or 2C, force according to table 16) (N) ..... :	2N	—
	Before each test the test pin is wiped free from grease with a chemical degreaser		P
	The plug not fall from each individual contact-assembly within 30 s		P
23	**FLEXIBLE CABLES AND THEIR CONNECTIONS**		N/A
23.1	Plugs and portable socket-outlets provided with a cord anchorage such that the conductors are relieved from strain and that their covering is protected from abrasion		N/A
	Sheath of flexible cable clamped within the cord anchorage		N/A
23.2	Pull and torque test:		—
	The plugs and portable socket-outlets is to be stored for one hour at 45 °C in a climatic cabinet; immediately after it the cord anchorage is to be drawn for 30 s with 50 N, whereby the cord anchorage must remain still effective. A replacement of the cord of less than 2 mm is not regarded as an error.		N/A
	After cooling down to ambient temperature the effectiveness of the retention of the cable by the cord anchorage is checked by the following test by means of an apparatus as shown in figure 20.		N/A
	Non-rewirable plugs and portable socket-outlets:		—
	- rating of plug or portable socket-outlet ..... :		—
	- type of flexible cable; number of conductors and nominal cross-sectional area (mm^2) ..... :		—
	- pull (100 times) (N) ..... :		—

DIN VDE 0620-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	- torque (1 min) as specified in table 18 (Nm) ..... :		—
	After the test:		—
	Displacement ≤ 2 mm ..... :		N/A
	No break in the electrical connections		N/A
	Rewirable plugs and portable socket-outlets:		—
	- rating of plug or portable socket-outlet..... :		—
	- clamping screws, if any, tightened with a torque equal to 2/3 of that specified in 12.2.8 (Nm) ..... :		—
	- type of flexible cable; number of conductors and smallest nominal cross-sectional area (mm^2) as show in table 17 ..... :		—
	- pull (100 times) (N) ..... :		—
	- torque (1 min) as specified in table 18 (Nm) ..... :		—
	After the test:		—
	Displacement ≤ 2 mm ..... :		N/A
	End of conductors not have moved noticeably in the terminals		N/A
	- type of flexible cable; number of conductors and largest nominal cross-sectional area (mm^2) as show in table 17 ..... :		—
	- pull (100 times) (N) ..... :		—
	- torque (1 min) as specified in table 18 (Nm) ..... :		—
	After the test:		—
	Displacement ≤ 2 mm ..... :		N/A
	End of conductors not have moved noticeably in the terminals		N/A
	Rewirable accessories having rated current up to and including 16 A:		—
	Suitable for fitting with the appropriate cable as shown in table 19		N/A
	Type of flexible cable; number of conductors and nominal cross-sectional area (mm^2)..... :		—
23.3	Plugs and portable socket-outlets shall be provided with a flexible cable complying with DIN VDE 0281 or DIN VDE 0282. Plugs may have other types of cord if permitted by other German standards.		N/A

DIN VDE 0620-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Cord extension sets and multiple portable socket-outlets with cord and plug without internal protective devices as well as their components shall be designed for a rated current of 16A.		N/A
	A reduction of the of the cross-section area below 1,5mm² till 1,0mm² is only permitted if an internal protective device is build-in that is designed for the rated current of the wire/conductors.		N/A
	Cord extension sets and multiple portable socket-outlets with cord and plug (table type) are testes as a unit in the assembled condition.		N/A
	Conductor connected to the earthing contact: identified by the colour combination green/yellow		N/A
23.4	Plugs and portable (rewirable and non-rewirable) socket-outlets with connected cord: designed that the flexible cable is protected against excessive bending .		N/A
	For rewirable plugs and socket outlets a radius of 0,5mm at the cable entrance is considered to meet the requirement	Radius at the cable entrance:	N/A
	The test is conducted for the entrance hole of the cable is sharp-edged.		N/A
	Guards shall be of insulating material and fixed in reliable manner		N/A
	Flexing test (10.000 flexings):		—
	- type of flexible cable and nominal cross-sectional area (mm²) ..... :		—
	- test current (A) ..... :		—
	- mass (N) ..... :		—
	During the test: no interruption of the test current and no short-circuit between conductors		N/A
	After the test: guard no separated from the body, insulation shows no sign of abrasion or wear, broken strands become no accessible		N/A
24	**MECHANICAL STRENGTH**		P
	Plugs, portable socket-outlets and screwed glands have adequate mechanical strength		P
24.1	Portable multiple socket-outlets: impact test (apparatus shown in fig. 22, 23, 24 and 25)		N/A

DIN VDE 0620-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	After the test: no damage, live parts do not become accessible		N/A
24.2	Portable single socket-outlets and plugs: tumbling barrel test; number of falls ..... :	1000 Times	P
	After the test:		—
	No part become detached or loosened;		P
	Pins no become so deformed that the plug cannot be introduced into a socket-outlet and also fails to comply with the requirements of 9.1 and 10.3;		P
	Pins no turn when a torque of 0,4 Nm is applied for 1 min in each direction		P
	Portable socket-outlets with shutters shall be tested again with the shutter test in clause 21 without redoing normal operation.		P
24.3	Not apply		—
24.4	Portable single socket-outlets, multiple socket-outlets and plugs (elastomeric or thermoplastic material): impact test, weight 1000 g, height 100 mm (apparatus shown in fig. 28)		P
	Specimens placed in a refrigerator at –15 °C ± 2 °C for at least 16 h		P
	After the test: no damage		P
24.5	Portable single socket-outlets and plugs (elastomeric or thermoplastic material): compression test, 300 N for 1 min, position a) and b) (apparatus shown in fig. 8)		P
	After the test: no damage		P
24.6	Screwed glands of accessories other than ordinary: torque test (1 min)		—
	- diameter of test rod (mm) ..... :		N/A
	- type of material (metal / moulded)..... :		N/A
	- torque (Nm) ..... :		N/A
	After the test: no damage of glands and enclosure of the specimens		N/A
24.7	Plug pins provided with insulating sleeves: 20000 movements, 4 N (apparatus shown in fig. 29)		N/A
	After the test: no damage of pins, insulating sleeve not have punctured or rucked up		N/A
24.8	Shuttered portable socket-outlets: mechanical test carried out on specimens submitted to the normal operation test according to clause 21		—

DIN VDE 0620-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Force applied for 1 min against the shutter of an entry hole by means of one pin ..... :	40 N / ~~75 N~~	—
	Pin not come in contact with live parts		P
	After the test: no damage		P
	Portable socket-outlets with shutters shall be tested again with the shutter test in cl 21 without repeating normal operation test		P
24.9	Multiple portable socket-outlet: mechanical test		—
	Rewirable multiple socket-outlets: flexible cable of the smallest cross-sectional area specified in table 3 .....:		N/A
	8 falls on concrete floor with the specimens arranged as shown in figure 30		N/A
	After the test: no damage, no part have become detached or loosened		N/A
	Portable socket-outlets With IP code higher than IP X0 submitted again to the test as specified in 16.2		N/A
	Portable socket-outlets with shutters shall be tested again with the shutter test in cl 21 without repeating normal operation test		N/A
24.10	Plugs: pull test to verify the fixation of pins in the body of the plug (new specimens)		—
	Maximum withdrawal force (table 16) applied for 1 min on each pin in turn, after the specimen has been placed at 70 °C for 1 h ..... :	54N	—
	After the test: displacement of pins in the body of the plug ≤ 1 mm ..... :	Max. 0mm	P
24.11	Barriers of portable socket-outlets having means for suspension on a wall:		—
	Force applied for 10 s against the barrier by means of a cylindrical steel rod (1,5 times the maximum plug withdrawal force specified in table 16) (N) ... :		—
	Rod not pierce the barrier		N/A
24.12	Portable socket-outlets having means for suspension on a wall (pull test):		—
	Pull applied to the supply flexible cable for 10 s (force prescribed in 23.2 for checking the flexible cable anchorage) (N) ..... :		—
	During the test: no break of the means for suspension on a wall		N/A
24.13	Portable socket-outlets having means for suspension on a wall (pull test):		—

DIN VDE 0620-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Pull applied to the engagement face of the portable socket-outlet for 10 s (maximum withdrawal force specified, for the corresponding plug, in table 16) (N) ..... :		—
	During the test: no break of the means for suspension on a wall		N/A
24.14	Force necessary for covers or cover-plates to come off or not to come off (accessibility with the test finger to live parts)		—
24.14.1	Verification of the non-removal of covers or cover-plates		—
	Forces are gradually applied perpendicular to the mounting surface, in such a way that the resulting force acting on the centre of the covers, cover-plates, or parts of them is as follows:		—
	80 N, for other covers, cover-plates or parts of them.		N/A
	Force applied for 1 min. Covers or cover-plates not come off		N/A
	After the test: no damage		N/A
24.14.2	Verification of the removal of covers or cover-plates		—
	A force not exceeding 120 N is gradually applied, perpendicular to the mounting/supporting surfaces, to covers, cover-plates or parts of them by means of a hook placed in turn in each of the grooves, holes, spaces or the like, provided for removing them.		N/A
	Covers or cover-plates come off		N/A
	The test is made 10 times on each separable part, the fixing of which is not dependent on screws		N/A
	After the test: no damage		N/A
24.15	Not apply		—
24.16	Not apply		—
24.17	Not apply		—
24.18	Not apply		—
24.19	Shroud of portable socket-outlets: compression test (20 ± 2) N at (25 ± 5) °C by means of the apparatus shown in figure 37b		—
	After 1 min and while the shrouds are still under pressure the dimensions did comply with the appropriate standard sheet		P
	Test repeated with the specimen rotated 90 °		P

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Clause	Requirement + Test	Result - Remark	Verdict
24.20	Portable socket-outlets with self closing lid for securing a degree of protection larger or equal to IP44 the flap lid is to be subjected to a movement test. After assembly as for the intended use the flap lid is to open to at least 5° before the limit stop for 5000-times. Possibly existing springs or other mechanisms for closing the lid shall not get lost to or become useless.		N/A
24.21	Portable socket-outlet with a non-self-closing lid a pull test for the captiveness of lid with a force without jerk of 50N for 30s is to be performed in the most unfavourable direction. The lid shall not come loose.		N/A
25	**RESISTANCE TO HEAT**		P
25.1	Specimens kept for 1 h in a heating cabinet at (100 ± 2) °C for 1 h		—
	During the test: no change impairing their further use and sealing compound, if any, not flow		P
	After the test:		—
	- no access to live parts with test probe applied with a force not exceeding 5 N		P
	Markings still legible		P
25.2	Parts of insulating material (Except from parts made of rubber) of portable accessories, necessary to retain current-carrying parts and parts of the earthing circuit in position, and parts of the front surface zone of 2 mm width surrounding the phase and neutral pin entry holes: ball-pressure test (1 h, 125 °C) (table 23)		—
	After the test: diameter of impression ≤ 2 mm ..... :	Enclosure(PC): Max. 1,53mm Enclosure(PP): Max. 1,49mm	P
25.3	For parts not necessary to retain current-carrying parts and parts of the earthing circuit in position, even though in contact with them: ball-pressure test (1 h)		—
	Test temperature (°C) ..... :	70°C	P
	After the test: diameter of impression ≤ 2 mm ..... :	Shutter body: Max. 0,75mm Shutter box: Max.0,83mm	P
25.4	Portable accessories: compression test (20 N, 1 h, 80 °C) by means of the apparatus shown in figure 37a		—
	After the test: no damage		P
26	**SCREWS, CURRENT-CARRYING PARTS AND CONNECTIONS**		P

DIN VDE 0620-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
26.1	Connections withstand mechanical stresses		P
	Thread-forming or thread-cutting screws used only if supplied together with the piece in which they are intended to be inserted		N/A
	Thread-cutting screws intended to be used during installation: captive		N/A
	Screws or nuts which transmit contact pressure: be made of metal, and in engagement with a metal thread		N/A
	Test:		—
	- 10 times for screws in engagement with a thread of insulating material and for screws of insulating material		N/A
	- 5 times for all other cases		N/A
	During the test: no damage impairing the further use of the screwed connections		N/A
26.2	Screws in engagement with a thread of insulating material: correct introduction into the screw hole or nut ensured		N/A
26.3	Contact pressure: not transmitted through insulating material other than ceramic, pure mica or other material no less suitable unless there is sufficient resiliency in metallic parts		P
	Connections made by insulation piercing of tinsel cord reliable		N/A
26.4	Screws and rivets locked against loosening and/or turning		P
26.5	Current-carrying parts (including earthing terminals) have mechanical strength, electrical conductivity and resistance to corrosion adequate:		—
	- copper;		N/A
	- alloy with at least 58 % copper for parts made from cold-rolled sheet or with at least 50 % copper for other parts;	>58%	P
	- stainless steel with at least 13 % chromium and not more than 0,12 % carbon		N/A
	- steel with electroplated coating of zinc (DIN 50961): service condition ISO no. (1/2/3); IP (X0/X4/X5/X6); thickness (µm) ..... :		N/A
	- steel with electroplated coating of nickel and chromium (DIN EN ISO 1456): service condition ISO no. (2/3/4); IP (X0/X4/X5/X6); thickness (µm) ..... :		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- steel with electroplated coating of tin (DIN 50965): service condition ISO no. (2/3/4); IP (X0/X4/X5/X6); thickness (µm) ..... :		N/A
	Current-carrying parts subjected to mechanical wear: not of steel with electroplated coating		P
	Metals having a great difference of electrochemical potential: not used in contact with each other		P
26.6	Contacts subjected to a sliding action: of metal resistant to corrosion		P
26.7	Thread-forming screws and thread-cutting screws not used for the connection of current-carrying parts		P
	Thread-forming screws and thread-cutting screws used to provide earthing connection: not necessary to disturb the connection and at least two screws are used for each connection		N/A
26.8	If other than screw-type or screwless terminals used for internal connections in plugs and portable socket-outlets, these connections shall be soldered, welded, crimped or equally effective permanent connections.		P
	Screwless terminations, similar like insulating piercing terminations, shall only be used for uninsulated rigid conductors, compliance is checked by the tests according to 12.3 as far as applicable.		N/A
	Screw-type terminals shall not be used for internal connections in non-rewirable portable accessories, compliance is checked by inspection.		P
27	**CREEPAGE DISTANCES, CLEARANCES AND DISTANCES THROUGH SEALING COMPOUND**		P
27.1	Creepage distances, clearances and distances through sealing compound no less than the values shown in table 24		P
	Creepage distances (cr):		—
	1) between live parts of different polarity ≥ 4(3) mm ..... :	>4mm	P
	2) between live parts and:		—
	- accessible insulating and earthed metal parts ≥ 3 mm ..... :	>4mm	P
	- parts of earthing circuit ≥ 3 mm ..... :	>4mm	P

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Clause	Requirement + Test	Result - Remark	Verdict
	- external assembly screws, other than screws which are on the engagement face of plugs and are isolated from the earthing circuit ≥ 3 mm ..... :		N/A
	3) between pins of plugs and metal parts connected to them, when fully engaged, and a socket-outlet of the same system having accessible unearthed metal parts ≥ 6(4,5) mm ..... :		N/A
	4) between the accessible unearthed metal parts of a socket-outlet and a fully engaged plug of the same system having pins and metal parts connected to them ≥ 6(4,5) mm ..... :		N/A
	5) between live parts of a socket-outlet (without a plug) or of a plug and its accessible unearthed metal parts ≥ 6(4,5) mm ..... :		N/A
	Clearances (cl):		—
	6) between live parts of different polarity ≥ 3 mm .. :	>4mm	P
	7) between live parts and:		—
	- accessible insulating and earthed metal parts not mentioned under 8 ≥ 3 mm ..... :	>4mm	P
	- parts of earthing circuit ≥ 3 mm ..... :	>4mm	P
	- external assembly screws, other than screws which are on the engagement face of plugs and are isolated from the earthing circuit ≥ 3 mm ..... :		N/A
	8) between live parts and:		—
	- accessible unearthed or functional earthed metal partsb of plugs and portable socket-outlets ≥ 6(4,5) mm ..... :		N/A
	9) Remains free		—
	10) Remains free		—
	11) Between live parts of a portable socket-outlet (without plug) or of a plug and their accessible metal parts which are not connected to the earthing circuit ≥ 6(4.5) mm……..:		N/A
	Distance through insulating sealing compound:		—
	12) Remains free		—
	13) Remains free		—
	Distance through insulation:		—

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Clause	Requirement + Test	Result - Remark	Verdict
	14) Between accessible surfaces and live parts of non-rewirable, moulded-on plugs and portable socket-outlets. ≥ 1,5 mm……..:		N/A
27.2	Insulating sealing compound: not protrude above the edge of the cavity in which it is contained		N/A
27.3	Not apply		—
28	**RESISTANCE OF INSULATING MATERIAL TO ABNORMAL HEAT, TO FIRE AND TO TRACKING**		P
28.1	Resistance to abnormal heat and to fire		—
28.1.1	Glow-wire test		—
	For parts of plugs and portable socket-outlets necessary to retain current-carrying parts and parts of the earthing circuit in position: test temperature 750 °C For moulded on plugs the tests is performed on the pin base separately. Note 5: The outer material by moulded plugs is totally removed when testing the supporting parts.		—
	No visible flame and no sustained glowing	Enclosure	P
	Flame and glowing extinguish within 30 s ..... :		N/A
	No ignition of the tissue paper		P
	For parts not necessary to retain current-carrying parts and parts of the earthing circuit in position, even though in contact with them: test temperature 650 °C		—
	No visible flame and no sustained glowing	Shutter box	P
	Flame and glowing extinguish within 30 s ..... :		N/A
	No ignition of the tissue paper		P
28.1.2	Plugs with pins provided with insulating sleeves:		—
	Test temperature maintained for 3 h by means of the apparatus shown in figure 39 ..... :	120 °C / 180 °C	N/A
	Impact test according to sub-clause 30.4 (mass 100 g, height 100 mm, 4 impacts): no cracks of the insulating sleeves		N/A
28.2	Resistance to tracking		—
	Parts of insulating material retaining live parts in position of plugs and portable socket-outlets >IP X0: test voltage 175 V, 50 drops, solution A of DIN EN 60112		N/A
	No flashover or breakdown		N/A
29	**RESISTANCE TO RUSTING**		P
	Ferrous parts protected against rusting		P

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Clause	Requirement + Test	Result - Remark	Verdict
	No signs of rust after 10 min in carbon tetrachloride, trichloroethane or equivalent degreasing agent, 10 min 10 % solution of ammonium chloride, 10 min in a box with air saturated with moisture and 10 min at 100 °C		P
30	**ADDITIONAL TESTS ON PINS PROVIDED WITH INSULATING SLEEVES**		N/A
30.1	Pressure test at high temperature		—
	Apparatus shown in figure 40, with the test specimen in position, maintained for 2 h at 200 °C. Force applied through the blade: 2,5 N		N/A
	Thickness of insulation measured: before the test (mm); after the test (mm) .....:		N/A
	Thickness within the area of impression ≥ 50 % of the thickness measured before the test: percent value (%) .....:		N/A
30.2	Static damp heat test		—
	Set of 3 specimens submitted to two damp heat cycles in accordance with DIN EN 60068-2-30		N/A
	After the test:		—
	Insulation resistance and electric strength test (clause 17)		N/A
	Abrasion test (sub-clause 24.7)		N/A
30.3	Test at low temperature		—
	Set of 3 specimens maintained at –15 °C ± 2 °C for 24 h		N/A
	After the test:		—
	Insulation resistance and electric strength test (clause 17)		N/A
	Abrasion test (sub-clause 24.7)		N/A
30.4	Impact test at low temperature		—
	Specimens maintained at –15 °C ± 2 °C for 24 h subjected to 4 impacts (mass 100±1 g, height 100 mm) by means of the apparatus shown in figure 41 rotating the specimen through 90° between impacts		N/A
	After the test: no crack of the insulating sleeves		N/A
31	**EMC**		P

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Clause	Requirement + Test	Result - Remark	Verdict
	No requirements except when the plugs and portable socket-outlets contain electronic parts. Neon lamps are not electronic parts.		P
	Plugs and portable socket-outlets with electronic parts must comply with the relevant EMC requirements. .		P

DIN VDE 0620-2-1 Annex C Additional requirements for plug and portable socket with “Hammer” logo for rough use			
Clause	Requirement + Test	Result - Remark	Verdict
C.1	DIN 49406-2, DIN49440-3 or DIN 49440-6 and Din 49441-2, used under rough use condition.		N/A
	Splash-proof socket-outlets according to DIN49440-3 & DIN49440-1 are allowed if they meet the requirements of protection IP44 according to DIN EN 60529 (VDE 0470-1).		N/A
C.2	Symbol according to DIN ISO 7000:2008-12 (1325)		N/A
C.3	Plug or portable sockets in Annex C.1 must meet minimum degree of protection IPX4		N/A
C.4	Plug and portable socket-outlet comply with C.1 must be with flexible cord of H07RN-F according to DIN EN 50525-2-21(VDE 0285-525-2-21) and NSSHÖU according to DIN VDE 0250-812(VDE 0250-812) min. 3x1,5mm^2 with max outer diameter of 11,9mm.		N/A
C.5	Plug and portable sockets within C.1 need the test of 24.5		N/A

DIN VDE 0620-2-1 Annex D During production required test for the manufacturing of plugs and outlets with crimp connections			
Clause	Requirement + Test	Result - Remark	Verdict
D1	An ability proof of the used tool must be accomplished on at least 50 test samples. At least the following shall be documented: the crimping height; or the withdrawal force; or voltage drop of the crimping connection Testing is performed on the bases of EN 60352-2 With this test no worse values may be obtained than those, which were specified during the type testing in accordance with 12.4.		P
D2	During the production the crimping height, the withdrawal force or the voltage drop of the crimp connection is to be tested. The determined values may not be worse than those, which were specified during the type testing in accordance with 12.4. The test is to be conducted on at least 3 test samples for each product at the starting of the manufacturing and at the end of manufacturing of a batch, however at the latest after 8 hours. The results may not be worse than those, which were specified during the type testing in accordance with 12.4. The results are to be documented by the manufacturer and be kept for ten years.		P

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Annex E

Units intended for installation shall be marked on the smallest closed selling unit with the note according to Appendix E **(referred by clause 8.10)**

	Hinweis! ***Installation nur durch Personen mit einschlägigen elektrotechnischen Kenntnissen und Erfahrungen!****)*** *Durch eine unsachgemäße Installation gefährden **Sie**:* *– Ihr eigenes Leben;* *– das Leben der Nutzer der elektrischen Anlage.* *Mit einer unsachgemäßen Installation riskieren **Sie** schwere Sachschäden, z. B. durch Brand.* *Es droht für **Sie** die persönliche Haftung bei Personen- und Sachschäden.* ***Wenden Sie sich an einen Elektroinstallateur!*** ***)** **Erforderliche Fachkenntnisse für die Installation*** *Für die Installation sind insbesondere folgende Fachkenntnisse erforderlich:* *– die anzuwendenden „5 Sicherheitsregeln": Freischalten; gegen Wiedereinschalten sichern; Spannungsfreiheit – feststellen; Erden und Kurzschließen; benachbarte, unter Spannung stehende Teile abdecken oder abschranken;* *– Auswahl des geeigneten Werkzeuges, der Messgeräte und ggf. der persönlichen Schutzausrüstung;* *– Auswertung der Messergebnisse;* *– Auswahl des Elektro-Installationsmaterials zur Sicherstellung der Abschaltbedingungen;* *– IP-Schutzarten;* *– Einbau des Elektroinstallationsmaterials;* *– Art des Versorgungsnetzes (TN-System, IT-System, TT-System) und die daraus folgenden Anschlussbedingungen* *– (klassische Nullung, Schutzerdung, erforderliche Zusatzmaßnahmen etc.).* **Reference!** **Installation only by persons with relevant electrotechnical knowledge and experiences!*)** By an inappropriate installation **you** endanger - your own life; - the life of the users of the electrical system. With an inappropriate installation you risk heavy damages to property, e.g. by fire. The personal adhesion threatens with damages to property and person for **you**. **Contact an Electrician! *)** ***)Necessary expertise for the installation** For the installation in particular the following expertise is necessary: - The appropriate "5 safety rules" : De-energize; secure against restarting; determine De-energizing; Grounding and short circuiting; cover energized neighbouring parts or provide it with barriers; - Selection of the suitable tool, the measuring instruments and if necessary the personal protection equipment; - Evaluation of the measurement results; - Selection of the electricity installation material for the securing of the switching off conditions; - IP enclosures; - Installation of the electrical installation material; - Kind of the supply network (TN-system, IT-system, TT-system) and the electrical operating conditions following from it (classical protective grounding, protective grounding, necessary additional measures etc.)	N/A

Appendix 1: Additional requirements according to DIN VDE 0620-1/-2-1: 2021 Clause 10.5.

