

# Test report

**UL62368**

**Audio/video, information and communication technology  
equipment -Safety requirements**

<b>Report No.:</b>	CstarVI29U01X
<b>Applicant:</b>	Shenzhen Zhiyuantongtai Technology Co.,LTD
<b>Address:</b>	Southeast 3F 8hao Tongfuyu Industrial Xinh Community Fuhai Street, Baoan District, shenzhen china
<b>Product:</b>	Battery base
<b>Trade name:</b>	PlusAcc, HomeMount.
<b>Model name:</b>	E02-B, E01-A, E01-B, E02-A, E03, E04, E05-A, E05-B, E06-A, E06-B, E07.
<b>Rating:</b>	INPUT: DC12V, 1.25A. Output: DC12V, 1.25A.
<b>Manufacturer:</b>	Shenzhen Zhiyuantongtai Technology Co.,LTD
<b>Address:</b>	Southeast 3F 8hao Tongfuyu Industrial Xinh Community Fuhai Street, Baoan District, shenzhen china
<b>Date of receipt of test item:</b>	2021-09-19
<b>Date (s) of performance of tests:</b>	2021-09-19
<b>Date of issue:</b>	2021-09-29
<b>Service Requested:</b>	Perform the UL62368 test as customer's requirement
<b>Method:</b>	As specified in UL62368: 2014
<b>Conclusion</b>	Pass

<b>Testing Laboratory:</b>	Shenzhen C-Star Test Co., Ltd.
<b>Testing location/ address:</b>	Room 208, 2/F, Building A3, No.416, Xuegang North Road, Qinghu Community, Longhua Subdistrict, Longhua District, Shenzhen, Guangdong, China
<b>Tested by:</b>	Jesse Fu
<b>Approved by:</b>	Jason Zhang



**2.0 Product Description**

Product	Battery base
Brand name	PlusAcc, HomeMount
Description	<p>The product covered by this report is Battery base, indoor use.  The product has one Phone charger port, one warch Wireless charger port and one Apple Airpods Wireless charger port.  The output port of the product complied with the requirement of Limited power source.</p> <p>Source of electrical energy: Corresponding classification (ES)  - All circuits supplied by DC mains: ES1  - Output port: ES1</p> <p>Source of power or PIS: Corresponding classification (PS)  - All circuits supplied by DC mains: PS1  - Output port: PS1</p> <p>Source of hazardous substances: Corresponding chemical  - Electrolytic capacitor: Electrolyte</p> <p>Source of kinetic/mechanical energy: Corresponding classification (MS)  - Equipment mass: MS1  - Edges and corners: MS1</p> <p>Source of thermal energy: Corresponding classification (TS)  - All part: TS1</p> <p>Type of radiation: Corresponding classification (RS)  - NA</p> <p>Relevant technical consideration:  Classification of use by: Ordinary person  Supply connection: DC mains  Operating condition: Continuous  Supply connection - type: No connection AC mains  Equipment mobility: transportable  Class of equipment: Class III  Access location: NA  Pollution degree (PD): PD2  Maximum ambient temperature: 40 degree C  IP protection class: IPX0  Power systems: NA  Mass of equipment (kg): Approx. 0.174</p>
Models	E02-B
Model Similarity	E01-A, E01-B, E02-A, E03, E04, E05-A, E05-B, E06-A, E06-B, E07.
Ratings	DC12V, 1.25A
Other Ratings	NA

### 3.0 Product Photographs

Photo 1 - External view



Photo 2 - External view

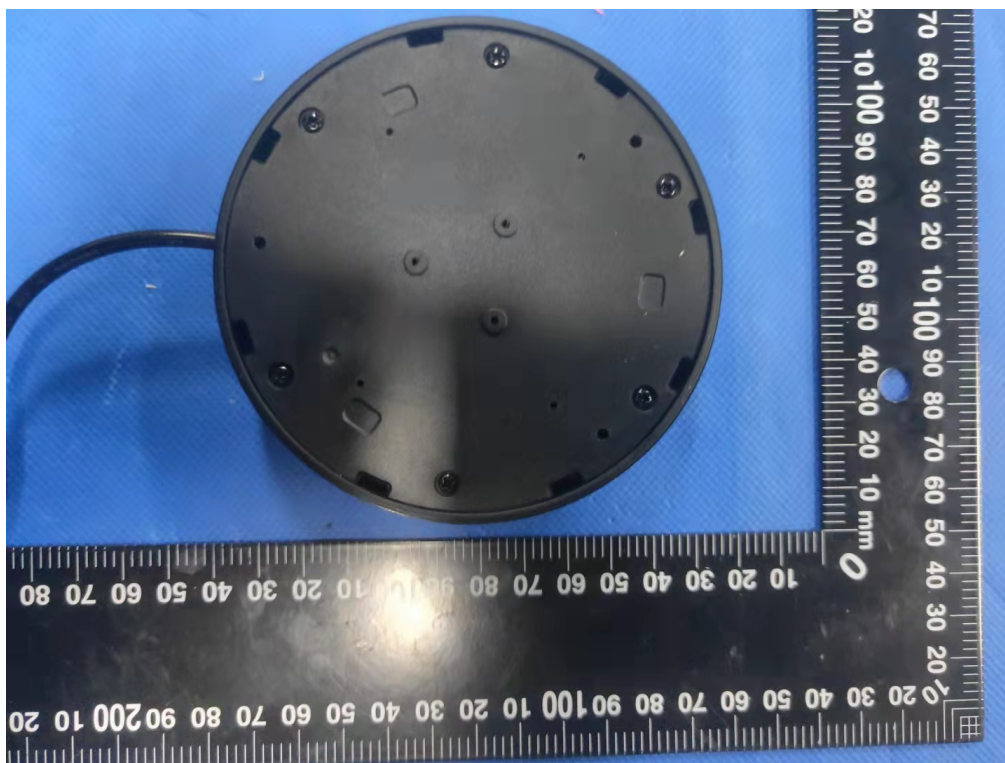




Photo 3 - External view



Photo 4 - External view

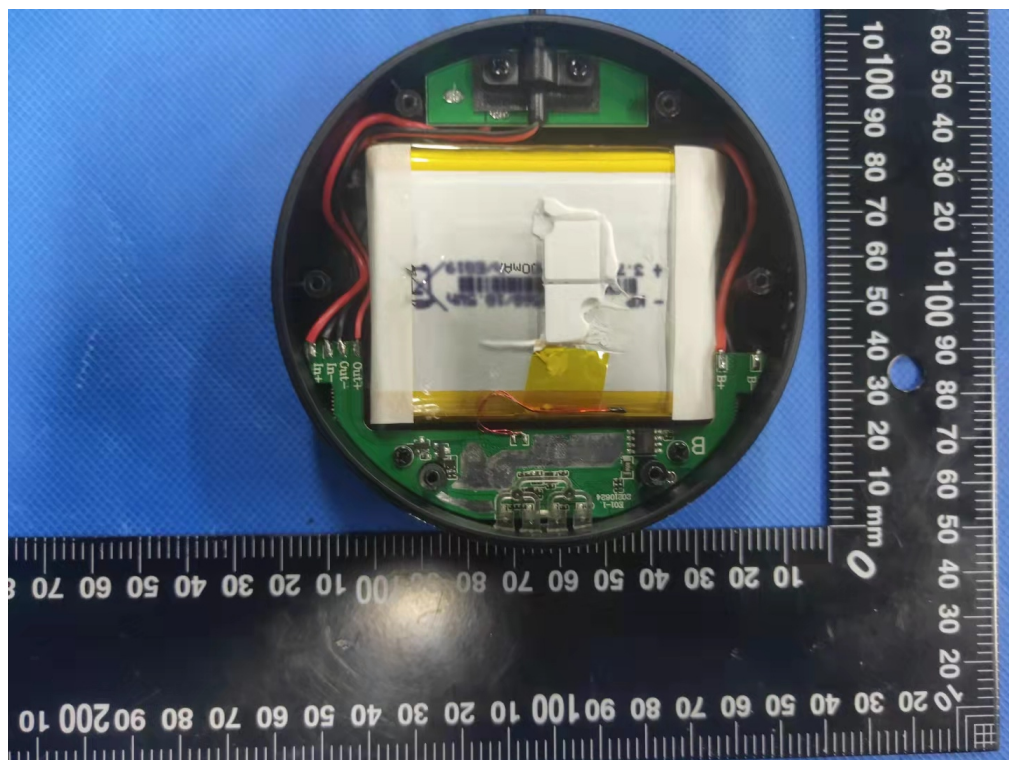
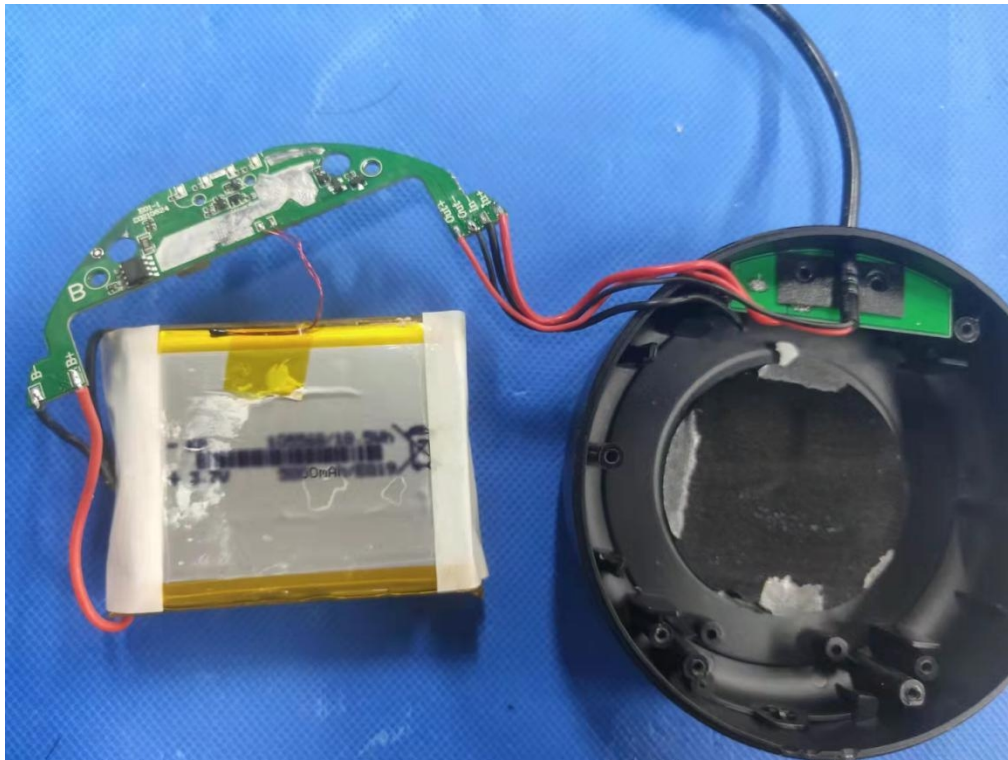


Photo 5 - External view



**4.0 Critical Components**

Item	Name	Manufacturer/ trademark <sup>2</sup>	Type / model <sup>2</sup>	Technical data and securement means	Mark(s) of conformity <sup>3</sup>
1	PWB	KINGBOARD LAMINATES HOLDINGS LIMITED	KB-6160A	V-0, 130°C	UL (E123995)
2	Internal wire	DONGGUAN HAODE WIRE & CABLE TECHNOLOGY CO LTD	3239	22AWG, 200°C, 3KVdc, VW-1	E364036
3	Pvc Jacketed Cable	Dongguan Jialian Wire & Cable Co Ltd	2464	24AWG, 80°C, 300V, VW-1	E481928
4	IC U3 PCB_PB	XySemi Inc	XB8886A	Overcharge detection voltage: 4.3V Over discharge detection voltage: 2.4V	Tested with appliance
5	IC U4 PCB_PB	SILERGY	SY7215A	VIN: 3V~16V	Tested with appliance
6	IC U5 PCB_PB	SOUTHCHIP	SC8930A/QFN	VBus: 4V~14V	Tested with appliance
7	Cell	Shandong Kinpin Energy Co., Ltd.	955565	3.7Vdc, 5000mAh	UL approved
8	Cell	GanZhou Novel Battery Technology Co., Ltd.	955465	3.7Vdc, 5000mAh	UL approved
9	Cell	GanZhou Novel Battery Technology Co., Ltd.	105568	3.7Vdc, 5000mAh	UL approved

**NOTES:**

1) Not all item numbers are indicated (called out) in the photos, as their location is obvious.

