



## VERIFICATION OF CONFORMITY

**No.** : PTC23070700701S-LD01  
**Applicant** : Guangdong Obao Intelligent Electric Appliance Co., LTD  
**Address** : Chenghai District, Shantou City, Chenghua Street, New Jia Dongyuan Road, 9 fifth, sixth floor  
**Manufacturer** : Guangdong Obao Intelligent Electric Appliance Co., LTD  
**Address** : Chenghai District, Shantou City, Chenghua Street, New Jia Dongyuan Road, 9 fifth, sixth floor  
**Factory** : Guangdong Obao Intelligent Electric Appliance Co., LTD  
**Address** : Chenghai District, Shantou City, Chenghua Street, New Jia Dongyuan Road, 9 fifth, sixth floor  
**Product** : sweeping robot  
**Trade Mark** : —  
**Model** : OB16, OB16Pro, OB8S, OB8S MAX, OB11, OB11Pro, OB10  
**Ratings** : Charging Input: 19V $\overline{=}$  0.5A, Working: 14.4V $\overline{=}$  Rated Power: 26W  
 (Adapter LYD1900500EF : Input: 100-240V $\sim$  50/60Hz Output: 19.0V $\overline{=}$  0.5A 9.5W, Docking station model: XLX-3809)

The submitted sample of the above equipment has been tested and found to comply with the following European Directive:

### Low voltage (LVD) Directive - 2014/35/EU

The standard(s) used for showing compliance with the essential requirements:

Applicable Standard(s)	Test Report(s) Number
<b>EN 60335-1:2012 + AC:2014 + A11:2014 + A13:2017 + A1:2019 + A14:2019 + A2:2019+ A15:2021</b> <b>EN 60335-2-2:2010 + A11:2012 + A1:2013</b> <b>EN 62233:2008</b>	<b>PTC23070700701S-LD01</b>

This verification is part of the full test report(s) and should be read in conjunction with it. This verification is based on an evaluation of one sample of above mentioned product. It does not imply assessment of the production of the product. Without the written approval of Precise Testing & Certification (Guangdong) Co., Ltd., this verification is not permitted to be reproduced, except in full. It is not permitted to use the test lab's logo. The CE marking may only be used if all the relevant and effective European Directives are applicable.



*Jacky Ou*



**Jacky Ou**  
**Manager**  
**Date: 2023-07-25**



Test Report issued under the responsibility of:



<b>TEST REPORT</b> <b>IEC 60335-2-2</b> <b>Household and similar electrical appliances – Safety –</b> <b>Part 2-2: Particular requirements for vacuum cleaners and water-</b> <b>suction cleaning appliances</b>	
<b>Report Number</b> ..... :	PTC23070700701S-LD01
<b>Date of issue</b> ..... :	2023-07-25-
<b>Total number of pages</b> .....	107 pages
<b>Name of Testing Laboratory preparing the Report</b> .....	Precise Testing & Certification (Guangdong) Co., Ltd. Building 1, No. 6, Tongxin Road, Dongcheng Street, Dongguan, Guangdong, China
<b>Applicant's name</b> .....	Guangdong Obao Intelligent Electric Appliance Co., LTD
<b>Address</b> ..... :	Chenghai District, Shantou City, Chenghua Street, New Jia Dongyuan Road, 9 fifth, sixth floor
<b>Test specification:</b>	
<b>Standard</b> .....	IEC 60335-2-2:2019, with IEC 60335-1:2010, COR1:2010, COR2:2010, AMD1:2013, COR1:2014, AMD2:2016, COR1:2016
<b>Test procedure</b> .....	PTC
<b>Non-standard test method</b> .....	N/A
<b>Test Report Form No.</b> .....	IEC60335_2_2M
<b>Test Report Form(s) Originator</b> .... :	LCIE
<b>Master TRF</b> .....	Dated 2019-09-10
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<b>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.</b>	
<b>General disclaimer:</b>	
The test results presented in this report relate only to the object tested.	





<b>Test item description</b> ..... :	sweeping robot	
<b>Trade Mark(s)</b> .....	—	
<b>Original Product/Equipment Manufacturer</b> .....	Guangdong Obao Intelligent Electric Appliance Co., LTD Chenghai District, Shantou City, Chenghua Street, New Jia Dongyuan Road, 9 fifth, sixth floor	
<b>Branding Manufacturer(s)</b> .....	Guangdong Obao Intelligent Electric Appliance Co., LTD Chenghai District, Shantou City, Chenghua Street, New Jia Dongyuan Road, 9 fifth, sixth floor	
<b>Model/Type reference</b> .....	OB16, OB16Pro,OB8S,OB8S MAX,OB11,OB11Pro,OB10	
<b>Ratings</b> .....	Charging Input: 19V=== 0.5A, Working:14.4V=== Rated Power: 26W (Adapter LYD1900500EF: Input:100-240V~ 50/60Hz Output: 19.0V=== 0.5A 9.5W, Docking station model: XLX-3809)	
<b>Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):</b>		
<input checked="" type="checkbox"/>	<b>Testing Laboratory:</b>	Precise Testing & Certification (Guangdong) Co., Ltd.
	<b>Testing location/ address</b> ..... :	Building 1, No. 6, Tongxin Road, Dongcheng Street, Dongguan, Guangdong, China
	<b>Tested by (name, function, signature)</b> .....	Kevin Li Project engineer
	<b>Approved by (name, function, signature)</b> ...	Alan Ao Reviewer
<input type="checkbox"/>	<b>Testing procedure: CTF Stage 1:</b>	
	<b>Testing location/ address</b> ..... :	
	<b>Tested by (name, function, signature)</b> .....	
	<b>Approved by (name, function, signature)</b> ...	
<input type="checkbox"/>	<b>Testing procedure: CTF Stage 2:</b>	
	<b>Testing location/ address</b> ..... :	
	<b>Tested by (name + signature)</b> .....	
	<b>Witnessed by (name, function, signature)</b> ..	
	<b>Approved by (name, function, signature)</b> ...	
<input type="checkbox"/>	<b>Testing procedure: CTF Stage 3:</b>	
<input type="checkbox"/>	<b>Testing procedure: CTF Stage 4:</b>	
	<b>Testing location/ address</b> ..... :	
	<b>Tested by (name, function, signature)</b> .....	
	<b>Witnessed by (name, function, signature)</b> ..	
	<b>Approved by (name, function, signature)</b> ...	
	<b>Supervised by (name, function, signature)</b> :	



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

Attachment 1: includes 16 pages of National differences.

Attachment 2: includes 5 pages of photo documentation.

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

Based on general product information, full tests were carried out on model OB16  
Other models were subjected to clause 7.  
The submitted samples fulfilled the requirements of specified standards.

**Testing location:**

Precise Testing & Certification (Guangdong) Co., Ltd  
Building 1, No. 6, Tongxin Road, Dongcheng Street, Dongguan, Guangdong, China

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

**The product fulfils the requirements of EN 60335-1:2012 + AC:2014 + A11:2014 + A13:2017 + A1:2019 + A14:2019 + A2:2019 + A15:2021; EN 60335-2-2:2010 + A11:2012 + A1:2013; EN 62233:2008**

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

(may be required by the product standard or client)

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

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

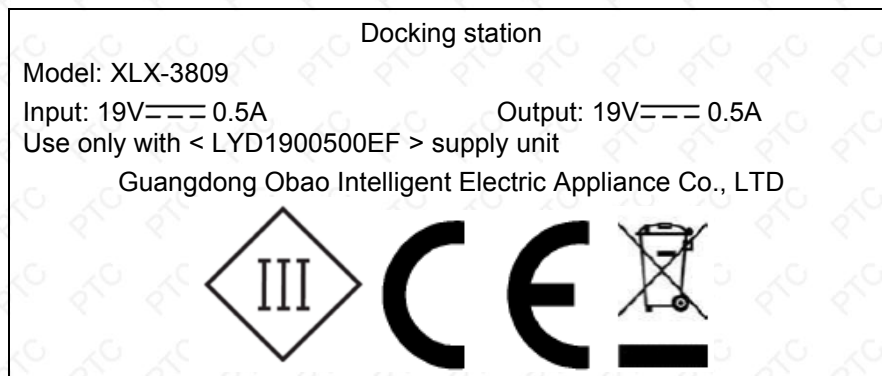
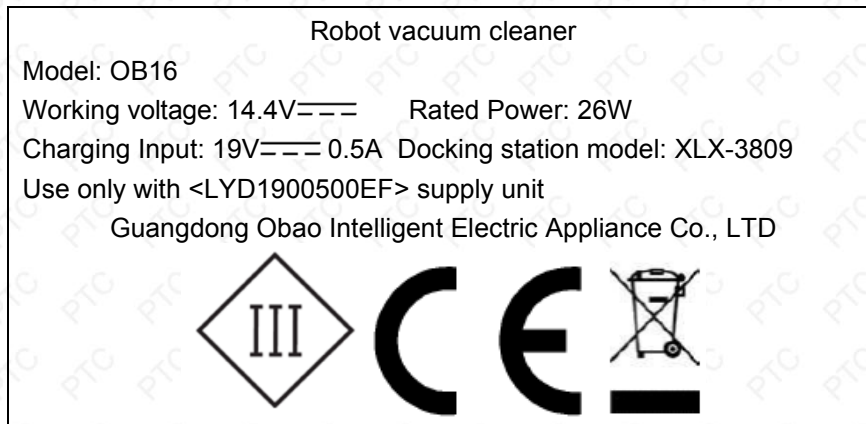
Calculations leading to the reported values are on file with the NCB and testing laboratory that conducted the testing.

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

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

**Copy of marking plate:**

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

**Remark:**

All models are equipped with the same model of charging station.



**Remark:**

1. As declared by the applicant, the importer (and manufacturer, if it is different)'s name, registered trade name or registered trademark and the postal address will be marked on the products before being place on the market. The contact details shall be in a language easily understood by end-users and market surveillance authorities.
2. Marking on the packaging or in a document accompanying the electrical equipment is only acceptable if it is not possible to place such markings on the product.
3. Height of "CE" symbol shall be at least 5mm. Height of "WEEE" Symbol shall be at least 7mm.
4. Label of other model are identical with Label of model OB16 except for model name
5. All models are equipped with the same model of docking station.



<b>Test item particulars</b> .....	
<b>Classification of installation and use</b> ..... Portable appliance for household indoor use	
<b>Supply Connection</b> ..... Supplied with adapter for charging, powered by battery	
<b>Possible test case verdicts:</b>	
- 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)	
<b>Testing</b> .....	
<b>Date of receipt of test item</b> ..... 2023-07-14	
<b>Date (s) of performance of tests</b> ..... 2023-07-14 to 2023-07-25	
<b>General remarks:</b>	
<p>"(See Enclosure #)" refers to additional information appended to the report.          "(See appended table)" refers to a table appended to the report.  <b>Throughout this report a <input type="checkbox"/> comma / <input checked="" type="checkbox"/> point is used as the decimal separator.</b>          Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law."          Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.</p>	
<b>Manufacturer's Declaration per sub-clause 4.2.5 of IEC60335-2-21:</b>	
The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided .....	<input type="checkbox"/> <b>Yes</b> <input checked="" type="checkbox"/> <b>Not applicable</b>
<b>When differences exist; they shall be identified in the General product information section.</b>	
<b>Name and address of factory (ies)</b> .....	Guangdong Obao Intelligent Electric Appliance Co., LTD Chenghai District, Shantou City, Chenghua Street, New Jia Dongyuan Road, 9 fifth, sixth floor
<b>General product information and other remarks:</b>	
1. The product is supplied with adapter for charging, powered by batteries, for household indoor use. 2. Model differences: Models OB16 and OB16Pro,OB8S,OB8S MAX,OB11,OB11Pro,OB10are identical except for model name and appearance colour. These models have the same construction, circuits designed and electrical components.	

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
<b>5</b>	<b>GENERAL CONDITIONS FOR THE TESTS</b>		
	Tests performed according to clause 5, e.g. nature of supply, sequence of testing, etc.		P
5.2	A new hose is used for each of the tests of 21.101 to 21.105 (IEC 60335-2-2)		N/A
	The test of 19.105 may be carried out on a separate appliance (IEC 60335-2-2)		N/A
5.101	Current-carrying hoses operating at safety extra-low voltage subjected not to the tests of 21.101 to 21.105 (IEC 60335-2-2)		N/A

<b>6</b>	<b>CLASSIFICATION</b>		
6.1	Protection against electric shock: Class 0, 0I, I, II, III .....	II (Adapter) III (Host)	P
	If an appliance consists of a part of class III construction and a detachable power supply part, the complete appliance is classified as a class I appliance or class II appliance in accordance with the classification applicable to its detachable power supply part.		N/A
	-Vacuum cleaners and water-suction cleaning appliances: class I, II or III .....(IEC 60335-2-2)	II (Adapter) III (Host)	P
	-Vacuum cleaners for animal grooming: class II or III (IEC 60335-2-2)		N/A
	-Vacuum cleaners may be class 0 provided that their rated voltage does not exceed 150 V (IEC 60335-2-2)		N/A
	Stationary parts of automatic battery-powered cleaners may be class 0 if the rated voltage does not exceed 150 V (IEC 60335-2-2)		N/A
6.2	Protection against harmful ingress of water	IPX0	N/A
	Vacuum cleaners for animal grooming and water-suction cleaning appliances at least IPX4 (IEC 60335-2-2)		N/A

<b>7</b>	<b>MARKING AND INSTRUCTIONS</b>		
7.1	Rated voltage or voltage range (V) .....	See copy of marking plate	P
	Symbol for nature of supply, or .....	See copy of marking plate	P
	Rated frequency (Hz) .....	See copy of marking plate	P
	Rated power input (W), or .....	See copy of marking plate	P
	Rated current (A) .....	See copy of marking plate	P



IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
	The sum of the rated power input and the maximum load of the appliance outlet (W)...(IEC 60335-2-2):		N/A
	Ash vacuum cleaners shall be marked with symbol ISO 7000-0434A (2004-01), symbol ISO 7000-0790 (2004-01) symbol ISO 7010 W021 and Warning sign ISO 7010 W021(2011-06).. (IEC 60335-2-2)		N/A
	Manufacturer's or responsible vendor's name, trademark or identification mark.....:	See copy of marking plate	P
	Model or type reference .....	See copy of marking plate	P
	Symbol IEC 60417-5172, for class II appliances	See copy of marking plate	P
	IP number, other than IPX0.....:	IPX0	N/A
	Symbol IEC 60417-5180, for class III appliances, unless	See copy of marking plate	P
	the appliance is operated by batteries or		N/A
	for appliances powered by rechargeable batteries recharged in the appliance		N/A
	Symbol IEC 60417-5018, for class II and class III appliances incorporating a functional earth		N/A
	Symbol IEC 60417-5036, for the enclosure of electrically-operated water valves in external hose-sets for connection of an appliance to the water mains, if the working voltage exceeds extra-low voltage		N/A
7.2	Warning for stationary appliances for multiple supply		N/A
	Warning placed in vicinity of terminal cover		N/A
7.3	Range of rated values marked with the lower and upper limits separated by a hyphen	See copy of marking plate	P
	Different rated values marked with the values separated by an oblique stroke	See copy of marking plate	P
7.4	Appliances adjustable for different rated voltages or rated frequencies, the voltage or the frequency setting is clearly discernible		N/A
	Requirement met if frequent changes are not required and the rated voltage to which the appliance is to be adjusted is determined from a wiring diagram		N/A
7.5	Appliances with more than one rated voltage or one or more rated voltage ranges, marked with rated input or rated current for each rated voltage or range, unless		N/A

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
	the power input is related to the arithmetic mean value of the rated voltage range		N/A
	Relation between marking for upper and lower limits of rated power input or rated current and voltage is clear		N/A
7.6	Correct symbols used		P
	Symbol for nature of supply placed next to rated voltage		P
	Symbol for class II appliances placed unlikely to be confused with other marking		P
	Units of physical quantities and their symbols according to international standardized system		P
	Motorized cleaning head for water-suction cleaning (symbol IEC 60417-5935-2012-09)(IEC 60335-2-2)		N/A
	Warning; risk of fire / flammable materials (symbol ISO 7010 W021 (2011-06)) (IEC 60335-2-2)		N/A
7.7	Connection diagram fixed to appliances to be connected to more than two supply conductors and appliances for multiple supply, unless		N/A
	correct mode of connection is obvious		N/A
7.8	Except for type Z attachment, terminals for connection to the supply mains indicated as follows:		--
	- marking of terminals exclusively for the neutral conductor (letter N)		N/A
	- marking of protective earthing terminals (symbol IEC 60417-5019)		N/A
	- marking of functional earthing terminals (symbol IEC 60417-5018)		N/A
	- marking not placed on removable parts		N/A
7.9	Marking or placing of switches which may cause a hazard		P
7.10	Indications of switches on stationary appliances and controls on all appliances by use of figures, letters or other visual means .....	Figures, letters or other visual means	P
	This applies also to switches which are part of a control		P
	If figures are used, the off position indicated by the figure 0		N/A
	The figure 0 indicates only OFF position, unless no confusion with the OFF position		N/A
7.11	Indication for direction of adjustment of controls		N/A

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
7.12	Instructions for safe use provided		P
	Details concerning precautions during user maintenance		P
	The instructions state that:		--
	- the appliance is not to be used by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction		P
	- children being supervised not to play with the appliance		P
	For a part of class III construction supplied from a detachable power supply unit, the instructions state that the appliance is only to be used with the unit provided		N/A
	Instructions for class III appliances state that it must only be supplied at SELV, unless		N/A
	it is a battery-operated appliance, the battery being charged outside the appliance		N/A
	Instructions for current-carrying hose operating at other than safety extra-low voltage (IEC 60335-2-2): CAUTION: This hose contains electrical connections: <ul style="list-style-type: none"> <li>do not use to suck up water (for vacuum cleaners only)</li> <li>do not immerse in water for cleaning</li> <li>the hose should be checked regularly and must not be used if damaged</li> </ul>		N/A
	For appliances for altitudes exceeding 2000 m, the maximum altitude is stated :		N/A
	The instructions for appliances incorporating a functional earth states that the appliance incorporates an earth connection for functional purposes only		N/A
	The instructions for vacuum cleaners incorporating rotating brushes or similar devices, and water-suction cleaning appliances, shall state that the plug must be removed from the socket-outlet before cleaning or maintaining the appliance (IEC 60335-2-2)		N/A
	If symbol IEC 60417-5935 (2012-09) is used, its meaning shall be explained (IEC 60335-2-2)		N/A
7.12.1	Sufficient details for installation supplied		P
	For an appliance intended to be permanently connected to the water mains and not connected by a hose-set, this is stated		N/A

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
	If different rated voltages or different rated frequencies are marked, the instructions state what action to be taken to adjust the appliance		N/A
	The instructions for ash vacuum cleaners shall include the substance of the following: (IEC 60335-2-2)		--
	This appliance is intended to pick up cold ash from fireplaces, chimneys, ovens, ash-trays, and similar places of ash accumulation		N/A
	WARNING: Risk of fire		N/A
	– do not pick up hot, glowing or burning ash. Pick up cold ash only;		N/A
	– the dust container must be emptied and cleaned before and after each use;		N/A
	– do not use paper dust bags or bags made from similar flammable materials;		N/A
	– do not use any other vacuum cleaner to vacuum ash;		N/A
	– do not rest the ash vacuum cleaner on flammable or polymeric surfaces, including carpeting and vinyl tile.		N/A
7.12.2	Stationary appliances not fitted with means for disconnection from the supply mains having a contact separation in all poles that provide full disconnection under overvoltage category III, the instructions state that means for disconnection must be incorporated in the fixed wiring in accordance with the wiring rules		N/A
7.12.3	Insulation of the fixed wiring in contact with parts exceeding 50 K during clause 11; instructions state that the fixed wiring must be protected		N/A
7.12.4	Instructions for built-in appliances:		--
	- dimensions of space		N/A
	- dimensions and position of supporting and fixing		N/A
	- minimum distances between parts and surrounding structure		N/A
	- minimum dimensions of ventilating openings and arrangement		N/A
	- connection to supply mains and interconnection of separate components		N/A
	- allow disconnection of the appliance after installation, by accessible plug or a switch in the fixed wiring, unless		N/A
	a switch complying with 24.3		N/A

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
7.12.5	Replacement cord instructions, type X attachment with a specially prepared cord		N/A
	Replacement cord instructions, type Y attachment		N/A
	Replacement cord instructions, type Z attachment		N/A
7.12.6	Caution in the instructions for appliances incorporating a non-self-resetting thermal cut-out that is reset by disconnection of the supply mains, if this cut-out is required to comply with the standard		N/A
7.12.7	Instructions for fixed appliances stating how the appliance is to be fixed		N/A
7.12.8	Instructions for appliances connected to the water mains:		--
	- max. inlet water pressure (Pa).....: .....		N/A
	- min. inlet water pressure, if necessary (Pa).....: .....		N/A
	Instructions concerning new and old hose-sets for appliances connected to the water mains by detachable hose-sets		N/A
7.12.9	Instructions specified in 7.12 and from 7.12.1 to 7.12.8 appear together before any other instructions supplied with the appliance		P
	These instructions may be supplied with the appliance separately from any functional use booklet		P
	They may follow the description of the appliance that identifies parts, or follow the drawings/sketches		P
	In addition, instructions are also available in an alternative format such as on a website or on request from the user in a format such as a DVD		P
	In addition, instructions are also available in an alternative format such as on a website or in a format such as a DVD .....	It can be downloaded from the manufacturer's website	P
7.13	Instructions and other texts in an official language	English	P
7.14	Marking clearly legible and durable, rubbing test as specified		P
	Signal words WARNING, CAUTION, DANGER in uppercase having a height as specified .....		N/A
	Uppercase letter of the text explaining the signal word not smaller than 1,6 mm .....		P
	Moulded in, engraved, or stamped markings either raised above or have a depth below the surface of at least 0,25 mm, unless		N/A

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
	contrasting colours are used		P
	Markings checked by inspection, measurement and rubbing test as specified		P
	Height of symbol IEC 60417-5935 (2012-09), symbol ISO 7000-0434A (2004-01), symbol ISO 7000-0790 (2004-01) and symbol ISO 7010 W021 (2011-06) at least 15 mm (mm)(IEC 60335-2-2)		N/A
7.15	Markings on a main part		P
	Marking clearly discernible from the outside, if necessary after removal of a cover		P
	For portable appliances, cover can be removed or opened without a tool		P
	For stationary appliances, name, trademark or identification mark and model or type reference visible after installation		N/A
	For fixed appliances, name, trademark or identification mark and model or type reference visible after installation according to the instructions		N/A
	Indications for switches and controls placed on or near the components. Marking not on parts which can be positioned or repositioned in such a way that the marking is misleading		P
	Symbol ISO 7000-0434A (2004-01) shall be located next to symbol ISO 7000-0790 (2004-01). (IEC 60335-2-2)		N/A
7.16	Marking of a possible replaceable thermal link or fuse link clearly visible with regard to replacing the link		N/A
7.101	Motorized cleaning heads shall be marked with ..... (IEC 60335-2-2)		--
	- rated voltage or rated voltage range (V) .....		N/A
	- rated power input (W) .....		N/A
	- name, trade mark or identification mark of manufacturer/responsible vendor .....		N/A
	- model/type reference .....		N/A
	Motorized cleaning heads for water-suction cleaning appliances shall be marked with symbol IEC 60417-5935 (2012-09). .....(IEC 60335-2-2)		N/A
7.102	Appliance outlets for accessories marked with maximum load (W).....(IEC 60335-2-2):		N/A
	This marking may be on the appliance close to the appliance outlet.		N/A

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
<b>8</b>	<b>PROTECTION AGAINST ACCESS TO LIVE PARTS</b>		
8.1	Adequate protection against accidental contact with live parts		P
8.1.1	Requirement applies for all positions, detachable parts removed		P
	Lamps behind a detachable cover not removed, if conditions met		N/A
	Insertion or removal of lamps, protection against contact with live parts of the lamp cap		N/A
	Use of test probe B of IEC 61032, with a force not exceeding 1 N: no contact with live parts		P
	Instructions for disconnection before opening (IEC 60335-2-2)		N/A
	Access to live parts prevented by at least basic insulation (IEC 60335-2-2)		N/A
8.1.2	Use of test probe 13 of IEC 61032, with a force not exceeding 1 N, through openings in class 0 appliances and class II appliances/constructions: no contact with live parts		P
	Test probe 13 also applied through openings in earthed metal enclosures having a non-conductive coating: no contact with live parts		N/A
8.1.3	For appliances other than class II, use of test probe 41 of IEC 61032, with a force not exceeding 1 N: no contact with live parts of visible glowing heating elements		N/A
	For a single switching action obtained by a switching device, requirements as specified		N/A
	For appliances with a supply cord and without a switching device, the single switching action may be obtained by the withdrawal of the plug		N/A
8.1.4	Accessible part not considered live if:		--
	- safety extra-low a.c. voltage: peak value not exceeding 42.4 V		N/A
	- safety extra-low d.c. voltage: not exceeding 42.4 V	The adapter has been certified	P
	- or separated from live parts by protective impedance		P
	If protective impedance: d.c. current not exceeding 2 mA, and		N/A
	a.c. peak value not exceeding 0.7 mA		P

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- for peak values over 42.4 V up to and including 450 V, capacitance not exceeding 0,1 $\mu$ F		N/A
	- for peak values over 450 V up to and including 15 kV, discharge not exceeding 45 $\mu$ C		N/A
	- for peak values over 15kV, the energy in the discharge not exceeding 350 mJ		N/A
8.1.5	Live parts protected at least by basic insulation before installation or assembly:		--
	- built-in appliances		N/A
	- fixed appliances		N/A
	- appliances delivered in separate units		N/A
8.2	Class II appliances and constructions constructed so that there is adequate protection against accidental contact with basic insulation and metal parts separated from live parts by basic insulation only		P
	Only possible to touch parts separated from live parts by double or reinforced insulation		P

9	STARTING OF MOTOR-OPERATED APPLIANCES		
	Requirements and tests are specified in part 2 when necessary		N/A

10	POWER INPUT AND CURRENT		
10.1	Power input at normal operating temperature, rated voltage and normal operation not deviating from rated power input by more than shown in table 1.....:	(see appended table)	P
	If the power input varies throughout the operating cycle and the maximum value of the power input exceeds, by a factor greater than two, the arithmetic mean value of the power input occurring during a representative period, the power input is the maximum value that is exceeded for more than 10 % of the representative period		N/A
	Otherwise the power input is the arithmetic mean value		N/A
	Test carried out at upper and lower limits of the ranges for appliances with one or more rated voltage ranges, unless		N/A
	the rated power input is related to the arithmetic mean value		N/A



IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Power input of motorized cleaning heads measured separately without booster settings (IEC 60335-2-2)		N/A
10.2	Current at normal operating temperature, rated voltage and normal operation not deviating from rated current by more than shown in table 2.....:	(see appended table)	P
	If the current varies throughout the operating cycle and the maximum value of the current exceeds, by a factor greater than two, the arithmetic mean value of the current occurring during a representative period, the current is the maximum value that is exceeded for more than 10 % of the representative period		N/A
	Otherwise the current is the arithmetic mean value		N/A
	Test carried out at upper and lower limits of the ranges for appliances with one or more rated voltage ranges, unless		P
	the rated current is related to the arithmetic mean value of the range		N/A

11	HEATING		
11.1	No excessive temperatures in normal use		P
11.2	The appliance is held, placed or fixed in position as described .....	Place on the floor of the test corner	P
11.3	Temperature rises, other than of windings, determined by thermocouples		P
	Temperature rises of windings determined by resistance method, unless		N/A
	the windings are non-uniform or it is difficult to make the necessary connections		P
	Where the accessible external surfaces are suitably flat and access permits, the probe is applied with a force of 4 N ± 1 N to the surface in such a way that the best possible contact between the probe and the surface is ensured (IEC 60335-2-2)		N/A
11.4	Heating appliances operated under normal operation at 1.15 times rated power input (W) .....		N/A
11.5	Motor-operated appliances operated under normal operation at most unfavourable voltage between 0.94 and 1.06 times rated voltage (V).....:	(see appended table)	P
	Booster settings activated during test as often as allowed .....(IEC 60335-2-2):		N/A

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Docking stations of automatic battery-powered cleaners are operated at 0,94 or 1,06 times rated voltage, whichever is the most unfavourable .....(IEC 60335-2-2):	(see appended table)	P
	If a suction mode is incorporated in docking stations of automatic battery-powered cleaners, the test conditions of 3.1.9 are applied... (IEC 60335-2-2):		N/A
11.6	Combined appliances operated under normal operation at most unfavourable voltage between 0.94 and 1.06 times rated voltage (V).....:		N/A
11.7	Operation duration corresponding to the most unfavourable conditions of normal use		P
	Until steady conditions are established (IEC 60335-2-2)		P
	Appliances incorporating an automatic cord reel are operated first during 30 min with one third of cord unreeled (IEC 60335-2-2)		N/A
11.8	Temperature rises monitored continuously and not exceeding the values in table 3 .....	(see appended table)	P
	Except for external enclosure of motor-operated appliances except handles held in normal use (IEC 60335-2-2)		N/A
	If the temperature rise of a motor winding exceeds the value of table 3, or		N/A
	if there is doubt with regard to classification of insulation,		N/A
	tests of Annex C are carried out		N/A
	Sealing compound does not flow out		N/A
	Protective devices do not operate, except		P
	components in protective electronic circuits tested for the number of cycles specified in 24.1.4		N/A
	During the test, the temperature rises are monitored continuously and shall not exceed the values shown in Table 101. (IEC 60335-2-2)		P

<b>13</b>	<b>LEAKAGE CURRENT AND ELECTRIC STRENGTH AT OPERATING TEMPERATURE</b>		
13.1	Leakage current not excessive and electric strength adequate		P
	Heating appliances operated at 1.15 times the rated power input (W).....:		N/A

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Motor-operated appliances and combined appliances supplied at 1.06 times the rated voltage (V) .....	(see appended table)	P
	Protective impedance and radio interference filters disconnected before carrying out the tests		P
	Booster settings not used (IEC 60335-2-2)		N/A
13.2	The leakage current is measured by means of the circuit described in Figure 4 of IEC 60990:1999		P
	For class 0I appliances and class I appliances, except parts of class II construction, C may be replaced by a low impedance ammeter		N/A
	Leakage current measurements .....	(see appended table)	P
13.3	The appliance is disconnected from the supply		P
	Electric strength tests according to table 4 .....	(see appended table)	P
	No breakdown during the tests		P

14	TRANSIENT OVERVOLTAGES		
	Appliances withstand the transient over-voltages to which they may be subjected		N/A
	Clearances having a value less than specified in table 16 subjected to an impulse voltage test, the test voltage specified in table 6 .....	(see appended table)	N/A
	No flashover during the test, unless		N/A
	of functional insulation if the appliance complies with clause 19 with the clearance short-circuited		N/A

15	MOISTURE RESISTANCE		
15.1	Enclosure provides the degree of moisture protection according to classification of the appliance		N/A
	Compliance checked as specified in 15.1.1, taking into account 15.1.2, followed by the electric strength test of 16.3		N/A
	No trace of water on insulation which can result in a reduction of clearances or creepage distances below values specified in clause 29		N/A
15.1.1	Appliances, other than IPX0, subjected to tests as specified in IEC 60529 .....		N/A
	Water valves containing live parts in external hoses for connection of an appliance to the water mains tested as specified for IPX7 appliances		N/A

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
15.1.2	Hand-held appliance turned continuously through the most unfavourable positions during the test		N/A
	Built-in appliances installed according to the instructions		N/A
	Appliances placed or used on the floor or table placed on a horizontal unperforated support		N/A
	Appliances normally fixed to a wall and appliances with pins for insertion into socket-outlets are mounted on a wooden board		N/A
	For IPX3 appliances, the base of wall mounted appliances is placed at the same level as the pivot axis of the oscillating tube		N/A
	For IPX4 appliances, the horizontal centre line of the appliance is aligned with the pivot axis of the oscillating tube, and		N/A
	for appliances normally used on the floor or table, the movement is limited to two times 90° for a period of 5 min, the support being placed at the level of the pivot axis of the oscillating tube		N/A
	Wall-mounted appliances, take into account the distance to the floor stated in the instructions		N/A
	Appliances normally fixed to a ceiling are mounted underneath a horizontal unperforated support, the pivot axis of the oscillating tube located at the level of the underside of the support, and		N/A
	for IPX4 appliances, the movement of the tube is limited to two times 90° from the vertical for a period of 5 min		N/A
	Appliances with type X attachment fitted with a flexible cord as described		N/A
	Detachable parts subjected to the relevant treatment with the main part		N/A
	However, if a part has to be removed for user maintenance and a tool is needed, this part is not removed		N/A
15.2	Spillage of liquid due to overfilling, and due to overturning of appliances liable to be overturned in normal use does not affect the electrical insulation in normal use and, (IEC 60335-2-2)		N/A
	Appliances with type X attachment fitted with the lightest flexible cord of the smallest cross-sectional area specified in table 13 (IEC 60335-2-2)		N/A

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Appliances incorporating an appliance inlet tested with or without an connector in position, whichever is most unfavourable (IEC 60335-2-2)		N/A
	Overfilling test with additional amount of water, over a period of 1 min (l) (IEC 60335-2-2)		N/A
	Containers of hand-held appliances and other appliances liable to be overturned in normal use are completely filled, the cover being closed. The appliance is then overturned and left in that position for 5 min, unless it returns automatically to its normal position of use. (IEC 60335-2-2)		N/A
	Operation of water suction cleaning appliance until its liquid container is completely full and for a further 5 min, with nozzle placed in a container with a detergent solution (IEC 60335-2-2)		N/A
	The appliance withstands the electric strength test of 16.3 (IEC 60335-2-2)		N/A
	No trace of liquid on insulation that can result in a reduction of clearances and creepage distances below values specified in clause 29 (IEC 60335-2-2)		N/A
15.3	Appliances proof against humid conditions		P
	Checked by test Cab: Damp heat steady state in IEC 60068-2-78		P
	Detachable parts removed and subjected, if necessary, to the humidity test with the main part		P
	Humidity test for 48 h in a humidity cabinet		P
	Reassembly of those parts that may have been removed		P
	The appliance withstands the tests of clause 16		P

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
15.101	Motorized cleaning heads of water-suction cleaning appliances resist contacting liquids (IEC 60335-2-2)		N/A
	Impact test according to IEC 60068-2-75, impact being 2 J (IEC 60335-2-2)		N/A
	Test Free fall – Procedure 1 of IEC 60068-2-31, dropped 4000 times (IEC 60335-2-2)		N/A
	Motorized cleaning head subjected to test 14.2.7 as specified in IEC 60529 (IEC 60335-2-2)		N/A
	The appliance withstands the electric strength test of 16.3 (IEC 60335-2-2)		N/A
	No trace of liquid on insulation that can result in a reduction of clearances and creepage distances below values specified in clause 29 (IEC 60335-2-2)		N/A

<b>16</b>	<b>LEAKAGE CURRENT AND ELECTRIC STRENGTH</b>		
16.1	Leakage current not excessive and electric strength adequate		P
	Protective impedance disconnected from live parts before carrying out the tests		P
	Tests carried out at room temperature and not connected to the supply		P
16.2	Single-phase appliances: test voltage 1.06 times rated voltage (V).....:	(see appended table)	P
	Three-phase appliances: test voltage 1.06 times rated voltage divided by $\sqrt{3}$ (V) .....		N/A
	Leakage current measurements .....	(see appended table)	P
	Limit values doubled if:		
	- all controls have an off position in all poles, or		N/A
	- the appliance has no control other than a thermal cut-out, or		N/A
	- all thermostats, temperature limiters and energy regulators do not have an off position, or		N/A
	- the appliance has radio interference filters		N/A
	With the radio interference filters disconnected, the leakage current do not exceed limits specified .....	(see appended table)	N/A
16.3	Electric strength tests according to table 7 .....	(see appended table)	P

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Test voltage applied between the supply cord and inlet bushing and cord guard and cord anchorage as specified .....	(see appended table)	P
	Tests for current-carrying hoses immersed for 1 h ..... (IEC 60335-2-2)		N/A
	- electric strength test 2000 V		N/A
	- electric strength test 3000 V		N/A
	No breakdown during the tests		N/A

17	<b>OVERLOAD PROTECTION OF TRANSFORMERS AND ASSOCIATED CIRCUITS</b>		
	No excessive temperatures in transformer or associated circuits in event of short-circuits likely to occur in normal use .....	The adapter has been certified	P
	Appliance supplied with 1.06 or 0.94 times rated voltage under the most unfavourable short-circuit or overload likely to occur in normal use (V).....		N/A
	Basic insulation is not short-circuited		N/A
	Temperature rise of insulation of the conductors of safety extra-low voltage circuits not exceeding the relevant value specified in table 3 by more than 15 K		N/A
	Temperature of the winding not exceeding the value specified in table 8		N/A
	However, limits do not apply to fail-safe transformers complying with sub-clause 15.5 of IEC 61558-1		N/A

18	<b>ENDURANCE</b>		
	Requirements and tests are specified in part 2 when necessary		N/A

19	<b>ABNORMAL OPERATION</b>		
19.1	The risk of fire, mechanical damage or electric shock under abnormal or careless operation obviated		P
	Electronic circuits so designed and applied that a fault will not render the appliance unsafe .....	(see appended table)	P
	Appliances incorporating heating elements subjected to the tests of 19.2 and 19.3, and		N/A

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
	if the appliance also has a control that limit the temperature during clause 11 it is subjected to the test of 19.4, and		N/A
	if applicable, to the test of 19.5		N/A
	Appliances incorporating PTC heating elements are also subjected to the test of 19.6		N/A
	Appliances incorporating motors subjected to the tests of 19.7 to 19.10, as applicable		P
	Appliances incorporating electronic circuits subjected to the tests of 19.11 and 19.12, as applicable		P
	Appliances incorporating contactors or relays subjected to the test of 19.14, being carried out before the tests of 19.11		N/A
	Appliances incorporating voltage selector switches subjected to the test of 19.15		N/A
	Unless otherwise specified, the tests are continued until a non-self-resetting thermal cut-out operates, or		N/A
	until steady conditions are established		P
	If a heating element or intentionally weak part becomes open-circuited, the relevant test is repeated on a second sample		N/A
	If the control performs more than one function, only that aspect of the control under consideration is rendered inoperative. Other functions of the control may continue to operate normally.		N/A
	The test of 19.7 is only carried out on motorized cleaning heads and separate fan motors of centrally-sited vacuum cleaners (IEC 60335-2-2)		N/A
	Water-suction cleaning appliances having a valve are also subjected to the test of 19.101 (IEC 60335-2-2)		N/A
	Appliances incorporating a booster setting that is not deactivated electronically, are also subjected to the test of 19.102 (IEC 60335-2-2)		N/A
	Centrally-sited vacuum cleaners are also subjected to the tests of 19.103, and 19.104 if applicable (IEC 60335-2-2)		N/A
	Vacuum cleaners that stop automatically when there is a blockage are also subject to the test of 19.4. (IEC 60335-2-2)		N/A



IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
19.2	Test of appliances with heating elements with restricted heat dissipation; test voltage (V), power input of 0.85 times rated power input (W) .....		N/A
19.3	Test of 19.2 repeated; test voltage (V), power input of 1.24 times rated power input (W) .....		N/A
19.4	Test conditions as in clause 11, any control limiting the temperature during tests of clause 11 short-circuited		N/A
	The appliance is tested under the conditions specified in Clause 11 with the inlet blocked. Any control that is allowed to disconnect the suction motor during the Pi determination of 3.1.9 is short-circuited. (IEC 60335-2-2)		N/A
19.5	Test of 19.4 repeated on Class 0I and I appliances with tubular sheathed or embedded heating elements. No short-circuiting, but one end of the element connected to the sheath		N/A
	The test repeated with reversed polarity and the other end of the heating element connected to the sheath		N/A
	The test is not carried out on appliances intended to be permanently connected to fixed wiring and on appliances where an all-pole disconnection occurs during the test of 19.4		N/A
19.6	Appliances with PTC heating elements tested at rated voltage, establishing steady conditions		N/A
	The working voltage of the PTC heating element is increased by 5% and the appliance is operated until steady conditions are re-established. The voltage is then increased in similar steps until 1.5 times working voltage or until the PTC heating element ruptures (V) .....		N/A
19.7	Stalling test by locking the rotor if the locked rotor torque is smaller than the full load torque, or		N/A
	locking moving parts of other appliances		P
	Locked rotor, capacitors open-circuited one at a time		N/A
	Test repeated with capacitors short-circuited one at a time, unless		N/A
	capacitor is of class S2 or S3 of IEC 60252-1		N/A
	Appliances with timer or programmer supplied with rated voltage for each of the tests, for a period equal to the maximum period allowed .....		N/A

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
	An electronic timer or programmer that operates to ensure compliance with the test before the maximum period under the conditions of Clause 11 is reached, is a protective electronic circuit		N/A
	Other appliances supplied with rated voltage for a period as specified .....	Power by full charged battery	P
	Winding temperatures not exceeding values specified in table 8 .....	(see appended table)	P
	Motorized cleaning heads with rotating brush or similar device locked for 30 s (IEC 60335-2-2)		N/A
	Separate fan motors of centrally-sited vacuum cleaners are operated until steady conditions are reached (IEC 60335-2-2)		N/A
19.8	Multi-phase motors operated at rated voltage with one phase disconnected		N/A
19.9	Docking stations of automatic battery-powered cleaners incorporating a suction mode are tested at rated voltage with the air inlet fully blocked until steady conditions are established (IEC 60335-2-2)		N/A
	The temperatures of the windings shall not exceed the values specified in Table 8 (IEC 60335-2-2)		N/A
19.10	Series motors operated at 1,3 times rated voltage for 30 s with the air inlet blocked, rotating brushes and similar devices being removed (IEC 60335-2-2)		N/A
	Safety not impaired, windings and connections have not worked loose (IEC 60335-2-2)		N/A
19.11	Electronic circuits, compliance checked by evaluation of the fault conditions specified in 19.11.2 for all circuits or parts of circuits, unless		P
	they comply with the conditions specified in 19.11.1		N/A
	Appliances incorporating an electronic circuit that relies upon a programmable component to function correctly, subjected to the test of 19.11.4.8, unless		N/A
	restarting does not result in a hazard		P
	Appliances having a device with an off position obtained by electronic disconnection, or a device placing the appliance in a stand-by mode, subjected to the tests of 19.11.4		N/A
	If the safety of the appliance under any of the fault conditions depends on the operation of a miniature fuse-link complying with IEC 60127, the test of 19.12 is carried out		N/A

