LVD TEST REPORT

NEW-STANDARD

Report No	NSL-160714010104-R
Applicant	Wuxi Sans Electronic Co., Ltd Industrial WuYi, DongGang Town, Wuxi City, Jiangsu Province, China
Product	Li-ion Battery Charger SSLC109V55
Specification	EN 60335-2-29: 2004 +A2: 2010 EN 60335-1: 2012 EN 62233: 2008
Results	Complies with the requirements of the above specification
Authorized by	Robert Song (Laboratory Director)
Issue Date	16 July, 2014
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All applicable tests according to the above specified standard, See clauses tested of the test report. Test results are valid only for the tested samples. This report shall not be reproduced, except in full, without the written approval of the NEW-STANDARD laboratory.

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TEST REPORT

Safety of household and similar electrical appliances
Part 2: Particular requirements for battery chargers

Report:

Report No. ..... :	NSL-160714010104-R
Tested by (Printed name and signature) ..... :	Kawe Zhou
Approved by (Printed name and signature) ..... :	Robert Song
Date of issue ..... :	16 July, 2014
Total number of pages ..... :	95

Client:

Applicant name ..... :	Wuxi Sans Electronic Co., Ltd
Address ..... :	Industrial WuYi, DongGang Town, Wuxi City, Jiangsu Province, China
Manufacturer name ..... :	Same as applicant
Address ..... :	--
Factory name ..... :	Same as applicant
Address ..... :	--

Testing Laboratory:

Name ..... :	SUZHOU NEW-STANDARD LABORATORY CO LTD
Address ..... :	NO. 199, JINFENG ROAD, SUZHOU, 215011 P. R. CHINA
Testing location ..... :	Same as above

Test specification:

Standard ..... :	EN 60335-2-29: 2004 +A2: 2010 EN 60335-1: 2012 EN 62233: 2008
Non-standard test method ..... :	--

Test Item:

Product/Description ..... :	Li-ion Battery Charger
Trade Mark ..... :	SANS
Model/Type reference ..... :	SSLC109V55
Ratings ..... :	Input: 100-240 V ～, 47-63 Hz, 2.0 A MAX Output: 54.6 VDC, 2.0 A

Copy of marking plate

Test item particulars:

Classification of installation and use ..... : Portable appliance, Class I

Supply connection ..... : Detachable power cord with plug, Type Y

Possible test case verdicts:

- test case does not apply to the test object ..... : N (Not applicable)

- test object does meet the requirement ..... : P (Pass)

- test object does not meet the requirement ..... : F (Fail)

Testing:

Date of receipt of test item ..... : 01 July, 2014

Date(s) of performance of tests ..... : 01 July, 2014 to 16 July, 2014

Environmental condition:

Ambient temperature (°C) ..... : 23-25

Relative humidity (%) ..... : 35-48

Atmospheric pressure (kPa) ..... : 102.1-102.9

General remarks:

"(see remark #)" refers to a remark appended to the report.

"(see Annex #)" refers to an annex appended to the report.

"(see appended table)" refers to a table in the Test Report.

Throughout this report a point is used as the decimal separator.

When determining of test conclusion, measurement uncertainty of test has been considered.

General product information

This Li-ion Battery Charger is for household and indoor use. It's designed for charging Li-ion rechargeable battery only.

The distances between output and accessible parts of output connector are complied with reinforce insulation.

SUMMARY OF TESTING

CLAUSE	TEST(S)	RESULT
7	Marking shall be durable and easily	P
8	Protection against access to live parts	P
9	Starting of motor-operated appliances	N
10	Power input and current	P
11	Heating	P
13	Leakage current and electric strength at operating	P
14	Transient overvoltage	N
15	Moisture resistance	P
16	Leakage current and electric strength	P
17	Overload protection of transformers and associated	P
18	Endurance	N
19	Abnormal operation	P
20	Stability and mechanical hazards	P
21	Mechanical strength	P
22	Construction	P
23	Internal wiring	P
24	Components	P
25	Supply connection and external flexible cords	P
26	Terminals for external conductors	P
27	Provision for earthing	P
28	Screws and connections	P
29	Creepage distances, clearances and distance through	P
30	Resistance to heat and fire	P
31	Resistance to rusting	P
32	Radiation, toxicity and similar hazards	P

Remarks

EN 60335-2-29			
Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
5	**GENERAL CONDITIONS FOR THE TESTS**		**P**
	Tests performed according to cl. 5, e.g. nature of supply, sequence of testing, etc.		P
5.2	If the test of 21.101 is carried out, two additional battery chargers are required (IEC 60335-2-29)		P
5.101	Battery chargers tested as motor-operated appliances (IEC 60335-2-29)		P
6	**CLASSIFICATION**		**P**
6.1	Protection against electric shock: Class 0, 0I, I, II, III ..... :	Class I	P
6.2	Protection against harmful ingress of water		N
7	**MARKING AND INSTRUCTIONS**		**P**
7.1	Rated voltage or voltage range (V)..... :	100-240	P
	Symbol for nature of supply, or ..... :	~	P
	Rated frequency (Hz) ..... :	47-63	P
	Rated power input (W), or ..... :	--	N
	Rated current (A) ..... :	2.0	P
	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 5172 of IEC 60417, for Class II appliances		N
	IP number, other than IPX0 ..... :	--	N
	Symbol IEC 60417-5180, for class III appliances, unless		N
	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
	Battery chargers marked with (IEC 60335-2-29):		P
	- rated d.c. output voltage (V)	54.6	P
	- rated d.c. output current (A)	2.0	P
	- rated current (A) of protective devices incorporated in a d.c. distribution board		N
	- polarity of the output terminals indicated by symbol IEC 60417-5005 for the positive terminal and IEC 60417-5006 for the negative terminal (IEC 60335-2-29/A2)	(See copy of marking plate)	P
	- time-current characteristic of fuse-links of the time-lag type		N
	If the output exceeds 20 VA, battery chargers marked with (IEC 60335-2-29):	(See copy of marking plate)	P

EN 60335-2-29			
Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	- before charging, read the instructions	(See copy of marking plate)	P
	- for indoor use or do not expose to rain, unless appliance is at least IPX4	(See copy of marking plate)	P
	If the output exceeds 20 VA and the battery charger is for lead-acid batteries, battery chargers marked with (IEC 60335-2-29):	(See copy of marking plate)	P
	- disconnect the supply before making or breaking the connections to the battery	(See copy of marking plate)	P
	- WARNING: Explosive gases. Prevent flames and sparks. Provide adequate ventilation during charging.	(See copy of marking plate)	P
	Battery chargers incorporating an engine cracking switch allowing the charger to supply a supplementary starting current for the engine marked with (IEC 60335-2-29):		N
	- maximum “on” time		N
	- minimum “off” time or maximum ratio between “on” time and “off” time		N
7.2	Warning for stationary appliances for multiple supply		N
	Warning placed in vicinity of terminal cover		N
7.3	Range of rated values marked with the lower and upper limits separated by a hyphen	100-240 V AC	P
	Different rated values marked with the values separated by an oblique stroke		N
7.4	Appliances adjustable for different rated voltages, the voltage setting is clearly discernible		N
	Output voltage clearly discernible if the battery charger can be adjusted to different rated d.c. output voltages (IEC 60335-2-29)		N
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		P
	the power input is related to the arithmetic mean value of the rated voltage range		N
	Relation between marking for upper and lower limits of rated power input or rated current and voltage is clear		N
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		N
	Units of physical quantities and their symbols according to international standardized system		P
7.7	Connection diagram fixed to appliances to be connected to more than two supply conductors and appliances for multiple supply, unless		N

EN 60335-2-29			
Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	correct mode of connection is obvious		N
7.8	Except for type Z attachment, terminals for connection to the supply mains indicated as follows:		N
	- marking of terminals exclusively for the neutral conductor (N)		N
	- marking of protective earthing terminals (symbol 5019 of IEC 60417)		N
	- marking not placed on removable parts		N
7.9	Marking or placing of switches which may cause a hazard		N
7.10	Indications of switches on stationary appliances and controls on all appliances by use of figures, letters or other visual means ..... :	--	N
	The figure 0 indicates only OFF position, unless no confusion with the OFF position		N
7.11	Indication for direction of adjustment of controls		N
7.12	Instructions for safe use provided		P
	Details concerning precautions during user maintenance		P
	The instructions state that:	Provided in the manual	P
	- 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
	Instructions for class III appliances state that it must only be supplied at SELV, unless		N
	it is a battery-operated appliance, the battery being charged outside the appliance		N
	Ensure that the fan is switched off from the supply mains before removing the guard.		N
	Instructions for safe use contains (IEC 60335-2-29):		P
	- specification of types, number of cells and rated capacity of batteries that can be charged		P
	- warning against recharging non-rechargeable batteries		P
	- statement that during charging, batteries must be placed in the well ventilated area, only for battery chargers for lead-acid batteries		P
	- statement that battery chargers must only be plugged into an earthed socket-outlet, only for portable Class I		N

EN 60335-2-29			
Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	battery chargers for outdoor use		
	- explanation of automatic function stating any limitation, only for automatic battery chargers		N
	Battery chargers for charging automobile batteries include substance concerning (IEC 60335-2-29):		N
	- way of connection of battery terminal to chassis		N
	- way of disconnection of battery charger and chassis connection		N
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
	Statement above connection to the supply, only for battery chargers for installation in caravans and similar vehicles (IEC 60335-2-29)		N
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
7.12.3	Insulation of the fixed wiring in contact with parts exceeding 50 K during clause 11; instructions stating that the fixed wiring must be protected		N
7.12.4	Instructions for built-in appliances:		N
	- dimensions of space		N
	- dimensions and position of supporting and fixing		N
	- distances between parts and surrounding structure		N
	- dimensions of ventilation openings and arrangement		N
	- connection to supply mains and interconnection of separate components		N
	- allow disconnection of the appliance after installation, by accessible plug or a switch in the fixed wiring, unless		N
	a switch complying with 24.3		N
7.12.5	Replacement cord instructions, type X attachment with a specially prepared cord		N
	Replacement cord instructions, type Y attachment		P
	Replacement cord instructions, type Z attachment		N
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
7.12.7	Instructions for fixed appliances stating how the		N

EN 60335-2-29			
Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	appliance is to be fixed		
7.12.8	Instructions for appliances connected to the water mains:		N
	- max. inlet water pressure (Pa) .....:	--	N
	- min. inlet water pressure, if necessary (Pa).....:	--	N
	Instructions concerning new and old hose-sets for appliances connected to the water mains by detachable hose-sets		N
7.13	Instructions and other texts in an official language	English	P
7.14	Marking clearly legible and durable, rubbing test as specified		P
7.15	Marking 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		N
	For stationary appliances, name, trademark or identification mark and model or type reference visible after installation		N
	For fixed appliances, name, trademark or identification mark and model or type reference visible after installation according to the instructions		N
	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		N
7.16	Marking of a possible replaceable thermal link or fuse link clearly visible with regard to replacing the link		N
7.101	D.C. distribution boards marked with (IEC 60335-2-29):		N
	- maximum output current (A) for each output circuit ...:	--	N
	- types of any additional power supply which can be connected		N

8	**PROTECTION AGAINST ACCESS TO LIVE PARTS**		**P**
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
	Insertion or removal of lamps, protection against contact with live parts of the lamp cap		N
	Use of test probe B of IEC 61032, with a force not		P