2) "Various" means any type, from any manufacturer that complies with the "Technical data and securement means" and meets the "Mark(s) of conformity" can be used.

3) Indicates specific marks to be verified, which assures the agreed level of surveillance for the component. "NR" - indicates Unlisted and only visual examination is necessary. "See 5.0" indicates Unlisted components or assemblies to be evaluated periodically refer to section 5.0 for details.

## **5.0 Critical Unlisted CEC Components**

No Unlisted CEC components are used in this report.

**6.0 Critical Features**

Recognized Component - A component part, which has been previously evaluated by an accredited certification body with restrictions and must be evaluated as part of the basic product considering the restrictions as specified by the Conditions of Acceptability.

Listed Component - A component part, which has been previously Listed or Certified by an accredited Certification Organization with no restrictions and is used in the intended application within its ratings.

Unlisted Component - A part that has not been previously evaluated to the appropriate designated component standard. It may also be a Listed or Recognized component that is being used outside of its evaluated Listing or component recognition.

Critical Features/Components - An essential part, material, subassembly, system, software, or accessory of a product that has a direct bearing on the product's conformance to applicable requirements of the product standard.

Construction Details - For specific construction details, reference should be made to the photographs and descriptions. All dimensions are approximate unless specified as exact or within a tolerance. In addition to the specific construction details described in this Report, the following general requirements also apply.

1. Spacing - Class III product

2. Mechanical Assembly - Components such as switches, fuseholders, connectors, wiring terminals and display lamps are mounted and prevented from shifting or rotating by the use of lockwashers, starwashers, or other mounting format that prevents turning of the component.

3. Corrosion Protection - All ferrous metal parts are protected against corrosion by painting, plating or the equivalent.

4. Accessibility of Live Parts - All circuits is ES1

5. Grounding - Class III product

6. Polarized Connection - This product is not provided with a polarized power supply connection.

7. Internal Wiring - Internal wiring is routed away from sharp or moving parts. Internal wiring leads terminating in soldered connections are made mechanically secure prior to soldering. Recognized Component separable (quick disconnect) connectors of the positive detent type, closed loop connectors, or other types specifically described in the text of this report are also acceptable as internal wiring terminals. At points where internal wiring passes through metal walls or partitions, the wiring insulation is protected against abrasion or damage by plastic bushings or grommets.

8. Schematics - NA

9. Markings - Refer to Illustration No.1 of Section 7.0 for details.

10. Cautionary Markings - This product is not need to provided with any cautionary markings.

11. Installation, Operating and Safety Instructions - Instructions for installation and use of this product are provided by the manufacturer. When selling in Canada market, instructions in both French and English are required.



**7.0 Illustrations****Illustration 1 - Marking**

Note 2: The above markings are the minimum requirements required by the safety standard. For the final production samples, the additional markings which do not give rise to misunderstanding may be added.

**8.0 Test Summary**

Evaluation Period	19-Sept-2021 to 29-Sept-2021			Project No.	SP1912067I01
Sample Rec. Date	19-Sept-2021	Condition	Prototype	Sample ID.	P191206701001
Test Location	Shenzhen C-Star Test Co., Ltd.. Room 208, 2/F., Building A3, No.416, Xuegang North Road, Qinghu Community, Longhua Subdistrict, Longhua District, Shenzhen, Guangdong, China				
Test Procedure	Testing Lab				
Determination of the result includes consideration of measurement uncertainty from the test equipment and methods. The product was tested as indicated below with results in conformance to the relevant test criteria.					
The following tests were performed:					
Test Description			UL 62368-1:2014 Ed.2 / Clause		
Heating test and abnormal & fault condition test			5.4.1.4, 6.3, 6.4, 9.0, B.2.6, B.3, B.4, Annex G.5.3, G.5.4		
Electrical Power Source (PS) measurements for classification			6.2.2		
Determination of Arcing PIS			6.2.3.1		
Determination of Resistive PIS			6.2.3.2		
Input test			Annex B.2.5, Annex E		
Durability, legibility and permanence of markings			Annex F.3.9		
Limited power source test (LPS)			Annex Q.1		
Steady force test, 10 N			Annex T.2		
Steady force test, 30 N			Annex T.3		

**8.1 Signatures**

A representative sample of the product covered by this report has been evaluated and found to comply with the applicable requirements of the standards indicated in Section 1.0.

Completed by:	Jesse Fu	Reviewed by:	Jason Zhang
Title:	Project Handler	Title:	Reviewer
Signature:	Jesse Fu	Signature:	Jason Zhang

**9.0 Correlation Page For Multiple Listings**

The following products, which are identical to those identified in this report except for model number and Listee name.

BASIC LISTEE	
Address	
Country	
Product	

MULTIPLE LISTEE 1	None
Address	
Country	
Brand Name	
ASSOCIATED MANUFACTURER	
Address	
Country	
MULTIPLE LISTEE 1 MODELS	BASIC LISTEE MODELS

MULTIPLE LISTEE 2	None
Address	
Country	
Brand Name	
ASSOCIATED MANUFACTURER	
Address	
Country	
MULTIPLE LISTEE 2 MODELS	BASIC LISTEE MODELS

MULTIPLE LISTEE 3	None
Address	
Country	
Brand Name	
ASSOCIATED MANUFACTURER	
Address	
Country	
MULTIPLE LISTEE 3 MODELS	BASIC LISTEE MODELS

**10.0 General Information**

The Applicant and Manufacturer have agreed to produce, test and label ETL Listed products in accordance with the Report. The Manufacturer has also agreed to notify Intertek and to request authorization prior to using alternate materials.

**COMPONENTS**

Components used shall be those itemized in this C-star report covering the product, including any amendments and/ Components used shall be those itemized in this C-star report covering the product, including any

The manufacturer agrees to conduct the following Manufacturing and Production Tests as specified:

#### **Required Tests**

Dielectric Voltage Withstand Test

**(Not: this product is not applicable)**

#### **11.1 Dielectric Voltage Withstand Test**

##### Method

One hundred percent of production of the products covered by this Report shall be subjected to a routine production line dielectric withstand test.

The test shall be conducted on products, which are fully assembled. Prior to applying the test potential, all switches, contactors, relays, etc., should be closed so that all primary circuits are energized by the test potential. If all primary circuits cannot be tested at one time, then separate applications of the test potential shall be made.

The test voltage specified below shall be applied between primary circuits and accessible dead-metal parts. The test voltage may be gradually increased to the specified value but must be maintained at the specified value for one second or one minute as required.

##### Test Equipment

The test equipment shall incorporate a transformer with an essentially sinusoidal output, a means to indicate the applied test potential, and an audible and/or visual indicator of dielectric breakdown.

The test equipment shall incorporate a voltmeter in the output circuit to indicate directly the applied test potential if the rated output of the test equipment is less than 500VA.

If the rated output of the test equipment is 500VA or more, the applied test potential may be indicated by either:

- 1 - a voltmeter in the primary circuit;
- 2 - a selector switch marked to indicate the test potential; or
- 3 - a marking in a readily visible location to indicate the test potential for test equipment having a single test potential output.

In cases 2 and 3, the test equipment shall include a lamp or other visual means to indicate that the test potential is present at the test equipment output. All test equipment shall be maintained in current calibration.

#### **Products Requiring Dielectric Voltage Withstand Test:**

<u>Product</u>	<u>Test Voltage</u>	<u>Test Time</u>
NA		
NA	NA	NA

## 12.0 Revision Summary

The following changes are in compliance with the declaration of Section 8.1:

[illegible]



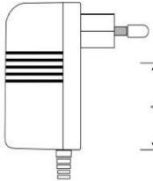
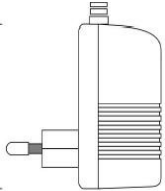
## TEST DATA SHEET of IEC 62368-1

Job No .....	CstarVI29U01X
Applicant.....	Shenzhen Zhiyuantongtai Technology Co.,LTD
Standard .....	Audio/video, information and communication technology equipment -Safety requirements <input type="checkbox"/> IEC 62368: 2014 <input type="checkbox"/> EN 62368: 2014 <input checked="" type="checkbox"/> UL 62368-1: 2014 (Ed. 2) ( ANSI standard)
Tested/ Checked by.....	Jesse Fu / <i>Jesse Fu</i>
Reviewed by.....	Jason Zhang / <i>Jason Zhang</i>
Page information .....	40 pages
Product .....	Battery base
Model no.....	E02-B
Rating .....	DC12V, 125A
Class .....	Class III
Mass the product (kg) .....	0.022
Test location.....	Shenzhen C-Star Test Co., Ltd.. Room 208, 2/F., Building A3, No.416, Xuegang North Road, Qinghu Community, Longhua Subdistrict, Longhua District, Shenzhen, Guangdong, China
<b>Test case verdicts</b> Test case does not apply to the test object..... : NA (Not Applicable) Test item comply the requirement of standard..... : P (Pass) Test item does not comply the requirement of standard.... : F (Fail) Information for reference ..... : Info.	
<b>General remarks</b> The test results presented in this report relate only to the item tested. Selection mark:     or <input checked="" type="checkbox"/> Main test model: -- <input checked="" type="checkbox"/>	

Clause	Performance Test	Comment
4.7	Torque test of Devices Forming a Part of Mains Plug	<input type="checkbox"/> P/ <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA
4.8	Safety requirements for coin/button cell batteries	<input type="checkbox"/> P/ <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA
5.2, 5.7.2.1	Classification of electrical energy sources	<input type="checkbox"/> P/ <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA
5.3.2	Accessibility to electrical energy sources and safeguards (Accessibility test)	<input type="checkbox"/> P/ <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA
5.4.1.3	Hygroscopic Material Provided As an Insulation Material	<input type="checkbox"/> P/ <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA
5.4.1.4, 6.3, 6.4, 9.0, B.2.6, B.3, B.4, Annex G.5.3, G.5.4	Heating test and abnormal & fault condition test	<input checked="" type="checkbox"/> P/ <input type="checkbox"/> F / <input type="checkbox"/> NA
5.4.1.5.2, 5.4.1.5.3	Test for pollution degree 1 environment	<input type="checkbox"/> P/ <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA
5.4.1.8	Determination of working voltage	<input type="checkbox"/> P/ <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA
5.4.2, 5.4.3	Clearances and Creepage Distances Measurement	<input type="checkbox"/> P/ <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA
5.4.1.10.3	Ball pressure test	<input type="checkbox"/> P/ <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA
5.4.5	Surge test	<input type="checkbox"/> P/ <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA
5.4.7	Test for cemented joints	<input type="checkbox"/> P/ <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA
5.4.8	Humidity test	<input type="checkbox"/> P/ <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA
5.4.4, 5.4.9	Electric strength test	<input type="checkbox"/> P/ <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA
5.4.10	Safeguards against transient voltages from external circuits	<input type="checkbox"/> P/ <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA
5.4.11	Separation between external circuits and earth	<input type="checkbox"/> P/ <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA
5.5.2.2	Safeguards against capacitance discharge test	<input type="checkbox"/> P/ <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA
5.6.6.2	Resistance of the protective bonding system (Ground continuity test)	<input type="checkbox"/> P/ <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA
5.7.2.1, 5.7.2.2, 5.7.4	Earthed accessible conductive part test	<input type="checkbox"/> P/ <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA
6.2.2	Electrical Power Source (PS) measurements for classification	<input checked="" type="checkbox"/> P/ <input type="checkbox"/> F / <input type="checkbox"/> NA
6.2.3.1	Determination of Potential Ignition Sources (Arcing PIS)	<input type="checkbox"/> P/ <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA