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
	During and after each test the following is checked:		--
	- the temperature of the windings do not exceed the values specified in table 8		P
	- the appliance complies with the conditions specified in 19.13		P
	- any current flowing through protective impedance not exceeding the limits specified in 8.1.4		N/A
	If a conductor of a printed board becomes open-circuited, the appliance is considered to have withstood the particular test, provided both of the following conditions are met:		--
	- the base material of the printed circuit board withstands the test of Annex E		N/A
	- any loosened conductor does not reduce clearance or creepage distances between live parts and accessible metal parts below the values specified in clause 29		N/A
19.11.1	Fault conditions a) to g) in 19.11.2 are not applied to circuits or parts of circuits meeting both of the following conditions:		--
	- the electronic circuit is a low-power circuit, that is, the maximum power at low-power points does not exceed 15 W according to the tests specified		N/A
	- the protection against electric shock, fire hazard, mechanical hazard or dangerous malfunction of other parts of the appliance does not rely on the correct functioning of the electronic circuit		P
19.11.2	Fault conditions applied one at a time, the appliance operating under conditions specified in clause 11, but supplied at rated voltage, duration of the tests as specified:		--
	a) short circuit of functional insulation if clearances or creepage distances are less than the values specified in clause 29		N/A
	b) open circuit at the terminals of any component		P
	c) short circuit of capacitors, unless		P
	they comply with IEC 60384-14		N/A
	d) short circuit of any two terminals of an electronic component, other than integrated circuits		P
	This fault condition is not applied between the two circuits of an optocoupler		N/A
	e) failure of triacs in the diode mode		N/A
	f) failure of microprocessors and integrated circuits		P
	g) failure of an electronic power switching device		N/A

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Each low power circuit is short-circuited by connecting the low-power point to the pole of the supply source from which the measurements were made		N/A
19.11.3	If the appliance incorporates a protective electronic circuit that operates to ensure compliance with clause 19, the appliance is tested as specified		N/A
19.11.4	Appliances having a device with an off position obtained by electronic disconnection, or		N/A
	a device that can be placed in the stand-by mode,		N/A
	subjected to the tests of 19.11.4.1 to 19.11.4.7, the device being set in the off position or in the stand-by mode		N/A
	Appliances incorporating a protective electronic circuit subjected to the tests of 19.11.4.1 to 19.11.4.7, the tests being carried out after the protective electronic circuit has operated, except that		N/A
	appliances operated for 30 s or 5 min during the test of 19.7 are not subjected to the tests for electromagnetic phenomena.		N/A
	Surge protective devices disconnected, unless		N/A
	They incorporate spark gaps		N/A
19.11.4.1	The appliance is subjected to electrostatic discharges in accordance with IEC 61000-4-2, test level 4		N/A
19.11.4.2	The appliance is subjected to radiated fields in accordance with IEC 61000-4-3, at frequency ranges specified		N/A
19.11.4.3	The appliance is subjected to fast transient bursts in accordance with IEC 61000-4-4, test level 3 or 4 as specified		N/A
19.11.4.4	The power supply terminals of the appliance subjected to voltage surges in accordance with IEC 61000-4-5, test level 3 or 4 as specified		N/A
	An open circuit test voltage of 2 kV is applicable for the line-to-line coupling mode		N/A
	An open circuit test voltage of 4 kV is applicable for the line-to-earth coupling		N/A
	Earthed heating elements in class I appliances disconnected		N/A
19.11.4.5	The appliance is subjected to injected currents in accordance with IEC 61000-4-6, test level 3		N/A

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
19.11.4.6	Appliances having a rated current not exceeding 16 A are subjected to the Class 3 voltage dips and interruptions in accordance with IEC 61000-4-11		N/A
	Appliances having a rated current exceeding 16 A are subjected to the Class 3 voltage dips and interruptions in accordance with IEC 61000-4-34		N/A
19.11.4.7	The appliance is subjected to mains signals in accordance with IEC 61000-4-13, test level class 2		N/A
19.11.4.8	The appliance is supplied at rated voltage and operated under normal operation. After 60s the power supply is reduced to a level such that the appliance ceases to respond or parts controlled by the programmable component cease to operate		N/A
	The appliance continues to operate normally, or		N/A
	requires a manual operation to restart		N/A
19.12	If the safety of the appliance for any of the fault conditions specified in 19.11.2 depends on the operation of a miniature fuse-link complying with IEC 60127, the test is repeated, measuring the current flowing through the fuse-link; measured current (A); rated current of the fuse-link (A) .....	The adapter has been certified	P
19.13	During the tests the appliance does not emit flames, molten metal, poisonous or ignitable gas in hazardous amounts		P
	Temperature rises not exceeding the values shown in table 9 .....	(see appended table)	P
	Compliance with clause 8 not impaired		P
	If the appliance can still be operated it complies with 20.2		N/A
	Insulation, other than of class III appliances or class III constructions that do not contain live parts, withstands the electric strength test of 16.3, the test voltage as specified in table 4:		--
	- basic insulation (V).....:		N/A
	- supplementary insulation (V) .....		N/A
	- reinforced insulation (V) .....	3000	P
	After operation or interruption of a control, clearances and creepage distances across the functional insulation withstand the electric strength test of 16.3, the test voltage being twice the working voltage		P
	The appliance does not undergo a dangerous malfunction, and		P

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
	no failure of protective electronic circuits, if the appliance is still operable		P
	Appliances tested with an electronic switch in the off position, or in the stand-by mode:		--
	- do not become operational, or		P
	- if they become operational, do not result in a dangerous malfunction during or after the tests of 19.11.4		N/A
	If the appliance contains lids or doors that are controlled by one or more interlocks, one of the interlocks may be released provided that:		--
	- the lid or door does not move automatically to an open position when the interlock is released, and		N/A
	- the appliance does not start after the cycle in which the interlock was released		N/A
19.14	Appliances operated under the conditions of clause 11, any contactor or relay contact operating under the conditions of clause 11 being short-circuited		N/A
	For a relay or contactor with more than one contact, all contacts are short-circuited at the same time		N/A
	A relay or contactor operating only to ensure the appliance is energized for normal use is not short-circuited		N/A
	If more than one relay or contactor operates in clause 11, they are short-circuited in turn		N/A
19.15	For appliances with a mains voltage selector switch, the switch is set to the lowest rated voltage position and the highest value of rated voltage is applied		N/A

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
19.101	Operation of water-suction cleaning appliances as specified .If the appliance incorporates more than one overfill prevention device, these are rendered inoperative in turn. .... (IEC 60335-2-2)		N/A
19.102	Operation of booster setting as specified (IEC 60335-2-2)		N/A
19.103	Centrally-sited vacuum cleaners are operated with the inlet for suction hose open and closed (IEC 60335-2-2)		N/A
	Temperatures of windings not exceeding values specified in 19.9 (IEC 60335-2-2)		N/A
19.104	Central-sited vacuum cleaners with separate ventilation for the motor are operated with the airflow through the motor blocked (IEC 60335-2-2)		N/A
19.105	Ash vacuum cleaners shall not cause a risk of fire or electric shock when operated under the test conditions described (IEC 60335-2-2)		N/A
	During the tests, the appliance shall not emit flames or molten material.		N/A
	After the test the appliance shall comply with 19.13.		N/A

20	STABILITY AND MECHANICAL HAZARDS		
20.1	Appliances having adequate stability		P
	Tilting test through an angle of 10°, appliance placed on an inclined plane/horizontal support, not connected to the supply mains; appliance does not overturn	Appliance does not overturn	P
	Tilting test repeated on appliances with heating elements, angle of inclination increased to 15°		N/A
	Possible heating test in overturned position; temperature rise does not exceed values shown in table 9		N/A
	Motorized cleaning heads are not subjected to this test. (IEC 60335-2-2)		N/A
20.2	Moving parts adequately arranged or enclosed as to provide protection against personal injury		P
	Protective enclosures, guards and similar parts are non-detachable, and		P
	have adequate mechanical strength		P
	Enclosures that can be opened by overriding an interlock are considered to be detachable parts		N/A

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Self-resetting thermal cut-outs and overcurrent protective devices not causing a hazard by unexpected closure		N/A
	Not possible to touch dangerous moving parts with the test probe described		P
	The requirement regarding moving parts does not apply to rotating brushes and similar devices. It does not apply to parts that become accessible when changing accessories and only move when the brush or similar device is in operation (IEC 60335-2-2)		P

21	MECHANICAL STRENGTH		
21.1	Appliance has adequate mechanical strength and is constructed as to withstand rough handling		P
	Checked by applying 3 blows to every point of the enclosure like to be weak, in accordance with test Ehb of IEC 60068-2-75, spring hammer test, with an impact energy of 0,5 J		P
	The appliance shows no damage impairing compliance with this standard, and		P
	compliance with 8.1, 15.1 and clause 29 not impaired		P
	If doubt, supplementary or reinforced insulation subjected to the electric strength test of 16.3		N/A
	If necessary, repetition of groups of three blows on a new sample		N/A
21.2	Accessible parts of solid insulation having strength to prevent penetration by sharp implements		P
	Test not applicable if the thickness of supplementary insulation is at least 1 mm and reinforced insulation at least 2 mm		P
	The insulation is tested as specified, and does withstand the electric strength test of 16.3		N/A
21.101	Current-carrying hoses resistant to crushing test (1,5 kN) (IEC 60335-2-2)		N/A
	Electric strength test of 16.3 carried out between conductors connected together and the saline solution		N/A
21.102	Current-carrying hoses resistant to abrasion (IEC 60335-2-2)		--
	100 revolutions of crank		N/A
	Basic insulation is not exposed		N/A



IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Electric strength test of 16.3 is carried out between conductors connected together and the saline solution		N/A
21.103	Current-carrying hoses resistant to flexing test	(IEC 60335-2-2)	--
	Hose withstands electric strength test of 16.3		N/A
21.104	Current-carrying hoses resistant to torsion test	(IEC 60335-2-2)	--
	Test carried out for 2000 cycles		N/A
	No damage to such extent that compliance with standard is impaired		N/A
21.105	Current-carrying hoses resistant to cold conditions test	(IEC 60335-2-2)	--
	Test carried out 3 times		N/A
	No cracks or breaks in hose and it withstands electric strength test of 16.3		N/A
21.106	A handle intended for carrying an appliance shall be constructed to withstand the weight of the appliance without damage. This requirement is not applicable to hand-held vacuum cleaners or automatic battery operated cleaners (IEC 60335-2-2)		N/A
	After the test, there shall be no damage to the handle, its securing means, or that portion of the appliance to which the handle is attached		N/A

22	<b>CONSTRUCTION</b>		
22.1	Appliance marked with the first numeral of the IP system, relevant requirements of IEC 60529 are fulfilled		P
22.2	Stationary appliance: means to ensure all-pole disconnection from the supply being provided:		--
	- a supply cord fitted with a plug, or		N/A
	- a switch complying with 24.3, or		N/A
	- a statement in the instruction sheet that a disconnection incorporated in the fixed wiring is to be provided, or		N/A
	- an appliance inlet		N/A
	Single-pole switches and single-pole protective devices for the disconnection of heating elements in single-phase, permanently connected class 01 and class I appliances, connected to the phase conductor		N/A
22.3	Appliance provided with pins: no undue strain on socket-outlets		N/A

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Applied torque not exceeding 0.25 Nm		N/A
	Pull force of 50N to each pin after the appliance has being placed in the heating cabinet; when cooled to room temperature the pins are not displaced by more than 1mm		N/A
	Each pin subjected to a torque of 0.4Nm; the pins are not rotating, unless		N/A
	rotating does not impair compliance with this standard		N/A
22.4	Appliance for heating liquids and appliance causing undue vibration not provided with pins for insertion into socket-outlets		N/A
22.5	No risk of electric shock when touching the pins, for appliances having a capacitor with rated capacitance equal to or greater than 0,1µF, the appliance being disconnected from the supply at the instant of voltage peak		P
	Voltage not exceeding 34 V (V) .....	8V	P
	If compliance relies on the operation of an electronic circuit, the electromagnetic phenomena tests of 19.11.4.3 and 19.11.4.4 are applied		N/A
	The discharge test is then repeated three times, voltage not exceeding 34 V (V) .....		N/A
22.6	Electrical insulation not affected by condensing water or leaking liquid		N/A
	Electrical insulation of Class II appliances not affected if a hose ruptures or seal leaks		N/A
	In case of doubt, test as described		N/A
22.7	Adequate safeguards against the risk of excessive pressure in appliances containing liquid or gases or having steam-producing devices		N/A
22.8	Electrical connections not subject to pulling during cleaning of compartments to which access can be gained without the aid of a tool, and that are likely to be cleaned in normal use		P
22.9	Insulation, internal wiring, windings, commutators and slip rings not exposed to oil, grease or similar substances, unless		P
	the substance has adequate insulating properties		N/A
22.10	Not possible to reset voltage-maintained non-self-resetting thermal cut-outs by the operation of an automatic switching device incorporated within the appliance, if:		N/A

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- a non-self-resetting thermal cut-out is required by the standard, and		N/A
	- a voltage maintained non-self-resetting thermal cut-out is used to meet it		N/A
	Non-self-resetting thermal motor protectors have a trip-free action, unless		N/A
	they are voltage maintained		N/A
	Reset buttons of non-self-resetting controls so located or protected that accidental resetting is unlikely		N/A
22.11	Reliable fixing of non-detachable parts that provide the necessary degree of protection against electric shock, moisture or contact with moving parts		P
	Obvious locked position of snap-in devices used for fixing such parts		N/A
	No deterioration of the fixing properties of snap-in devices used in parts that are likely to be removed during installation or servicing		N/A
	Tests as described		P
22.12	Handles, knobs etc. fixed in a reliable manner, if loosening result in a hazard		P
	Removing or fixing in wrong position of handles, knobs etc. indicating position of switches or similar components not possible, if resulting in a hazard		P
	A choking hazard does not apply to appliances for commercial use		P
	Axial force 15 N applied to parts, the shape being so that an axial pull is unlikely to be applied		P
	Axial force 30 N applied to parts, the shape being so that an axial pull is likely to be applied		P
	If the part is removed and can be contained within the small parts cylinder, it is considered to be a choking hazard		N/A
22.13	Unlikely that handles, when gripped as in normal use, make the operator's hand touch parts having a temperature rise exceeding the value specified for handles which are held for short periods only		N/A
22.14	No ragged or sharp edges creating a hazard for the user in normal use, or during user maintenance		P
	No exposed pointed ends of self-tapping screws or other fasteners, likely to be touched by the user in normal use or during user maintenance		P

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
22.15	Storage hooks and the like for flexible cords smooth and well rounded		P
22.16	Automatic cord reels cause no undue abrasion or damage to the sheath of the flexible cord, no breakage of conductors strands and no undue wear of contacts		N/A
	Cord reel tested with 6000 operations, as specified		N/A
	Electric strength test of 16.3, voltage of 1000 V applied		N/A
22.17	Spacers not removable from the outside by hand or by means of a screwdriver or a spanner		N/A
22.18	Current-carrying parts and other metal parts resistant to corrosion		P
22.19	Driving belts not relied upon to provide the required level of insulation, unless		N/A
	constructed to prevent inappropriate replacement		N/A
22.20	Direct contact between live parts and thermal insulation effectively prevented, unless		N/A
	material used is non-corrosive, non-hygroscopic and non-combustible		N/A
22.21	Wood, cotton, silk, ordinary paper and fibrous or hygroscopic material not used as insulation, unless		P
	impregnated		N/A
	This requirement does not apply to magnesium oxide and mineral ceramic fibres used for the electrical insulation of heating elements		N/A
22.22	Appliances not containing asbestos		P
22.23	Oils containing polychlorinated biphenyl (PCB) not used		P
22.24	Bare heating elements, except in class III appliances or class III constructions that do not contain live parts, adequately supported		N/A
	In case of rupture, the heating conductor is unlikely to come in contact with accessible metal parts		N/A
22.25	Sagging heating conductors, except in class III appliances or class III constructions that do not contain live parts, cannot come into contact with accessible metal parts		N/A

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
22.26	For class III constructions the insulation between parts operating at safety extra-low voltage and other live parts complies with the requirements for double or reinforced insulation		P
22.27	Parts connected by protective impedance separated by double or reinforced insulation		P
22.28	Metal parts of Class II appliances conductively connected to gas pipes or in contact with water, separated from live parts by double or reinforced insulation		N/A
22.29	Class II appliances permanently connected to fixed wiring so constructed that the required degree of access to live parts is maintained after installation		N/A
22.30	Parts serving as supplementary or reinforced insulation fixed so that they cannot be removed without being seriously damaged, or		P
	so constructed that they cannot be replaced in an incorrect position, and so that if they are omitted, the appliance is rendered inoperable or manifestly incomplete		P
22.31	Neither clearances nor creepage distances over supplementary and reinforced insulation reduced below values specified in clause 29 as a result of wear		P
	Neither clearances nor creepage distances between live parts and accessible parts reduced below values for supplementary insulation if wires, screws etc. become loose		P
22.32	Supplementary and reinforced insulation constructed or protected against pollution so that clearances or creepage distances are not reduced below the values in clause 29		P
	Supplementary insulation of natural or synthetic rubber resistant to ageing, or arranged and dimensioned so that creepage distances are not reduced below values specified in 29.2		N/A
	Ceramic material not tightly sintered, similar materials or beads alone not used as supplementary or reinforced insulation		N/A
	Ceramic and similar porous material in which heating conductors are embedded is considered to be basic insulation, not reinforced insulation		N/A
	Oxygen bomb test at 70 °C for 96 h and 16 h at room temperature		N/A

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Vacuum cleaners constructed so that internal parts of motors and electrical connections protected against deposition of dust due to passage of air. requirement is met if the air passes through the dust bag before it passes through the motor. (IEC 60335-2-2)		P
	For water-suction cleaning appliances, compliance with the requirement concerning protection against deposition of pollution has been adequately checked by the test of 15.2. (IEC 60335-2-2)		N/A
22.33	Conductive liquids that are or may become accessible in normal use and conductive liquids that are in contact with unearthed accessible metal parts are not in direct contact with live parts, , or		N/A
	unearthed metal parts separated from live parts by basic insulation only		N/A
	Electrodes not used for heating liquids		N/A
	For class II constructions, conductive liquids that are or may become accessible in normal use and conductive liquids that are in contact with unearthed accessible metal parts, not in direct contact with basic or reinforced insulation, unless		N/A
	the reinforced insulation consists of at least 3 layers		N/A
	For class II constructions, conductive liquids which are in contact with live parts, not in direct contact with reinforced insulation, unless		N/A
	the reinforced insulation consists of at least 3 layers		N/A
	An air layer not used as basic or supplementary insulation in a double insulation system if likely to be bridged by leaking liquid		N/A
22.34	Shafts of operating knobs, handles, levers etc. not live, unless		P
	the shaft is not accessible when the part is removed		N/A
22.35	For other than class III constructions, handles, levers and knobs, held or actuated in normal use, not becoming live in the event of a failure of basic insulation		N/A

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Such parts being of metal, and their shafts or fixings are likely to become live in the event of a failure of basic insulation, are either adequately covered by insulation material or their accessible parts are separated from their shafts or fixings by supplementary insulation		N/A
	This requirement does not apply to handles, levers and knobs on stationary appliances and cordless appliances, other than those of electrical components, provided they are reliably connected to an earthing terminal or earthing contact, or separated from live parts by earthed metal		N/A
	Insulating material covering metal handles, levers and knobs withstand the electric strength test of 16.3 for supplementary insulation		N/A
22.36	For appliances other than class III, handles continuously held in the hand in normal use so constructed that when gripped as in normal use, the operators hand is not likely to touch metal parts, unless		N/A
	they are separated from live parts by double or reinforced insulation		N/A
22.37	Capacitors in Class II appliances not connected to accessible metal parts and their casings, if of metal, separated from accessible metal parts by supplementary insulation, unless		N/A
	the capacitors comply with 22.42		N/A
22.38	Capacitors not connected between the contacts of a thermal cut-out		N/A
22.39	Lamp holders used only for the connection of lamps		N/A
22.40	Motor-operated appliances and combined appliances intended to be moved while in operation, or having accessible moving parts, fitted with a switch to control the motor. The actuating member of the switch being easily visible and accessible		P
	If the appliance cannot operate continuously, automatically or remotely without giving rise to a hazard, appliances for remote operation being fitted with a switch for stopping the operation. The actuating member of the switch being easily visible and accessible		P
22.41	No components, other than lamps, containing mercury		P

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
22.42	Protective impedance consisting of at least two separate components		P
	Values specified in 8.1.4 not exceeded if any one of the components are short-circuited or open-circuited		P
	Resistors checked by the test of 14.1 a) in IEC 60065		N/A
	Capacitors checked by the tests for class Y capacitors in IEC 60384-14		P
22.43	Appliances adjustable for different voltages, accidental changing of the setting of the voltage unlikely to occur		N/A
22.44	Appliances not having an enclosure that is shaped or decorated like a toy		P
22.45	When air is used as reinforced insulation, clearances not reduced below the values specified in 29.1.3 due to deformation as a result of an external force applied to the enclosure		P
22.46	For programmable protective electronic circuits used to ensure compliance with the standard, the software contains measures to control the fault/error conditions in table R.1		P
	Software that contains measures to control the fault/error conditions specified in table R.2 is to be specified in parts 2 for particular constructions or to address specific hazards		N/A
	These requirements are not applicable to software used for functional purpose or compliance with clause 11		N/A
22.47	Appliances connected to the water mains withstand the water pressure expected in normal use		N/A
	No leakage from any part, including any inlet water hose		N/A
22.48	Appliances connected to the water mains constructed to prevent backsiphonage of non-potable water		N/A
22.49	For remote operation, the duration of operation is to be set before the appliance can be started, unless		P
	the appliance switches off automatically or can operate continuously without hazard		N/A
22.50	Controls incorporated in the appliance take priority over controls actuated by remote operation		P



IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
22.51	There is a control on the appliance manually adjusted to the setting for remote operation before the appliance can be operated in this mode		P
	There is a visual indication showing that the appliance is adjusted for remote operation		N/A
	These requirements not necessary on appliances that can operate as follows, without giving rise to a hazard:		--
	- continuously, or		N/A
	- automatically, or		N/A
	- remotely		P
22.52	Socket-outlets on appliances accessible to the user in accordance with the socket-outlet system used in the country in which the appliance is sold		N/A
22.53	Class II appliances and class III appliances that incorporate functionally earthed parts have at least double insulation or reinforced insulation between live parts and the functionally earthed parts		N/A
22.54	Button cells and batteries designated R1 not accessible without the aid of a tool, unless		N/A
	the cover of their compartment can only be opened after at least two independent movements have been applied simultaneously		N/A
22.55	Devices operated to stop the intended function of the appliance, if any, are be distinguished from other manual devices by means of shape, size, surface texture or position .....	See photo	P
	The requirement concerning position does not preclude use of a push on push off switch		N/A
	An indication when the device has been operated is given by:		--
	- tactile feedback from the actuator or from the appliance, or		N/A
	- reduction in heat output; or		N/A
	- audible and visible feedback		N/A
22.56	Detachable power supply part provided with the part of class III construction		P
22.57	The properties of non-metallic materials do not degrade from exposure to UV-C radiation, as specified in Annex T		N/A
	This requirement does not apply to glass, ceramics or similar materials		N/A

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
22.101	Motorized cleaning heads for use with appliances that have a water-suction cleaning mode, except those of class III construction having a working voltage up to 24 V, shall be motorized cleaning heads for water-suction cleaning appliances (IEC 60335-2-2)		N/A
22.102	Ash vacuum cleaners shall be equipped with a finely woven metal pre-filter or a pre-filter manufactured using flame retardant material with a GWFI as specified in 30.2.101. All parts including accessories in direct contact with ash located before the pre filter shall be made out of metal or made of a non-metallic material complying with 30.2.102. Metal containers shall have a minimum wall thickness of 0,35 mm. (IEC 60335-2-2)		N/A
	Compliance is checked by inspection, by measurement, by the tests of 30.2.101 and 30.2.102 if applicable		N/A
	and by the test probe C from IEC 61032 shall not penetrate the finely woven metal pre-filter when applied with a force of 3 N.		N/A
22.103	The length of hoses supplied with ash vacuum cleaners shall be limited. (IEC 60335-2-2)		N/A
	The fully extended length shall not exceed 2 m.		N/A
			N/A

<b>23</b>	<b>INTERNAL WIRING</b>		
23.1	Wireways smooth and free from sharp edges		P
	Wires protected against contact with burrs, cooling fins etc.		P
	Wire holes in metal well-rounded or provided with bushings		N/A
	Wiring effectively prevented from coming into contact with moving parts		P
23.2	Beads etc. on live wires cannot change their position, and are not resting on sharp edges		N/A
	Beads inside flexible metal conduits contained within an insulating sleeve		N/A
23.3	Electrical connections and internal conductors movable relative to each other not exposed to undue stress		N/A
	Flexible metallic tubes not causing damage to insulation of conductors		N/A
	Open-coil springs not used		N/A

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Adequate insulating lining provided inside a coiled spring, the turns of which touch one another		N/A
	No damage after 10 000 flexings for conductors flexed during normal use, or		N/A
	100 flexings for conductors flexed during user maintenance		N/A
	Electric strength test of 16.3, 1000 V between live parts and accessible metal parts		N/A
	Not more than 10% of the strands of any conductor broken, and		N/A
	not more than 30% for wiring supplying circuits that consume no more than 15W		N/A
23.4	Bare internal wiring sufficiently rigid and fixed		P
23.5	The insulation of internal wiring subjected to the supply mains voltage withstanding the electrical stress likely to occur in normal use		P
	Basic insulation electrically equivalent to the basic insulation of cords complying with IEC 60227 or IEC 60245, or		N/A
	no breakdown when a voltage of 2000 V is applied for 15 min between the conductor and metal foil wrapped around the insulation		P
	For class II construction, the requirements for supplementary insulation and reinforced insulation apply,		N/A
	except that the sheath of a cord complying with IEC 60227 or IEC 60245 may provide supplementary insulation.		N/A
	A single layer of internal wiring insulation does not provide reinforced insulation		N/A
23.6	Sleeving used as supplementary insulation on internal wiring retained in position by clamping at both ends, or		N/A
	be such that it can only be removed by breaking or cutting		N/A
23.7	The colour combination green/yellow only used for earthing conductors		N/A
23.8	Aluminium wires not used for internal wiring		P
23.9	Stranded conductors not consolidated by soldering where they are subjected to contact pressure, unless		P

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
	the contact pressure is provided by spring terminals		N/A
23.10	The insulation and sheath of internal wiring, incorporated in external hoses for the connection of an appliance to the water mains, at least equivalent to that of light polyvinyl chloride sheathed flexible cord (60227 IEC 52)		N/A

24	COMPONENTS		--
24.1	Components comply with safety requirements in relevant IEC standards		P
	List of components .....	(see appended table)	P
	Motors not required to comply with IEC 60034-1, they are tested as part of the appliance		P
	Relays tested as part of the appliance, or		N/A
	alternatively acc. to IEC 60730-1, and meeting the additional requirements in IEC 60335-1		N/A
	The requirements of Clause 29 apply between live parts of components and accessible parts of the appliance		N/A
	Components can comply with the requirements for clearances and creepage distances for functional insulation in the relevant component standard		P
	30.2 of this standard apply to parts of non-metallic material in components including parts of non-metallic material supporting current-carrying connections		P
	Components that have not been previously tested to comply with the IEC standard for the relevant component are tested according to the requirements of 30.2		P
	Components that have been previously tested to comply with the resistance to fire requirements in the IEC standard for the relevant component need not be retested provided the specified conditions are met		N/A
	If these conditions are not satisfied, the component is tested as part of the appliance.		P
	Power electronic converter circuits not required to comply with IEC 62477-1, they are tested as part of the appliance		N/A

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
	If components have not been tested and found to comply with relevant IEC standard for the number of cycles specified, they are tested in accordance with 24.1.1 to 24.1.9		N/A
	For components mentioned in 24.1.1 to 24.1.9 no additional tests specified in the relevant component standard are necessary other than those specified in 24.1.1 to 24.1.9		N/A
	Components not tested and found to comply with relevant IEC standard and components not marked or not used in accordance with its marking, tested under the conditions occurring in the appliance		P
	Lampholders and starterholders that have not being tested and found to comply with the relevant IEC standard, tested as a part of the appliance and additionally according to the gauging and interchangeability requirements of the relevant IEC standard		N/A
	No additional tests specified for nationally standardized plugs such as those detailed in IEC/TR 60083 or connectors complying with the standard sheets of IEC 60320-1 and IEC 60309		P
24.1.1	Capacitors likely to be permanently subjected to the supply voltage and used for radio interference suppression or for voltage dividing, complying with IEC 60384-14	The adapter has been certified	P
	If the capacitors have to be tested, they are tested according to Annex F		N/A
24.1.2	Transformers in associated switch mode power supplies comply with Annex BB of IEC 61558-2-16	The adapter has been certified	P
	Safety isolating transformers complying with IEC 61558-2-6		N/A
	If they have to be tested, they are tested according to Annex G		N/A
24.1.3	Switches complying with IEC 61058-1, the number of cycles of operation being at least 10 000		P
	If they have to be tested, they are tested according to Annex H		N/A
	If the switch operates a relay or contactor, the complete switching system is subjected to the test		N/A
	If the switch only operates a motor starting relay complying with IEC 60730-2-10 with the number of cycles of a least 10 000 as specified, the complete switching system need not be tested		N/A

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Switches incorporated in vacuum cleaners, other than for household use only, tested for 50 000 cycles of operation (IEC 60335-2-2)		N/A
24.1.4	Automatic controls complying with IEC 60730-1 with the relevant part 2. The number of cycles of operation being at least:		--
	- thermostats: 10 000		N/A
	- temperature limiters: 1 000		N/A
	- self-resetting thermal cut-outs: 300		N/A
	- voltage maintained non-self-resetting thermal cut-outs: 1 000		N/A
	- other non-self-resetting thermal cut-outs: 30		N/A
	- timers: 3 000		N/A
	- energy regulators: 10 000		N/A
	The number of cycles for controls operating during clause 11 need not be declared, if the appliance meets the requirements of this standard when they are short-circuited		N/A
	Thermal motor protectors are tested in combination with their motor under the conditions specified in Annex D		N/A
	For water valves containing live parts and that are incorporated in external hoses for connection of an appliance to the water mains, the degree of protection declared for subclause 6.5.2 of IEC 60730-2-8 is IPX7		N/A
	Thermal cut-outs of the capillary type comply with the requirements for type 2.K controls in IEC 60730-2-9		N/A
24.1.5	Appliance couplers complying with IEC 60320-1		N/A
	However, for class II appliances classified higher than IPX0, the appliance couplers complying with IEC 60320-2-3		N/A
	Interconnection couplers complying with IEC 60320-2-2		N/A
24.1.6	Small lamp holders similar to E10 lampholders complying with IEC 60238, the requirements for E10 lampholders being applicable		N/A
24.1.7	For remote operation of the appliance via a telecommunication network, the relevant standard for the telecommunication interface circuitry in the appliance is IEC 62151		N/A

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
24.1.8	The relevant standard for thermal links is IEC 60691		N/A
	Thermal links not complying with IEC 60691 are considered to be an intentionally weak part for the purposes of Clause 19		N/A
24.1.9	Contactors and relays, other than motor starting relays, tested as part of the appliance		N/A
	They are also tested in accordance with Clause 17 of IEC 60730-1, the number of cycles of operations in 24.1.4 selected according to the contactor or relay function in the appliance .....		N/A
24.2	Appliances not fitted with:		--
	- switches, automatic controls or power supplies in flexible cords		P
	- devices causing the protective device in the fixed wiring to operate in the event of a fault in the appliance		P
	- thermal cut-outs that can be reset by soldering, unless		P
	the solder has a melting point of at least 230 °C		N/A
24.3	Switches intended for all-pole disconnection of stationary appliances are directly connected to the supply terminals and have a contact separation in all poles, providing full disconnection under overvoltage category III conditions		N/A
24.4	Plugs and socket-outlets for extra-low voltage circuits and heating elements, not interchangeable with plugs and socket-outlets listed in IEC/TR 60083 or IEC 60906-1 or with connectors and appliance inlets complying with the standard sheets of IEC 60320-1		N/A
24.5	Capacitors in auxiliary windings of motors marked with their rated voltage and capacitance, and used accordingly		N/A
	Voltage across capacitors in series with a motor winding does not exceed 1,1 times rated voltage, when the appliance is supplied at 1,1 times rated voltage under minimum load		N/A
24.6	Working voltage of motors connected to the supply mains and having basic insulation that is inadequate for the rated voltage of the appliance, not exceeding 42 V		N/A
	In addition, the motors comply with the requirements of Annex I		N/A

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
24.7	Detachable hose-sets for connection of appliances to the water mains comply with IEC 61770		N/A
	They are supplied with the appliance		N/A
	Appliances intended to be permanently connected to the water mains not connected by a detachable hose-set		N/A
24.8	Motor running capacitors in appliances for which 30.2.3 is applicable and that are permanently connected in series with a motor winding, not causing a hazard in event of a failure		N/A
	One or more of the following conditions are to be met:		--
	- the capacitors are of class S2 or S3 according to IEC 60252-1		N/A
	- the capacitors are housed within a metallic or ceramic enclosure		N/A
	- the distance of separation of the outer surface to adjacent non-metallic parts exceeds 50 mm		N/A
	- adjacent non-metallic parts within 50 mm withstand the needle-flame test of Annex E		N/A
	- adjacent non-metallic parts within 50 mm classified as at least V-1 according to IEC 60695-11-10		N/A
<b>25</b>	<b>SUPPLY CONNECTION AND EXTERNAL FLEXIBLE CORDS</b>		
25.1	Appliance not intended for permanent connection to fixed wiring, means for connection to the supply:		--
	- supply cord fitted with a plug, the current rating and voltage rating of the plug being not less than the corresponding ratings of its associated appliance		N/A
	- an appliance inlet having at least the same degree of protection against moisture as required for the appliance, or		N/A
	- pins for insertion into socket-outlets	Adapter	P
	No appliance inlet for vacuum cleaners for animal grooming and water-suction cleaning appliances (IEC 60335-2-2)		N/A
25.2	Appliance not provided with more than one means of connection to the supply mains		P
	Stationary appliance for multiple supply may be provided with more than one means of connection, provided electric strength test of 1250 V for 1 min between each means of connection causes no breakdown		N/A



IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
25.3	Appliance intended to be permanently connected to fixed wiring provided with one of the following means for connection to the supply mains:		--
	- a set of terminals allowing the connection of a flexible cord		N/A
	- a fitted supply cord		N/A
	- a set of supply leads accommodated in a suitable compartment		N/A
	- a set of terminals for the connection of cables of fixed wiring, cross-sectional areas specified in 26.6, and the appliance allows the connection of the supply conductors after the appliance has been fixed to its support		N/A
	- a set of terminals and cable entries, conduit entries, knock-outs or glands, allowing connection of appropriate types of cable or conduit, and the appliance allows the connection of the supply conductors after the appliance has been fixed to its support		N/A
	For a fixed appliance constructed so that parts can be removed to facilitate easy installation, this requirement is met if it is possible to connect the fixed wiring without difficulty after a part of the appliance has been fixed to its support		N/A
25.4	Cable and conduit entries, rated current of appliance not exceeding 16 A, dimension according to table 10 (mm) .....		N/A
	Introduction of conduit or cable does not reduce clearances or creepage distances below values specified in clause 29		N/A
25.5	Method for assembling the supply cord to the appliance:		--
	- type X attachment		N/A
	- type Y attachment		N/A
	- type Z attachment, if allowed in relevant part 2		N/A
	Type X attachment, other than those with a specially prepared cord, not used for flat twin tinsel cords		N/A
	For multi-phase appliances supplied with a supply cord and that are intended to be permanently connected to fixed wiring, the supply cord is assembled to the appliance by type Y attachment		N/A
25.6	Plugs fitted with only one flexible cord		N/A
25.7	Supply cords, other than for class III appliances, being one of the following types:		--
	- rubber sheathed (at least 60245 IEC 53)		N/A

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- polychloroprene sheathed (at least 60245 IEC 57)		N/A
	- polyvinyl chloride sheathed. Not used if they are likely to touch metal parts having a temperature rise exceeding 75 K during the test of clause 11		--
	<ul style="list-style-type: none"> <li>light polyvinyl chloride sheathed cord (60227 IEC 52), for appliances not exceeding 3 kg</li> </ul>		N/A
	<ul style="list-style-type: none"> <li>ordinary polyvinyl chloride sheathed cord (60227 IEC 53), for other appliances</li> </ul>		N/A
	- heat resistant polyvinyl chloride sheathed. Not used for type X attachment other than specially prepared cords		
	<ul style="list-style-type: none"> <li>heat-resistant light polyvinyl chloride sheathed cord (60227 IEC 56), for appliances not exceeding 3 kg</li> </ul>		N/A
	<ul style="list-style-type: none"> <li>heat-resistant polyvinyl chloride sheathed cord (60227 IEC 57), for other appliances</li> </ul>		N/A
	- halogen-free, low smoke, thermoplastic insulated and sheathed		--
	<ul style="list-style-type: none"> <li>light duty halogen-free low smoke flexible cable (62821 IEC 101) for circular cable and (62821 IEC 101f) for flat cable</li> </ul>		N/A
	<ul style="list-style-type: none"> <li>Ordinary duty halogen-free low smoke flexible cable (62821 IEC 102) for circular cable and (62821 IEC 102f) for flat cable</li> </ul>		N/A
	Supply cords for class III appliances adequately insulated		N/A
	Test with 500 V for 2 min for supply cords of class III appliances that contain live parts		N/A
	Supply cords are not lighter than the following	(IEC 60335-2-2):	--
	For hand-held appliances (mass ≤ 1,5 kg):		N/A
	- ordinary tough rubber sheathed flexible cord (60245 IEC 53)		N/A
	- light polyvinyl chloride sheathed flexible cord (60227 IEC 52)		N/A
	For appliances for animal grooming:		N/A
	- ordinary polychloroprene sheathed flexible cord (60245 IEC 57)		N/A
	- flat twin flexible cord (60227 IEC 42)		N/A
	-for appliances having a power cord greater than 3 m in length, polyvinyl chloride insulated, ordinary polyvinyl chloride sheathed flexible cord (code designation 60227 IEC 53).		N/A

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
	For other appliances:		N/A
	- ordinary tough rubber sheathed flexible cord (60245 IEC 53)		N/A
	- ordinary polyvinyl chloride sheathed flexible cord (60227 IEC 53)		N/A
25.8	Nominal cross-sectional area of supply cords not less than table 11; rated current (A); cross-sectional area (mm <sup>2</sup> ) .....		N/A
25.9	Supply cords not in contact with sharp points or edges		N/A
25.10	Supply cord of class I appliances have a green/yellow core for earthing		N/A
	In multi-phase appliances, the colour of the neutral conductor of the supply cord is blue.		N/A
	Where additional neutral conductors are provided in the supply cord:		--
	– other colours may be used for these additional neutral conductors;		N/A
	– all of the neutral conductors and line conductors are identified by marking using the alpha numeric notation specified in IEC 60445		N/A
	– the supply cord is fitted to the appliance		N/A
25.11	Conductors of supply cords not consolidated by soldering where they are subject to contact pressure, unless		N/A
	The contact pressure is provided by spring terminals		N/A
25.12	Insulation of the supply cord not damaged when moulding the cord to part of the enclosure		N/A
25.13	Inlet openings so constructed as to prevent damage to the supply cord		N/A
	If it is not evident that the supply cord can be introduced without risk of damage,, a non-detachable lining or bushing complying with 29.3 for supplementary insulation provided		N/A
	If unsheathed supply cord, a similar additional bushing or lining is required, unless the appliance is		N/A
	class 0, or		N/A
	a class III appliance not containing live parts		N/A
25.14	Supply cords moved while in operation adequately protected against excessive flexing		N/A

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Flexing test, as described:		--
	- applied force (N) .....		N/A
	- number of flexings.....		N/A
	The test does not result in:		--
	- short-circuit between the conductors, such that the current exceeds a value of twice the rated current		N/A
	- breakage of more than 10% of the strands of any conductor		N/A
	- separation of the conductor from its terminal		N/A
	- loosening of any cord guard		N/A
	- damage to the cord or the cord guard		N/A
	- broken strands piercing the insulation and becoming accessible		N/A
25.15	For appliances with supply cord and appliances to be permanently connected to fixed wiring by a flexible cord, conductors of the supply cord relieved from strain, twisting and abrasion by use of cord anchorage		N/A
	The cord cannot be pushed into the appliance to such an extent that the cord or internal parts of the appliance can be damaged		N/A
	Pull and torque test of supply cord:		--
	- fixed appliances: pull 100 N; torque (not on automatic cord reel) (Nm) :		N/A
	- other appliances: values shown in table 12: mass (kg); pull (N); torque (not on automatic cord reel) (Nm) :		N/A
	Pull and torque test of supply cord, values shown in table 12: mass (kg); pull (N); torque (not on automatic cord reel) (Nm) .....		N/A
	Cord not damaged and max. 2 mm displacement of the cord		N/A
25.16	Cord anchorages for type X attachments constructed and located so that:		--
	- replacement of the cord is easily possible		N/A
	- it is clear how the relief from strain and the prevention of twisting are obtained		N/A
	- they are suitable for different types of supply cord		N/A
	- cord cannot touch the clamping screws of cord anchorage if these screws are accessible, unless		N/A

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
	they are separated from accessible metal parts by supplementary insulation		N/A
	- the cord is not clamped by a metal screw which bears directly on the cord		N/A
	- at least one part of the cord anchorage securely fixed to the appliance, unless		N/A
	it is part of a specially prepared cord		N/A
	- screws which have to be operated when replacing the cord do not fix any other component, unless		N/A
	the appliance becomes inoperative or incomplete or the parts cannot be removed without a tool		N/A
	- if labyrinths can be bypassed the test of 25.15 is nevertheless withstood		N/A
	- for class 0, 0I and I appliances they are of insulating material or are provided with an insulating lining, unless		N/A
	failure of the insulation of the cord does not make accessible metal parts live		N/A
	- for class II appliances they are of insulating material, or		N/A
	if of metal, they are insulated from accessible metal parts by supplementary insulation		N/A
	After the test of 25.15, under the conditions specified, the conductors have not moved by more than 1 mm in the terminals		N/A
25.17	Adequate cord anchorages for type Y and Z attachment, test with the cord supplied with the appliance		N/A
25.18	Cord anchorages only accessible with the aid of a tool, or		N/A
	Constructed so that the cord can only be fitted with the aid of a tool		N/A
25.19	Type X attachment, glands not used as cord anchorage in portable appliances		N/A
	Tying the cord into a knot or tying the cord with string not used		N/A
25.20	The conductors of the supply cord for type Y and Z attachment insulated from accessible metal parts		N/A
25.21	Space for supply cord for type X attachment or for connection of fixed wiring constructed:		--