10.5	Portable socket-outlets with shutters: live parts of socket-outlet and its additional functions not accessible, without a plug in engagement, with the gauges G.13 and G.15.		P
	Portable socket-outlet: Live contacts automatically screened when the plug is withdrawn		P
	The means cannot be easily operated by anything other than a plug and not depend upon parts which are liable to be lost		P
10.5.1	Portable socket-outlets with enclosures or cover of thermoplastic material: test carried out at 35 °C ± 2 °C		P
	Gauge G.13: applied to the entry holes corresponding to the live contacts, as well as all other openings in the enclosure and cover.		P
	Gauge: not touch live parts of the socket-outlet and their additional components.		P
	The gauge G.13 shall not touch live parts or parts of SELV circuit when the earthing circuit is touched at the same time.		P
10.5.2	Gauge G.15: applied to the entry holes corresponding to the live contacts with a force of 20 N and shall not touch live parts.		P
10.5.3	Shutter shall not obstruct the insertion of the plug unduly. The force to open the shutter shall not exceed 30 N.		P
	The test is carried out with the gauge 19a or 19b. The gauge is movable.		P
10.5.4	A pin from a plug of the same system is applied for 1 min with a force of 40 N against the shutter of an entry hole		P
	The pin shall not come in contact with live parts.		P
	After the test the specimens shall not be damaged within the meaning of this standard.		P

Appendix 2: Photo documentation

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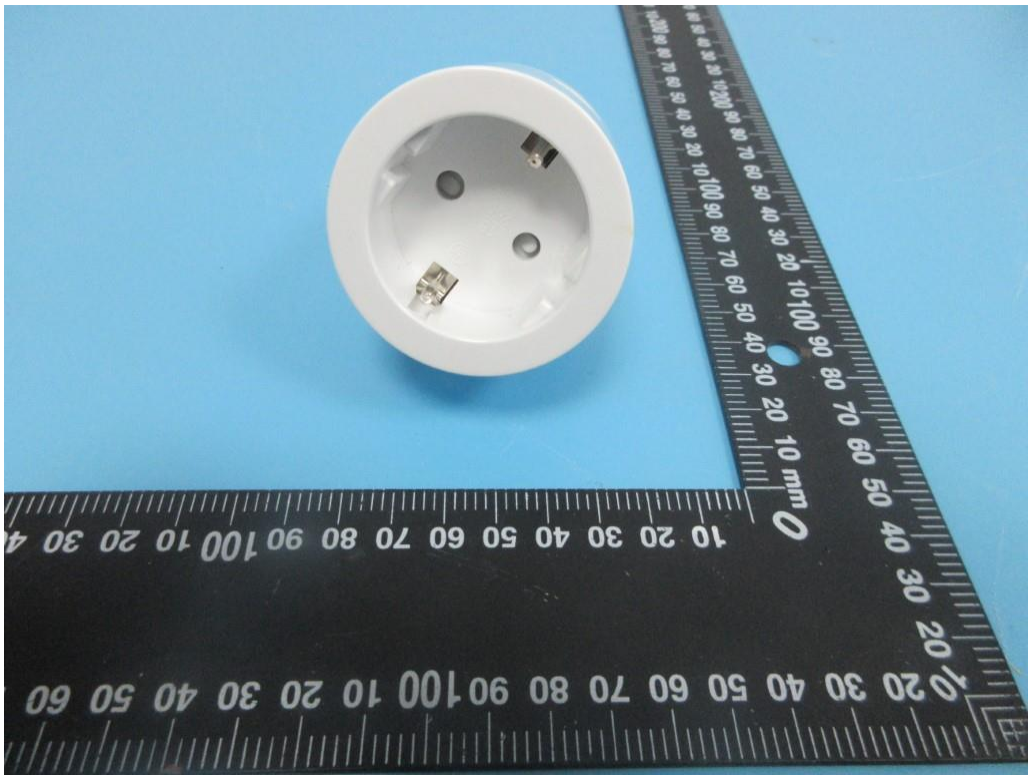

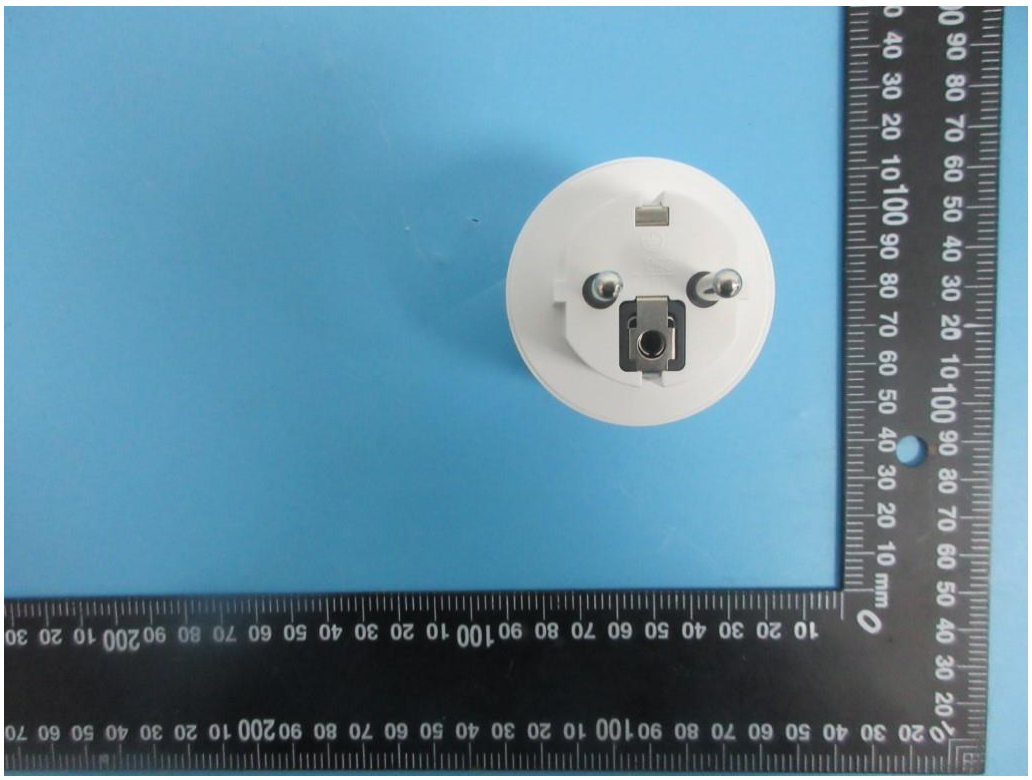

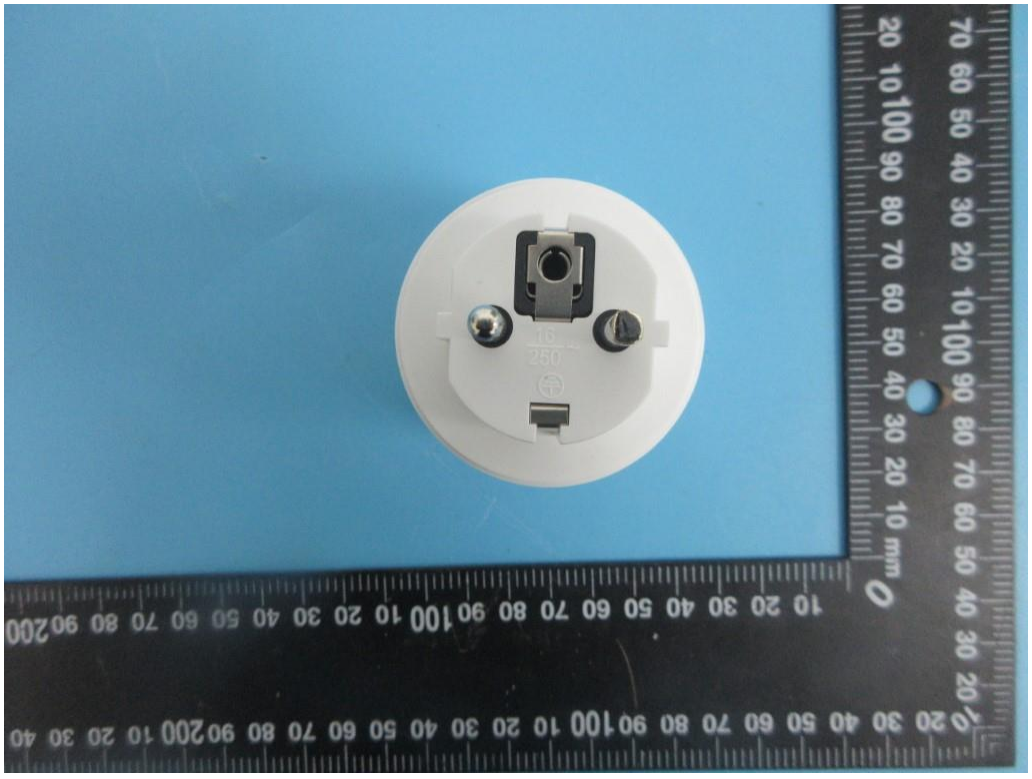

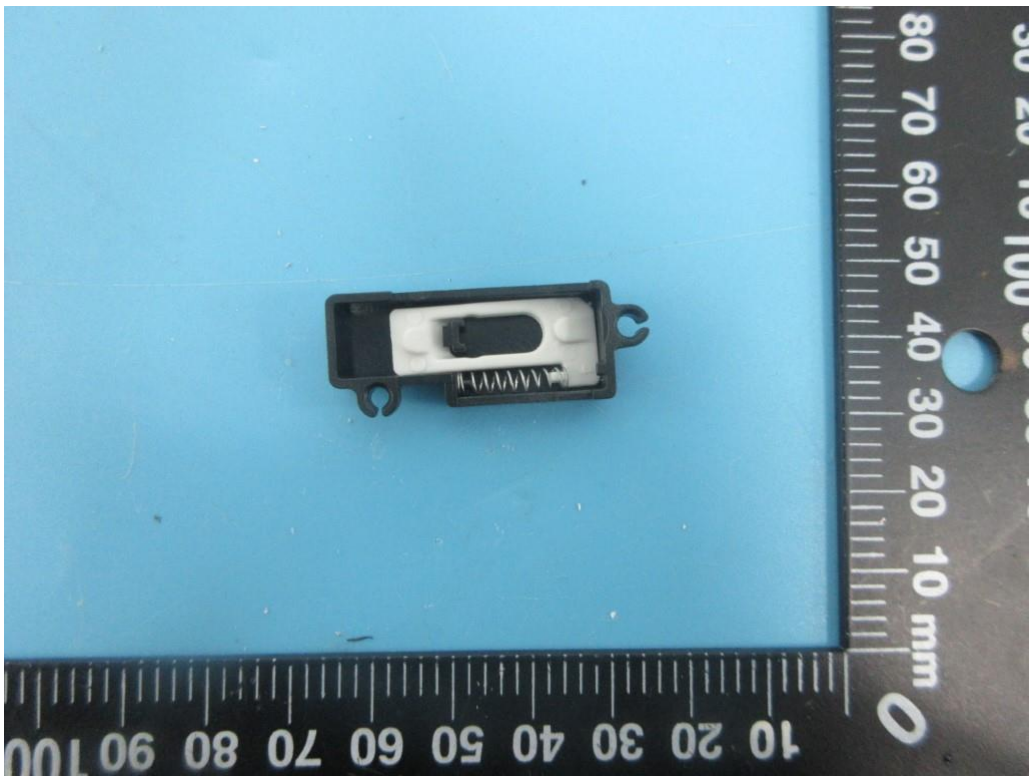

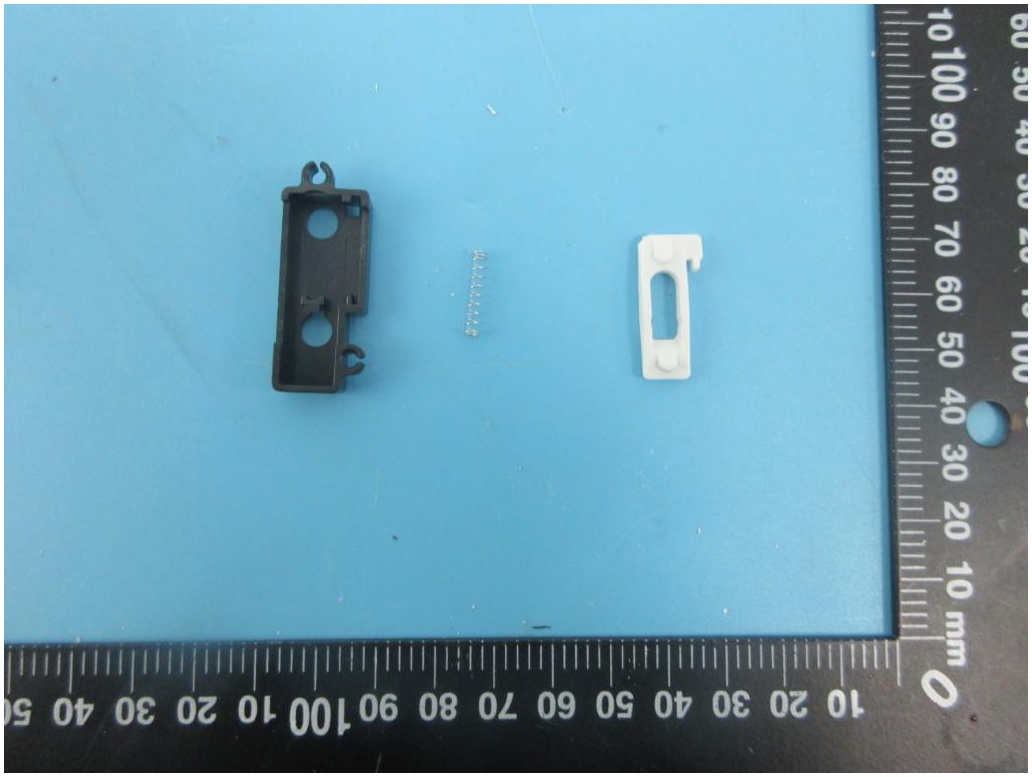

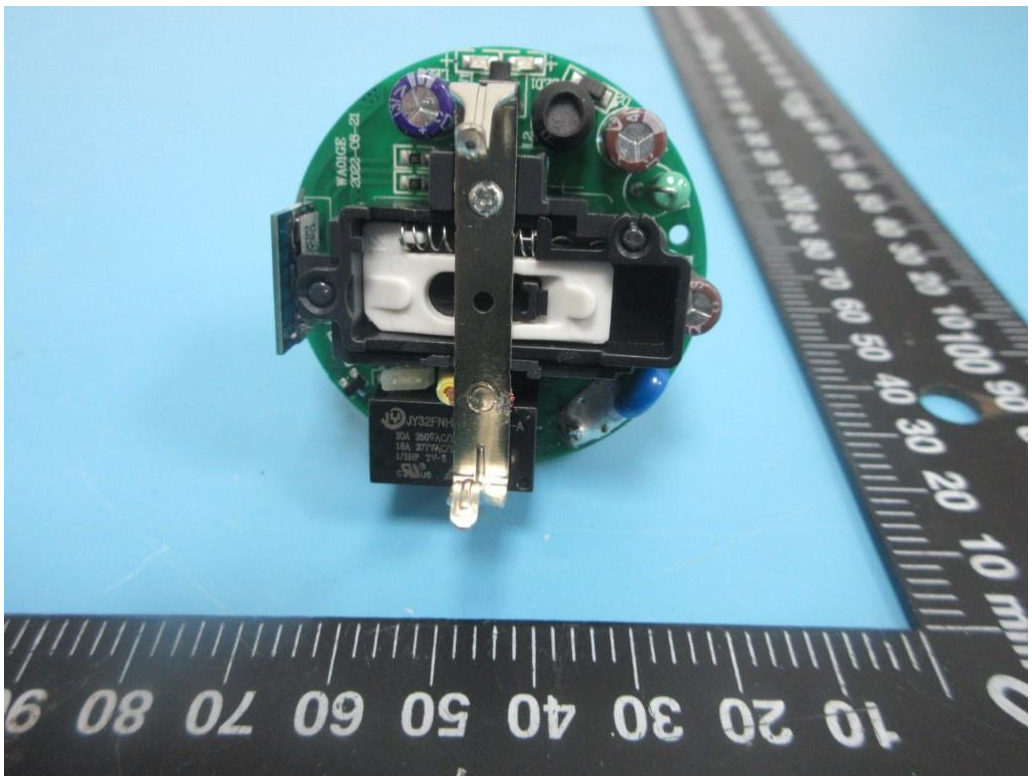

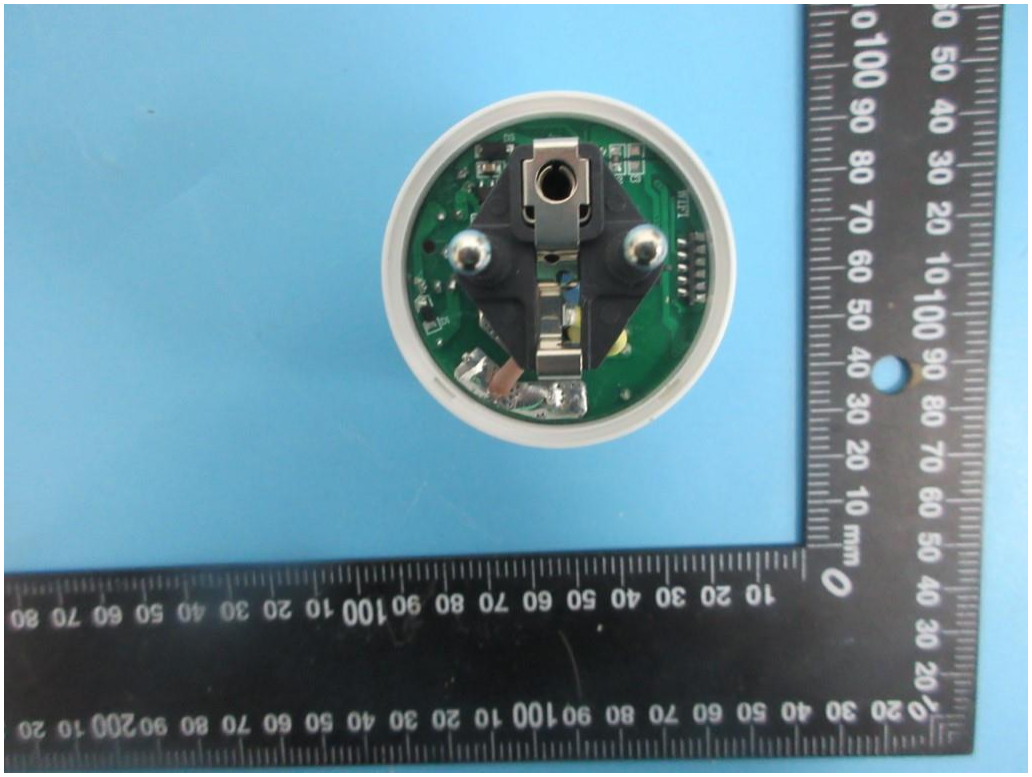

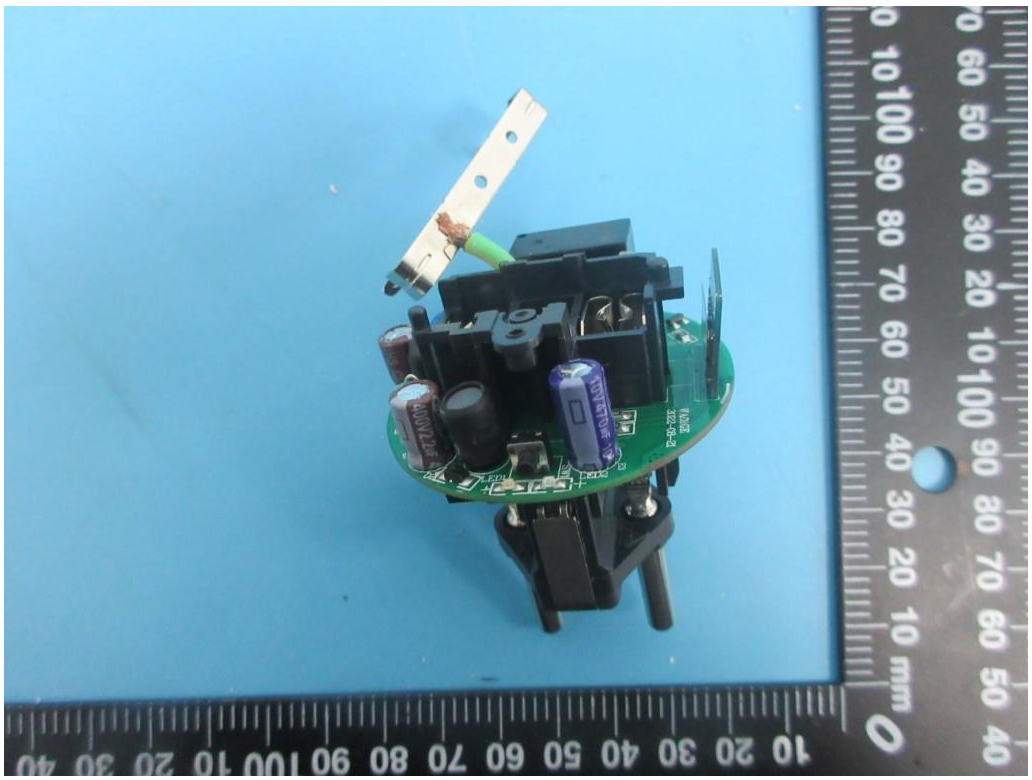

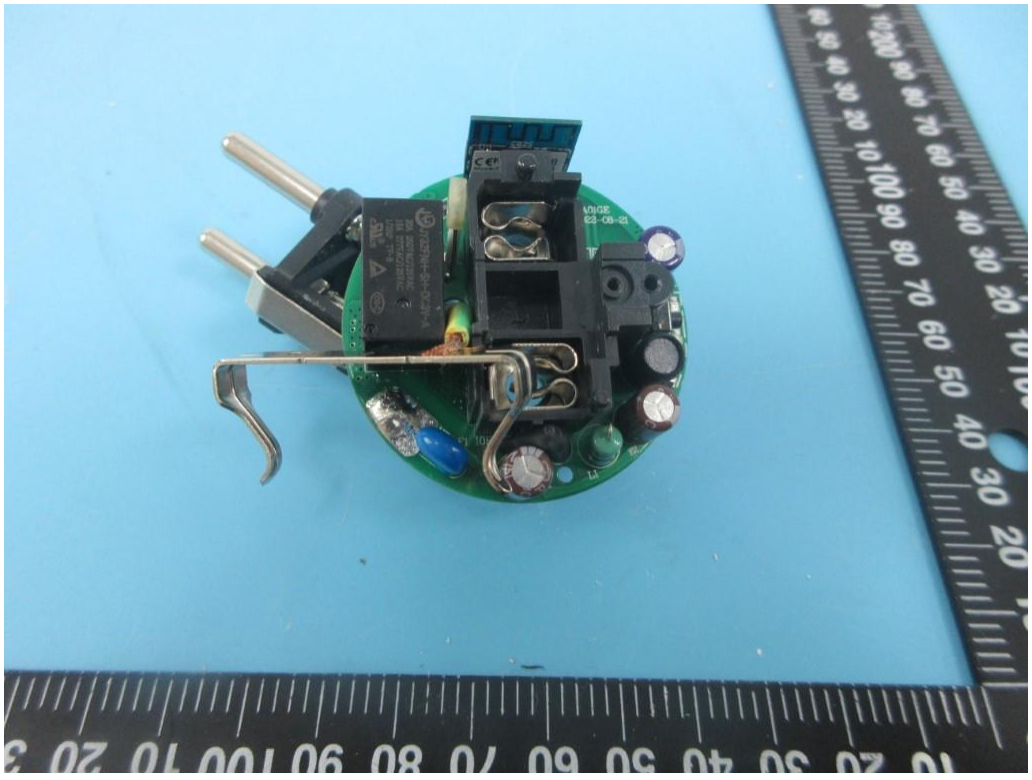

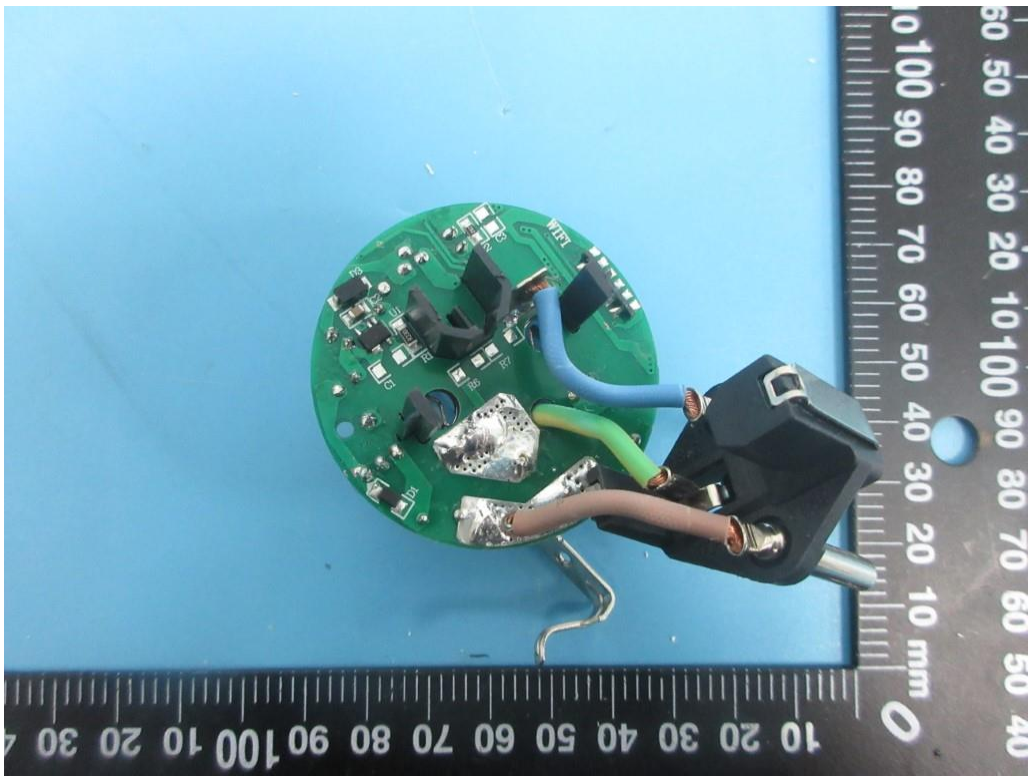

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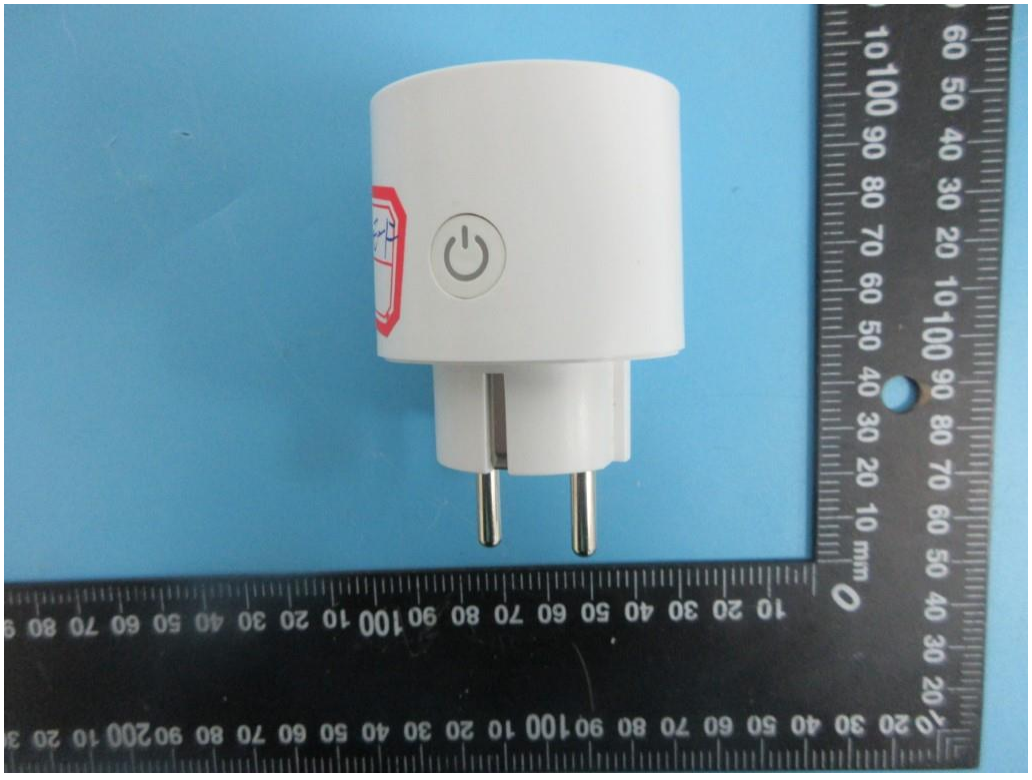