Clause	Performance Test	Comment
		NA
6.2.3.2	Determination of Potential Ignition Sources (Resistive PIS)	<input checked="" type="checkbox"/> P/ <input type="checkbox"/> F / <input type="checkbox"/> NA
8.6	Stability test	<input type="checkbox"/> P/ <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA
8.7	Wall or ceiling mount loading test	<input type="checkbox"/> P/ <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA
8.8	Handle strength test	<input type="checkbox"/> P/ <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA
8.10	Carts, stands, and similar carriers test	<input type="checkbox"/> P/ <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA
Annex B.2.5, Annex E	Input test	<input checked="" type="checkbox"/> P/ <input type="checkbox"/> F / <input type="checkbox"/> NA
Annex F.3.9	Durability, legibility and permanence of markings	<input checked="" type="checkbox"/> P/ <input type="checkbox"/> F / <input type="checkbox"/> NA
Annex G.5.2	Endurance test of wire insulation in wound components	<input type="checkbox"/> P/ <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA
Annex G.7.3.2	Cord strain relief test	<input type="checkbox"/> P/ <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA
Annex G10	Resistor test	<input type="checkbox"/> P/ <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA
M.3	Batteries	<input type="checkbox"/> P/ <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA
M.4	Additional safeguards for equipment containing secondary lithium batteries	<input type="checkbox"/> P/ <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA
Annex Q.1	Limited power source test (LPS)	<input checked="" type="checkbox"/> P/ <input type="checkbox"/> F / <input type="checkbox"/> NA
Annex S	Tests for resistance to heat and fire	<input type="checkbox"/> P/ <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA
Annex P.4	Adhesive test	<input type="checkbox"/> P/ <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA
Annex T.2	Steady force test, 10 N	<input checked="" type="checkbox"/> P/ <input type="checkbox"/> F / <input type="checkbox"/> NA
Annex T.3	Steady force test, 30 N	<input checked="" type="checkbox"/> P/ <input type="checkbox"/> F / <input type="checkbox"/> NA
Annex T.4	Steady force test, 100 N	<input type="checkbox"/> P/ <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA
Annex T.5	Steady force test, 250 N	<input type="checkbox"/> P/ <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA
Annex T.6	Enclosure impact test	<input type="checkbox"/> P/ <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA

Clause	Performance Test	Comment
Annex T.7	Drop test	<input type="checkbox"/> P/ <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA
Annex T.8	Stress relief test	<input type="checkbox"/> P/ <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA
Annex T.9	Glass impact test	<input type="checkbox"/> P/ <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA
Annex T.11	Test for telescoping or rod antennas	<input type="checkbox"/> P/ <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA

4.7	Torque Tests For Devices Forming a Part of Mains Plug		<input type="checkbox"/> P / <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA
<b><u>METHOD:</u></b> A EUT was plugged into a standard socket-outlet without earthing contact. UK plug was tested with earthing contact. The output cords of a transformer or power supply shall not be bundled so that it will influence a lot of the testing result. The output cord may be cut out to leave 10 cm on the sample to minimize the influence of the cord weight. The additional torque to maintain balance was recorded. Test was repeated with the EUT reverse inserted. The test was repeated with different plugs.			
<b><u>PASS/FAIL CRITERIA:</u></b> At most unfavorable position $\leq 0.25 \text{ Nm}$ ( $\equiv 2.55 \text{ kg}\cdot\text{f}\cdot\text{cm}$ )			
Tested at output cord downward position: 		Torque: _____ Nm	
Tested Up-side down: 		Torque: _____ Nm	
<b>Equipment used:</b>			

4.8	Safety requirements for coin/button cell batteries	<input type="checkbox"/> P/ <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA
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**Note: The requirement of this clause do not apply to:**

- ☐ PROFESSIONAL EQUIPMENT
- ☐ Equipment for locations where it is unlikely that children will be present
- ☐ Apparatus containing COIN / BUTTON CELL BATTERIES which are soldered in place.
- ☐ The coin/button cell batteries with a diameter of 32 mm or less (Diameter:                      mm)

#### 4.8.4.2 Stress relief test

If the battery compartment utilizes moulded or formed thermoplastic materials, the sample consisting of the complete equipment, or of the complete enclosure together with any supporting framework, is tested according to the stress relief test of Clause T.8.

During the test, the battery may be removed.

4.8.4.3	Battery replacement test	<input type="checkbox"/> P/ <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA
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**After the test:** The coin/button cell batteries shall not become ACCESSIBLE.

4.8.4.4	Drop test	<input type="checkbox"/> P/ <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA
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**After the test:** The coin/button cell batteries shall not become ACCESSIBLE.

4.8.4.5	Impact test	<input type="checkbox"/> P/ <input type="checkbox"/> F /    NA
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**After the test:** The coin/button cell batteries shall not become ACCESSIBLE.

4.8.4.6	Crush test	<input type="checkbox"/> P/ <input type="checkbox"/> F /    NA
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**After the test:** The coin/button cell batteries shall not become ACCESSIBLE.

4.8.5	Compliance	<input type="checkbox"/> P/ <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA
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**After the test:**

☐ **For IEC /EN 62368-1:** The battery compartment door / cover shall remain functional, the coin/button cell batteries shall not become ACCESSIBLE.

☐ **For UL/CSA 62368-1:** The battery compartment door / cover shall remain functional, the battery compartment door/cover shall not open and the coin/button cell batteries shall not become ACCESSIBLE.

**Equipment used:**



<b>Clause 5.2, 5.7.2.1</b>	<b>Classification of Electrical energy sources</b>	<input type="checkbox"/> P / <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA
<p><b>METHOD:</b></p> <p>The unit was connected to a supply source as indicated below and operated under any load conditions which can generate maximum voltage or current (currents were measured according to 5.7, using measuring networks in Figures 4 and 5 respectively in IEC 60990) under normal, abnormal and single fault conditions.</p> <p>Class II equipment or class II construction, the user accessible area was tested by a metal foil 10cm x 20 cm.</p>		
<p><b>PASS/FAIL CRITERIA:</b></p> <p>Within the limit of Table defined and the following described.</p> <ul style="list-style-type: none"> <li>- The ES1 limits <u>under normal operating conditions (NC)</u> and <u>abnormal operating conditions</u>.</li> <li>- The ES1 limits <u>under single fault conditions (SFC)</u> of a component, device or insulation <u>not serving as a safeguard</u>.</li> <li>- The ES2 limits under single fault conditions (SFC) of a basic safeguard.</li> </ul>		

5.2.2.2, 5.2.2.4, 5.2.2.5, 5.7.2.1		TABLE: Classification of electrical energy sources					
5.2.2.2 – Steady State Voltage and Current conditions							
No.	Test voltage (V)	Location	Test conditions	Parameters			ES Class
				Vrms or Vpk	Arms or Apk	Hz	
			Normal				
			Abnormal - Maximum load at output terminal				
			Single fault –SC				
			Single fault –SC				

5.2.2.4 - Single Pulses							
No.	Test voltage (V)	Location	Test conditions	Parameters			ES Class
				Duration (ms)	Upk (V)	Ipk (mA)	
			Normal: _____				
			Abnormal:				
			Single fault: SC/OC				

5.2.2.5 - Repetitive Pulses							
No.	Test voltage (V)	Location	Test conditions	Parameters			ES Class
				Off time (ms)	Upk (V)	Ipk (mA)	
			Normal:				
			Abnormal:				

			Single fault: SC/OC				
<b>Notes:</b> SC – <b>short</b> circuit, OC – open circuit							
<b>Equipment used:</b>							

Clause 5.3.2 Accessibility to electrical energy sources and safeguards		<input type="checkbox"/> P/ <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA
<b>METHOD:</b> Protection of Operator – by the indicated below EUT: Remove all operator-detachable parts, including fuseholders; open all doors and covers which were user accessible (lamps were not removed); operator separable connectors disconnected (not including IEC60083 plug & socket-outlet); movable parts were in most unfavorable positions.		
<b>PASS/FAIL CRITERIA:</b> - shall not become <b>accessible</b> to class 3 energy sources other than PS3; and - All other <b>safeguards</b> shall remain effective. - <b>Air gap &gt; 420 V: Additional spacing</b> of contact the voltage as specified in <b>Table 9</b> of the standard or <b>dielectric strength test</b> .		
Test Probe	Contact to hazardous parts possible	Falling location
<input type="checkbox"/> <b>Fig. V.1:</b> accessible to children • <u>Jointed test probe</u> : without appreciable force • <u>Straight unjointed test probe</u> : up to 30 N	<input type="checkbox"/> Yes, <input type="checkbox"/> No	
<input type="checkbox"/> <b>Fig. V.2:</b> unlikely accessible to children • <u>Jointed test probe</u> : without appreciable force • <u>Straight unjointed test probe</u> : up to 30 N	<input type="checkbox"/> Yes, <input type="checkbox"/> No	
<input type="checkbox"/> • <b>Fig. V.3 (Blunt probe)</b> without appreciable force: Plugs, jacks, connectors	<input type="checkbox"/> Yes, <input type="checkbox"/> No	
<input type="checkbox"/> • <b>Fig. V.4 (Wedge probe)</b> : slot openings	<input type="checkbox"/> Yes, <input type="checkbox"/> No	
<input type="checkbox"/> • <b>Fig. V.5 (Terminal probe)</b> : any other openings within 25 mm from the terminal, up to 1 N	<input type="checkbox"/> Yes, <input type="checkbox"/> No	
<b>Equipment used:</b>		

5.4.1.3	Hygroscopic Material Provided As an Insulation Material	<input type="checkbox"/> P/ <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA
<input type="checkbox"/> A specimen of the material is subjected to a temperature (20 °C~30 °C, ±2°C), and a relative humidity of 90% to 96%, 48h.		
<input type="checkbox"/> For apparatus to be used under tropical conditions, A specimen of the material is subjected to a temperature (40°C ±2°C), and a relative humidity of 90% to 96%, 120h.		
After this preconditioning, the specimen shall comply with the Insulation resistance and dielectric strength test in Clause 5.4.9.1		

Insulation resistance measured after humidity treatment for:	R (MW)	Limit (MW)
		$\geq 4 \text{ M}\Omega$
Dielectric strength test after humidity treatment for:	Test voltage (Vpeak)	Breakdown
		<input type="checkbox"/> Yes, <input type="checkbox"/> No
<b>Equipment used:</b>		

5.4.1.4, 6.3, 6.4, 9.0, B.2.6, B.3, B.4, Annex G.5.3, G.5.4	Heating test and abnormal & fault condition test	<input checked="" type="checkbox"/> P / <input type="checkbox"/> F / <input type="checkbox"/> NA
---	--	--

**METHOD:**

The sample was connected to a supply source and operated until temperatures became stable under **normal operating conditions** according to **Clause B.2** and under **abnormal operating conditions** according to **Clause B.3**. Temperatures of parts were measured by thermal couplers (TC), or windings were measured by resistance change method. Measuring place shall be a point close to the heat source.

The test conditions with **Thermocouple method** were as follows:

**PASS/FAIL CRITERIA:**

Within the limit of Table defined.

5.4.1.4, 6.3.2, 9.0, B.2.6	<b>TABLE: Maximum temperature measurements</b>					
	Test voltage (V)	:	a) U - _____ = 4.25Vdc b) U + _____ = 6.00Vdc c) U - _____ = 7.65Vdc d) U - _____ = 10.80Vdc			
Channel	Test location/parts	Maximum measured temperature T(°C)				Allowed T <sub>max</sub> (°C)
		5Vdc		9Vdc		
1	PCB near IC	70.3	--	72.8	--	130
2	Internal wire	62.5	--	60.1	--	80
3	Wireless induction coil	76.3	--	75.9	--	120
4	Enclosure insider near induction coil	72.1		70.5		80
5	Ambient	40.0	--	40.0	--	--
--	--	--	--	--	--	--
1	Enclosure outsider near induction coil	42.3	--	41.1	--	77
2	Accessible metal connector of iPhone	36.2	--	35.6	--	77
3	Ambient	25.0	--	--	--	--

No.	Condition	Test voltage (V)	Input current (A)	Input power (W)	Output power (W)	Fuse open current (A)	Result
1	Output SC	9	0	0	--	--	Unit shutdown immediately. no damaged, no hazards, NB, NC, NT.
2	Blocked ventilation openings	9	1.1→1.1	11.4→11.4	--	--	Running for 60mins, Normal working, no damaged, no hazards, NB, NC, NT. 1. Wireless induction coil: 79.5°C; 2. Enclosure outsider near induction coil: 43.5°C; 3. Accessible metal connector of iPhone: 37.5°C 4. Ambient: 25.2°C.
<p><i>Note: <b>Max</b>=max non-clipped or available output power, <b>SC</b>=short circuit, <b>OC</b>=open circuit, <b>OL</b>=over load, <b>BL</b>=block. <b>V</b>= vertical, <b>H</b> =horizontal</i></p> <p>Equipment used: --</p>							