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- to permit checking of conductors with respect to correct positioning and connection before fitting any cover		N/A
	- so there is no risk of damage to the conductors or their insulation when fitting the cover		N/A
	- for portable appliances, so that the uninsulated end of a conductor, if it becomes free from the terminal, prevented from contact with accessible metal parts		N/A
	2 N test to the conductor for portable appliances; no contact with accessible metal parts		N/A
25.22	Appliance inlets:		--
	- live parts not accessible during insertion or removal		N/A
	Requirement not applicable to appliance inlets complying with IEC 60320-1		N/A
	- connector can be inserted without difficulty		N/A
	- the appliance is not supported by the connector		N/A
	- not for cold conditions if temp. rise of external metal parts exceeds 75 K during clause 11, unless		N/A
	the supply cord is unlikely to touch such metal parts		N/A
25.23	Interconnection cords comply with the requirements for the supply cord, except that:		--
	- the cross-sectional area of the conductors is determined on the basis of the maximum current during clause 11		N/A
	- the thickness of the insulation may be reduced		N/A
	- for class I or class II appliance with class III construction, the cross sectional areas of the conductors need not comply with 25.8 if specified conditions are met		N/A
	If necessary, electric strength test of 16.3		N/A
	Live conductors in a flexible hose shall have an insulation and sheath thickness at least equivalent to that specified for a 60227 IEC 52 cord of 2×0,75mm <sup>2</sup> (IEC 60335-2-2)		N/A
25.24	Interconnection cords not detachable without the aid of a tool if compliance with this standard is impaired when they are disconnected		N/A

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
25.25	Dimensions of pins that are inserted into socket-outlets compatible with the dimensions of the relevant socket-outlet.		P
	Dimensions of pins and engagement face in accordance with the dimensions of the relevant plug in IEC/TR 60083		P

26	TERMINALS FOR EXTERNAL CONDUCTORS		
26.1	Appliances provided with terminals or equally effective devices for connection of external conductors		P
	Terminals only accessible after removal of a non-detachable cover, except		P
	for class III appliances that do not contain live parts		N/A
	Earthing terminals may be accessible if a tool is required to make the connections and means are provided to clamp the wire independently from its connection		N/A
26.2	Appliances with type X attachment and appliances for the connection of cables to fixed wiring provided with terminals in which connections are made by means of screws, nuts or similar devices, unless		N/A
	the connections are soldered		N/A
	Screws and nuts not used to fix any other component, except		N/A
	internal conductors, if so arranged that they are unlikely to be displaced when fitting the supply conductors		N/A
	If soldered connections used, the conductor so positioned or fixed that reliance is not placed on soldering alone, unless		N/A
	barriers provided so that neither clearances nor creepage distances between live parts and other metal parts reduced below the values for supplementary insulation if the conductor becomes free at the soldered joint		N/A
26.3	Terminals for type X attachment and for connection of cables of fixed wiring so constructed that the conductor is clamped between metal surfaces with sufficient contact pressure but without damaging the conductor		N/A
	Terminals fixed so that when the clamping means is tightened or loosened:		--

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- the terminal does not become loose		N/A
	- internal wiring is not subjected to stress		N/A
	- neither clearances nor creepage distances are reduced below the values in clause 29		N/A
	Compliance checked by inspection and by the test of subclause 9.6 of IEC 60999-1, the torque applied being equal to two-thirds of the torque specified (Nm) .....		N/A
	No deep or sharp indentations of the conductors		N/A
26.4	Terminals for type X attachment, except those having a specially prepared cord and those for the connection of cables of fixed wiring, no special preparation of conductors such as by soldering, use of cable lugs, eyelets or similar, and		N/A
	so constructed or placed that conductors prevented from slipping out when clamping screws or nuts are tightened		N/A
26.5	Terminals for type X attachment so located or shielded that if a wire of a stranded conductor escapes, no risk of accidental connection to other parts that result in a hazard		N/A
	Stranded conductor test, 8 mm insulation removed		N/A
	No contact between live parts and accessible metal parts and,		N/A
	for class II constructions, between live parts and metal parts separated from accessible metal parts by supplementary insulation only		N/A
26.6	Terminals for type X attachment and for connection of cables of fixed wiring suitable for connection of conductors with cross-sectional area according to table 13; rated current (A); nominal cross-sectional area (mm <sup>2</sup> ) .....		N/A
	If a specially prepared cord is used, terminals need only be suitable for that cord		N/A
26.7	Terminals for type X attachment, except in class III appliances not containing live parts, accessible after removal of a cover or part of the enclosure		N/A
26.8	Terminals for the connection of fixed wiring, including the earthing terminal, located close to each other		N/A
26.9	Terminals of the pillar type constructed and located as specified		N/A
26.10	Terminals with screw clamping and screwless terminals not used for flat twin tinsel cords, unless		N/A



IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
	conductors ends fitted with means suitable for screw terminals		N/A
	Pull test of 5 N to the connection		N/A
26.11	For type Y and Z attachment, soldered, welded, crimped or similar connections may be used		N/A
	For Class II appliances, the conductor so positioned or fixed that reliance is not placed on soldering, welding or crimping alone		N/A
	If soldering, welding or crimping alone used, barriers provided so that clearances and creepage distances between live parts and other metal parts are not reduced below the values for supplementary insulation if the conductor becomes free		N/A

<b>27</b>	<b>PROVISION FOR EARTHING</b>		
27.1	Accessible metal parts of Class 0I and I appliances permanently and reliably connected to an earthing terminal or earthing contact of the appliance inlet		N/A
	Earthing terminals and earthing contacts not connected to the neutral terminal		N/A
	Class 0, II and III appliances have no provision for earthing	II (Adapter) III (Host)	P
	Class II appliances and class III appliances can incorporate an earth for functional purposes		N/A
	Safety extra-low voltage circuits not earthed, unless		N/A
	protective extra-low voltage circuits		N/A
27.2	Clamping means of earthing terminals adequately secured against accidental loosening		N/A
	Terminals for the connection of external equipotential bonding conductors allow connection of conductors of 2.5 to 6 mm <sup>2</sup> , and		N/A
	-do not provide earthing continuity between different parts of the appliance, and		N/A
	-conductors cannot be loosened without the aid of a tool		N/A
	Requirements not applicable to class II appliances and class III appliances that incorporate an earth for functional purposes		N/A

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
27.3	For a detachable part having an earth connection and being plugged into another part of the appliance, the earth connection is made before and separated after current-carrying connections when removing the part		N/A
	For appliances with supply cords, current-carrying conductors become taut before earthing conductor, if the cord slips out of the cord anchorage		N/A
	Requirements not applicable to class II appliances and class III appliances that incorporate an earth for functional purposes		N/A
27.4	No risk of corrosion resulting from contact between parts of the earthing terminal and the copper of the earthing conductor or other metal		N/A
	Parts providing earthing continuity, other than parts of a metal frame or enclosure, have adequate resistance to corrosion		N/A
	If of steel, these parts provided with an electroplated coating with a thickness at least 5 µm		N/A
	Adequate protection against rusting of parts of coated or uncoated steel, only intended to provide or transmit contact pressure		N/A
	In the body of the earthing terminal is a part of a frame or enclosure of aluminium or aluminium alloys, precautions taken to avoid risk of corrosion		N/A
	Requirements not applicable to class II appliances and class III appliances that incorporate an earth for functional purposes		N/A
27.5	Low resistance of connection between earthing terminal and earthed metal parts		N/A
	This requirement does not apply to connections providing earthing continuity in the protective extra-low voltage circuit, provided the clearances of basic insulation are based on the rated voltage of the appliance		N/A
	Requirements not applicable to class II appliances and class III appliances that incorporate an earth for functional purposes		N/A
	Resistance not exceeding 0,1 Ω at the specified low-resistance test (Ω) .....		N/A
27.6	The printed conductors of printed circuit boards not used to provide earthing continuity in hand-held appliances.		N/A

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
	They may be used to provide earthing continuity in other appliances if at least two tracks are used with independent soldering points and the appliance complies with 27.5 for each circuit		N/A
	Requirements not applicable to class II appliances and class III appliances that incorporate an earth for functional purposes		N/A

28	SCREWS AND CONNECTIONS		
28.1	Fixings, electrical connections and connections providing earthing continuity withstand mechanical stresses		N/A
	Screws not of soft metal liable to creep, such as zinc or aluminium		N/A
	Diameter of screws of insulating material min. 3 mm		N/A
	Screws of insulating material not used for any electrical connections or connections providing earthing continuity		N/A
	Screws used for electrical connections or connections providing earthing continuity screwed into metal		N/A
	Screws not of insulating material if their replacement by a metal screw can impair supplementary or reinforced insulation		N/A
	For type X attachment, screws to be removed for replacement of supply cord or for user maintenance, not of insulating material if their replacement by a metal screw impairs basic insulation		N/A
	For screws and nuts; torque-test as specified in table 14.....:	(see appended table)	N/A
28.2	Electrical connections and connections providing earthing continuity constructed so that contact pressure is not transmitted through non-ceramic insulating material liable to shrink or distort, unless		N/A
	there is resiliency in the metallic parts to compensate for shrinkage or distortion of the insulating material		N/A
	This requirement does not apply to electrical connections in circuits of appliances for which:		--
	<ul style="list-style-type: none"> <li>30.2.2 is applicable and that carry a current not exceeding 0,5 A</li> </ul>		N/A

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
	<ul style="list-style-type: none"> <li>30.2.3 is applicable and that carry a current not exceeding 0,2 A</li> </ul>		N/A
28.3	Space-threaded (sheet metal) screws only used for electrical connections if they clamp the parts together		N/A
	Thread-cutting (self-tapping) screws and thread rolling screws only used for electrical connections if they generate a full form standard machine screw thread		N/A
	Thread-cutting (self-tapping) screws not used if they are likely to be operated by the user or installer		N/A
	Thread-cutting, thread rolling and space threaded screws may be used in connections providing earthing continuity provided it is not necessary to disturb the connection:		--
	- in normal use,		N/A
	- during user maintenance,		N/A
	- when replacing a supply cord having a type X attachment, or		N/A
	- during installation		N/A
	At least two screws being used for each connection providing earthing continuity, unless		N/A
	the screw forms a thread having a length of at least half the diameter of the screw		N/A
28.4	Screws and nuts that make mechanical connection secured against loosening if they also make electrical connections or connections providing earthing continuity		N/A
	This requirement does not apply to screws in the earthing circuit if at least two screws are used, or		N/A
	if an alternative earthing circuit is provided		N/A
	Rivets for electrical connections or connections providing earthing continuity secured against loosening if the connections are subjected to torsion		N/A

29	CLEARANCES, CREEPAGE DISTANCES AND SOLID INSULATION		
	Clearances, creepage distances and solid insulation withstand electrical stress		P
	For coatings used on printed circuits boards to protect the microenvironment (Type 1) or to provide basic insulation (Type 2), Annex J applies:		N/A

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
	The microenvironment is pollution degree 1 under type 1 protection		N/A
	For type 2 protection, the spacing between the conductors before the protection is applied is not less than the values specified in Table 1 of IEC 60664-3		N/A
	These values apply to functional, basic, supplementary and reinforced insulation .....		N/A
29.1	Clearances not less than the values specified in table 16, taking into account the rated impulse voltage for the overvoltage categories of table 15, unless .....	(see appended table)	P
	for basic insulation and functional insulation they comply with the impulse voltage test of clause 14		N/A
	However, if the distances are affected by wear, distortion, movement of the parts or during assembly, the clearances for rated impulse voltages of 1500V and above are increased by 0,5 mm and the impulse voltage test is not applicable		P
	For appliances intended for use at altitudes exceeding 2 000 m, the clearances in Table 16 is increased according to the relevant multiplier values in Table A.2 of IEC 60664-1		N/A
	Impulse voltage test is not applicable:		--
	- when the microenvironment is pollution degree 3, or	For host and docking station	P
	- for basic insulation of class 0 and class 01 appliances		N/A
	- to appliances intended for use at altitudes exceeding 2 000 m		N/A
	Appliances are in overvoltage category II		P
	A force of 2 N is applied to bare conductors, other than heating elements		P
	A force of 30 N is applied to accessible surfaces		P
29.1.1	Clearances of basic insulation withstand the overvoltages, taking into account the rated impulse voltage		P
	The values of table 16 or the impulse voltage test of clause 14 are applicable .....	(see appended table)	P
	Clearance at the terminals of tubular sheathed heating elements may be reduced to 1,0 mm if the microenvironment is pollution degree 1		N/A

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Lacquered conductors of windings considered to be bare conductors		P
29.1.2	Clearances of supplementary insulation not less than those specified for basic insulation in table 16 .....	(see appended table)	P
29.1.3	Clearances of reinforced insulation not less than those specified for basic insulation in table 16, using the next higher step for rated impulse voltage.....	(see appended table)	P
	For double insulation, with no intermediate conductive part between basic and supplementary insulation, clearances are measured between live parts and the accessible surface, and the insulation system is treated as reinforced insulation		N/A
29.1.4	Clearances for functional insulation are the largest values determined from:		--
	- table 16 based on the rated impulse voltage .....	(see appended table)	P
	- table F.7a in IEC 60664-1, frequency not exceeding 30 kHz		P
	- clause 4 of IEC 60664-4, frequency exceeding 30 kHz		N/A
	If values of table 16 are largest, the impulse voltage test of clause 14 may be applied instead, unless		N/A
	the microenvironment is pollution degree 3, or	For host and docking station	P
	the distances can be affected by wear, distortion, movement of the parts or during assembly		P
	However, clearances are not specified if the appliance complies with clause 19 with the functional insulation short-circuited		N/A
	Lacquered conductors of windings considered to be bare conductors		P
	However, clearances at crossover points are not measured		P
	Clearance between surfaces of PTC heating elements may be reduced to 1mm		N/A
29.1.5	Appliances having higher working voltages than rated voltage, clearances for basic insulation are the largest values determined from:		--
	- table 16 based on the rated impulse voltage .....		N/A
	- table F.7a in IEC 60664-1, frequency not exceeding 30 kHz		N/A

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- clause 4 of IEC 60664-4, frequency exceeding 30 kHz		N/A
	If clearances for basic insulation are selected from Table F.7a of IEC 60664-1 or Clause 4 of IEC 60664-4, the clearances of supplementary insulation are not less than those specified for basic insulation		N/A
	If clearances for basic insulation are selected from Table F.7a of IEC 60664-1, the clearances of reinforced insulation dimensioned as specified in Table F.7a are to withstand 160% of the withstand voltage required for basic insulation		N/A
	If clearances for basic insulation are selected from Clause 4 of IEC 60664-4, the clearances of reinforced insulation are twice the value required for basic insulation		N/A
	If the secondary winding of a step-down transformer is earthed, or if there is an earthed screen between the primary and secondary windings, clearances of basic insulation on the secondary side not less than those specified in table 16, but using the next lower step for rated impulse voltage		N/A
	Circuits supplied with a voltage lower than rated voltage, clearances of functional insulation are based on the working voltage used as the rated voltage in table 15		N/A
29.2	Creepage distances not less than those appropriate for the working voltage, taking into account the material group and the pollution degree .....	(see appended table)	P
	Pollution degree 2 applies, unless	For adapter	P
	- precautions taken to protect the insulation; pollution degree 1		N/A
	- insulation subjected to conductive pollution; pollution degree 3	For host and docking station	P
	A force of 2 N is applied to bare conductors, other than heating elements		P
	A force of 30 N is applied to accessible surfaces		P
	In a double insulation system, the working voltage for both the basic and supplementary insulation is taken as the working voltage across the complete double insulation system		N/A
29.2.1	Creepage distances of basic insulation not less than specified in table 17 .....	(see appended table)	P

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
	However, if the working voltage is periodic and has a frequency exceeding 30 kHz, the creepage distances are also determined from table 2 of IEC 60664-4, these values being used if exceeding the values in table 17 .....		N/A
	Except for pollution degree 1, corresponding creepage distance not less than the minimum specified for the clearance in table 16, if the clearance has been checked according to the test of clause 14 .....		N/A
29.2.2	Creepage distances of supplementary insulation at least those specified for basic insulation in table 17, or .....	(see appended table)	P
	Table 2 of IEC 60664-4, as applicable .....		N/A
29.2.3	Creepage distances of reinforced insulation at least double those specified for basic insulation in table 17, or .....	(see appended table)	P
	Table 2 of IEC 60664-4, as applicable .....		N/A
29.2.4	Creepage distances of functional insulation not less than specified in table 18 .....	(see appended table)	P
	However, if the working voltage is periodic and has a frequency exceeding 30 kHz, the creepage distances are also determined from table 2 of IEC 60664-4, these values being used if exceeding the values in table 18 .....		N/A
	Creepage distances may be reduced if the appliance complies with clause 19 with the functional insulation short-circuited		N/A
29.3	Supplementary and reinforced insulation have adequate thickness, or a sufficient number of layers, to withstand the electrical stresses		P
	Compliance checked:		--
	- by measurement, in accordance with 29.3.1, or		P
	- by an electric strength test in accordance with 29.3.2, or		N/A
	- for insulation, other than single layer internal wiring insulation, by an assessment of the thermal quality of the material combined with an electric strength test, in accordance with 29.3.3, and		N/A
	for accessible parts of reinforced insulation consisting of a single layer, by measurement in accordance with 29.3.4, or		N/A



IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- by an assessment of the thermal quality of the material according to 29.3.3 combined with an electric strength test in accordance with 23.5, for each single layer internal wiring insulation touching each other, or		N/A
	- as specified in subclause 6.3 of IEC 60664-4 for insulation that is subjected to any periodic voltage having a frequency exceeding 30 kHz		N/A
29.3.1	Supplementary insulation have a thickness of at least 1 mm		P
	Reinforced insulation have a thickness of at least 2 mm		P
29.3.2	Each layer of material withstand the electric strength test of 16.3 for supplementary insulation		N/A
	Supplementary insulation consist of at least 2 layers		N/A
	Reinforced insulation consist of at least 3 layers		N/A
29.3.3	The insulation is subjected to the dry heat test Bb of IEC 60068-2-2, followed by		N/A
	the electric strength test of 16.3		N/A
	If the temperature rise during the tests of clause 19 does not exceed the value specified in table 3, the test of IEC 60068-2-2 is not carried out		N/A
29.3.4	Thickness of accessible parts of reinforced insulation consisting of a single layer not less than specified in table 19 .....		N/A

<b>30 RESISTANCE TO HEAT AND FIRE</b>			
30.1	External parts of non-metallic material,		P
	parts supporting live parts, and		N/A
	parts of thermoplastic material providing supplementary or reinforced insulation		N/A
	sufficiently resistant to heat		P
	Ball-pressure test according to IEC 60695-10-2		P
	External parts tested at 40 °C plus the maximum temperature rise determined during the test of clause 11, or at 75 °C, whichever is the higher; temperature (°C) .....	(see appended table)	P

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Parts supporting live parts tested at 40°C plus the maximum temperature rise determined during the test of clause 11, or at 125 °C, whichever is the higher; temperature (°C) .....	(see appended table)	N/A
	Parts of thermoplastic material providing supplementary or reinforced insulation tested at 25 °C plus the maximum temperature rise determined during clause 19, if higher; temperature (°C).....	(see appended table)	N/A
30.2	Parts of non-metallic material resistant to ignition and spread of fire		P
	This requirement does not apply to:		--
	parts having a mass not exceeding 0,5 g, provided the cumulative effect is unlikely to propagate flames that originate inside the appliance by propagating flames from one part to another, or		P
	decorative trims, knobs and other parts unlikely to be ignited or to propagate flames that originate inside the appliance		P
	Compliance checked by the test of 30.2.1, and in addition:		P
	- for attended appliances, 30.2.2 applies		N/A
	- for unattended appliances, 30.2.3 applies	Charging state	P
	For appliances for remote operation, 30.2.3 applies		P
	For base material of printed circuit boards, 30.2.4 applies		P
	Centrally-sited vacuum cleaners, 30.2.3 applicable (IEC 60335-2-2)		N/A
	Other appliances, 30.2.2 applicable (IEC 60335-2-2)		N/A
30.2.1	Parts of non-metallic material subjected to the glow-wire test of IEC 60695-2-11 at 550 °C		P
	However, test not carried out if the material is classified as having a glow-wire flammability index according to IEC 60695-2-12 of at least 550 °C, or		N/A
	the material is classified at least HB40 according to IEC 60695-11-10		N/A
	Parts for which the glow-wire test cannot be carried out need to meet the requirements in ISO 9772 for material classified HBF		N/A
30.2.2	Appliances operated while attended, parts of non-metallic material supporting current-carrying connections, and		N/A

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
	parts of non-metallic material within a distance of 3mm of such connections,		N/A
	subjected to the glow-wire test of IEC 60695-2-11		N/A
	The test severity is:		
	- 750 °C, for connections carrying a current exceeding 0,5 A during normal operation		N/A
	- 650 °C, for other connections		N/A
	Glow-wire applied to an interposed shielding material, if relevant		N/A
	The glow-wire test is not carried out on parts of material classified as having a glow-wire flammability index according to IEC 60695-2-12 of at least:		
	- 750 °C, for connections carrying a current exceeding 0,5 A during normal operation		N/A
	- 650 °C, for other connections		N/A
	The glow-wire test is also not carried out on small parts. These parts are to:		
	- comprise material having a glow-wire flammability index of at least 750 °C, or 650 °C as appropriate, or		N/A
	- comply with the needle-flame test of Annex E, or		N/A
	- comprise material classified as V-0 or V-1 according to IEC 60695-11-10 .....		N/A
	Glow-wire test not applicable to conditions as specified .....		N/A
30.2.3	Appliances operated while unattended, tested as specified in 30.2.3.1 and 30.2.3.2		P
	The tests are not applicable to conditions as specified .....		N/A
30.2.3.1	Parts of non-metallic material supporting connections carrying a current exceeding 0,2 A during normal operation, and		P
	parts of non-metallic material, other than small parts, within a distance of 3 mm,		P
	subjected to the glow-wire test of IEC 60695-2-11 with a test severity of 850 °C		P
	Glow-wire applied to an interposed shielding material, if relevant		N/A
	The glow-wire test is not carried out on parts of material classified as having a glow-wire flammability index according to IEC 60695-2-12 of at least 850 °C		N/A

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
30.2.3.2	Parts of non-metallic material supporting connections, and		P
	parts of non-metallic material within a distance of 3mm,		P
	subjected to glow-wire test of IEC 60695-2-11		P
	The test severity is:		--
	- 750 °C, for connections carrying a current exceeding 0,2 A during normal operation		P
	- 650 °C, for other connections		N/A
	Glow-wire applied to an interposed shielding material, if relevant		N/A
	However, the glow-wire test of 750 °C or 650 °C as appropriate, is not carried out on parts of material fulfilling both or either of the following classifications:		--
	- a glow-wire ignition temperature according to IEC 60695-2-13 of at least:		N/A
	<ul style="list-style-type: none"> <li>• 775 °C, for connections carrying a current exceeding 0,2 A during normal operation</li> </ul>		N/A
	<ul style="list-style-type: none"> <li>• 675 °C, for other connections</li> </ul>		N/A
	- a glow-wire flammability index according to IEC 60695-2-12 of at least:		N/A
	- 750 °C, for connections carrying a current exceeding 0,2 A during normal operation		N/A
	- 650 °C, for other connections		N/A
	The glow-wire test is also not carried out on small parts. These parts are to:		--
	- comprise material having a glow-wire ignition temperature of at least 775 °C or 675 °C as appropriate, or		N/A
	- comprise material having a glow-wire flammability index of at least 750 °C or 650 °C as appropriate, or		N/A
	- comply with the needle-flame test of Annex E, or		N/A
	- comprise material classified as V-0 or V-1 according to IEC 60695-11-10		N/A
	The consequential needle-flame test of Annex E applied to non-metallic parts that encroach within the vertical cylinder placed above the centre of the connection zone and on top of the non-metallic parts supporting current-carrying connections, and parts of non-metallic material within a distance of 3 mm of such connections if these parts are those:		--
	- parts that withstood the glow-wire test of IEC 60695-2-11 of 750 °C or 650 °C as appropriate, but produce a flame that persist longer than 2 s, or		N/A

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- parts that comprised material having a glow-wire flammability index of at least 750 °C or 650 °C as appropriate, or		N/A
	- small parts, that comprised material having a glow-wire flammability index of at least 750 °C or 650 °C as appropriate, or		N/A
	- small parts for which the needle-flame test of Annex E was applied, or		N/A
	- small parts for which a material classification of V-0 or V-1 was applied		N/A
	However, the consequential needle-flame test is not carried out on non-metallic parts, including small parts, within the cylinder that are:		--
	- parts having a glow-wire ignition temperature of at least 775 °C or 675 °C as appropriate, or		N/A
	- parts comprising material classified as V-0 or V-1 according to IEC 60695-11-10, or		N/A
	- parts shielded by a flame barrier that meets the needle-flame test of Annex E or that comprises material classified as V-0 or V-1 according to IEC 60695-11-10		N/A
30.2.4	Base material of printed circuit boards subjected to the needle-flame test of Annex E		P
	Test not applicable to conditions as specified.....:		N/A
30.2.101	The container and filters of ash vacuum cleaners shall have a glow-wire flammability index (GWFI) of at least 850 °C according to IEC 60695-2-12, the test samples used for the classification shall be not thicker than the relevant part of the ash vacuum cleaner. (IEC 60335-2-2)		N/A
	As an alternative, the container and filters of ash vacuum cleaners shall have a glow-wire ignition temperature (GWIT) of at least 875 °C according to IEC 60695-2-13, the test samples used for the classification shall be not thicker than the relevant part of the ash vacuum cleaner.		N/A
	As an alternative the container and filters of ash vacuum cleaners are subjected to the glow wire test of IEC 60695-2-11 with a test severity of 850 °C. The value of $t_e - t_i$ shall not exceed 2 s.		N/A

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
30.2.102	All nozzles, deflectors and connectors located upstream of the pre-filter made out of non-metallic material are subjected to the needle flame test in accordance of Annex E. The needle flame test is not applicable to parts that comprise material classified as V-0 or V-1 according to IEC 60695-11-10 provided that the test sample used for the classification was no thicker than the relevant part of the ash vacuum cleaner (IEC 60335-2-2)		N/A

31	RESISTANCE TO RUSTING		
	Relevant ferrous parts adequately protected against rusting		P
	Tests specified in part 2 when necessary		N/A

32	RADIATION, TOXICITY AND SIMILAR HAZARDS		
	Appliance does not emit harmful radiation or present a toxic or similar hazard due to their operation in normal use		P
	Compliance is checked by the limits or tests specified in part 2, if relevant		N/A

A	ANNEX A (INFORMATIVE) ROUTINE TESTS		
	Description of routine tests to be carried out by the manufacturer		N/A

B	ANNEX B (NORMATIVE) APPLIANCES POWERED BY RECHARGEABLE BATTERIES THAT ARE RECHARGED IN THE APPLIANCE		
	The following modifications to this standard are applicable for appliances powered by batteries that are recharged in the appliance		P
	Three forms of construction covered:		--
	a) Appliance supplied directly from the supply mains or a renewable energy source, the battery charging circuitry and other supply unit circuitry incorporated within the appliance		N/A
	b) The part of the appliance incorporating the battery is supplied from the supply mains or a renewable energy source, via a detachable supply unit. The battery charging circuitry is incorporated within the part of the appliance containing the battery		P

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
	c) The part of the appliance incorporating the battery is supplied from the supply mains or a renewable energy source, via a detachable supply unit. The battery charging circuitry is incorporated within the detachable supply unit		N/A
	This annex does not apply to battery chargers		N/A
3.1.9	Appliance operated under the following conditions:		--
	- the appliance, supplied by its fully charged battery, operated as specified in relevant part 2		P
	- the battery is charged, the battery being initially discharged to such an extent that the appliance cannot operate		P
	-if possible, the appliance is supplied from the supply mains through its battery charger, the battery being initially discharged to such an extent that the appliance cannot operate. The appliance is operated as specified in relevant part 2		P
	- if the appliance incorporates inductive coupling between two parts that are detachable from each other, the appliance is supplied from the supply mains with the detachable part removed		N/A
3.6.2	Part to be removed in order to discard the battery is not considered to be detachable		P
5.B.101	Appliances supplied from the supply mains tested as specified for motor-operated appliances		P
6.1	Mobile parts of automatic battery-powered cleaners shall be class II or class III (IEC 60335-2-2)		P
7.1	Battery compartment for batteries intended to be replaced by the user, marked with battery voltage and polarity of the terminals		N/A
	The positive terminal indicated by symbol IEC 60417-5005 and the negative terminal by symbol IEC 60417-5006		N/A
	Appliances intending to be supplied from a detachable supply unit marked with symbol IEC 60417-6181 and its type reference along with symbol ISO 7000-0790 (2004-01), or		N/A
	use only with <model designation> supply unit:	See marking plate	P
	The mobile part of an automatic battery-powered cleaner shall be marked with the (IEC 60335-2-2)		--
	-name, trademark or identification mark of the manufacturer or responsible vendor		P
	-the model or type reference of the docking station with which the mobile part is intended to be used		P

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
7.6	Additional symbols		N/A
7.12	The instructions give information regarding charging		P
	The instructions for appliances incorporating batteries intended to be replaced by the user includes required information		N/A
	Instructions for appliances containing non-user-replaceable batteries state the substance of the following:		--
	This appliance contains batteries that are only replaceable by skilled persons		N/A
	Instructions for appliances containing non-replaceable batteries shall state the substance of the following:		--
	This appliance contains batteries that are non-replaceable		P
	WARNING: For the purposes of recharging the battery, only use the detachable supply unit provided with this appliance		P
	If the symbol for detachable supply unit is used, its meaning is explained		N/A
	Automatic battery-operated cleaners shall also be provided with cautionary instructions for room preparation and constant care (IEC 60335-2-2)		P
7.15	Markings placed on the part of the appliance connected to the supply mains		P
	The type reference of the detachable supply unit is placed in close proximity to the symbol		N/A
8.2	Appliances having batteries that according to the instruction may be replaced by the user need only have basic insulation between live parts and the inner surface of the battery compartment		N/A
	If the appliance can be operated without batteries, double or reinforced insulation required		N/A
11.7	The battery is charged for the period stated in the instructions or 24 h.....:	24h	P
	For mobile parts of automatic battery-powered cleaners, the test ends when the cleaning operation is stopped due to the discharging of the battery ..... (IEC 60335-2-2)		P
11.8	Temperature rise of the battery surface does not exceed the limit in the battery manufacturer's specification; measured (K); limit (K) :		N/A
	If no limit specified, the temperature rise does not exceed 20 K; measured (K) .....	(see appended table)	P



IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
19.1	Appliances subjected to tests of 19.B.101, 19.B.102 and 19.B.103		P
	Mobile parts of automatic battery-powered cleaners are subjected to the test of 19.7 while they are being supplied by their battery (IEC 60335-2-2)		P
19.7	On mobile parts of automatic battery-powered cleaners, the rotor is locked (IEC 60335-2-2)		P
19.10	Not applicable		N/A
19.B.101	Appliances supplied at rated voltage for 168 h, the battery being continually charged		P
19.B.102	For appliances having batteries that can be removed without the aid of a tool, short-circuit of the terminals of the battery, the battery being fully charged,		N/A
19.B.103	Appliances having batteries replaceable by the user supplied at rated voltage under normal operation with the battery removed or in any position allowed by the construction		N/A
19.13	The battery does not rupture or ignite		P
21.B.101	Appliances having pins for insertion into socket-outlets have adequate mechanical strength		P
	Part of the appliance incorporating the pins subjected to the free fall test, procedure 2, of IEC 60068-2-31, the number of falls being:		--
	- 100, if the mass of the part does not exceed 250 g (g).....:	100	P
	- 50, if the mass of the part exceeds 250 g.....:		N/A
	After the test, the requirements of 8.1, 15.1.1, 16.3 and clause 29 are met		P
21.201	Mobile parts of automatic battery-powered cleaners shall have sufficient mechanical strength (IEC 60335-2-2)		P
	An evenly distributed load of 60 kg is placed on top of the mobile part for 60 s		P
	- During this test, no short circuit shall occur		P
	-After the test, there shall be no visible damage that could impair compliance with this standard		P
22.3	Appliances having pins for insertion into socket-outlets tested as fully assembled as possible	Adapter	N/A

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
22.40	Mobile parts of automatic battery-powered cleaners shall be fitted with a switch to turn the appliance off (IEC 60335-2-2)		P
	If compliance relies on the operation of an electronic circuit, the electromagnetic phenomena tests of Subclause 19.11.4.1 and 19.11.4.2 have to be applied. During the tests, the motor which moves the mobile part shall not start. (IEC 60335-2-2)		N/A
22.201	Mobile parts of automatic battery-powered cleaners shall be equipped with (IEC 60335-2-2)		--
	- a device to stop movement within 1 s of accessible hazardous moving parts when they lose contact with the surface being cleaned		P
	- a device to protect the appliance from dropping off the cleaning surface (e.g. stairways,etc.). When the mobile part senses that it has reached a critical edge, it shall stop or reverse and move away from the edge of the cleaning surface and then continue to operate normally		P
	If compliance relies on the operation of an electronic circuit, the test is repeated under the following conditions applied separately: – the fault conditions in a) to g) of 19.11.2 applied one at a time to the electronic circuit; – the electromagnetic phenomena test of 19.11.4.1 and 19.11.4.2 applied to the appliance. If the electronic circuit is programmable, the software shall contain measures to control the fault/error conditions specified in Table R.1 and is evaluated in accordance with the relevant requirements of Annex R. (IEC 60335-2-2)		P
22.202	When operating on a sloping surface, the speed of the mobile part shall not be excessive (IEC 60335-2-2)		P
	The speed of the mobile part is measured during the test of Clause 11		P
	The mobile part is then directed to move down a glass surface inclined at 10° to the horizontal and its speed is again measured. The measured speed shall not exceed the speed initially measured by more than 10 %		P

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
24.201	Thermal cut-outs and protective electronic circuits incorporated in automatic battery-powered cleaners for compliance with 19.7 shall be non-self-resetting (IEC 60335-2-2)		N/A
25.13	An additional lining or bushing not required for interconnection cords in class III appliances or class III constructions operating at safety extra-low voltage not containing live parts		P
30.2	For parts of the appliance connected to the supply mains during the charging period, 30.2.3 applies		P
	For other parts, 30.2.2 applies		N/A
	For automatic battery-powered cleaners, 30.2.3 is applicable (IEC 60335-2-2)		P

<b>C</b>	<b>ANNEX C (NORMATIVE) AGEING TEST ON MOTORS</b>		
	Tests, as described, carried out when doubt with regard to the temperature classification of the insulation of a motor winding		N/A
	Test conditions as specified		N/A
	Modification in Table C.1: $p=2\ 000$ (IEC 60335-2-2)		N/A

<b>D</b>	<b>ANNEX D (NORMATIVE) THERMAL MOTOR PROTECTORS</b>		
	Applicable to appliances having motors that incorporate thermal motor protectors necessary for compliance with the standard		N/A
	Test conditions as specified		N/A

<b>E</b>	<b>ANNEX E (NORMATIVE) NEEDLE-FLAME TEST</b>		
	Needle-flame test carried out in accordance with IEC 60695-11-5, with the following modifications:		--
7	Severities		--
	The duration of application of the test flame is 30 s $\pm$ 1 s		P
9	Test procedure		--
9.1	The specimen so arranged that the flame can be applied to a vertical or horizontal edge as shown in the examples of Figure 1		P

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
9.2	The first paragraph does not apply		P
	If possible, the flame is applied at least 10 mm from a corner		P
9.3	The test is carried out on one specimen		P
	If the specimen does not withstand the test, the test may be repeated on two additional specimens, both withstanding the test		N/A
11	Evaluation of test results		--
	The duration of burning not exceeding 30 s		N/A
	However, for printed circuit boards, the duration of burning not exceeding 15 s		P

<b>F</b>	<b>ANNEX F (NORMATIVE) CAPACITORS</b>		
	Capacitors likely to be permanently subjected to the supply voltage, and used for radio interference suppression or voltage dividing, comply with the following clauses of IEC 60384-14, with the following modifications:		--
1.5	Terms and definitions		--
1.5.3	Class X capacitors tested according to subclass X2		N/A
1.5.4	This subclause is applicable		N/A
1.6	Marking		
	Items a) and b) are applicable		N/A
3.4	Approval testing		--
3.4.3.2	Table 3 is applicable as described		N/A
4.1	Visual examination and check of dimensions		--
	This subclause is applicable		N/A
4.2	Electrical tests		--
4.2.1	This subclause is applicable		N/A
4.2.5	This subclause is applicable		N/A
4.2.5.2	Only table 11 is applicable		N/A
	Values for test A apply		N/A
	However, for capacitors in heating appliances the values for test B or C apply		N/A
4.12	Damp heat, steady state		--
	This subclause is applicable		N/A

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Only insulation resistance and voltage proof are checked		N/A
4.13	Impulse voltage		--
	This subclause is applicable		N/A
4.14	Endurance		--
	Subclauses 4.14.1, 4.14.3, 4.14.4 and 4.14.7 are applicable		N/A
4.14.7	Only insulation resistance and voltage proof are checked		N/A
	No visible damage		N/A
4.17	Passive flammability test		--
	This subclause is applicable		N/A
4.18	Active flammability test		--
	This subclause is applicable		N/A

<b>G</b>	<b>ANNEX G (NORMATIVE) SAFETY ISOLATING TRANSFORMERS</b>		
	The following modifications to this standard are applicable for safety isolating transformers:		--
7	Marking and instructions		--
7.1	Transformers for specific use marked with:		--
	-name, trademark or identification mark of the manufacturer or responsible vendor .....		N/A
	-model or type reference .....		N/A
17	Overload protection of transformers and associated circuits		--
	Fail-safe transformers comply with subclause 15.5 of IEC 61558-1		N/A
22	Construction		--
	Subclauses 19.1 and 19.1.2 of IEC 61558-2-6 are applicable		N/A
29	Clearances, creepage distances and solid insulation		--
29.1, 29.2, 29.3	The distances specified in items 2a, 2c and 3 in table 13 of IEC 61558-1 apply		N/A
	For insulated winding wires complying with subclause 19.12.3 of IEC 61558-1 there are no requirements for clearances or creepage distances		N/A

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
	For windings providing reinforced insulation, the distance specified in item 2c of table 13 of IEC 61558-1 is not assessed		N/A
	For safety isolating transformers subjected to periodic voltages with a frequency exceeding 30 kHz, the clearances, creepage distances and solid insulation values specified in IEC 60664-4 are applicable, if greater than the values specified in items 2a, 2c and 3 in table 13 of IEC 61558-1		N/A

H	ANNEX H (NORMATIVE) SWITCHES		
	Switches comply with the following clauses of IEC 61058-1, as modified below:		--
	The tests of IEC 61058-1 carried out under the conditions occurring in the appliance		N/A
	Before being tested, switches are operated 20 times without load		N/A
8	Marking and documentation		--
	Switches are not required to be marked		N/A
	However, a switch that can be tested separately from the appliance marked with the manufacturer's name or trade mark and the type reference		N/A
13	Mechanism		--
	The tests may be carried out on a separate sample		N/A
15	Insulation resistance and dielectric strength		--
15.1	Not applicable		N/A
15.2	Not applicable		N/A
15.3	Applicable for full disconnection and micro-disconnection		N/A
17	Endurance		--
	Compliance is checked on three separate appliances or switches		N/A
	For 17.2.4.4, the number of cycles declared according to 7.1.4 is 10 000, unless		N/A
	otherwise specified in 24.1.3 of the relevant part 2 of IEC 60335 .....		N/A
	Switches for operation under no load and which can be operated only by a tool, and		N/A
	switches operated by hand that are interlocked so that they cannot be operated under load,		N/A

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
	are not subjected to the tests		N/A
	However, switches without this interlock are subjected to the test of 17.2.4.4 for 100 cycles of operation		N/A
	Subclauses 17.2.2 and 17.2.5.2 not applicable		N/A
	The ambient temperature during the test is that occurring in the appliance during the test of Clause 11 in IEC 60335-1		N/A
	The temperature rise of the terminals not more than 30 K above the temperature rise measured in clause 11 of IEC 60335-1 (K).....:		N/A
20	Clearances, creepage distances, solid insulation and coatings of rigid printed board assemblies		--
	clause 20 is applicable to clearances and creepage distances for functional insulation,		N/A
	It is also applicable to creepage distances for functional insulation, across full disconnection and micro-disconnection, as stated in table 24		N/A

N/A

<b>I</b>	<b>ANNEX I (NORMATIVE) MOTORS HAVING BASIC INSULATION THAT IS INADEQUATE FOR THE RATED VOLTAGE OF THE APPLIANCE</b>		
	The following modifications to this standard are applicable for motors having basic insulation that is inadequate for the rated voltage of the appliance:		--
8	Protection against access to live parts		--
8.1	Metal parts of the motor are considered to be bare live parts		N/A
11	Heating		--
11.3	The temperature rise of the body of the motor is determined instead of the temperature rise of the windings		N/A
11.8	The temperature rise of the body of the motor, where in contact with insulating material, not exceeding values in table 3 for the relevant insulating material		N/A
16	Leakage current and electric strength		--
16.3	Insulation between live parts of the motor and its other metal parts is not subjected to the test		N/A
19	Abnormal operation		--
19.1	The tests of 19.7 to 19.9 are not carried out		N/A
19.1.101	Appliance operated at rated voltage with each of the following fault conditions:		--

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- short circuit of the terminals of the motor, including any capacitor incorporated in the motor circuit		N/A
	- short circuit of each diode of the rectifier		N/A
	- open circuit of the supply to the motor		N/A
	- open circuit of any parallel resistor, the motor being in operation		N/A
	Only one fault simulated at a time, the tests carried out consecutively		N/A
22	Construction		--
22.1.101	For class I appliances incorporating a motor supplied by a rectifier circuit, the d.c. circuit being insulated from accessible parts of the appliance by double or reinforced insulation		N/A
	Compliance checked by the tests specified for double and reinforced insulation		N/A

<b>J</b>	<b>ANNEX J (NORMATIVE) COATED PRINTED CIRCUIT BOARDS</b>		
	Testing of protective coatings of printed circuit boards carried out in accordance with IEC 60664-3 with the following modifications:		--
5.7	Conditioning of the test specimens		--
	When production samples are used, three samples of the printed circuit board are tested		N/A
5.7.1	Cold		--
	The test is carried out at -25 °C		N/A
5.7.3	Rapid change of temperature		--
	Severity 1 is specified		N/A
5.9	Additional tests		--
	This subclause is not applicable		N/A