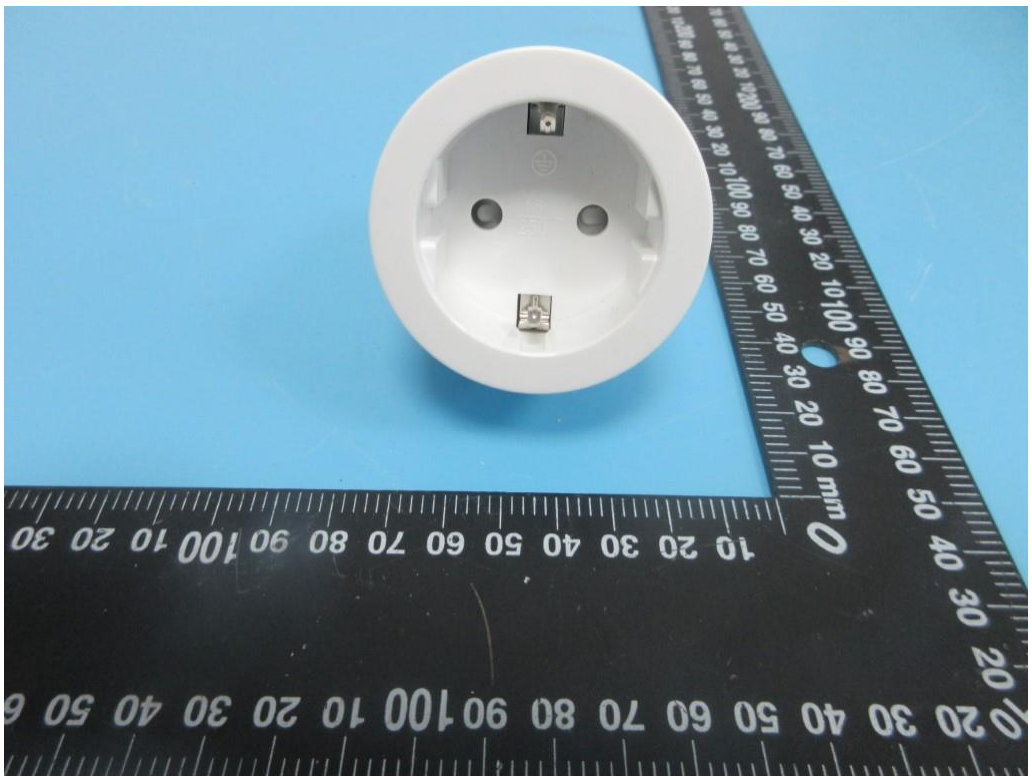

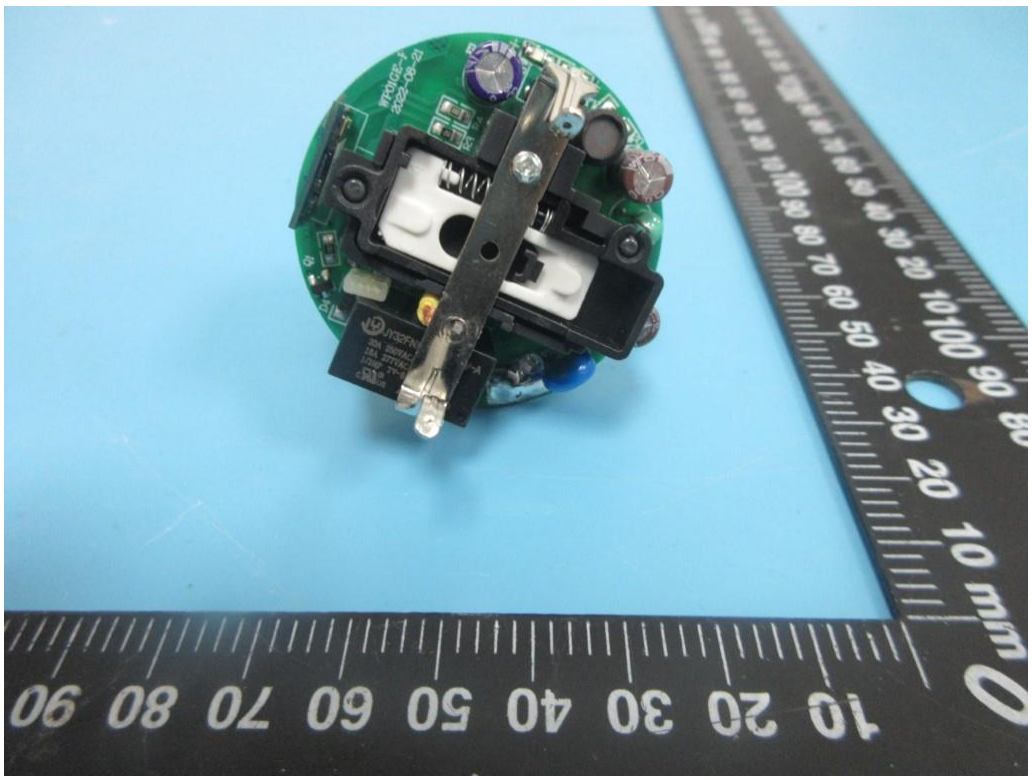

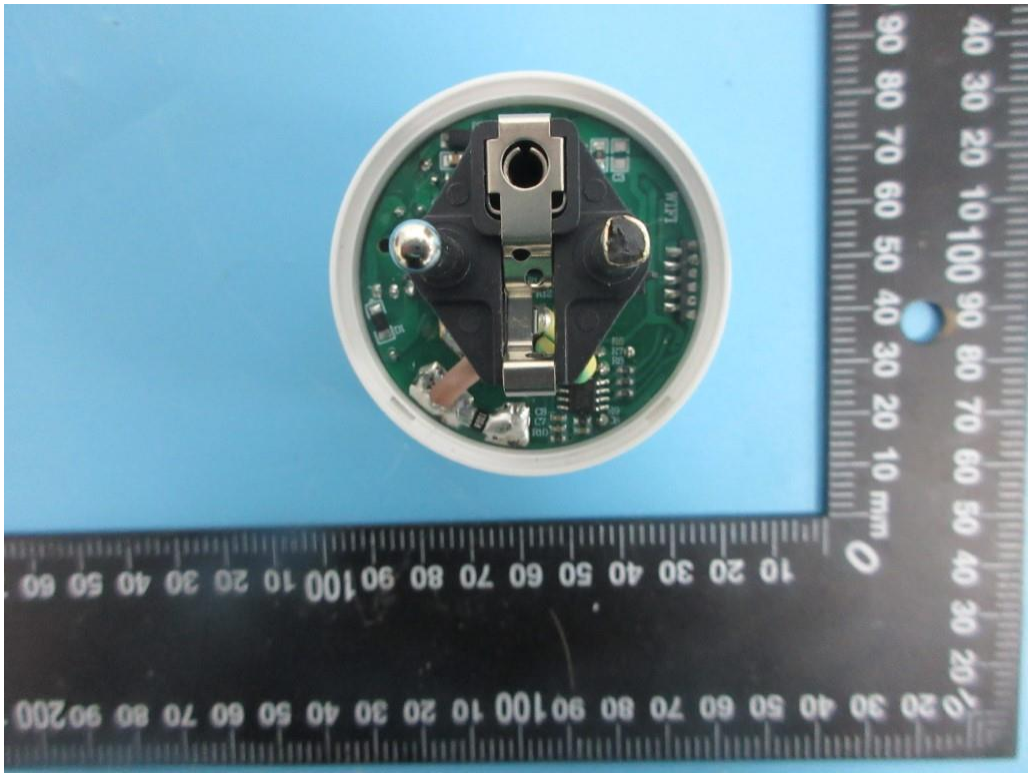

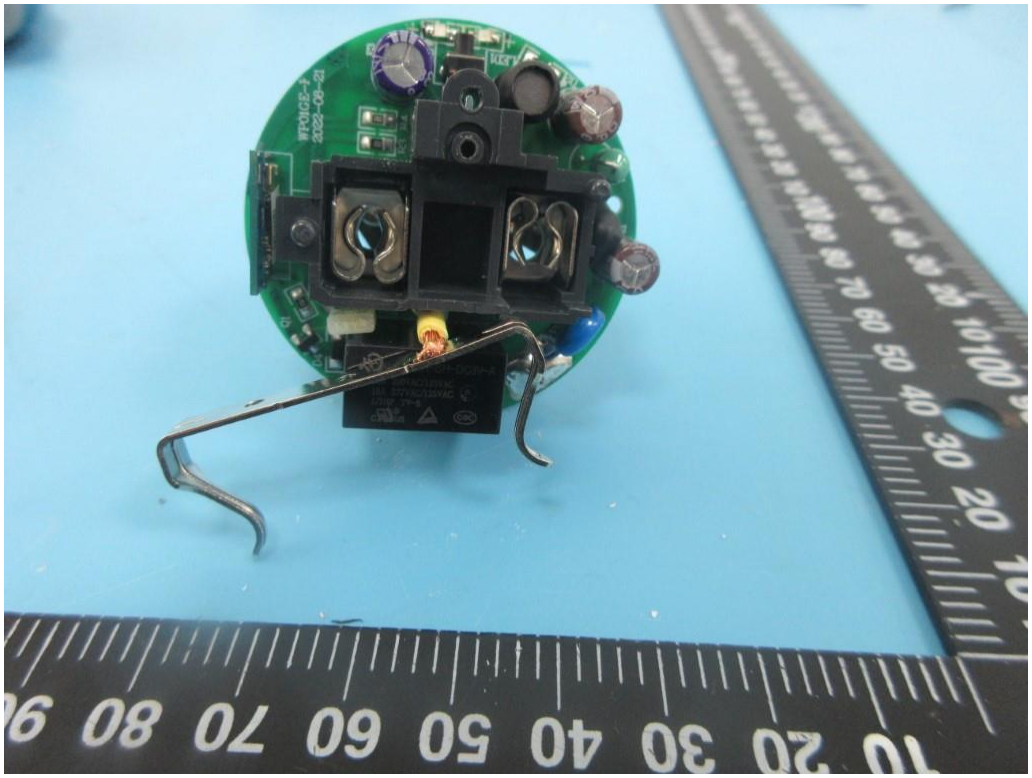

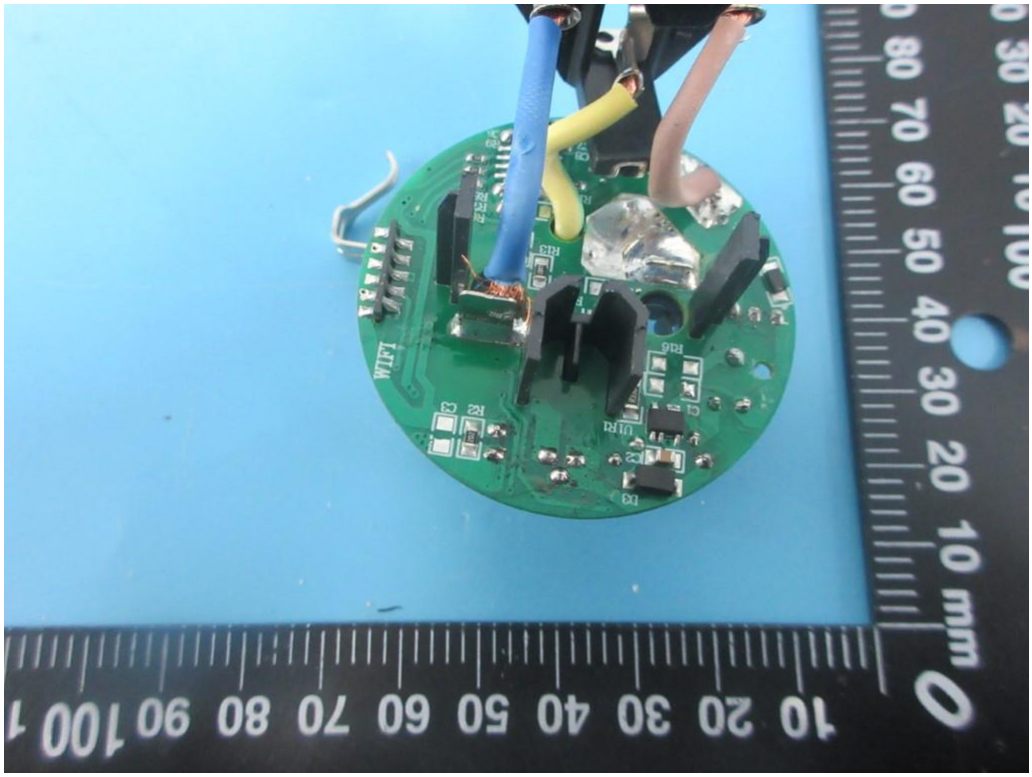

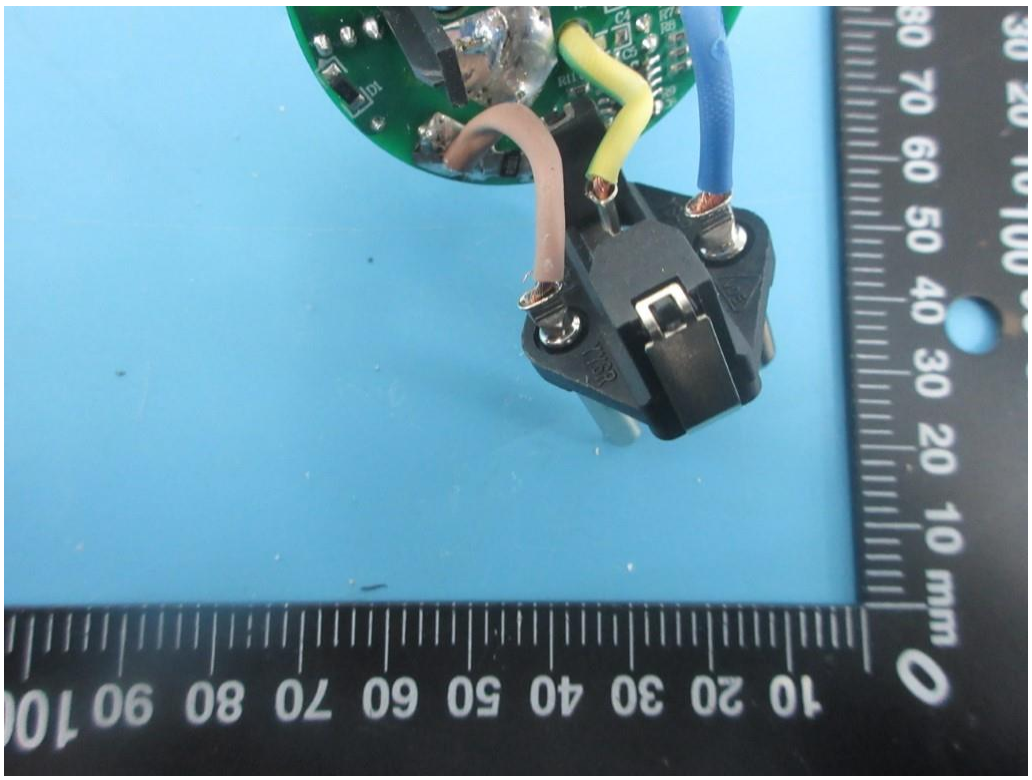

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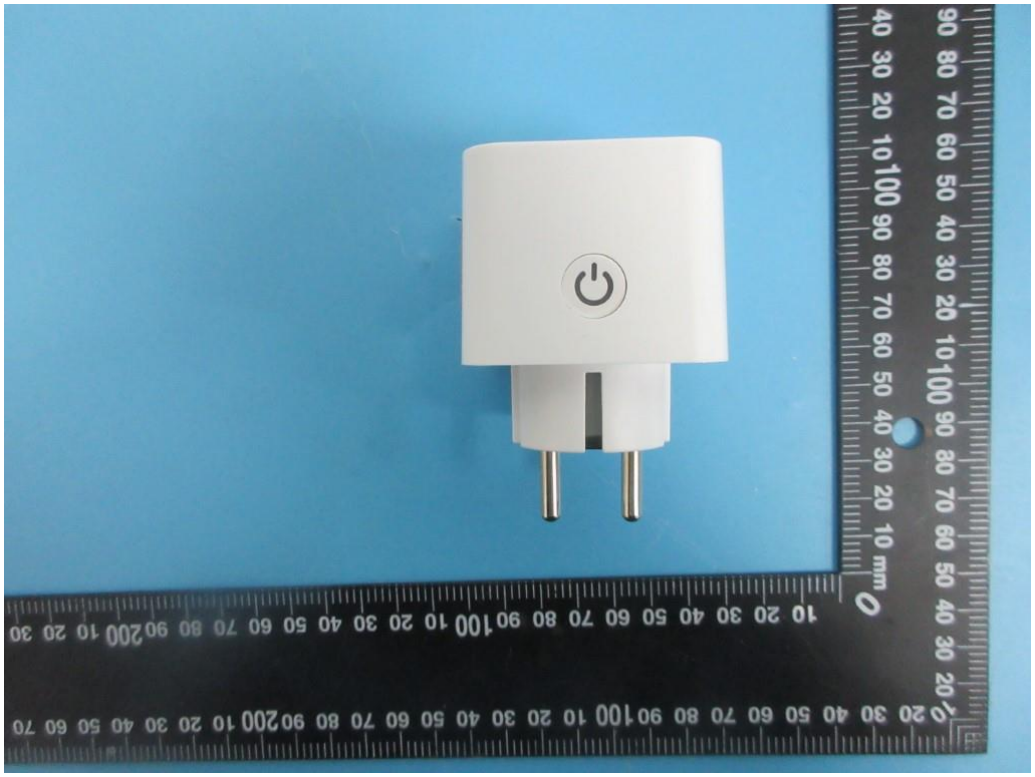