<b>Clause 5.4.1.5.2</b>	<b>Test for Pollution Degree 1 environment and for an insulation compound</b>	<input type="checkbox"/> P/ <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA
<b>METHOD:</b> <ul style="list-style-type: none"> <li>• <b>Step 1, Thermal cycling:</b> 1 sample, 10 times of the following sequence of temperature cycles; then           <ul style="list-style-type: none"> <li>a) 68 h at <math>(T_1 \pm 2)^\circ\text{C}</math></li> <li>b) 1 h at <math>(25^\circ\text{C} \pm 2)^\circ\text{C}</math></li> <li>c) 2 h at <math>(0^\circ\text{C} \pm 2)^\circ\text{C}</math></li> <li>d) <math>\geq 1</math> h at <math>(25^\circ\text{C} \pm 2)^\circ\text{C}</math></li> </ul> <math>T_1 = (T_2 + T_{ma} - T_{amb} + 10\text{K})</math> or <math>85^\circ\text{C}</math>, whichever was higher;  <math>T_2</math> = temperature of the part during test of <b>5.4.1.4</b>.         </li> <li>• <b>Step 2, Humidity test:</b> after humidity conditioning of <b>5.4.8</b>, then electric strength test of <b>5.4.9</b>.</li> </ul>		
<b>PASS/FAIL CRITERIA:</b> <ul style="list-style-type: none"> <li>– There shall be no delamination which affects the <b>creepage distances</b> required to fulfil the requirements of <b>pollution degree 1</b>.</li> <li>– There shall be no visible voids, gaps or cracks in the insulating material.</li> </ul>		
<b>Step 1, Thermal cycling:</b>		
Temperature T1 : _____	Started date: _____, Time: _____	Ended date: _____, Time: _____
<b>Step 2, Humidity test of 5.4.8:</b>		
Temperature : _____ and Humidity : _____ % RH	Started date: _____, Time: _____	Ended date: _____, Time: _____
<b>Step 2, Electric strength test of 5.4.9:</b>		
<b>Test voltage applied between</b>	<b>Test voltage</b>	<b>Breakdown</b>
	Vac/Vdc	<input type="checkbox"/> Yes, <input type="checkbox"/> No
	Vac/Vdc	<input type="checkbox"/> Yes, <input type="checkbox"/> No
	Vac/Vdc	<input type="checkbox"/> Yes, <input type="checkbox"/> No
<b>Notes: Alternating polarity</b> for electric strength test of <b>dc voltage</b> .		
<b>Equipment used:</b>		

<b>Clause 5.4.1.8</b>	<b>Determination of working voltage</b>	<input type="checkbox"/> P/ <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA
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**METHOD:**

The unit was connected to **a supply source as indicated below** and operated normally. Working voltages between the following points were recorded.

Common reference GND established by connecting PE to N – neutral (TN power system) and to secondary GND (or output – ).

<b>5.4.1.8</b>	<b>Table: Working voltage measurement</b>		
	Test voltage	:	___ Vac/, ___ Hz
	Ambient temperature	:	___ °C

Location	Measured voltage/frequency			Comments
	Peak (V)	RMS (V)	Hz	

**Equipment used:**

<b>5.4.2, 5.4.3</b>	<b>Measurement of Clearance and Creepage Distance</b>	<input type="checkbox"/> P/ <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA
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To determine the **clearance**, the highest value of the following two procedures shall be used:

- Procedure 1: Determine **clearances** according to 5.4.2.2 using the **peak working voltage**.
- Procedure 2: Determine **clearances** according to 5.4.2.3 using the **required withstand voltages**. Alternatively, the adequacy of **clearances** may be determined using an electric strength test according to 5.4.2.4, in which case the values according to procedure 1 shall be maintained.

**Procedure:**   2  

Clearance (cl) and creepage distance (cr) at/of/between:	Up (V)	U r.m.s. (V)	Frequency (kHz) <sup>1</sup>	Required cl (mm)	cl (mm) <sup>2</sup>	Required <sup>3</sup> cr (mm)	cr (mm)

Supplementary information:

Note 1: Only for frequency above 30 kHz



Note 2: See table 5.4.2.4 if this is based on electric strength test

Note 3: Provide Material Group

**Table 16 – Electric strength test voltages**

Test voltage applied between	Test voltage	Breakdown			
		<input type="checkbox"/> Yes, <input type="checkbox"/> No			
<b>Procedure 2:</b> _____					
clearance and creepage distance at/of:	Required withstand voltages	Min. required	cl (mm)	Min. required	dcr (mm)

**Equipment used:**

Clause 5.4.1.10.3B	Ball pressure test	<input type="checkbox"/> P/ <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA
<p><b>METHOD:</b>            Test according to <b>IEC 60695-10-2</b>. The surface of the thermoplastic part was placed in a horizontal position and a steel ball 5 mm in diameter pressed against this surface by a force of 20 N.             The test was made at a temperature which was (T-Tamb+Tma+15°C) 2°C. However, a thermoplastic supporting parts in a circuit supplied from the mains was tested at a minimum 125°C.            After 1 h, the ball was removed and the sample cooled down to approximate room temperature within 10 s by immersion in the cold water.</p>		
<p><b>PASS/FAIL CRITERIA:</b>            After the test, dimension d (diameter of the indentation) shall not exceed 2 mm.</p>		
5.4.1.10.3	<b>TABLE: Ball pressure test of thermoplastic parts</b>	
Material/Manufacturer/Part No.	Test temperature (°C)	Impression diameter (mm)
<b>Equipment used:</b>		

Clause 5.4.5	Surge Test	<input type="checkbox"/> P/ <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA
<p><b>METHOD:</b>            The EUT for class II apparatus between accessible parts or parts connected to them and hazard live parts which was subjected to 50 discharges from the impulse test generator <b>circuit 3 of Table D.1</b>, at not more than 12 discharges per minute, with Uc equal to 10 kV.</p>		

**PASS/FAIL CRITERIA:**

After the test, the tested insulation shall comply with the requirement of the following.

- Insulation resistance in **Table 24**, or
- Electric strength test of **5.4.9** without insulation breakdown.

<b>5.4.5</b>	<b>TABLE: Surge test</b>		
Insulation between	Electric strength test	Insulation resistance (M )	Results
The mains and the POE output		> 4 M	<input type="checkbox"/> Pass, <input type="checkbox"/> Fail
<b>Notes: Alternating polarity for electric strength test of dc voltage.</b>			
<b>Equipment used:</b>			

<b>Clause 5.4.7</b>	<b>Test for cemented joints</b>	<input type="checkbox"/> P/ <input type="checkbox"/> F / <b>NA</b>
<b>METHOD:</b> <ul style="list-style-type: none"> <li>• <b>Step 1, Thermal cycling:</b> 3 samples, 10 times of the following sequence of temperature cycles; then           <ul style="list-style-type: none"> <li>a) 68 h at <math>(T_1 \pm 2)^\circ\text{C}</math></li> <li>b) 1 h at <math>(25^\circ\text{C} \pm 2)^\circ\text{C}</math></li> <li>c) 2 h at <math>(0^\circ\text{C} \pm 2)^\circ\text{C}</math></li> <li>d) <math>\geq 1</math> h at <math>(25^\circ\text{C} \pm 2)^\circ\text{C}</math></li> </ul> <math>T_1 = (T_2 + T_{ma} - T_{amb} + 10\text{K})</math> or <math>85^\circ\text{C}</math>, whichever was higher;  <math>T_2</math> = temperature of the part during test of <b>5.4.1.4</b>.         </li> <li>• <b>Step 2, Electric strength test:</b> 1 sample, <b>1.6 times test voltage</b> of <b>5.4.9</b>.</li> <li>• <b>Step 2, Humidity test:</b> the other two samples, after humidity conditioning of <b>5.4.8</b>, then electric strength test above.</li> </ul>		
<b>PASS/FAIL CRITERIA:</b> <ul style="list-style-type: none"> <li>- There shall be no delamination.</li> <li>- There shall be no visible voids, gaps or cracks in the insulating material.</li> </ul>		
<b>Step 1, Thermal cycling:</b>		
Temperature T1 : _____	Started date: _____, Time: _____	Ended date: _____, Time: _____
<b>Step 2, Humidity test of 5.4.8:</b>		
Temperature : _____ $^\circ\text{C}$ and Humidity : _____ % RH	Started date: _____, Time: _____	Ended date: _____, Time: _____
<b>Step 2, Electric strength test of 5.4.9:</b>		
Test voltage applied between	Test voltage	Breakdown
	Vac/Vdc	<input type="checkbox"/> Yes, <input type="checkbox"/> No
<b>Notes: Alternating polarity for electric strength test of dc voltage.</b>		
<b>Equipment used:</b>		

<b>Clause 5.4.8</b>	<b>Humidity conditioning</b>	<input type="checkbox"/> P/ <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA
<b>METHOD:</b> A humidity chamber was maintained below. The unit and any other separate components were brought to a temperature between t and (t + 4) °C. They were then placed in the chamber and held at a relative humidity and testing period. Prior to conditioning, parts of the unit (covers) that could be removed without the use of tools were removed and separately placed in the chamber. During conditioning, cable entrances and/or a conduit opening were left open. During this treatment, the unit was not energized. The insulation was then subjected to electric strength test of <b>5.4.9</b> while the EUT was still in the cabinet.		
<b>PASS/FAIL CRITERIA:</b> The dielectric strength test shall be conducted without insulation breakdown under double insulation or/and basic insulation after humidity conditioning.		
<b>5.4.8</b>	<b>TABLE: Humidity conditioning</b>	
Temperature : ____ °C and Humidity: ____ %RH, Test time: ____ hours		
<b>Electric strength test of 5.4.9:</b>		
<b>Test voltage applied between</b>	<b>Test voltage</b>	<b>Breakdown</b>
L/N to output terminal		<input type="checkbox"/> Yes, <input checked="" type="checkbox"/> No
L/N to metal enclosure		<input type="checkbox"/> Yes, <input checked="" type="checkbox"/> No
<b>Notes: Alternating polarity</b> for electric strength test of <b>dc voltage</b> .		
<b>Equipment used:</b>		

<b>Clause 5.4.9</b>	<b>Electric Strength test</b>	<input type="checkbox"/> P/ <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA
<b>METHOD:</b> The test was made while the EUT was still in well-heated condition (immediately after <b>5.4.1.4</b> heating test). Make sure the power switch of the EUT was in ON position. Thin material can be tested in room temperature. The test voltage was a.c. of 50 or 60 Hz or d.c. voltage equal to peak voltage of the a.c. voltage. Test voltage was applied gradually raised from zero to the specified voltage and held at that value for 60s. Insulation breakdown was: Current flows through the insulation rapidly increases in an uncontrolled manner; that was the insulation does not restrict the flow of the current. Corona discharge or a single momentary flashover was not regarded as insulation breakdown. A test incorporating reinforced insulation and lower grades insulation (BI, SI), care was taken not to overstress BI or SI. This was happened frequently when the secondary circuits (user accessible parts) were directly connected to earth. Where capacitors were across the insulation, d.c. voltage was recommended for the test.		
<b>PASS/FAIL CRITERIA:</b> Without indication of insulation breakdown during or after the test.		
<b>5.4.9</b>	<b>TABLE: Electric strength tests</b>	
<b>Test voltage applied between</b>	<b>Test voltage</b>	<b>Breakdown</b>
L/N to output terminal		<input type="checkbox"/> Yes, <input checked="" type="checkbox"/> No
L/N to metal enclosure		<input type="checkbox"/> Yes, <input checked="" type="checkbox"/> No
<b>Notes: Alternating polarity</b> for electric strength test of <b>dc voltage</b> .		

Equipment used:

#### Clause 5.4.10

#### Safeguards against transient voltages from external circuits

☐ P/ ☐ F / ☒ NA

#### METHOD:

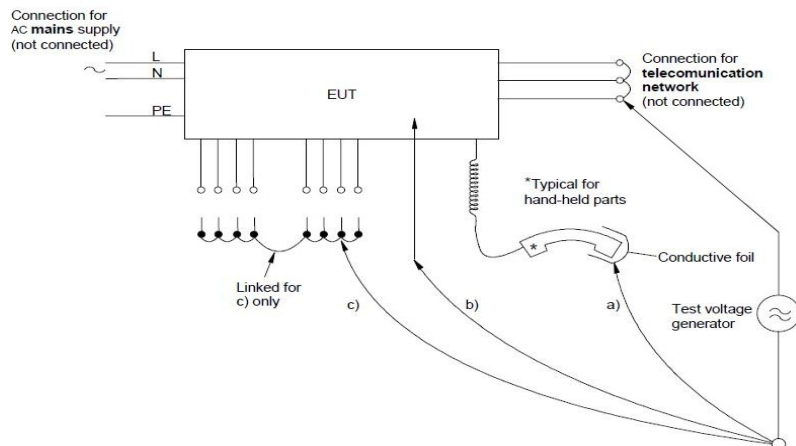


Table 29 – Test values for electric strength tests

Parts	Impulse test	Steady state test
Parts indicated in 5.4.10.1 a) <sup>a</sup>	2,5 kV 10/700 $\mu$ s	1,5 kV
Parts indicated in 5.4.10.1 b) and c) <sup>b</sup>	1,5 kV 10/700 $\mu$ s <sup>c</sup>	1,0 kV

<sup>a</sup> Surge suppressors shall not be removed.  
<sup>b</sup> Surge suppressors may be removed, provided that such devices pass the impulse test of 5.4.10.2.2 when tested as components outside the equipment.  
<sup>c</sup> During this test, it is allowed for a surge suppressor to operate and for a sparkover to occur in a GDT.