<b>K</b>	<b>ANNEX K (NORMATIVE) OVERVOLTAGE CATEGORIES</b>		
	The information on overvoltage categories is extracted from IEC 60664-1		P
	Overvoltage category is a numeral defining a transient overvoltage condition		P
	Equipment of overvoltage category IV is for use at the origin of the installation		N/A



IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Equipment of overvoltage category III is equipment in fixed installations and for cases where the reliability and the availability of the equipment is subject to special requirements		N/A
	Equipment of overvoltage category II is energy consuming equipment to be supplied from the fixed installation		P
	If such equipment is subjected to special requirements with regard to reliability and availability, overvoltage category III applies		N/A
	Equipment of overvoltage category I is equipment for connection to circuits in which measures are taken to limit transient overvoltages to an appropriate low level		N/A

<b>L</b>	<b>ANNEX L (INFORMATIVE) GUIDANCE FOR THE MEASUREMENT OF CLEARANCES AND CREEPAGE DISTANCES</b>		
	Information for the determination of clearances and creepage distances		P
<b>M</b>	<b>ANNEX M (NORMATIVE) POLLUTION DEGREE</b>		
	The information on pollution degrees is extracted from IEC 60664-1		P
	Pollution		--
	The microenvironment determines the effect of pollution on the insulation, taking into account the macroenvironment		P
	Means may be provided to reduce pollution at the insulation by effective enclosures or similar		P
	Minimum clearances specified where pollution may be present in the microenvironment		P
	Degrees of pollution in the microenvironment		--
	For evaluating creepage distances, the following degrees of pollution in the microenvironment are established:		--
	- pollution degree 1: no pollution or only dry, non-conductive pollution occurs. The pollution has no influence		N/A
	- pollution degree 2: only non-conductive pollution occurs, except that occasionally a temporary conductivity caused by condensation is to be expected	For adapter	P

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- pollution degree 3: conductive pollution occurs or dry non-conductive pollution occurs that becomes conductive due to condensation that is to be expected	For host and docking station	P
	- pollution degree 4: the pollution generates persistent conductivity caused by conductive dust or by rain or snow		N/A
<b>N</b>	<b>ANNEX N (NORMATIVE) PROOF TRACKING TEST</b>		
	The proof tracking test is carried out in accordance with IEC 60112 with the following modifications:		--
7	Test apparatus		--
7.3	Test solutions		--
	Test solution A is used		P
10	Determination of proof tracking index (PTI)		--
10.1	Procedure		--
	The proof voltage is 100V, 175V, 400V or 600V ...	175V	P
	The test is carried out on five specimens		N/A
	In case of doubt, additional test with proof voltage reduced by 25V, the number of drops increased to 100		N/A
10.2	Report		--
	The report states if the PTI value was based on a test using 100 drops with a test voltage of (PTI-25) V		N/A
<b>O</b>	<b>ANNEX O (INFORMATIVE) SELECTION AND SEQUENCE OF THE TESTS OF CLAUSE 30</b>		
	Description of tests for determination of resistance to heat and fire		P
<b>P</b>	<b>ANNEX P (INFORMATIVE) GUIDANCE FOR THE APPLICATION OF THIS STANDARD TO APPLIANCES USED IN TROPICAL CLIMATES</b>		
	Modifications applicable for class 0 and 01 appliances having a rated voltage exceeding 150V, intended to be used in countries having a warm damp equable climate and that are marked WDaE		--
	Modifications may also be applied to class 1 appliances having a rated voltage exceeding 150V, intended to be used in countries having a warm damp equable climate and that are marked WdaE, if liable to be connected to a supply mains that excludes the protective earthing conductor		--
5.7	The ambient temperature for the tests of clauses 11 and 13 is 40 +3/0 °C		N/A

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
7.1	The appliance marked with symbol IEC 60417-6332		N/A
7.12	The instructions state that the appliance is to be supplied through a residual current device (RCD) having a rated residual operating current not exceeding 30 mA		N/A
	The instructions state that the appliance is considered to be suitable for use in countries having a tropical climate, but may also be used in other countries		N/A
	If symbol IEC 60417-6332 is used, its meaning is explained		N/A
11.8	The values of Table 3 are reduced by 15 K		N/A
13.2	The leakage current for class I appliances not exceeding 0,5 mA		N/A
15.3	The value of t is 37 °C		N/A
16.2	The leakage current for class I appliances not exceeding 0,5 mA (mA):		N/A
19.13	The leakage current test of 16.2 is applied in addition to the electric strength test of 16.3		N/A
<b>Q</b>	<b>ANNEX Q (INFORMATIVE) SEQUENCE OF TESTS FOR THE EVALUATION OF ELECTRONIC CIRCUITS</b>		
	Description of tests for appliances incorporating electronic circuits		P

<b>R</b>	<b>ANNEX R (NORMATIVE) SOFTWARE EVALUATION</b>		
	Programmable electronic circuits requiring software incorporating measures to control the fault/error conditions specified in table R.1 or R.2 validated in accordance with the requirements of this annex	Table R.1	P
R.1	Programmable electronic circuits using software		--
	Programmable electronic circuits requiring software incorporating measures to control the fault/error conditions specified in table R.1 or R.2 constructed so that the software does not impair compliance with the requirements of this standard		P
R.2	Requirements for the architecture		--

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Programmable electronic circuits requiring software incorporating measures to control the fault/error conditions specified in table R.1 or R.2 use measures to control and avoid software-related faults/errors in safety-related data and safety-related segments of the software		P
R.2.1.1	Programmable electronic circuits requiring software incorporating measures to control the fault/error conditions specified in table R.2 have one of the following structures:		--
	- single channel with periodic self-test and monitoring		N/A
	- dual channel (homogenous) with comparison		N/A
	- dual channel (diverse) with comparison		N/A
	Programmable electronic circuits requiring software incorporating measures to control the fault/error conditions specified in table R.1 have one of the following structures:		--
	- single channel with functional test		P
	- single channel with periodic self-test		P
	- dual channel without comparison		N/A
R.2.2	Measures to control faults/errors		--
R.2.2.1	When redundant memory with comparison is provided on two areas of the same component, the data in one area is stored in a different format from that in the other area		N/A
R.2.2.2	Programmable electronic circuits with functions requiring software incorporating measures to control the fault/error conditions specified in table R.2 and that use dual channel structures with comparison, have additional fault/error detection means for any fault/errors not detected by the comparison		N/A
R.2.2.3	For programmable electronic circuits with functions requiring software incorporating measures to control the fault/error conditions specified in table R.1 or R.2, means are provided for the recognition and control of errors in transmissions to external safety-related data paths		P
R.2.2.4	For programmable electronic circuits with functions requiring software incorporating measures to control the fault/error conditions specified in table R.1 or R.2, the programmable electronic circuits incorporate measures to address the fault/errors in safety-related segments and data indicated in table R.1 and R.2 as appropriate		P

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
R.2.2.5	For programmable electronic circuits with functions requiring software incorporating measures to control the fault/error conditions specified in Table R.1 or Table R.2, detection of a fault/error shall occur before compliance with Clause 19 and 22.201 of Annex B or Annex Sis impaired. (IEC 60335-2-2)		P
R.2.2.6	The software is referenced to relevant parts of the operating sequence and the associated hardware functions		P
R.2.2.7	Labels used for memory locations are unique		P
R.2.2.8	The software is protected from user alteration of safety-related segments and data		P
R.2.2.9	The software and safety-related hardware under its control shall be initialized and shall terminate before compliance with Clause 19 and 22.201 of Annex B or Annex Sis impaired. (IEC 60335-2-2)		P
R.3	Measures to avoid errors		--
R.3.1	General		--
	For programmable electronic circuits with functions requiring software incorporating measures to control the fault/error conditions specified in table R.1 or R.2, the following measures to avoid systematic fault in the software are applied		--
	Software that incorporates measures used to control the fault/error conditions specified in table R.2 is inherently acceptable for software required to control the fault/error conditions specified in table R.1		P
R.3.2	Specification		--
R.3.2.1	Software safety requirements:	Software Id:	P
	The specification of the software safety requirements includes the descriptions listed		P
R.3.2.2	Software architecture		--

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
R.3.2.2.1	The specification of the software architecture includes the aspects listed - techniques and measures to control software faults/errors (refer to R.2.2); - interactions between hardware and software; - partitioning into modules and their allocation to the specified safety functions; - hierarchy and call structure of the modules (control flow); - interrupt handling; - data flow and restrictions on data access; - architecture and storage of data; - time-based dependencies of sequences and data	Document ref. No:	P
R.3.2.2.2	The architecture specification is validated against the specification of the software safety requirements by static analysis		P
R.3.2.3	Module design and coding		--
R.3.2.3.1	Based on the architecture design, software is suitably refined into modules		P
	Software module design and coding is implemented in a way that is traceable to the software architecture and requirements		P
R.3.2.3.2	Software code is structured		P
R.3.2.3.3	Coded software is validated against the module specification by static analysis		P
	The module specification is validated against the architecture specification by static analysis		P
R.3.3.3	Software validation		--
	The software is validated with reference to the requirements of the software safety requirements specification		P
	Compliance is checked by simulation of:		--
	- input signals present during normal operation		P
	- anticipated occurrences		P
	- undesired conditions requiring system action		P

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict

TABLE R.1 – GENERAL FAULT/ERROR CONDITIONS						
Component <sup>1)</sup>	Fault/error	Acceptable measures <sup>2) 3)</sup>	Definitions	Document reference for applied measure	Document reference for applied test	Verdict
1 CPU 1.1 Registers	Stuck at	Functional test, or periodic self-test using either: <ul style="list-style-type: none"> <li>- static memory test, or</li> <li>- word protection with single bit redundancy</li> </ul>	H.2.16.5 H.2.16.6 H.2.19.6 H.2.19.8.2			P
1.2 VOID						N/A
1.3 Programme counter	Stuck at	Functional test, or Periodic self-test, or Independent time-slot monitoring, or Logical monitoring of the programme sequence	H.2.16.5 H.2.16.6 H.2.18.10.4 H.2.18.10.2			P
2 Interrupt handling and execution	No interrupt or too frequent interrupt	Functional test, or time-slot monitoring	H.2.16.5 H.2.18.10.4			P
3 Clock	Wrong frequency (for quartz synchronized clock: harmonics/sub-harmonics only)	Frequency monitoring, or time slot monitoring	H.2.18.10.1 H.2.18.10.4			P

IEC 60335-2-2						
Clause	Requirement + Test		Result - Remark			Verdict
4. Memory						P
4.1 Invariable memory	All single bit faults	Periodic modified checksum, or multiple checksum, or word protection with single bit redundancy	H.2.19.3.1 H.2.19.3.2 H.2.19.8.2			
4.2 Variable memory	DC fault	Periodic static memory test, or word protection with single bit redundancy	H.2.19.6 H.2.19.8.2			P
4.3 Addressing (relevant to variable and invariable memory)	Stuck at	Word protection with single bit redundancy including the address	H.2.19.8.2			P
5 Internal data path	Stuck at DC fault	Word protection with single bit redundancy Comparison of redundant CPUs by either: - reciprocal comparison - independent hardware comparator	H.2.19.8.2  H.2.18.15 H.2.18.3			P
5.1 VOID						N/A
5.2 Addressing	Wrong address	Word protection with single bit redundancy including the address	H.2.19.8.2			P
6 External communication	Hamming distance 3	Word protection with multi-bit redundancy, or CRC – single work, or Transfer redundancy, or Protocol test	H.2.19.8.1  H.2.19.4.1 H.2.18.2.2 H.2.18.14			N/A
6.1 VOID						N/A



IEC 60335-2-2						
Clause	Requirement + Test			Result - Remark		Verdict
6.2 VOID						N/A
6.3 Timing	Wrong point in time  Wrong sequence	Time-slot monitoring, or scheduled transmission  Time-slot and logical monitoring, or Comparison of redundant communication channels by either: - reciprocal comparison - independent hardware comparator  Logical monitoring, or time-slot monitoring, or Scheduled transmission (same options as for wrong point in time)	H.2.18.10.4 H.2.18.18 H.2.18.10.3  H.2.18.15 H.2.18.3  H.2.18.10.2 H.2.18.10.4 H.2.18.18			N/A
7 Input/output periphery	Fault conditions specified in 19.11.2	Plausibility check Comparison of redundant communication channels by either: - reciprocal comparison - independent hardware comparator	H.2.18.13  H.2.18.15 H.2.18.3			P
7.1 VOID						N/A
7.2 Analog I/O 7.2.1 A/D and D/A- converter	Fault conditions specified in 19.11.2	Plausibility check	H.2.18.13			P
7.2.2 Analog multiplexer	Wrong addressing	Plausibility check	H.2.18.13			P
8 VOID						N/A

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict

9 Custom chips <sup>4)</sup> e.g. ASIC, GAL, Gate array	Any output outside the static and dynamic functional specification	Periodic self-test	H.2.16.6			N/A
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NOTE A Stuck-at fault model denotes a fault model representing an open circuit or a non-varying signal level. A DC fault model denotes a stuck-at fault model incorporating short circuit between signal lines.

- 1) For fault/error assessment, some components are divided into their sub-functions.
- 2) For each sub-function in the table, the Table R.2 measure will cover the software fault/error.
- 3) Where more than one measure is given for a sub-function, these are alternatives.
- 4) To be divided as necessary by the manufacturer into sub-functions.

S	<b>ANNEX S (NORMATIVE) BATTERY OPERATED APPLIANCES POWERED BY BATTERIES THAT ARE NON-RECHARGEABLE OR NOT RECHARGED IN THE APPLIANCE</b>		--
	The following modifications to this standard are applicable for battery-operated appliances where the batteries are either non-rechargeable (primary batteries), or		N/A
	rechargeable batteries (secondary batteries) that are not recharged in the appliance		N/A
5.8.1	If the supply terminals for the connection of the battery have no indication of polarity, the more unfavourable polarity is applied		N/A
5.S.101	Appliances intended for use with a battery box are tested with the battery box supplied with the appliance or with the battery box recommended in the instructions		N/A
5.S.102	Appliances are tested as motor-operated appliances.		N/A
7.1	Appliances marked with the battery voltage (V) and the polarity of the terminals, unless		N/A
	the polarity is irrelevant		N/A
	Appliances also marked with:		--
	– name, trade mark or identification mark of the manufacturer or responsible vendor .....		N/A
	– model or type reference .....		N/A
	– IP number according to degree of protection against ingress of water, other than IPX0....		N/A
	– type reference of battery or batteries .....		N/A
	If relevant, the positive terminal is indicated by the symbol IEC 60417-5005 and the negative terminal by the symbol IEC 60417-5006		N/A

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
	If appliances use more than one battery, they are marked to indicate correct polarity connection of the batteries		N/A
7.6	Additional symbols		N/A
7.12	The instructions contain the following, as applicable:		--
	– the types of batteries that may be used... ..:		N/A
	– how to remove and insert the batteries		N/A
	– non-rechargeable batteries are not to be recharged		N/A
	– rechargeable batteries are to be removed from the appliance before being charged		N/A
	– different types of batteries or new and used batteries are not to be mixed		N/A
	– batteries are to be inserted with the correct polarity		N/A
	– exhausted batteries are to be removed from the appliance and safely disposed of		N/A
	– if the appliance is to be stored unused for a long period, the batteries are removed		N/A
	– the supply terminals are not to be short-circuited		N/A
11.5	Appliances are supplied with the most unfavourable supply voltage between		--
	– 0,55 and 1,0 times the battery voltage, if the appliance can be used with non-rechargeable batteries		N/A
	– 0,75 and 1,0 times battery voltage, if the appliance is designed for use with rechargeable batteries only		N/A
	The values specified in Table S.101 for the internal resistance per cell of the battery is taken into account		N/A
19.1	The tests are carried out with the battery fully charged unless otherwise specified		N/A
19.13	The battery does not rupture or ignite		N/A
19.S.101	Appliances are supplied with the voltage specified in 11.5. The supply terminals having an indication of polarity are connected to the opposite polarity, unless		N/A
	such a connection is unlikely to occur due to the construction of the appliance		N/A

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
19.S.102	For appliances with provision for multiple batteries, one or more of the batteries are reversed and the appliance is operated, if reversal of batteries is allowed by the construction		N/A
25.5	The flexible leads or flexible cord used to connect an external battery or battery box in is connected to the appliance by a type X attachment		N/A
25.13	This requirement is not applicable to the flexible leads or flexible cord connecting external batteries or a battery box with an appliance		N/A
25.S.101	Appliances have suitable means for connection of the battery. If the type of battery is marked on the appliance, the means of connection is suitable for this type of battery		N/A
26.5	Terminal devices in an appliance for the connection of the flexible leads or flexible cord connecting an external battery or battery box are so located or shielded that there is no risk of accidental connection between supply terminals		N/A
30.2.3.2	There is no battery in the area of the vertical cylinder used for the consequential needle flame test, unless		N/A
	the battery is shielded by a barrier that meets the needle flame test of Annex E, or		N/A
	that comprises material classified as V-0 or V-1 according to IEC 60695-11-10		N/A
<b>T</b>	<b>ANNEX T (NORMATIVE) UV-C RADIATION EFFECT ON NON-METALLIC MATERIALS</b>		--
	Requirements for non-metallic materials subject to direct or reflected UV-C radiation exposure and whose mechanical and electrical properties are relied upon for compliance with the		N/A
	Does not apply to glass, ceramic and similar materials		N/A
	Tested as specified in ISO 4892-1 and ISO 4892-2, with the following modifications:		--
	Modifications to ISO 4892-1:		--
5.1.6	The UV-C emitter is a low pressure mercury lamp with a quartz envelope having a continuous spectral irradiance of 10 W/m <sup>2</sup> at 254 nm		N/A
	Subclause 5.1.6.1 and Table 1 are not applicable		N/A

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
5.2.4	The black-panel temperature shall be 63 °C +/- 3 °C		N/A
5.3.1	Humidification of the chamber air is specified in part 2 when necessary		N/A
9	This clause is not applicable		N/A
	Modifications to ISO 4892-2:		--
7.1	At least three test specimens are tested		N/A
	Ten samples of internal wiring is tested		N/A
7.2	The specimens are attached to the specimen holders such that they are not subject to any stress		N/A
7.3	Apparatus prepared as specified		N/A
	The test specimens and, if used, the irradiance-measuring instrument are exposed for 1 000 h		N/A
7.4	If used, a radiometer is mounted and calibrated such that it measures the irradiance at the exposed surface of the test specimen		N/A
7.5	Material properties and test methods for parts providing mechanical support or impact resistance as specified in Table T.1		N/A
	Material properties and test method for electrical insulation of internal wiring as specified in Table T.2		N/A
8	This clause is not applicable		N/A

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict

10.1	TABLE: Power input deviation					P
Input deviation of/at:	P rated (W)	P measured (W)	dP (W, %)	Required dP (W, %)	Remark	
Battery is full	26	21.4	-17.7%	+20%	OB16	
Supplementary information: N/A						

10.2	TABLE: Current deviation					P
Current deviation of/at:	I rated (A)	I measured (A)	dI (A, %)	Required dI (A, %)	Remark	
100V 50Hz	0.4	0.131	-67.3%	+20%	Host + docking station + Adaptor	
100V 60Hz	0.4	0.129	-67.8%	+20%	Host + docking station + Adaptor	
240V 50Hz	0.4	0.062	-84.5%	+20%	Host + docking station + Adaptor	
240V 60Hz	0.4	0.062	-84.5%	+20%	Host + docking station + Adaptor	
Supplementary information: N/A						

11.8-1	TABLE: Heating Test (For charging status)			P
	Test voltage (V) .....	94		—
	Ambient (°C) .....	t1: 23.3, t2:23.7		—
Thermocouple Locations		Max. temperature measured, (°C)	Max. temperature limit, (°C)	
PCB of host		18.6	120	
Plastic enclosure of host (inside)		6.3	cl.30	
Plastic enclosure of host (outside)		4.1	58	
Control panel		5.5	60	
Battery		16.7	20	
Surface of adapter		35.8	58	
Internal wire of host		16.8	T80-25=55	
PCB of docking station		8.8	120	
Internal wire of docking station		10.9	120	
Plastic enclosure of docking station		4.6	cl.30	

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
(inside)			
Plastic enclosure of docking station (outside)	3.5	58	
Test corner	2.0	65	
Supplementary information: N/A			

11.8-2	TABLE: Heating Test (For normal operation status)			P
	Test voltage (V) .....	Battery is full		—
	Ambient (°C) .....	t1: 23.5, t2: 23.7		—
Thermocouple Locations	Max. temperature measured, (°C)	Max. temperature limit, (°C)		
Battery	9.1	20		
Internal wire	9.5	T80-25=55		
PCB	12.1	120		
Plastic enclosure of host (outside)	4.1	58		
Plastic enclosure of host (inside)	4.4	cl.30		
Left side clean motor	22.8	65		
Right side clean motor	21.1	65		
Left walking motor	14.3	65		
Right walking motor	15.2	65		
Dust suction motor	11.1	65		
Middle clean motor	23.1	65		
Air pump	4.0	65		
Control panel	4.1	60		
Test corner	1.5	65		
Supplementary information: N/A				

11.8	TABLE: Heating test, resistance method					N/A
	Test voltage (V) .....					—
	Ambient, t <sub>1</sub> (°C).....					—
	Ambient, t <sub>2</sub> (°C).....					—
Temperature rise of winding	R <sub>1</sub> (Ω)	R <sub>2</sub> (Ω)	ΔT (K)	Max. dT (K)	Insulation class	
Void						
Supplementary information: N/A						

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict

13.2	TABLE: Leakage current		P
	Heating appliances: 1.15 x rated input (W) .....	/	—
	Motor-operated and combined appliances: 1.06 x rated voltage (V) .....	254.4	—
Leakage current between		I (mA)	Max. allowed I (mA)
Any pole of the supply and accessible parts		0.125 peak	0.35 peak
Supplementary information: N/A			

13.3	TABLE: Dielectric Strength		P
Test voltage applied between:		Test potential applied (V)	Breakdown / flashover (Yes/No)
Live part and accessible parts		3000	No
Supplementary information: N/A			

14	TABLE: Transient overvoltages					N/A
Clearance between:	CI (mm)	Required CI (mm)	Rated impulse voltage (V)	Impulse test voltage (V)	Flashover (Yes/No)	
--	--	--	--	--	--	
--	--	--	--	--	--	
Supplementary information: N/A						

16.2	TABLE: Leakage current		P
	Single phase appliances: 1.06 x rated voltage (V) .....	254.4	—
	Three phase appliances 1.06 x rated voltage divided by $\sqrt{3}$ (V) .....	/	—
Leakage current between		I (mA)	Max. allowed I (mA)
Live part and accessible parts		0.062	0.25
Supplementary information: N/A			

16.3	TABLE: Electric strength		P
Test voltage applied between:		Voltage (V)	Breakdown (Yes/No)
Live part and accessible parts		3000	No
Supplementary information: N/A			



IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict

<b>17</b>	<b>TABLE: Overload protection, thermocouple measurements</b>		<b>N/A</b>
Temperature rise of part/at:		dT (K)	Max. dT (K)
--		--	--
Supplementary information: N/A			

<b>17</b>	<b>TABLE: Overload protection, resistance method</b>					<b>N/A</b>
Test voltage (V).....:		--			--	
Ambient, t1 (°C) .....		--			--	
Ambient, t2 (°C) .....		--			--	
Temperature of winding	R1 (Ω)	R2 (Ω)	dT (K)	T (°C)	Max. T (°C)	
--	--	--	--	--	--	
Supplementary information: N/A						

<b>19</b>	<b>Abnormal operation conditions</b>						<b>P</b>
Operational characteristics		YES/NO	Operational conditions				
Are there electronic circuits to control the appliance operation?		YES	--				
Are there “off” or “stand-by” position?		YES	stand-by				
The unintended operation of the appliance results in dangerous malfunction?		NO	N/A				
Sub-clause	Operating conditions description	Test results description	PEC description	EMP 19.11.4	Software type required	19.11.3 PEC	Final result
19.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A
19.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A
19.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A
19.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A
19.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A
19.7	See clause 19.7	No hazard	N/A	N/A	See annex R	N/A	P
19.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A
19.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A
19.10	N/A	N/A	N/A	N/A	N/A	N/A	N/A
19.11.2	See clause 19.11.2	No hazard	N/A	N/A	N/A	N/A	P

IEC 60335-2-2							
Clause	Requirement + Test			Result - Remark			Verdict
19.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A
19.10X	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Supplementary information: N/A							

19.7	TABLE: Abnormal operation, locked rotor/moving parts						P
	Test voltage (V).....:			Battery is full			—
	Ambient, t1 (°C) .....			24.0			—
	Ambient, t2 (°C) .....			24.0			—
Temperature of winding		R1 (Ω)	R2 (Ω)	dT (K)	T (°C)	Max. T (°C)	
--		--	--	--	--	--	
Supplementary information: The Robot vacuum cleaner was not operated when the any one motor was locked.							

19.9	TABLE: Abnormal operation, running overload						N/A
	Test voltage (V).....:			--			—
	Ambient, t1 (°C) .....			--			—
	Ambient, t2 (°C) .....			--			—
Temperature of winding		R1 (Ω)	R2 (Ω)	dT (K)	T (°C)	Max. T (°C)	
--		--	--	--	--	--	
Supplementary information: N/A							

19.13	TABLE: Abnormal operation, temperature rises			N/A
Thermocouple locations		Max. temperature rise measured, Δ T (K)	Max. temperature rise limit, Δ T (K)	
--		--	--	
Supplementary information: N/A				

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict

24.1	TABLE: Components information					P
Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity <sup>1)</sup>	
Adapter	Shenzhen Nalin Elec Tech Company Limited	NLB100150W 1U4S58	INPUT: 100-240V~ 50/60Hz 0.4A Max OUTPUT: 15V 1A	EN61558-1:2005/A1:2019 EN61558-2-16:2009/A1:2013 EN 60335-1:2012 + AC:2014 + A11:2014 + A13:2017 + A1:2019 + A14:2019 + A2:2019+ A15:2021 EN 60335-2-2:2010+A11:2012 +A1:2013	N8A074743 0113+ Test with appliance	
Battery	Shenzhen Ept Battery Co., Ltd.	18650-4400mAh 11.1V	11.1V 2200mAh 3S2P	IEC62133 EN 60335-1:2012 + AC:2014 + A11:2014 + A13:2017 + A1:2019 + A14:2019 + A2:2019+ A15:2021 EN 60335-2-2:2010 + A11:2012 + A1:2013	TUV*+Test with appliance	
Control PCB	KINGBOARD LAMINATES HOLDINGS LTD.	material: FR4,CEM-X,model: KB-XXXX HF-XXX 0.8-1.6mm 94V-0	material: FR4,CEM-X,model: KB-XXXX HF-XXX 0.8-1.6mm 94V-0	EN 60335-1:2012 + AC:2014 + A11:2014 + A13:2017 + A1:2019 + A14:2019 + A2:2019+ A15:2021 EN 60335-2-2:2010+A11:2012 +A1:2013	UL E123995 / Tested with appliance	

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict

24.1	TABLE: Components information					P
Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity <sup>1)</sup>	
Motor for rotary brush	Shenzhen Pureatic Electromechanical Technology Co., Ltd.	PD2847UB-12V0B	Rated Voltage:12V	EN 60335-1:2012 + AC:2014 + A11:2014 + A13:2017 + A1:2019 + A14:2019 + A2:2019+ A15:2021 EN 60335-2-2:2010+A11:2012 +A1:2013	Test with appliance	
Motor for drive wheel	Shenzhen Pureatic Electromechanical Technology Co., Ltd.	PD2815MZ-12V00	Rated Voltage:12V Rated load current:0.21A	EN 60335-1:2012 + AC:2014 + A11:2014 + A13:2017 + A1:2019 + A14:2019 + A2:2019+ A15:2021 EN 60335-2-2:2010+A11:2012 +A1:2013		
Motor for rolling	Shenzhen Pureatic Electromechanical Technology Co., Ltd.	PD2815HZ-12V0B	Rated Voltage:12V Rated load current:0.35A	EN 60335-1:2012 + AC:2014 + A11:2014 + A13:2017 + A1:2019 + A14:2019 + A2:2019+ A15:2021 EN 60335-2-2:2010+A11:2012 +A1:2013	Test with appliance	
Motor for vacuum cleaning function	Shenzhen Pureatic Electromechanical Technology Co., Ltd.	PB6364HB-12V0B	Rated Voltage:12V Rated load current:1.5A	EN 60335-1:2012 + AC:2014 + A11:2014 + A13:2017 + A1:2019 + A14:2019 + A2:2019+ A15:2021 EN 60335-2-2:2010+A11:2012 +A1:2013	Test with appliance	

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict

24.1	TABLE: Components information					P
Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity <sup>1)</sup>	
Air pump	SHENZHEN DEYUXIN DEYUXIN TECHNOLOGY CO.,LTD.	DRB320A-02	Rated Voltage:5V Rated load current:300mA	EN 60335-1:2012 + AC:2014 + A11:2014 + A13:2017 + A1:2019 + A14:2019 + A2:2019+ A15:2021 EN 60335-2- 2:2010+A11:2012 +A1:2013	Test with appliance	
Internal wire	DONGGUAN ZHONGZHENG WIRE & CABLE TECH CO LTD	1007,22# 1007,20# 1061,28# 1061,30# 1571,28# 1571,22#	300V 80°C/30V 80°C	EN 60335-1:2012 + AC:2014 + A11:2014 + A13:2017 + A1:2019 + A14:2019 + A2:2019+ A15:2021 EN 60335-2- 2:2010+A11:2012 +A1:2013	E336285+ Test with appliance	
Charging base internal wire	DONGGUAN AIJIA ELECTRONICS CO.,LTD.	1007,22#, 1061,22#, 1571,22 #	300V 80°C/30V 80°C	EN 60335-1:2012 + AC:2014 + A11:2014 + A13:2017 + A1:2019 + A14:2019 + A2:2019+ A15:2021 EN 60335-2- 2:2010+A11:2012 +A1:2013	E214500+ Test with appliance	
Plastic enclosure	Shenzhen Chuang Rong Technology Co., Ltd.	ABS	ABS 757 HB	EN 60335-1:2012 + AC:2014 + A11:2014 + A13:2017 + A1:2019 + A14:2019 + A2:2019+ A15:2021 EN 60335-2- 2:2010 + A11:2012 + A1:2013	E56070 Test with appliance	

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict

24.1	TABLE: Components information					P
Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity <sup>1)</sup>	
Charging base Plastic enclosure	Shenzhen Chuang Rong Technology Co., Ltd.	ABS	ABS 757 HB, 920 HB	EN 60335-1:2012 + AC:2014 + A11:2014 + A13:2017 + A1:2019 + A14:2019 + A2:2019+ A15:2021 EN 60335-2- 2:2010 + A11:2012 + A1:2013	E56070 Test with appliance	
Charging base PCB	JIANGSU RODA ELECTRON MATERIAL CO LTD	DOCK-VN1	material: FR4,CEM- X,model: KB- XXXX HF-XXX 0.8- 1.6mm 94V-0	EN 60335-1:2012 + AC:2014 + A11:2014 + A13:2017 + A1:2019 + A14:2019 + A2:2019 EN 60335-2- 2:2010+A11:2012 +A1:2013	UL E320689	
Charging base DC inlet	JINBAOLI(HONGK ONG) LIMITED	PA66	PA66, V-0	EN 60335-1:2012 + AC:2014 + A11:2014 + A13:2017 + A1:2019 + A14:2019 + A2:2019+ A15:2021 EN 60335-2- 2:2010 + A11:2012 + A1:2013	Test with appliance	
Supplementary information:						
1) Provided evidence ensures the agreed level of compliance. See OD-CB2039.						

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict

28.1	TABLE: Threaded part torque test			N/A
Threaded part identification	Diameter of thread (mm)	Column number (I, II, or III)	Applied torque (Nm)	
--	--	--	--	
Supplementary information:				

29.1	TABLE: Clearances						P
	Overvoltage category ..... II					—	
		Type of insulation:					
Rated impulse voltage (V):	Min. cl (mm)	Basic (mm)	Supplementary (mm)	Reinforced (mm)	Functional (mm)	Verdict / Remark	
330	0,2* / 0,5 / 0,8**	--	--	--	--	N/A	
500	0,2* / 0,5 / 0,8**	--	--	--	--	N/A	
800	0,2* / 0,5 / 0,8**	--	--	--	--	N/A	
1 500	0,5 / 0,8** / 1,0***	--	--	--	--	N/A	
2 500	1,5 / <u>2,0</u> ***	>2.6	>2.6	--	>2.6	P	
4 000	3,0 / <u>3,5</u> ***	--	--	>4.6	--	P	
6 000	5,5 / 6,0***	--	--	--	--	N/A	
8 000	8,0 / 8,5***	--	--	--	--	N/A	
10 000	11,0 / 11,5***	--	--	--	--	N/A	
Supplementary information:							
*) For tracks on printed circuit boards if pollution degree 1 and 2							
**) For pollution degree 3							
***) If the construction is affected by wear, distortion, movement of the parts or during assembly							

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict

29.2	TABLE: Creepage distances, basic, supplementary and reinforced insulation										P
Working voltage (V)	Creepage distance (mm)							Type of insulation			Verdict
	Pollution degree										
	1	2			3						
		Material group			Material group						
		I	II	IIIa/IIIb	I	II	IIIa/IIIb*)	B**)	S**)	R**)	Verdict
≤50	0,18	0,6	0,85	1,2	1,5	1,7	1,9	—	—	—	N/A
≤50	0,18	0,6	0,85	1,2	1,5	1,7	1,9	—	—	—	N/A
≤50	0,36	1,2	1,7	2,4	3,0	3,4	3,8	—	—	—	N/A
125	0,28	0,75	1,05	1,5	1,9	2,1	2,4	—	—	—	N/A
125	0,28	0,75	1,05	1,5	1,9	2,1	2,4	—	—	—	N/A
125	0,56	1,5	2,1	3,0	3,8	4,2	4,8	—	—	—	N/A
250	0,56	1,25	1,8	<b>2,5</b>	3,2	3,6	4,0	> 3.3	—	—	P
250	0,56	1,25	1,8	<b>2,5</b>	3,2	3,6	4,0	—	> 3.3	—	P
250	1,12	2,5	3,6	<b>5,0</b>	6,4	7,2	8,0	—	—	> 6.5	P
400	1,0	2,0	2,8	4,0	5,0	5,6	6,3	—	—	—	N/A
400	1,0	2,0	2,8	4,0	5,0	5,6	6,3	—	—	—	N/A
400	2,0	4,0	5,6	8,0	10,0	11,2	12,6	—	—	—	N/A
500	1,3	2,5	3,6	5,0	6,3	7,1	8,0	—	—	—	N/A
500	1,3	2,5	3,6	5,0	6,3	7,1	8,0	—	—	—	N/A
500	2,6	5,0	7,2	10,0	12,6	14,2	16,0	—	—	—	N/A
>630 and ≤800	1,8	3,2	4,5	6,3	8,0	9,0	10,0	—	—	—	N/A
>630 and ≤800	1,8	3,2	4,5	6,3	8,0	9,0	10,0	—	—	—	N/A
>630 and ≤800	3,6	6,4	9,0	12,6	16,0	18,0	20,0	—	—	—	N/A
>800 and ≤1000	2,4	4,0	5,6	8,0	10,0	11,0	12,5	—	—	—	N/A
>800 and ≤1000	2,4	4,0	5,6	8,0	10,0	11,0	12,5	—	—	—	N/A
>800 and ≤1000	4,8	8,0	11,2	16,0	20,0	22,0	25,0	—	—	—	N/A
>1000 and ≤1250	3,2	5,0	7,1	10,0	12,5	14,0	16,0	—	—	—	N/A
>1000 and ≤1250	3,2	5,0	7,1	10,0	12,5	14,0	16,0	—	—	—	N/A
>1000 and ≤1250	6,4	10,0	14,2	20,0	25,0	28,0	32,0	—	—	—	N/A



IEC 60335-2-2											
Clause	Requirement + Test							Result - Remark			Verdict
>1250 and ≤1600	4,2	6,3	9,0	12,5	16,0	18,0	20,0		—	—	N/A
>1250 and ≤1600	4,2	6,3	9,0	12,5	16,0	18,0	20,0	—		—	N/A
>1250 and ≤1600	8,4	12,6	18,0	25,0	32,0	36,0	40,0	—	—		N/A
>1600 and ≤2000	5,6	8,0	11,0	16,0	20,0	22,0	25,0		—	—	N/A
>1600 and ≤2000	5,6	8,0	11,0	16,0	20,0	22,0	25,0	—		—	N/A
>1600 and ≤2000	11,2	16,0	22,0	32,0	40,0	44,0	50,0	—	—		N/A
>2000 and ≤2500	7,5	10,0	14,0	20,0	25,0	28,0	32,0		—	—	N/A
>2000 and ≤2500	7,5	10,0	14,0	20,0	25,0	28,0	32,0	—		—	N/A
>2000 and ≤2500	15,0	20,0	28,0	40,0	50,0	56,0	64,0	—	—		N/A
>2500 and ≤3200	10,0	12,5	18,0	25,0	32,0	36,0	40,0		—	—	N/A
>2500 and ≤3200	10,0	12,5	18,0	25,0	32,0	36,0	40,0	—		—	N/A
>2500 and ≤3200	20,0	25,0	36,0	50,0	64,0	72,0	80,0	—	—		N/A
>3200 and ≤4000	12,5	16,0	22,0	32,0	40,0	45,0	50,0		—	—	N/A
>3200 and ≤4000	12,5	16,0	22,0	32,0	40,0	45,0	50,0	—		—	N/A
>3200 and ≤4000	25,0	32,0	44,0	64,0	80,0	90,0	100,0	—	—		N/A
>4000 and ≤5000	16,0	20,0	28,0	40,0	50,0	56,0	63,0		—	—	N/A
>4000 and ≤5000	16,0	20,0	28,0	40,0	50,0	56,0	63,0	—		—	N/A
>4000 and ≤5000	32,0	40,0	56,0	80,0	100,0	112,0	126,0	—	—		N/A
>5000 and ≤6300	20,0	25,0	36,0	50,0	63,0	71,0	80,0		—	—	N/A
>5000 and ≤6300	20,0	25,0	36,0	50,0	63,0	71,0	80,0	—		—	N/A
>5000 and ≤6300	40,0	50,0	72,0	100,0	126,0	142,0	160,0	—	—		N/A
>6300 and ≤8000	25,0	32,0	45,0	63,0	80,0	90,0	100,0		—	—	N/A
>6300 and ≤8000	25,0	32,0	45,0	63,0	80,0	90,0	100,0	—		—	N/A
>6300 and ≤8000	50,0	64,0	90,0	126,0	160,0	180,0	200,0	—	—		N/A
>8000 and ≤10000	32,0	40,0	56,0	80,0	100,0	110,0	125,0		—	—	N/A
>8000 and ≤10000	32,0	40,0	56,0	80,0	100,0	110,0	125,0	—		—	N/A
>8000 and ≤10000	64,0	80,0	112,0	160,0	200,0	220,0	250,0	—	—		N/A
>10000 and ≤12500	40,0	50,0	71,0	100,0	125,0	140,0	160,0		—	—	N/A
>10000 and ≤12500	40,0	50,0	71,0	100,0	125,0	140,0	160,0	—		—	N/A
>10000 and ≤12500	80,0	100,0	142,0	200,0	250,0	280,0	320,0	—	—		N/A
Supplementary information:											
*) Material group IIIb is allowed if the working voltage does not exceed 50 V											
**) B = Basic insulation, S = Supplementary insulation, R = Reinforced insulation											

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict

29.2	TABLE: Creepage distances, functional insulation							P
Working voltage (V)	Creepage distance (mm) Pollution degree							Verdict / Remark
	1	2			3			
	Material group			Material group				
	I	II	IIIa/IIIb	I	II	IIIa/IIIb*)		
≤10	0,08	0,4	0,4	0,4	1,0	1,0	1,0	N/A
50	0,16	0,56	0,8	1,0	1,4	1,6	1,8	N/A
125	0,25	0,71	1,0	1,4	1,8	2,0	2,2	N/A
250	0,42	1,0	1,4	<b>2,0</b>	2,5	2,8	3,2	P(>2.6)
400	0,75	1,6	2,2	3,2	4,0	4,5	5,0	N/A
500	1,0	2,0	2,8	4,0	5,0	5,6	6,3	N/A
>630 and ≤800	1,8	3,2	4,5	6,3	8,0	9,0	10,0	N/A
>800 and ≤1000	2,4	4,0	5,6	8,0	10,0	11,0	12,5	N/A
>1000 and ≤1250	3,2	5,0	7,1	10,0	12,5	14,0	16,0	N/A
>1250 and ≤1600	4,2	6,3	9,0	12,5	16,0	18,0	20,0	N/A
>1600 and ≤2000	5,6	8,0	11,0	16,0	20,0	22,0	25,0	N/A
>2000 and ≤2500	7,5	10,0	14,0	20,0	25,0	28,0	32,0	N/A
>2500 and ≤3200	10,0	12,5	18,0	25,0	32,0	36,0	40,0	N/A
>3200 and ≤4000	12,5	16,0	22,0	32,0	40,0	45,0	50,0	N/A
>4000 and ≤5000	16,0	20,0	28,0	40,0	50,0	56,0	63,0	N/A
>5000 and ≤6300	20,0	25,0	36,0	50,0	63,0	71,0	80,0	N/A
>6300 and ≤8000	25,0	32,0	45,0	63,0	80,0	90,0	100,0	N/A
>8000 and ≤10000	32,0	40,0	56,0	80,0	100,0	110,0	125,0	N/A
>10000 and ≤12500	40,0	50,0	71,0	100,0	125,0	140,0	160,0	N/A

Supplementary information:  
\*) Material group IIIb is allowed if the working voltage does not exceed 50 V

IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict

<b>30.1</b>	<b>TABLE: Ball Pressure Test of Thermoplastics</b>			<b>P</b>
Allowed impression diameter (mm) ..... :				2.0
<b>Object/ Part No./ Material</b>		<b>Manufacturer/ trademark</b>	<b>Test temperature (°C)</b>	<b>Impression diameter (mm)</b>
Plastic enclosure		See table 24.1	75	0.7
Charging base Plastic enclosure		See table 24.1	75	0.6
Charging base DC inlet		See table 24.1	75	0.7
Supplementary information: N/A				