EN 60335-2-29			
Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	exceeding 1 N: no contact with live parts		
8.1.2	Use of test probe 13 of IEC 61032 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		P
8.1.3	For appliances other than class II, use of test probe 41 of IEC 61032: no contact with live parts of visible glowing heating elements		N
8.1.4	Accessible part not considered live if:		P
	- safety extra-low a.c. voltage: peak value not exceeding 42. 4 V		N
	- safety extra-low d.c. voltage: not exceeding 42.4 V		P
	- or separated from live parts by protective impedance		N
	If protective impedance: d.c. current not exceeding 2 mA, and		N
	a.c. peak value not exceeding 0.7 mA		P
	- for peak values over 42.4 V up to and including 450 V, capacitance not exceeding 0.1 µF		N
	- for peak values over 450 V up to and including 15 kV, discharge not exceeding 45 µC		N
	- for peak values over 15 kV, the energy in the discharge not exceeding 350 mJ		N
8.1.5	Live parts protected at least by basic insulation before installation or assembly:		N
	- built-in appliances		N
	- built-in appliances		N
	- appliances delivered in separate units		N
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**		**N**
	Requirements and tests are specified in part 2 when necessary		N
10	**MARKING AND INSTRUCTIONS**		**P**
10.1	Power input at normal operating temperature, rated		N

EN 60335-2-29			
Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	voltage and normal operation not deviating from rated power input by more than shown in table 1		
	Test carried out at upper and lower limits of the ranges for appliances with one or more rated voltage ranges, unless		N
	the rated power input is related to the arithmetic mean value		N
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 10.2)	P
	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
10.101	No-load d.c. output voltage does not exceed 42.2 V (IEC 60335-2-29)	(See appended table 10.101)	P
10.102	Arithmetic mean value of output current does not deviate from rated d.c. output current by more than 10 % (IEC 60335-2-29)	(See appended table 10.102)	P
11	**HEATING**		**P**
11.1	No excessive temperatures in normal use		P
11.2	Placing and mounting of battery chargers in the test corner as specified for heating appliances (IEC 60335-2-29)		P
11.3	Temperature rises, other than of windings, determined by thermocouples		P
	Temperature rises of windings determined by resistance method, unless		N
	the windings makes it difficult to make the necessary connections		N
11.4	Heating appliances operated under normal operation at 1.15 times rated power input ..... :	--	N
11.5	Battery chargers supplied only at 1.06 times rated voltage (IEC 60335-2-29) ..... :	(See appended table 11.8)	P
11.6	Combined appliances operated under normal operation at most unfavourable voltage between 0.94 and 1.06 times rated voltage ..... :	--	N
11.7	Battery chargers operate until steady conditions are established (IEC 60335-2-29)		P
11.8	Temperature rises not exceeding values in table 3	(See appended table 11.8)	P
	If the temperature rise of a motor winding exceeds the value of table 3, or		N

EN 60335-2-29			
Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	if there is doubt with regard to classification of insulation,		N
	tests of Annex C are carried out		N
	Sealing compound does not flow out		P
	Protective devices do not operate, except		P
	components in protective electronic circuits tested for the number of cycles specified in 24.1.4		N
13	**LEAKAGE CURRENT AND ELECTRIC STRENGTH AT OPERATING TEMPERATURE**		**P**
13.1	Leakage current not excessive and electric strength adequate		P
	Heating appliances operated at 1.15 times rated power input ..... :	--	N
	Motor operated appliances and combined appliances supplied at 1.06 times rated voltage ..... :	(See appended table 13.2)	P
	Protective impedance and radio interference filters disconnected before carrying out the tests		N
13.2	Leakage current measured by means of the circuit described in figure 4 of IEC 60990		P
	Leakage current measurements	(See appended table 13.2)	P
13.3	The appliance is disconnected from the supply		P
	Electric strength tests according to table 4	(See appended table 13.3)	P
	No breakdown during the tests		P
14	**TRANSIENT OVERVOLTAGES**		**N**
	Appliances withstand the transient overvoltages to which they may be subjected		N
	Clearances having a value less than specified in table 16 subjected to an impulse voltage test, the test voltage specified in table 6..... :	--	N
	No flashover during the test, unless		N
	In case of flashover of functional insulation, the appliance complies with clause 19 with the clearance short circuited		N
15	**MOISTURE RESISTANCE**		**P**
15.1	Enclosure provides the degree of moisture protection according to classification of the appliance		N
	Compliance checked as specified in 15.1.1, taking into account 15.1.2, followed by the electric strength test of 16.3		N

EN 60335-2-29			
Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	No trace of water on insulation which can result in a reduction of clearances and creepage distances below values specified in clause 29		N
15.1.1	Appliances, other than IPX0, subjected to tests as specified in IEC 60529..... :	--	N
	Water valves in external hoses for connection of an appliance to the water mains tested as specified for IPX7 appliances		N
15.1.2	Hand-held appliance turned continuously through the most unfavourable positions during the test		N
	Built-in appliances installed according to the instructions		N
	Appliances placed or used on the floor or table placed on a horizontal unperforated support		N
	Appliances normally fixed to a wall and appliances with pins for insertion into socket-outlets are mounted on a wooden board		N
	For IPX3 appliances, the base of wall mounted appliances is placed at the same level as the pivot axis of the oscillating tube		N
	For IPX4 appliances, the horizontal centre line of the appliance is aligned with the pivot axis of the oscillating tube, and		N
	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
	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		N
	For IPX4 appliances, the movement of the tube is limited to two times 90° from the vertical for a period of 5 min		N
	Wall-mounted appliances, take into account the distance to the floor stated in the instructions		N
	Appliances with type X attachment fitted with a flexible cord as described		N
	Detachable parts tested as specified		N
15.2	Spillage of liquid does not affect the electrical insulation		N
	Appliances with type X attachment fitted with a flexible cord as described		N
	Appliances incorporating an appliance inlet tested with or without an connector, whichever is most unfavourable		N
	Detachable parts removed		N

EN 60335-2-29			
Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	Appliances with type X attachment fitted with a flexible cord as described		N
	Appliances incorporating an appliance inlet tested with or without an connector, whichever is most unfavourable		N
	Detachable parts are removed		
	Overfilling test with additional amount of water, over a period of 1 min (l) .....:	--	N
	The appliance withstands the electric strength test of 16.3		N
	No trace of water on insulation that can result in a reduction of clearances and creepage distances below values specified in clause 29		N
15.3	Appliances proof against humid conditions		P
	Humidity test for 48 h in a humidity cabinet	25 °C, 93 % RH, 48 h	P
	The appliance withstands the tests of clause 16		P
16	**LEAKAGE CURRENT AND ELECTRIC STRENGTH**		**P**
16.1	Leakage current not excessive and electric strength adequate		P
	Protective impedance disconnected from live parts before carrying out the tests		N
	Tests carried out at room temperature and not connected to the supply		N
16.2	Single-phase appliances: test voltage 1.06 times rated voltage (V) .....:	(See appended table 16.2)	P
	Three-phase appliances: test voltage 1.06 times rated voltage divided by √3 (V).....:	--	N
	Leakage current measurements	(See appended table 16.2)	P
16.3	Electric strength tests according to table 7	(See appended table 16.3)	P
	No breakdown during the tests		P
17	**OVERLOAD PROTECTION OF TRANSFORMERS AND ASSOCIATED CIRCUITS**		**P**
	No excessive temperatures in transformer or associated circuits in event of short circuits likely to occur in normal use	(See appended table 17)	P
	Appliance supplied with 1.06 or 0.94 times rated voltage and the most unfavourable short-circuit or overload likely to occur in normal use applied (V) .....:	(See appended table 17)	P
	Output terminals of battery chargers are short-circuited (IEC 60335-2-29)		P
	Temperature rise of insulation of the conductors of		P

EN 60335-2-29			
Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	safety extra-low voltage circuits not exceeding the relevant value specified in table 3 by more than 15 K		
	Temperature of the winding not exceeding the value specified in table 8,		P
	however limits do not apply to fail-safe transformers complying with sub-clause 15.5 of IEC 61558-1		N
18	**ENDURANCE**		**N**
	Requirements and tests are specified in part 2 when necessary		N
19	**ABNORMAL OPERATION**		**P**
19.1	The risk of fire or mechanical damage under abnormal or careless operation obviated		P
	Electronic circuits so designed and applied that a fault will not render the appliance unsafe		P
	Appliances incorporating heating elements subjected to the tests of 19.2 and 19.3, and		N
	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
	if applicable, to the test of 19.5		N
	Appliances incorporating PTC heating elements are also subjected to the test of 19.6		N
	Appliances incorporating motors subjected to the tests of 19.7 to 19.10, as applicable		N
	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
	Appliances incorporating voltage selector switches subjected to the test of 19.15		N
	Unless otherwise specified, the tests are continued until a non-self-resetting thermal cut-out operates, or		N
	until steady conditions are established		N
	If a heating element or intentionally weak part becomes open-circuited, the relevant test is repeated on a second sample		N
	Battery chargers subjected to the tests of 19.11, 19.12 and 19.101 to 19.103 (IEC 60335-2-29)		P
19.2	Test of appliance with heating elements with restricted heat dissipation; test voltage (V): power input of 0.85	--	N

EN 60335-2-29			
Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	times rated power input (W) ..... :		
19.3	Test of 19.2 repeated; test voltage (V): power input of 1.24 times rated power input (W) ..... :	--	N
19.4	Test conditions as in cl. 11, any control limiting the temperature during tests of cl. 11 short circuited		N
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 elements sheath		N
	The test repeated with reversed polarity and the other end of the heating element connected to the sheath		N
	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
19.6	Appliances with PTC heating elements tested at rated voltage, establishing steady conditions		N
	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
19.7	Stalling test by locking the rotor if the locked rotor torque is smaller than the full load torque or locking moving parts of other appliances		N
	Locked rotor, motor capacitors open-circuited or short-circuited, if required		N
	Locked rotor, capacitors open-circuited one at a time		N
	Test repeated with capacitors short-circuited one at a time, if required		N
	Appliances with timer or programmer supplied with rated voltage for each of the tests, for a period equal to the maximum period allowed		N
	Other appliances supplied with rated voltage for a period as specified		N
	Winding temperatures not exceeding values specified in table 8		N
19.8	Three phase motors operated at rated voltage with one phase disconnected		N
19.9	Running overload test on appliances incorporating motors intended to be remotely or automatically controlled or liable to be operated continuously		N
	Winding temperatures not exceeding values as specified		N
19.10	Series motor operated at 1.3 times rated voltage for 1 min (V) ..... :	--	N

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	During the test, parts not being ejected from the appliance		N
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 they comply with the conditions specified in 19.11.1		P
	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
	restarting does not result in a hazard		N
	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
	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		P
	During and after each test the following is checked:		P
	- 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		P
	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:		N
	- the base material of the printed circuit board withstands the test of Annex E		N
	- 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
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:		P
	- 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
	- the protection against electric shock, fire hazard, mechanical hazard or dangerous malfunction in 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 operated under conditions specified in cl. 11, but		P

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	supplied at rated voltage, the duration of the tests as specified:		
	a) short circuit of functional insulation if clearances or creepage distances are less than the values specified in 29		N
	b) open circuit at the terminals of any component	(See appended table 19.11.2)	P
	c) short circuit of capacitors, unless they comply with IEC 60384-14	(See appended table 19.11.2)	P
	d) short circuit of any two terminals of an electronic component, other than integrated circuits. This fault condition is not applied between the two circuits of an optocoupler	(See appended table 19.11.2)	P
	e) failure of triacs in the diode mode	(See appended table 19.11.2)	P
	f) failure of an integrated circuit	(See appended table 19.11.2)	P
	g) failure of an electronic power switching device		N
	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
19.11.3	If the appliance incorporates a protective electronic circuit which operates to ensure compliance with clause 19, the relevant test is repeated with a single fault simulated, as indicated in a) to g) of 19.11.2		N
19.11.4	Appliances having a switch with an off position obtained by electronic disconnection, or		N
	a switch that can be placed in the stand-by mode,		N
	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
	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
	appliances operated for 30 s or 5 min during the test of 19.7 are not subjected to the tests for electromagnetic phenomena.		N
	Surge protective devices disconnected, unless		N
	They incorporate spark gaps		N
19.11.4.1	The appliance is subjected to electrostatic discharges in accordance with IEC 61000-4-2, test level 4		N
19.11.4.2	The appliance is subjected to radiated fields in accordance with IEC 61000-4-3, test level 3		N
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