☐ **Impulses test** : the electrical separation is subjected to ten impulses of alternating polarity. The interval between successive impulses is 60 s with a voltage as given in Table 29. OR  
**alternative** ☐ **Steady-state test**: according to 5.4.9.1

#### PASS/FAIL CRITERIA:

There shall be no insulation breakdown; and except as indicated in Table 29, footnote <sup>b</sup>, a surge suppressor shall not operate, or a sparkover shall not occur within a GDT.

For the impulse tests, insulation breakdown is verified in one of the following two ways:

- ☐ during the application of the impulses, by observation of oscillograms, surge suppressor operation or breakdown through insulation is judged from the shape of an oscillogram.
- ☐ after application of all the impulses, by an insulation resistance test. Disconnection of surge suppressors is permitted while insulation resistance is being measured. The test voltage is 500 V d.c. or, if surge suppressors are left in place, a d.c. test voltage that is 10 % less than the surge suppressor operating or striking voltage. The insulation resistance shall not be less than 2 M $\Omega$ .

Equipment used:

#### Clause 5.4.11

#### Separation between external circuits and earth

☐ P/ ☐ F / ☒ NA

#### METHOD:

Compliance is checked by inspection and by the electric strength test of 5.4.9.1.

Components, other than capacitors, that bridge the separation, may be removed during electric strength testing.

Components that are left in place during the test shall not be damaged.

If components are removed, the following additional test with a test circuit according to Figure 31 is performed with all components in place.

For equipment powered from a.c. mains, the test is performed with a voltage equal to the rated voltage of the equipment or to the upper voltage of the rated voltage range. For equipment powered from d.c. mains, the test is performed with a voltage equal to the highest nominal voltage of the a.c. mains in the region where the equipment is to be used (for example, 230 V for Europe or 120 V for North America).

#### **PASS/FAIL CRITERIA:**

The current flowing in the test circuit of Figure 31 shall not exceed 10 mA.

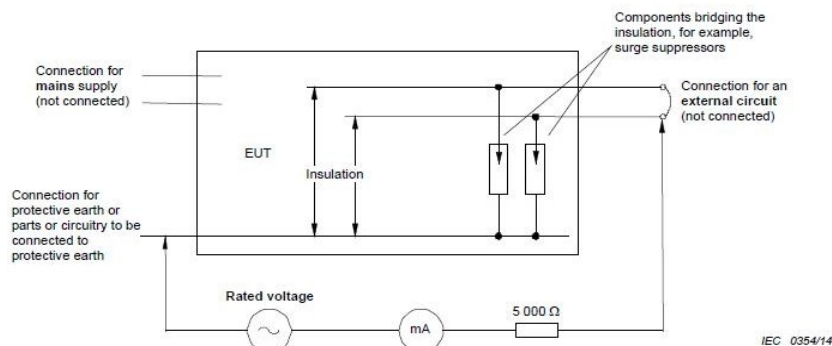


Figure 31 – Test for separation between an external circuit and earth

Clause 5.4.11	Separation between external circuits and earth		
Test Voltage / Circuit	Components Removed??	Components removed are	Insulation breakdown?
	Yes / No		Yes / No
	Yes / No		Yes / No
Observation	Result		Remarks
Current measured (mA)			Shall      10 mA
Current measured (mA)			Shall      10 mA
Equipment used:			

Clause 5.5.2.2      Capacitance discharge test	<input type="checkbox"/> P / <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA
<b>METHOD:</b> The unit was connected to <b>a supply source as indicated below</b> . A storage oscilloscope was connected across the external point of disconnection of the mains supply. Measurement of the voltage decayed, shall be achieved by storage oscilloscope having high input impedance (100 M $\pm$ 5 M $\Omega$ , <25 pF). A probe of minimum 100:1 can achieve this requirement. The power switch of the EUT shall be either in ON or OFF position. The <b>accessible</b> voltage measured 2 s after disconnection of power source and recorded. Several times of trying may be needed to get a higher voltage of disconnection moment.	
<b>PASS/FAIL CRITERIA:</b> – The ES1 limits of Table 5 <b>under normal operating conditions (NC)</b> .	

- The ES1 limits of Table 5 under single fault conditions (SFC) of a component, device or insulation **not serving as a safeguard**.
- The ES2 limits of Table 5 under single fault conditions (SFC) of a **basic safeguard**.

**5.5.2.2****Table: Stored discharge on capacitors**

Test voltage	:	_____Vac/Vdc, _____Hz
Ambient temperature	:	_____°C
Related component value	:	Overall capacity : _____μF Discharge resistor : _____, total: ICX : <u>NA</u>

Test condition/location	Switch position (On or Off)	Measured voltage (V peak)		Limit (V peak)		SFC Part
		Under NC (N, S)	Under SFC	ES1	ES2	

**Notes:**

- 1) N – Normal operating condition (e.g. normal operation, or open fuse), S – Single fault condition
- 2) Attach the measured oscilloscope chart.

**Equipment used:**

<b>Clause 5.6.6.2</b>	<b>Resistance of the protective bonding system (Ground continuity test)</b>	<input type="checkbox"/> P/ <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA
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**METHOD:**

The test current can be either a.c. or d.c. and the test voltage shall not exceed 12 V. The measurement was made between the main protective earthing terminal and the point in the equipment that was required to be earthed.

**If the protective current rating of the circuit ≤ 25 A: (EU 16A, UK 13A, US 20A)****If the protective current rating of the circuit > 25 A:**

The test current was 200 % of the **protective current rating** or 500 A, whichever was less, and the duration of the test was as shown in **Table 33**.

**Table 33 – Test duration, mains connected equipment**

Protective current rating of the circuit A up to and including	Duration of the test min
30	2
60	4
100	6
200	8
over 200	10

**PASS/FAIL CRITERIA:**

- The protective current rating of the circuit ≤ 25 A: the resistance ≤ 0.1
- The **protective current rating** of the circuit > 25 A: the voltage drop ≤ 2.5 V

5.6.6	Table: Resistance of protective conductors and terminations			
	Ambient temperature : __24.5__°C			
Location from A to B		Measured resistance (m )	Measured voltage drop (V)	Comments
Designated protective bonding conductor to inlet protective earthing conductor				
Equipment used:				

5.7.2.1, 5.7.2.2, 5.7.4	<b>Earthed accessible conductive part test</b>	<input type="checkbox"/> P / <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA
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**METHOD:**

The unit was connected to a **supply voltage** that is **anticipated maximum Touch Voltage**. EUT was placed on an insulated table or stand.

1. Using measuring networks in **Figure 5** in **IEC 60990** and secondary circuits were disconnected from other equipment.
2. Set up a **Fault condition No.** specified in **IEC 60990** clauses **6.2.2.1** through **6.2.2.8** (except for **6.2.2.7**) for EQUIPMENT having a protective earthing connection or a functional earthing connection.
3. The protective conductor and the earthed neutral conductor for the EUT should have a voltage difference of less than 1 % of line-to-line voltage (see example in **figure 1** of **IEC 60990**).
4. Test was made with both Line and Neutral conductor. Power switch of the EUT, if any, shall be opened or closed in all possible position. The ON/OFF of a single pole switch will influence the measuring result.
5. If a range of Y-capacitor will be used by the manufacturer, the test shall be conducted under max capacitance of the Y-capacitor that the manufacturer will use and the capacitance shall be recorded.

**PASS/FAIL CRITERIA:**

- Earthed accessible conductive parts: The touch current does not exceed the ES2 limits of Table 4 in 5.2.2.2.

5.7.2.1, 5.7.2.2, 5.7.4	<b>Table: Earthed accessible conductive part</b>					
	Supply voltage	:	Vac/Vde, Hz			
	Ambient temperature	:	__ °C			
Location	Fault condition No. (1, 2, 3, 4, 5, 6, 8)	Polarity (normal) [mA]		Polarity (reverse) [mA]		Touch current (mA)
		Switch: ON	Switch: OFF	Switch: ON	Switch: OFF	
Earthing metal enclosure to PE	1 (earth open)					
	1 (earth open)					
-	2 (neutral open)					
Equipment used:						

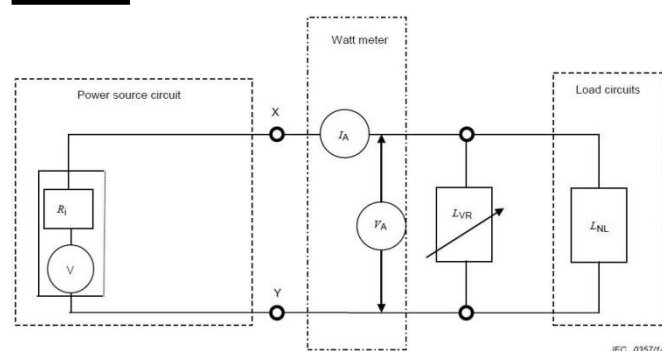
**Clause 6.2.2****Power source circuit classifications**
☒ P / ☐ F / ☐ NA
**METHOD:**

The electrical power source classification shall be determined by measuring the maximum power under each of the following conditions:

- **For load circuits:** a power source under **normal operating conditions** as specified by the manufacturer into a worst-case fault (see **Figure 34**), adjust the variable resistor,  $L_{VR}$ , for maximum power.

If the following situation happened shall be repeated.

- An **overcurrent protective device** operates during the test, the measurement shall be repeated at 125 % of the current rating of the overcurrent protective device.
- A **power limiting circuit operates** during the test, the measurement shall be repeated at a point just below the current at which the power limiting circuit operated.

**Figure 34 – Power measurement for worst-case fault****Key**

V voltage source

$R_i$  internal resistance of the power source

$I_A$  current from the power source

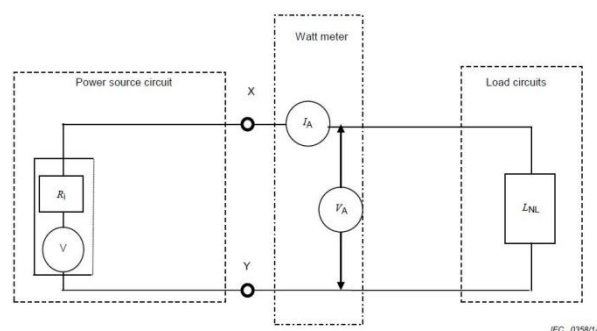
$V_A$  voltage at the points where determination of PS power is made.

$L_{NL}$  normal load

- **For power source circuits:** a worst-case power source fault into **the specified normal load circuit** (see **Figure 35**), simulate any **single fault condition** that will result in maximum power.

If the following situation happened shall be repeated.

- An **overcurrent protective device operates** during the test; the measurement shall be repeated at 125 % of the current rating of the overcurrent protective device.
- A **power limiting circuit operates** during the test, the measurement shall be repeated at a point just below the current at which the power limiting circuit operated. When the tests were repeated, a variable resistance may be used to simulate the component under fault.

**Figure 35 – Power measurement for worst-case power source fault****Key**

V voltage source

$R_i$  internal resistance of the power source

$I_A$  current from the power source

$V_A$  voltage at the points where determination of PS power is made.