<b>30.2</b>	<b>TABLE: Resistance to heat and fire - Glow wire tests</b>							<b>P</b>
Object/ Part No./ Material	Manufacturer / trademark	Glow wire test (GWT); (°C)						Verdict
		550	650		750		850	
			te	ti	te	ti		
Plastic enclosure	See table 24.1	P	N/A	N/A	N/A	N/A	N/A	P
Charging base Plastic enclosure	See table 24.1	P	N/A	N/A	N/A	N/A	N/A	P
Charging base DC inlet	See table 24.1	N/A	N/A	N/A	P	P	P	P
Object/ Part No./ Material	Manufacturer / trademark	Glow-wire flammability index (GWFI), °C				GW ignition temp. (GWIT), °C		Verdict
		550	650	750	850	675	775	
--	--	--	--	--	--	--	--	N/A
--	--	--	--	--	--	--	--	N/A
--	--	--	--	--	--	--	--	N/A
The test specimen passed the glow wire test (GWT) with no ignition [(te – ti) ≤ 2s] (Yes/No):								Yes
If no, then surrounding parts passed the needle-flame test of annex E (Yes/No)..... :								No
The test specimen passed the test by virtue of most of the flaming material being withdrawn with the glow-wire (Yes/No)? .....								Yes
Ignition of the specified layer placed underneath the test specimen (Yes/No)..... :								No
Supplementary information:								
- 550 °C GWT not relevant (or applicable) to parts of material classified at least HB40 or if relevant HBF								
- The GWIT pre-selection option, the 850 °C GWFI pre-selection option, and the 850 °C GWT are not relevant (or applicable) for attended appliances								



IEC 60335-2-2			
Clause	Requirement + Test	Result - Remark	Verdict

30.2/30.2.4 TABLE: Needle- flame test (NFT)					P
Object/ Part No./ Material	Manufacturer/ trademark	Duration of application of test flame (ta); (s)	Ignition of specified layer Yes/No	Duration of burning (tb) (s)	Verdict
Control PCB	See table 24.1	30	No	0	P
Charging base PCB	See table 24.1	30	No	0	P

Supplementary information:

- NFT not relevant (or applicable) for Parts of material classified as V-0 or V-1
- NFT not relevant (or applicable) for Base material of PCBs classified as V-0 or if relevant VTM-0

--- End of report ---



IEC60335_2_2N ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
<b>ATTACHMENT TO TEST REPORT</b> <b>IEC 60335-2-2</b> <b>EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES</b> Household and similar electrical appliances – Safety – Part 2-2: Particular requirements for vacuum cleaners and water-suction cleaning appliances			
<b>Differences according to .....</b> : EN 60335-2-2:2010 + A11:2012 + A1:2013 used in conjunction with EN 60335 1:2012 + AC:2014 + A11:2014 + A13:2017 + A1:2019 + A14:2019 + A2:2019 + A15:2021 EN 62233:2008 + AC:2008			
<b>TRF template used.....</b> : IEC EE OD-2020-F2:2020, Ed. 1.1			
<b>Attachment Form No. ....</b> : EU_GD_IEC60335_2_2N			
<b>Attachment Originator.....</b> : Nemko Group AS			
<b>Master Attachment.....</b> : 2022-04-08			
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<b>CENELEC COMMON MODIFICATIONS (EN)</b>			—
6.1	Delete “class 0” and “class 01”		N/A
7.1	Single-phase appliances to be connected to the supply mains: 230 V covered		P
	Multi-phase appliances to be connected to the supply mains: 400 V covered		N/A
7.12	Instructions for use are provided with the appliance so that the appliance can be used safely.		P
	It is necessary to take precautions during user maintenance, appropriate details are given.		P
	The instructions include the substance of the following:		—
	- this appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved		P
	- children shall not play with the appliance		P
	- cleaning and user maintenance shall not be made by children without supervision		P



# Attachment 1

IEC60335_2_2N ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	If a vacuum cleaner can be equipped with a hand-held accessory with rotating parts a warning is given concerning entrapment.		N/A
	The instructions for appliances having a current-carrying hose operating at other than safety extra low voltage include the substance of the following:		N/A
	CAUTION: This hose contains electrical connections:		N/A
	– do not use to suck up water (for vacuum cleaners only);		N/A
	– do not immerse in water for cleaning;		N/A
	– the hose should be checked regularly and must not be used if damaged		N/A
	The instructions for appliances having a part of class III construction supplied from a detachable power supply unit state that the appliance is only to be used with the power supply unit provided with the appliance		P
	The instructions for class III appliances state that it must only be supplied at safety extra low voltage corresponding to the marking on the appliance		P
	This instruction is not necessary for battery operated appliances if the battery is a primary battery or secondary battery charged outside of the appliance		N/A
	The instructions for vacuum cleaners incorporating rotating brushes or similar devices, and water-suction cleaning appliances, state that the plug must be removed from the socket-outlet before cleaning or maintaining the appliance		P
	If symbol 5935 of IEC 60417 is used, its meaning is explained		N/A
8.1.1	Also test probe 18 of EN 61032 is applied		P
	The appliance being in every possible position during the test, except that		P
	appliances normally used on the floor and having a mass exceeding 40 kg are not tilted		P
	The force on the probe in the straight position is increased to 10 N when probe 18 is used		P
	When using test probe 18 the appliance is fully assembled as in normal use without any parts removed, and		P



# Attachment 1

IEC60335_2_2N ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	parts intended to be removed for user maintenance are also not removed		P
8.1.3	Instead of test probe B, test probe 18 and test probe 13, for appliances other than those of class II, test probe 41 of IEC 61032 is applied with a force not exceeding 1 N to live parts of visibly glowing heating elements, all poles of which can be disconnected by a single switching action		N/A
8.2	Compliance is checked by inspection and by applying the test probes of EN 61032 in accordance with the conditions specified in 8.1.1		P
	Test probe B and probe 18 of EN 61032 are applied to built-in appliances and fixed appliances only after installation		P
11.8	During the test, the temperature rises are monitored continuously and do not exceed the values shown in Table 3 and Table Z101		P
15.1.2	Appliances with an automatic cord reel tested with the cord in the most unfavourable position so that the reeling of the wet cord may affect electrical insulation during operation, the cord not being dried before reeling		N/A
20.2	For appliances having hazardous moving parts, due to their working function, e.g. the needle of a sewing machine, tools of kitchen machines or the blade of an electrical knife, full protection is not possible for performing their intended use		P
	When using a test probe similar to test probe B of EN 61032, having a circular stop face and applied with a force of 5N, the accessories and detachable covers are removed		P
	When using test probe 18 it is applied with a force of 2,5N on the appliance fully assembled		N/A
20.Z101	Driven parts of an appliance do not become accessible if the appliance is switched on by overturning		N/A
	Hazardous moving parts are not accessible according to 20.2		N/A
20.Z102	Inadvertent access to hazardous rotating brushes and similar devices during normal operation is prevented, so far as is reasonably practicable		N/A
	The probe does not touch rotating parts		N/A



# Attachment 1

IEC60335_2_2N ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
21.1	The appliance is rigidly supported and three blows, having an impact energy of 1,0 J, are applied to every point of the enclosure that is likely to be weak		P
21.Z101	Hand-held appliances are subjected to the described drop test		N/A
	The appliance is not damaged to such an extent that compliance with this European Standard is impaired		N/A
	The appliance does not emit flames or molten metal and the requirements of Clauses 8 and 29 are fulfilled		N/A
22.12	Other parts intended to be detached during use, maintenance or cleaning (e.g. batteries, battery covers, lids, attachments, steam nozzles) are not considered as parts providing a similar function as handles, knobs, grips, levers		N/A
22.17	The requirement is not applicable to built-in appliances		N/A
22.44	An appliance is child-appealing if one of the following criteria is present:		—
	- appliance decorated using faces, cartoon like characters, or similar images		N/A
	- appliance using shapes representing animals, characters, persons or scale models		N/A
	An appliance is child-appealing if more than one of the following criteria are present:		—
	- using non-functional light (functional light is e.g. illumination of an object or area, signal indicating status of an appliance)		N/A
	- using non-functional sound (e.g. music)		N/A
	- using non-functional movement		N/A
	If the appliance is child-appealing, has a mass less than 4 kg or is mounted or normally intended for use at a height less than 850 mm, the following conditions are met:		—
	- surface temperature rise requirements not exceeded		N/A
	- hazardous moving parts not accessible		N/A
	- live parts not accessible		N/A
	- liquid temperature requirement not exceeded,		N/A
	unless for vessels in which two independent and sequential actions are needed to access the liquid		N/A





# Attachment 1

IEC60335_2_2N ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	- the requirement of 22.12 is applicable for all accessible parts of the appliance		N/A
22.Z101	Hinged handles of vacuum cleaners intended to be free standing require a specific action to operate them, such as a lever, the handle release mechanism or similar		N/A
22.Z102	Supply cords of appliances not damaged by the appliance running over them		N/A
	The functional openings of power rotating brushes, driven by the main suction motor, do not exceed 120 mm along the major dimension of the opening		N/A
	Measured (mm).....:		N/A
24.1	Components comply with the safety requirements specified in the relevant EN standards as far as they reasonably apply		P
	Motors are not required to comply with EN 60034-1, but tested as part of the appliance according to this standard		P
	Relays are tested as part of the appliance according to this standard		N/A
	Relays may be alternatively tested to EN 60730-1 and the additional requirements in EN 60335-1		P
	The requirements of Clause 29 of this standard apply between live parts of components and accessible parts of the appliance		P
	Components may comply with the requirements for clearances and creepage distances for functional insulation as specified in the relevant component standard		P
	The requirements of 30.2 of this standard apply to parts of non-metallic material in components including parts of non-metallic material supporting current-carrying connections inside components		P
	Components that have not been tested and shown to comply with the EN standard for the relevant component are tested according to the requirements of 30.2 of this standard		P
	Components that have been tested and shown to comply with the resistance to fire requirements in the EN standard for the relevant component need not be retested provided that:		—
	- the severity specified in the component standard is not less than the severity specified in 30.2, and		N/A



# Attachment 1

IEC60335_2_2N ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	- the test report for the component states the values of $t_e$ and $t_i$ acc. to EN 60695-2-11		N/A
	If the above two conditions are not satisfied, the component is tested as part of the appliance		P
	Power electronic converter circuits are not required to comply with EN 62477-1, but tested as part of the appliance according to this standard		N/A
	Unless components have been tested and found to comply with the relevant EN standard for the number of cycles specified, they are tested in accordance with 24.1.1 to 24.1.9		P
	For components mentioned in 24.1.1 to 24.1.9, no additional tests specified in the relevant EN standard for the component are necessary other than those specified in 24.1.1 to 24.1.9		N/A
	Components that have not been tested and found to comply with the relevant EN standard, and		N/A
	components that are not marked or not used in accordance with their marking,		N/A
	are tested in accordance with the conditions occurring in the appliance, the number of samples being that required by the relevant standard		N/A
	Lamp-holders and starter-holders that have not been tested and found to comply with the relevant EN standard are tested as a part of the appliance and additionally comply with the gauging and interchangeability requirements of the relevant EN standard under the conditions occurring in the appliance		N/A
	Where the relevant EN standard specifies these gauging and interchangeability requirements at elevated temperatures, the temperatures measured during the tests of Clause 11 are used		N/A
	There are no additional tests specified for nationally standardized plugs such as those detailed in IEC/TR 60083 or connectors complying with the standard sheets of EN 60320-1 and EN 60309, unless they are specifically mentioned in the text of this standard		P
	Plugs and socket-outlets and other connecting devices of interconnection cords are not interchangeable with plugs and socket-outlets listed in IEC/TR 60083 or IEC 60906-1, or		N/A
	with connectors and appliance inlets complying with the standard sheets of EN 60320-1, if		N/A



# Attachment 1

IEC60335_2_2N ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	direct supply to these parts from the supply mains gives rise to a hazard		N/A
	For plugs used in CENELEC countries Annex ZH applies		P
24.Z1	Type S2 and S3 capacitors according to EN 60252-1 are not required to undergo the testing as required by 30.2.2 and 30.2.3.1		N/A
25.1	Plugs and pins for insertion into socket outlets follow the relevant standards sheets in Annex ZH		P
25.7	Rubber sheathed cords (60245 IEC 53) are not suitable for appliances intended to be used outdoors, or		N/A
	when they are liable to be exposed to significant amount of ultraviolet radiation		N/A
25.25	Instead of IEC/TR 60083, dimensions of the pins and engagement face of plugs of appliances that are inserted into socket-outlets are in accordance with the dimensions of the relevant plug standard		P
	Common plugs and socket-outlets types in CENELEC countries as shown in Annex ZH		P
26.11	Conductors connected by soldering are not considered to be positioned or fixed so that reliance is not placed upon the soldering alone to maintain them in position,		N/A
	unless they are held in place near the terminals independently of the solder		N/A
29.3.Z1	Appliance constructed so that if there is a possibility of damaging the insulation during installation, the insulation withstands the scratch and penetration test of 21.2		P
32	Compliance regarding electromagnetic fields is checked according to EN 62233		P
Annex I, 19.1.101	The appliance is supplied at rated voltage and operated under normal operation with each of the fault conditions specified		N/A
	The duration of any of the tests is as specified in 19.7		N/A
<b>ZA</b>	<b>ANNEX ZA (NORMATIVE) SPECIAL NATIONAL CONDITIONS (EN)</b>		—
	<b>Denmark, Sweden, Norway and Finland</b>		N/A



# Attachment 1

IEC60335_2_2N ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
7.12.8	The maximum inlet water pressure is at least 1,0 MPa .....		N/A
	<b>Norway</b>		N/A
19.5	The test is also applicable to appliances intended to be permanently connected to fixed wiring		N/A
	<b>Norway</b>		N/A
22.2	The second paragraph of this subclause, dealing with single-phase, permanently connected class I appliances having heating elements, is not applicable due to the supply system		N/A
	<b>Denmark</b>		N/A
22.47	The maximum inlet water pressure is at least 1,0 MPa .....		N/A
	<b>Ireland, United Kingdom and Cyprus</b>		N/A
25.8	In the table, the line >10 A and ≤16 A is replaced with:		—
	> 10 and ≤ 13 1,25 (1,0) <sup>b</sup>		N/A
	> 13 and ≤ 16 1,5 (1,0) <sup>b</sup>		N/A
<b>ZB</b>	<b>ANNEX ZB (INFORMATIVE) A-DEVIATIONS</b>		—
	<b>Ireland</b>		N/A
25.1 and 25.25	These regulations apply to all plugs for domestic use at a voltage of not less than 200 V and in general allow only plugs complying with I.S. 401:1997, or equivalent, to be fitted to domestic appliances		N/A
	<b>United Kingdom</b>		N/A
25.1 and 25.25	These regulations apply to all plugs for domestic use at a voltage of not less than 200 V and in general allow only plugs to BS 1363 to be fitted to domestic appliances.		N/A



**Attachment 1**

IEC60335_2_2N ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	It also allows plugs to BS 4573 and EN 50075 to be fitted to shavers and toothbrushes		N/A
<b>ZC</b>	<b>ANNEX ZC (NORMATIVE) NORMATIVE REFERENCES TO INTERNATIONAL PUBLICATIONS WITH THEIR CORRESPONDING EUROPEAN PUBLICATIONS</b>		—
	A list of documents referred to in the text of this standard in such a way that some or all of their content constitutes requirements of this document		P
<b>ZD</b>	<b>ANNEX ZD (INFORMATIVE) IEC and CENELEC CODE DESIGNATIONS FOR FLEXIBLE CORDS</b>		—
	List of IEC and CENELEC code designations for flexible cords		P
<b>ZE</b>	<b>ANNEX ZE (INFORMATIVE) SPECIFIC ADDITIONAL REQUIREMENTS FOR APPLIANCES AND MACHINES INTENDED FOR COMMERCIAL USE</b>		—
7.1	Business name and full address of the manufacturer and, where applicable, his authorized representative .....		N/A
	Model or type reference .....		N/A
	Serial number, if any		N/A
	Production year		N/A
	Designation of the appliance.....		N/A
7.12	Instructions provided with the appliance so that the appliance can be used safely		N/A
	The instructions contain at least the following information:		—
	- the business name and full address of the manufacturer and, where applicable, his authorized representative		N/A
	- model or type reference of the appliance as marked on the appliance itself, except for the serial number		N/A
	- the designation of the appliance together with its explanation in case it is given by a combination of letters and/or numbers		N/A
	- the general description of the appliance, when needed due to the complexity of the appliance		N/A



# Attachment 1

IEC60335_2_2N ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	- specific precautions required during installation, operation, adjusting, user maintenance, cleaning, repairing or moving		N/A
	- when needed drawings, diagrams, descriptions and explanations necessary for the safe use and user maintenance of the appliance		N/A
	- the possible reasonably foreseeable misuse and, whenever relevant, a warning against the effects it may have on the safe use of the appliance		N/A
	The words "Original instructions" appear on the language version(s) verified by the manufacturer or by the authorized representative		N/A
	When a translation of the original instructions has been provided by a person introducing the appliance on the market; the meaning of the sentence "Translation of the original instructions" appear in the relevant instructions delivered with the appliance		N/A
	The instructions for maintenance/service to be done by specialized personnel, mandated by the manufacturer or the authorized representative may be supplied in only one Community language which the specialized personnel understand		N/A
	The instructions indicate the type and frequency of inspections and maintenance required for safe operation including the preventive maintenance measures		N/A
7.12.ZE1	If needed for specific appliances, the following information to be given:		—
	- on use, transportation, assembly, dismantling when out of service, testing or foreseeable breakdowns, if these operations have consequences on stability of the appliance in order to avoid overturning, falling or uncontrolled movements of the appliance or of its component parts		N/A
	- on how to maintain adequate mechanical stability when in use, during transportation, assembly, dismantling, scrapping and any other action involving the appliance		N/A
	- on the protective measures to be taken by the user, including, where appropriate, the personal protective equipment to be provided		N/A
	- on the operating method to be followed in the event of accident or breakdown; if a blockage is likely to occur the operating method to safely unblock the appliance		N/A



**Attachment 1**

IEC60335_2_2N ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	- on the specifications on the spare parts to be used, when these affect the health and safety of the operator		N/A
	- on airborne noise emissions, determined and declared in accordance with the relevant Part 2, which includes:		—
	- the A-weighted emission sound pressure level at workstations, where this exceeds 70 dB(A).....;		N/A
	- where this level does not exceed 70 dB(A), this fact is indicated		N/A
	- the peak C-weighted instantaneous sound pressure value at workstations, where this exceeds 63 Pa (130 dB in relation to 20 µPa) .....		N/A
	- the A-weighted sound power level emitted by the machinery, where the A-weighted emission sound pressure level at workstations exceeds 80 dB(A) .....		N/A
7.12.ZE2	The instructions include a warning to disconnect the appliance from its power source during service and when replacing parts		N/A
	If the removal of the plug is foreseen, it is clearly indicated that the removal of the plug is such that an operator can check from any of the points to which he has access that the plug remains removed		N/A
	If this is not possible, due to the construction of the appliance or its installation, a disconnection with a locking system in the isolated position is provided		N/A
19.11.4.8	The appliance continues to operate, without causing any hazard to the user, from the same point in its operating cycle at which the voltage fluctuation occurred, or		N/A
	a manual operation is required to restart it		N/A
20.1	Appliances and their components and fittings have adequate mechanical stability during transportation, assembly, dismantling and any other action involving the appliance		N/A
20.2	Dangerous moving transmission parts safeguarded either by design or guards		N/A
	When guards are used, they are fixed guards, interlocking movable guards or protective devices		N/A
	Moving parts directly involved in the function of the appliance which cannot be made completely inaccessible fitted with:		—



# Attachment 1

IEC60335_2_2N ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	- fixed guards or interlocking movable guards preventing access to those sections of the parts that are not used in the work, and		N/A
	- adjustable guards restricting access to those sections of the moving parts where access is necessary		N/A
	Interlocking movable guards used where frequent access is required		N/A
21.1	Appliances and their components and fittings have adequate mechanical strength and is constructed to withstand such rough handling that may be expected in normal use, during transportation, assembly, dismantling, scrapping and any other action involving the appliance		N/A
22.ZE.1	For appliances provided with a seat, the seat gives adequate stability		N/A
	The distance between the seat and the control devices capable of being adapted to the operator		N/A
22.ZE.2	For appliances provided with separate devices for the start and the stop functions, the stop function is unambiguously identifiable and does always override the start function		N/A
	For appliances provided with one device performing the start and the stop function, the stop function is unambiguously identifiable and does always override the start function		N/A
22.ZE.3	Appliances designed in such a way that incorrect mounting is avoided, if this can lead to an unsafe situation		N/A
	If this is not possible, information on the correct mounting is given directly on the part and/or the enclosure		N/A
22.ZE.4	Where the weight, size or shape prevents appliances from being moved manually, they are fitted with attachments for lifting gear, or		N/A
	so designed that they can be fitted with such attachments, or		N/A
	be shaped in such a way that standard lifting gear can easily be used		N/A
	Appliances to be moved manually are constructed or equipped so that they can be moved easily and safely		N/A





**Attachment 1**

IEC60335_2_2N ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
22.ZE.5	The fixing systems of fixed guards which prevent access to dangerous moving transmission parts only removable with the use of tools		N/A
	If such guards have to be removed by the user for routine cleaning or maintenance their fixing systems remain attached to the fixed guards or to the machine after removal		N/A
	Where possible, guards are incapable of remaining in place without their fixings		N/A
	This does not apply if, after removal of the screws, or if the component is incorrectly repositioned, the appliance becomes inoperative		N/A
	Movable guards are interlocked		N/A
	The interlocking devices prevent the start of hazardous appliance functions until the guards are fixed in their position, and give a stop command whenever they are no longer closed		N/A
	Where it is possible for an operator to reach the danger zone before the risk due to hazardous appliance functions has ceased, movable guards associated with a guard locking device in addition to an interlocking device that:		—
	- prevents the start of hazardous appliance functions until the guard is closed and locked, and		N/A
	- keeps the guard closed and locked until the risk of injury from the hazardous appliance functions has ceased		N/A
	Interlocking movable guards remain attached to the appliance when open, and		N/A
	they are designed and constructed in such a way that they can be adjusted only by means of an intentional action		N/A
22.ZE.6	Interlocking movable guards designed in such a way that the absence or failure of one of their components prevents starting or stops the hazardous appliance functions		N/A
	The guard is opened to the extent needed to cause the interlocking to operate and is then closed, the number of operations being defined in the specific Part 2 .....		N/A
	After this test any defect that may be expected in normal use is applied to the interlock system, including interruption of the supply, only one defect being simulated at a time		N/A
	After these tests the interlock system is fit for further use		N/A



**Attachment 1**

IEC60335_2_2N ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
22.ZE.7	Adjustable guards restricting access to areas of the moving parts strictly necessary for the work are:		—
	- adjustable manually or automatically, depending on the type of work involved, and		N/A
	- readily adjustable without the use of tools		N/A
22.ZE.8	In case of interruption, re-establishment after an interruption or fluctuation in whatever manner of the power supply, the appliance does not restart		N/A
	However, automatic restarting of the operation is allowed if the appliance may continue to operate, without causing any hazard to the user, from the same point in its operating cycle at which the voltage interruption or fluctuation occurred		N/A
22.ZE.9	Appliances fitted with means to isolate them from all energy sources		N/A
	Such isolators are clearly identified, and		N/A
	they are capable of being locked if reconnection endanger persons		N/A
	After the energy source is disconnected, it is possible to dissipate any energy remaining or stored in the circuits of the appliance without risk to persons		N/A
<b>ZF</b>	<b>ANNEX ZF (INFORMATIVE) CRITERIA APPLIED FOR THE ALLOCATION OF PRODUCTS COVERED BY STANDARDS IN THE EN 60335 SERIES UNDER LVD OR MD</b>		—
	List of standards under CENELEC/TC61 with the allocation under the LVD (Low Voltage Directive) or the MD (Machinery Directive) .....	LVD	P
<b>ZG</b>	<b>ANNEX ZG (NORMATIVE) UV APPLIANCES</b>		—
	The following modifications to this standard apply to appliances having UV emitters		N/A
	This annex is not applicable to appliances covered by the scopes of IEC 60335-2-27, IEC 60335-2-59 or IEC 60335-2-109		N/A
7.12.ZG	The instructions for appliances incorporating UVC emitters include the substance of the following: <b>WARNING</b> — This appliance contains a UV emitter. Do not stare at the light source		N/A



# Attachment 1

IEC60335_2_2N ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
32	For appliances incorporating UV emitters the manufacturer delivers a declaration providing evidence that the plastic material exposed to the radiation is UV resistant		N/A
<b>ZH</b>	<b>ANNEX ZH (INFORMATIVE) Common plug and socket-outlet types in CENELEC countries</b>		—
	In general, supply cords of single-phase appliances having a rated current not exceeding 16 A are fitted with a plug complying with the following standard sheets:		—
	- for class I appliances or class II appliances with functional earth, standard sheet EU2, EU3 or EU4 .....		N/A
	- for class II appliances, standard sheet EU5, EU6 or EU7 .....	EU6	P
	There are exemptions or differences in certain CENELEC countries		P
<b>ZI</b>	<b>ANNEX ZI (INFORMATIVE) Information on the application of A11:2014 to EN 60335-1:2012 CENELEC CLC/TC 61(SEC)2096A</b>		—
	Clarification of the application of parts 2 in conjunction with the 2002 or 2012 version of EN 60335-1		P
<b>ZZA</b>	<b>ANNEX ZZA (INFORMATIVE) RELATIONSHIP BETWEEN THIS EUROPEAN STANDARD AND THE SAFETY OBJECTIVES OF DIRECTIVE 2014/35/EU [2014 OJ L96] AIMED TO BE COVERED</b>		—
	This standard provides one means of conforming to safety objectives of Directive 2014/35/EU		P
	When cited in the Official Journal under that Directive, compliance with the normative clauses of this standard given in Table ZZA.1 confers a presumption of conformity with the safety objectives of that Directive and associated EFTA regulations		P
	Compliance with this Part 1 when used together with the relevant Part 2 provides one means of conformity with the safety objectives		P
<b>ZZB</b>	<b>ANNEX ZZB (INFORMATIVE) RELATIONSHIP BETWEEN THIS EUROPEAN STANDARD AND THE ESSENTIAL REQUIREMENTS OF DIRECTIVE 2006/42/EC AIMED TO BE COVERED</b>		—



# Attachment 1

IEC60335_2_2N ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	This standard provides one means of conforming to essential requirements of EU Directive 2006/42/EC		N/A
	When cited in the Official Journal under that Directive, compliance with the normative clauses of this standard given in Table ZZB.1 confers a presumption of conformity with the essential requirements of that Directive and associated EFTA regulations		N/A
	Compliance with this Part 1 when used together with the relevant Part 2 provides one means of conformity with the essential health and safety requirements		N/A
	<b>ANNEX EN 62233:2008 + AC:2008</b> <b>EMF- ELECTROMAGNETICS FIELDS</b>		—
	The tested product also complies with the requirements of EN 62233:2008		—
	Limit .....100%	Measured max. 3.526%	P

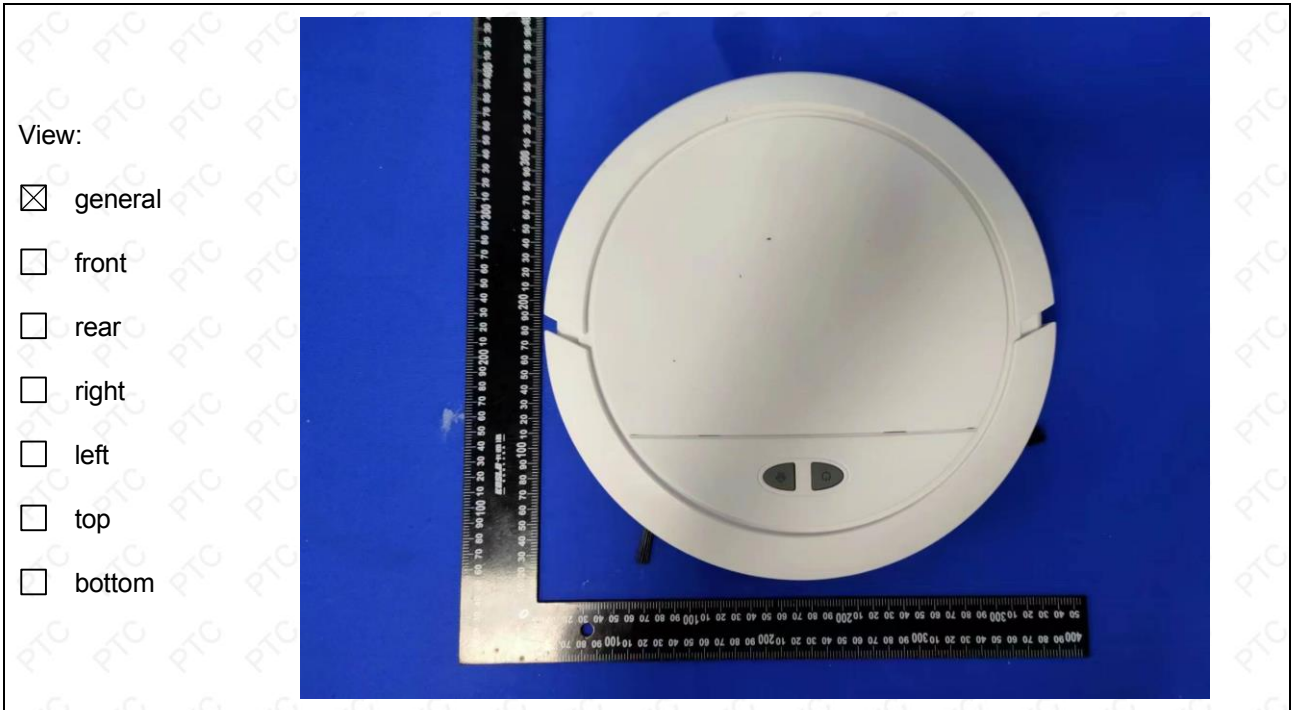
-- End of attachment --

## Attachment 2

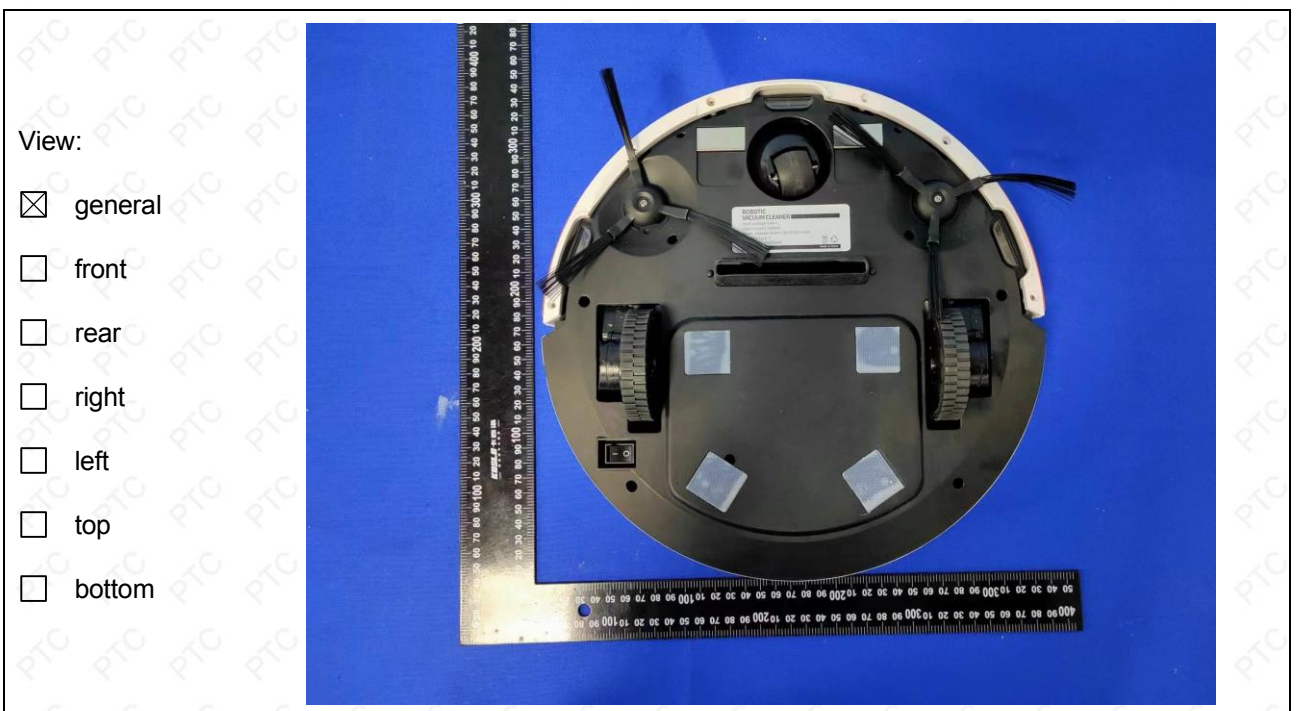
### Photo documentation

Type of equipment, model: Sweeping robot, OB16, OB16Pro, OB8S, OB8S MAX, OB11, OB11Pro, OB10