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
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
	Earthed heating elements in class I appliances disconnected		N
19.11.4.5	The appliance is subjected to injected currents in accordance with IEC 61000-4-6, test level 3		N
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
	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		
19.11.4.7	The appliance is subjected to mains signals in accordance with IEC 61000-4-13, test level class 2		N
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
	The appliance continues to operate normally or requires a manual operation to restart		N
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)..... :	(See appended table 19.11.2)	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 19.13)	P
	Winding temperatures not exceeding the values shown in table 8	(See appended table 19.13)	P
	Enclosures not deformed to such an extent that compliance with cl. 8 is impaired		P
	If the appliance can still be operated it complies with 20.2		N
	Insulation, other than of class III appliance, withstand the electric strength test of 16.3, the test voltage specified in table 4:		P
	- basic insulation (V) ..... :	1000 V	P
	- supplementary insulation (V) ..... :	1750 V	P
	- reinforced insulation (V)..... :	3000 V	P

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	After operation or interruption of a control, clearances and creepage distances across the functional insulation withstanding 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
	no failure of protective electronic circuits, if the appliance is still operable		N
	Appliances tested with an electronic switch in the off position, or in the stand-by mode:		N
	- do not become operational, or		N
	- if they become operational, do not result in a dangerous malfunction during or after the tests of 19.11.4		N
	If the appliance contains lids or doors that are controlled by one or more interlocks, one of the interlocks may be released provided that:		N
	- the lid or door does not move automatically to an open position when the interlock is released, and		N
	- the appliance does not start after the cycle in which the interlock was released		N
19.14	Appliances operated under the conditions of Clause 11. Contactors or relays contacts operating under the conditions of clause 11 short-circuited	--	N
	For a relay or contactor with more than one contact, all contacts are short-circuited at the same time		N
	A relay or contactor operating only to ensure the appliance is energized for normal use is not short-circuited		N
	If more than one relay or contactor operates in clause 11, they are short-circuited in turn		N
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
19.101	Battery chargers supplied at rated voltage and operated under normal operation, any control limiting the temperature during tests of clause 11 short circuited (IEC 60335-2-29)		P
19.102	Reverse connection of battery chargers to a fully charged battery at rated voltage (IEC 60335-2-29)		P
	The capacity of the battery (IEC 60335-2-29)..... :	12 Ah max.	P
19.103	Battery chargers intended to be used with a d.c. distribution board supplied at rated voltage and operated under normal operation, load increased as specified until protective device operates or short-circuit	‼ FORMTEXT	N

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	conditions are established (IEC 60335-2-29)		

20	**STABILITY AND MECHANICAL HAZARDS**		**P**
20.1	Adequate stability		P
	Tilting test through an angle of 10° (appliance placed on an inclined plane/horizontal plane); appliance does not overturn		P
	Tilting test repeated on appliances with heating elements, angle of inclination increased to 15°		N
	Possible heating test in overturned position; temperature rise does not exceed values shown in table 9		N
20.2	Moving parts adequately arranged or enclosed as to provide protection against personal injury		N
	Protective enclosures, guards and similar parts are non-detachable, and		N
	have adequate mechanical strength		N
	Enclosures that can be opened by overriding an interlock are considered to be detachable parts		N
	Self resetting thermal cut outs and overcurrent protective devices not causing a hazard, by unexpected reclosure		N
	Not possible to touch dangerous moving parts with test probe		N

21	**MECHANICAL STRENGTH**		**P**
21.1	Appliance has adequate mechanical strength and is constructed as to withstand rough handling		P
	Checked by applying blows to the appliance in accordance with test Ehb of IEC 60068-2-75, spring hammer test, impact energy 1.0 J ± 0.05 J (IEC 60335-2-29)	Enclosure	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		P
	If necessary, repetition of groups of three blows on a new sample		N
21.2	Accessible parts of solid insulation having strength to prevent penetration by sharp implements		P
	The insulation is tested as specified, unless		N
	the thickness of supplementary insulation is at least 1		P

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	mm and reinforced insulation is at least 2 mm		
	The insulation is tested as specified, and does withstand the electric strength test of 16.3		P
21.101	Battery chargers, other than built-in battery chargers, having a mass not exceeding 5 kg, subjected to a drop test (IEC 60335-2-29)		P
	Battery chargers show no damage that could impair compliance with 8.1, 15.1.1, 16.3 and cl. 29 (IEC 60335-2-29)		P
21.102	Battery chargers for installing in caravans and similar vehicles withstand vibrations to which they may be subjected (IEC 60335-2-29)		N
	Vibration test as specified in IEC 60068-2-6 (IEC 60335-2-29)		N
	Battery chargers show no damage that could impair compliance with 8.1, 15.1.1, 16.3 and cl. 29 (IEC 60335-2-29)		N
	Connections have not worked loose (IEC 60335-2-29)		N
22	**CONSTRUCTION**		**P**
22.1	Appliance marked with the first numeral of the IP system, relevant requirements of IEC 60529 are fulfilled		N
22.2	Stationary appliance: means to provide all-pole disconnection from the supply provided, the following means being available:		N
	- a supply cord fitted with a plug		N
	- a switch complying with 24.3		N
	- a statement in the instruction sheet that a disconnection incorporated in the fixed wiring is to be provided		N
	- an appliance inlet		N
	Singe-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
22.3	Appliance provided with pins: no undue strain on socket-outlets		N
	Applied torque not exceeding 0.25 Nm		N
	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
	Each pin subjected to a torque of 0.4Nm; the pins are not rotating unless rotating does not impair compliance		N

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	with the standard		
22.4	Appliance for heating liquids and appliance causing undue vibration not provided with pins for insertion into socket-outlets		N
22.5	No risk of electric shock when touching the pins of the plug, for appliances having a capacitor with rated capacitance exceeding 0.1uF, the appliance being disconnected from the supply at the instant of voltage peak		P
	Voltage not exceeding 34 V (V)..... :	28	P
22.6	Electrical insulation not affected by condensing water or leaking liquid		N
	Electrical insulation of Class II appliances not affected in case of a hose rupture or seal leak		N
	In case of doubt, test as described		N
22.7	Adequate safeguards against the risk of excessive pressure in appliances provided with steam-producing devices		N
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		N
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
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		N
	- a non-self-resetting thermal cut-out is required by the standard, and		N
	- a voltage maintained non-self-resetting thermal cut-out is used to meet it		N
	Non-self-resetting thermal motor protectors have a trip-free action, unless		N
	they are voltage maintained		N
	Reset buttons of non-self-resetting controls so located or protected that accidental resetting is unlikely		N
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

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	No deterioration of the fixing properties of snap-in devices used in parts that are likely to be removed during installation or servicing		N
	Tests as described		N
22.12	Handles, knobs etc. fixed in a reliable manner		N
	Fixing in wrong position of handles, knobs etc. indicating position of switches or similar components not possible		N
	Axial force 15 N applied to parts, the shape being so that an axial pull is unlikely to be applied		N
	Axial force 30 N applied to parts, the shape being so that an axial pull is likely to be applied		N
22.13	Unlikely that handles, when gripped as in normal use, make the operators hand touch parts having a temperature rise exceeding the value specified for handles which are held for short periods only		P
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 etc., liable to be touched by the user in normal use or during user maintenance		P
22.15	Storage hooks and the like for flexible cords smooth and well rounded		N
22.16	Automatic cord reels cause no undue abrasion or damage to the sheath of the flexible cord, no breakage of conductors strands, no undue wear of contacts		N
	Cord reel tested with 6000 operations, as specified		N
	Electric strength test of 16.3, voltage of 1000 V applied		N
22.17	Spacers not removable from the outside by hand or by means of a screwdriver or a spanner		N
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
	constructed to prevent inappropriate replacement		N
22.20	Direct contact between live parts and thermal insulation effectively prevented, unless material used is non-corrosive, non-hygroscopic and non-combustible		P
22.21	Wood, cotton, silk, ordinary paper and fibrous or hygroscopic material not used as insulation, unless impregnated		P
	This requirement does not apply to magnesium oxide and mineral ceramic fibres used for the electrical insulation of heating elements		N
22.22	Appliances not containing asbestos		P

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
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
	In case of rupture, the heating conductor is unlikely to come in contact with accessible metal parts		N
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
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		N
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
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
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	Clearances and creepage distances over supplementary and reinforced insulation not reduced below values specified in clause 29 as a result of wear		P
	Clearances and creepage distances between live parts and accessible parts not 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
	Ceramic material not tightly sintered, similar material or beads alone not used as supplementary or reinforced insulation		N

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	Oxygen bomb test at 70 °C C for 96 h and 16 h at room temperature		N
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		N
	Electrodes not used for heating liquids		N
	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
	the reinforced insulation consists of at least 3 layers		N
	For class II constructions, conductive liquids which are in contact with live parts, not in direct contact with reinforced insulation, unless		N
	the reinforced insulation consists of at least 3 layers		N
	An air layer not used as basic or supplementary insulation in a double insulation system if likely to be bridged by leaking liquid		N
22.34	Shafts of operating knobs, handles, levers etc. not live, unless the shaft is not accessible when the part is removed		N
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
	Such parts being of metal, and their shafts or fixings are likely to become live in the event of an insulation fault, they are either adequately covered by insulation material, or their accessible parts are separated from their shafts or fixings by supplementary insulation		N
	This requirement does not apply to handles, levers and knobs on stationary appliances other than those of electrical components, provided they are either reliably connected to an earthing terminal or earthing contact, or separated from live parts by earthed metal		N
	Insulating material covering metal handles, levers and knobs withstand the electric strength test of 16.3 for supplementary insulation		N
22.36	Handles continuously held in the hand in normal use are so constructed that when gripped as in normal use, the operators hand is not likely to touch metal parts, unless they are separated from live parts by double or reinforced insulation		N
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		N

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	insulation, unless		
	the capacitors comply with 22.42		N
22.38	Capacitors not connected between the contacts of a thermal cut-out		N
22.39	Lamp holders used only for the connection of lamps		N
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		N
	Unless the appliance can operate continuously, automatically or remotely without giving rise to a hazard, appliances for remote operation being fitted with a switch. The actuating member of the switch being easily visible and accessible		N
22.41	No components, other than lamps, containing mercury		P
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		P
	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
22.44	Appliances shall not have 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 29.1.4 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		N
	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
	These requirements are not applicable to software used for functional purpose or compliance with clause 11		N
22.47	Appliances connected to the water mains withstand the water pressure expected in normal use		N
	No leakage from any part, including any inlet water hose		N