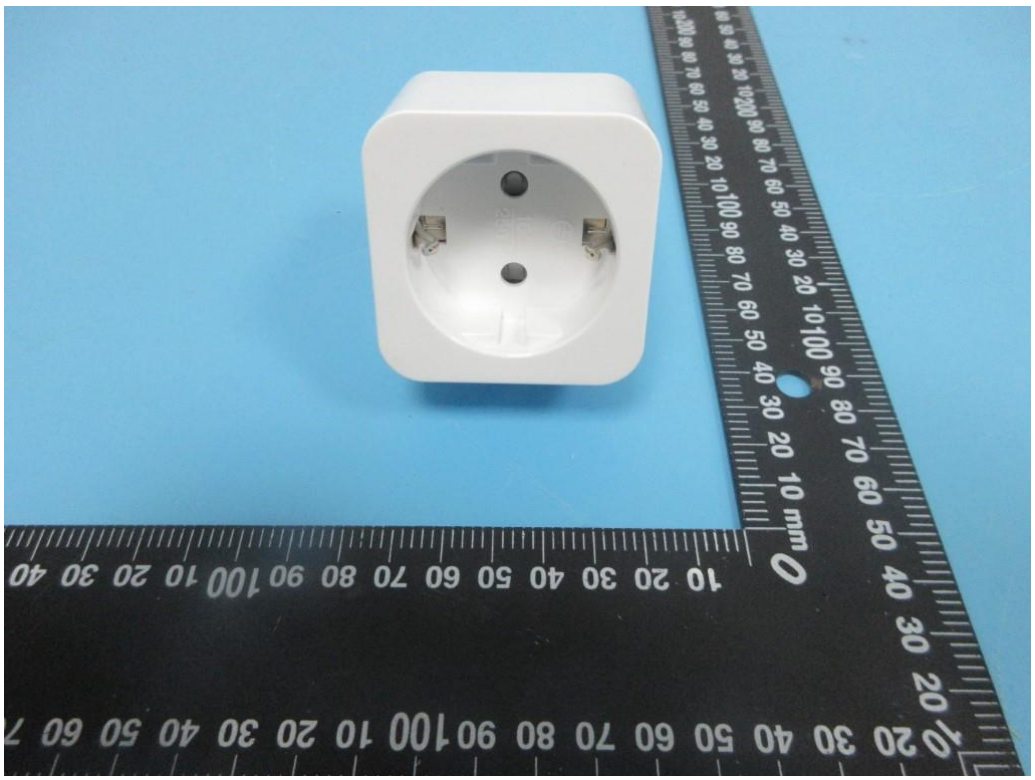

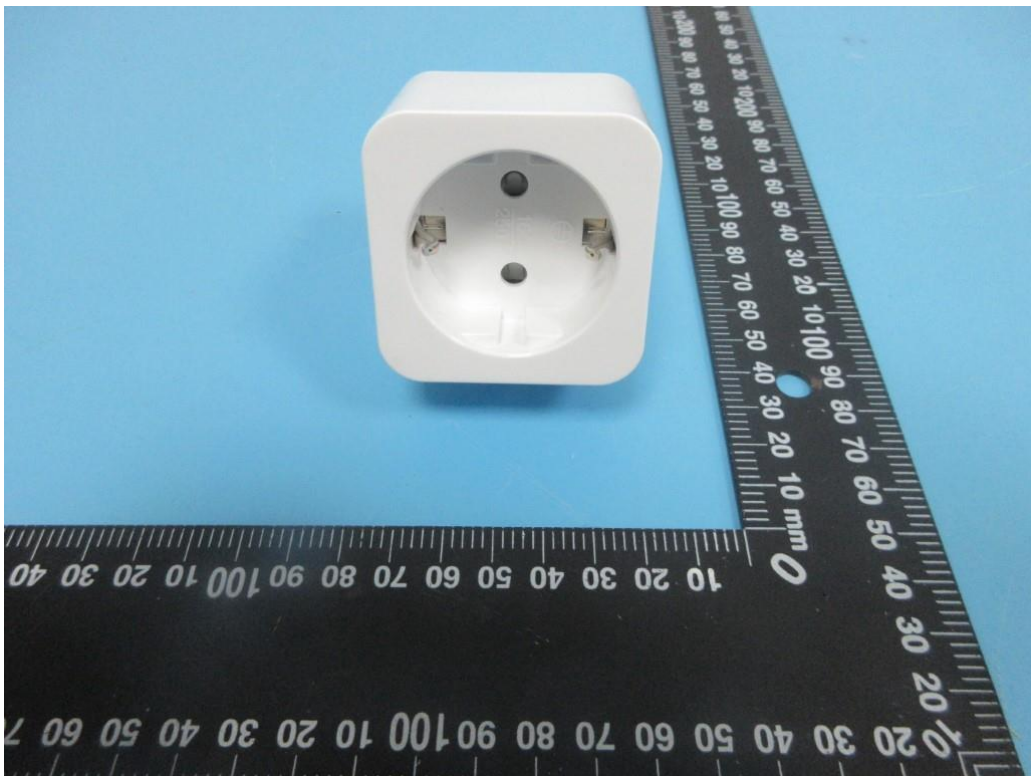

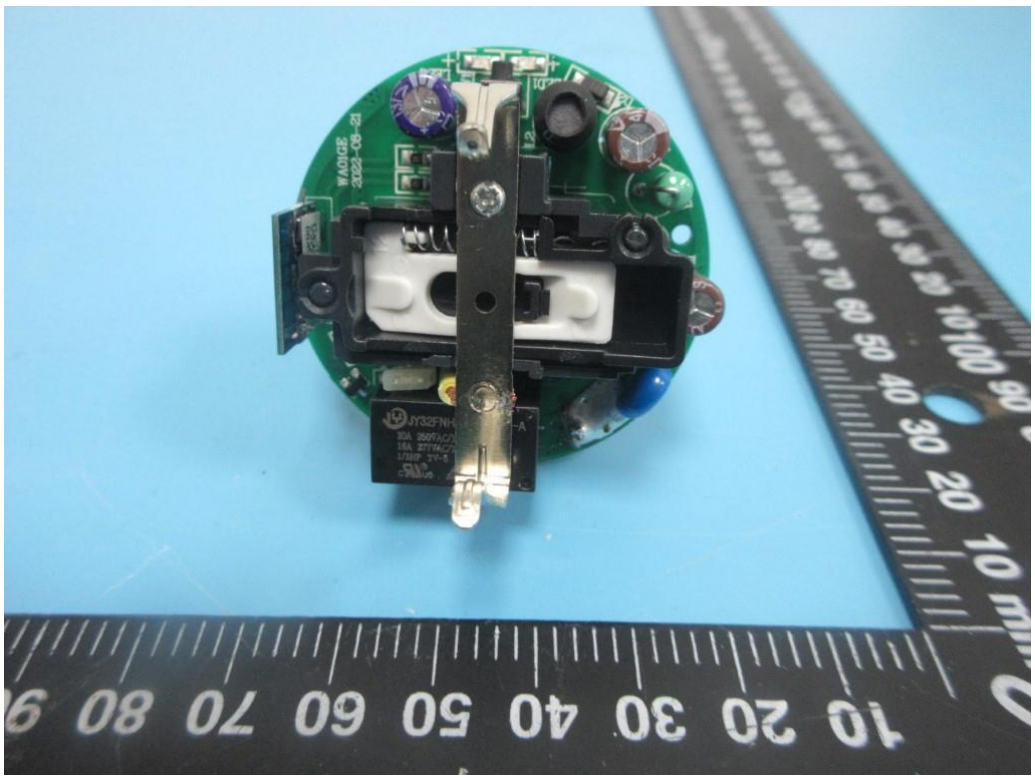

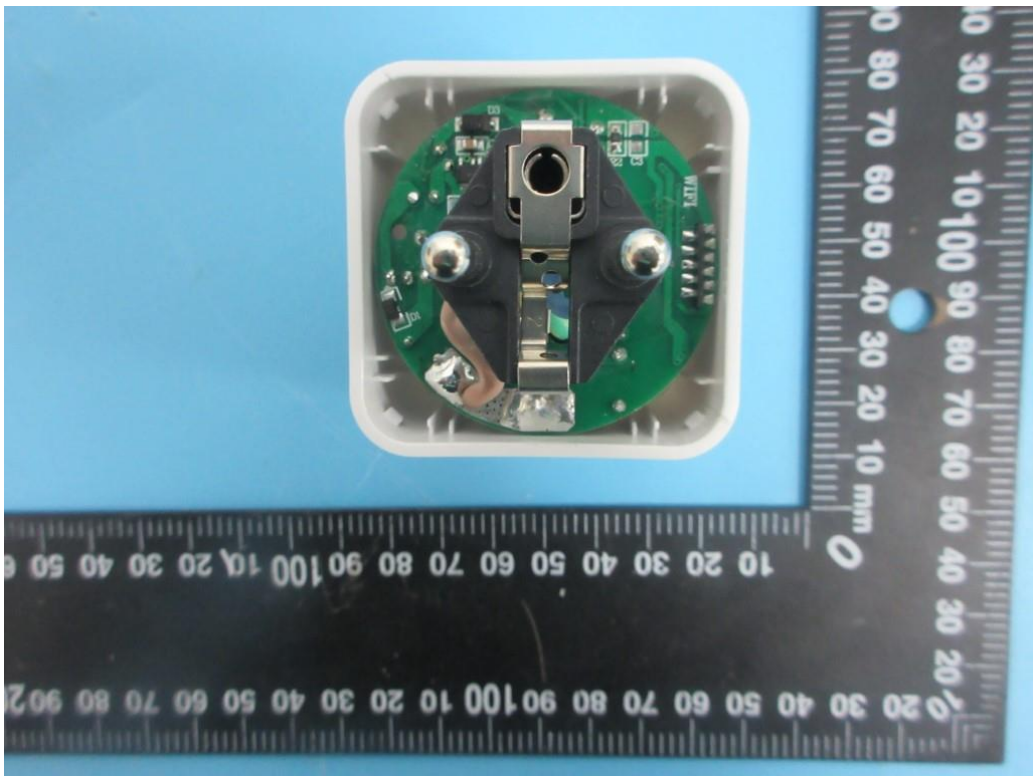

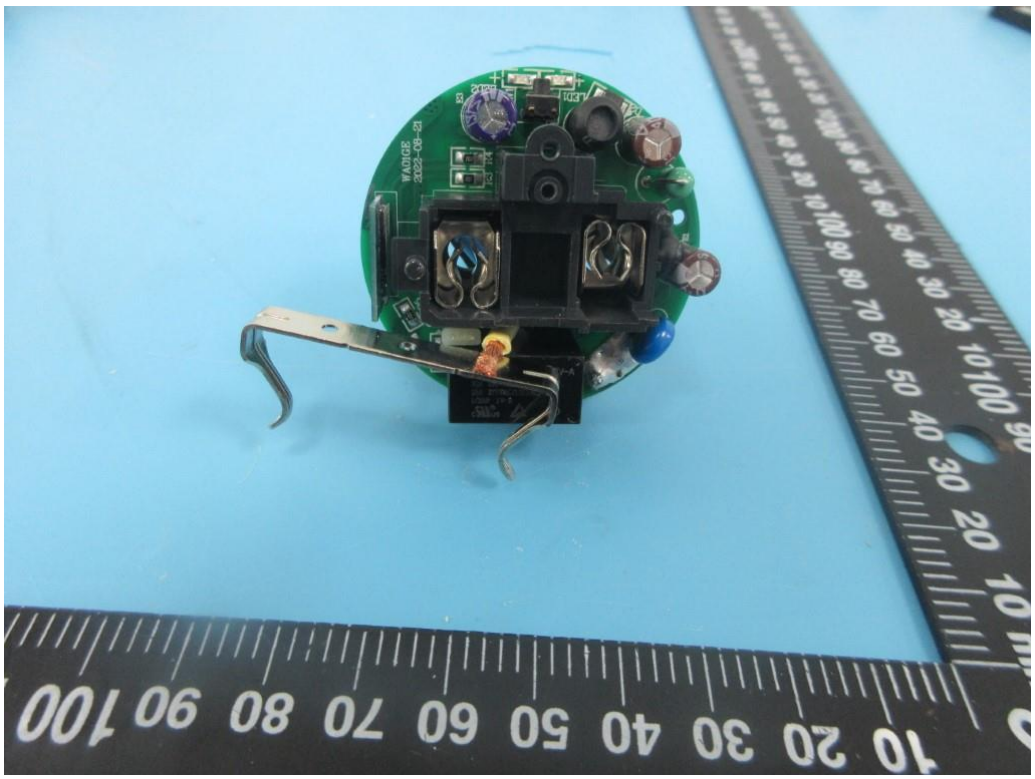

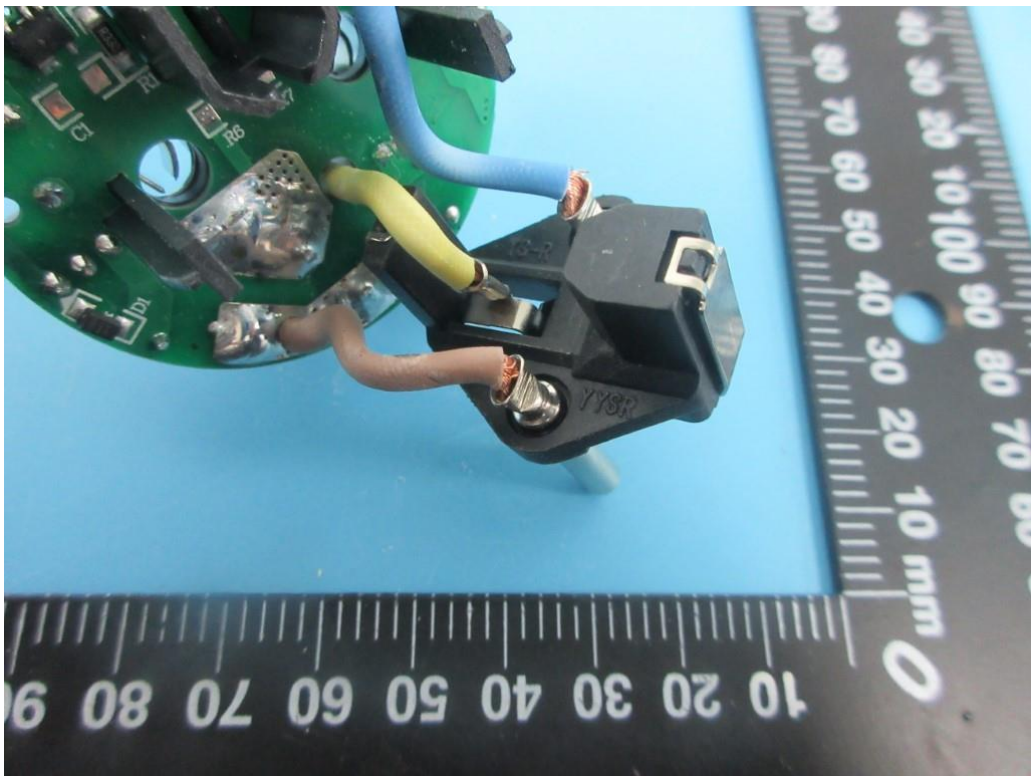

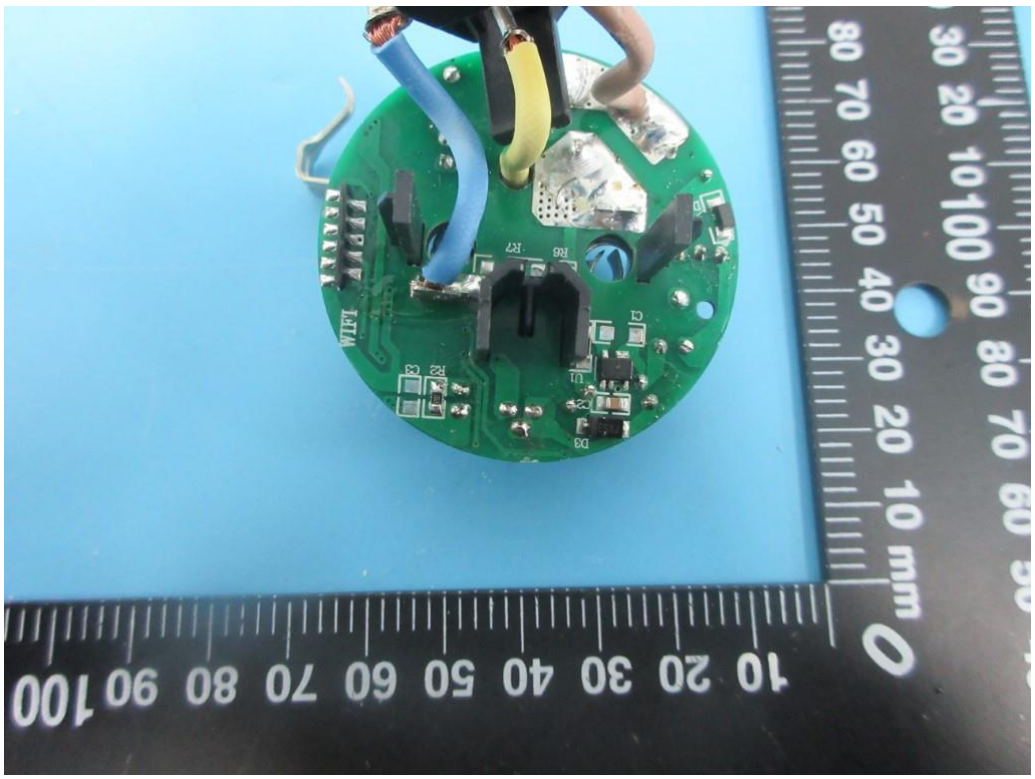

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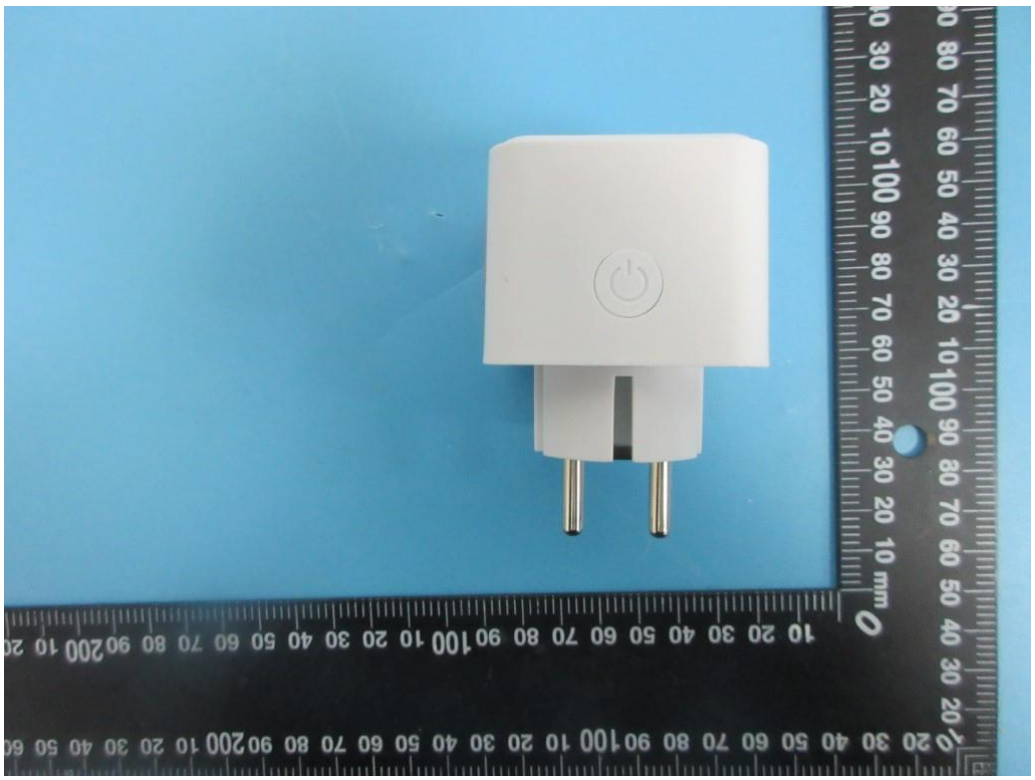