Details of: General view

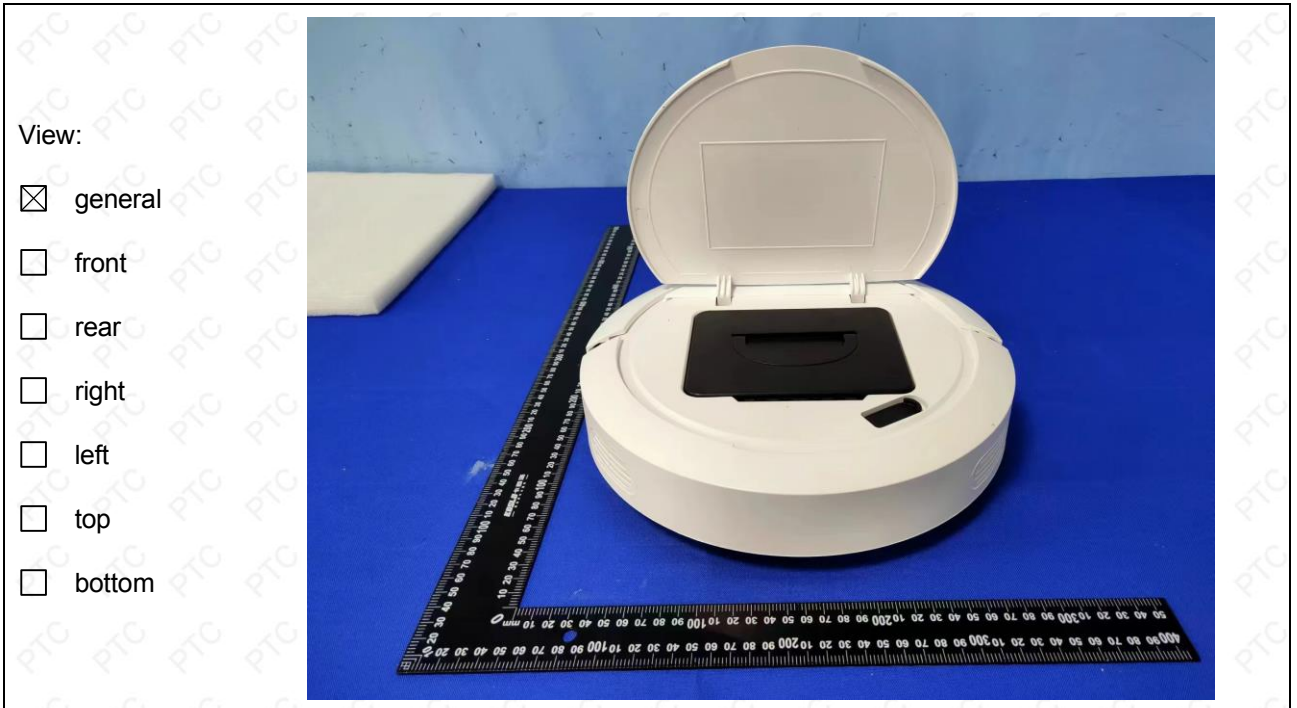


Details of: General view

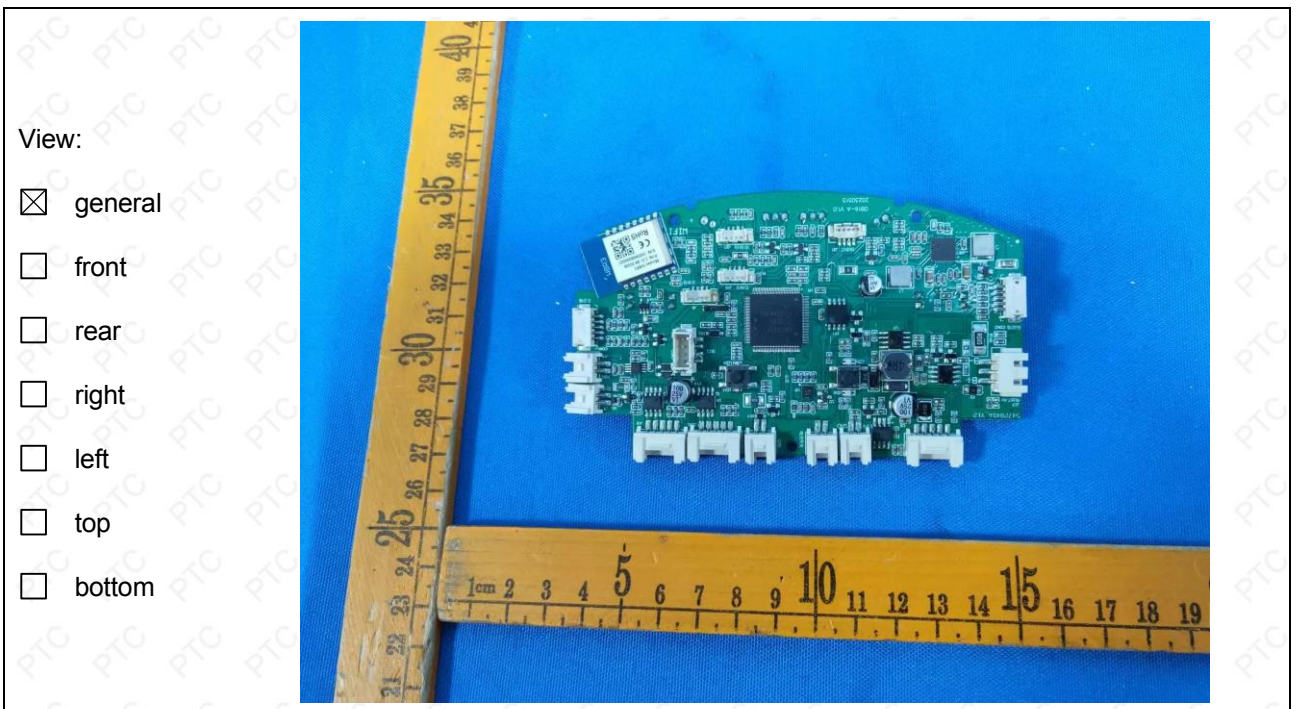


## Attachment 2

Details of: General view

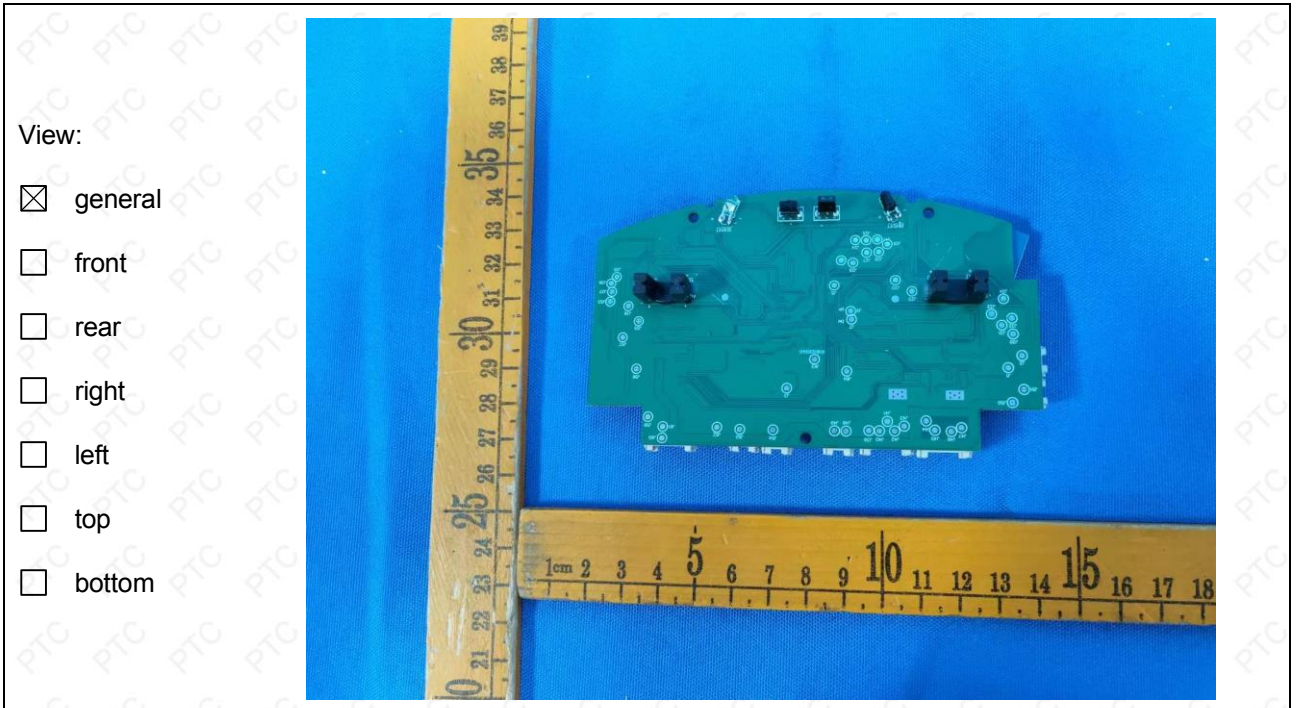


Details of: Internal view

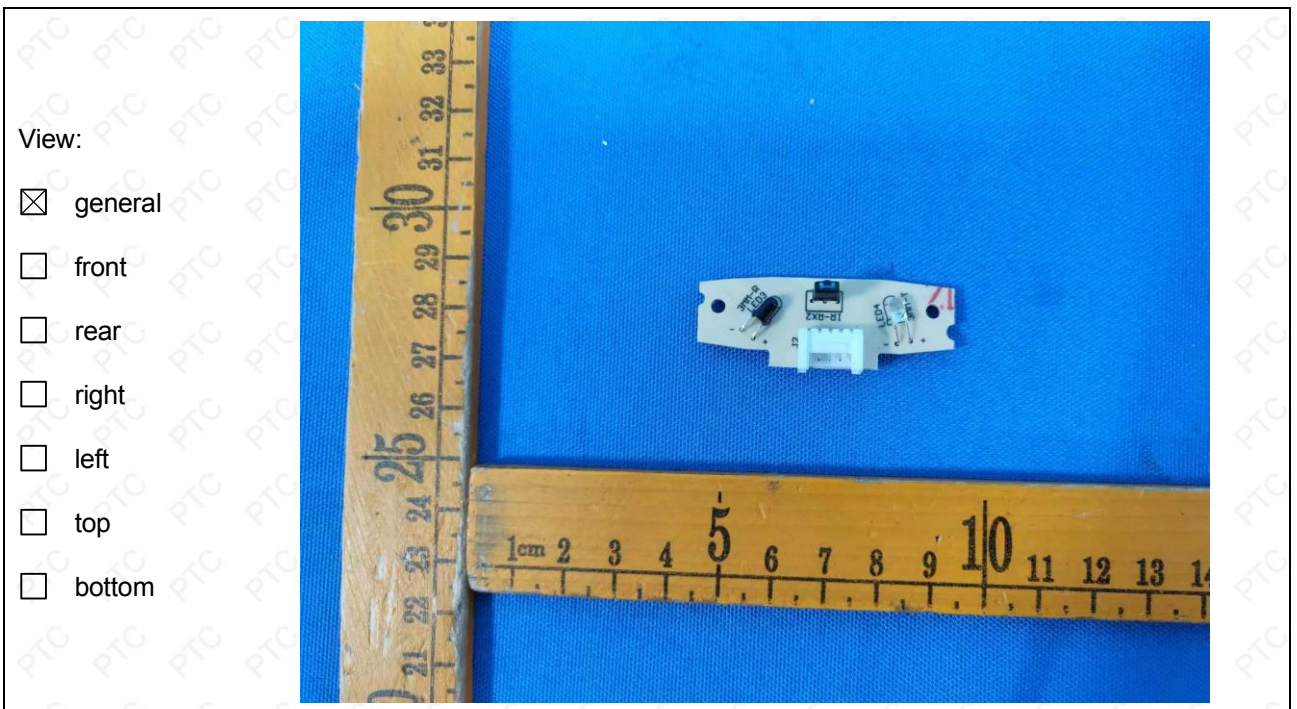


## Attachment 2

Details of: Internal view

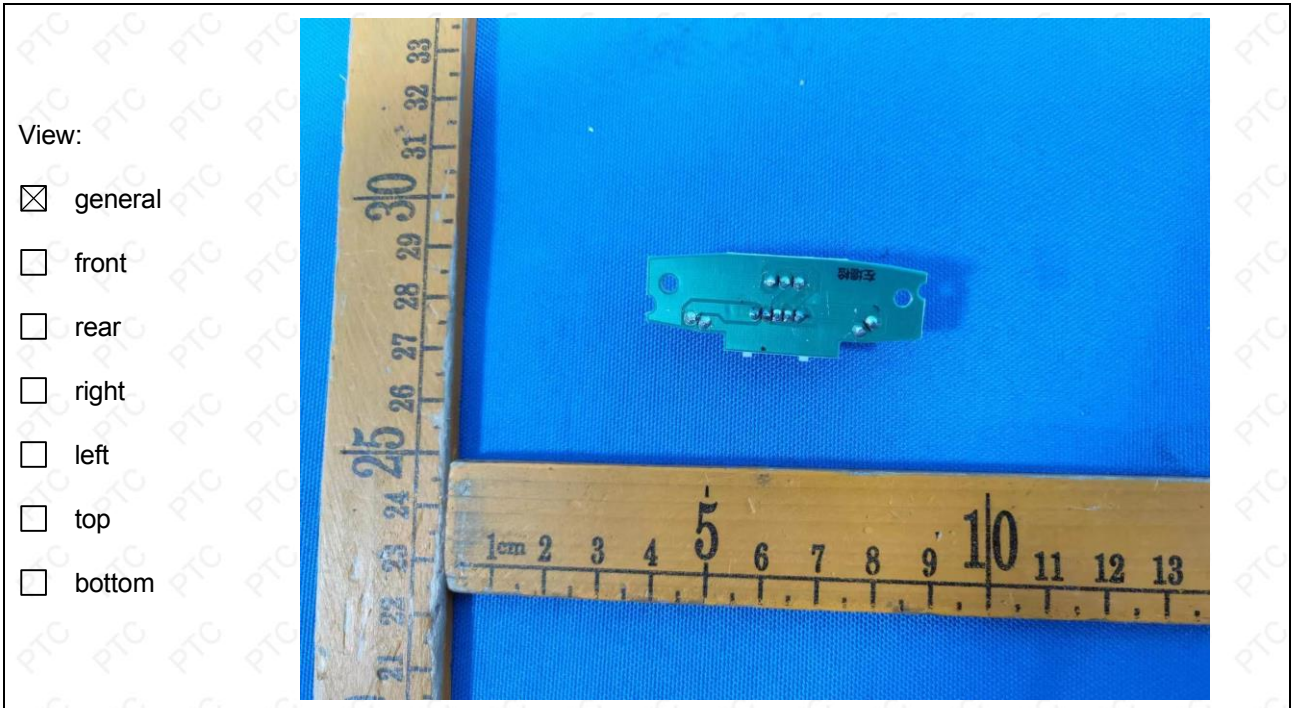


Details of: Internal view

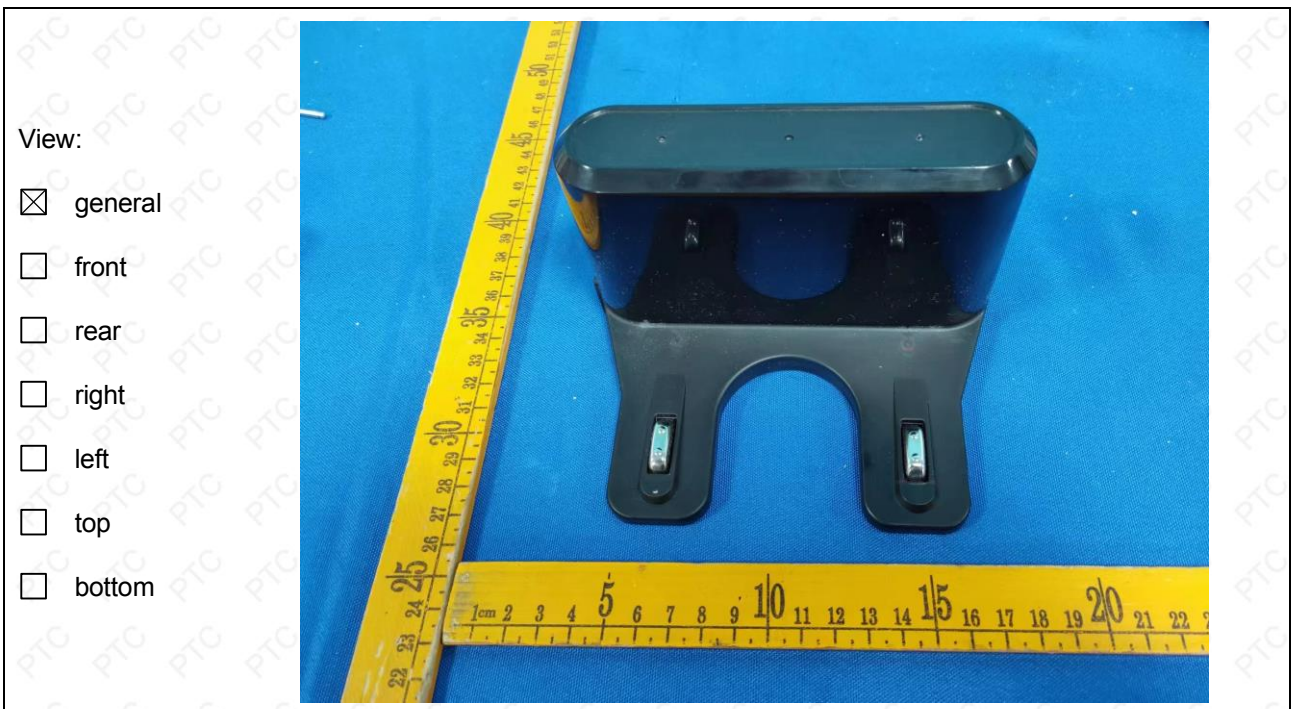


## Attachment 2

Details of: Internal view



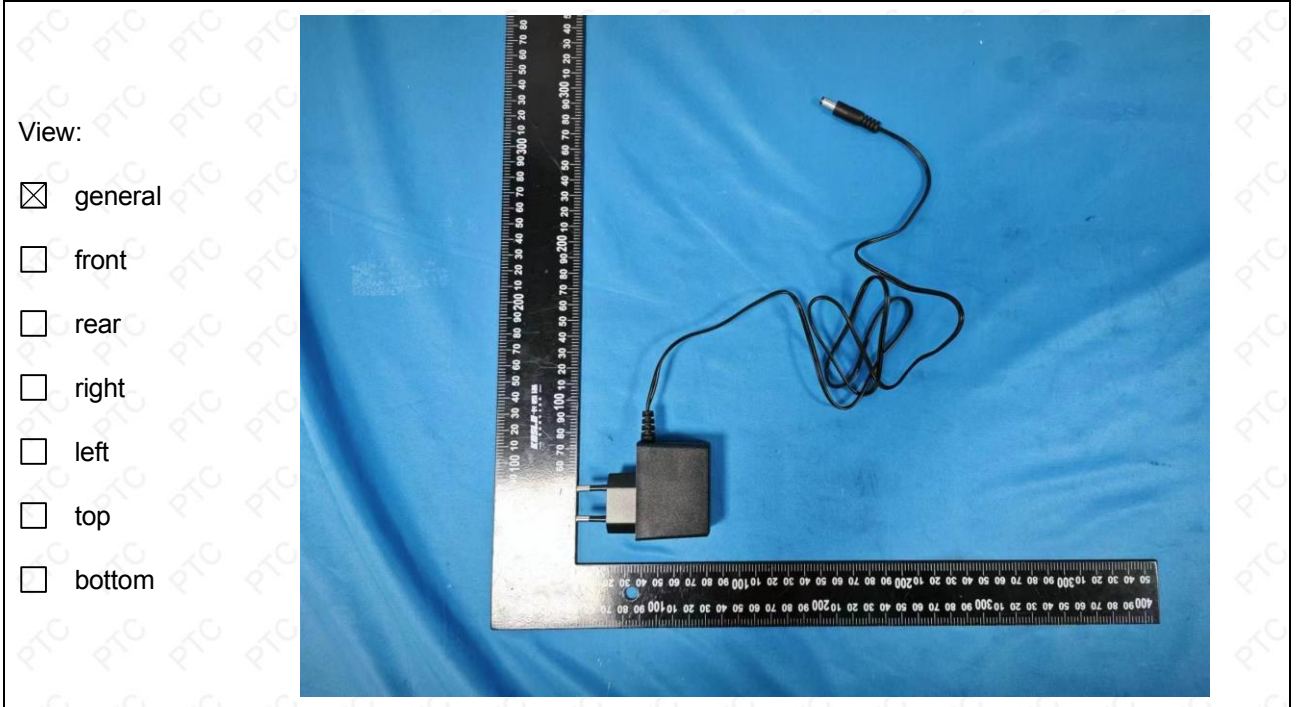
Details of: General view





## Attachment 2

Details of: General view



Details of: General view



--- End of this attachment ---

## VERIFICATION OF CONFORMITY

**No.** : PTC23070700701E-EM01  
**Applicant** : Guangdong Obao Intelligent Electric Appliance Co., LTD  
**Address** : Chenghai District, Shantou City, Chenghua Street, New Jia Dongyuan Road, 9 fifth, sixth floor  
**Manufacturer** : Guangdong Obao Intelligent Electric Appliance Co., LTD  
**Address** : Chenghai District, Shantou City, Chenghua Street, New Jia Dongyuan Road, 9 fifth, sixth floor  
**Factory** : Guangdong Obao Intelligent Electric Appliance Co., LTD  
**Address** : Chenghai District, Shantou City, Chenghua Street, New Jia Dongyuan Road, 9 fifth, sixth floor  
**Product** : sweeping robot  
**Trade Mark** : —  
**Model** : OB16、OB16Pro、OB8S、OB8S MAX、OB11、OB11Pro、OB10  
**Ratings** : Battery  
DC 12V for Adapter 230V/50Hz

The submitted sample of the above equipment has been tested and found to comply with the following European Directive:

### Electromagnetic compatibility (EMC) Directive - 2014/30/EU

The standard(s) used for showing compliance with the essential requirements:

Applicable Standard(s)	Test Report(s) Number
<b>EN IEC 55014-1:2021</b> <b>EN IEC 55014-2:2021</b> <b>EN IEC 61000-3-2:2019+A1:2021</b> <b>EN 61000-3-3:2013+A1:2019</b>	PTC23070700701E-EM01

This verification is part of the full test report(s) and should be read in conjunction with it. This verification is based on an evaluation of one sample of above mentioned product. It does not imply assessment of the production of the product. Without the written approval of Precise Testing & Certification (Guangdong) Co., Ltd., this verification is not permitted to be reproduced, except in full. It is not permitted to use the test lab's logo. The CE marking may only be used if all the relevant and effective European Directives are applicable.



*Jacky Ou*

Jacky Ou  
Manager  
Date: 2023-08-09





# CE EMC TEST REPORT

for

**Product: sweeping robot**

**Model: OB16、OB16Pro、OB8S、OB8S MAX、OB11、OB11Pro、OB10**

**Report No.: PTC23070700701E-EM01**

Issued for

**Guangdong Obao Intelligent Electric Appliance Co., LTD  
Chenghai District, Shantou City, Chenghua Street, New Jia Dongyuan Road,  
9 fifth, sixth floor**

Issued by

**Precise Testing & Certification (Guangdong) Co., Ltd.  
Building 1, No. 6, Tongxin Road, Dongcheng Street, Dongguan, Guangdong,  
China.**

**TEL: +86-769-3880 8222**

**FAX: + 86-769-3882 6111**

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## TABLE OF CONTENTS

<b>1. TEST CERTIFICATION .....</b>	<b>3</b>
<b>2. TEST SUMMARY .....</b>	<b>4</b>
<b>3. TEST SITE .....</b>	<b>5</b>
3.1. TEST FACILITY .....	5
3.2. Measurement Uncertainty .....	5
3.3. LIST OF TEST AND MEASUREMENT INSTRUMENTS .....	6
<b>4. EUT DESCRIPTION .....</b>	<b>10</b>
<b>5. TEST METHODOLOGY .....</b>	<b>11</b>
5.1. TEST MODE .....	11
5.2. EUT SYSTEM OPERATION .....	11
<b>6. SETUP OF EQUIPMENT UNDER TEST .....</b>	<b>12</b>
6.1. DESCRIPTION OF SUPPORT UNITS .....	12
6.2. CONFIGURATION OF SYSTEM UNDER TEST .....	12
<b>7. EMISSION TEST .....</b>	<b>13</b>
7.1. CONDUCTED EMISSION MEASUREMENT .....	13
7.2. CLICK MEASUREMENT .....	17
7.3. DISTURBANCE POWER MEASUREMENT .....	19
7.4. RADIATED EMISSION MEASUREMENT .....	21
7.5. HARMONICS CURRENT MEASUREMENT .....	32
7.6. VOLTAGE FLUCTUATION AND FLICKS MEASUREMENT .....	36
<b>8. IMMUNITY TEST .....</b>	<b>37</b>
8.1. GENERAL DESCRIPTION .....	38
8.2. GENERAL PERFORMANCE CRITERIA DESCRIPTION .....	39
8.3. ELECTROSTATIC DISCHARGE (ESD) .....	40
8.4. RADIATED RADIO-FREQUENCY, ELECTROMAGNETIC FIELD (RS) .....	43
8.5. ELECTRICAL FAST TRANSIENT (EFT) .....	46
8.6. SURGE IMMUNITY TEST .....	48
8.7. CONDUCTED RADIO FREQUENCY DISTURBANCES (CS) .....	50
8.8. VOLTAGE DIP & VOLTAGE INTERRUPTIONS .....	52
<b>9. PHOTOGRAPHS OF THE TEST CONFIGURATION .....</b>	<b>54</b>
<b>10. PHOTOGRAPHS OF EUT .....</b>	<b>61</b>



# 1. TEST CERTIFICATION

Product:	sweeping robot
Model:	OB16、OB16Pro、OB8S、OB8S MAX、OB11、OB11Pro、OB10
Applicant :	Guangdong Obao Intelligent Electric Appliance Co., LTD
Address:	Chenghai District, Shantou City, Chenghua Street, New Jia Dongyuan Road, 9 fifth, sixth floor
Manufacturer:	Guangdong Obao Intelligent Electric Appliance Co., LTD
Address:	Chenghai District, Shantou City, Chenghua Street, New Jia Dongyuan Road, 9 fifth, sixth floor
Test Date:	July 14, 2023 to August 9, 2023
Issued Date:	August 9, 2023
Test Voltage:	Battery DC 12V for Adapter 230V/50Hz
Applicable Standards:	EMC Directive 2014/30/EU EN IEC 55014-1:2021 EN IEC 55014-2:2021 EN IEC 61000-3-2:2019+A1:2021 EN 61000-3-3:2013+A1:2019

The above equipment has been tested by Precise Testing & Certification (Guangdong) Co., Ltd. and found compliance with the requirements in the technical standards mentioned above. The test results presented in this report only relate to the product/system tested. The Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Test Engineer:

Technical Manager:

*Carson Zhong*  
Carson Zhong / Engineer  
  
*Simon Pu*  
Simon Pu / Manager



## 2. TEST SUMMARY

EMISSION			
Standard	Item	Result	Remarks
EN IEC 55014-1: 2021	Conducted (Main Port)	PASS	Complied with limit
	Disturbance Power	N/A	N/A
	Radiated Emission	PASS	Complied with limit
	Click	N/A	N/A
EN IEC 61000-3-2:2019+A1:2021	Harmonic current emissions	N/A	N/A
EN 61000-3-3:2013+A1:2019	Voltage fluctuations & flicker	PASS	Complied with limit

IMMUNITY			
Standard	Item	Result	Remarks
IEC 61000-4-2:2008	ESD	PASS	Complied with the requirements
IEC 61000-4-3:2006+A1:2007+A2:2010	RS	PASS	Complied with the requirements
IEC 61000-4-4:2012	EFT	PASS	Complied with the requirements
IEC 61000-4-5:2014+A1:2017	Surge	PASS	Complied with the requirements
IEC 61000-4-6:2013	CS	PASS	Complied with the requirements
IEC 61000-4-11:2020	Voltage dips & voltage variations	PASS	Complied with the requirements

Note: 1) The test result verdict is decided by the limit of test standard.

2) The information of measurement uncertainty is available upon the customer's request.



### 3. TEST SITE

#### 3.1. TEST FACILITY

Precise Testing & Certification (Guangdong) Co., Ltd.

Address: Building 1, No. 6, Tongxin Road, Dongcheng Street, Dongguan, Guangdong, China.

- ☆ CNAS Registration No.: CNAS L5772
- ☆ FCC Registration No.: 790290
- ☆ A2LA Certificate No.: 4408.01
- ☆ IC Registration No.: 12191A

#### 3.2. Measurement Uncertainty

Parameter	Uncertainty
Temperature	$\pm 1^{\circ} \text{C}$
Humidity	$\pm 5\%$
DC and Low Frequency Voltages	$\pm 3\%$
Conducted Emission(150KHz-30MHz)	$\pm 3.60\text{dB}$
Radiated Emission(30MHz-1GHz)	$\pm 4.76\text{dB}$
Radiated Emission (1GHz-18GHz)	$\pm 4.44\text{dB}$

Note 1: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.



### 3.3. LIST OF TEST AND MEASUREMENT INSTRUMENTS

#### 3.3.1. For conducted emission at the mains terminals test

Name of Equipment	Manufacturer	Model	Serial No.	Calibration Due
EMI Test Receiver	Rohde&Schwarz	ESCI	101417	Aug 21, 2023
Artificial Mains Network	Rohde&Schwarz	ENV216	102453	Aug 21, 2023
ISN	SCHWARZBECK	NTFM8131	00257	Aug 21, 2023
Test S/W	Tonscend	JS32-CE/4.0.0.3		

#### 3.3.2. For click test (DQT)

Name of Equipment	Manufacturer	Model	Serial No.	Calibration Due
Click Tester	SCHWARZBECK	DIA1512D	21554	Aug 21, 2023
Artificial Mains Network	SCHWARZBECK	NSLK8126	8126415	Aug 21, 2023

#### 3.3.3. For disturbance power test

Name of Equipment	Manufacturer	Model	Serial No.	Calibration Due
EMI Test Receiver	Rohde&Schwarz	ESCI	101417	Aug 21, 2023
Absorbing Clamp	LUTHI	MDS 21B	P1407131815	Aug 21, 2023
Test S/W	Tonscend	JS32-CE/4.0.0.3		

#### 3.3.4. For radiated emission test (30MHz-1GHz)

Name of Equipment	Manufacturer	Model	Serial No.	Calibration Due
EMI Test Receiver	Rohde&Schwarz	ESCI	101417	Aug 21, 2023
Bilog Antenna	SCHWARZBECK	VULB 9160	9160-3355	Aug 21, 2023
Preamplifier (low frequency)	SCHWARZBECK	BBV 9745	9745-0013	Aug 21, 2023





Test S/W	Tonscend	JS32-RE/4.0.0.0
----------	----------	-----------------

**3.3.5. For harmonic current emissions and voltage fluctuations/flicker test**

Name of Equipment	Manufacturer	Model	Serial No.	Calibration Due
Harmonics / Flicker Test System	California Instruments	CTS/PACS-1-115	1534A00401	Aug 21, 2023
AC Power Source	California Instruments	3001IX-208-CTS	1534A00401	Aug 21, 2023
Test S/W	AMETEK	CTS 4		

**3.3.6. For electrostatic discharge immunity test**

Name of Equipment	Manufacturer	Model	Serial No.	Calibration Due
ESD Generator	SCHLODER	SESD216	606137	Aug 21, 2023

**3.3.7. For radio frequency electromagnetic field immunity (R/S) test**

Name of Equipment	Manufacturer	Model	Serial No.	Calibration Due
Power meter	Agilent	E4419B	GB42421440	Aug 21, 2023
Isotropic Field Probe	Narda	EP-601	611WX80275	Aug 21, 2023
Amplifier	SKET	HAP_801000M-250W	201811050	Aug 21, 2023
Amplifier	SKET	HAP_0103G-75W	201811051	Aug 21, 2023
Amplifier	SKET	HAP_0306G-20W	201811052	Aug 21, 2023
Log-periodic Antenna	SKET	ZDSZ-80T1000M-231	SKT231015	Aug 21, 2023
Log-periodic Antenna	SKET	ZDSZ-1T6G-232	SKT232079	Aug 21, 2023



**3.3.8. For electrical fast transient/burst immunity test**

Name of Equipment	Manufacturer	Model	Serial No.	Calibration Due
EFT Tester	HTEC	HV1P16T/HCOM PACT52	170901/190901	Aug 21, 2023
EFT Coupling Clamp	HTEC	HEFT 51-C	1416011	Aug 21, 2023

**3.3.9. For surge immunity test**

Name of Equipment	Manufacturer	Model	Serial No.	Calibration Due
Surge Tester	HTEC	HCWG 71	174302	Aug 21, 2023
Surge Tester	HTEC	TCOMB 4	142103	Aug 21, 2023
Surge Tester	HTEC	HTSG 70	175002	Aug 21, 2023

**3.3.10. For injected currents susceptibility test**

Name of Equipment	Manufacturer	Model	Serial No.	Calibration Due
C/S Test System	SCHLODER	CDG-6000-25	126A1279/2014	Aug 21, 2023
Coupling Decoupling Network	SCHLODER	CDN-M2+3	A2210251/2013	Aug 21, 2023
Electromagnetic Injection Clamp	Luthi	EM101	36041	Aug 21, 2023
Test S/W	SCHLODER	CDG/1.0.0.0		

**3.3.11. For voltage dips and short interruptions immunity test**

Name of Equipment	Manufacturer	Model	Serial No.	Calibration Due
-------------------	--------------	-------	------------	-----------------



Report No.: PTC23070700701E-EM01

Dips Tester	HTEC	HV1P16T/HCOM PACT52	170901/190901	Aug 21, 2023
-------------	------	------------------------	---------------	--------------



#### 4. EUT DESCRIPTION

<b>Product</b>	sweeping robot
<b>Model</b>	OB16
<b>Additional model</b>	OB16Pro、OB8S、OB8S MAX、OB11、OB11Pro、OB10
<b>Power Supply</b>	Battery DC 12V for Adapter 230V/50Hz
<b>Adapter</b>	N/A
<b>Power</b>	N/A

#### I/O PORT

I/O PORT TYPES	Q'TY	TESTED WITH
AC Port	1	<input checked="" type="checkbox"/>
DC Port	1	<input checked="" type="checkbox"/>

#### Models Difference

The appearance color and model name are different.



## 5. TEST METHODOLOGY

### 5.1. TEST MODE

The EUT was tested together with the thereafter additional components, and a configuration, which produced the worst emission levels, was selected and recorded in this report.

The following test mode(s) were assessed.

	Test Items	Test Mode
Emission	Conducted Emission	Charging
	Disturbance Power	N/A
	Radiated Emission	Charging,Working
	Harmonic current emissions	N/A
	Voltage fluctuations & flicker	Charging
Immunity	ESD	Charging,Working
	RS	Charging,Working
	EFT	Charging
	Surge	Charging
	C/S	Charging
	Dips	Charging

### 5.2. EUT SYSTEM OPERATION

1. Set up EUT with the support equipment.
2. Make sure the EUT work normally during the test.



## 6. SETUP OF EQUIPMENT UNDER TEST

### 6.1. DESCRIPTION OF SUPPORT UNITS

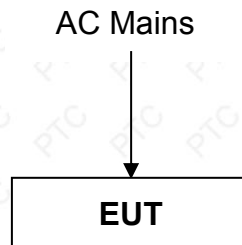
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

No.	Equipment	Model	Serial No.	FCC ID	Trade Name	Data Cable	Power Cord
1.	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Note: 1) All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.

2) Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

### 6.2. CONFIGURATION OF SYSTEM UNDER TEST



(EUT: iMat®Vending Series-Intelligent Vending Machine)



## 7. EMISSION TEST

### 7.1. CONDUCTED EMISSION MEASUREMENT

#### 7.1.1. LIMITS

Household appliances and equipment causing similar disturbances  
and regulation controls incorporation semiconductor devices

FREQUENCY (MHz)	At mains terminals		At load terminals and additional terminals	
	Quasi-peak dB $\mu$ V	Average dB $\mu$ V	Quasi-peak dB $\mu$ V	Average dB $\mu$ V
0.15 - 0.5	66-56	59-46	80	70
0.5 - 5.0	56	46	74	64
5.0 - 30.0	60	50	74	64

Mains terminals of tools

FREQUENCY (MHz)	Rated motor power not exceeding 700W		Rated motor power above 700W and not exceeding 1000W		Rated motor power above 1000W	
	Quasi-peak dB $\mu$ V	Average dB $\mu$ V	Quasi-peak dB $\mu$ V	Average dB $\mu$ V	Quasi-peak dB $\mu$ V	Average dB $\mu$ V
0.15 - 0.35	66-59	59-49	70-63	63-53	79-69	69-59
0.35 - 5.0	59	49	63	53	69	59
5.0 - 30.0	64	54	68	58	74	64

Note: 1) The lower limit shall apply at the transition frequencies.

2) Decreasing linearly with the logarithm of the frequency.

#### 7.1.2. TEST PROCEDURES

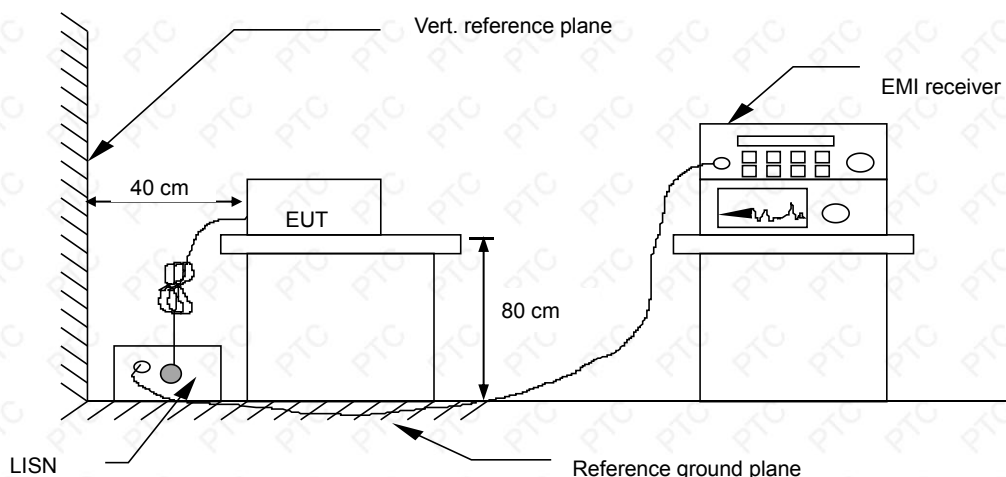
The EUT and Support equipment, if needed, was set up as per the test configuration to simulate typical usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane. When the EUT is floor standing equipment, it is placed on the ground plane, which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane. The EUT should be 0.8m apart from the AMN, where the mains cable supplied by the manufacturer is longer than 0.8 m, the excess should be folded at the centre into a bundle no longer than 0.4 m, Details please refer to test setup photography.

The Receiver scanned from 150 kHz to 30 MHz for emissions in each of the test modes. During the above scans, the emissions were maximized by cable manipulation.

A scan was taken on both power lines, Line and Neutral, recording at least the six highest

emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. The test data of the worst-case condition(s) was recorded.  
 Note: Test Software Name: e3, Software Version: 1.0.0.0.

### 7.1.3. TEST SETUP



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

### 7.1.4. TEST RESULT

<b>Product name</b>	sweeping robot	<b>Tested By</b>	Mickey
<b>Model</b>	OB16	<b>Detector Function</b>	Quasi-peak/AV
<b>Test Mode</b>	Charging	<b>6 dB Bandwidth</b>	9 kHz
<b>Environmental Conditions</b>	25°C, 60 % RH, 101.3 kPa	<b>Test Result</b>	Pass

Note:

L = Line Line, N = Neutral Line

Freq. = Emission frequency in MHz

Reading level (dB $\mu$ V) = Receiver reading

Corr. Factor (dB) = attenuator + Cable loss

Level (dB $\mu$ V) = Reading level (dB $\mu$ V) + Corr. Factor (dB)

Limit (dB $\mu$ V) = Limit stated in standard

Over Limit (dB) = Level (dB $\mu$ V) – Limit (dB $\mu$ V)

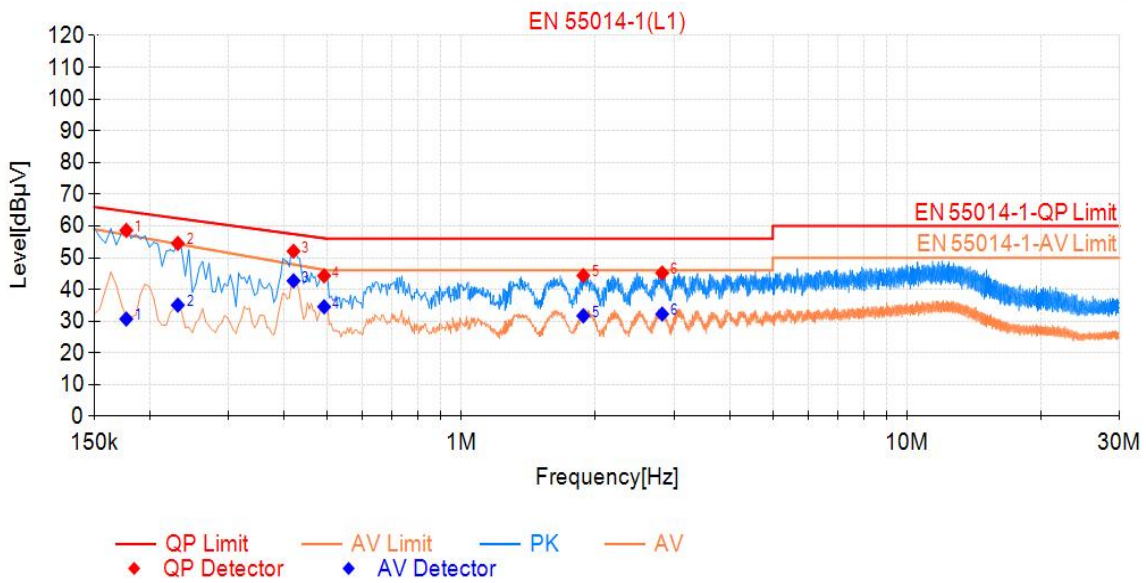
QP = Quasi-PeakAV = Average





Please refer to the following diagram:

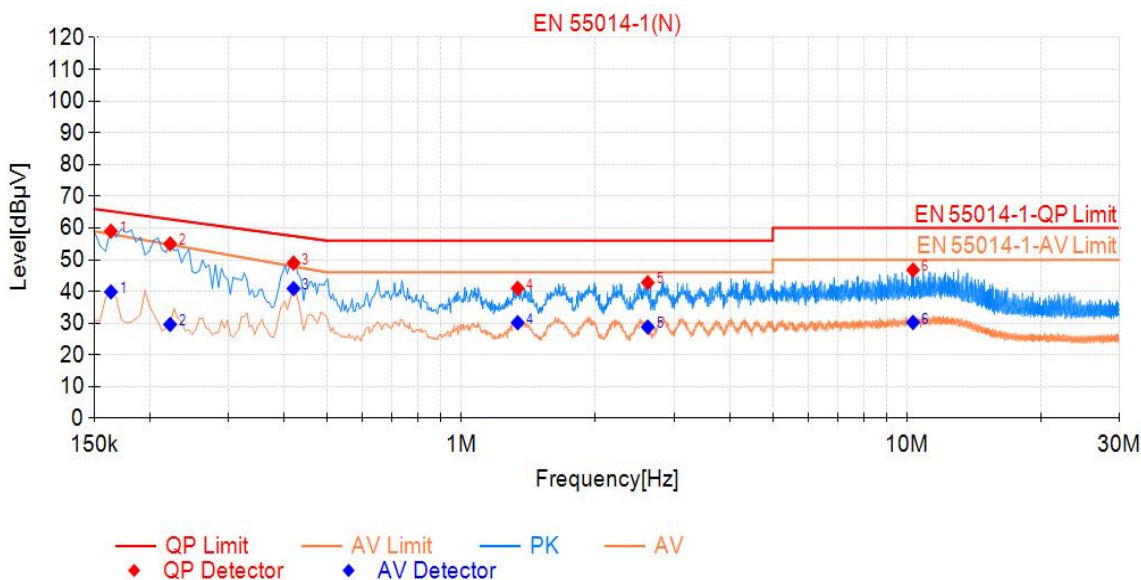
Line:



Final Data List								
NO.	Freq. [MHz]	QP Value [dBµV]	QP Limit [dBµV]	QP Margin [dB]	AV Value [dBµV]	AV Limit [dBµV]	AV Margin [dB]	Verdict
1	0.177	58.62	64.63	6.01	30.69	57.21	26.52	PASS
2	0.231	54.52	62.41	7.89	35.07	54.34	19.27	PASS
3	0.420	52.06	57.45	5.39	42.70	47.88	5.18	PASS
4	0.492	44.29	56.13	11.84	34.53	46.17	11.64	PASS
5	1.878	44.37	56.00	11.63	31.70	46.00	14.30	PASS
6	2.823	45.18	56.00	10.82	32.24	46.00	13.76	PASS



Neutral:



Final Data List								
NO.	Freq. [MHz]	QP Value [dBµV]	QP Limit [dBµV]	QP Margin [dB]	AV Value [dBµV]	AV Limit [dBµV]	AV Margin [dB]	Verdict
1	0.164	58.98	65.28	6.30	39.84	58.07	18.23	PASS
2	0.222	55.00	62.74	7.74	29.60	54.77	25.17	PASS
3	0.420	48.97	57.45	8.48	40.91	47.88	6.97	PASS
4	1.338	41.00	56.00	15.00	30.15	46.00	15.85	PASS
5	2.621	42.78	56.00	13.22	28.79	46.00	17.21	PASS
6	10.320	46.76	60.00	13.24	30.22	50.00	19.78	PASS



## 7.2. CLICK MEASUREMENT

### 7.2.1. LIMITS

The click limit  $L_q$  is determined from the formula:

$$L_q = L + \Delta L$$

which the limits  $L$  for continuous disturbance shall be increased (see table 1):

which corresponding to the click rate  $N$  shall be calculated the amount  $\Delta L$  by

$$\Delta L = 44 \text{ dB for } N < 0,2$$

$$\Delta L = [20 \log(30/N)] \text{ dB for } 0,2 \leq N < 30$$

Table 1

FREQUENCY (MHz)	At mains terminals		At load terminals and additional terminals	
	Quasi-peak dB $\mu$ V	Average dB $\mu$ V	Quasi-peak dB $\mu$ V	Average dB $\mu$ V
0.15 - 0.5	66-56	59-46	80	70
0.5 - 5.0	56	46	74	64
5.0 - 30.0	60	50	74	64

### 7.2.2. TEST PROCEDURE

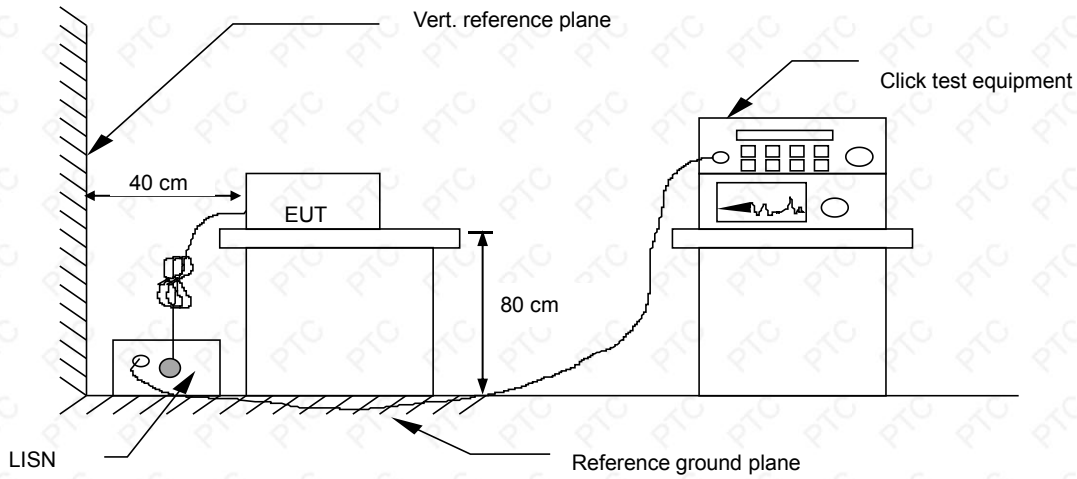
The EUT and Support equipment, if needed, was set up as per the test configuration to simulate typical usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane. When the EUT is floor standing equipment, it is placed on the ground plane, which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane. The EUT should be 0.8 m apart from the AMN, where the mains cable supplied by the manufacturer is longer than 1m, the excess should be folded at the centre into a bundle no longer than 0.4 m, Details please refer to test setup photography.

At first, determining  $N$  by measuring the Clicks, calculating the limit.

Then, use the Upper quartile method to confirm EUT is fulfilled the requirement of standard or not.

The amplitude of the clicks shall be evaluated only at the following restricted number of frequencies: 150 kHz; 500 kHz; 1.4 MHz and 30 MHz

### 7.2.3. TEST SETUP



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration

### 7.2.4. TEST RESULT

This test is not applicable because the EUT does not have the relative function.



### 7.3. DISTURBANCE POWER MEASUREMENT

#### 7.3.1. LIMITS

FREQUENCY (MHz)	Household appliances and similar appliances		Rated motor power not exceeding 700W		Rated motor power above 700W and not exceeding 1000W		Rated motor power above 1000W	
	QP dBpW	Average dBpW	QP dBpW	Average dBpW	QP dBpW	Average dBpW	QP dBpW	Average dBpW
30 ~ 300	45-55	35-45	45-55	35-45	49-59	39-49	55-65	45-55
FREQUENCY (MHz)	Household appliances and similar appliances		Rated motor power not exceeding 700W		Rated motor power above 700W and not exceeding 1000W		Rated motor power above 1000W	
	QP dBpW	Average dBpW	QP dBpW	Average dBpW	QP dBpW	Average dBpW	QP dBpW	Average dBpW
200 ~ 300	0 to 10 dB		0 to 10 dB		0 to 10 dB		0 to 10 dB	

- Note: 1) The lower limit shall apply at the transition frequencies.  
 2) Increasing linearly with the frequency.  
 3) QP means Quasi-peak, AV means Average.  
 4) The limit of column 2 and 3 apply to this product.

#### 7.3.2. TEST PROCEDURE

The EUT is placed on a 0.8 meters height wooden table above the ground plane, and kept at least 0.8 m from other metallic object. The straight portion of lead would put on 6 m long testing bench of (if lead is shorter than 6 m it should be extended)

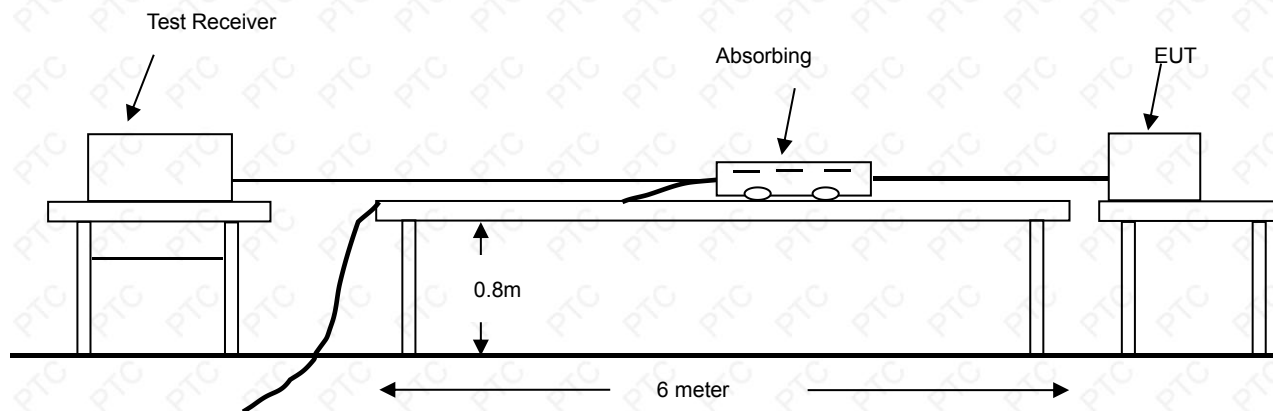
Any lead connecting the main appliance to an auxiliary apparatus is disconnected if this does not affect the operation of the appliance, or is isolated by means of ferrite rings (or an absorbing clamp) close to the appliance.