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
22.48	Appliances connected to the water mains constructed to prevent backsiphonage of non-potable water		N
22.49	For remote operation, the duration of operation set before the appliance can be started, unless		N
	the appliance switches off automatically or operate continuously without hazard		N
22.50	Controls incorporated in the appliance take priority over controls actuated by remote operation		N
22.51	A control on the appliance being manually adjusted to the setting for remote operation before the appliance operated in this mode		N
	Visual indication showing that the appliance is adjusted for remote operation		N
	Manual setting and visual indication not necessary on appliances that can operate as follows, without giving rise to a hazard:		N
	- operate continuously,		N
	- operate automatically, or		N
	- be operated remotely		N
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
22.101	Each circuit supplied from a d.c. distribution board incorporates an overload protective device (IEC 60335-2-29)		N
22.103	Battery chargers for installing in caravans or similar vehicles constructed so that they can be securely fixed to a support (IEC 60335-2-29)		N

23	**INTERNAL WIRING**		**P**
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
	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
	Beads inside flexible metal conduits contained within an insulating sleeve		N
23.3	Electrical connections and internal conductors movable relatively to each other not exposed to undue stress		N

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	Flexible metallic tubes not causing damage to insulation of conductors		N
	Open-coil springs not used		N
	Adequate insulating lining provided inside a coiled spring, the turns of which touch one another		N
	No damage after 10 000 flexings for conductors flexed during normal use or 100 flexings for conductors flexed during user maintenance		N
	Electric strength test, 1000 V between live parts and accessible metal parts		N
23.4	Bare internal wiring sufficiently rigid and fixed		N
23.5	The insulation of internal wiring 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		P
	No breakdown when a voltage of 2000 V is applied for 15 min between the conductor and metal foil wrapped around the insulation		P
23.6	Sleeving used as supplementary insulation on internal wiring retained in position by clamping at both ends, or		N
	be such that it can only be removed by breaking or cutting		N
23.7	The colour combination green/yellow used only for earthing conductors		P
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
	the contact pressure is provided by spring terminals		N
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

24	**COMPONENTS**		**P**
24.1	Components comply with safety requirements in relevant IEC standards		P
	List of components	(See appended table 24.1)	P
	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		P

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Clause	**Requirement + Test**		**Result - Remark**	**Verdict**
	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			P
	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
	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, or			P
	tested according to annex F			N
24.1.2	Safety isolating transformers complying with IEC 61558-2-6, or			N
	tested according to annex G			P
24.1.3	Switches complying with IEC 61058-1, the number of cycles of operation being at least 10 000, or			N
	tested according to annex H			N
	If the switch operates a relay or contactor, the complete switching system is subjected to the test			N
	If the switch only operates a motor staring 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
24.1.4	Automatic controls complying with IEC 60730-1 with relevant part 2. The number of cycles of operation being:			N
	- thermostats:	10000		N
	- temperature limiters:	1000		N
	- self-resetting thermal cut-outs:	300		N
	- voltage maintained non-self-resetting thermal cut-outs:	1000		N
	- other non-self-resetting thermal cut-outs:	30		N

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Clause	**Requirement + Test**		**Result - Remark**	**Verdict**
	- timers	3000		N
	- energy regulators:	10000		N
	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
	Thermal motor protectors are tested in combination with their motor under the conditions specified in Annex D			N
	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
24.1.5	Appliance couplers complying with IEC 60320-1			P
	However, appliances classified higher than IPX0, the appliance couplers complying with IEC 60320-2-3			N
	Interconnection couplers complying with IEC 60320-2-2			N
24.1.6	Small lamp holders similar to E10 lampholders complying with IEC 60238, the requirements for E10 lampholders being applicable			N
24.1.7	If the remote operation of the appliance is via a telecommunication network, the relevant standard for the telecommunication interface circuitry in the appliance is IEC 62151			N
24.1.8	The relevant standard for thermal links is IEC 60691. Thermal links not complying with IEC 60691 are considered to be an intentionally weak part for the purposes of Clause 19			N
24.1.9	Relays, other than motor starting relays, tested as part of the appliance			N
	They also tested in accordance with Clause 17 of IEC 60730-1, the number of operations in 24.1.4 selected according to the relay function in the appliance.....:		--	N
24.2	Appliances not fitted with:			P
	- switches or automatic controls 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 melding point of at least 230 °C			P
24.3	Switches intended for all-pole disconnection of stationary appliances are directly connected to the supply terminals and having a contact separation in all poles, providing full disconnection under overvoltage category III conditions			N

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
24.4	Plugs and socket-outlets for extra-low voltage circuits and heating elements, not interchangeable with plugs and socket-outlets listed in IEC 60083 or IEC 60906-1 or with connectors and appliance inlets complying with the standard sheets of IEC 60320-1		P
24.5	Capacitors in auxiliary windings of motors marked with their rated voltage and capacitance and used accordingly		N
	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
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 42V		N
	In addition, the motors are complying with the requirements of Annex I		N
24.7	Hose-sets for connection of appliances to the water mains, complying with IEC 61770 and supplied with the appliance		N
	Appliances intended to be permanently connected to the water mains not connected by a detachable hose-set		N
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
	One or more of the following conditions are to be met:		N
	- the capacitors are of class P2 according to IEC 60252-1		N
	- the capacitors are housed within a metallic or ceramic enclosure		N
	- the distance of separation of the outer surface to adjacent non-metallic parts exceeds 50 mm		N
	- adjacent non-metallic parts within 50 mm withstand the needle-flame test of Annex E		N
	- adjacent non-metallic parts within 50 mm classified as at least V-1 according to IEC 60695-11-10		N

25	**SUPPLY CONNECTION AND EXTERNAL FLEXIBLE CORDS**		**P**
25.1	Appliance not intended for permanent connection to fixed wiring, means for connection to the supply:		P
	- supply cord fitted with a plug		P
	- an appliance inlet having at least the same degree of protection against moisture as required for the appliance		N

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	- pins for insertion into socket-outlets		N
25.2	Appliance not provided with more than one means of connection to the supply mains		N
	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
25.3	Appliance intended to be permanently connected to fixed wiring provided with one of the following means for connection to the supply mains:		N
	- a set of terminals allowing the connection of a flexible cord		N
	- a fitted supply cord		N
	- a set of supply leads accommodated in a suitable compartment		N
	- 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 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
	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
25.4	Cable and conduit entries, rated current of appliance not exceeding 16 A, dimension according to table 10		N
	Introduction of conduit or cable does not reduce clearances or creepage distances below values specified in 29		N
25.5	Method for assemble supply cord with the appliance:		P
	- type X attachment		N
	- type Y attachment		P
	- type Z attachment, if allowed in part 2		N
	Type X attachment, other than those with a specially prepared cord, not used for flat twin tinsel cords		N
	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		N

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	appliance by type Y attachment		
25.6	Plugs fitted with only one flexible cord		P
25.7	Supply cords, other than for class III appliances, being one of the following types:		P
	- rubber sheathed (at least 60245 IEC 53)		N
	- polychloroprene sheathed (at least 60245 IEC 57)		N
	- cross-linked polyvinyl chloride sheathed (at least 60245 IEC 88)		N
	- 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		N
	light polyvinyl chloride sheathed cord (at least 60227 IEC 52), appliances not exceeding 3 kg		N
	ordinary polyvinyl chloride sheathed cord (at least 60227 IEC 53), other appliances		P
	- heat resistant polyvinyl chloride sheathed. Not used for type X attachment other than specially prepared cords		N
	heat-resistant light polyvinyl chloride sheathed cord (60227 IEC 56), for appliances not exceeding 3 kg		N
	heat-resistant polyvinyl chloride sheathed cord (60227 IEC 57), other appliances		N
	Supply cords for class III appliances adequately insulated		N
	Test with 500 V for 2 min for supply cords of class III appliances that contain live parts		N
25.8	Nominal cross-sectional area of supply cords according to table 11; rated current (A); cross-sectional area (mm^2) :	2 A; 0.75 mm^2	P
25.9	Supply cord not in contact with sharp points or edges		P
25.10	Supply cord of class I appliances have a green/yellow core for earthing		P
25.11	Conductors of supply cords not consolidated by lead-tin soldering where they are subject to contact pressure, unless		N
	the contact pressure is provided by spring terminals		N
25.12	Insulation of the supply cord not damaged when moulding the cord to part of the enclosure		N
25.13	Inlet opening so shaped as to prevent damage to the supply cord		P
	Unless the enclosure at the inlet opening is of insulation material, a non-detachable lining or bushing complying with 29.3 for supplementary insulation provided		P
	If unsheathed supply cord, a similar additional bushing or lining is required, unless		N

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	the appliance is class 0		N
	a class III appliance not containing live parts		N
25.14	Supply cords adequately protected against excessive flexing		N
	Flexing test:		N
	- applied force (N) ..... :	--	N
	- number of flexings ..... :	--	N
	The test does not result in:		N
	- short-circuit between the conductors, such that the current exceeds a value of twice the rated current		N
	- breakage of more than 10% of the strands of any conductor		N
	- separation of the conductor from its terminal		N
	- loosening of any cord guard		N
	- damage to the cord or the cord guard		N
	- broken strands piercing the insulation and becoming accessible		N
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		P
	The cord cannot be pushed into the appliance to such an extent that the cord or internal parts of the appliance can be damaged		P
	Pull and torque test of supply cord, values shown in table 10: pull (N); torque (not on automatic cord reel) (Nm) ..... :	30 N; 0.1 Nm	P
	Max. 2 mm displacement of the cord, and conductors not moved more than 1 mm in the terminals		P
25.16	Cord anchorages for type X attachments constructed and located so that:		N
	- replacement of the cord is easily possible		N
	- it is clear how the relief from strain and the prevention of twisting are obtained		N
	- they are suitable for different types of cord		N
	- cord cannot touch the clamping screws of cord anchorage if these screws are accessible, unless separated from accessible metal parts by supplementary insulation		N
	- the cord is not clamped by a metal screw which bears directly on the cord		N
	- at least one part of the cord anchorage securely fixed		N

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	to the appliance, unless part of a specially prepared cord		
	- screws which have to be operated when replacing the cord do not fix any other component, if applicable		N
	- if labyrinths can be bypassed the test of 25.15 is nevertheless withstood		N
	- for Class 0, 0I and I appliances: they are of insulating material or are provided with an insulating lining, unless a failure of the insulation of the cord does not make accessible metal parts live		N
	- for Class II appliances: they are of insulating material, or if of metal, they are insulated from accessible metal parts by supplementary insulation		N
25.17	Adequate cord anchorages for type Y and Z attachment, test with the cord supplied with the appliance		P
25.18	Cord anchorages only accessible with the aid of a tool, or		P
	Constructed so that the cord can only be fitted with the aid of a tool		P
25.19	Type X attachment, glands not used as cord anchorage in portable appliances		N
	Tying the cord into a knot or tying the cord with string not used		N
25.20	The insulated conductors of the supply cord for type Y and Z attachment additionally insulated from accessible metal parts		P
25.21	Space for supply cord for type X attachment or for connection of fixed wiring constructed:		N
	- to permit checking of conductors with respect to correct positioning and connection before fitting any cover		N
	- so there is no risk of damage to the conductors or their insulation when fitting the cover		N
	- 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
	2 N test to the conductor for portable appliances; no contact with accessible metal parts		N
25.22	Appliance inlet:		N
	- live parts not accessible during insertion or removal		N
	- connector can be inserted without difficulty		N
	- the appliance is not supported by the connector		N
	- is not for cold conditions if temp. rise of external metal parts exceeds 75 K, unless the supply cord is not likely to touch such metal parts		N