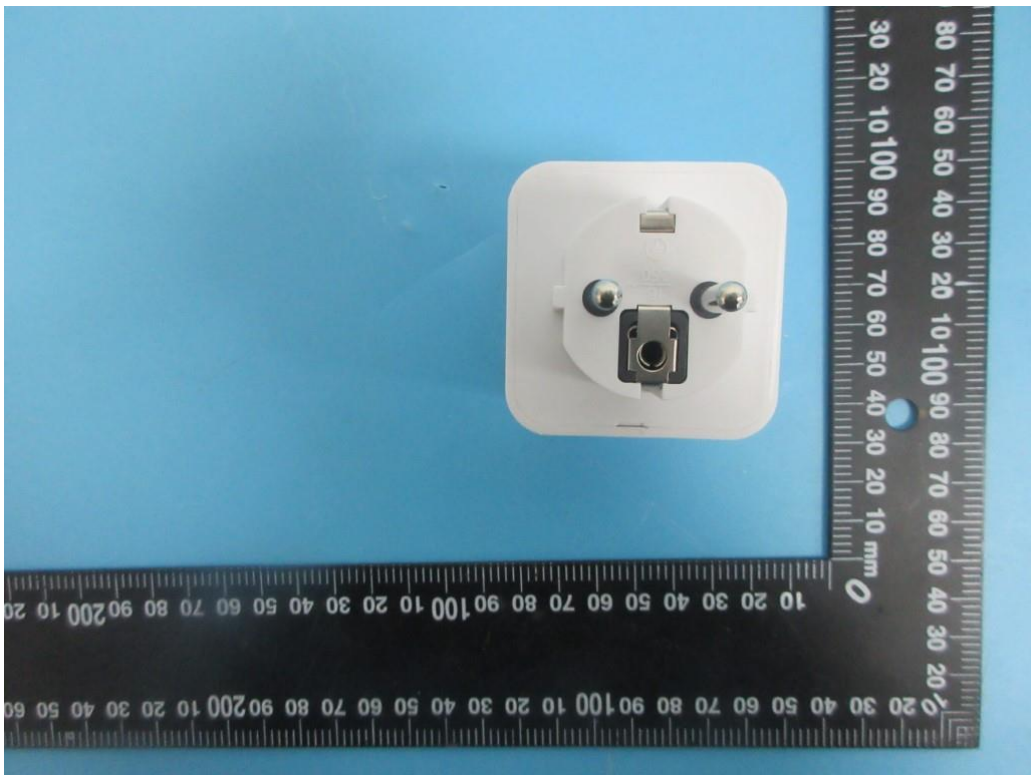

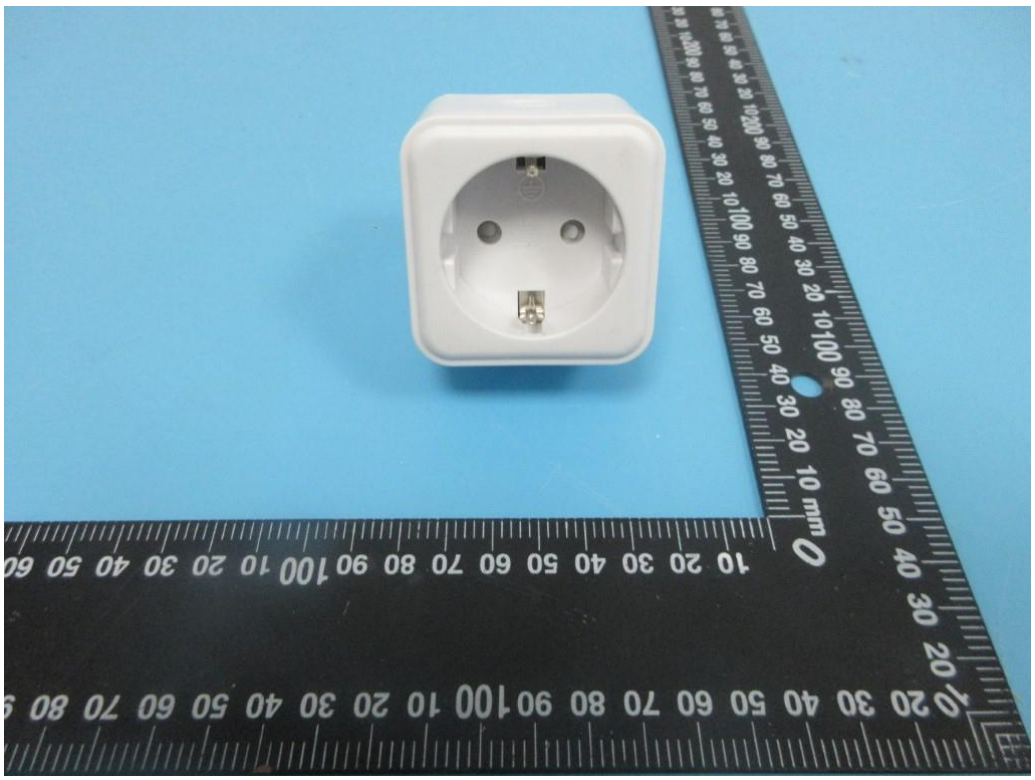

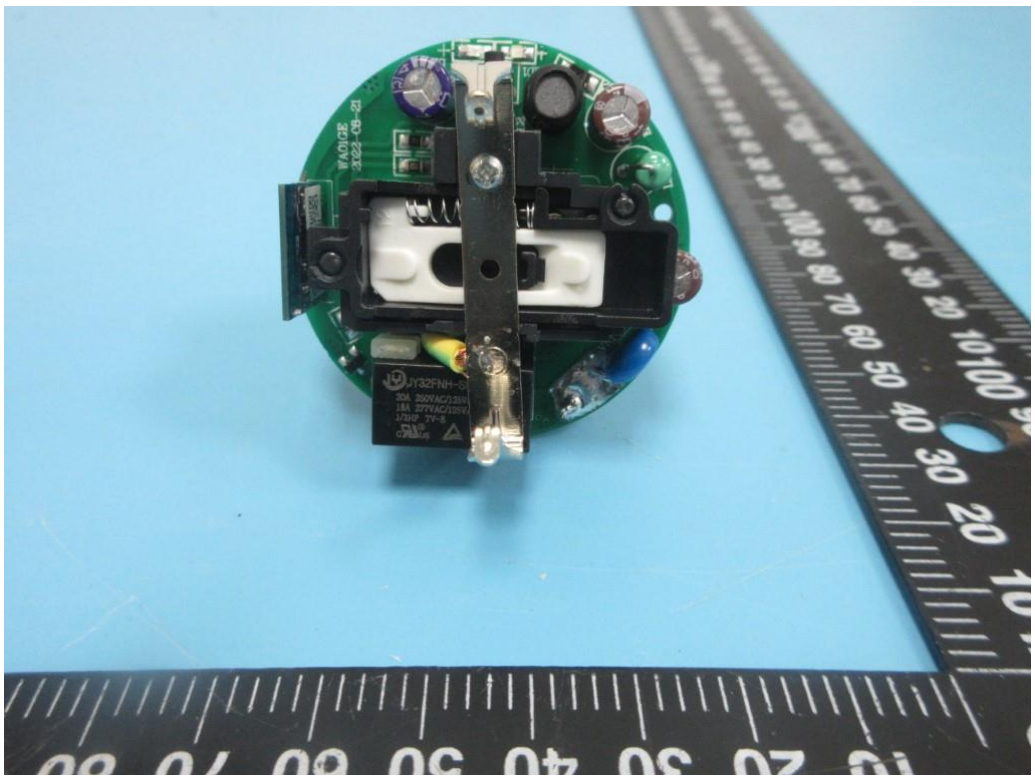

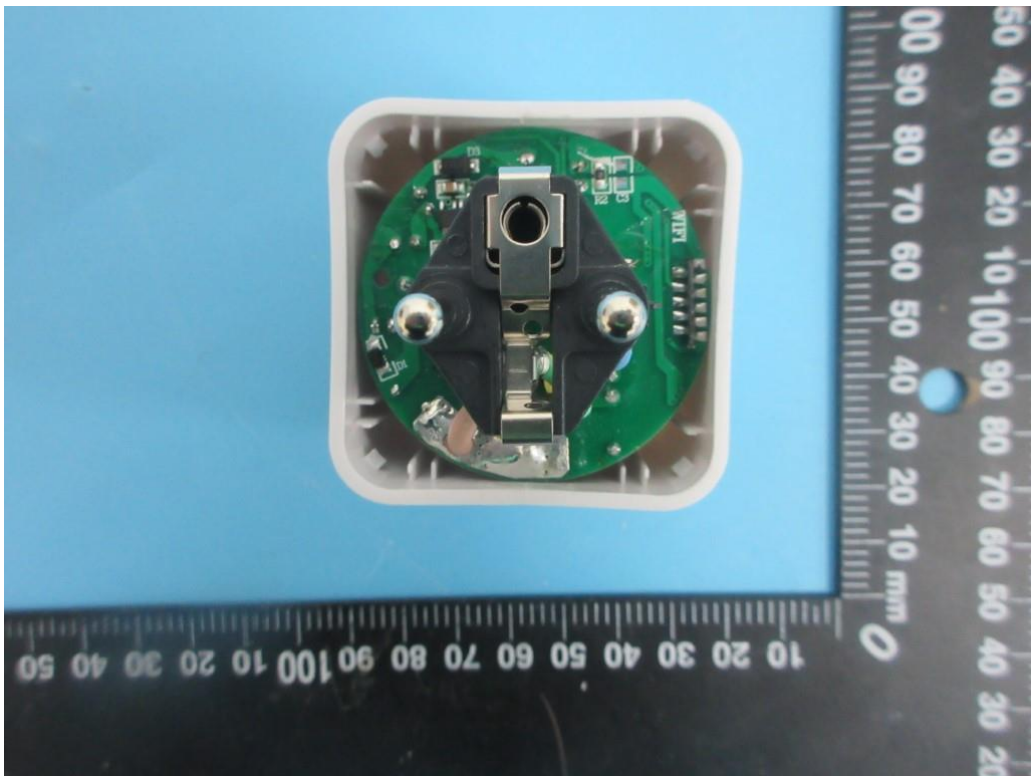

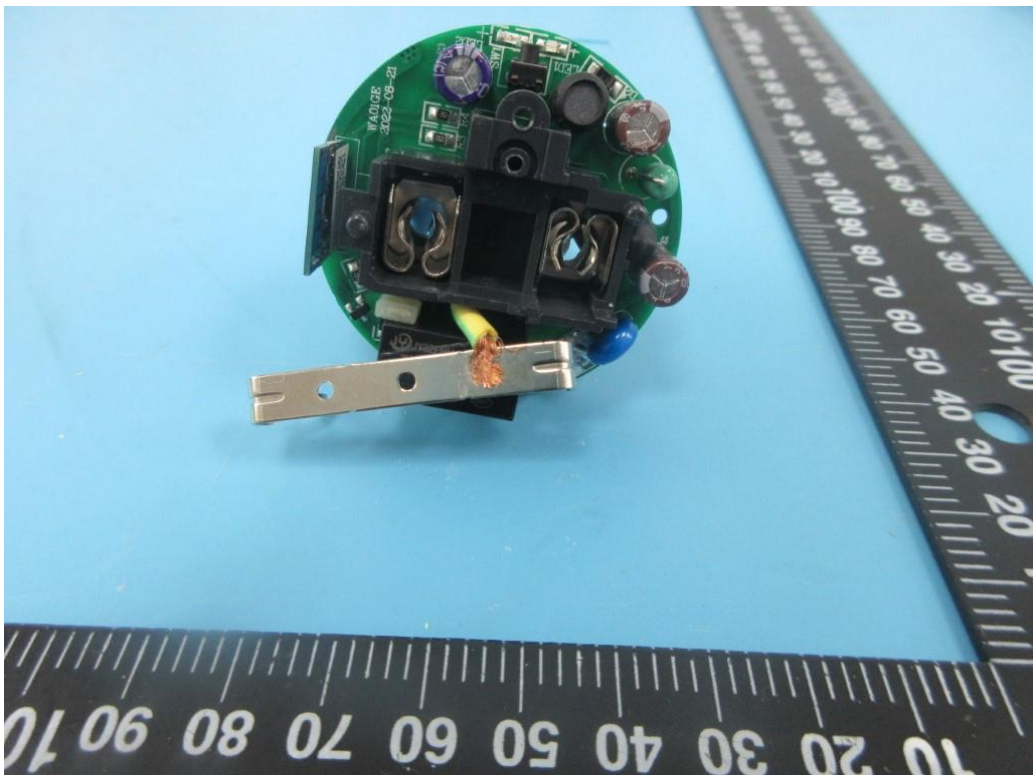

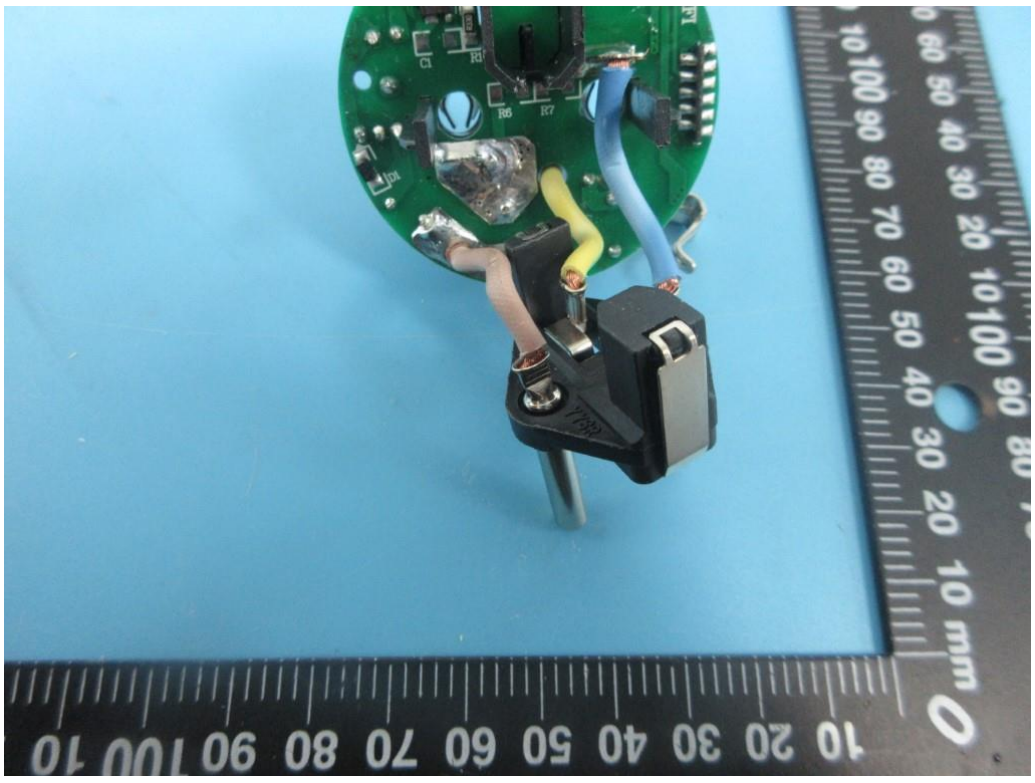

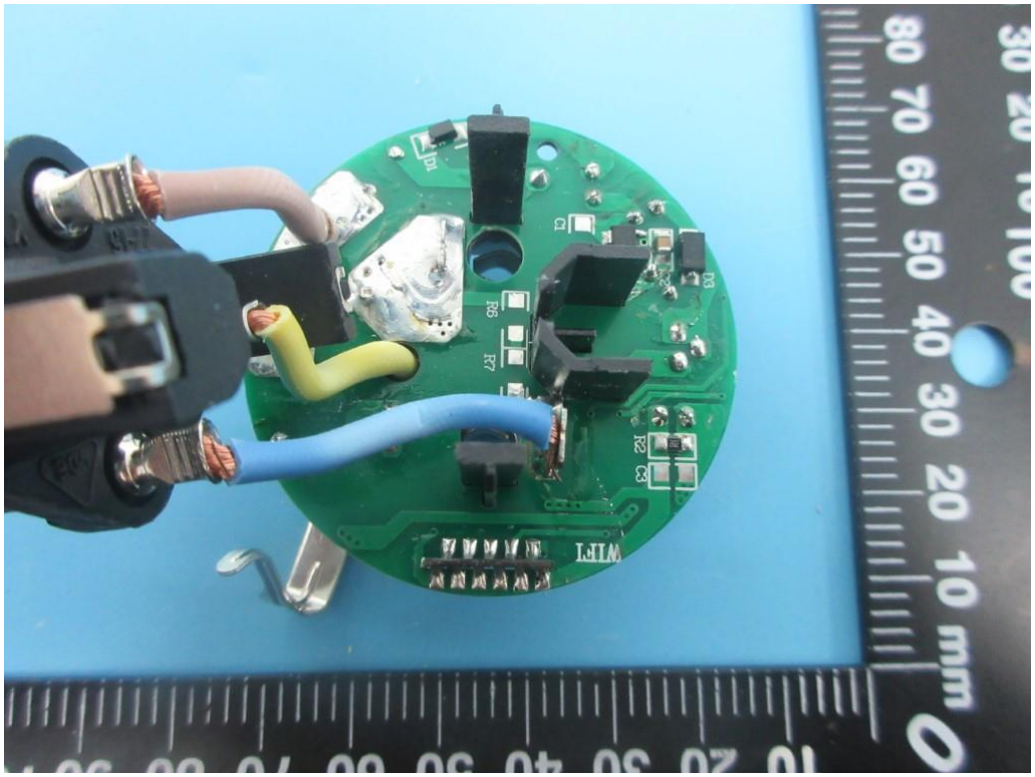

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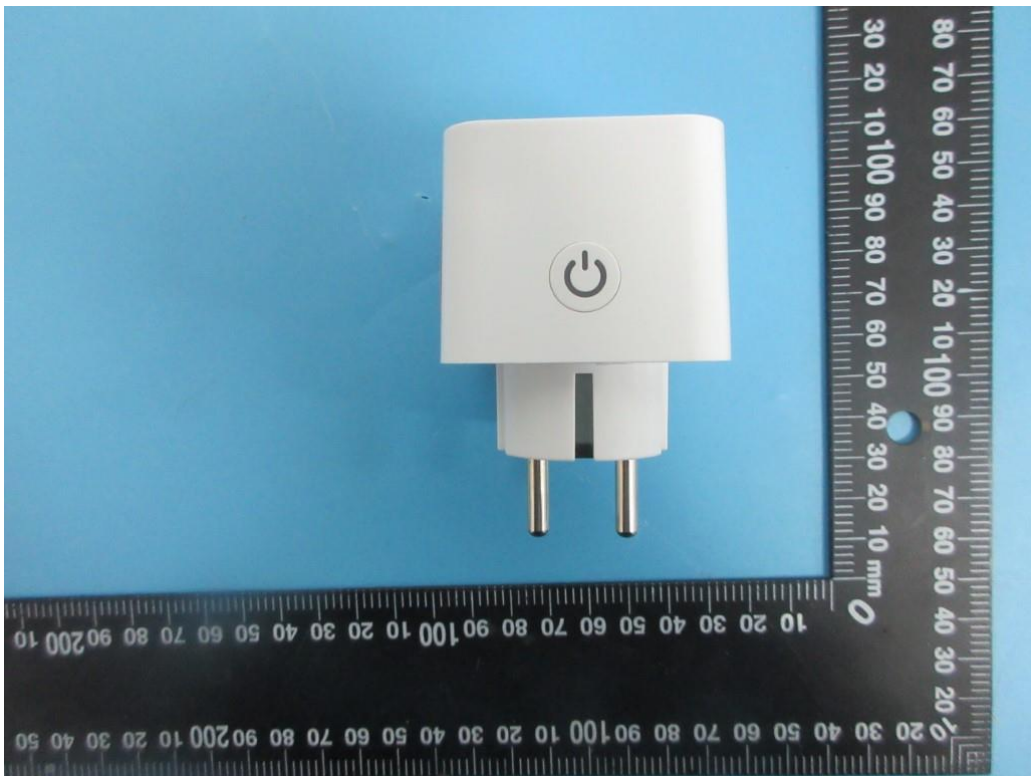
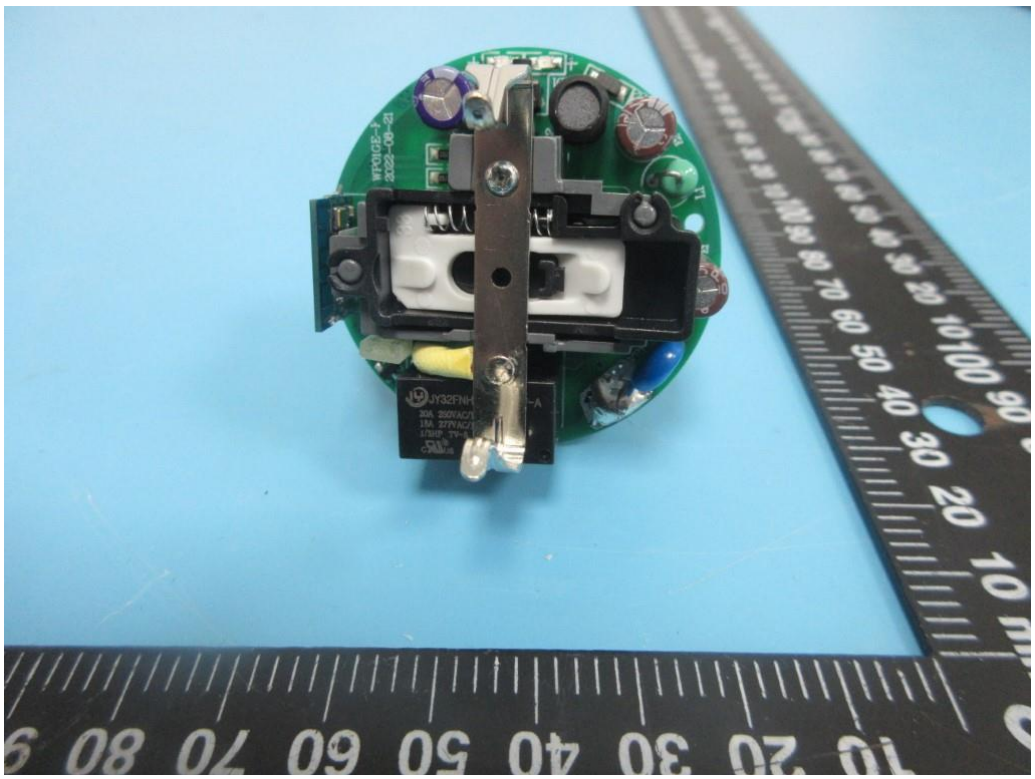
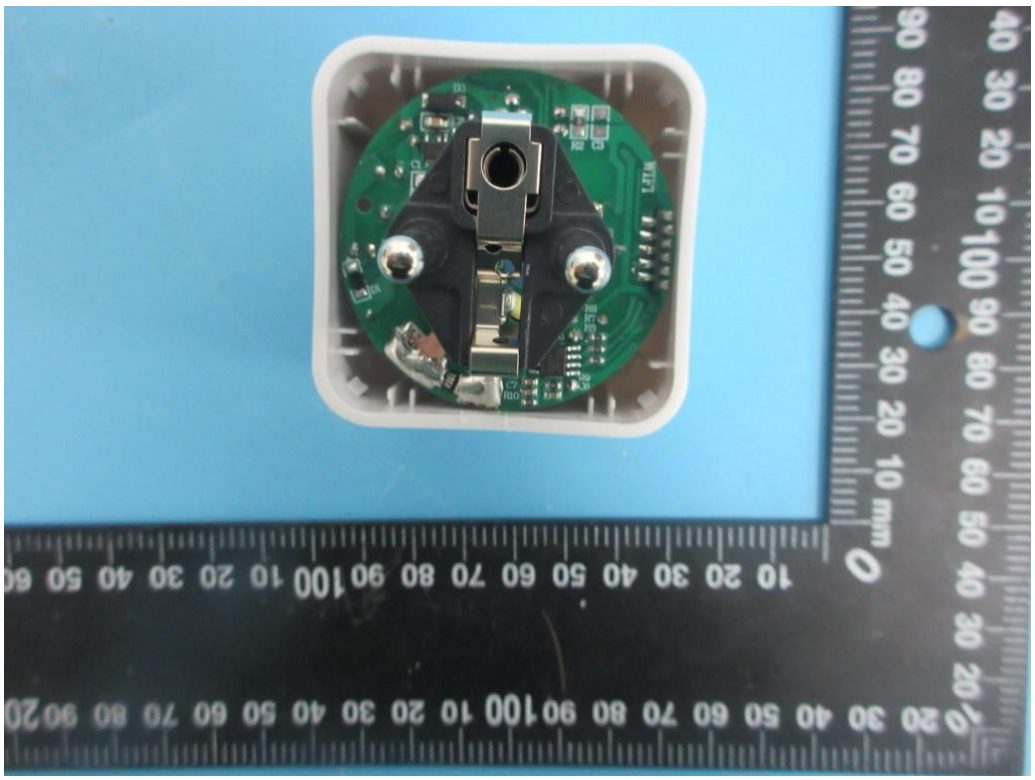
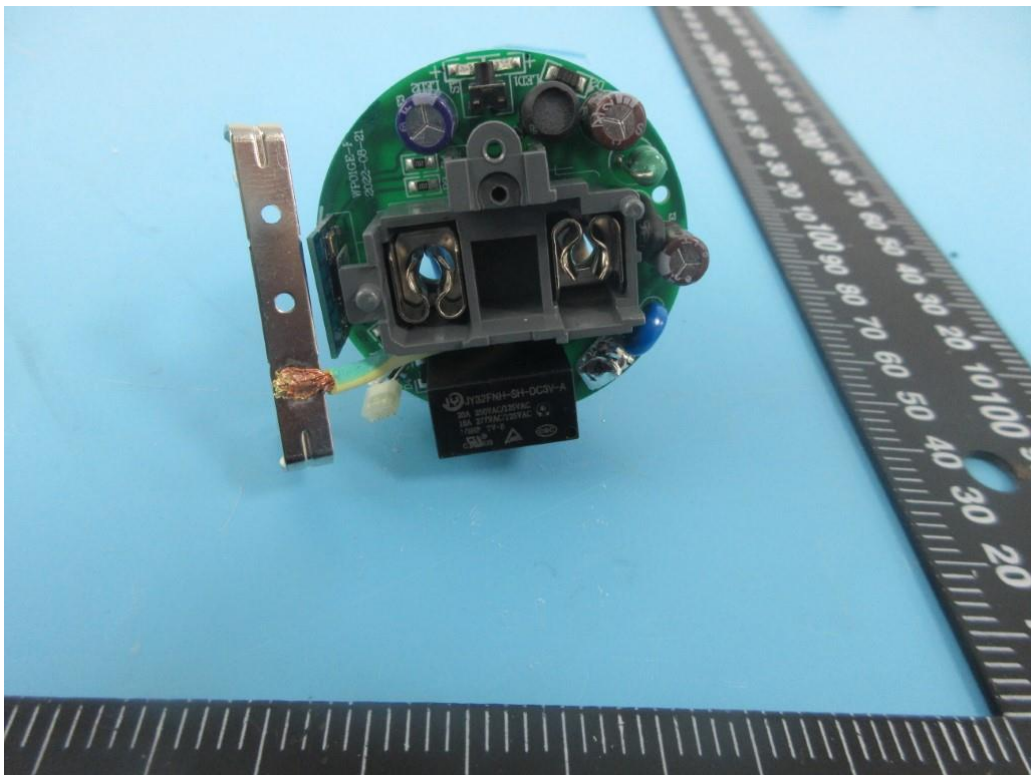
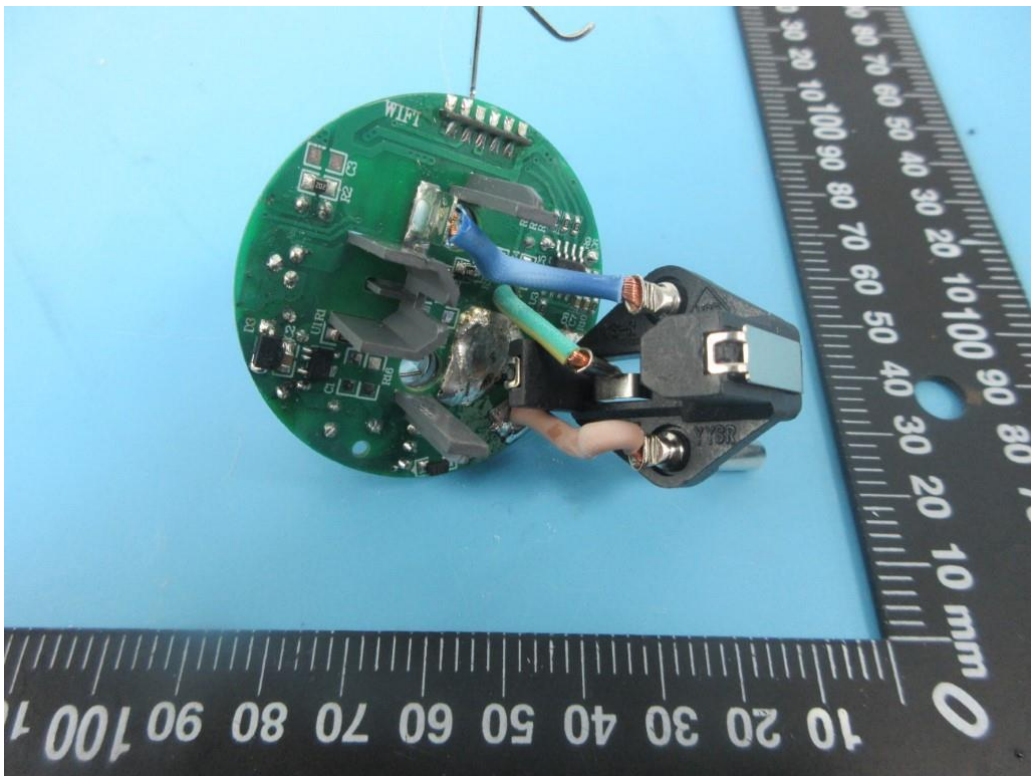
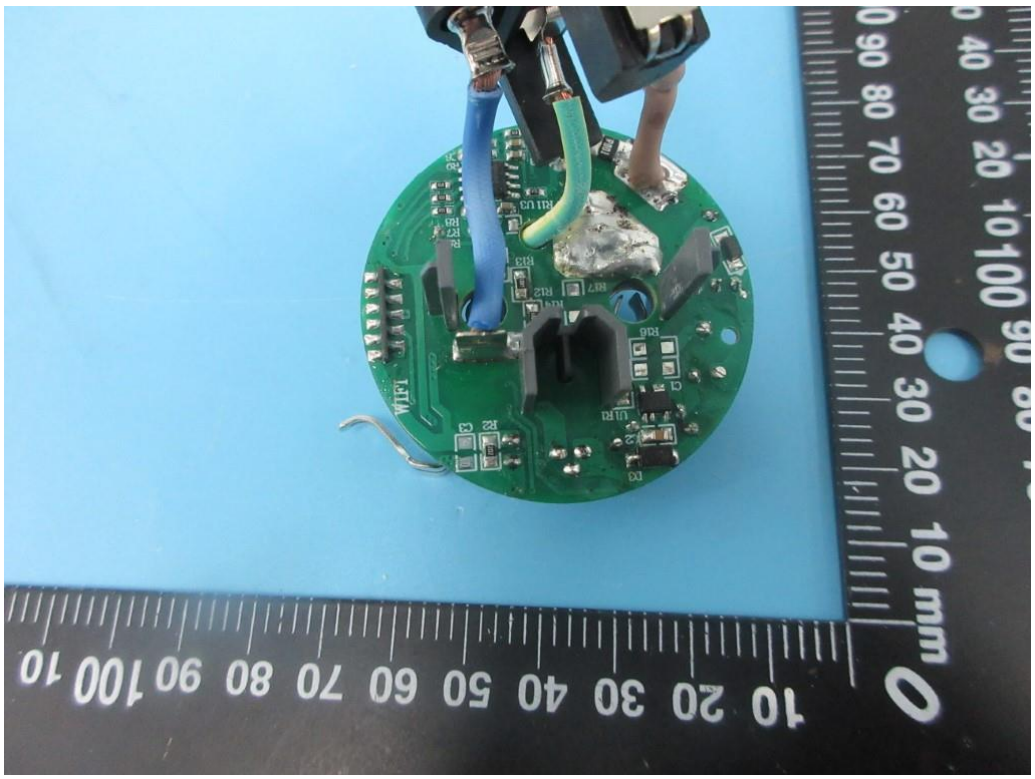




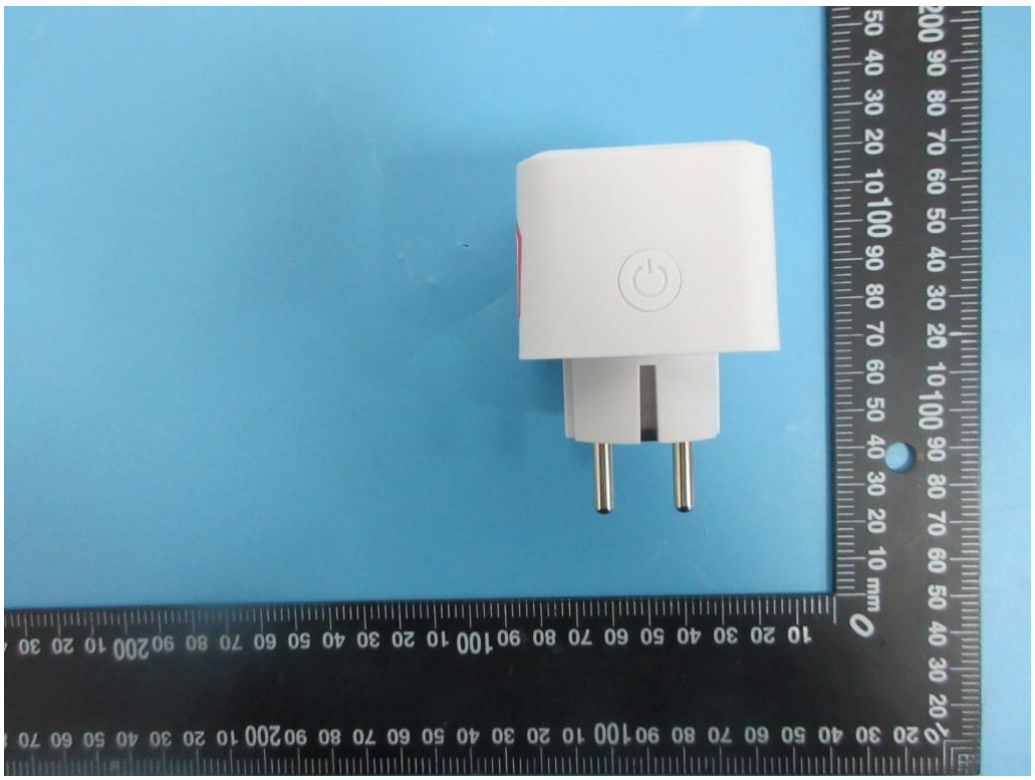


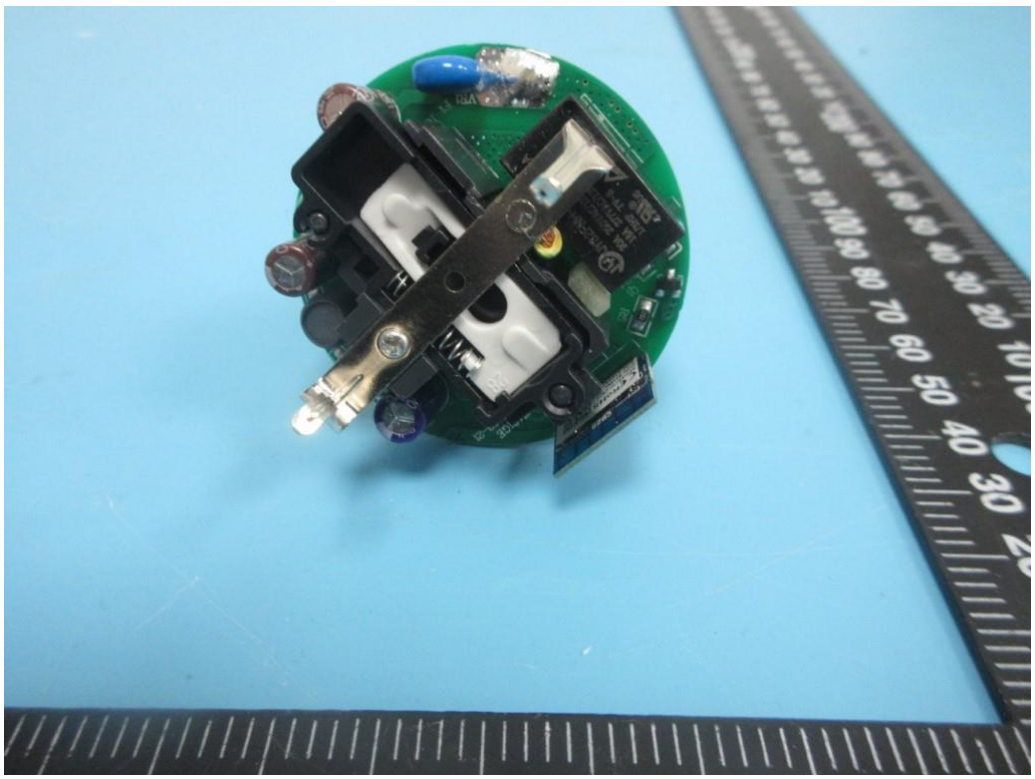


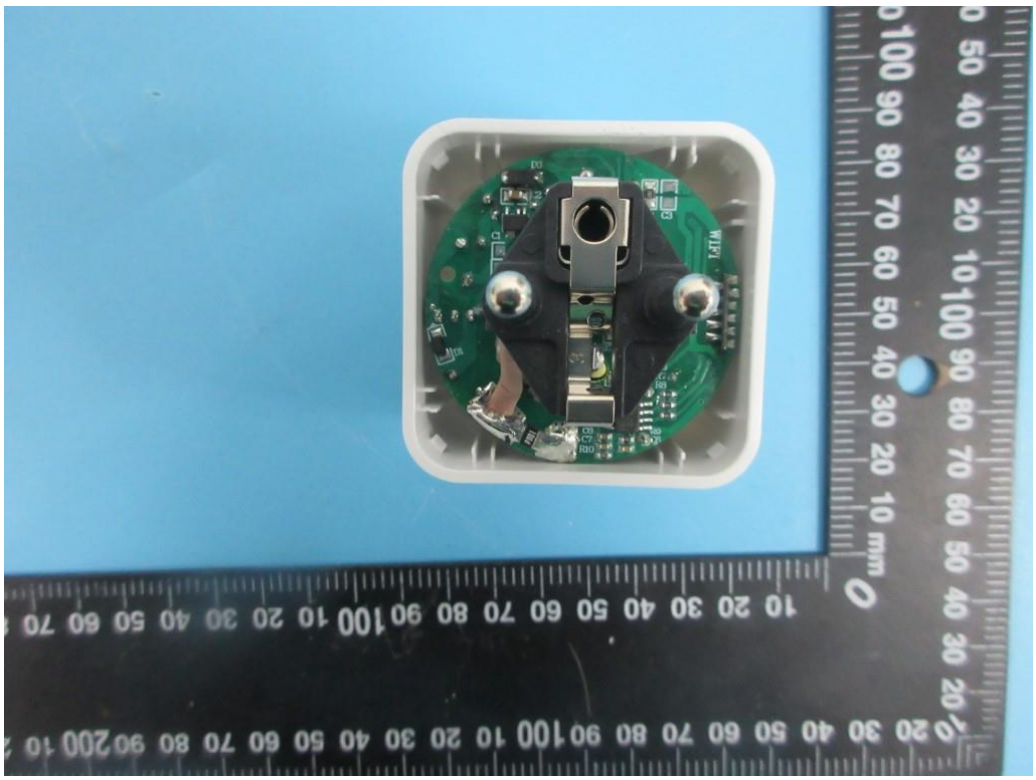

WIFI

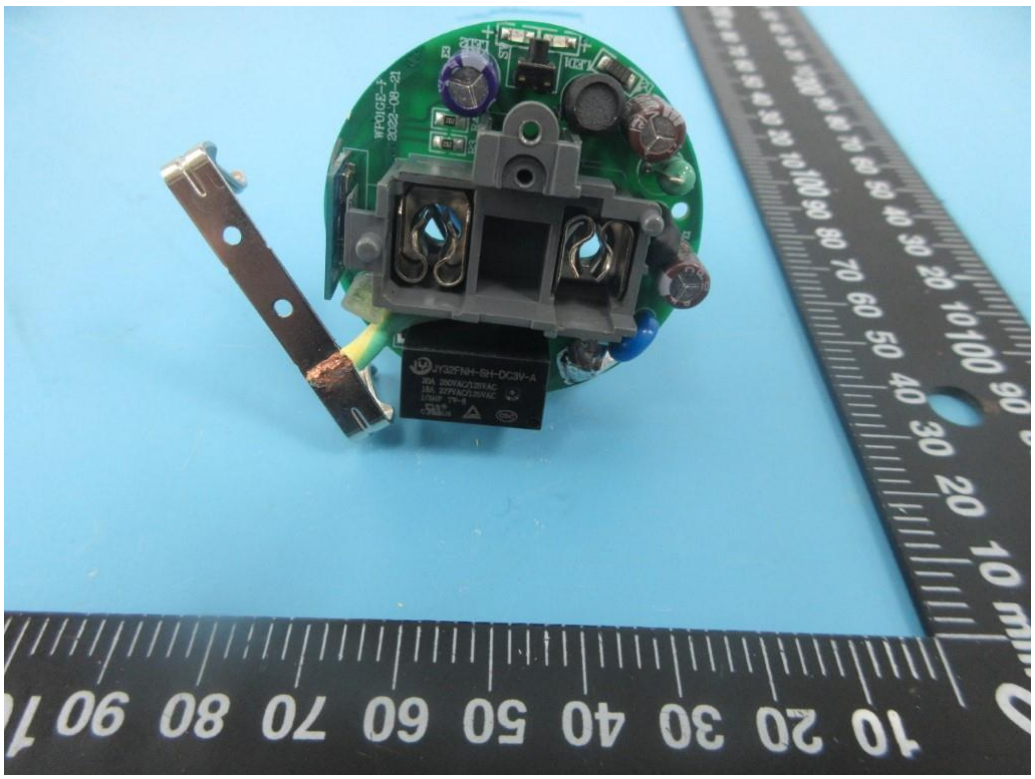


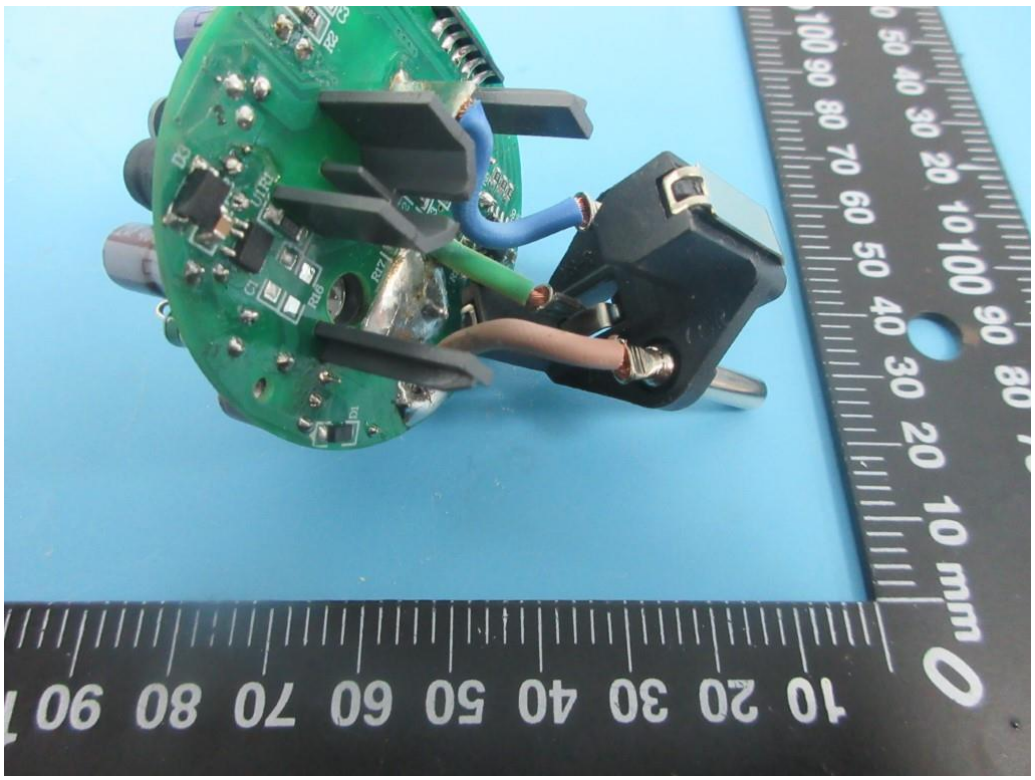
SPL-W-TY-PM-EU-RY-L

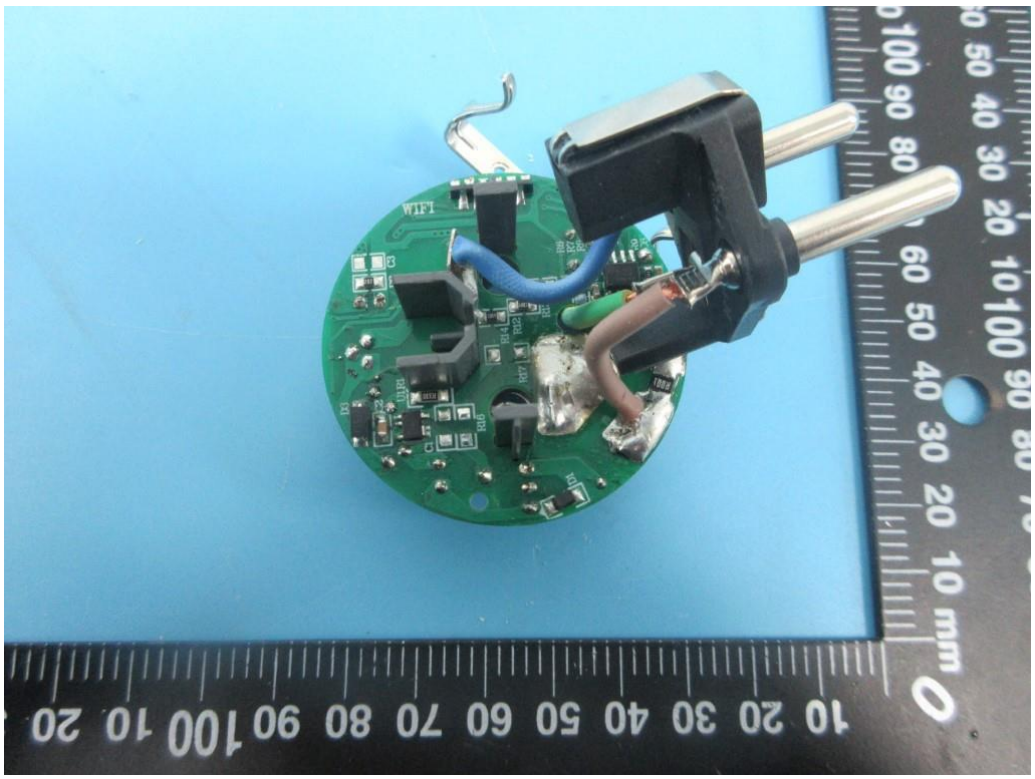











WIFI
mm

Test report no.: *Prüfbericht-Nr.:*	**CN22T0G5 001 part 2 of 2**	**Order No.:** *Auftragsnr.:*	**180246649**	**Page 1 of 54** *Seite 1 von 54*
Client reference no.: *Kunden-Referenz-Nr.:*	**N/A**	**Order date:** *Auftragsdatum:*	**2022-11-11**	
Client: *Auftraggeber:*	ZHEJIANG AMAN LIGHTING CO., LTD. No. 171 North Star-Bridge Road, Yuhang District, Hangzhou, 311100 Zhejiang P.R. China			
Test item: *Prüfgegenstand:*	Smart Plug			
Identification / Type no.: *Bezeichnung / Typ-Nr.:*	SPL-W-TY-EU-RY-C; SPL-W-TY-PM-EU-RY-C; SPL-W-TY-PM-EU-RY; SPL-W-TY-EU-RY; SPL-W-TY-PM-EU-RY-L; SPL-W-TY-EU-RY-L			
Order content: *Auftrags-Inhalt***:**	Type test			
Test specification *Prüfgrundlage:*	EN IEC 61058-1:2018 and EN 61058-1-1: 2016			

Date of sample receipt: *Wareneingangsdatum:*	2022-10-11
Test sample no: *Prüfmuster-Nr.:*	A003232450
Testing period: *Prüfzeitraum:*	2023-10-10 - 2023-11-09
Place of testing: *Ort der Prüfung:*	TÜV Rheinland/CCIC (Ningbo) Co., Ltd.
Testing laboratory: *Prüflaboratorium:*	TÜV Rheinland/CCIC (Ningbo) Co., Ltd.
Test result*: *Prüfergebnis*:*	Pass

tested by: *geprüft von:*	Fan. Xu.	**authorized by:** *genehmigt von:*	Jie Zheng
Date: 2023-05-22 *Datum:*	Signed by: Fan Xu	**Issue date:** 2023-05-22 *Ausstellungsdatum:*	Signed by: Jie Zheng
Position / *Stellung*:	Project Engineer	**Position** / *Stellung*:	Report Authorizer

Other:
Sonstiges: This report was created for the type test of Smart Plug.