$L_{NL}$  normal load

**CLASSIFICATION CRITERIA:**

**PS1:** < 15 W after 3 s.



**PS2:** > 15 W and < 100 W after 5 s.

**PS3:** > PS2 limits

6.2.2		TABLE: Electrical power source (PS) measurements for Classification						
Source	Description	Max. power after 3 s			Max. power after 5 s			PS Class
		Power (W)	V <sub>A</sub> (V)	I <sub>A</sub> (A)	Power (W)	V <sub>A</sub> (V)	I <sub>A</sub> (A)	
A	Output	10. 5	5.0	2.2	10. 5	5.0	2.2	PS1
Equipment used: --								

Clause 6.2.3.1		Determination of Potential Ignition Sources (Arcing PIS)			<input type="checkbox"/> P / <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA
<b>METHOD:</b> Determination of an <b>arcing PIS</b> was performed under <u>normal operating conditions</u> .					
<b>ARCING PIS CRITERIA:</b> <ul style="list-style-type: none"><li>- &gt; 50 V peak a.c. or d.c. after 3 s in open circuit voltage (Vp), and</li><li>- &gt; 15 W (Vp x Irms) for any of the following:<ul style="list-style-type: none"><li>• A contact, such switch or connector;</li><li>• A termination, such as one made by a crimp, spring or solder termination;</li><li>• Opening of a conductor, such as a PWB trace (except for PWB made of V-1 material)</li></ul></li><li>- Reliable or redundant connections are not considered to be an <b>arcing PIS</b></li></ul>					
6.2.3.1		TABLE: Determination of Potential Ignition Sources (Arcing PIS)			
Location	Open circuit voltage after 3 s (Vp)	Measured current (Irms)	Calculated value (Vp x Irms)	Arcing PIS?	
Blade of Plug, Pin L to N				<input type="checkbox"/> Yes <input type="checkbox"/> No	
Equipment used:					

Clause 6.2.3.2	Determination of Potential Ignition Sources (Resistive PIS)				<input checked="" type="checkbox"/> P/ <input type="checkbox"/> F / <input type="checkbox"/> NA
<b>METHOD:</b> Determination of a <b>resistive PIS</b> was performed under <u>normal operating conditions</u> or <u>single fault conditions</u> .					
<b>RESISTIVE PIS CRITERIA:</b> - <u>Under normal operating conditions</u> , parts > 15 W after 30 s (during the first 30 s there is no limit); or - <u>Under single fault conditions</u> : - > 100 W <u>measured during 30 s immediately</u> after the introduction of the fault if electronic circuits, regulators or PTC devices are used, or - > 15 W <u>measured 30 s</u> after the introduction of the fault.					
6.2.3.2		TABLE: Determination of Potential Ignition Sources (Resistive PIS)			
Circuit location	Operating condition	Measured during first 30 s (W/VA)	Measured during after 30 s (W/VA)	a. Protective circuit, or b. regulator, or c. PTC operated?	Resistive PIS?

Output	Normal condition	10.5	10.5	<input type="checkbox"/> a, <input type="checkbox"/> b, <input type="checkbox"/> c, <input checked="" type="checkbox"/> N/A	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<b>Equipment used:</b> --					

<b>Clause 8.6</b>	<b>Stability test (<math>\geq 7</math> kg)</b>	<input type="checkbox"/> P/ <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA
<b>METHOD:</b> The EUT was subjected to the following tests. During the tests, containers were to contain the amount of substance within their capacity that will result in the most disadvantageous condition. All doors, drawers, casters, adjustable feet and other appurtenance were arranged in any combination that results in the least stability.		
<b>PASS/FAIL CRITERIA:</b> During the test, the equipment shall not slide on a supporting surface made of glass or tip over.		
<input type="checkbox"/> <b>Static stability:</b> For non-floor standing $\leq 25$ kg, controls or display, floor standing <ul style="list-style-type: none"> <li>• <math>20\% \times W</math> or 250 N (whichever was less) =                      N at any height up to 1.5 m after being tilted <math>10^\circ</math>; or</li> <li>• Tilt <math>10^\circ</math></li> </ul> <input type="checkbox"/> <b>Downward force:</b> For floor standing $\geq 25$ kg <ul style="list-style-type: none"> <li>• 800 N at any height up to 1 m after being titled <math>10^\circ</math>.</li> </ul> <input type="checkbox"/> <b>Relocation:</b> For floor standing <ul style="list-style-type: none"> <li>• Tilt <math>10^\circ</math> , rotate 360</li> </ul> <input type="checkbox"/> <b>Glass slide:</b> For controls or display <ul style="list-style-type: none"> <li>• Tilt <math>10^\circ</math> , rotate 360</li> </ul> <input type="checkbox"/> <b>Horizontal force:</b> For controls or display <ul style="list-style-type: none"> <li>• 100 N or <math>13\% \times W</math> (whichever was less) =                      N at any height up to 1.5 m; or</li> <li>• Moved through any angle after being tilted <math>15^\circ</math> , or</li> <li>• Tilt <math>15^\circ</math> with rotating 360</li> </ul> <p><b>Note:</b> Equipment Weight = “W”</p>		
<b>Equipment used:</b>		

<b>Clause 8.7</b>	<b>Wall or ceiling mount loading test</b>	<input type="checkbox"/> P/ <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA
<b>METHOD:</b> The EUT for the purposes of wall mounting means was applied for 60 s and by the means of the following loading test.		
<b>PASS/FAIL CRITERIA:</b> The equipment or its associated mounting means shall <b>not become dislodged</b> and shall <b>remain mechanically intact</b> and secure during the test.		
<input type="checkbox"/> <b>Test 1:</b> Through the center of gravity <ul style="list-style-type: none"> <li>• <math>W + (3 \times W) =</math>                      kg, or</li> <li>• <math>W + 880</math> N =                      kg,</li> </ul> In addition, a lateral force of 50 N shall be applied for 60 s. <input type="checkbox"/> <b>Test 2:</b> Divided by the number of attachment points <ul style="list-style-type: none"> <li>• <math>4 \times W =</math>                      kg, or</li> <li>• <math>2 \times W + 880</math> N =                      kg</li> </ul> <input type="checkbox"/> <b>Test 3:</b> Threaded parts, a torque according to <b>Table 37</b> =                      Nm		

**Note:** Equipment Weight = “W”

**Equipment used:**

<b>Clause 8.8</b>	<b>Handle strength test</b>	<input type="checkbox"/> P/ <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA
<p><b>METHOD:</b></p> <p>A handle that was for the purpose of lifting or carrying the EUT was done by the following test. The additional weight shall be started at zero and gradually increased so that the test value was attained in 5 s to 10 s and maintained for 60 s. When more than one handle was provided, the force shall be distributed between the handles.</p>		
<p><b>PASS/FAIL CRITERIA:</b></p> <p>The handle, its securing means, or that portion of the <b>enclosure</b> to which it was secured, shall not break, crack, or detach from the equipment.</p>		
<p><b>MS2 (7 kg &lt; mass ≤ 25 kg): Each handle</b></p> <p><input type="checkbox"/> • <u>3 x W =</u>      kg</p> <p><input type="checkbox"/> <b>MS3 ≤ 50 kg:</b> Whichever was greater</p> <p>• <u>(2 x W) or 75 kg =</u>      kg</p> <p><input type="checkbox"/> <b>MS3 &gt; 50 kg:</b> Whichever was greater</p> <p>• <u>W or 100 kg =</u>      kg</p> <p><b>Note:</b> Equipment Weight = “W”</p> <p><b>Equipment used:</b></p>		

<b>Clause 8.10</b>	<b>Carts, stands, and similar carriers test</b>	<input type="checkbox"/> P/ <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA
<p><b>METHOD:</b></p> <p>A cart, stand or carrier shall be subjected to the applicable tests alone and again with the equipment specified by the manufacturer placed on the cart or stand.</p> <p>MS3 equipment, including their supporting carts, stands and similar carriers that support the equipment, that are not moved as part of its <b>normal operating conditions</b>, shall comply with the horizontal force test of 8.6.5.</p> <p>MS2 or MS3 equipment more than 1 m in height, including equipment mounted on their specified cart, stand or carrier, shall comply with the relocation stability test in 8.6.3 except that the tip angle becomes 15°.</p>		
<b>Clause 8.10.6</b>	<b>Thermoplastic temperature stability</b>	
<p><b>METHOD:</b></p> <p>An equipment, cart, stand or carrier using thermoplastic materials in its construction shall withstand the test of Clause T.8</p>		
<p><b>PASS/FAIL CRITERIA:</b></p> <p>Without any shrinkage, warpage, or other distortion of the thermoplastic materials that results in the equipment failing to comply with 8.10.3, 8.10.4 and 8.10.5.</p>		
<b>Clause 8.10.3</b>	<b>Cart, stand or carrier loading test</b>	
<p><b>METHOD:</b></p> <p><input type="checkbox"/> The force <b>220N</b> is applied through the end of a 30 mm diameter circular cylinder. The force is to be applied to a shelf drawer, dowel rung support, or equivalent part that is within 750 mm from the floor and will support some or all of a child's weight. The force is to be applied for 1 min with the cart or stand at room temperature.</p> <p><input type="checkbox"/> The manufacturer's intended load plus 440 N for the surface intended to support a display with moving images, applied for 1 min or <input type="checkbox"/> four times the manufacturer's intended load or 100 N, whichever is greater but not to</p>		

exceed 440 N, is applied to all applicable surfaces, applied for 1 min on each supporting surface	
<b><u>PASS/FAIL CRITERIA:</u></b> No permanent deformation or no damage	
<b><u>Clause 8.10.4</u></b>	<b><u>Cart, stand or carrier loading test</u></b>
<b><u>METHOD:</u></b> A single 7 J impact is to be applied to any part of the cart or stand and the test method is to be as described in Clause T.6. However, a cart, stand or carrier made of glass shall be tested instead according to 4.4.4.6.	
<b><u>PASS/FAIL CRITERIA:</u></b> No produce a risk of injury to persons.	
<b><u>Clause 8.10.5</u></b>	<b><u>Mechanical stability</u></b>
<b><u>METHOD:</u></b> <input type="checkbox"/> <b><u>Relocation:</u></b> Clause 8.6.3 <input type="checkbox"/> <b><u>Horizontal force:</u></b> Clause 8.6.5 If during the tests of 8.6.3 and 8.6.5 the equipment starts to slide or tip relative to the cart, stand or carrier, only the horizontal force test shall be repeated by reducing the force to 13 % of the weight of the equipment alone, or 100 N, whichever is less.	
<b><u>PASS/FAIL CRITERIA:</u></b> The equipment and cart or stand shall not tip over.	
<b><u>Equipment used:</u></b>	

<b>Annex B.2.5</b>	<b>Input Current</b>	<input checked="" type="checkbox"/> <b>P/</b> <input type="checkbox"/> <b>F /</b> <input type="checkbox"/> <b>NA</b>
<b>METHOD:</b> The unit was connected to a variable voltage as specified and then operated normally under max. normal load conditions. The input current and average powers were measured. <b>For AC mains:</b> 1.1 and 0.9 of rated voltage shall also be measured for reference purpose. This can be referred during abnormal operation. <b>For DC mains:</b> normally, 1.2 and 0.85 of rated voltage shall be measured. If the tolerance was declared by client, to conduct by the client's declared values.		
<b>PASS/FAIL CRITERIA:</b> The measured input current or input power under <b>normal operating conditions</b> , but at the <b>rated voltage</b> or at each end of each <b>rated voltage range</b> , shall not exceed the <b>rated current</b> or <b>rated power</b> by more than 10 %.		
<b>Annex B.2.5</b>	<b>Table: electrical data (in normal conditions)</b>	
The marked rating on the sample was: see page 1 for details		
Speaker impedance: Left= $\Omega$ / Right= $\Omega$ /Sub= $\Omega$ ; <b>no speaker.</b>		
Test Audio signal = <input type="checkbox"/> Pink noise / <input type="checkbox"/> 1 KHz / <input type="checkbox"/> Hz; <input type="checkbox"/> <b>no power amplifier circuits</b>		
Test Video signal = ; <b>no video circuits</b>		
<input type="checkbox"/> 100% of max. non-clipped output power/ max. available non-clipped output power ( 50 Hz/ 60 Hz/ DC )		
V input (V)	I input (A)	P input (W)
=	=	=
=	=	=
=	=	=
=	=	=
=	=	=
<input type="checkbox"/> 1/8 of 100% or max available non-clipped output power / <input checked="" type="checkbox"/> Normal operation (without amplifier)/ 50 Hz/ 60 Hz/ DC )		
V input (V)	I input (A)	P input (W)
5.00Vdc	1.96	9.72
9.00Vdc	1.31	11.8
<b>Notes:</b> Load conditions:		
<b>Equipment used:</b>		