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
25.23	Interconnection cords comply with the requirements for the supply cord, except as specified		N
	- the cross-sectional area of the conductors is determined on the basis of the maximum current during clause 11		N
	- the thickness of the insulation may be reduced		N
	If necessary, electric strength test of 16.3		N
25.24	Interconnection cords not detachable without the aid of a tool if compliance with the standard is impaired when they are disconnected		N
25.25	Dimensions of pins compatible with the dimensions of the relevant socket-outlet. Dimensions of pins and engagement face in accordance with the relevant plug in IEC 60083		N
26	**TERMINALS FOR EXTERNAL CONDUCTORS**		**P**
26.1	Appliances provided with terminals or equally effective devices for connection of external conductors		N
	Terminals only accessible after removal of a non-detachable cover, except		N
	for class III appliances that do not contain live parts		N
	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
26.2	Appliances with type X attachment and appliances for connection to fixed wiring provided with terminals in which connections are made by means of screws, nuts or similar devices, unless the connections are soldered		N
	Screws and nuts serve only to clamp supply conductors, except		N
	internal conductors, if so arranged that they are unlikely to be displaced when fitting the supply conductors		N
	If soldered connections used, the conductor so positioned or fixed that reliance is not placed on soldering alone		N
	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
26.3	Terminals for type X attachment and for connection to fixed wiring so constructed that the conductor is clamped between metal surfaces with sufficient contact pressure and without damaging the conductor		N
	Terminals fixed so that when the clamping means is		N

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	tightened or loosened:		
	- the terminal does not loosen		N
	- internal wiring is not subjected to stress		N
	- clearances and creepage distances are not reduced below the values in 29		N
	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. Nominal diameter of thread (mm); screw category; torque (Nm)... :	--	N
26.4	Terminals for type X attachment, except those with a specially prepared cord, and those for connection to fixed wiring, no special preparation of conductors required, and so constructed or placed that conductors prevented from slipping out		N
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
	Stranded conductor test, 8 mm insulation removed		N
	No contact between live parts and accessible metal parts and, for class II constructions, between live parts and metal parts separated from accessible metal parts by supplementary insulation only		N
26.6	Terminals for type X attachment and for connection to fixed wiring suitable for connection of conductors with required cross-sectional area according to table 13; rated current (A); nominal cross-sectional area (mm^2) ..... :	--	N
	Terminals only suitable for a specially prepared cord		N
26.7	Terminals for type X attachment accessible after removal of a cover or part of the enclosure		N
26.8	Terminals for the connection to fixed wiring, including the earthing terminal, located close to each other		N
26.9	Terminals of the pillar type constructed and located as specified		N
26.10	Terminals with screw clamping and screwless terminals not used for flat twin tinsel cords, unless conductors ends fitted with a device suitable for screw terminals		N
	Pull test of 5 N to the connection		N
26.11	For type Y and Z attachment: soldered, welded, crimped and similar connections may be used		P
	For Class II appliances: the conductor so positioned or fixed that reliance is not placed on soldering, welding or crimping alone		P
	For Class II appliances: soldering, welding or crimping alone used, barriers provided, clearances and creepage		N

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	distances satisfactory if the conductor becomes free		
27	**PROVISION FOR EARTHING**		**P**
27.1	Accessible metal parts of Class 0I and I appliances, permanently and reliably connected to an earthing terminal or contact of the appliance inlet		P
	Earthing terminals not connected to neutral terminal		P
	Class 0, II and III appliance have no provision for earthing		N
	Safety extra-low voltage circuits not earthed, unless protective extra-low voltage circuits		P
27.2	Clamping means adequately secured against accidental loosening		P
	Terminals used for the connection of external equipotential bonding conductors allow connection of conductors of 2.5 to 6 mm^2, and		P
	do not provide earthing continuity between different parts of the appliance		P
	Conductors cannot be loosened without the aid of a tool		P
27.3	For detachable parts that are plugged into another part of the appliance, and having an earth connection, the earth connection made before and separated after current-carrying connections when removing the part		P
	For appliances with supply cord, current-carrying conductors become taut before earthing conductor, if the cord slips out of the cord anchorage		P
27.4	No risk of corrosion resulting from contact between metal of earthing terminal and other metal		P
	Adequate resistance to corrosion of coated or uncoated parts providing earthing continuity, other than parts of a metal frame or enclosure		P
	Parts of steel providing earthing continuity provided at the essential areas with an electroplated coating, thickness at least 5 µm		P
	Adequate protection against rusting of parts of coated or uncoated steel, only intended to provide or transmit contact pressure		P
	In case of aluminium alloys precautions taken to avoid risk of corrosion		P
27.5	Low resistance of connection between earthing terminal and earthed metal parts		P
	This requirement does not apply to connections providing earthing continuity in the protective extra-low voltage circuit, provided that clearances of basic insulation are based on the rated voltage of the		P

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	appliance		
	Resistance not exceeding 0.1 Ω at the specified low-resistance test (Ω)..... :	0.032	P
27.6	The printed conductors of printed circuit boards not used to provide earthing continuity in hand-held appliances		P
	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		P
28	**SCREWS AND CONNECTIONS**		**P**
28.1	Fixings, electrical connections and connections providing earthing continuity withstand mechanical stresses		P
	Screws not of soft metal liable to creep, such as zinc or aluminium		P
	Diameter of screws of insulating material min. 3 mm		P
	Screws of insulating material not used for any electrical connection or connections providing earthing continuity		N
	Screws used for electrical connections or connections providing earthing continuity screw into metal		N
	Screws not of insulating material if their replacement by a metal screw can impair supplementary or reinforced insulation		N
	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 can impair basic insulation		N
	For screws and nuts; torque-test as specified in table 14 . :	(See appended table 28.1)	P
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
	there is resiliency in the metallic parts to compensate for shrinkage or distortion of the insulating material		N
	This requirement does not apply to electrical connections in circuits of appliances for which:		N
	30.2.2 is applicable and that carry a current not exceeding 0.5 A		N
	30.2.3 is applicable and that carry a current not exceeding 0.2 A		N
28.3	Space-threaded (sheet metal) screws only used for electrical connections if they clamp the parts together		N

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	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
	Thread-cutting (self-tapping) screws not used if they are likely to be operated by the user or installer		N
	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:		N
	- in normal use,		N
	- during user maintenance,		N
	- when replacing a supply cord having a type X attachment, or		N
	- during installation		N
	At least two screws being used for each connection providing earthing continuity, unless		N
	the screw forms a thread having a length of at least half the diameter of the screw		N
28.4	Screws and nuts that make mechanical connection secured against loosening if they also make electrical connections or connections providing earthing continuity		N
	Rivets for electrical connections or connections providing earthing continuity secured against loosening if subjected to torsion		N

29	**CLEARANCES, CREEPAGE DISTANCES AND SOLID INSULATION**		**P**
	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
	The microenvironment is pollution degree 1 under type 1 protection		N
	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
	These values apply to functional, basic, supplementary and reinforced insulation..... :	--	N
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 29.1)	P
	for basic insulation and functional insulation they comply with the impulse voltage test of clause 14		N

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	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		N
	Impulse voltage test is not applicable:		N
	- when the microenvironment is pollution degree 3, or		N
	- for basic insulation of class 0 and class 01 appliances		N
	Appliances are in overvoltage category II		P
	A force of 2 N is applied to bare conductors, other than heating elements		N
	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		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
	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		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		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		P
29.1.4	Clearances for functional insulation are the largest values determined from:		P
	- table 16 based on the rated impulse voltage		P
	- table F.7a in IEC 60664-1, frequency not exceeding 30 kHz		N
	- clause 4 of IEC 60664-4, frequency exceeding 30 kHz		N
	If values of table 16 are largest, the impulse voltage test of clause 14 may be applied instead, unless		N
	the microenvironment is pollution degree 3, or		N
	the distances can be affected by wear, distortion, movement of the parts or during assembly		N

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	However, clearances are not specified if the appliance complies with clause 19 with the functional insulation short-circuited		N
	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
29.1.5	Appliances having higher working voltages than rated voltage, clearances for basic insulation are the largest values determined from:		N
	- table 16 based on the rated impulse voltage		N
	- table F.7a in IEC 60664-1, frequency not exceeding 30 kHz		N
	- clause 4 of IEC 60664-4, frequency exceeding 30 kHz		N
	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
	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
	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
	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
	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
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 29.2)	P
	Pollution degree 2 applies, unless		P
	- precautions taken to protect the insulation; pollution degree 1		N
	- insulation subjected to conductive pollution; pollution degree 3		N

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	A force of 2 N is applied to bare conductors, other than heating elements		N
	A force of 30 N is applied to accessible surfaces		P
29.2.1	Creepage distances of basic insulation not less than specified in table 17		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 17		P
	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
29.2.2	Creepage distances of supplementary insulation at least those specified for basic insulation in table 17, or		P
	Table 2 of IEC 60664-4, as applicable		P
29.2.3	Creepage distances of reinforced insulation at least double those specified for basic insulation in table 17, or		P
	Table 2 of IEC 60664-4, as applicable		P
29.2.4	Creepage distances of functional insulation not less than specified in table 18		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		P
	Creepage distances may be reduced if the appliance complies with clause 19 with the functional insulation short-circuited		N
29.3	Supplementary and reinforced insulation have adequate thickness, or a sufficient number of layers, to withstand the electrical stresses		P
	Compliance checked:		P
	- by measurement, in accordance with 29.3.1, or		P
	- by an electric strength test in accordance with 29.3.2, or		P
	- by an assessment of the thermal quality of the material combined with an electric strength test, in accordance with 29.3.3, and		N
	for accessible parts of reinforced insulation consisting of a single layer, by measurement in accordance with 29.3.4, or		N
	- 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

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
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		P
	Supplementary insulation consist of at least 2 layers		P
	Reinforced insulation consist of at least 3 layers		P
29.3.3	The insulation is subjected to the dry heat test Bb of IEC 60068-2-2, followed by		N
	the electric strength test of 16.3		N
	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
29.3.4	Thickness of accessible parts of reinforced insulation consisting of a single layer not less than specified in table 19		P
30	**RESISTANCE TO HEAT AND FIRE**		**P**
30.1	External parts of non-metallic material,		P
	parts supporting live parts, and		P
	thermoplastic material providing supplementary or reinforced insulation,		P
	sufficiently resistant to heat		P
	Ball-pressure test according to IEC 60695-10-2		P
	External parts: 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 30.1)	P
	Parts supporting live parts: 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 30.1)	P
	Parts of thermoplastic material providing supplementary or reinforced insulation, 25°C plus the maximum temperature rise determined during clause 19, if higher; temperature (°C) .....:	(See appended table 30.1)	P
30.2	Parts of non-metallic material adequately resistant to ignition and spread of fire		P
	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		N
	decorative trims, knobs and other parts unlikely to be ignited or to propagate flames that originate inside the		N

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	appliance		
	Compliance checked by the tests of 30.2.1 and 30.2.3		P
	For base material of printed circuit boards, 30.2.4 applies		P
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
	the material is classified at least HB40 according to IEC 60695-11-10		N
	Parts for which the glow-wire test cannot be carried out meet the requirements in ISO 9772 for category HBF material		N
30.2.2	Appliances operated while attended, parts of non-metallic material supporting current-carrying connections, and parts of non-metallic material within a distance of 3mm of such connections, are subjected to the glow-wire test of IEC 60695-2-11.		N
	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:		N
	-750°C, for connections carrying a current exceeding 0.5A during normal operation		N
	-650°C, for other connections		N
	Test as specified for an interposed shielding material		N
	When the glow-wire test of IEC 60695-2-11 is carried out, the temperatures are:		N
	-750°C, for connections carrying a current exceeding 0.5A during normal operation		N
	-650°C, for other connections		N
	Test not applicable to conditions as specified		N
30.2.3	Appliances operated while unattended, tested as specified in 30.2.3.1 and 30.2.3.2		P
	Tests not applicable to conditions as specified		N
30.2.3.1	Parts of insulating material supporting connections carrying a current exceeding 0.2A during normal operation, and	(See appended table 30.2)	P
	parts of non-metallic material within a distance of 3mm,		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		P