Condition of the test item at delivery:
Zustand des Prüfgegenstandes bei Anlieferung: Test item complete and undamaged
Prüfmuster vollständig und unbeschädigt

* Legend:	P(ass) = passed a.m. test specification(s)	F(ail) = failed a.m. test specification(s)	N/A = not applicable	N/T = not tested
* Legende:	P(ass) = entspricht o.g. Prüfgrundlage(n)	F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	N/A = nicht anwendbar	N/T = nicht getestet

V05

Test report no.: **CN22T0G5 001 part 2 of 2** **Page 2 of 54**
Prüfbericht-Nr.: *Seite 2 von 54*

Remarks
Anmerkungen

1	The equipment used during the specified testing period was calibrated according to our test laboratory calibration program. The equipment fulfils the requirements included in the relevant standards. The traceability of the test equipment used is ensured by compliance with the regulations of our management system. Detailed information regarding test conditions, equipment and measurement uncertainty is available in the test laboratory and could be provided on request. *Alle eingesetzten Prüfmittel waren zum angegebenen Prüfzeitraum gemäß eines festgelegten Kalibrierungsprogramms unseres Prüfhauses kalibriert. Sie entsprechen den in den Prüfprogrammen hinterlegten Anforderungen. Die Rückverfolgbarkeit der eingesetzten Prüfmittel ist durch die Einhaltung der Regelungen unseres Managementsystems gegeben.* *Detaillierte Informationen bezüglich Prüfkonditionen, Prüfequipment und Messunsicherheiten sind im Prüflabor vorhanden und können auf Wunsch bereitgestellt werden.*
2	As contractually agreed, this document has been signed digitally only. TUV Rheinland has not verified and unable to verify which legal or other pertaining requirements are applicable for this document. Such verification is within the responsibility of the user of this document. Upon request by its client, TUV Rheinland can confirm the validity of the digital signature by a separate document. Such request shall be addressed to our Sales department. An environmental fee for such additional service will be charged. *Wie vertraglich vereinbart, wurde dieses Dokument nur digital unterzeichnet. Der TÜV Rheinland hat nicht überprüft, welche rechtlichen oder sonstigen diesbezüglichen Anforderungen für dieses Dokument gelten. Diese Überprüfung liegt in der Verantwortung des Benutzers dieses Dokuments. Auf Verlangen des Kunden kann der TÜV Rheinland die Gültigkeit der digitalen Signatur durch ein gesondertes Dokument bestätigen. Diese Anfrage ist an unseren Vertrieb zu richten. Eine Umweltgebühr für einen solchen zusätzlichen Service wird erhoben.*
3	Test clauses with remark of * are subcontracted to qualified subcontractors and descripted under the respective test clause in the report. Deviations of testing specification(s) or customer requirements are listed in specific test clause in the report. *Prüfklausel mit der Note * wurden an qualifizierte Unterauftragnehmer vergeben und sind unter der jeweiligen Prüfklausel des Berichts beschrieben. Abweichungen von Prüfspezifikation(en) oder Kundenanforderungen sind in der jeweiligen Prüfklausel im Bericht aufgeführt.*
4	The decision rule for statements of conformity, based on numerical measurement results, in this test report is based on the “Zero Guard Band Rule” and “Simple Acceptance” in accordance with ILAC G8:2019 and IEC Guide 115:2021, unless otherwise specified in the applied standard mentioned on Page 1 of this report or requested by the customer. This means that measurement uncertainty is not taken in account and hence also not declared in the test report. For additional information to the resulting risk based of this decision rule please refer to ILAC G8:2019. *Die Entscheidungsregel für Konformitätserklärungen basierend auf numerischen Messergebnisen in diesem Prüfbericht basiert auf der "Null-Grenzwert-Regel" und der "Einfachen Akzeptanz" gemäß ILAC G8:2019 und IEC Guide 115:2021, es sei denn, in der auf Seite 1 dieses Berichts genannten angewandten Norm ist etwas anderes festgelegt oder vom Kunden gewünscht. Dies bedeutet, dass die Messunsicherheit nicht berücksichtigt wird und daher auch nicht im Prüfbericht angegeben wird. Zu weiteren Informationen bezueglich des Risikos durch diese Entscheidungsregel siehe ILAC G8:2019.*
5	

Test Report issued under the responsibility of:

TÜVRheinland®

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

Report reference No. ..... :	CN22T0G5 001 part 2 of 2
Date of issue ..... :	See cover page
Total number of pages ..... :	See cover page
Name of Testing Laboratory preparing the Report ..... :	TÜV Rheinland / CCIC (Ningbo) Co., Ltd.
Applicant's name ..... :	ZHEJIANG AMAN LIGHTING CO., LTD.
Address ..... :	No. 171 North Star-Bridge Road, Yuhang District, Hangzhou, 311100 Zhejiang P.R. China
Test specification:	
Standard ..... :	IEC 61058-1:2016
Test procedure ..... :	Type test
Non-standard test method…….. :	N/A
Test Report Form No. ..... :	IEC61058_1G
Test Report Form(s) Originator.... :	Intertek Semko AB
Master TRF ..... :	2018-08-31

This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.

General disclaimer:

The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the Issuing CB Testing Laboratory. The authenticity of this Test Report and its contents can be verified by contacting the NCB, responsible for this Test Report..

Test item description .....:	Smart Plug	
Trademark .....:	**SKYING**	
Manufacturer.....:	Same as applicant	
Model/type reference .....:	SPL-W-TY-EU-RY-C; SPL-W-TY-PM-EU-RY-C; SPL-W-TY-PM-EU-RY; SPL-W-TY-EU-RY; SPL-W-TY-PM-EU-RY-L; SPL-W-TY-EU-RY-L	
Rating .....:	16A 230V~, Max.3680W	
Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):		
☒ **Testing Laboratory..... :**	TÜV Rheinland / CCIC (Ningbo) Co., Ltd.	
Testing location/ address ..... :	3F Building C13, R&D Park, No.32 , Lane 299 Guanghua Road, National Hi-Tech Zone, Ningbo, 315048, P. R. China	
Tested by (name, function, signature) ..... :	See cover page	
Approved by (name, function, signature) ..... :	See cover page	
☐ **Testing procedure: CTF Stage 1:..... :**		
Testing location/ address ..... :		
Tested by (name, function, signature) ..... :		
Approved by (name, function, signature) ..... :		
☐ **Testing procedure: CTF Stage 2:..... :**		
Testing location/ address ..... :		
Tested by (name + signature) ..... :		
Witnessed by (name, function, signature)..... :		
Approved by (name, function, signature) ..... :		
☐ **Testing procedure: CTF Stage 3..... :**		
☐ **Testing procedure: CTF Stage 4..... :**		
Testing location/ address ..... :		
Tested by (name + signature) ..... :		
Witnessed by (name, function, signature)..... :		

Approved by (+ signature)..... :		
Supervised by (+ signature)..... :		

List of Attachments:

N/A

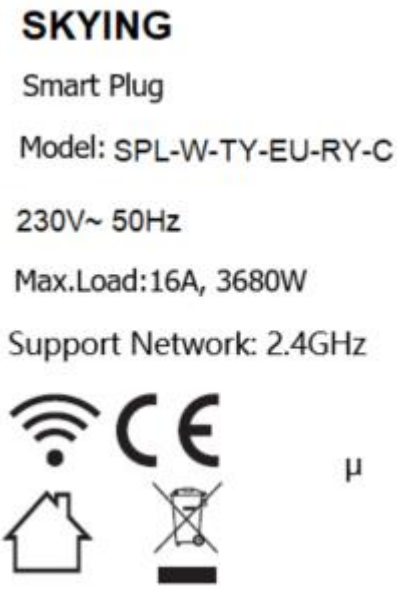
Summary of testing:
All tests passed.

Tests performed (name of test and test clause):	**Testing location:**
1. Full tests; 2. This test report only refers to the tests of wifi controlled switch portion Appendix 1: Additional tests according to IEC 61058-1-1:2016	TÜV Rheinland / CCIC (Ningbo) Co., Ltd. 3F Building C13, R&D Park, No.32 , Lane 299 Guanghua Road, National Hi-Tech Zone, Ningbo, 315048, P. R. China

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

☒ The product fulfils the requirements of EN IEC 61058-1:2018 and EN 61058-1-1: 2016.

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.



Test item particulars.....:	--
Classification of installation and use.....: **Supply Connection .....:**	Portable type Plug
Possible test case verdicts: • test case does not apply to the test object.....: • test object does meet the requirement.....: • test object does not meet the requirement.....:	 N/A Pass (P) Fail (F)
Testing: Date of receipt of test item .....: Date(s) of performance of test.....:	 See cover page 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.

The decision rule for statements of conformity in this test report is based on the “Zero Guard Band Rule” and “Simple Acceptance” in accordance with ILAC G8:2019 and IEC Guide 115:2021, unless otherwise specified in the applied standard mentioned on Page 1 of this report or requested by the customer. This means that measurement uncertainty is not taken in account and hence also not declared in the test report.

Manufacturer’s Declaration per sub-clause 4.2.5 of IECEE 02:

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) .....:	Factory: Hangzhou Sky-Lighting Co., Ltd. Address: No.161 North Star-Bridge Road, Linping, Hangzhou, Zhejiang, 311100 China

General Product Information and other remarks:

See test report Part 1 of 2.

Test items particulars:	
Type reference (*3.1.8 and 3.1.9*) ..... :	☐ unique (U.T.) ☒ common (C.T.)
Type of switch (*3.3.1 to 3.3.9*) ..... :	☒ incorporated ☐ integrated ☐ rotary ☐ lever ☐ rocker ☒ push-button ☐ cord-operated ☐ push-pull ☐ biased switch ☒ other: WIFI controlled
Operation of the switch (*3.4.1 to 3.4.4*) ..... :	☒ **actuation** – of the actuating member by human activity ☐ **indirect actuation** – of the actuating member indirectly ☒ **actuating member** – pulled, pushed, turned or otherwise influenced to cause an operation ☐ **actuating means** – part between the actuating member and the contact mechanism
Connections to the switch (*3.5*) ..... :	☐ external conductor ☒ integrated conductor
Terminals and terminations (*3.6.1 to 3.6.8*) .... :	☐ terminal: ☐ screw type terminal (*7.20.12*) ☐ screw less terminal (*Push-in terminals / 7.20.13*) ☐ termination: ☐ flat quick-connect termination (*7.20.14*) **Tab terminals:** ☐ 2.8 x 0.5 mm ☐ 2.8 x 0.8 mm ☐ 4.7 x 0.5 mm ☐ 4.7 x 0.8 mm ☐ 6.3 x 0.8 mm ☐ 9.5 x 1.2 mm **Female connector:** ☐ 2.3 x 3.8 mm ☐ 2.9 x 6.0 mm ☐ 3.5 x 7.8 mm ☐ 4.0 x 11.1 mm ☐ solder (*7.20.15*) ☐ PCB (*Printed Circuit Board*) ☐ special declared type:
Relating to insulation (*3.7.8 to 3.7.11*)..... :	☐ a class 0 appliance; ☒ a class I appliance; ☐ a class II appliance; ☐ a class III appliance
CTI (V) (*3.7.12*)..... :	N/A
PTI (V) (*Annex C*) ..... :	175
Material group (*20.4.11*) ..... :	☐ I ☐ II ☒ IIIa ☐ IIIb
Pollution, micro inside the switch (*3.8.1*) ..... :	☐ 1 ☒ 2 ☐ 3
Pollution, macro outside the switch (*3.8.2*) ..... :	☐ 1 ☐ 2 ☐ 3
Nature of supply (*7.1.1 to 7.1.3*)..... :	☒ AC ☐ DC ☐ both AC and DC
Type of load – A.C. circuits (*IEC 61058-1-1:2016, Table 102*) ..... :	☒ Substantially resistive ☐ General purpose load ☐ Resistive and/or motor ☐ Circuit for specific load of motor with a locked rotor ☐ Circuit for an inductive load ☐ Resistive and capacitive ☐ Tungsten filament lamp load ☐ Circuit for specific lamp load ☐ Specific declared

Type of load – D.C. circuits. (*IEC 61058-1-1:2016, Table 103*) ..... :	☐ Substantially resistive ☐ Tungsten filament lamp load ☐ Resistive and capacitive load ☐ Circuit for specific lamp load ☐ Declared specific load
Ambient temperature (*7.3*) ..... :	☒ 7.3.1: 0 °C ≤ T ≤ 55 °C(0-35°C,integrated into adaptor) ☐ 7.3.2: not classified as 7.3.1 and 7.3.3 ☐ 7.3.3: accessible member and parts 0 °C ≤ T ≤ 55 °C and other parts of the switch not within 0 °C ≤ T ≤ 55 °C
Ambient temperature, actuating member (°C) :	~~0 °C ≤ T ≤ 55 °C~~
Ambient temperature, other parts (°C) ..... :	~~0 °C ≤ T ≤ 55 °C~~
Number of cycles (*7.4*) ..... :	1E4
IP number (*7.5 and 7.6*) ..... :	IP20
Glow wire temperature (°C) (*7.11*) ..... :	☐ 650 ☒ 750 ☐ 850 ☐ 960
Rated Impulse Voltage U_{imp} (V) (*7.12*) ..... :	2500V
Over voltage category (*7.13*)..... ;	☐ Category I; ☒ Category II; ☐ Category III
Disconnection (*3.4.5 to 3.4.9 and 7.14*) ..... :	☐ disconnection ☒ micro-disconnection ☐ electronic-disconnection ☐ full-disconnection ☐ all-pole disconnection (*7.16.4*) ☐ combination declared
Coating for rigid printed board (*7.15*) ..... :	☐ type 1 ☐ type 2
According to type and/or connection of switches (*7.16*) ..... :	☒ 7.16.1 number of poles: 1 ☒ 7.16.2 number of ways: 1 ☐ 7.16.3 polarity reversal ☐ 7.16.5 number of non-switchable through connections:
Type of circuit (*7.16.6 according to code of switch type given in Table 2*) ..... :	☒ 1.2 ☐ 2.2 [1.2] ☐ 3.2 ☐ 4.2 ☐ 1.3 ☐ 2.3 ☐ 3.3 ☐ 4.3 ☐ 1.4 [1.2] ☐ 2.4 [1.3] ☐ 3.4 ☐ 4.4 ☐ 1.5 [1.2] [1.4] ☐ 2.5 ☐ 3.5 ☐ 4.5 ☐ 1.6 ☐ 2.6 ☐ 3.6 ☐ 1.7 ☐ 2.7 ☐ 3.7 [3.3] ☐ 1.8 ☐ 2.8 ☐ 3.8 ☐ Special ☐ 2.9 ☐ 3.9 [3.3]
According to configuration of switching device Electronic switch with (*7.17.1 – 7.17.5*)..... :	☐ SD without mechanical switching device; ☐ SD with series mechanical switching device; ☐ SD with parallel mechanical switching device; ☐ SD with series and parallel mechanical switching device; ☐ only mechanical switching device without SD. SD to be provided in the end application
Mechanical switch with (*7.17.6 – 7.17.7*) ..... :	☐ or without electronics, which does not impact the safety of the switch; ☒ electronics, which impacts the safety of the switch
According to duty type (*7.18*) ..... :	☒ S1 – continuous duty ☐ S2 – short-time duty with defined ON and OFF ☐ S3 – intermittent periodic duty with defined ON and OFF ☐ as declared for a specific application

Linkage between contact and actuator speed (*7.19*) Speed of contact closure ..... :	☐ or opening is **dependent** on the actuator speed ☒ and opening is **independent** of the actuator speed
According to the type of terminals (*7.20*) for ... :	☐ unprepared conductors (*7.20.1*) ☐ prepared conductors (*7.20.2*) ☐ flexible stranded conductors (7.20.3) ☐ rigid stranded conductors (*7.20.4*) ☐ solid conductors (*7.20.5*)
	☐ conductor size range according to Table 4 (*7.20.6*) ☐ a declared limited conductor size range (*7.20.7*) ☐ only one conductor (*7.20.8*) ☐ the interconnection of two or more conductors (*7.20.9*) ☐ assembling one time (*7.20.10*) ☐ assembling and disassembling more than one time (*7.20.11*) ☐ welding or ridged terminals (*7.20.16*) ☐ wires for connections (*7.20.17*) ☐ piercing conductors (7.*20.18*) ☐ declared by the manufacturer (*7.20.19*)
Type of built in protection (*7.21*)..... :	☐ Built in protection provided; ☒ None provided
Type of forced cooling (*7.22*)..... :	☒ Not requiring forced cooling. ☐ Forced cooling required, with description of forced cooling.
According to the capacitor provided with the switch (*7.23.1 – 7.23.5*) ..... :	☐ Capacitor class X1 ☐ Capacitor class X2 ☐ Capacitor class X3 ☐ Capacitor class Y2 ☐ Capacitor class Y4

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

8	**MARKING AND DOCOMENTATION**		P
8.1	**Switch information**		
8.1.1	The switch manufacturer provide adequate information to ensure that the:		
	• appliance manufacturer can select and install a switch; • end user can use a switch as intended by the switch manufacturer; • corresponding tests can be performed in accordance with this standard		P
	Information is provided in one or more of the following ways, as in Table 3.		
8.1.2	By switch marking.	☒ Ma	P
8.1.3	By documentation.	☒ Do	P
	Documentation available in any suitable format.		P

Table 3 No.	**Switch information** Characteristic	Means of information: ☒ C.T. ☐ U.T.			P
1	**SWITCH IDENTIFICATION**				
1.1	Manufacturer's name or trade mark.				P
1.2	Type reference.				P
2	**SWITCH ENVIRONMENT/MOUNTING**				
2.1	Degree of protection provided for the switch when mounted according to documentation.	IP	20	code of IEC 60529	P
2.2	Degree of protection against electric shock, from outside an appliance.	See page 6 and (*3.7.8 to 3.7.11*).			P
2.3	Method of mounting and actuating the switch.				P
	Method of providing earthing if appropriate.				N/A
	Method(s) of mounting and orientation(s) declared.				P
2.4	Pollution degree micro.	See page 6 and (*3.8.1*).			P
2.5	Pollution degree macro.	See page 6 and (*3.8.2*).			N/A
3	**TEMPERATURE**				
3.1	Ambient temperature limits if ≠ 0 – 55°C.		°C		N/A
4	**ELECTRICAL LOAD / CONNECTION**				
4.1	Rated voltage or voltage range.	230	V		P
4.2	Nature of supply.	AC			P
4.3	Frequency or frequency range.	50	Hz		P
4.4	The rated current and the electrical load type.	See page 3 “*Rating*”.			P
4.5	For switches for more than one circuit, the current applicable to each circuit and to each terminal.				N/A

IEC 61058-1			
Clause	Requirement - Test	Result - Remark	Verdict
	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.	V	N/A
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.	1.2	P
4.10	Configuration of switching device:		P
5	**TERMINALS / CONDUCTORS**		
5.1	All terminals suitably identified		N/A
	☐ or their purpose self-evident ☐ or the switch circuitry visually apparent		N/A
	For terminals intended for the connection of supply conductors, the identification may take the form	☐ of a letter L, ☐ a number ☐ or of an arrow	N/A
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.		N/A
5.4	The type of conductor to be connected to the terminal.	☐ solid, ☐ stranded and/or ☐ flexible	N/A
5.5	The suitability of the terminal for connection of conductors indicated:		
	• maximum conductor diameter	mm	N/A
	• minimum conductor diameter	mm	N/A
5.6	Suitability for interconnection of two or more conductors to terminals.		N/A
5.7	The type of solder terminal mechanical securement before soldering, iron, bath, etc.		N/A
5.8	For terminals with specific connection method, such as:		
	• solder temperatures or process declared		N/A
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:		
	• the appropriate female connector		N/A
6	**OPERATING CYCLES / SEQUENCE**		
6.1	Number of operating cycles.	10 000 cycles	N/A
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.		N/A

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Clause	Requirement - Test	Result - Remark	Verdict
7	**SIGNAL INDICATORS**		
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
8	**CIRCUIT DISCONNECTION**		
8.1 – 8.4	☐ Electronic ☒ Micro ☐ Full ☐ Combination		P
9	**INSULATING MATERIALS**		
9.1	Tracking ☒ PTI or ☐ CTI	175V	P
9.2	Glow-wire temperatures.	750°C	P
10	**COOLING CONDITION**		
10.1 10.2 10.3 10.4 10.5 10.6	☒ Not requiring forced cooling ☐ Requiring cooling ☐ Direction of air for forced cooling ☐ Speed of air for forced cooling ☐ Thermal resistance of heat sink ☐ Incoming temperature, density and other details of the air stream		P
11	**PROTECTIVE DEVICE**		
11.1	Rated current/fusing characteristic/breaking capacity of replaceable built-in protection		N/A
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
12	**TEST CONDITIONS**		
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_{th} (3.2.12)		N/A
8.2	**Symbols** (*when used*)		
	☒ Ampere (A) ☒ Volt (V) ☐ Watt (W) ☐ Volt-amperes (VA) Alternating current (*single-phase*) ☐ ∼ ☒ or a.c. ☐ or ∼a.c. Direct current ☐ ⎓ ☐ or d.c. ☐ or ⎓ d.c.		P
	Tungsten filament lamp load: ⊗		N/A
	Protective earth symbol: ⏚		N/A
	Hertz – Frequency of supply	Hz	50	P
	Number of operating cycles	See 8.5	10000	N/A
	Symbol for micro-disconnection	μ		P

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Clause	Requirement - Test		Result - Remark	Verdict
	☐ “OFF”-position or the direction of actuation to the “OFF” position ☐ “ON”-position or the direction of actuation to the “ON” position			N/A
	Electronic disconnection	ε		N/A
8.3	**Load rating**			
8.3.2	Substantially resistive		16A	P
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			N/A
8.3.6	Declared specific load			N/A
8.3.7	Inductive loads			N/A
8.3.8	General Purpose loads			N/A
8.4	**Temperature rating**			
8.4.1	☐ 25 T 85 (-25 °C up to +85 °C) (*example*) ☐ T 85 (0 °C up to +85 °C) (*example*)			N/A
	If no information is given:			
	• rated ambient temperature range is 0 – 55 °C			P
8.4.2	Switches only partially suitable for a rated ambient temperature > 55 °C:			
	• T85/55 or 25T85/55 (*examples*)			N/A
8.5	**Operating cycles**			
	Information about rated operating cycles by using symbol "E", indicating exponent.		10 000 cycles	N/A
8.6	**Switches intended for use in Class II equipment or appliances**			
	The symbol ⧈ shall not be marked on the switch.			N/A
8.7	**Required marking**			
	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.		No such parts	N/A
	The characteristics may be indicated by symbols (see IEC 60127).			N/A
8.8	**Legibility and durability of marking**			
	The requirements of 8.1 to 8.8 is checked by inspection and by rubbing the marking by hand for 15 s with a piece of cotton cloth:			
	a) soaked with water and			P

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Clause	Requirement - Test	Result - Remark	Verdict
	b) again for 15 s soaked with aliphatic solvent hexane		P
	After these tests, the marking shall still be legible.		P
8.9	**Switches with their own enclosure**		
	• "OFF"-position, clearly indicated		N/A
	Switches with micro-disconnection or electronic disconnection:		
	• not marked with symbol "O" for the "OFF" position		P
	Switches where marking of switch position is impossible or leads to misunderstanding:		
	• direction of actuation(s) is marked		N/A
	Switches having more than one actuating member:		
	• 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
9	**PROTECTION AGAINST ELECTRIC SHOCK**		P
9.1	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:		
	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:		
	• shall not be relied upon to give the required protection against contact with live parts		N/A
	c) Probe B according to IEC 61032 (IEC 60529:1989, Figure 1) jointed test finger is:		
	• applied without force in every possible position		P
	If Probe B is able to enter the opening:		
	• the finger is repeated with an electrical contact indicator to show contact		N/A
	d) Probe 11 according to IEC 61032 straight unjointed test finger is applied:		
	• with 20 N of force to any opening that prevents the entry of probe B		P
	e) Test pin Probe 13 according to IEC 61032 is applied to:		