The receiver scanned from 30 MHz to 300 MHz. Emissions were scanned and measured to moving the absorbing clamp along the main lead until the maximum emission value is found. Recorded at least the six highest emissions.

The test data of the worst-case condition(s) was recorded.

Note: Test Software Name: e3, Software Version: 1.0.0.0.

### 7.3.3. TEST SETUP



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration

### 7.3.4. TEST RESULT

N/A



## 7.4. RADIATED EMISSION MEASUREMENT

### 7.4.1. LIMITS

FREQUENCY (MHz)	Limit (dB $\mu$ V/m) (At 3m)
30 ~ 230	40
230 ~ 1000	47
1000~ 3000	50(Average), 70(Peak)
3000~ 6000	54(Average), 74(Peak)

Note: 1) The lower limit shall apply at the transition frequencies.

2) Emission level (dB $\mu$ V/m) = 20 log Emission level ( $\mu$ V/m).

### 7.4.2. TEST PROCEDURE

The equipment was set up as per the test configuration to simulate typical usage per the user's manual. When the EUT is a tabletop system, a wooden turntable with a height of 0.8 meters is used which is placed on the ground plane. When the EUT is floor standing equipment, it is placed on the ground plane which has a 0.1 m non-conductive covering to insulate the EUT from the ground plane.

The antenna was placed at 3 meter away from the EUT. The antenna connected to the spectrum analyzer via a cable and at times a pre-amplifier would be used.

The analyzer / receiver quickly scanned from 30 MHz to 6000 MHz. The EUT test program was started. Emissions were scanned and measured rotating the EUT to 360 degrees and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.

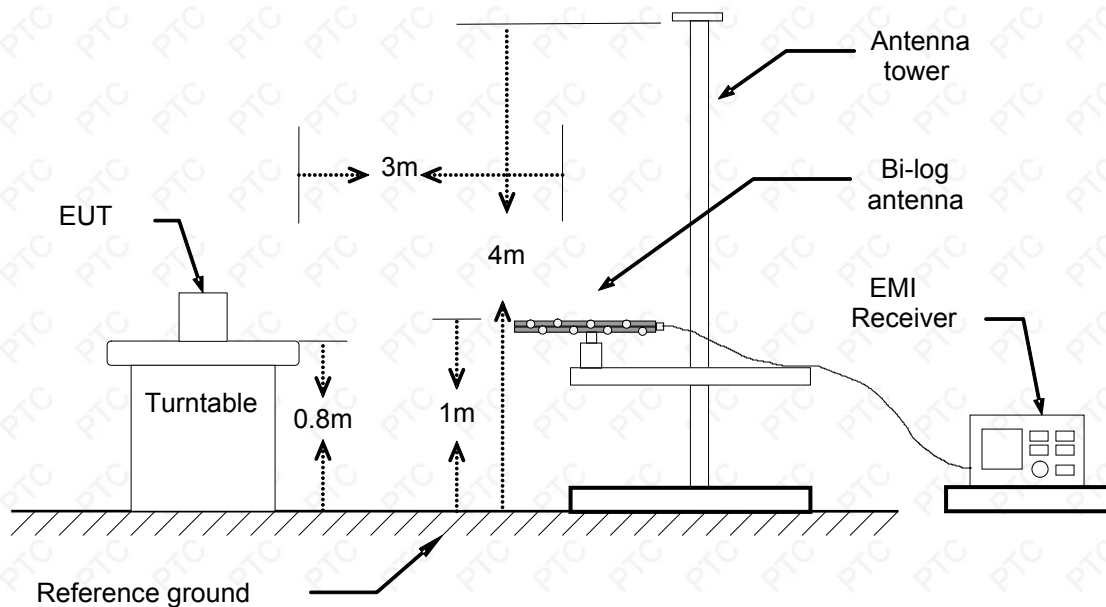
During the above scans, the emissions were maximized by cable manipulation. Each modes is measured, recorded at least the six highest emissions. The emission frequency, amplitude, antenna position, polarization and turntable position were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit and only Q.P. reading is presented.

The test data of the worst-case condition(s) was recorded.

Note: Test Software Name: e3, Software Version: 8.2.1.0.

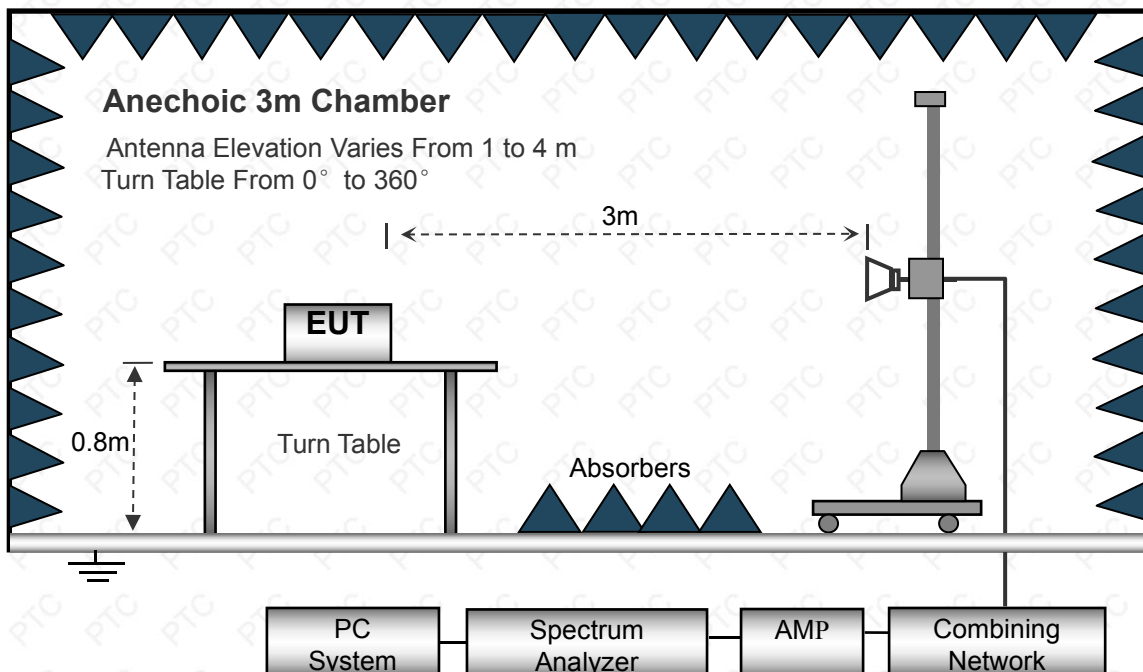
### 7.4.3. TEST SETUP

Frequency Range: Below 1 GHz



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration

Frequency Range: Above 1 GHz







#### 7.4.4. TEST RESULT

<b>Product name</b>	sweeping robot	<b>Antenna Distance</b>	3 m
<b>Model</b>	OB16	<b>Antenna Pole</b>	Vertical / Horizontal
<b>Test Mode</b>	Working, Charging	<b>Detector Function</b>	Quasi-peak
<b>Environmental Conditions</b>	24.5°C, 52 % RH, 101.3 kPa	<b>6 dB Bandwidth</b>	120 kHz
<b>Tested by</b>	Lu	<b>Test Result</b>	Pass

Note:

Freq. = Emission frequency in MHz

Reading level (dB $\mu$ V) = Receiver reading(dB $\mu$ V)

Corr.Factor (dB/m)=Antenna factor(dB/m)+Cable loss(dB)-Preamp Factor(dB)

Measurement (dB $\mu$ V/m)=Reading level(dB $\mu$ V)+ Corr. Factor (dB/m)

Limit (dB $\mu$ V/m) = Limit stated in standard

Over Limit (dB) = Measurement (dB $\mu$ V/m) – Limit (dB $\mu$ V/m)

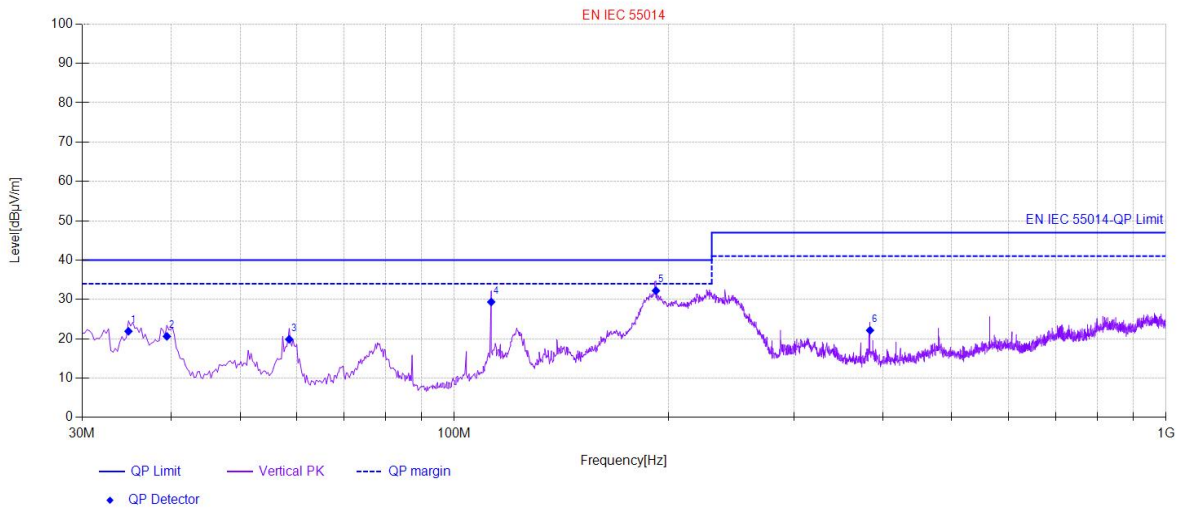
QP = Quasi-Peak

The highest frequency of the EUT internal source is greater than 108MHz, so the frequency is measured to 6GHz.



Please refer to the following diagram:

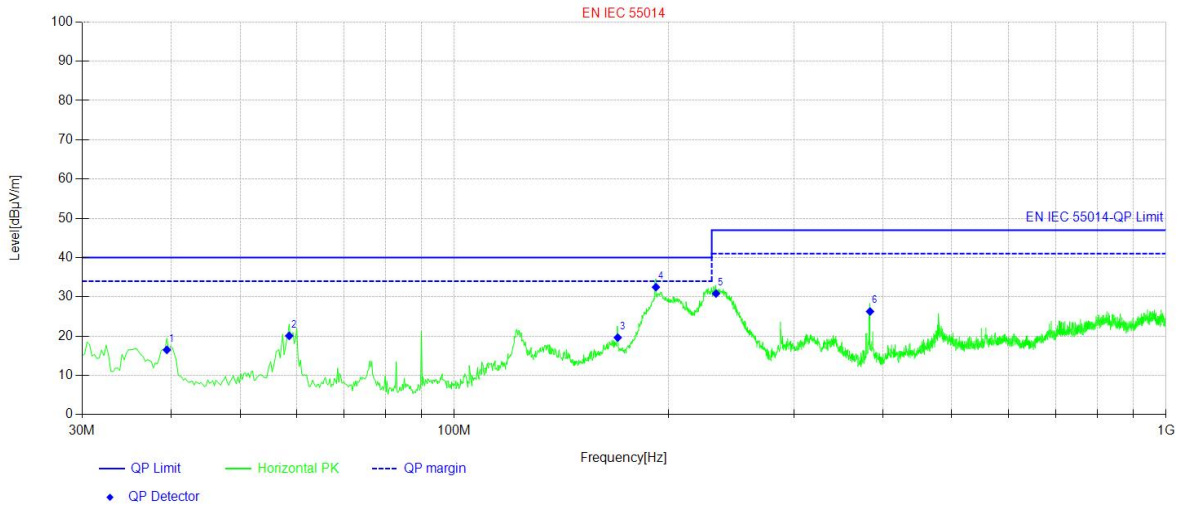
Vertical:Charging



Final Data List[QP]								
NO.	Freq. [MHz]	QP Reading [dBµV/m]	Factor [dB]	QP Value [dBµV/m]	QP Limit [dBµV/m]	QP Margin [dB]	Polarity	Verdict
1	34.85	40.06	-18.15	21.91	40.00	18.09	Vertical	PASS
2	39.46	38.44	-17.82	20.62	40.00	19.38	Vertical	PASS
3	58.62	37.74	-17.88	19.86	40.00	20.14	Vertical	PASS
4	112.69	47.96	-18.60	29.36	40.00	10.64	Vertical	PASS
5	191.99	50.46	-18.24	32.22	40.00	7.78	Vertical	PASS
6	383.81	35.76	-13.62	22.14	47.00	24.86	Vertical	PASS



Horizontal:

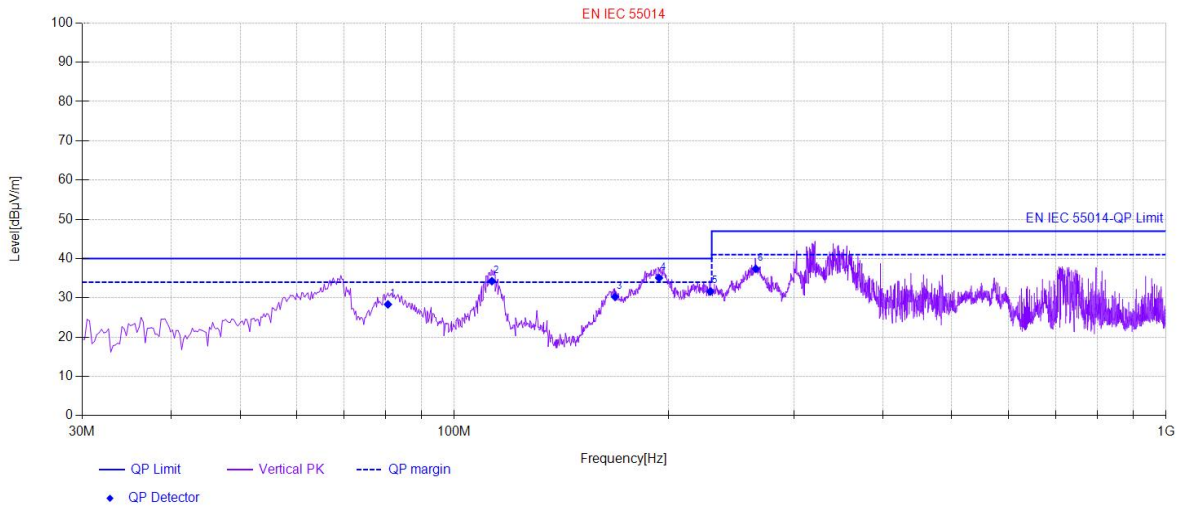


Final Data List[QP]								
NO.	Freq. [MHz]	QP Reading [dBµV/m]	Factor [dB]	QP Value [dBµV/m]	QP Limit [dBµV/m]	QP Margin [dB]	Polarity	Verdict
1	39.46	34.32	-17.82	16.50	40.00	23.50	Horizontal	PASS
2	58.62	37.95	-17.88	20.07	40.00	19.93	Horizontal	PASS
3	169.68	35.9	-16.28	19.62	40.00	20.38	Horizontal	PASS
4	191.99	50.71	-18.24	32.47	40.00	7.53	Horizontal	PASS
5	233.22	48.92	-18.08	30.84	47.00	16.16	Horizontal	PASS
6	383.81	39.9	-13.62	26.28	47.00	20.72	Horizontal	PASS



Please refer to the following diagram:

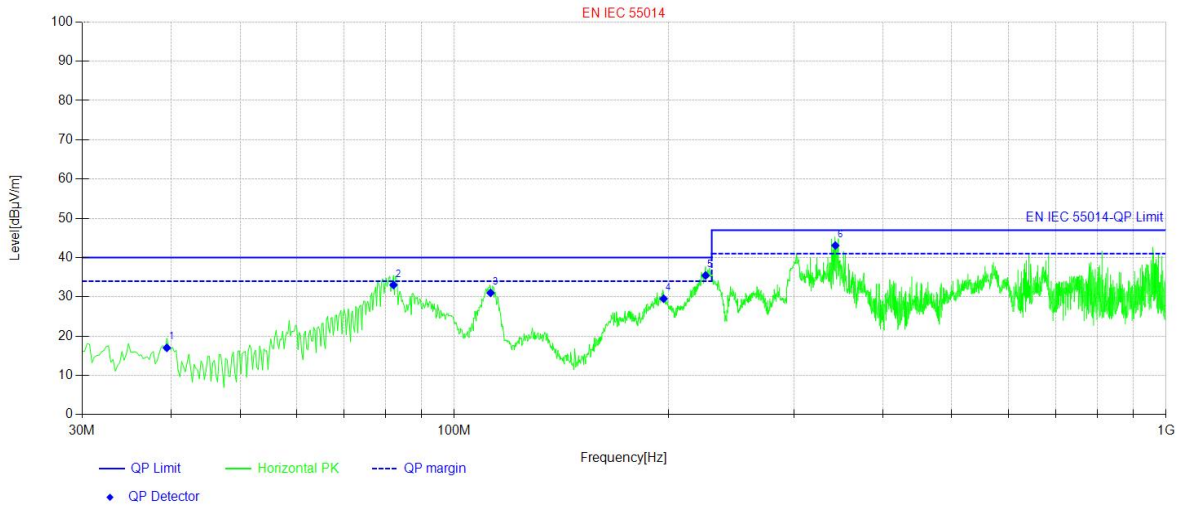
Vertical:Working



Final Data List[QP]								
NO.	Freq. [MHz]	QP Reading [dBµV/m]	Factor [dB]	QP Value [dBµV/m]	QP Limit [dBµV/m]	QP Margin [dB]	Polarity	Verdict
1	80.68	49.54	-21.20	28.34	40.00	11.66	Vertical	PASS
2	112.94	52.84	-18.58	34.26	40.00	5.74	Vertical	PASS
3	168.23	46.43	-16.17	30.26	40.00	9.74	Vertical	PASS
4	193.93	53.45	-18.39	35.06	40.00	4.94	Vertical	PASS
5	228.85	49.8	-18.18	31.62	40.00	8.38	Vertical	PASS
6	265.23	53.94	-16.54	37.40	47.00	9.60	Vertical	PASS



Horizontal:

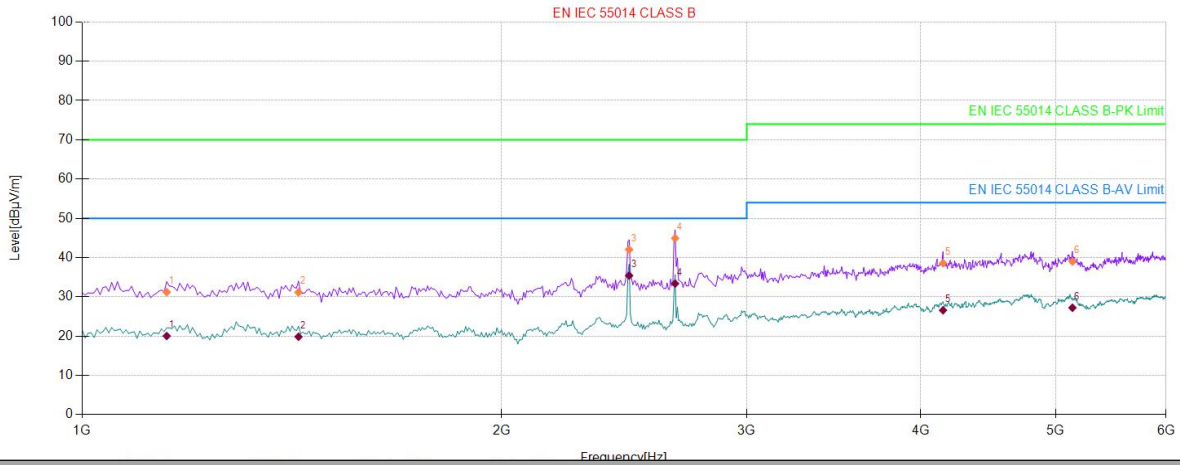


Final Data List[QP]								
NO.	Freq. [MHz]	QP Reading [dBµV/m]	Factor [dB]	QP Value [dBµV/m]	QP Limit [dBµV/m]	QP Margin [dB]	Polarity	Verdict
1	39.46	34.85	-17.82	17.03	40.00	22.97	Horizontal	PASS
2	82.14	54.15	-21.13	33.02	40.00	6.98	Horizontal	PASS
3	112.45	49.62	-18.61	31.01	40.00	8.99	Horizontal	PASS
4	196.84	48.12	-18.60	29.52	40.00	10.48	Horizontal	PASS
5	225.46	53.71	-18.26	35.45	40.00	4.55	Horizontal	PASS
6	343.07	57.49	-14.41	43.08	47.00	3.92	Horizontal	PASS



Please refer to the following diagram: ( Radiated Emission test Result Above 1G )

Vertical:Charging

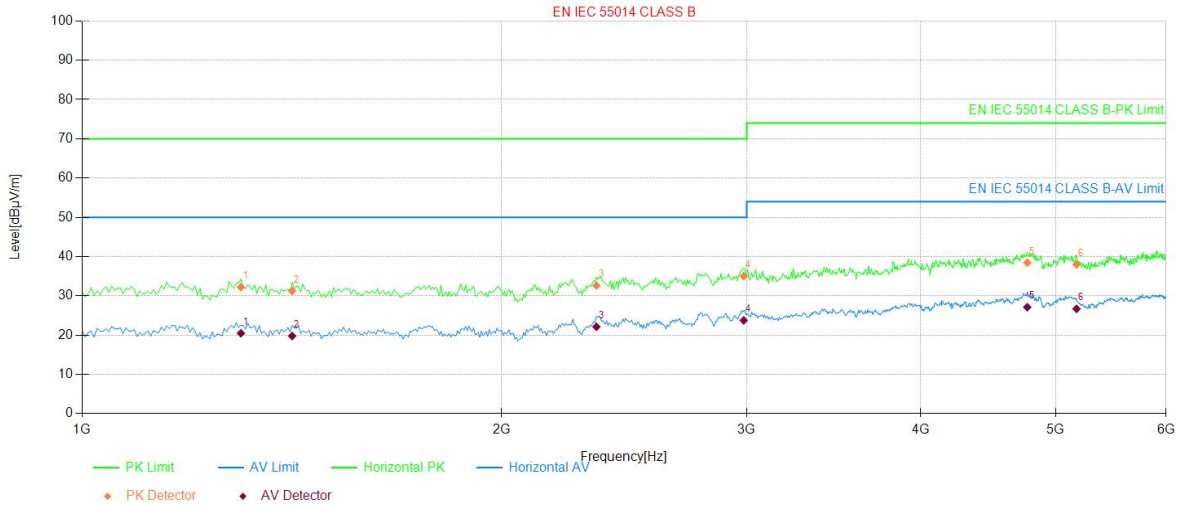


NO.	Freq. [MHz]	Factor [dB]	PK Value [dBµV/m]	PK Limit [dBµV/m]	PK Margin [dB]	Detector	Height [cm]	Angle [°]	Polarity
1	1150.0	-2.91	31.21	70.00	38.79	Peak	100	146	Vertical
2	1430.0	-2.83	31.16	70.00	38.84	Peak	100	292	Vertical
3	2470.0	-0.70	42.06	70.00	27.94	Peak	100	118	Vertical
4	2665.0	-0.02	44.92	70.00	25.08	Peak	100	146	Vertical
5	4150.0	3.92	38.57	74.00	35.43	Peak	100	32	Vertical
6	5140.0	6.56	39.00	74.00	35.00	Peak	100	52	Vertical

NO.	Freq. [MHz]	Factor [dB]	AV Value [dBµV/m]	AV Limit [dBµV/m]	AV Margin [dB]	Detector	Height [cm]	Angle [°]	Polarity
1	1150.0	-2.91	20.04	50.00	29.96	AV	100	146	Vertical
2	1430.0	-2.83	19.84	50.00	30.16	AV	100	292	Vertical
3	2470.0	-0.70	35.41	50.00	14.59	AV	100	118	Vertical
4	2665.0	-0.02	33.38	50.00	16.62	AV	100	146	Vertical
5	4150.0	3.92	26.59	54.00	27.41	AV	100	32	Vertical
6	5140.0	6.56	27.23	54.00	26.77	AV	100	52	Vertical



Horizontal:



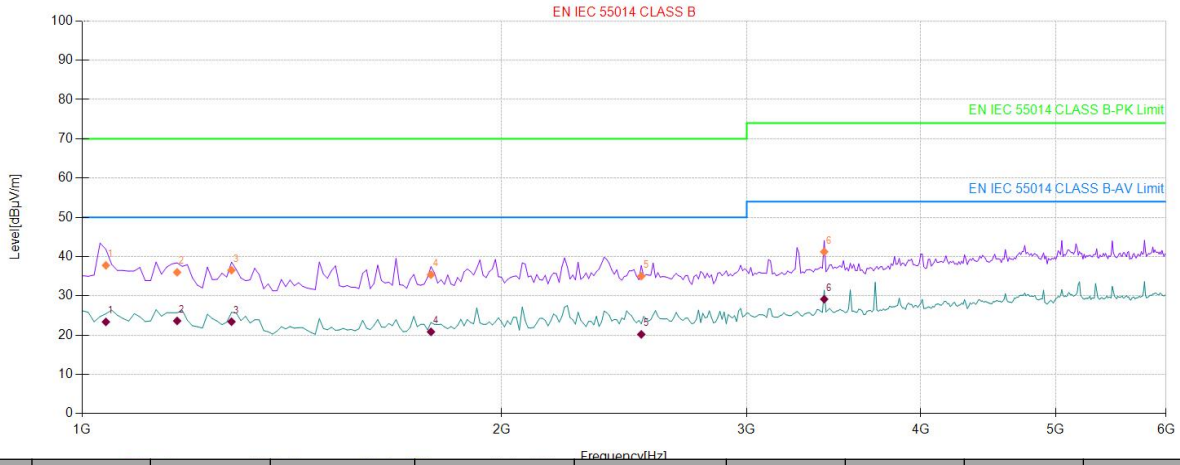
NO.	Freq. [MHz]	Factor [dB]	PK Value [dBµV/m]	PK Limit [dBµV/m]	PK Margin [dB]	Detect or	Height [cm]	Angle [°]	Polarity
1	1300.0	-2.84	32.23	70.00	37.77	Peak	100	203	Horizontal
2	1415.0	-2.78	31.28	70.00	38.72	Peak	100	203	Horizontal
3	2340.0	-1.37	32.64	70.00	37.36	Peak	100	162	Horizontal
4	2985.0	0.99	35.03	70.00	34.97	Peak	100	289	Horizontal
5	4770.0	5.70	38.47	74.00	35.53	Peak	100	118	Horizontal
6	5175.0	6.60	37.98	74.00	36.02	Peak	100	359	Horizontal

NO.	Freq. [MHz]	Factor [dB]	AV Value [dBµV/m]	AV Limit [dBµV/m]	AV Margin [dB]	Detect or	Height [cm]	Angle [°]	Polarity
1	1300.0	-2.84	20.48	50.00	29.52	AV	100	203	Horizontal
2	1415.0	-2.78	19.78	50.00	30.22	AV	100	203	Horizontal
3	2340.0	-1.37	22.12	50.00	27.88	AV	100	162	Horizontal
4	2985.0	0.99	23.75	50.00	26.25	AV	100	289	Horizontal
5	4770.0	5.70	27.12	54.00	26.88	AV	100	118	Horizontal
6	5175.0	6.60	26.70	54.00	27.30	AV	100	359	Horizontal



Please refer to the following diagram: ( Radiated Emission test Result Above 1G )

Vertical:Working



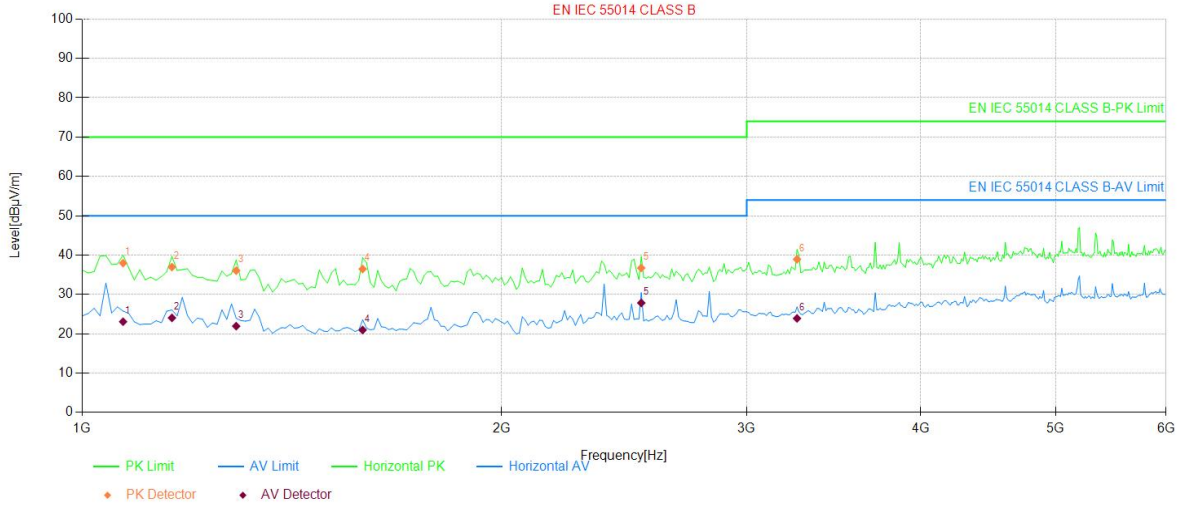
NO.	Freq. [MHz]	Factor [dB]	PK Value [dBµV/m]	PK Limit [dBµV/m]	PK Margin [dB]	Detect or	Height [cm]	Angle [°]	Polarity
1	1040.0	-2.86	37.76	70.00	32.24	Peak	100	62	Vertical
2	1170.0	-2.92	36.00	70.00	34.00	Peak	100	191	Vertical
3	1280.0	-2.86	36.54	70.00	33.46	Peak	100	360	Vertical
4	1780.0	-3.51	35.39	70.00	34.61	Peak	100	5	Vertical
5	2520.0	-0.48	35.02	70.00	34.98	Peak	100	65	Vertical
6	3410.0	1.77	41.23	74.00	32.77	Peak	100	29	Vertical

NO.	Freq. [MHz]	Factor [dB]	AV Value [dBµV/m]	AV Limit [dBµV/m]	AV Margin [dB]	Detect or	Height [cm]	Angle [°]	Polarity
1	1040.0	-2.86	23.37	50.00	26.63	AV	100	62	Vertical
2	1170.0	-2.92	23.63	50.00	26.37	AV	100	191	Vertical
3	1280.0	-2.86	23.42	50.00	26.58	AV	100	360	Vertical
4	1780.0	-3.51	20.84	50.00	29.16	AV	100	5	Vertical
5	2520.0	-0.48	20.19	50.00	29.81	AV	100	65	Vertical
6	3410.0	1.77	29.16	54.00	24.84	AV	100	29	Vertical





Horizontal:



NO.	Freq. [MHz]	Factor [dB]	PK Value [dBµV/m]	PK Limit [dBµV/m]	PK Margin [dB]	Detect or	Height [cm]	Angle [°]	Polarity
1	1070.0	-2.87	37.96	70.00	32.04	Peak	100	41	Horizontal
2	1160.0	-2.92	36.96	70.00	33.04	Peak	100	123	Horizontal
3	1290.0	-2.85	36.05	70.00	33.95	Peak	100	30	Horizontal
4	1590.0	-3.30	36.47	70.00	33.53	Peak	100	174	Horizontal
5	2520.0	-0.48	36.73	70.00	33.27	Peak	100	342	Horizontal
6	3260.0	1.50	38.93	74.00	35.07	Peak	100	74	Horizontal

NO.	Freq. [MHz]	Factor [dB]	AV Value [dBµV/m]	AV Limit [dBµV/m]	AV Margin [dB]	Detect or	Height [cm]	Angle [°]	Polarity
1	1070.0	-2.87	23.07	50.00	26.93	AV	100	41	Horizontal
2	1160.0	-2.92	24.05	50.00	25.95	AV	100	123	Horizontal
3	1290.0	-2.85	21.94	50.00	28.06	AV	100	30	Horizontal
4	1590.0	-3.30	20.96	50.00	29.04	AV	100	174	Horizontal
5	2520.0	-0.48	27.85	50.00	22.15	AV	100	342	Horizontal
6	3260.0	1.50	23.91	54.00	30.09	AV	100	74	Horizontal



## 7.5. HARMONICS CURRENT MEASUREMENT

### 7.5.1. LIMITS OF HARMONICS CURRENT MEASUREMENT

Limit for Class A equipment		Limit for Class D equipment		
Harmonics Order N	Max. permissible harmonics current A	Harmonics Order n	Max. permissible harmonics current per watt mA/W	Max. permissible harmonics current A
Odd harmonics		Odd Harmonics only		
3	2.30	3	3.4	2.30
5	1.14	5	1.9	1.14
7	0.77	7	1.0	0.77
9	0.40	9	0.5	0.40
11	0.33	11	0.35	0.33
13	0.21	13	0.30	0.21
15 ≤ n ≤ 39	0.15x(15/n)	15 ≤ n ≤ 39 (odd harmonics only)	3.85/n	0.15x(15/n)
Even harmonics				
2	1.08			
4	0.43			
6	0.30			
8 ≤ n ≤ 40	0.23x8/n			

Limit for Class C equipment <sup>a</sup>	
Harmonics Order n	Max. permissible harmonics current expressed as a percentage of the input current at the fundamental frequency A
2	2
3	27 <sup>b</sup>
5	10
7	7
9	5
11 ≤ n < 39 (odd harmonics only)	3

<sup>a</sup>:For some Class C products, other emission limits apply (see EN IEC 61000-3-2 7.4).

<sup>b</sup>:The limit is determined based on the assumption of modern lighting technologies having power factors of 0,90 or higher

Note: Class A, B, C and D are classified according to item 7.5.2.of this report



### 7.5.2. TEST PROCEDURES

The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the maximum harmonic. The classification of EUT is according to section 5 of EN IEC 61000-3-2.

The EUT is classified as follows:

Class A:

Equipment not specified as belonging to Class B, C or D shall be considered as Class A equipment.

Some examples of Class A equipment are:

- balanced three-phase equipment;
- household appliances, excluding those specified as belonging to Class B, C or D;
- vacuum cleaners;
- high pressure cleaners;
- tools, excluding portable tools;
- independent phase control dimmers;
- audio equipment;
- professional luminaires for stage lighting and studios.

NOTE 1 Equipment that can be shown to have a significant effect on the supply system might be reclassified in a future edition of this document, taking into account the following factors:

- number of pieces of equipment in use;
- duration of use;
- simultaneity of use;
- power consumption;
- harmonic spectrum, including phase.

Class B:

- portable tools;
- arc welding equipment which is not professional equipment.

Class C:

- lighting equipment.

Class D:

Equipment having a specified power less than or equal to 600 W according to 6.3.2, of the following types:

- personal computers and personal computer monitors;

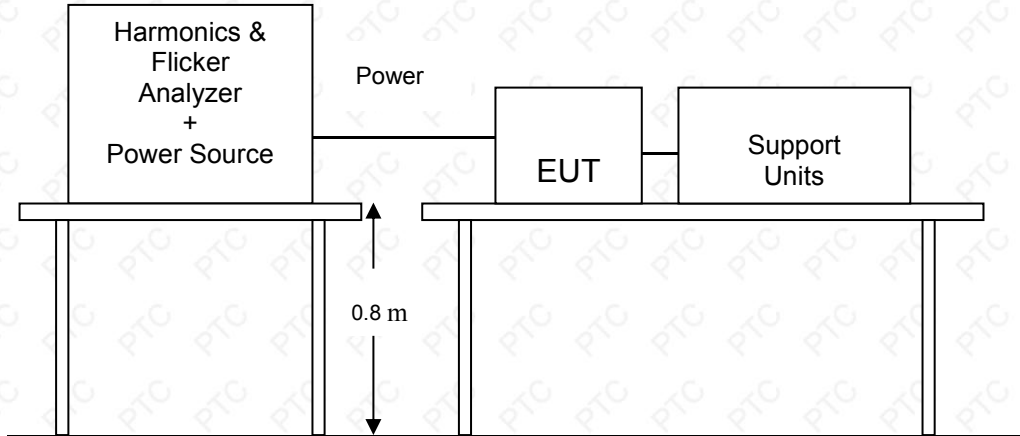


- television receivers;
- refrigerators and freezers having one or more variable-speed drives to control compressor motor(s).

NOTE 2 Class D limits are reserved for equipment that, by virtue of the factors listed in note 1 , can be shown to have a pronounced effect on the public electricity supply system.

The correspondent test program of test instrument to measure the current harmonics emanated from EUT is chosen. The measure time shall be not less than the time necessary for the EUT to be exercised.

### 7.5.3. TEST SETUP



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

### 7.5.4. TEST RESULT

N/A

## 7.6. VOLTAGE FLUCTUATION AND FLICKS MEASUREMENT

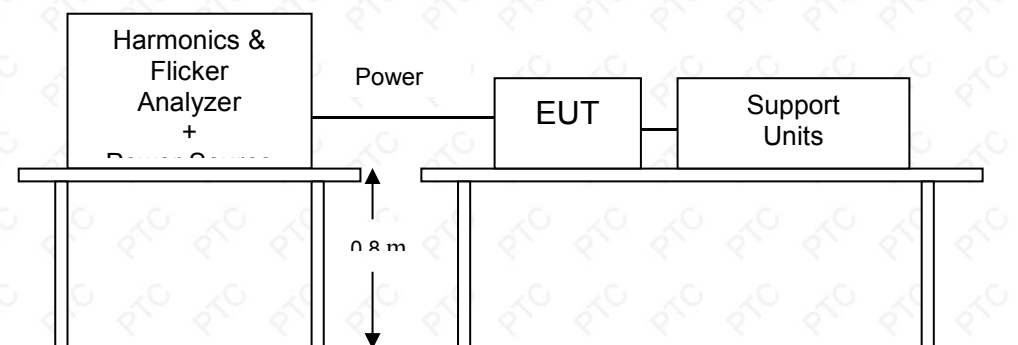
### 7.6.1. LIMITS OF VOLTAGE FLUCTUATION AND FLICKS MEASUREMENT

TEST ITEM	LIMIT	REMARK
$P_{st}$	1.0	$P_{st}$ means short-term flicker indicator.
$P_{lt}$	0.65	$P_{lt}$ means long-term flicker indicator.
$T_{dt}$ (ms)	500	$T_{dt}$ means maximum time that dt exceeds 3 %.
$d_{max}$ (%)	4/6/7 %	$d_{max}$ means maximum relative voltage change.
dc (%)	3.3 %	dc means relative steady-state voltage change

### 7.6.2. TEST PROCEDURE

The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the most unfavorable sequence of voltage changes under lighting operating conditions. During the flick measurement, the measure time shall include that part of whole operation cycle in which the EUT produce the most unfavorable sequence of voltage changes. The observation period for short-term flicker indicator is 10 minutes and the observation period for long-term flicker indicator is 2 hours.