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	Glow-wire test not carried out on parts of material classified as having a glow-wire flammability index of at least 850°C according to IEC 60695-2-12		P
30.2.3.2	Parts of non-metallic material supporting current-carrying connections, and	(See appended table 30.2)	P
	parts of non-metallic material within a distance of 3mm,		P
	subjected to glow-wire test of IEC 60695-2-11		P
	Test not carried out on material having a glow-wire ignition temperature according to IEC 60695-2-13 of at least:		N
	-775°C, for connections carrying a current exceeding 0.2A during normal operation		N
	-675°C, for other connections		N
	When the glow-wire test of IEC 60695-2-11 is carried out, the temperatures are:		P
	-750°C, for connections carrying a current exceeding 0.2A during normal operation		P
	-650°C, for other connections		N
	Parts that during the test produce a flame persisting longer than 2 s, tested as specified		N
	If a flame persists longer than 2 s during the test, parts above the connection, as specified, subjected to the needle-flame test of annex E, unless		N
	the material is classified as V-0 or V-1 according to IEC 60695-11-10		N
30.2.4	Base material of printed circuit boards subjected to needle-flame test of annex E	PCB are V-0 certified	P
	Test not applicable to conditions as specified		N
31	**RESISTANCE TO RUSTING**		**P**
	Relevant ferrous parts adequately protected against rusting		P
	Tests specified in part 2 when necessary		P
32	**RADIATION, TOXICITY AND SIMILAR HAZARDS**		**P**
	Appliance shall not emit harmful radiation, present a toxic or similar hazard due to their operation in normal use		P
	Relevant tests specified in part 2, if necessary		P
A	**ANNEX A (INFORMATIVE)** **ROUTINE TESTS**		**N**

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	Description of routine tests to be carried out by the manufacturer		N
	Test voltage of electric strength test between the input and output circuits (IEC 60335-2-29)		N
B	**ANNEX B (NORMATIVE)** **APPLIANCES POWERED BY RECHARGEABLE BATTERIES**		**N**
	The following modifications to this standard are applicable for appliances powered by batteries that are recharged in the appliance		N
	This annex does not apply to battery chargers		N
3.1.9	Appliance operated under the following conditions:		N
	-the appliance, supplied by its fully charged battery, operated as specified in relevant part 2		N
	-the battery is charged, the battery being initially discharged to such an extent that the appliance cannot operate		N
	-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		N
	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
3.6.2	Part to be removed in order to discard the battery is not considered to be detachable		N
5.101	Appliances supplied from the supply mains tested as specified for motor-operated appliances		N
7.1	Battery compartment for batteries intended to be replaced by the user, marked with battery voltage and polarity of the terminals		N
	The positive terminal indicated by symbol IEC 60417-5005 and the negative terminal by symbol IEC 60417-5006		N
7.6	Symbols 60417-5005 and IEC 60417-5006		N
7.12	The instructions for appliances incorporating batteries intended to be replaced by the user includes required information		N
	Details about how to remove batteries containing materials hazardous to the environment given		N
7.15	Markings placed on the part of the appliance connected to the supply mains		N

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
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
	If the appliance can be operated without batteries, double or reinforced insulation required		N
11.7	The battery is charged for the period described		N
19.1	Appliances subjected to tests of 19.101, 19.102 and 19.103		N
19.10	Not applicable		
19.101	Appliances supplied at rated voltage for 168 h, the battery being continually charged		N
19.102	Short-circuiting of the terminals of the battery, being fully charged, for appliances having batteries that can be removed without the aid of a tool		N
19.103	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 construction1		N
21.101	Appliances having pins for insertion into socket-outlets have adequate mechanical strength		N
	Part of the appliance incorporating the pins subjected to the free fall test, procedure 2, of IEC 60068-2-32, the number of falls being:		N
	- 100, the mass of part does not exceed 250 g		N
	- 50, the mass of part exceeds 250 g		N
	After the test, the requirements of 8.1, 15.1.1, 16.3 and clause 29 are met		N
22.3	Appliances having pins for insertion into socket-outlets tested as fully assembled as possible		N
25.13	An additional lining or bushing not required for interconnection cords operating at safety extra-low voltage		N
30.2	For parts of the appliance connected to the supply mains during the charging period, 30.2.3 applies		N
	For other parts, 30.2.2 applies		N

C	**ANNEX C (NORMATIVE)** **AGEING TEST ON MOTORS**		**N**
	Tests, as described, carried out when doubt with regard to the temperature classification of the insulation of a motor winding		N

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
D	**ANNEX D (NORMATIVE)** **THERMAL MOTOR PROTECTORS**		**N**
	Applicable to appliances having motors that incorporate thermal motor protectors		N
E	**ANNEX E (NORMATIVE)** **NEEDLE-FLAME TEST**		**P**
	Needle-flame test carried out in accordance with IEC 60695 11-5, with the following modifications:		P
7	Severities		P
	The duration of application of the test flame is 30 s ± 1 s		P
9	Test procedure		P
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
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 further specimens, both withstanding the test		P
11	Evaluation of test results		P
	The duration of burning not exceeding 30 s		P
	However, for printed circuit boards, the duration of burning not exceeding 15 s		P
F	**ANNEX F (NORMATIVE)** **CAPACITORS**		**N**
	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:		N
1.5	Terminology		N
1.5.3	Class X capacitors tested according to subclass X2		N
1.5.4	This subclause is applicable		N
1.6	Marking		N
	Items a) and b) are applicable		N
3.4	Approval testing		N

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
3.4.3.2	Table 3 is applicable as described		N
4.1	Visual examination and check of dimensions		N
	This subclause is applicable		N
4.2	Electrical tests		N
4.2.1	This subclause is applicable		N
4.2.5	This subclause is applicable		N
4.2.5.2	Only table IX is applicable		N
	Values for test A apply		N
	However, for capacitors in heating appliances the values for test B or C apply		N
4.12	Damp heat, steady state		N
	This subclause is applicable		N
	Only insulation resistance and voltage proof are checked		N
4.13	Impulse voltage		N
	This subclause is applicable		N
4.14	Endurance		N
	Subclauses 4.14.1, 4.14.3, 4.14.4 and 4.14.7 applicable		N
4.14.7	Only insulation resistance and voltage proof are checked		N
	Visual examination, no visible damage		N
4.17	Passive flammability test		N
	This subclause is applicable		N
4.18	Active flammability test		N
	This subclause is applicable		N

G	**ANNEX G (NORMATIVE)** **SAFETY ISOLATING TRANSFORMERS**		**P**
	The following modifications to this standard are applicable for safety isolating transformers:		P
7	Marking and instructions		P
7.1	Transformers for specific use marked with:		P
	-name, trademark or identification mark of the manufacturer or responsible vendor		P
	-model or type reference		P
17	Overload protection of transformers and associated circuits		P
	Fail-safe transformers comply with subclause 15.5 of IEC 61558-1		N
22	Construction		P

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	Subclauses 19.1 and 19.1.2 of IEC 61558-2-6 are applicable		P
29	Clearances, creepage distances and solid insulation		P
29.1, 29.2 and 29.3	The distances specified in items 2a, 2c and 3 in table 13 of IEC 61558-1 apply		P
	For insulated winding wires complying with subclause 19.12.3 of IEC 61558-1 there are no requirements for clearances or creepage distances		P
	For windings providing reinforced insulation, the distance specified in item 2c of table 13 of IEC 61558-1 is not assessed		P
	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		P
H	**ANNEX H (NORMATIVE)** **SWITCHES**		**N**
	Switches comply with the following clauses of IEC 61058-1, as modified:		N
	-The tests of IEC 61058-1 carried out under the conditions occurring in the appliance		N
	-Before being tested, switches are operated 20 times without load		N
8	Marking and documentation		N
	Switches are not required to be marked		N
	However, switches that can be tested separately from the appliance marked with the manufacturer's name or trade mark and the type reference		N
13	Mechanism		N
	The tests may be carried out on a separate sample		N
15	Insulation resistance and dielectric strength		N
15.1	Not applicable		N
15.2	Not applicable		N
15.3	Applicable for full disconnection and micro-disconnection		N
17	Endurance		N
	Compliance is checked on three separate appliances or switches		N
	For 17.2.4.4, the number of cycles is 10 000, unless otherwise specified in 24.1.3 of the relevant part 2 of		N

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	IEC 60335		
	Switches for operation under no load and which can be operated only by a tool and switches operated by hand that are interlocked so that they cannot be operated under load, are not subjected to the tests		N
	However, switches without this interlock are subjected to the test of 17.2.4.4 for 100 cycles of operation		N
	Subclauses 17.2.2 and 17.2.5.2 not applicable		N
	The ambient temperature during the test is that occurring in the appliance during the test of Clause 11 in IEC 60335-1		N
	Temperature rise of the terminals not more than 30 K above the temperature rise measured in clause 11 of IEC 60335-1		N
20	Clearances, creepage distances, solid insulation and coatings of rigid printed board assemblies		N
	This clause is applicable to clearances and creepage distances for functional insulation, across full disconnection and micro-disconnection, as stated in table 24		N
I	**ANNEX I (NORMATIVE)** **MOTORS HAVING BASIC INSULATION THAT IS INADEQUATE FOR THE RATED VOLTAGE OF THE APPLIANCE**		**N**
	The following modifications to this standard are applicable for motors having basic insulation that is inadequate for the rated voltage of the appliance:		N
8	Protection against access to live parts		N
8.1	Metal parts of the motor are considered to be bare live parts		N
11	Heating		N
11.3	Temperature rise of the body of the motor is determined instead of the temperature rise of the windings		N
11.8	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
16	Leakage current and electric strength		N
16.3	Insulation between live parts of the motor and its other metal parts not subjected to the test		N
19	Abnormal operation		N
19.1	The tests of 19.7 to 19.9 not carried out		N
19.101	Appliance operated at rated voltage with each of the following fault conditions:		N

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	- short circuit of the terminals of the motor, including any capacitor incorporated in the motor circuit		N
	- short circuit of each diode of the rectifier		N
	- open circuit of the supply to the motor		N
	- open circuit of any parallel resistor, the motor being in operation		N
	Only one fault simulated at a time, the tests carried out consecutively		N
22	Construction		N
22.101	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
	Compliance checked by the tests specified for double and reinforced insulation		N
J	**ANNEX J (NORMATIVE)** **COATED PRINTED CIRCUIT BOARDS**		**N**
	Testing of protective coatings of printed circuit boards carried out in accordance with IEC 60664-3 with the following modifications:		N
5.7	Climatic sequence		N
	When production samples are used, three samples of the printed circuit board are tested		N
5.7.1	Cold		N
	The test is carried out at -25°C		N
5.7.3	Rapid change of temperature		N
	Severity 1 is specified		N
5.9	Additional tests		N
	This subclause is not applicable		N
K	**ANNEX K (NORMATIVE)** **OVERVOLTAGE CATEGORIES**		**P**
	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
	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		N