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Clause	Requirement - Test	Result - Remark	Verdict
	• openings in insulation materials and unearthed metal parts without force in every possible position		P
	It shall not be possible to touch bare live parts.		P
	For switches which have any parts of double insulation construction:		
	• 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		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:		
	The protective impedance shall consist of resistors and/or capacitors comply with one of the following at least:		
	☐ a) 2 independent resistors of the same nominal value in series complying with 24.4; ☐ b) 2 independent capacitors in series, of the same value complying with class Y2 according to IEC 60384-14; ☐ 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:		
	• only by destruction of the switch or by rendering the electronic switch obviously unusable		N/A
	The protective impedances so designed and arranged that along their surfaces and between their surfaces:		
	• the requirements according to Clause 20 are met		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:		
	• protection against contact with live parts assured even after removal of the cover or cover-plate		N/A
	Checked with Probe C according to Figure 3 IEC 61032:1997, through the hole, applying up to 20 N of force.		
	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.		P
9.2	For switches for appliances other than of Class III, actuating members shall be of one of the following types:		
	a) insulating material;		P
	b) metal separated from basic insulated parts by supplementary insulation;		N/A
	c) metal separated from live parts by double or reinforced insulation;		N/A

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Clause	Requirement - Test	Result - Remark		Verdict
	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 kΩ:			
	☐ at rated voltage (and rated load in ON-state) ☐ in ON- and OFF-state ☐ and/or at lowest and highest setting value			N/A
	The current not exceed, in any measurement:			
	• 0,7 mA (*peak*) for a.c. ≤ 1 kHz or 2 mA for d.c.		mA	N/A
	For frequencies > 1 kHz:			
	• the limit of 0,7 mA is multiplied by the value of the frequency in kHz, but shall not exceed 70 mA		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	**PROVISION FOR EARTHING**			N/A
10.1	Switches for Class II appliances:			
	• have no provision for earthing the switch or parts thereof			N/A
	Interconnections for maintaining the earthing circuit are permitted.			N/A
10.2	Earthing terminals, earthing terminations and other earthing means:			
	• not connected electrically to any neutral terminal			N/A
10.3	Accessible metal parts of switches for Class I appliances:			
	• 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:			
	• 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:			
	• 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**.**			
	a) a current of $1.5I_R$ but ≥ 25 A a.c. with ≤ 12 V, passed between the type of used earthing and each of the parts in turn		A	N/A

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Clause	Requirement - Test	Result - Remark		Verdict
	The resistance not exceeding 50 mΩ.		mΩ	N/A
10.5	Earthing terminals of all types for unprepared conductors:			
	• is of a size ≥ required for the corresponding current carrying terminal			N/A
	Not possible to loosen the clamping means without the aid of a tool, and they be adequately locked against unintentional loosening.			N/A
10.5.1	Terminals according to 11.1 and 11.2:			
	• provide sufficient resilience for adequate locking against unintentional loosening			N/A
10.5.2	Switch subjected to excessive vibration or temperature cycling:			
	• special provisions are used			N/A
10.6	Thread-cutting and thread-forming screws may be used to provide earthing continuity;			
	• provided it is not necessary to disturb the connection in normal use			N/A
	• and at least 2 screws are used for each connection (*see tests in 19.2*)			N/A
10.7	All parts of an earthing terminal:			
	• no risk of corrosion			N/A
10.8	The body of an earthing terminal shall be:			
	☐ of brass ☐ or other metal no less resistant to corrosion			N/A
	Unless:			
	☐ it is a part of the enclosure when any screws or nuts be of brass plated steel complying with 19.3 ☐ or other metal no less resistant to corrosion and rusting			N/A
10.9	If the body of an earthing terminal is part of a frame or enclosure of aluminium or aluminium alloy:			
	• precautions taken to avoid risk of corrosion resulting from contact between copper and aluminium or its alloys			N/A

11	**TERMINALS AND TERMINATIONS**	N/A
11.1 11.1.1	**Common requirements to terminals** General	
	Terminals enable a safe and reliable connection for the conductors declared under the conditions of the intended use.	N/A
	Screws and nuts for clamping the conductors:	

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Clause	Requirement - Test	Result - Remark	Verdict
	• shall not serve to fix any other part		N/A
	• they may hold the clamping part in place or prevent it from turning		N/A
	Clamping shall be between metal surfaces except for terminals:		
	• intended to be used in circuits carrying a current ≤ 0,2 A, one of the surfaces may be non-metallic		N/A
11.1.2	Design of terminals		
	• so designed that a suitable conductor may be inserted into the aperture to the designed depth without undue force and undue damage to the conductor and terminal		N/A
11.1.3	Insulation		
	Terminals shall be designed so that there is no reduction of the insulation strength:		
	• when the conductor is attached to the terminal as declared by the manufacturer (*see clause 20*)		N/A
11.1.4	Connection		
	A terminal shall be designed so that a conductor cannot slip out:		
	• while being connected or while the switch is being operated as intended (*checked by TT1*)		N/A
11.2	**Fixing of terminals**		
11.2.1	Terminals shall be fixed so, that they will not work loose:		
	• when the conductor is connected or disconnected		N/A
	The intended removal of a conductor shall require an action other than a pull at the conductor.		N/A
	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 (*flat quick-connect termination*) the tabs shall:		
	• allow the application and withdrawal of female connectors without damage to the switch (*checked by TT2*)		N/A
11.2.2	For terminals declared 7.20.13 (*push in*) in combination with conductors declared unprepared (*7.20.1*):		
	• checked by inspection and 11.8.4		N/A
11.3	**Location and shielding of terminals**		
11.3.1	Terminals shall be located or shielded so that when wires are connected, there:		
	• is no reduction of the insulation strength of the terminals, live parts or to accessible metal parts		N/A
11.3.2	Terminals suitable for the connection of flexible conductors (7.20.3) shall be located or shielded so that:		

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Clause	Requirement - Test	Result - Remark	Verdict
	• there is no risk of contact between live parts and accessible metal parts		N/A
11.3.3	For 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 inspection and for stranded wires by TT3*)		N/A
11.4	**Terminals for interconnection of more than one conductors**		
	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 (*checked by inspection and TT4*)		N/A
11.5	**Thermal stress**		
	Terminals shall withstand thermal stress occurring in normal use.		
	Checked according to TE2 in Clause 17 of .....:	☒ IEC 61058-1-1:2016 or ☐ IEC 61058-1-2:2016.	P
11.6	**Test sequences**		
	Depending on terminals allowing the connection of prepared or unprepared conductors:		
	• the tests are conducted according Table 5 in the sequence with increasing TT-number	See table 5.	N/A
11.7	**Conductor escape test (TT1)**		
	Conductors as declared by the manufacturer.	mm²	N/A
	Or of **maximum** cross sectional areas in Table 4.	See table 4.	N/A
	The conductor is inserted into the terminal over a length equal to the minimum distance prescribed.		N/A
	Or, if no distance is prescribed, until an end-stop is reached.		N/A
	Or until the conductor just projects from the far side of the terminal and in the position most likely to assist a strand to escape.		N/A
	Test is repeated with the terminal fitted with conductors as declared.	mm²	N/A
	Or of **minimum** cross sectional area in Table 4	See table 4.	N/A
	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:		
	• the wires are straightened		N/A
	Terminals declared for stranded conductors (7.20.3 or 7.20.4), these are twisted:		

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Clause	Requirement - Test	Result - Remark	Verdict
	• in one direction, so a twist of one complete turn in a length of approximately 2 cm is obtained		N/A
	Terminals declared screw type terminals (7.20.12) these are:		
	• 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):		
	• 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:		
	• no test is necessary		N/A
	After the test, the conductor shall not have:		
	• escaped into or through the gap between the clamping means and retaining device		N/A
11.8	**Terminal displacement test (TT2)**		
11.8.1	Connection test		
	A conductor connected and disconnected 10 times using the parameters of TT1, if no test according to 11.8.2 is required.		N/A
	Terminals declared for only one time connection (7.20.10), test is not required.		N/A
	After the test the terminal:		
	• have not displaced from its intended position		N/A
11.8.2	Screw-type terminal		
	a) is fitted with a conductor of the **smallest**	mm²	N/A
	or **declared** cross sectional area as in Table 4	See table 4.	N/A
	The terminal screw being tightened with a torque as specified 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 is 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.	N	N/A
	d) Repeat a) to c) with the **largest** wire size.	mm²	N/A
	Terminals declared for the connection of two or more conductors (7.20.9):		
	• the test is repeated with the terminal fitted with the declared number of conductors		N/A
	Terminals declared suitable for two or more conductors (7.20.9):		
	• the appropriate pull is applied consecutively to each conductor		N/A
	During the test:		

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Clause	Requirement - Test	Result - Remark		Verdict
	• 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:			
	• checked by applying the axial forces without jerks to the tab equal to those specified in **IEC 61210:2010, Table 6 (*retention force*)**		N	N/A
	No significant displacement or damage shall occur.			N/A
11.8.4	Push in terminals.			
	Conductors fitted as **declared** by the manufacturer.		mm²	N/A
	Or of **maximum** cross sectional areas as in Table 4.	See table 4.		N/A
Step a)	• Insert of the conductor into the terminal.			N/A
Step b)	• Twist through 90° in an axial direction.			N/A
Step c)	• Apply a pull force in opposite to direction of insertion as in Table 6; without jerks, for 1 min.		N	N/A
Step d)	• Disconnect the conductor by the designed disconnect means other than a pull on the conductor only.			N/A
Step e)	• New conductor for each of the next 3 insertions indicated above.			N/A
Step f)	• At the 5th insertion, the conductor for the 4th insertion is reused.			N/A
	The test repeated with the terminal fitted with conductors as **declared**.		mm²	N/A
	Or of **minimum** cross sectional area according to Table 4.	See table 4.		N/A
	Compliance of the test:			
	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
11.9	**Strand escape test (TT3)**			
	The insulation from the end of a stranded conductor having the **minimum** or **declared** cross sectional area as in Table 4 is removed for a length of 8 mm.	See table 4.		N/A
	One strand of the flexible conductor is separated and left free.			N/A
	The remainder are fully inserted into the terminal and clamped.			N/A
	Terminals declared for unprepared stranded conductors 7.20.3 and 7.20.4:			

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Clause	Requirement - Test	Result - Remark		Verdict
	The free strand shall be bent without tearing the insulation back and without making sharp bends in every possible direction.			N/A
	The free strand of the flexible conductor shall not touch relevant parts mentioned in 11.3.			N/A
	The free strand of a flexible conductor connected to an earthing terminal shall not touch any live part.			N/A
11.10	**Multiple conductors (TT4)**			
	Conductors fitted as **declared** by the manufacturer.		mm²	N/A
	Or of **maximum** cross sectional areas as in Table 4	See table 4.		N/A
	For conductors classified 7.20.13, perform steps a) to c) of TT2 Clause 11.8.4.			
Step a)	• Insert the conductor into the terminal, either as far as possible or insert so that adequate connection is obvious.			N/A
Step b)	• Twist it through 90° in an axial direction.			N/A
Step c)	• Apply a pull force in opposite to direction of insertion as in Table 6; applied without jerks, for 1 min.		N	N/A
	For conductors classified 7.20.12 perform steps a) to c) of TT2 Clause 11.8.2.			
	a) The screw-type terminal is fitted with a conductor of the **smallest** or **declared** cross sectional area as in Table 4	See table 4.		N/A
	The terminal screw being tightened with a torque as specified 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 is 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.		N	N/A
	Compliance of the test:			
	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

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Clause	Requirement - Test	Result - Remark	Verdict
12	**CONSTRUCTION**		P
12.1 12.1.1	**Constructional requirements relating to protection against electric shock** When double insulation is used the design shall be such that the:		
	• basic and the supplementary tested separately		N/A
	Unless compliance to the properties of both insulations is provided in another way:		
	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:		
	• 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:		
	☒ not expected that two independent fixings will become loose at the same time ☐ parts fixed by screws or nuts provided with locking washers not liable to become loose ☐ 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		P
12.1.3	Integrated conductors is rigid and fixed,		P
	• or insulated that creepage distances and clearances not reduced below values in Clause 20		P
	Insulation, if any, shall be such that it cannot be damaged during mounting or in normal use.		P
	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		N/A
12.1.4	Full disconnection or micro-disconnection can only be achieved using a:		
	• series mechanical contact		P
12.1.5	Electronic disconnection is formed by any parallel components or path across a series contact		N/A
	• or when no mechanical contact is provided in the switch		N/A

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Clause	Requirement - Test	Result - Remark	Verdict
12.2	**Constructional requirements relating to safety during mounting and normal operation of the switch**		
12.2.1	Covers, cover plates, removable actuators and the like cannot be displaced or removed except by use of a tool.		P
	Fixings for a cover or cover plate do not serve to fix any other part except an actuating member.		P
	Not possible to mount removable parts, such that indication of switch positions does not correspond with the actual switch position.		N/A
12.2.2	Fixing screws of covers or cover plates captive.		N/A
12.2.3	Switch not damaged when its actuating member is removed as intended.		P
12.2.4	Pull-cord insulated from live parts.		N/A
	Possible to fit or to replace it without removing parts causing live parts to become accessible.		N/A
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 ±10 % of marked U_L or U_N.	253 V	P
12.3	**Constructional requirements relating to the mounting of switches and to the attachment of cords**		
12.3.1	Methods of mounting do not adversely affect compliance with this standard.		N/A
	Switch cannot rotate, or be displaced, and be removed from an appliance without the aid of a tool.		N/A
	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:		
	• indicate an obvious method for insertion and disconnection of the conductors		N/A
	The intended disconnection of a conductor shall require an operation:		
	• 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:		
	• be clearly distinguishable from the opening for the conductor		N/A

13	**MECHANISM**	P
13.1	For DC switches with a voltage rating above 28 V dc in combination with a current rating above 0,1 A**:**	

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Clause	Requirement - Test	Result - Remark	Verdict
	• the speed of contact making and breaking shall be independent of the speed of actuation		N/A
13.2	A switch with an intermediate position shall:		
	• not create an unintended operation		N/A
13.3	When the actuating member is released		
	☒ it take automatically or stay in the position corresponding to the moving contacts ☐ except only one rest position		P
13.4	Cord-operated switch (pull cord) shall be constructed so that, after actuating the switch and releasing the cord:		
	• 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

14	**PROTECTION AGAINST INGRESS OF SOLID FOREIGN OBJECTS, INGRESS OF WATER AND HUMID CONDITIONS**			P
14.1	**Protection against ingress of solid foreign objects**			
	Degree of protection as in 13.3 of IEC 60529.			P
	Detachable parts are removed.			N/A
	Switch which relies on mounting for the declared degree of protection:			
	• mounted in or on a closed box to simulate the appliance • tests performed using this simulated assembly			N/A
	For numerals 5 and 6:			
	• test carried out according to category 2 with the specimen in the most unfavourable position to the manufacturer's declarations for a period of 8 h			N/A
	During the 8 h the specimen loaded alternatively 1 h with the maximum I_R and 1 h without current.		A	N/A
	For the test for first characteristic numeral 5, the switch comply if:			
	• all actions function as declared			N/A
	• $\triangle t$ at the terminals $\leq$ 55 K tested as in 16.2 at I_R and at 25 $\pm$ 10°C		K	N/A
	• dielectric strength of 15.3 with no humidity treatment before application of test voltage 75 % of the test voltage in 15.3		V	N/A

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Clause	Requirement - Test	Result - Remark		Verdict
	• no transient fault between live parts and earth metal, accessible metal parts, or actuating members has occurred			N/A
	Test for 1st characteristic numeral 6, no deposit of dust is inside the switch at the end of the test.			N/A
14.2	**Protection against ingress of water** 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.			N/A
	Switches kept at 25 ± 10 °C for 24 h before being subjected to the test.		°C	N/A
	The test is carried out according to IEC 60529 as follows:			
	☐ IPX1 – IPX2 switches as in 14.2.1 – 14.2.2 with **the drain holes open** ☐ IPX3 – IPX9 switches as in 14.2.3 – 14.2.9 with **the drain holes closed**			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.			N/A
	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:			
	• aged in a heating cabinet with an atmosphere having the composition and pressure of the ambient air and ventilated by natural circulation			N/A
	d) Switches **without T-rating** (*7.3.1*), kept in the cabinet at a temperature of 70 ± 2 °C for 240 h		°C	N/A
	Switches **with T-rating** (*7.3.2*), kept in the cabinet at a temperature of T + 30 °C for 240 h		°C	N/A
	Switch according to 7.3.3, the “T” equals the lower of the two values following the letter T in 8.4.2.		°C	N/A
	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.	See table 11.		N/A
	Fixing screws for enclosures are tightened with a torque as in Table 10.	See table 10.		N/A
	e) Immediately after ageing, the parts are taken out of the cabinet and left at 25 ± 10 °C, avoiding direct daylight, for at least 16 h		°C	N/A
	f) Switch which relies on mounting for the declared degree of protection:			
	• mounted in or on a closed box to simulate the appliance			N/A

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Clause	Requirement - Test	Result - Remark		Verdict
	• tests performed using this simulated assembly			N/A
	g) For tests of 2nd 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	N/A
	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
14.3	**Protection against humid conditions**			
	Cable inlet openings and drain-holes left open. Drain-hole for a water-tight switch is opened.	☐ Yes ☐ No ☒ N/A ☐ Yes ☐ No ☒ 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.	☐ Yes ☐ No ☒ 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:			
	• completed within 2 h under ambient conditions			P
	The switch does not show any damage			P

15	**INSULATION RESISTANCE AND DIELECTRIC STRENGTH**		P
15.1	**General requirements.**		
	Checked by the tests of 15.2 and 15.3, immediately after test of 14.3.		P
	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:		
	• 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
15.2	**Measurement of insulation resistance**		
	The insulation resistance is measured with a DC voltage of ~ 500 V applied, being made 60 s after application of the voltage.		P

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Clause	Requirement - Test	Result - Remark	Verdict
	The insulation resistance not less than specified in Table 7.	See table 7.	P
15.3	**Insulation test voltage**		
	The test voltage raised uniformly from a value not greater than the rated U_n to the value specified in Table 8 within not more than 5 s and held at that value for 60 s.	See table 8.	P

16	**HEATING**			P
16.1	**General requirements**			
	Switches shall be constructed so that they do not attain excessive temperatures in normal use.			P
	The materials used shall be such that the performance of the switches is not adversely affected by operation in normal use at the rated temperature of the switch.			P
16.2	**Contacts and terminals**			
	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.			
	Compliance is checked by Clause 17.			P
16.3	**Other parts**			
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 (*checked/verified on data provided by switch manufacturer*)			P
16.4	**Heating test**			
	Unless declared otherwise, the test is carried out on 3 specimens mounted as declared by the manufacturer.			
	a) Conductors of an approximate length of 1 m, are fitted to the terminals or leads.			N/A
	The cross-sectional area as declared.		mm²	N/A
	Or specified in Table 4 “medium”.	See table 4.		N/A
	b) Connected conductors when provided are joined to conductors in item a) per the manufacturer’s instructions.			N/A
	c) Screw terminals and/or nuts are tightened with a torque equal to 2/3 of the appropriate column of Table 10.		Nm	N/A

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Clause	Requirement - Test	Result - Remark		Verdict
	d) Heating cabinets for testing switches without forced convection or a draught free condition.			N/A
	e) The temperature of the air in the heating cabinet is measured as near as possible to the centre of the space occupied by the specimens and at a distance not closer than 50 mm to the specimen.			N/A
	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	N/A
	The temperature of the cabinet maintained at T ± 5 °C or T ± 5 % (T ± 0,05T), whichever is greater.		°C	N/A
	g) Partially suitable rated switches as 7.3.3, with accessible parts rated 0 to 55 °C, exposed to a temperature ≤ 55 °C.		°C	N/A
	The internal switch enclosure with a T rating is tested as described for “all parts”.		°C	N/A
	h) The temperature of mounting surfaces of the test equipment is between T and 20 °C.		°C	N/A
	i) The specimens are subjected to 20 operating cycles with no current flowing.			P
	The actuating member is left in the most unfavourable "ON" position.			P
	If more "ON" positions, then 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.			N/A
	m) Any convenient AC or DC voltage may be used for the test circuit as far as the result is not affected.			N/A
	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.			N/A

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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 ± 2 °C.		P
	For a cycling load, after 1 h, the maximum temperature of the cycle is measured.		N/A
	q) Thermocouples shall measure the temperature of the surfaces of the switch indicated below.		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	**ENDURANCE**		P
	See IEC 61058-1-1 for mechanical switch testing.		P
	See IEC 61058-1-2 for electronic switch testing.		N/A
18	**MECHANICAL STRENGTH**		P
18.1	**General requirements**		
	Accessible parts shall have adequate mechanical strength to withstand a minimum level of force during normal use.		P
18.2	**Impact**		
	Switches rated;		
	• ≥ 0 °C are tested at 25 °C± 10 °C	35 °C	P
	• < 0 °C, are cooled to the minimum rated temperature T + 0/-5 °C for 2 h prior to testing	°C	N/A
	The impact is delivered using the spring hammer test apparatus of IEC 60068-2-75.		
	The impact is equal to:		
	• 0,5 Nm ± 0,04 Nm,		P
	• for foot operated switches: 1,0 Nm ± 0,05 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.		N/A
	Immediately apply 3 blows, in a direction perpendicular to the switch.		P
18.3	**Pull**		

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

18.3.1	Cord-operated switches are submitted to an additional pull test as follows:			
	• mounted as declared by the manufacturer • the pull-cord is subjected to a force, without jerks • first for 60 s in the normal direction • then for 60 s in a direction 45° maximum from the normal direction • minimum values of the pull force as in Table 9 or three times the values of the normal operating force if that is greater			
	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).			
	Testing is completed at 25 °C ± 10 C.	25	°C	P
	A pull force is applied for 60 s to try to pull off the actuating member.			P
	The pull to be applied is 15 N.			P
	But if the actuating member is intended to be pulled in normal use,			
	The pull force is increased to 30 N.			N/A
18.4	**Push**			
	A push force of 30 N, using a switch not subjected to the pull force, shall be:			
	• applied for 60 s to try to push in the actuating members			P
	The sample shall not be damaged in a way that reduces the electrical safety.			P

19	**SCREWS, CURRENT-CARRYING PARTS AND CONNECTIONS**		P
19.1	**General requirements for electrical connections** Contact pressure is not transmitted through insulating material other than		
	☐ ceramic ☐ pure mica ☐ other material no less suitable ☐ 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
	This requirement is not applicable to connections internal to a switch where the connection is used for:		
	• lamps for indicating purposes		N/A
	• and where the current in this circuit is ≤ 20 mA		N/A
19.2 19.2.1	**Screwed connections** Screwed connections, not tested in Clause 11, electrical or other:		

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Clause	Requirement - Test	Result - Remark	Verdict
	• withstand the mechanical stresses occurring in normal use		N/A
19.2.2	Screws transmitting contact pressure		
	• is in engagement with a metal thread		N/A
	Such screws not be of metal which is		
	• soft or liable to creep, as zinc or aluminium		N/A
19.2.3	Mechanical connections used during installation of switches may be made of using thread-forming or thread-cutting tapping screws:		
	• only if the screws are supplied together with the piece in which they are intended to be inserted		N/A
	Thread-cutting tapping screws intended to be used during installation:		
	• captive with the relevant part of the switch		N/A
19.2.4	Thread-forming (*metal sheet*) screws not used:		
	☐ for the connection of current-carrying parts ☐ unless they clamp directly in contact with each other and are provided with means of locking		N/A
	Thread-cutting (*self-tapping*) screws not used:		
	☐ for electrical connection of current-carrying parts ☐ unless they generate a full metric ISO thread or a thread of equivalent effectiveness		N/A
	Such screws not used:		
	☐ if likely to be operated by the user or installer ☐ unless the thread is formed by a swaging action		N/A
	The screws or nuts are tightened and loosened:		
	☐ 10 times with thread of insulating material; ☐ 5 times in all other cases		N/A
	Nuts concentric with the button or lever are tightened and loosened 5 times. Thread:		
	☐ insulating material ⇒ the torque is 0.8 Nm ☐ are of metal ⇒ the torque is 1.8 Nm		N/A
	Screws and nuts are tightened and loosened by means of a suitable test screwdriver or spanner.		N/A
	The torque applied when tightening being equal to that specified in the appropriate column of Table 10, if not otherwise specified.	See table 10.	N/A
	During the test:		
	• terminals shall not work loose		N/A
	• and damage that could impair the further use of the screwed connection		N/A
19.2.5	Switches having screwed glands are submitted to the following test.		