### 7.6.3. TEST SETUP



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

### 7.6.4. TEST RESULT

<b>Product</b>	sweeping robot	<b>Tested by</b>	Bruce
<b>Model</b>	OB16	<b>Observation Period (Tp)</b>	10 mins
<b>Test Mode</b>	Charging	<b>Test Result</b>	Pass
<b>Environmental Conditions</b>	24.3°C, 54.5 % RH, 101.1 kPa		

Please refer to the following test data:



EUT: sweeping robot M/N:OB16

Tested by: Bruce

Test category: All parameters (European limits)

Test Margin: 100

Test date: 2023/7/25

Start time: 9:05:55

End time: 9:16:22

Test duration (min): 10

Data file name: F-000375.cts\_data

Comment: Comment

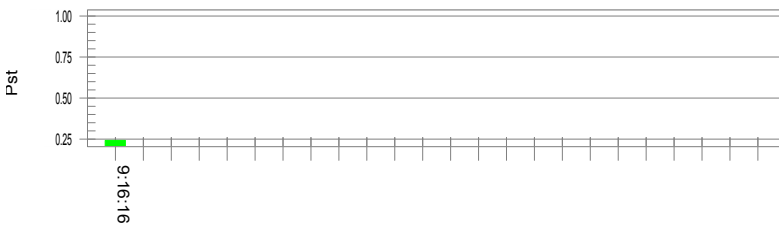
Customer: Guangdong Obao Intelligent Electric Appliance Co., LTD

Test Result: Pass

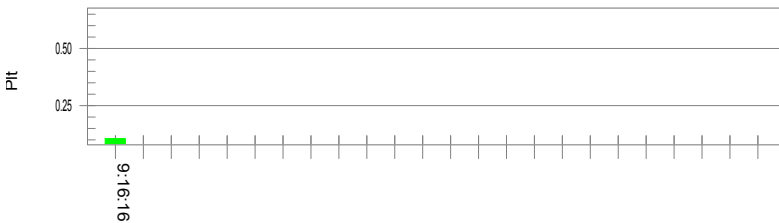
Status: Test Completed

Pst<sub>i</sub> and limit line

European Limits



Plt and limit line



**Parameter values recorded during the test:**

**Vrms at the end of test (Volt): 229.04**

**Highest dt (%):**

**Test limit (%):**

**T-max (mS): 0**

**Test limit (mS): 500.0 Pass**

**Highest dc (%): 0.00**

**Test limit (%): 3.30 Pass**

**Highest dmax (%): 0.00**

**Test limit (%): 4.00 Pass**

**Highest Pst (10 min. period): 0.242 Test limit:**

**1.000 Pass**

**Highest Plt (2 hr. period): 0.106 Test limit:**

**0.650 Pass**

**Highest Plt (2 hr. period): 0.096**

**Test limit: 0.650 Pass**



## 8. IMMUNITY TEST

### 8.1. GENERAL DESCRIPTION

Product Standard	EN IEC 55014-2	
	Test Type	Minimum Requirement
<b>Basic Standard, Specification, and Performance Criterion required</b>	IEC 61000-4-2	Electrostatic Discharge – ESD: ±8 kV air discharge, ±4 kV Contact discharge, Performance Criterion B
	IEC 61000-4-3	Radio-Frequency Electromagnetic Field Susceptibility Test – RS: 80 MHz to 1 GHz, 3 V/m, 80 % AM(1 kHz), Performance Criterion A
	IEC 61000-4-4	Electrical Fast Transient/Burst - EFT, Power line: ±1kV, Signal line: ±0.5kV, Performance Criterion B
	IEC 61000-4-5	Surge Immunity Test: 1.2/50 μs Open Circuit Voltage, 8 /20 μs Short Circuit Current, Power Port ~ Line to line: ±1 kV, Line to ground: ±2 kV Signal and Control Port : ±0.5 kV Performance Criterion B
	IEC 61000-4-6	Conducted Radio Frequency Disturbances Test –CS: 0.15 ~ 230 MHz, 3 Vrms, 80 % AM, 1 kHz, Performance Criterion A
	IEC 61000-4-11	Voltage Dips and Interruptions: 50/60Hz i) 0 % reduction for 0.5/0.5 period, Performance Criterion C ii) 40 % reduction for 10/12 period, Performance Criterion C iii) 70 % reduction for 25/30 period Performance Criterion C





## 8.2. GENERAL PERFORMANCE CRITERIA DESCRIPTION

<b>Criteria A:</b>	The apparatus shell continues to operate as intended without operator intervention. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. The performance level may be replaced by a permissible loss of performance. If the manufacturer does not specify the minimum performance level or the permissible performance loss, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.
<b>Criteria B:</b>	<p>After test, the apparatus shell continues to operate as intended without operator intervention. No degradation of performance or loss of function is allowed, after the application of the phenomenon below a performance level specified by the manufacturer, when the apparatus is used as intended. The performance level may be replaced by a permissible loss of performance.</p> <p>During the test, degradation of performance is however allowed. However, no change of operating state if stored data is allowed to persist after the test. If the manufacturer does not specify the minimum performance level or the permissible performance loss, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.</p>
<b>Criteria C:</b>	<p>Temporary loss of function is allowed, provided the functions is self-recoverable or can be restored by the operation of controls by the user in accordance with the manufacturer instructions.</p> <p>Functions, and/or information stored in non-volatile memory, or protected by a battery backup, shall not be lost.</p>



## 8.3. ELECTROSTATIC DISCHARGE (ESD)

### 8.3.1. TEST SPECIFICATION

<b>Basic Standard:</b>	IEC 61000-4-2
<b>Discharge Impedance:</b>	330 $\Omega$
<b>Working Capacity:</b>	150 pF
<b>Discharge Voltage:</b>	Air Discharge: $\pm 8$ kV (Direct) Contact Discharge: $\pm 4$ kV (Direct/Indirect)
<b>Polarity:</b>	Positive & Negative
<b>Number of Discharge:</b>	10 times at each test point
<b>Discharge Mode:</b>	1 time/s
<b>Performance Criterion:</b>	B

### 8.3.2. TEST PROCEDURE

The discharges shall be applied in two ways:

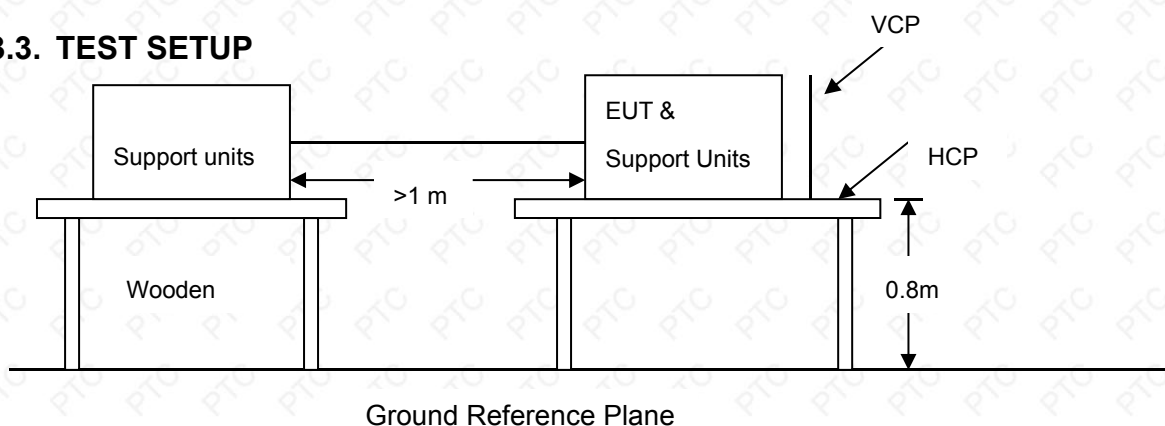
- a) Contact discharges to the conductive surfaces and coupling planes:  
Twenty dischargers (10 with positive and 10 with negative polarity) shall be applied on each accessible metallic part of the enclosure, terminals are excluded. In case of a non-conductive enclosure, dischargers shall be applied on the horizontal or vertical coupling planes. Test shall be performed at a maximum repetition rate of one discharge per second.
- b) Air discharges at slots and apertures and insulating surfaces:  
On those parts of the EUT where it is not possible to perform contact discharge testing, the equipment should be investigated to identify user accessible points where breakdown may occur. Such points are tested using the air discharge method. This investigation should be restricted to those area normally handled by the user. A minimum of 10 single air discharges shall be applied to the selected test point for each such area.

The basic test procedure was in accordance with IEC 61000-4-2:

- a) The EUT was located 0.1 m minimum from all side of the HCP (dimensions 1.6 m x 0.8 m).
- b) The support units were located another table 30 cm away from the EUT, but direct support unit was/were located at same location as EUT on the HCP and keep at a distance of 10cm with EUT.

- c) The time interval between two successive single discharges was at least 1 second.
- d) Contact discharges were applied to the non-insulating coating, with the pointed tip of the generator penetrating the coating and contacting the conducting substrate.
- e) Air discharges were applied with the round discharge tip of the discharge electrode approaching the EUT as fast as possible (without causing mechanical damage) to touch the EUT. After each discharge, the ESD generator was removed from the EUT and re-triggered for a new single discharge. The test was repeated until all discharges were complete.
- f) At least ten single discharges (in the most sensitive polarity) were applied at the front edge of each HCP opposite the center point of each unit of the EUT and 0.1 meters from the front of the EUT. The long axis of the discharge electrode was in the plane of the HCP and perpendicular to its front edge during the discharge.
- g) At least ten single discharges (in the most sensitive polarity) were applied to the center of one vertical edge of the Vertical Coupling Plane (VCP) in sufficiently different positions that the four faces of the EUT were completely illuminated. The VCP (dimensions 0.5 m x 0.5 m) was placed vertically to and 0.1 meters from the EUT.

### 8.3.3. TEST SETUP



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

Note:

#### 1) TABLE-TOP EQUIPMENT

The configuration consisted of a wooden table 0.8 meters high standing on the ground reference plane (GRP). The GRP consisted of a sheet of aluminum at least 0.25 mm thick, and 2.5 meters square connected to the protective grounding system. A horizontal coupling plane (HCP) (1.6 m x 0.8 m) was placed on the table and attached to the GRP by means of a cable with 940k total impedance. The

equipment under test, was installed in a representative system as described in section 7 of IEC



61000-4-2, and its cables were placed on the HCP and isolated by an insulating support of 0.5 mm thickness. A distance of 1-meter minimum was provided between the EUT and the walls of the laboratory and any other metallic structure.

2) FLOOR-STANDING EQUIPMENT

The equipment under test was installed in a representative system as described in section 7 of IEC 61000-4-2, and its cables were isolated from the ground reference plane by an insulating support of 0.1 meter thickness. The GRP consisted of a sheet of aluminum that is at least 0.25 mm thick, and 2.5 meters square connected to the protective grounding system and extended at least 0.5 meters from the EUT on all sides.

8.3.4. TEST RESULT

<b>Product</b>	sweeping robot	<b>Environmental Conditions</b>	24.3°C, 52 % RH, 101.2 kPa
<b>Model</b>	OB16	<b>Tested By</b>	Bruce
<b>Test mode</b>	Working,Charging	<b>Test Result</b>	Pass

Air Discharge					
Test Points	Test Levels	Results			
	± 8 kV	Pass	Fail	Observation	Performance Criterion
GAP	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Note <input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C	B
Hull	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Note <input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C	B

Contact Discharge					
Test Points	Test Levels	Results			
	± 4 kV	Pass	Fail	Observation	Performance Criterion
HCP	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Note <input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C	B
VCP	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Note <input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C	B

Note: A) There was no change compared with initial operation during the test.

B) During the test, degradation of performance is allowed. However, no change of operating state or stored data is allowed to persist after the test. If the minimum performance level (or the permissible performance loss) is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the EUT if used as intended.

C) During and after testing, a temporary loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls or cycling of the power to the EUT by the user in accordance with the manufacturer's instructions.



## 8.4. RADIATED RADIO-FREQUENCY, ELECTROMAGNETIC FIELD (RS)

### 8.4.1. TEST SPECIFICATION

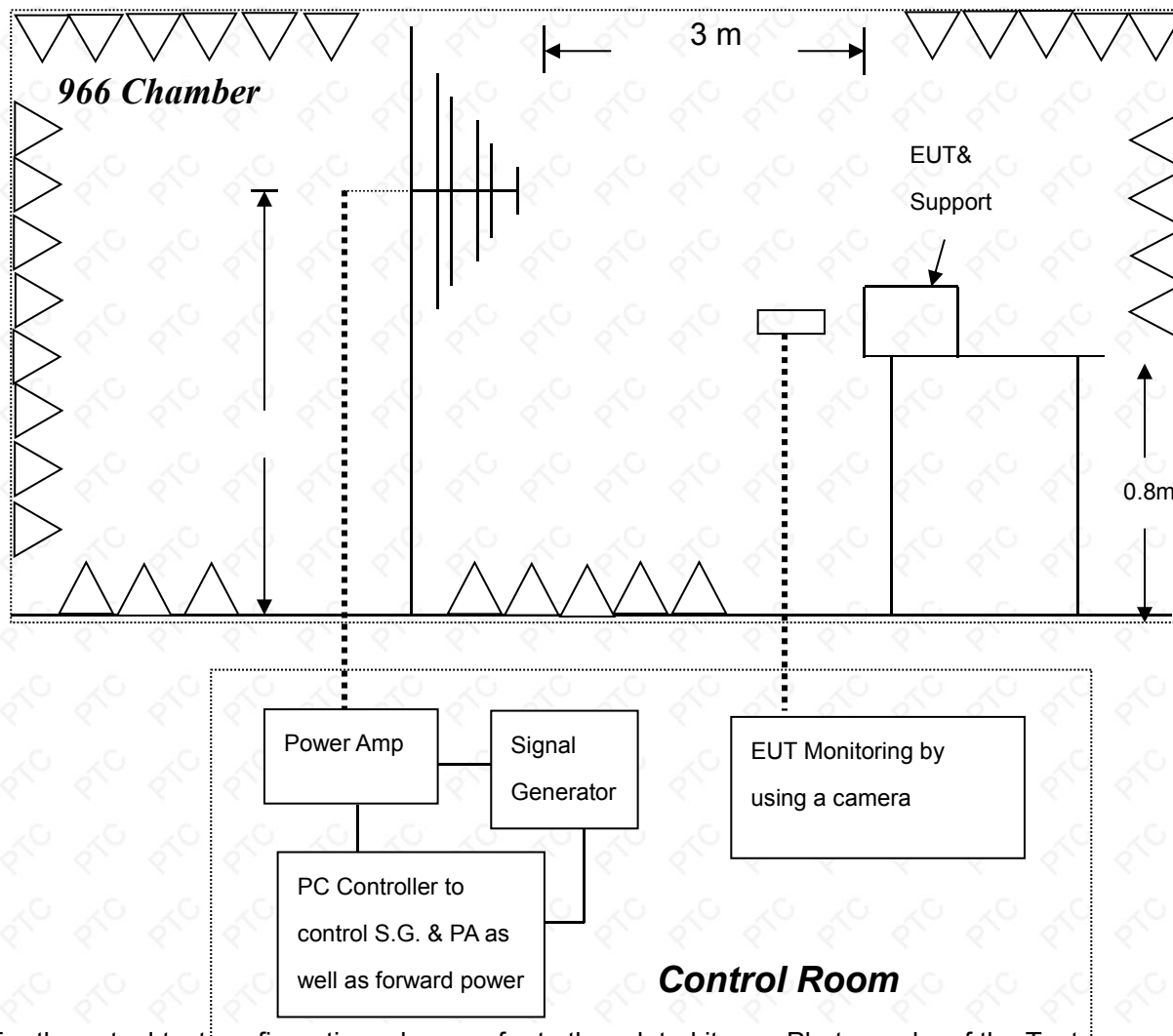
<b>Basic Standard:</b>	IEC 61000-4-3
<b>Frequency Range:</b>	80 MHz ~ 1000 MHz
<b>Field Strength:</b>	3 V/m
<b>Modulation:</b>	1 kHz Sine Wave, 80 %, AM Modulation
<b>Frequency Step:</b>	1 % of preceding frequency value
<b>Polarity of Antenna:</b>	Horizontal and Vertical
<b>Test Distance:</b>	3 m
<b>Antenna Height:</b>	1.5 m
<b>Performance Criterion:</b>	A

### 8.4.2. TEST PROCEDURE

The test procedure was in accordance with IEC 61000-4-3

- The testing was performed in a fully anechoic chamber. The transmit antenna was located at a distance of 3 meters from the EUT.
- The frequency range is swept from 80 MHz to 1000 MHz, with the signal 80% amplitude modulated with a 1 kHz sine-wave. The rate of sweep did not exceed  $1.5 \times 10^{-3}$  decade/s, where the frequency range is swept incrementally, the step size was 1 % of preceding frequency value.
- The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.
- The test was performed with the EUT exposed to both vertically and horizontally polarized fields on each of the four sides.

### 8.4.3. TEST SETUP



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

Note:

#### TABLETOP EQUIPMENT

The EUT installed in a representative system as described in section 7 of IEC 61000-4-3 was placed on a non-conductive table 0.8 meters in height. The system under test was connected to the power and signal wire according to relevant installation instructions.

#### FLOOR STANDING EQUIPMENT

The EUT installed in a representative system as described in section 7 of IEC 61000-4-3 was placed on a non-conductive wood support 0.1 meters in height. The system under test was connected to the power and signal wire according to relevant installation instructions.



#### 8.4.4. TEST RESULT

<b>Product</b>	sweeping robot	<b>Environmental Conditions</b>	24.3°C, 53 % RH, 101.1 kPa
<b>Model</b>	OB16	<b>Tested By</b>	Bruce
<b>Test mode</b>	Working,Charging	<b>Test Result</b>	Pass

Frequency (MHz)	Polarity	Position	Field Strength (V/m)	Observation	Performance Criterion
80 ~ 1000	V&H	Front	3	Note <input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C	A
80 ~ 1000	V&H	Rear	3	Note <input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C	A
80 ~ 1000	V&H	Left	3	Note <input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C	A
80 ~ 1000	V&H	Right	3	Note <input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C	A

Note: A) There was no change compared with initial operation during the test.

B) During the test, degradation of performance is allowed. However, no change of operating state or stored data is allowed to persist after the test. If the minimum performance level (or the permissible performance loss) is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the EUT if used as intended.

C) During and after testing, a temporary loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls or cycling of the power to the EUT by the user in accordance with the manufacturer's instructions.



## 8.5. ELECTRICAL FAST TRANSIENT (EFT)

### 8.5.1. TEST SPECIFICATION

<b>Basic Standard:</b>	IEC 61000-4-4
<b>Test Voltage:</b>	Power Line: $\pm 1$ kV Signal/Control Line: $\pm 0.5$ kV
<b>Polarity:</b>	Positive & Negative
<b>Impulse Frequency:</b>	5 kHz
<b>Impulse Wave-shape:</b>	5/50 ns
<b>Burst Duration:</b>	15 ms
<b>Burst Period:</b>	300 ms
<b>Test Duration:</b>	2 mins
<b>Performance Criterion:</b>	B

### 8.5.2. TEST PROCEDURE

EUT is placed on a 0.1 m tall wooden table.

EUT operate at normal mode, the transient/burst was 5/50 ns in accordance with IEC 61000-4-4, both positive and negative polarity burst waveform were applied.

The duration time of each test line was 2 minutes.

### 8.5.3. TEST SETUP

The EUT installed in a representative system as described in section 7 of IEC 61000-4-4.

For the actual test configuration, please refer to the related item – photographs of the test configuration.





**8.5.4. TEST RESULT**

<b>Product</b>	sweeping robot	<b>Environmental Conditions</b>	24.3°C, 52 % RH, 101.2 kPa
<b>Model</b>	OB16	<b>Tested By</b>	Bruce
<b>Test mode</b>	Charging	<b>Test Result</b>	Pass

Test Point	Polarity	Test Level (kV)	Observation	Performance Criterion
L	+/-	1	Note <input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C	B
N	+/-	1	Note <input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C	B
L – N	+/-	1	Note <input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C	B
RJ45 UTP cable	--	--	--	--

Note: A) There was no change compared with initial operation during the test.

B) During the test, degradation of performance is allowed. However, no change of operating state or stored data is allowed to persist after the test. If the minimum performance level (or the permissible performance loss) is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the EUT if used as intended.

C) During and after testing, a temporary loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls or cycling of the power to the EUT by the user in accordance with the manufacturer’s instructions.



## 8.6. SURGE IMMUNITY TEST

### 8.6.1. TEST SPECIFICATION

<b>Basic Standard:</b>	IEC 61000-4-5
<b>Wave-Shape:</b>	Combination Wave 1.2/50 $\mu$ s Open Circuit Voltage 8/20 $\mu$ s Short Circuit Current
<b>Test Voltage:</b>	Power Port ~ Line to line: $\pm 1$ kV, Line to ground: $\pm 2$ kV
<b>Surge Input/Output:</b>	Power Line: L-N / L-PE / N-PE
<b>Generator Source Impedance:</b>	2 $\Omega$ between networks 12 $\Omega$ between network and ground
<b>Polarity:</b>	Positive/Negative
<b>Phase Angle:</b>	90°(positive polarity pulses) / 270°(negative polarity pulses)
<b>Pulse Repetition Rate:</b>	1 time / min
<b>Number of Tests:</b>	5 positive polarity pulses at the 90° phase angle, and 5 negative polarity pulses at 270° phase angle
<b>Performance Criterion:</b>	B

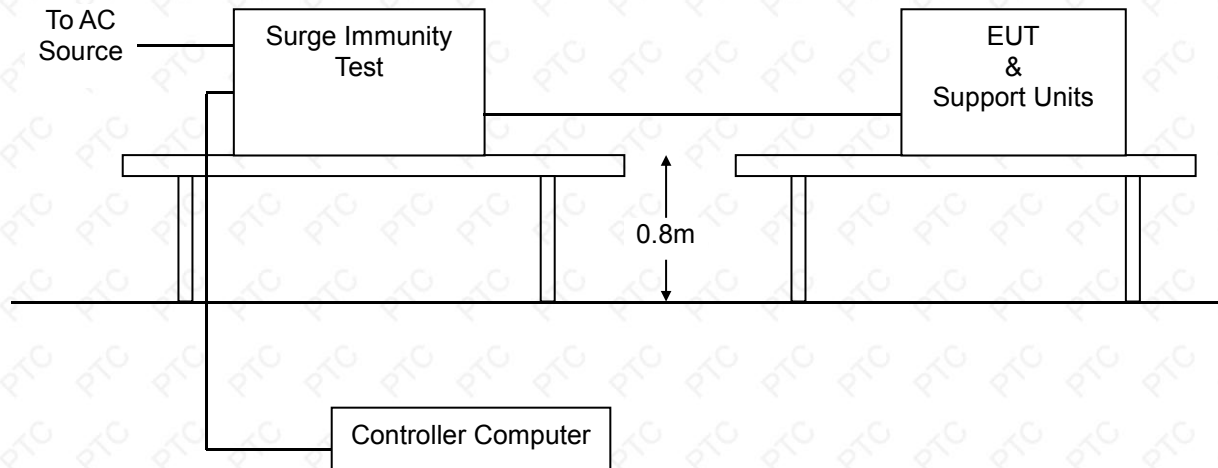
### 8.6.2. TEST PROCEDURE

EUT is placed on a 0.1 m (table type equipment) / 0.8 m (floor type equipment) tall wooden table.

EUT operate at normal mode, two types of combination wave generator (1.2/50 us open-circuit voltage and 8/20 us short-circuit current) are applied to the EUT power supply terminals via the capacitive coupling network.

The power cord between the EUT and the coupling/decoupling network shall not exceed 2 m in length.

### 8.6.3. TEST SETUP



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

### 8.6.4. TEST RESULT

<b>Product</b>	sweeping robot	<b>Environmental Conditions</b>	24.3°C, 52 % RH, 101.2 kPa
<b>Model</b>	OB16	<b>Tested By</b>	Bruce
<b>Test mode</b>	Charging	<b>Test Result</b>	Pass

Test Point	Polarity	Test Level (kV)	Observation	Performance Criterion
L - N	+/-	1	Note <input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C	B

Note: A) There was no change compared with initial operation during the test.

B) During the test, degradation of performance is allowed. However, no change of operating state or stored data is allowed to persist after the test. If the minimum performance level (or the permissible performance loss) is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the EUT if used as intended.

C) During and after testing, a temporary loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls or cycling of the power to the EUT by the user in accordance with the manufacturer's instructions.

## 8.7. CONDUCTED RADIO FREQUENCY DISTURBANCES (CS)

### 8.7.1. TEST SPECIFICATION

<b>Basic Standard:</b>	IEC 61000-4-6
<b>Frequency Range:</b>	0.15 MHz ~230 MHz
<b>Field Strength:</b>	3 V
<b>Modulation:</b>	1 kHz Sine Wave, 80 %, AM Modulation
<b>Frequency Step:</b>	1 % of preceding frequency value
<b>Coupled cable:</b>	Power Mains, Shielded
<b>Coupling device:</b>	CDN-M3/2 (3 wires/2 wires)
<b>Performance Criterion:</b>	A

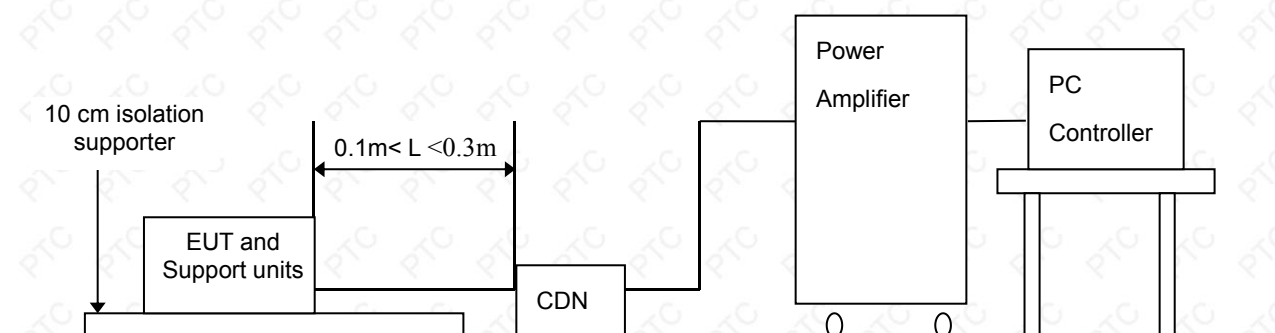
### 8.7.2. TEST PROCEDURE

The EUT shall be tested within its intended operating and climatic conditions.

The test shall be performed with the test generator connected to each of the coupling and decoupling devices in turn, while the other non-excited RF input ports of the coupling devices are terminated by a 50 Ω load resistor.

The frequency range was swept from 150 kHz to 230 MHz, using the signal level established during the setting process and with a disturbance signal of 80 % amplitude. The signal was modulated with a 1 kHz sine wave, pausing to adjust the RF signal level or the switch coupling devices as necessary. The sweep rate was  $1.5 \times 10^{-3}$  decades/s. Where the frequency range is swept incrementally, the step size was 1 % of preceding frequency value the dwell time of the amplitude modulated carrier at each frequency was 0.5 s.

### 8.7.3. TEST SETUP



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration

Note: 1) The EUT is setup 0.1 m above Ground Reference Plane

2) All relevant cables shall be provided with the appropriate coupling and decoupling devices at a distance between 0.1 meters and 0.3 meters from the projected geometry of the EUT on the ground reference plane.



#### 8.7.4. TEST RESULT

<b>Product</b>	sweeping robot	<b>Environmental Conditions</b>	23.9°C, 50 % RH, 100.6 kPa
<b>Model</b>	OB16	<b>Tested By</b>	Bruce
<b>Test mode</b>	Charging	<b>Test Result</b>	Pass

Frequency (MHz)	Field Strength (Vrms)	Injected Position	Injection Method	Observation	Performance Criterion
0.15 ~ 230	3	AC Mains	CDN-M2/M3	Note <input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C	A

Note: A) There was no change compared with initial operation during the test.

B) During the test, degradation of performance is allowed. However, no change of operating state or stored data is allowed to persist after the test. If the minimum performance level (or the permissible performance loss) is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the EUT if used as intended.

C) During and after testing, a temporary loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls or cycling of the power to the EUT by the user in accordance with the manufacturer's instructions.

## 8.8. VOLTAGE DIP & VOLTAGE INTERRUPTIONS

### 8.8.1. TEST SPECIFICATION

<b>Basic Standard:</b>	IEC 61000-4-11
<b>Test Duration Time:</b>	3 test events in sequence
<b>Interval Between Event:</b>	10 seconds
<b>Phase Angle:</b>	0°
<b>Test Cycle:</b>	3 times
<b>Performance Criterion:</b>	C

### 8.8.2. TEST PROCEDURE

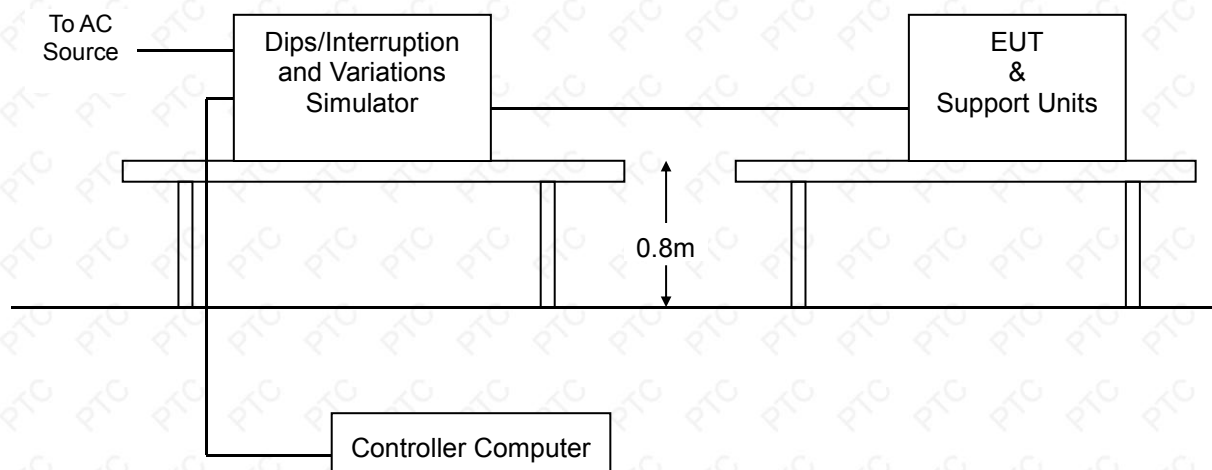
The EUT and support units were located on a wooden table, 0.8 m away from ground floor.

Setting the parameter of tests and then perform the test software of test simulator.

Changes to the voltage level shall occur at 0 degree crossing point in the a.c. voltage waveform.

Record the test result in test record form.

### 8.8.3. TEST SETUP



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.



**8.8.4. TEST RESULT**

<b>Product</b>	sweeping robot	<b>Environmental Conditions</b>	24.3°C, 54 % RH, 101.2 kPa
<b>Model</b>	OB16	<b>Tested By</b>	Bruce
<b>Test mode</b>	Charging	<b>Test Result</b>	Pass

<b>Test Power: 110/230 Vac, 50/60 Hz</b>			
<b>Voltage (% Reduction)</b>	<b>Duration (Period)</b>	<b>Observation</b>	<b>Performance Criterion</b>
0	0.5/0.5	Note <input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C	C
40	10/12	Note <input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C	C
70	25/30	Note <input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C	C

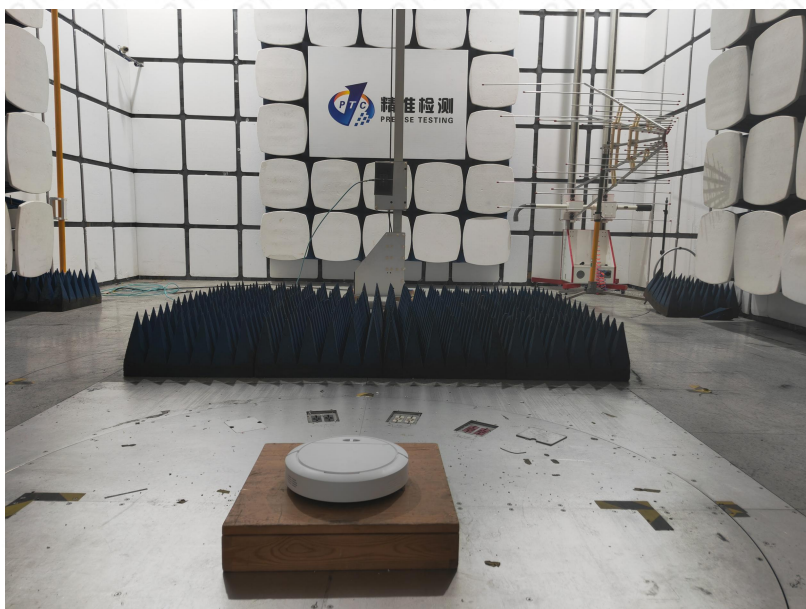
- Note: A) There was no change compared with initial operation during the test.  
 B) During the test, degradation of performance is allowed. However, no change of operating state or stored data is allowed to persist after the test. If the minimum performance level (or the permissible performance loss) is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the EUT if used as intended.  
 C) During and after testing, a temporary loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls or cycling of the power to the EUT by the user in accordance with the manufacturer's instructions.



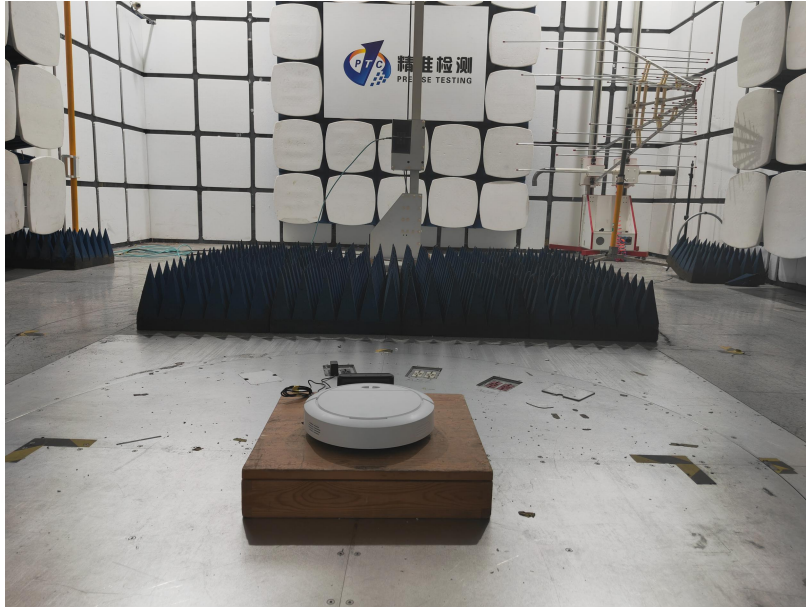
## 9. PHOTOGRAPHS OF THE TEST CONFIGURATION CONDUCTED EMISSION TEST

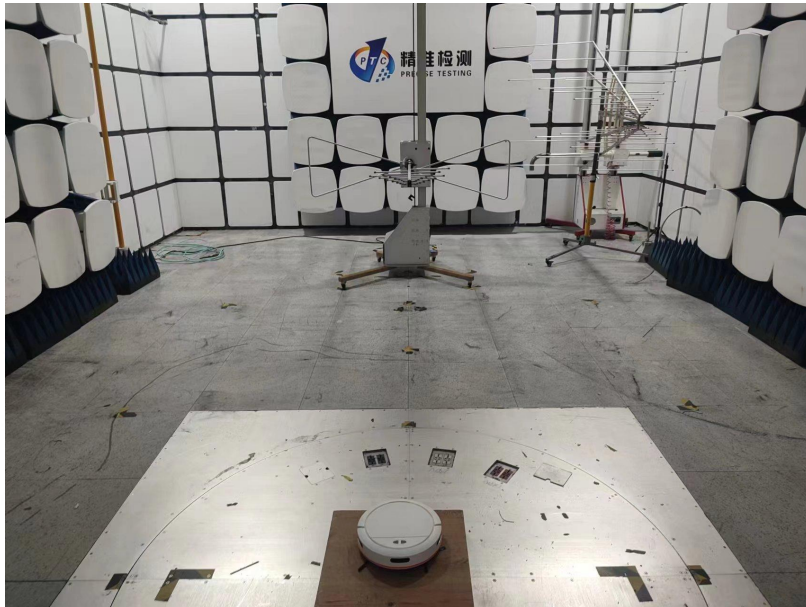


### RADIATED EMISSION TEST





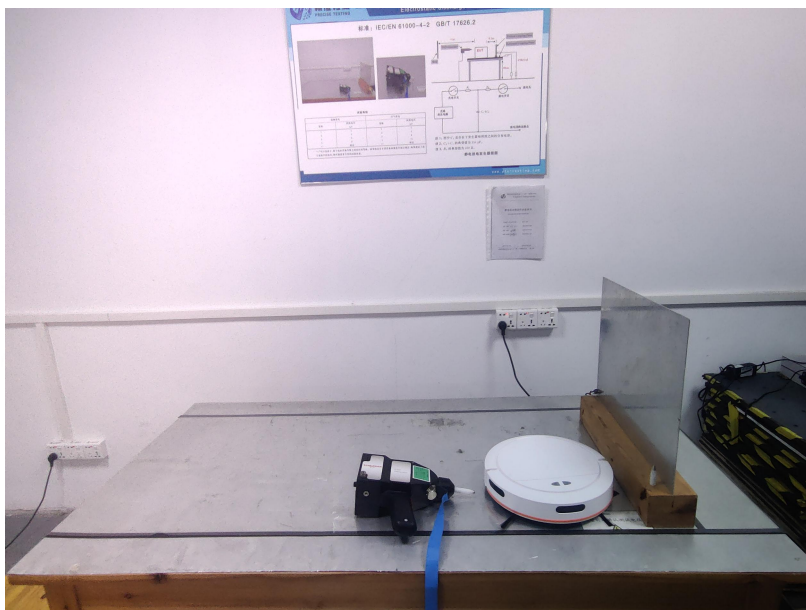




### Voltage Fluctuations and Flicker



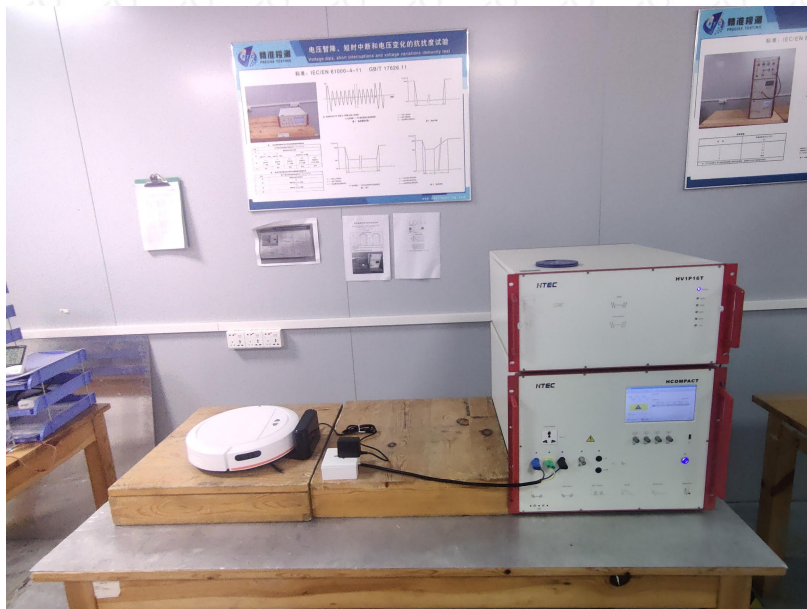
### ESD TEST



### EFT TEST

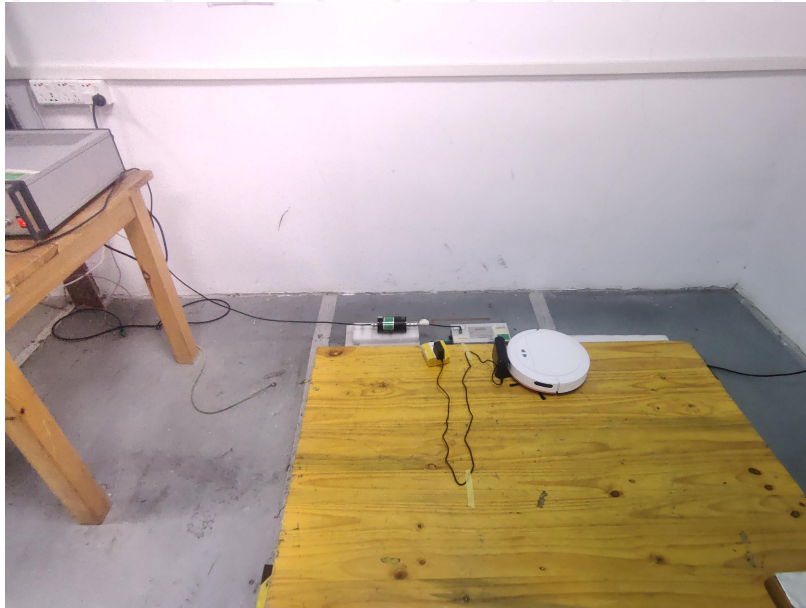


### SURGE TEST

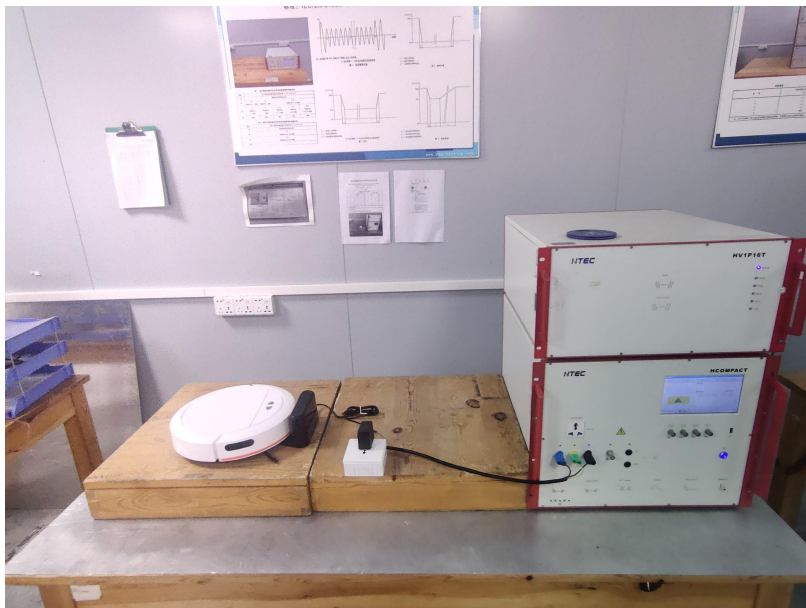




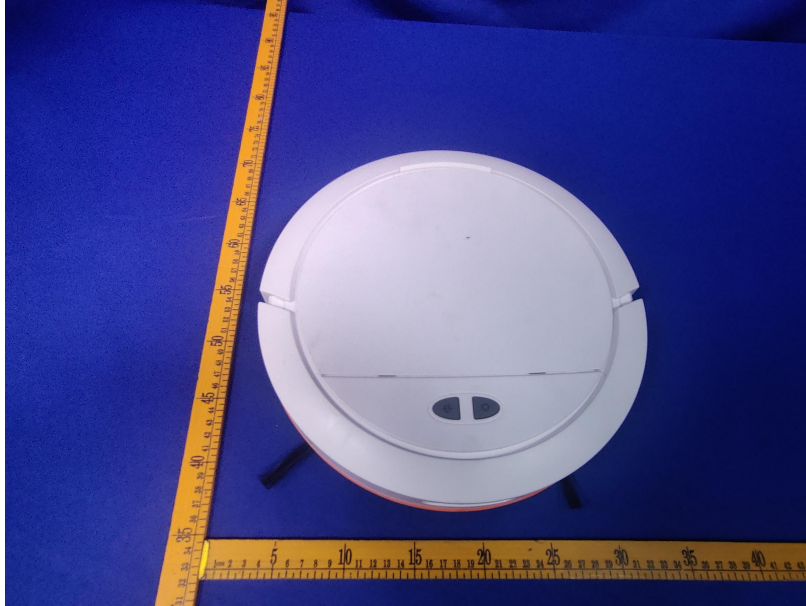
### CS TEST



### DIPS TEST

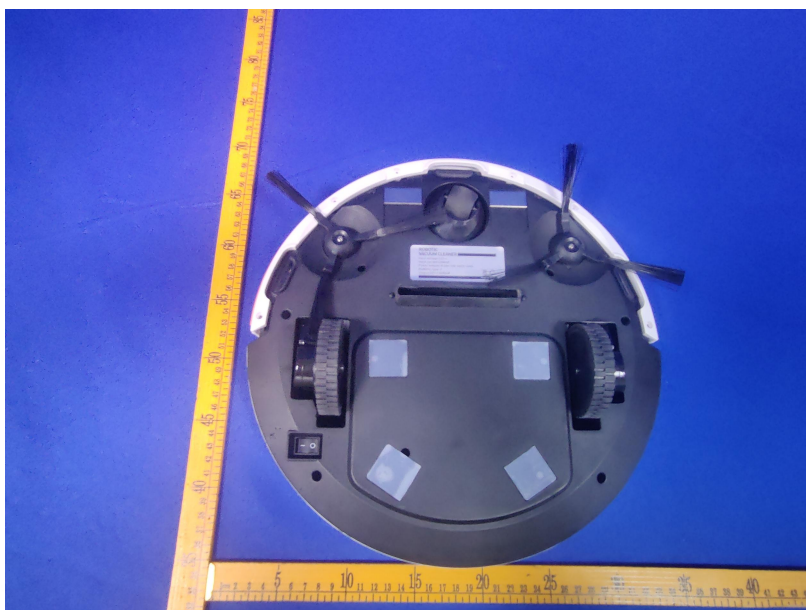


## 10. PHOTOGRAPHS OF EUT











— End of report —