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	requirements		
	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		P
	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
L	**ANNEX L (INFORMATIVE)** **GUIDANCE FOR THE MEASUREMENT OF CLEARANCES AND CREEPAGE DISTANCES**		**P**
	Sequences for the determination of clearances and creepage distances		P
M	**ANNEX M (NORMATIVE)** **POLLUTION DEGREE**		**P**
	The information on pollution degrees is extracted from IEC 60664-1		P
	Pollution		P
	The microenvironment determines the effect of pollution on the insulation, taking into account the microenvironment		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		P
	For evaluating creepage distances, the following degrees of pollution in the microenvironment are established:		P
	- pollution degree 1: no pollution or only dry, non-conductive pollution occurs. The pollution has no influence		N
	- pollution degree 2: only non-conductive pollution occurs, except that occasionally a temporary conductivity caused by condensation is to be expected		P
	- pollution degree 3: conductive pollution occurs or dry non-conductive pollution occurs that becomes conductive due to condensation that is to be expected		N
	- pollution degree 4: the pollution generates persistent conductivity caused by conductive dust or by rain or snow		N

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
N	**ANNEX N (NORMATIVE)** **PROOF TRACKING TEST**		**N**
	The proof tracking test is carried out in accordance with IEC 60112 with the following modifications:		N
7	Test apparatus		N
7.3	Test solutions		N
	Test solution A is used		N
10	Determination of proof tracking index (PTI)		N
10.1	Procedure		N
	The proof voltage is 100V, 175V, 400V or 600V.....:	--	N
	The last paragraph of Clause 3 applies		N
	The test is carried out on five specimens		N
	In case of doubt, additional test with proof voltage reduced by 25V, the number of drops increased to 100		N
10.2	Report		N
	The report stating if the PTI value was based on a test using 100 drops with a test voltage of (PTI-25) V		N
O	**ANNEX O (INFORMATIVE)** **SELECTION AND SEQUENCE OF THE TESTS OF CLAUSE 30**		**P**
	Description of tests for determination of resistance to heat and fire		P
P	**ANNEX P (INFORMATIVE)** **GUIDANCE FOR THE APPLICATION OF THIS STANDARD TO APPLIANCES USED IN WARM DAMP EQUABLE CLIMATES**		**N**
	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		N
	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		N
5.7	The ambient temperature for the tests of Clauses 11 and 13 is 40 +3/0 °C		N
7	Marking and instructions		N
7.1	The appliance marked with the letters WDaE		N
7.12	The instructions state that the appliance is to be supplied through a RCD having a rated residual		N

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	operating current not exceeding 30 mA		
	The instructions state that the appliance is considered to be suitable for use in countries having a warm damp equable climate, but may also be used in other countries		N
11.8	The values of Table 3 are reduced by 15 K		N
13.2	The leakage current for class I appliances not exceeding 0.5 mA		N
15.3	The value of t is 37 °C		N
16.2	The leakage current for class I appliances not exceeding 0.5 mA		N
19.13	The leakage current test of 16.2 is applied in addition to the electric strength test of 16.3		N
Q	**ANNEX Q (INFORMATIVE)** **SEQUENCE OF TESTS FOR THE EVALUATION OF ELECTRONIC CIRCUITS**		**P**
	Description of tests for appliances incorporating electronic circuits		P
R	**ANNEX R (NORMATIVE)** **SOFTWARE EVALUATION**		**N**
	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		N
R.1	Programmable electronic circuits using software		N
	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		N
R.2	Requirements for the architecture		N
	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		N
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:		N
	- single channel with periodic self-test and monitoring		N
	- dual channel (homogenous) with comparison		N
	- dual channel (diverse) with comparison		N

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	Programmable electronic circuits requiring software incorporating measures to control the fault/error conditions specified in table R.1 have one of the following structures:		N
	- single channel with functional test		N
	- single channel with periodic self-test		N
	- dual channel without comparison		N
R.2.2	Measures to control faults/errors		N
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
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
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		N
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		N
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 R.2, detection of a fault/error occur before compliance with clause 19 is impaired		N
R.2.2.6	The software is referenced to relevant parts of the operating sequence and the associated hardware functions		N
R.2.2.7	Labels used for memory locations are unique		N
R.2.2.8	The software is protected from user alteration of safety-related segments and data		N
R.2.2.9	Software and safety-related hardware under its control is initialized and terminates before compliance with clause 19 is impaired		N
R.3	Measures to avoid errors		N

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
R.3.1	General		N
	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		N
	Software that incorporates measures used to control the fault/error conditions specified in table R.2 is inherently acceptabe for software required to control the fault/error condlitions specified in table R.1		N
R.3.2	Specification		N
R.3.2.1	Software safety requirements:		N
	The specification of the software safety requirements includes the descriptions listed		N
R.3.2.2	Software architecture		N
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		N
R.3.2.2.2	The architecture specification is validated against the specification of the software safety requirements by static analysis		N
R.3.2.3	Module design and coding		N
R.3.2.3.1	Based on the architecture design, software is suitably refined into modules		N
	Software module design and coding is implemented in a way that is traceable to the software architecture and requirements		N
R.3.2.3.2	Software code is structured		N
R.3.2.3.3	Coded software is validated against the module specification by static analysis		N
	The module specification is validated against the architecture specification by static analysis		N
R.3.3.3	Software validation		N
	The software is validated with reference to the		N

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	requirements of the software safety requirements specification		
	Compliance is checked by simulation of:		N
	- input signals present during normal operation		N
	- anticipated occurrences		N
	- undesired conditions requiring system action		N
H.2	Definitions		N
	Only definitions H.2.16 to H.2.20 applicable		N
H.7	Information		N
	Only footnotes 12) to 18) of Table 7.2, as modified, applicable		N
H.11.12	Controls using software		N
	All the subclauses of H.11.12, as modified, except H.11.12.6 and H.11.12.6.1, applicable		N
H.11.12.7	Delete text		N
H.11.12.7.1	For appliances using software class C having a single channel with self-test and monitoring structure, the manufacturer provides the measures necessary to address the fault/errors in safety related segments and data		N
H.11.12.8	Software fault/error detection occurs before compliance with 19.13 of IEC 60335-1 is impaired		N
H.11.12.8.1	Replace text		N
H.11.12.13	Software and safety related hardware under its control initializes and terminates before compliance with 19.13 of IEC 60335-1 is impaired		N

AA	**ANNEX AA (NORMATIVE)** **BATTERY CHARGERS FOR USE BY CHILDREN (IEC 60335-2-29)**		**N**
	The battery charger have a d.c. output at SELV not exceeding 30 V and a rated output not exceeding 50 VA		N
5.210	Use of rechargeable batteries giving the most unfavourable conditions		N
6.1	Protection against electric shock for battery chargers for outdoor use: Class III..... :	--	N
	Protection against electric shock for other battery chargers: Class II, III..... :	--	N
6.2	Protection against harmful ingress of water for battery chargers for outdoor use:	--	N

EN 60335-2-29			
Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	IPX7.....:		
6.201	Protection against ingress of solid foreign objects: IP3X.....:	--	N
7.1	Symbol 5957 of IEC 60417 or text "For indoor use only" for battery chargers for indoor use .....:	--	N
	IP number.....:	--	N
	Smiling face symbol together with 8+		N
7.6	Correct symbols used		N
7.12	Instructions for safe use contains:		N
	- Warning to only allow children at least 8 years old to use battery charger		N
	Sufficient instructions for safe use of battery charger by a child		N
	Explanation that battery charger is not a toy		N
	- Instruction for child not to try and recharge non-rechargeable batteries		N
	- Warning to examine battery charger regularly for damage		N
	Warning in case battery charger is damaged		N
	Instruction for Class III battery charger to be supplied from transformer for toys		N
7.14	Height of symbol marked on the appliance at least 10 mm		N
	Height of lettering at least 3 mm		N
8.1.1	Use of test probe B of IEC 61032: no contact with live parts or metal parts separated from live parts by basic insulation only, even after use of a tool to remove parts of enclosure		N
10.101	The output voltage not exceed 42.4 V peek.....:	--	N
11.8	Temperature rises of parts that can be touched by test probe 18 of IEC 61032		N
17	Temperature rises of parts that can be touched by test probe 18 of IEC 61032		N
19.13	Temperature rises of parts that can be touched by test probe 18 of IEC 61032		N
21.201	Impact test Eha of IEC 60068-2-75, with impact energy of 2 J		N
	Free fall test Ed, Procedure 1 of IEC 60068-2-32, from the height of 500 mm		N
	Battery charger not damaged to such extend that compliance is impaired, live parts not accessible		N
22.201	Battery charger with only one rated voltage or rated		N

EN 60335-2-29			
Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	voltage range		
	Battery charger not incorporate means for manually adjusting output voltage		N
22.202	Construction of battery charger prevent reverse charging		N
24.201	Transformer for toys tested in accordance with subclauses 7.2, 20.5.1 and 20.101 and clause 15 of standard IEC 61558-2-7		N
25.1	Battery charger not provided with an appliance inlet		N
25.5	Battery charger provided with type Y or type Z attachment		N
	National Differences for (country name) or Group Differences		--
	Group/CENELEC Common Differences to IEC 60335-1		**P**
6	Classification		N
6.1	Delete “class 0” and “class 01”		N
7	Marking and instructions		P
7.1	The marking of rated voltage or rated voltage range, for appliances intended to be connected to the supply mains, shall cover:		P
	-230 V for single-phase appliances		P
	-400 V for multi-phase appliances		N
7.10	Devices used to start/stop operational functions of the appliance, if any, shall be distinguished from other manual devices by means of shape, or size, or surface texture, or position, etc.		N
	An indication that the device has been operated shall be given by:		N
	A tactile feedback or		N
	An audible and visual feedback		N
	A selector switch with an off-position clearly identifiable is allowed		N
	An ON/OFF switch, if any, is considered a suitable device to stop operational functions. A plug is not considered a suitable device to stop operational functions, as it can be difficult to be reached by vulnerable persons		N
7.12	The instructions shall include the substance of the following:		N
	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		N

EN 60335-2-29				
Clause	**Requirement + Test**		**Result - Remark**	**Verdict**
	instruction concerning use of the appliance in a safe way and understand the hazards involved. Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision			
7.12.Z1	The specific instructions related to the safe operation of this appliance (as given in 7.12 of this standard) shall be collated together in the front section of the user instructions. The height of the characters, measured on the capital letters, shall be at least 3 mm			P
7.14	For the evaluation of legibility and clarity of safety warnings guidance can be found in IEC 62079			P
8	Protection against access to live parts			N
8.1.1	Test probe B and probe 18 of EN 61032 are applied with a force not exceeding 1 N, the appliance being in every possible position. Through openings, the test probe is applied to any depth that the probe will permit and is rotated or angled before, during and after insertion to any position. If the opening does not allow the entry of the probe, the force on the probe in the straight position is increased to 20 N when probe B is used or 10 N when probe 18 is used. If the probe then enters the opening, the test is repeated with the probe in the angled position. However when using test probe 18 the appliance shall be fully assembled as in normal use without any parts removed; parts that are intended to be removed for user maintenance shall not be removed			N
8.2	In the third sentence, replace “test probe B of EN 61032” by “test probes of EN 61032”			P
	In the fourth sentence, replace “test probe B of EN 61032 is” by “test probe B and probe 18 of EN 61032 are”			P
11	Heating			N
11.8	Replace in Table 3 the row “External enclosure of motor-operated appliances, except handles held in normal use” with the following:			N
	External enclosure of motor-operated appliances except handles held in normal use			N
	-of bare metal	50		N
	-of coated metal	60		N
	-of glass and ceramic	65		N
	-of plastic having a thickness exceeding 0.3 mm	75		N
15	Moisture resistance			N
15.1.2	Appliances with an automatic cord reel are tested with the cord in the most unfavourable position in such a way that the reeling of the wet cord may affect electrical			N