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Clause	Requirement - Test	Result - Remark	Verdict
	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 then tightened by means of a suitable spanner, the torque specified in Table 11 being applied to the spanner for 60 s.	See table 11.	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.		
	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 if these connections are subject to torsion in normal use		N/A
	Sealing compound which softens in heat provides adequate locking:		
	• only for screw connections not being subject to torsion in normal use		N/A
19.2.8	Screws and nuts for clamping the conductors shall have:		
	• a metric ISO standard thread or a thread comparable in pitch and mechanical strength		N/A
19.3	**Current-carrying parts**		
	Current-carrying parts and parts in an earthing path:		
	• have adequate mechanical strength and resistance to corrosion	☒ inspection ☐ checked by Clause 22	P

20	**CLEARANCES, CREEPAGE DISTANCES, SOLID INSULATION AND COATINGS OF RIGID PRINTED BOARD ASSEMBLIES**		P
20.1	**Generally requirements**		
	Compliance is checked:		
	• with detachable parts removed		P
	• and movable parts which can be assembled in different orientations placed in the most unfavourable position		P
	Distances through slots or openings in surfaces of insulating material are:		
	• measured to a metal foil in contact with the surface		P
	The foil is pushed into comers and the like by means of:		
	• the jointed test finger of IEC 61032 Probe B but is not pressed into openings		P

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Clause	Requirement - Test	Result - Remark	Verdict
	A force is applied to bare conductors and accessible surfaces in order to attempt to reduce clearances when making the measurement. The force is:		
	☒ 2 N for bare conductors. ☒ 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:		
	• not reduced below the specified values		P
20.2	**Clearances**		
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:		
	• rated U_n and overvoltage category in annex E	230 / Category II	P
	• pollution degree declared by the manufacturer	Pollution degree 2	P
20.2.2	Clearances for basic insulation ≥ the values given in Table 12	See table 12.	P
	Smaller clearances except those in Table 12 with note 5 may be used if the switch meets the U_{imp} test of annex G:		
	• but only if the parts are rigid or located by mouldings,		N/A
	• or if the construction is such that there is no likelihood of the distances being reduced by distortion		N/A
	• or by movement of the parts during mounting, connection and normal use		N/A
20.2.3	Clearances for functional insulation ≥ the values for basic insulation in 20.2.2.		P
20.2.4	Clearances for supplementary insulation ≥ the values given in Table 12.	See table 12.	N/A
20.2.5	Clearances for reinforced insulation ≥ the values for basic insulation in 20.2.2 but using the next higher step for the rated U_{imp} in Table 12.	See table 12.	P
20.3	**Clearances for disconnection**		
20.3.1	Electronic disconnection.		
	No clearances specified for electronic disconnection.		N/A
20.3.2	Micro disconnection		
	Clearances between terminals and terminations fulfil functional insulation according to 20.2.3.		P
	No clearances are specified for the distance across the contacts.		P

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Clause	Requirement - Test	Result - Remark	Verdict
	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:		
	• ≥ 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:		
	• shall be at least 0,5 mm		N/A
20.3.3	Full disconnection		
	Clearances for full disconnection ≥ the values in Table 12.	See table 12.	N/A
	Switches provided by two or more breaks in series:		
	• the separation is the sum of the distances of the breaks		N/A
	Each break ≥ 1/3 of the prescribed distance.		N/A
20.4	**Creepage distances**		
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: 175	P
	PTI values obtained in accordance with annex C.	175	P
	CTI (Comparative tracking index) may be substituted for PTI in Clause 20..... :	V	N/A
	Creepage distances for:		
20.4.2 20.4.3 20.4.4 20.4.5 20.4.6	☒ basic insulation ≥ the values in Table 13 ☒ functional insulation ≥ the values in Table 14 ☐ supplementary insulation ≥ the values for basic insulation in 20.4.2 ☒ reinforced insulation ≥ double the values for basic insulation in 20.4.2 ☒ disconnection ≥ the values for functional insulation in 20.4.3	See table 13 and 14.	P
20.5	**Solid insulation –** withstanding electrical and mechanical stresses, thermal and environmental influences which may occur during the anticipated life of the switch:		
	• checked during tests of clauses 14, 15, 16 and 17 in IEC 61058-1-1:2016 or IEC 61058-1-2:2016		P
	Distance through accessible supplementary solid insulation		
	• have a minimum value of 0.8 mm		N/A

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Clause	Requirement - Test	Result - Remark	Verdict
	Distances through accessible reinforced solid insulation have minimum values:		
	☐ for rated $U_{imp} \leq 1500$ V: ≥ 0.8 mm; ☒ for rated $U_{imp} \geq 2500$ V: ≥ 1.5 mm.	2,0mm	P
20.6 20.6.2	**Coatings of rigid printed board assemblies.** **Type 1 coating:** The insulation distances of a printed board assembly with type 1 coating declared:		
	• comply with pollution degree 1 of clearances in Table 12 and of creepage distances in Table 14		N/A
	Test specimens:		
	☐ as in 5.1 and 5.2 of IEC 60664-3 ☐ or any representative rigid printed board assemblies as in 5.3 of IEC 60664-3		N/A
20.6.3	**Type 2 coating:** 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 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
21	**FIRE HAZARD**		P
21.1	**Resistance to heat**		
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 (A) heating test results (*see 21.1.3*) ☒ or (B) calculated temperatures (*see 21.1.4*)		P
	The ∅ of the impression by the ball not > 2 mm.	See table “”Fire hazard”	P
21.2	**Resistance to abnormal heat**		
	Parts of non-metallic material shall be resistant to abnormal heat	See table “Resistance to abnormal heat”	P
22	**Resistance to rusting**		N/A
	Ferrous parts, the rusting of which might impair safety, adequately protected against rusting.		N/A
23	**ABNORMAL OPERATION AND FAULT CONDITIONS FOR ELECTRONIC SWITCHES**.		P
	See IEC 61058-1-1 for mechanical switch testing.		P
	See IEC 61058-1-2 for electronic switch testing.		N/A
24	**Components for switches**		P

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Clause	Requirement - Test	Result - Remark	Verdict
24.1	**General requirements** Components which, if they fail, may cause risk of electric shock or fire shall comply • either with the requirements of this standard • or with the relevant IEC component standard as far as they reasonably apply		
24.2	**Protective devices**		
24.2.1	General Protective devices shall be in accordance with the relevant IEC publications and/or the additional requirements specified in the following sub-clauses: ☐ 24.2.2 fuses; ☐ 24.2.3 cut-outs; ☐ 24.2.7 protective devices which only decrease the current; ☒ 24.2.8 fusing resistors		
24.2.2	Fuses:		
	• comply with IEC 60127 or IEC 60269-3 and have a rated breaking capacity ≥1 500 A		N/A
	• 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 °C to 35 °C or 55 °C:		
	• samples tested at this reference temperature	°C	N/A
	During the test:		
	• the other conditions shall be similar to those occurring in the switch		N/A
	• no sustained arcing shall occur		N/A
	After the test:		
	• the specimens show no damage impairing their further use or the safety of the switch		N/A
24.2.4	Non-resettable cut-outs: ☐ thermal links in accordance with IEC 60691 ☐ 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 be:		
	• cut out and the temperature neither exceed the maximum temperatures specified by the manufacturer for abnormal conditions	See table “Non-resettable cut-outs – After the test”	N/A
24.2.5	Resettable, non-self-resetting cut-outs shall be:		
	• in accordance with IEC 60730-1 and appropriate parts of IEC 60730-2		N/A
	• checked by the tests according to 24.2.3 and the following additional tests		N/A
	Resettable, non-self-resetting cut-outs in the load circuit of the switch:		

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Clause	Requirement - Test	Result - Remark		Verdict
	• tested at 1.1U_N of the switch and with loads as specified below		V	N/A
	The cut-outs are reset after each operation and caused to operate 10 times:			
	• Cut-outs in switches for incandescent lamps tested in a non-inductive circuit and loaded with the conventional fusing current of the protecting fuse		A	N/A
	• Cut-outs in switches for speed control circuits, subjected to 2 series of 10 operations. I_n the:			
	• 1st series the cut-out closes a circuit with 9I_N (*cos* $\varphi = 0.8 \pm 0.05$).		A	N/A
	• 2nd series, the circuit 6I_N (*cos* $\varphi = 0.6 \pm 0.05$).		A	N/A
	• Cut-outs for other types of load are tested with the opening and closing current as declared		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:			
	• Self-resetting cut-outs in the load circuit of the switch tested at 1.1U_N:		V	N/A
	• 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.		A	N/A
24.2.7	Protective devices which only decrease the current (for example PTC resistors) be:			
	☐ of a thermistor type according to Annex J in IEC 60730-1:2013 ☐ 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:			
	• with flammability category V-1 or better according to IEC 60695-11-10 and IEC 60695-11-20			N/A
24.2.8	Fusing resistors:			
	• have adequate breaking capacity and does not cause emission of flames or burning particles			P
24.3	**Capacitors**			
	• comply with Table 16 or as declared (7.23)	See table 16.		P
24.4	**Resistors**			
	Resistors 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*):			
	• have an adequate stable resistance value under overload and complies with the requirements of 14.1 of IEC 60065:2014			N/A

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Clause	Requirement - Test	Result - Remark	Verdict
25	**EMC REQUIREMENTS**		N/A
25.1	**General**		
	Tests in Clause 25:		
	• carried out on requested by the manufacturer	Refer to EMC test report	N/A
	Electronic switches for appliances		
	• fulfil the requirements for immunity and emission when used in accordance with the manufacturer's specification		N/A
	Electronic switches intended to be built in or incorporated in an appliance.		
	• comply with the requirements for immunity and emission as evaluated in the end product		N/A
25.2 25.2.1	**Immunity** General Electronic switches so designed that the switch state (ON or OFF) and/or setting value is protected against electromagnetic interference.		
	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:		
	☒ ON, ☒ highest setting; ☒ lowest setting; ☒ OFF, ☒ highest setting; ☒ lowest setting.		N/A
25.2.2	Voltage dips and short interruptions		
	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 ≥ 10 s minimum (between each test event).		N/A
	Abrupt changes in supply voltage occurs at zero crossings.		N/A
	The change between the test voltage U_T and the changed voltage is abrupt.		N/A
	U_T = to the rated voltage.		N/A
	Test level of 0 % = to a total supply voltage interruption.		N/A
	During the test: • the electronic switch state and/or setting may alter		N/A
	Occasional flickering of luminaires and irregular running of motors during the test are neglected.		N/A
	After the test, the electronic switch:		
	• be in the original state and the setting unchanged		N/A
25.2.3	Surge immunity test		

IEC 61058-1			
Clause	Requirement - Test	Result - Remark	Verdict
	Tests carried out according to IEC 61000-4-5 with an open-circuit test voltage of 1 kV (*level 2*).		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 (*bursts*) on supply and control terminals / terminations.		N/A
	The test is carried out according to IEC 61000-4-4 with the following specification:		
	The level of the repetitive fast transients consisting of bursts is in accordance with Table 18.		
	☐ Supply terminals/terminations 1 kV (level 2) ☐ Control terminals/terminations 0,5 kV (level 2)		N/A
	The duration of the test ≥ 1 min.		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
25.2.5	Electrostatic discharge test		
	The electronic switch mounted as in normal use.		N/A
	The following levels apply:		
	☒ test voltage of contact discharge: 4 kV; ☒ 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:		
	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:		
	• no other changes observed		N/A
25.2.7	Power-frequency magnetic field test		
	• carried out according to IEC 61000-4-8 by applying a magnetic field of 3 A/m, 50 Hz.		N/A

IEC 61058-1			
Clause	Requirement - Test	Result - Remark	Verdict
	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 **does not** occur.		N/A
25.3 25.3.1	**Emission** Low frequency emission Checked by tests according to IEC 61000-3-2 and IEC 61000-3-3 or IEC 61000-3-5.		
	Requirements met if the electronic switch complies with the criteria's specified in these standards.		N/A
	If overview shows an envelope of the spectrum with a monotonal decrease according to the increasing order of harmonics:		
	• measurements restricted to harmonics up to order 11		N/A
25.3.2	Radio-frequency emission		
	The electronic switch complies with the requirements of .....:	☐ CISPR 14-1 ☐ CISPR 15	N/A
	Electronic switch used for electrical lighting application, complies with CISPR 15.		N/A

Annex C	**PROOF TRACKING TEST** (PTI) **(***normative***)**	P
	Proof tracking test made according to IEC 60112.	P

Annex E	**RELATION BETWEEN RATED IMPULSE WITHSTAND VOLTAGE U_{IMP}, RATED VOLTAGE U_N AND OVERVOLTAGE CATEGORY (***normative***)**	P

Table E1	**Rated impulse withstand voltage for switches energized directly from the low voltage mains**						
	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_{imp} 2) 3) (kV) Overvoltage category I	II	III	—
			250V		2,5		P

Annex G	**IMPULSE VOLTAGE TEST** (*normative*)			N/A
	To verify that clearances will withstand specified transient overvoltage.			
	Impulse withstand voltage test U_{imp} 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			

IEC 61058-1			
Clause	Requirement - Test	Result - Remark	Verdict
	☐ 1.2/50 µs for the no-load voltage with amplitudes equal to the values in Table G1; ☐ 8/20 µs for an appropriate surge current.		N/A

Table G1	**Test voltages for verifying clearances at sea level**			
	Rated impulse withstand voltage Û (kV)	Impulse test voltage at sea level Û (kV)		—
	2,5	2,95		N/A

Annex H	**ALTITUDE CORRECTION FACTORS (*normative*)**	P
	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:	

Table H.1	**Altitude correction factors**				
	Altitude (m)	Normal barometric pressure (kPa)	Multiplication factor for clearances		—
	2000	80,0	1,00		P

Annex I	**TYPES OF COATINGS FOR RIGID PRINTED BOARD ASSEMBLIES (*normative*)**		N/A
	Type 1 coating:		
	Provides only protection against pollution by coating to pollution degree 1.		N/A
	Clearance and creepage distance of 20.1 and 20.2 apply to the rigid printed board assembly under the coating		N/A
	Type 2 coating:		
	Provides protection against pollution and insulation that the clearance and creepage distance of 20.1 and 20.2 are not applicable between conductors under the coating.		N/A

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Clause	Requirement - Test	Result - Remark	Verdict

11.1.1	General			
Table 4	**Resistive current carried by the terminal and related cross-sectional areas of terminals for unprepared conductors**			
	Flexible conductors			
	Terminal size..... :			—
	Resistive current carried by the terminal ..... :		A	—
	Cross-sectional areas ..... :		mm²	N/A
	Supplementary information:			
	Rigid conductors			
	Terminal size..... :			—
	Resistive current carried by the terminal ..... :		A	—
	Cross-sectional areas ..... :		mm²	N/A
	Supplementary information:			

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

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

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Clause	Requirement - Test	Result - Remark	Verdict

	Across disconnections	≥ 2 MΩ	> 100 MΩ	P
	Supplementary information:			

15.3	**Insulation test voltage**			
	The insulation is subjected to a voltage of substantially sine wave form, 50 or 60 Hz.			
Table 8	**Dielectric strength**	Rated voltage (V)	230	
	Insulation or disconnection to be tested	Test voltage (V)		
	Functional			N/A
	Basic	1500	Between L/N and earthing	P
	Supplementary			N/A
	Reinforced	3000	Between L/N and enclosure	P
	Electronic disconnection			N/A
	Micro-disconnection	500	Between L in and Lout	P
	Full disconnection			N/A
	No flash over or breakdown occurs.			P
	Supplementary information:			N/A

16.3	**Heating test**			
	Test voltage .....:	230	V	—
	Resistive or declared current .....:	16	A	—
	Cross-sectional areas .....:	-	mm²	—
Thermocouple locations			Max. temperature measured, (°C)	
Enclosure			49,6	P
Button			47,3	P
	Supplementary information:			

18.3	**Pull**					
Table 9	**Minimum values of pull force**					
	Rated current	Force (N)				—
	A	Normal direction		45° from normal direction		—
	☐ ≤ 4 ☐ > 4	☐ 50	☐ 100	☐ 25	☐ 50	N/A
	Supplementary information:					

19.2	**Screwed connections**	
Table 10	**Torque values**	

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

	Type of screw	Nominal thread ∅ (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.				
Table 11	**Torque values for screwed glands**				
	∅ of the test rod (mm)	Torque for glands of			—
		Metal		Nm	N/A
		Insulating material		Nm	N/A
	Supplementary information:				
	After the test neither the glands nor the enclosure of the specimen shall show any damage.				N/A

20	**CLEARANCES, CREEPAGE DISTANCES, SOLID INSULATION AND COATINGS OF RIGID PRINTED BOARD ASSEMBLIES**				P
	Working voltage (V):	230			—
	Degree of pollution, micro:	☐ 1	☒ 2	☐ 3	—
	Degree of pollution, macro:	☐ 1	☐ 2	☒ 3	—
Table 12 – 14	**Creepage distance Cd and clearance Cl across:**	required Cd (mm)	Cd (mm)	required Cl (mm)	Cl (mm)
	Functional, sealed or incapsulated	—	—	—	—
	Functional,	2,5	3,3	1,5	3,1
	Basic	2,5	4,0	1,5	4,0
	Supplementary	—	—	—	—
	Reinforced	5,0	>6,0	3,0	4,2
	Full disconnection	—	—	—	—
	Micro disconnection	2,5	2,7	—	—
	Supplementary information:				

20.6	**Coatings of rigid printed board assemblies.**			
Table 15	**Test levels and conditions (Type 2 coating)**			
	IEC 60664-3 sub-clause	Test levels and conditions		—
	6.6.1 cold storage	- 25°C		N/A
	6.6.3 Rapid change of temperature	Degree of severity 2 (- 25°C to 125°C)		N/A
	Supplementary information:			

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

21	**Fire hazard**			
21.1.2	Ball pressure test according to IEC 60695-10-2 at the temperatures using: ☒ (A) heating test results (*clause 16*) ☒ (B) calculated temperatures			
Non-metallic materials to be tested:		Ball pressure temperature (°C)	Max 2.0 mm impression	
PCB		125	0,8mm	P
	Supplementary information:			

21.2	**Resistance to abnormal heat**		
Non-metallic materials to be tested:	Test temperature (°C)	• extinguish within 30 s • no ignition of the layer of wrapping tissue	
PCB	750	No flame	P
	Supplementary information:		

24.2.4	Non-resettable cut-outs – After the test:			—
Thermocouple locations		Max. temperature measured, (°C)	Max permitted (°C) declared	
				—
	Supplementary information:			

24.3	**Capacitors**				—
Table 16	**Requirements for capacitors**				
	Application of capacitors	Type(s) of capacitors (*according IEC 60384-14*)			—
	Between live conductor	$U_N \leq$ 125V	125V < $U_N \leq$ 250V Over-current protection		—
	(Z = impedance)		Without [1)]	With [1)]	
	L or N and earth (PE)	☐ Y4	☐ Y2	☐ Y2	N/A
	L and N or L1 and L2				
	• without Z in series	☐ X2	☐ X1	☐ X2	N/A
	• with Z in series, by short-circuiting of capacitor, limits the current to ≥ 0.5 A	☐ X3	☐ X2	☐ X3	N/A
	• < 0.5 A No special requirement				N/A
	[1)] Fusing resistor (built in or external).				
	Supplementary information:				

	TABLE: List of critical components				P
Object/part No.	**Manufacturer/ trademark**	**Type/model**	**Technical data**	**Standard (Edition / year)**	**Mark(s) of conformity[1])**
- Description:					
- Description:					
- Description:					
- Description:					
- Description:					
- Description:					
Supplementary information: [1)] Provided evidence ensures the agreed level of compliance. See OD-2039. Refer to general information of product in part 1					

Appendix 1: EN 61058-1-1			
Clause	Requirement - Test	Result - Remark	Verdict
8	**MARKING AND DOCOMENTATION**		P
	This clause of part 1 is applicable.		
9	**PROTECTION AGAINST ELECTRIC SHOCK**		P
	This clause of part 1 is applicable.		
10	**PROVISION FOR EARTHING**		P
	This clause of part 1 is applicable.		
11	**TERMINALS AND TERMINATIONS**		N/A
	This clause of part 1 is applicable.		
12	**CONSTRUCTION**		P
	This clause of part 1 is applicable.		
13	**MECHANISM**		P
	This clause of part 1 is applicable.		
14	**PROTECTION AGAINST SOLID FOREIGN OBJECTS, INGRESS OF WATER AND HUMID CONDITIONS**		P
	This clause of part 1 is applicable.		
15	**INSULATION RESISTANCE AND DIELECTRIC STRENGTH**		P
	This clause of part 1 is applicable.		
16	**HEATING**		P
	This clause of part 1 is applicable.		
17	**ENDURANCE**		P
17.1	**General requirements**		
17.1.2	The sequence of tests to be completed on the same 3 specimens is as follows:		
		Carried out:	
	• TC3: a test at high speed specified in 17.5.3	☐ yes, ☐ no	N/A
	• TC2: a test at slow speed specified in 17.5.2	☐ yes, ☐ no	N/A
	• TC1: an increased-voltage test at accelerated speed as specified in 17.5.1	☒ yes, ☐ no	P
	• TC9: a locked-rotor test as specified in 17.5.5 at accelerated speed	☐ yes, ☐ no	N/A
	• TC4: a test at accelerated speed as specified in 17.5.4;	☒ yes, ☐ no	P

Appendix 1: EN 61058-1-1			
Clause	Requirement - Test	Result - Remark	Verdict
17.1.3	When required by Clause 13, TC10, is conducted on a different set of 3 specimens:		
	• a test at very slow speed as in 17.5.6; only applies to switches according to the requirements of 13.1		N/A
17.2	**Electrical endurance tests**		—
	The switch loaded as in Table 102 and/or Table 103 and connected in accordance with the circuit as given in Table 2.	☒ Table 102 and/or ☐ Table 103	P
a)	Where in Table 2 an auxiliary switch (A) is symbolised in the test circuit,		
	• 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),		
	• the connection and test load as specified by the manufacturer using the maximum occurring inrush current at room temperature		N/A
	• the specimen operated with loads that are used in the field rather than with synthetic loads		N/A
	• forced cooling of the specific lamp load applied in order to ensure cold resistance for each operating cycle and shorten the test time	☐ used ☐ not used	N/A
d)	No electrical endurance tests applied for switches for 20 mA load as classified to 7.2.6		N/A
17.3 17.3.1	**Thermal conditions** (*air temperatures*) Switches according to 7.3.2 during tests in 17.5.4 (TC4) all parts exposed to:		
	☒ 1st half of test at maximum T-rating (+5 / 0)°C	°C	N/A
	☐ 2nd half of test at 25°C ± 10°C ☒ or at the minimum T-rating (0 / -5)°C if T< 0°C	°C	N/A
17.3.2	Switches according to 7.3.3, during tests in 17.5.4 (TC4):		
	• parts for 0 °C to 55 °C, exposed to a temperature within this range for the complete test period		N/A
	☐ 1st half of test, the remainder of the switch maintained at (T +5/0) °C	°C	N/A
	☐ 2nd half of test, carried out at 25 °C ± 10 °C ☐ or at the minimum T-rating (T 0/-5) °C	°C	N/A
17.3.3	Switches according to 7.3.1, during the tests in 17.5.4 (TC4):		
	• the switch exposed to 25 °C ± 10 °C		P
17.4 17.4.1	**Actuating conditions** The operating speed for the operating cycles shall be as follows: a) For very slow speed approximately:		
	☐ 1°/s for rotary actuation; ☐ 0.5 mm/s for linear actuation.		N/A

Appendix 1: EN 61058-1-1			
Clause	Requirement - Test	Result - Remark	Verdict
	b) For slow speed approximately:		
	☐ 9°/s for rotary actuations at an angle ≤ 45°; ☐ 18°/s for rotary actuations at an angle >45°; ☐ 20 mm/s for linear actuations		N/A
	c) For high speed:		
	• actuating member actuated by hand as fast as possible		N/A
	d) For accelerated speed approximately:		
	☐ 45°/s for rotary actuations at an angle ≤ 45°; ☐ 90°/s for rotary actuations at an angle > 45°; ☐ 80 mm / s for linear actuations		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.		P
17.4.4	During the accelerated speed test:		
	a) Care taken that test apparatus allows actuating member to operate freely.		P
	b) Switches for a rotary actuation where movement is not limited in either direction:		
	• 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.		P
	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 104:		
	☐ $I_R \leq 10$ A; 1 (s) ON and 3 (s) OFF ☒ $I_R > 10$ A but < 25 A; 2 (s) ON and 6 (s) OFF ☐ I_R is ≥ 25 A; 4 (s) ON and 12 (s) OFF		P
	Capacitive and simulated lamp load (*IEC 61058-1:2016, Figures 8 and 9*);		
	• 2 (s) ON and 15 (s) OFF		N/A
	Tungsten lamp loads:		
	• Minimum 1 (s) ON and Minimum 55 (s) OFF		N/A
	Very slow speed TC10:		
	• Minimum 2 (s) ON and Minimum 6 (s) OFF		N/A
	Locked rotor (TC9):		
	• 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:		
	• the ON periods is approximately 50 %		N/A

Appendix 1: EN 61058-1-1			
Clause	Requirement - Test	Result - Remark	Verdict
	Multi-way switches comply with the table 104	(s) ON (s) OFF	N/A
	• 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)**		
17.5.2	Increased-voltage test at accelerated speed (TC1):		
	• Electrical conditions as in Table 102, 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 ± 10 °C. • Method of operation as in 17.4. • 100 operating cycles.	See table TC.	P
17.5.2	Test at slow speed (TC2)		
	• Electrical conditions as in 17.2. • Thermal conditions 25 ± 10 °C. • Actuating speed as in 17.4 slow speed. • 100 operating cycles	See table TC.	N/A
17.5.3	Test at high speed (TC3) (*only switches with more than one pole and with reversal polarity*).		
	• Electrical conditions as in 17.2. • Thermal conditions 25 ± 10 °C. • Actuating speed as in 17.4 high speed. • 100 operating speed.	See table TC.	N/A
17.5.4	Test at accelerated speed (TC4)		
	• Electrical conditions as in 17.2. • Thermal conditions as in 17.3. • Actuating speed, accelerated as in 17.4. • Operating cycles as number declared in (7.4) reduced with the number already tested in 17.5.1, 17.5.2 and 17.5.3.	See table TC.	P
17.5.5	Locked-rotor test (TC9):		
	• Electrical conditions as in 17.2. • Thermal conditions 25 ± 10 °C. • Actuating speed, accelerated as in 17.4. • 50 operating cycles.	See table TC.	N/A
17.5.6	Test at very slow speed (TC10):		
	• Electrical conditions as in 17.2. • Thermal conditions 25 ± 10 °C. • Actuating speed, very slow speed in 17.4. • 100 operating cycles.	See table TC.	N/A
17.6	**Evaluation of compliance**	See table TE1 – TE3.	P

18	**MECHANICAL STRENGTH**		P
	This clause of part 1 is applicable.		

Appendix 1: EN 61058-1-1			
Clause	Requirement - Test	Result - Remark	Verdict
19	**SCREWS, CURRENT-CARRYING PARTS AND CONNECTIONS**		P
	This clause of part 1 is applicable.		
20	**CLEARANCES, CREEPAGE DISTANCES, SOLID INSULATION AND COATINGS OF RIGID PRINTED BOARD ASSEMBLIES**		P
	This clause of part 1 is applicable.		
21	**FIRE HAZARD**		P
	This clause of part 1 is applicable.		
22	**Resistance to rusting**		P
	This clause of part 1 is applicable.		
23	**ABNORMAL OPERATION AND FAULT CONDITIONS FOR ELECTRONIC SWITCHES**.		P
	Mechanical switches with electronic components checked by clause 23 of IEC 61058-1-2:2016.	Short circuit E1: fusing reisitor open, no hazard. Short circuit L1: Normal operation, no hazard. Short circuit E2: Normal operation, no hazard. Short circuit C2: No output, no hazard.	P
	Switches with rigid printed boards with creepage distances and clearances that do not comply with the required distances of Table 12 to Table 14 of IEC 61058-1:2016:		
	• checked by Clause 23 of IEC 61058-1-2:2016		N/A
24	**COMPONENTS**		P
	This clause of part 1 is applicable.		
25	**EMC REQUIREMENTS**		P
	This clause of part 1 is applicable.		

Appendix 1: EN 61058-1-1			
Clause	Requirement - Test	Result - Remark	Verdict

	Results of endurance testing in clause 17									P
Type:	EMW303WF-F	**Tested for:**	-				**Circuit code:**	1.2		
Table 1	**Test loads for multi way switches**									
	Cycles of operations	Switch position of			Circuit ⇒ Load (A) ⇓					—
	1st half	Highest load			I_R					N/A
		Next lower load			0.8 I_R					N/A
		Further next lower load			0.533 I_R					N/A
	2nd half	Highest load			I_R					N/A
		Next lower load			0.5 I_R					N/A
		Further next lower load			0.333 I_R					N/A
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	264,5	18,4	18,4	1,0	1,0	-		100	P
17.5.2	TC2	-	-	-	-	-	-		-	N/A
17.5.3	TC3	-	-	-	-	-	-		-	N/A
17.5.4	TC4	230	16	16	1,0	1,0	-		9900	P
17.5.5	TC9	-	-	-	-	-	-		-	N/A
17.5.6	TC10	-	-	-	-	-	-		-	N/A
TE1 – TE3										
17.6.1	Functional compliance (TE1). Switch complies if									
	☒ all actions function as declared ☒ no loosening of electrical / mechanical connections occur; ☐ 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 Clause 16 at I_R and 25°C ± 10 °C									
	Test current						16		A	—
	Samples 1, 2, 3:					1) 2) 3)	43,1 42,8 42,0		K K K	P
17.6.3	Insulating compliance (TE3) • test voltage 75 % of the corresponding test voltage specified in sub-clause 15.3:									
	☒ Over contact gap(s) ☐ Between live parts of different polarity ☐ Between live parts and earth metal ☒ Between live parts and accessible metal parts or actuating members etc. Samples 1, 2, 3: No transient fault occurred									P