<b>Annex F.3.9</b>	<b>Durability, legibility and permanence of markings</b>	<input checked="" type="checkbox"/> <b>P</b> / <input type="checkbox"/> <b>F</b> / <input type="checkbox"/> <b>NA</b>
<b>METHOD:</b> <b>Step 1,</b> <u>Marking was rubbed by hand for 15 s with water, then</u> <b>Step 2,</b> <u>Marking was rubbed by hand for 15 s with petroleum spirit (&gt; 85 % n-hexane)</u> <b>Note:</b> <u>At a different place or on a different sample for water and petroleum spirit tests.</u>		
<b>PASS/FAIL CRITERIA:</b> <u>After each test, the marking shall remain legible. If the marking was on a separable label, the label shall show no curling and shall not be removable by hand.</u>		
<b><u>Requirement</u></b>	<b><u>Comments</u></b>	
<u>Legible?</u>	<input checked="" type="checkbox"/> <u>Yes</u> · <input type="checkbox"/> <u>No</u>	
<u>Marking easily removable?</u>	<input type="checkbox"/> <u>Yes</u> , <input checked="" type="checkbox"/> <u>No</u>	
<u>Curling?</u>	<input type="checkbox"/> <u>Yes</u> , <input checked="" type="checkbox"/> <u>No</u>	
<b>Note:</b> <u>Marking required by this standard shall be durable and legible. In considering the durability of the marking, the effect of normal use shall be taken in account.</u>		
<b><u>Equipment used:</u></b>		

<b>Annex G.5.2</b>	<b>Endurance test of wire insulation in wound components</b>		<input type="checkbox"/> <b>P</b> / <input type="checkbox"/> <b>F</b> / <input checked="" type="checkbox"/> <b>NA</b>
<b>METHOD:</b> Three samples of the wound component are subjected to 10 test cycles as follows: –The samples are subjected to the heat run test of G.5.2.2. After the test, the samples are allowed to cool down to ambient temperature. –The samples are then subjected to the vibration test of G.15.3.4. –The samples are then subjected for two days to the humidity conditioning of 5.4.8. The tests described below are made before the start of the 10 cycles and after each cycle. The electric strength test of 5.4.9.1 is carried out.			
<b>PASS/FAIL CRITERIA:</b> For wound components supplied from the mains, there shall be no breakdown of the insulation between the turns of a winding, between input and output windings, between adjacent input windings and between adjacent output windings, or between the windings and any conductive core.			
Thermal cycling:			
Temperature _____ :	Started date: _____	Time: _____	Ended date: _____
Time: _____			
<b>Vibration test:</b> The direction of vibration is vertical, and the severities are: – duration: 30 min; – amplitude: 0.35 mm; – frequency range: 10 Hz, 55 Hz, 10 Hz; – sweep rate: approximately one octave per minute.			
<b>Humidity test of 5.4.8:</b>			
Temperature _____ : _____ °C and	Started date: _____	Time: _____	Ended date: _____
Humidity _____ : _____ % RH	Time: _____		
<b>Electric strength test of 5.4.9:</b>			
<b>Test voltage applied between</b>	<b>Test voltage</b>	<b>Breakdown</b>	
	Vac/Vdc	<input type="checkbox"/> Yes · <input type="checkbox"/> No	
	Vac/Vdc	<input type="checkbox"/> Yes · <input type="checkbox"/> No	
	Vac/Vdc	<input type="checkbox"/> Yes · <input type="checkbox"/> No	
<b>Notes: Alternating polarity for electric strength test of dc voltage.</b>			
<b>Equipment used:</b>			



<b>Annex G.7.3.2</b>	<b>Cord Strain Relief</b>	<input type="checkbox"/> <b>P/</b> <input type="checkbox"/> <b>F /</b> <input checked="" type="checkbox"/> <b>NA</b>
<b>METHOD:</b> <u>A non-detachable power supply cord or cable, a basic safeguard shall minimize strain from being transmitted to the cord or cable terminations. Following steps were applied.</u>		
<b>PASS/FAIL CRITERIA:</b> <u>There shall be no damage to the cord or conductors and the displacement of the conductors shall not exceed 2 mm.</u>		
<b>The mass of equipment:</b> <input type="checkbox"/> $\leq 1$ kg: 30 N <input type="checkbox"/> $> 1$ kg and $\leq 4$ kg: 60 N <input type="checkbox"/> $> 4$ kg: 100 N		
<b>Step 1,</b> <u>The force above was applied in the most unfavourable direction and repeated 25 times , 1s for each time; then</u> <b>Step 2,</b> <u>The torque of 0.25 Nm for 1 min was applied as close as practicable to the strain relief mechanism and was repeated in the opposite direction.</u>		
<b>Annex G.7.3.2</b>	<b>Table: Cord Strain Relief</b>	
	Ambient temperature	:
<b>Longitudinal displacement:</b>	_____mm	
<b>Comments:</b>	The ends of the conductor was not become displaced; There was no damage to the mains supply cord.	
<b>Equipment used:</b>		

<b>Annex G10</b>	<b>Resistor Test</b>	<input type="checkbox"/> P / <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA								
<p><b>METHOD:</b></p> <p>Before the test, the resistance of ten samples was measured.          The samples were subjected to the following step tests</p> <p><b>Step 1, Damp heat test:</b> with the following conditions; then</p> <ul style="list-style-type: none"> <li>Temperature: <math>40 \pm 2^{\circ}\text{C}</math></li> </ul> <p>Humidity: <math>93 \pm 3\%</math></p> <ul style="list-style-type: none"> <li>Test duration: 21 days</li> </ul> <p><b>Step 2, Impulse test:</b> using the generator circuit 2 of Table D.1</p> <ul style="list-style-type: none"> <li>1.2/50 <math>\mu\text{s}</math>, ten impulses, the interval between successive impulses was 60 s</li> <li><math>U_c</math> = required withstand voltage =      V</li> </ul> <p><b>Note:</b> alternating polarity for impulse test.</p>										
<p><b>PASS/FAIL CRITERIA:</b></p> <p>After the tests, the resistance of each sample shall not have changed by more than 10 %. No failure was allowed.</p>										
<b>Annex G10</b>		<b>Table: Resistor test</b>								
<b>Resistor samples</b>	<b>Maker</b>	<b>Type</b>	<b>Rated ( )</b>	<b>10 % deviation</b>						
A										
B										
C										
<b>Samples A</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>
Before										
After										
<b>Samples B</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>
Before										
After										
Equipment used:										

<b>Annex M</b>	<b>TABLE: Batteries</b>							<input type="checkbox"/> P/ <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA	
The tests of Annex M are applicable only when appropriate battery data is not available									
Is it possible to install the battery in a reverse polarity position?..... :									
	Non-rechargeable batteries			Rechargeable batteries					
	Discharging		Un-intentional charging	Charging		Discharging		Reversed charging	
	Meas. current	Manuf. Specs.		Meas. current	Manuf. Specs.	Meas. current	Manuf. Specs.	Meas. current	Manuf. Specs.
Max. current during normal condition									
Max. current during fault condition									
Test results:								Verdict	
- Chemical leaks									
- Explosion of the battery									
- Emission of flame or expulsion of molten metal									
- Electric strength tests of equipment after completion of tests									
Supplementary information:									

<b>Annex M.4</b>	<b>TABLE: Batteries</b>				<input type="checkbox"/> P/ <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA	
Battery/Cell No.	Test conditions	Measurements			Observation	
		U	I (A)	Temp (C)		
	Normal					
	Abnormal					
	Single fault –SC/OC					
Supplementary Information:						

Battery identification	Charging at $T_{\text{lowest}}$ ( °C)	Observation	Charging at $T_{\text{highest}}$ ( °C)	Observation
Supplementary Information:				
<b>Equipment used in Annex M:</b>				

<b>Annex P.4</b>	<b>Adhesive test</b>	<input type="checkbox"/> P/ <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA
<b>METHOD:</b> A sample of the equipment or a subassembly of the equipment containing parts having metalized coating and the parts joined by adhesive was evaluated with the sample placed with the part secured by adhesive on the underside. Test as the step according to the standard. After the steps, the sample was immediately subjected to the tests of 4.4.4 as applicable.		
<b>PASS/FAIL CRITERIA:</b> <ul style="list-style-type: none"> <li>• A metalized coating or a part secured by adhesive shall not fall off or partly dislodged.</li> <li>• After the abrasion resistance test, the metalized coating shall have not loosened and no particles shall become loose from the coating</li> </ul>		
<b>Procedure</b>	<b>Temperature</b>	<b>Time duration</b>
a	100 ± 2°C	1 week
b	90 ± 2°C	3 weeks
c	82 ± 2°C	8 weeks
d		
<b>Material</b>	<b>Procedure a, b, c or d</b>	
<b>Notes:</b> After the above tests, a metalized coating was subjected to the abrasion resistance test of <b>G.13.6.2</b> .		
<b>Equipment used:</b>		

<b>Annex Q.1</b>	<b>Limited Power Source (LPS)</b>	<input checked="" type="checkbox"/> <b>P</b> / <input type="checkbox"/> <b>F</b> / <input type="checkbox"/> <b>NA</b>																		
<p><b>METHOD:</b></p> <p>A EUT was connected to <u>a supply source as indicated below.</u></p> <p>The non-capacitive load referenced in footnotes b) and c) of <b>Table Q.1</b> and <b>Table Q.2</b> was adjusted to develop maximum current and power transfer respectively. <b>Single fault conditions</b> were applied in a regulating network according to <b>Clause Q.1.1</b>, item b) 3) under these maximum current and power conditions.</p> <p><input checked="" type="checkbox"/> <b>Table Q.1</b> – Limits for inherently limited power sources</p> <p><u><b>Output current I<sub>sc</sub> (A) and S (VA) measurement:</b></u> Protection was by the following.</p> <p>a. <u><b>Electronic circuit:</b></u> Measured 5 s after application of the load.</p> <p>b. <u><b>PTC device or in other cases:</b></u> Measured 60 s after application of the load.</p> <p><input type="checkbox"/> <b>Table Q.2</b> – Limits for power sources not inherently limited (<b>overcurrent protective device required</b>)</p> <p>a. <u><b>Output current protection (OCP) Device:</b></u> Bypassed during the test.</p> <p>b. <u><b>Output current I<sub>sc</sub> (A) and S (VA):</b></u> Measured 60 s after application of the load</p> <p><u><b>U<sub>oc</sub></b></u> : The open circuit voltage with all load circuits disconnected.</p> <p><u><b>I<sub>sc</sub></b></u> : Maximum output current with any non-capacitive load, including a short-circuit.</p> <p><u><b>S</b></u> : Maximum output VA with any non-capacitive load.</p>																				
<p><b>PASS/FAIL CRITERIA:</b></p> <p>Within the limit of Table defined.</p>																				
<b>Annex Q.1</b>	<p><b>Table: Limited power source</b></p> <table border="1"> <tr> <td>Test voltage</td> <td>:</td> <td colspan="5">__38.4__ Vac/Vdc, ____Hz</td> </tr> <tr> <td>Ambient temperature</td> <td>:</td> <td colspan="5">__24.2__ °C</td> </tr> </table>						Test voltage	:	__38.4__ Vac/Vdc, ____Hz					Ambient temperature	:	__24.2__ °C				
Test voltage	:	__38.4__ Vac/Vdc, ____Hz																		
Ambient temperature	:	__24.2__ °C																		
Location / Condition (e.g. description of single fault)	Rated		Measured output			Remarks														
	Voltage	Current	Voltage (U <sub>oc</sub> )	Current (I <sub>sc</sub> )	Apparent Power (S)															
Output normal load	5	2	5.05	2.40	10.95	--														
<p><b>Equipment used:</b> --</p>																				

<b>Annex S.1</b>	<b>Flammability test for fire enclosure and fire barrier materials of equipment where the steady-state power does not exceed 4000 W</b>				<input type="checkbox"/> P / <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA
<b>Annex S.1</b>	<b>TABLE: Evaluation of test results of fire materials for power <math>\leq 4000</math> W</b>				
	Preconditioning : 3 samples, 168 h, _____ °C (Tmax + 10 K, or 70 °C; whichever is the higher)				
	Started date: _____ · Time: _____		Ended date: _____ · Time: _____		
<b>Material :</b>					
<b>Sample number</b>	<b>During test, any flaming drops or particles?</b>	<b>Flame duration after any application of test flame</b>	<b>Ignition of surgical cotton below the sample?</b>	<b>Sample (area) consumed completely?</b>	
1	<input type="checkbox"/> Yes, <input type="checkbox"/> No	seconds	<input type="checkbox"/> Yes, <input type="checkbox"/> No	<input type="checkbox"/> Yes, <input type="checkbox"/> No	
2	<input type="checkbox"/> Yes, <input type="checkbox"/> No	seconds	<input type="checkbox"/> Yes, <input type="checkbox"/> No	<input type="checkbox"/> Yes, <input type="checkbox"/> No	
3	<input type="checkbox"/> Yes, <input type="checkbox"/> No	seconds	<input type="checkbox"/> Yes, <input type="checkbox"/> No	<input type="checkbox"/> Yes, <input checked="" type="checkbox"/> No	
<b><u>Evaluation of test results:</u></b> <ul style="list-style-type: none"> <li>- after any application of the test flame, the test specimen shall <b>not be consumed completely</b>; and</li> <li>- after any application of the test flame, any self-sustaining flame shall <b>extinguish within 30 s</b>; and</li> <li>- <b>No burning</b> of the specified <b>layer</b> or <b>wrapping tissue</b> shall occur.</li> </ul>					

<b>Annex S.2</b>	<b>Flammability test for fire enclosure and fire barrier integrity</b>				<input type="checkbox"/> P / <input type="checkbox"/> F / <input type="checkbox"/> NA
<b>Annex S.2</b>	<b>TABLE: Evaluation of test results of fire materials</b>				
	Preconditioning : 3 samples, <input type="checkbox"/> 168 h, <input type="checkbox"/> Tmax + 10 K, 70 °C; whichever was the higher or 3 samples <input type="checkbox"/> 24h _____ °C , <input type="checkbox"/> 125 °C $\pm$ 2 °C				
	Started date: _____ , Time: _____		Ended date: _____ , Time: _____		
<b>Material :</b>					
<b>Sample number</b>	<b>The test flame is applied for 60 s.</b>				
1	<b>After application of the test flame, the test specimen shall not show any additional holes.</b>				<input type="checkbox"/> Yes · <input type="checkbox"/> No
2					<input type="checkbox"/> Yes · <input type="checkbox"/> No
3					<input type="checkbox"/> Yes · <input type="checkbox"/> No
<b><u>Evaluation of test results:</u></b> <p>After application of the test flame, the test specimen shall not show any additional holes.</p>					

<b>Annex S.5</b>	<b>Flammability test for fire enclosure materials of equipment with a steady-state power exceeding 4000 W</b>				<input type="checkbox"/> P/ <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA
<b>Annex S.5</b>	<b>TABLE: Evaluation of test results of fire materials for power &gt; 4000 W</b>				
	Preconditioning : 3 samples, 168 h, _____ °C ( $T_{max} + 10$ K, or 70 °C; whichever was the higher)				
	Started date: _____, Time: _____		Ended date: _____, Time: _____		
<b>Material :</b> (type, maker..)					
<b>Sample number</b>	<b>During test, any flaming drops or particles?</b>	<b>Flame duration after the fifth of the test flame</b>	<b>Ignition of surgical cotton below the sample?</b>	<b>Sample (area) consumed completely?</b>	
1	<input type="checkbox"/> Yes, <input type="checkbox"/> No	seconds	<input type="checkbox"/> Yes, <input type="checkbox"/> No	<input type="checkbox"/> Yes, <input type="checkbox"/> No	
2	<input type="checkbox"/> Yes, <input type="checkbox"/> No	seconds	<input type="checkbox"/> Yes, <input type="checkbox"/> No	<input type="checkbox"/> Yes, <input type="checkbox"/> No	
3	<input type="checkbox"/> Yes, <input type="checkbox"/> No	seconds	<input type="checkbox"/> Yes, <input type="checkbox"/> No	<input type="checkbox"/> Yes, <input type="checkbox"/> No	
<b><u>Evaluation of test results:</u></b> <ul style="list-style-type: none"> <li>– after any application of the test flame, the test specimen shall <b>not be consumed completely</b>; and</li> <li>– after the fifth application of the test flame, any flame shall <b>extinguish within 1 min</b>; and</li> <li>– <b>No burning</b> of the specified <b>cotton indicator</b> or <b>wrapping tissue</b> shall occur.</li> </ul>					
<b>Equipment used in Annex S:</b>					

<b>Annex T2</b>	<b>Steady force test, 10 N</b>		<input checked="" type="checkbox"/> P/ <input type="checkbox"/> F / <input type="checkbox"/> NA
<b>METHOD:</b>  A steady force of 10 N $\pm$ 1 N is applied to the component or part under consideration for a short time duration of approximately 5 s.			
<b>PASS/FAIL CRITERIA:</b> <ul style="list-style-type: none"> <li>• After the application of the force, clearances shall not be reduced below the required values.</li> </ul>			
Test locations.....:		Components and parts, other than parts serving as an enclosure	
<b><u>Comments:</u></b> No damage, no hazard.			
<b>Notes:</b>			
<b>Equipment used:</b>			

<b>Annex T3</b>	<b>Steady force test, 30 N</b>	<input checked="" type="checkbox"/> P/ <input type="checkbox"/> F / <input type="checkbox"/> NA
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<b>METHOD:</b>	
The unit provided the enclosure that only acted as a fire protection. The enclosure was subjected to a steady force of 30 N±3N was applied for a period of 5 s and by means of a straight unjointed version of the applicable test finger as shown in IEC 62368-1, Figure V.1 or Figure V.2.	
<b>PASS/FAIL CRITERIA:</b>	
<ul style="list-style-type: none"> <li>• shall not become <b>accessible</b> to class 3 energy sources other than PS3; and</li> <li>• All other <b>safeguards</b> shall remain effective.</li> </ul>	
Test locations	: Each side of enclosure
<b>Comments:</b> /	
<b>Notes:</b> In case of doubt, dielectric strength test.	
<b>Equipment used:</b> --	

<b>Annex T4, T5</b>	<b>Steady force test, 100 N or 250 N</b>	<input type="checkbox"/> P / <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA
<b>METHOD:</b>		
The unit provided the enclosure for mechanical protection, which was in operator access area. The enclosure was subjected to the tests indicated below.		
<input type="checkbox"/> <b><u>Steady Force Test, 100 N, for transportable, hand-held and direct plug-in equipment</u></b>		
<input type="checkbox"/> <b><u>Steady Force Test, 250 N, for other external enclosure</u></b>		
A steady force of above-mentioned was applied for a period of 5 s and by means of a suitable test tool providing contact over a circular plane surface 30 mm in diameter.		
<b>PASS/FAIL CRITERIA:</b>		
<ul style="list-style-type: none"> <li>• shall not become <b>accessible</b> to class 3 energy sources other than PS3; and</li> <li>• All other <b>safeguards</b> shall remain effective.</li> </ul>		
Enclosure material	:	
Test locations	:	
<b>Comments:</b>		
<b>Notes:</b> In case of doubt, dielectric strength test.		
<b>Equipment used:</b> --		

<b>Annex T.6</b>	<b>Impact test</b>	<input type="checkbox"/> P / <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA
<b>METHOD:</b>		
A EUT was supported in its normal position on a hard surface. Soft support can absorb the impact force and shall be prevented. A steel ball, 50mm in diameter with the mass of 500g was dropped freely from a height of indicated below onto the EUT enclosure. Only top and side of the enclosure planes were tested. Vertical planes could be tested by turning the EUT. Only one impact was made to one point. The impact point shall be chosen where the enclosure was the weakest point, such as the area with openings.		

<input type="checkbox"/> <b><u>1300 mm, for the external enclosure</u></b>	
<input type="checkbox"/> <b><u>410 mm, for a part only as a fire enclosure</u></b>	
<b>PASS/FAIL CRITERIA:</b> <ul style="list-style-type: none"> <li>shall not become <b>accessible</b> to class 3 energy sources other than PS3; and</li> <li>All other <b>safeguards</b> shall remain effective.</li> </ul>	
Enclosure material :	
Test locations :	
<u>Comments:</u> No damage	
Notes: In case of doubt, dielectric strength test.	
Equipment used:	

<b>Annex T.7</b>	<b>Drop test</b>	<input type="checkbox"/> P / <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA
<b>METHOD:</b> A EUT of complete equipment was dropped 3 times from a height onto a horizontal surface. The Height shall be indicated below. The drops shall be likely to produce the most adverse results. The surface was consisted of hardwood 13 mm thick, mounted on two layers of plywood each 19-20 mm thick, all supported on concrete floor.		
<input type="checkbox"/> <b><u>750 mm 10 mm, for desk-top and moveable equipment</u></b>		
<input type="checkbox"/> <b><u>1000 mm 10 mm, for hand-held, direct plug-in and transportable equipment</u></b>		
<input type="checkbox"/> <b><u>500 mm 10 mm, for a part only as a fire enclosure of desk-top and moveable equipment</u></b>		
<input type="checkbox"/>	<b><u>350 mm 10 mm, for a part only as a fire enclosure of hand-held, direct plug-in and transportable equipment</u></b>	
<b>PASS/FAIL CRITERIA:</b> <ul style="list-style-type: none"> <li>shall not become <b>accessible</b> to class 3 energy sources other than PS3; and</li> <li>All other <b>safeguards</b> shall remain effective.</li> </ul>		
Enclosure material :		
Test locations :		
<u>Comments:</u>		
Notes: <ol style="list-style-type: none"> <li>In case of doubt, dielectric strength test.</li> <li><u>Pass:</u> If any cracks or damages occur which do not change the normal shape then they were disregarded.</li> </ol>		

Otherwise the pass will be established by the Project Engineer.

Equipment used:

<b>Annex T.8</b>	<b>Stress Relief</b>	<input type="checkbox"/> <b>P</b> / <input type="checkbox"/> <b>F</b> / <input checked="" type="checkbox"/> <b>NA</b>
<p><b>METHOD:</b></p> <p>A EUT of complete equipment was placed in a circulating air oven for 7h. The temperature was 10 K higher than enclosure inside temperature (<b>5.4.1.4</b> heating test) but 70°C. The oven shall be preheated to the temperature for at least 30 min to attain the stable temperature environment. After test the EUT was permitted to cool to room temperature. Each enclosure material shall be tested.</p>		
<p><b>PASS/FAIL CRITERIA:</b></p> <ul style="list-style-type: none"> <li>• shall not become <b>accessible</b> to class 3 energy sources other than PS3; and</li> <li>• All other <b>safeguards</b> shall remain effective.</li> </ul>		
Enclosure material :	Plastic material	
Oven temperature :	<input type="checkbox"/> 70°C · or <input type="checkbox"/> T + 10 K = ____ °C	
<p><b>Comments:</b></p>		
<p>Equipment used:</p>		

<b>Annex T.9</b>	<b>Glass impact test</b>	<input type="checkbox"/> P/ <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA
<b>METHOD:</b> A EUT was supported over its whole area and subjected to a single impact, the impact was applied in a location representing the centre of the glass by a steel ball, 50mm in diameter with the mass of 500g to fall from rest through a vertical distance indicated below and struck the sample in a direction perpendicular to the surface of the EUT.		
<input type="checkbox"/> <u>714 mm (3.5 J), for a safeguard against class 3</u> <input type="checkbox"/> <u>714 mm (3.5 J), for floor standing equipment</u> <input type="checkbox"/> <u>408 mm (2 J), for portable, table-top and on fixed mounted equipment</u> <input type="checkbox"/> <u>204 mm (1 J), for serving only as a fire enclosure</u>		
<input type="checkbox"/>	<u>102 mm (0.5 J), for the attenuation of UV radiation</u>	
<b>PASS/FAIL CRITERIA:</b> <ul style="list-style-type: none"> <li>• shall not become <b>accessible</b> to class 3 energy sources other than PS3; and</li> <li>• glass shall:           <ul style="list-style-type: none"> <li>a. not break or crack; or</li> <li>b. not expel pieces of glass greater than 30 g in mass or greater than 50 mm in any dimension; or</li> <li>c. pass the fragmentation test of <b>Clause T.10</b> of the standard on a separate test sample;</li> </ul> </li> <li>• All other <b>safeguards</b> shall remain effective.</li> </ul>		
<b>Comments:</b> No glass used		
<b>Notes:</b> In case of doubt, dielectric strength test.		
Equipment used:		

<b>T.11</b>	<b>Test for telescoping or rod antennas</b>	<input type="checkbox"/> P/ <input type="checkbox"/> F / <input checked="" type="checkbox"/> NA
Diameter of end button or ball of antenna: _____ mm (Limit: $\geq 6.0$ mm).		
The antenna end piece <b><u>was not</u></b> become detached from the antenna, and the telescoping antenna sections <b><u>was not</u></b> separated.		
Equipment used:		