EN 60335-2-29			
Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	insulation during operation. The cord shall not be dried before reeling		
20	Stability and mechanical hazards		N
20.2	For appliances having dangerous movable parts, due to their main 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.		N
	Compliance is checked by inspection, by the tests of 21.1 and by means of		N
	-a test probe that is similar to test probe B of EN 61032 but having a circular stop face with a diameter of 50 mm, instead of the non circular face, applied with a force of 5N with the accessories and detachable covers removed and		N
	-test probe 18 of EN 61032, applied with a force of 2.5N on the appliance in a fully assembled situation		N
22	Construction		N
22.12	Hazard includes ingestion or a choking hazard for vulnerable people		N
24	Components		P
24.1	Components shall comply with the safety requirements specified in the relevant standards as far as they reasonably apply		P
	Unless otherwise specified, the requirements of Clause 29 of this standard apply between live parts of components and accessible parts of the appliance		P
	Unless otherwise specified, 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 previously tested or do not comply with the standard for the relevant component are tested according to the requirements of 30.2 of this standard		P
	Components that have been previously tested and shown to comply with the resistance to fire requirements in the standard for the relevant component need not be retested provided that		P
	-the severity specified in the component standard is not less than the severity specified in 30.2 of this standard, and		P
	-unless the preselection alternative is used, the test report for the component states whether it complied with the standard for the relevant component with or without flame. Flames existing for a cumulative time not		N

EN 60335-2-29			
Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	exceeding 2 s during the test are ignored.		
	If the above two conditions are not satisfied, the component is tested as part of the appliance		N
	There are two levels of severity specified for appliances for which 30.2.3 is applicable		P
	Unless components have been previously tested and found to comply with the relevant standard for the number of cycles specified, they are tested in accordance with 24.1.1 to 24.1.9. For components mentioned in 24.1.1 to 24.1.9, no additional tests specified in the relevant standard for the component are necessary other than those specified in 24.1.1 to 24.1.9		P
	Components that have not been separately tested and found to comply with the relevant standard and components that are not marked or not used in accordance with their marking, are tested in accordance with the conditions occurring in the appliance, the number of samples being that required by the relevant standard		P
	Lamp holders and starter holders that have not been previously tested and found to comply with the relevant standard are tested as a part of the appliance and shall additionally comply with the gauging and interchangeability requirements of the relevant standard under the conditions occurring in the appliance. Where the relevant standard specifies these gauging and interchangeability requirements at elevated temperatures, the temperatures measured during the tests of Clause 11 are used		N
	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 IEC 60320-1 and IEC 60309, unless they are specifically mentioned in the text of this standard		N
	Plugs and socket-outlets and other connecting devices of interconnection cords shall not be 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, if direct supply to these parts from the supply mains could give rise to a hazard		P
	When a standard does not exist for a component, there are no additional tests specified		N
24.1.3	For this test a thermostat or timer that is operating the relay or contactor is considered to be a switch		N
24.1.7	If the remote operation of the appliance is via a telecommunication network, the relevant standard for the telecommunication interface circuitry in the appliance is EN 41003		N

EN 60335-2-29			
Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	Compliance with Clause 8 of this standard shall not be impaired by connecting the appliance to a device covered by EN 41003		N
24.Z1	For motor running capacitors (IEC 60252-1 type P2) with a metallic enclosure having an overpressure fuse the flame testing of internal plastic parts supporting current carrying connections as required in 30.2.2 and 30.2.3.1 is not necessary		N
25	Supply connection and external flexible cords		P
25.6	Supply cords of single-phase portable appliances having a rated current not exceeding 16 A shall be fitted with a plug complying with the following standard sheets of IEC/TR 60083		P
	-for class I appliances, standard sheet C2b, C3b or C4		N
	-for class II appliances, standard sheet C5 or C6		P
25.7	Add the following text after the last dash and before the paragraph regarding "Supply cords for class III appliances":		N
	-Halogen-free thermoplastic compound sheathed		N
	halogen-free thermoplastic compound sheathed cords (code designation H03Z1Z1H2-F, H03Z1Z1-F), for appliances having a mass not exceeding 3 kg		N
	halogen-free thermoplastic compound sheathed cords (code designation H05Z1Z1H2-F or H05Z1Z1-F), for other appliances		N
	-Cross-linked halogen-free compound sheathed		N
26	Terminals for external conductors		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 unless they are held in place near the terminals independently of the solder		P
29	Clearances, creepage distances and solid insulation		N
29.1	Attention is drawn on the fact that for appliances intended for use at altitudes exceeding 2 000 m, the altitude correction factors, relevant to the intended altitude, for clearances specified in Table A.2 of EN 60664-1:2007 may need to be taken into account		N
29.3.Z1	Appliance shall be constructed so that if there is a possibility of damaging the insulation during installation, the insulation shall withstand the scratch and penetration test of 21.2		N
32	Radiation, toxicity and similar hazards		P
	Compliance regarding electromagnetic fields is checked according to EN 50366 or EN 62233	EN 62233	P

EN 60335-2-29			
Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
Annex I	Motors having basic insulation that is inadequate for the rated voltage of the appliance		N
19.I.101	The appliance is supplied at rated voltage and operated under normal operation with each of the following fault conditions		N
	When any of the fault conditions are simulated, the duration of the test is as specified in 19.7		N
	ANNEX ZA (NORMATIVE) **SPECIAL NATIONAL CONDITIONS (EN 60335-1)**		**P**
19.5	Norway: The test is also applicable to appliances intended to be permanently connected to fixed wiring		N
22.2	Norway: The second paragraph of this subclause, that deals with single-phase, permanently connected class I appliances having heating elements, is not applicable due to the supply system		N
25.6, 25.25	Information concerning National plug and socket-outlets is available from the CENELEC website		N
	Normative national requirements concerning plug and socket-outlets are shown in the relevant National standard		N
25.8	Ireland and United Kingdom		N
	In the table, replace the line for 10 A and 16 A by:		N
	> 10 and ≤ 13 1.25		N
	> 13 and ≤ 16 1.5		N
	ANNEX ZB (INFORMATIVE) **A-DEVIATIONS (EN 60335-1)**		**P**
25.6	Ireland (Statutory Instrument No. 525 of 1997)		P
	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		P
25.6	United Kingdom (Statutory Instrument 1994 No 1768)		P
	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. It also allows plugs to BS 4573 and EN 50075 to be fitted to shavers and toothbrushes.		P

EN 60335-2-29			
Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	ANNE ZC (NORMATIVE) (EN 60335-1)		**P**
	Normative references to international publications with their corresponding European publications		P
	ANNEX ZD (INFORMATIVE) (EN 60335-1)		**P**
	IEC and CENELEC code designations for flexible cords		P
	ANNEX ZE (INFORMATIVE) (EN 60335-1) SPECIFIC ADDITIONAL REQUIREMENTS FOR APPLIANCES AND MACHINES INTENDED FOR COMMERCIAL USE		**P**
7	Marking and instructions		P
7.1	-business name and full address of the manufacturer and, where applicable, his authorized representative		P
	- model or type reference, serial number, if any, and production year		P
	-designation of the appliance		P
7.12	Instructions shall be provided with the appliance so that the appliance can be used safely		N
	The instructions shall contain at least the following information:		P
	-the business name and full address of the manufacturer and, where applicable, his authorized representative		P
	-model or type reference of the appliance as marked on the appliance itself, except for the serial number		P
	-the designation of the appliance together with its explanation in case it is given by a combination of letters and/or numbers		N
	-the general description of the appliance, when needed due to the complexity of the appliance		N
	-specific precautions if required during installation, operation, adjusting, user maintenance, cleaning, repairing or moving		P
	-when needed drawings, diagrams, descriptions and explanations necessary for the safe use and user maintenance of the appliance		P
	-the possible reasonably foreseeable misuse and, whenever relevant, a warning against the effects it may have on the safe use of the appliance		P
	-the designation of the appliance together with its explanation in case it is given by a combination of letters and/or numbers		N
7.12.ZE1	Wherever needed for specific appliances, information		N

EN 60335-2-29			
Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	shall 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
	on how to maintain adequate mechanical stability when in use, during transportation, assembly, dismantling, scrapping and any other action involving the appliance		N
	on the protective measures to be taken by the user, including, where appropriate, the personal protective equipment to be provided		N
	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
	on the specifications on the spare parts to be used, when these affect the health and safety of the operator		N
	on airborne noise emissions, determined and declared in accordance with the relevant Part 2		N
	- the A-weighted emission sound pressure level at workstations, where this exceeds 70 dB(A); where this level does not exceed 70 dB(A), this fact shall be indicated		P
	- the peak C-weighted instantaneous sound pressure value at workstations, where this exceeds 63 Pa (130 dB in relation to 20 µPa),		N
	- 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
7.12.ZE2	The instructions shall include a warning that the appliance shall be disconnected from its power source during service and when replacing parts and, if that the removal of the plug is foreseen, it shall be clearly indicated that the removal of the plug has to be such that an operator can check from any of the points to which he has access that the plug remains removed		P
	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 shall be provided		N
19	Abnormal operation		N
19.11.4.8	The appliance shall continue to operate, without causing any hazard to the user, from the same point in its operating cycle at which the voltage fluctuation occurred, or a manual operation shall be required to restart it		N
20	Stability and mechanical hazards		N

EN 60335-2-29			
Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
20.1	Appliances and their components and fittings shall have adequate mechanical stability during transportation, assembly, dismantling and any other action involving the appliance		N
	Compliance is checked by verifying the instructions and by the relevant tests, if necessary, as specified in the relevant Part 2		N
20.2	Dangerous moving transmission parts shall be safeguarded either by design or guards. When guards are used, they shall be fixed guards, interlocking movable guards or protective devices		N
	Moving parts directly involved in the function of the appliance which cannot be made completely inaccessible shall be fitted with		N
	- fixed guards or interlocking movable guards preventing access to those sections of the parts that are not used in the work; and		N
	- adjustable guards restricting access to those sections of the moving parts where access is necessary		N
21	Mechanical strength		P
21.1	Appliances and their components and fittings shall have adequate mechanical strength and be 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		P
22	Construction		N
22.ZE.1	For appliances provided with a seat, the seat has to give adequate stability. The distance between the seat and the control devices shall be capable of being adapted to the operator		N
22.ZE.2	For appliances provided with separate devices for the start and the stop functions, the stop function shall be unambiguously identifiable and shall always override the start function		N
22.ZE.3	Appliances shall be designed in such a way that incorrect mounting is avoided, if this can lead to an unsafe situation. If this is not possible, information on the correct mounting shall be given directly on the part and/or the enclosure		N
22.ZE.4	Where the weight, size or shape prevents appliances from being moved manually, they shall befitted with attachments for lifting gear or be designed so they can be fitted with such attachments, or be shaped in such a way that standard lifting gear can easily be used		N
22.ZE.5	The fixing systems of fixed guards which prevent access to dangerous moving transmission parts shall only be		N

EN 60335-2-29			
Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	removable with the use of tools		
	This does not apply if, after removal of the screws, or if the component is incorrectly repositioned, the appliance becomes inoperative		N
	Where it is possible for an operator to reach the danger zone before the risk due to hazardous appliance functions has ceased, movable guards shall be associated with a guard locking device in addition to an interlocking device that		N
	-prevents the start of hazardous appliance functions until the guard is closed and locked, and		N
	-keeps the guard closed and locked until the risk of injury from the hazardous appliance functions has ceased.		N
22.ZE.6	Interlocking movable guards shall be designed in such a way that the absence or failure of one of their components prevents starting or stops the hazardous appliance functions		N
22.ZE.7	Adjustable guards restricting access to areas of the moving parts strictly necessary for the work shall be		N
	-adjustable manually or automatically, depending on the type of work involved, and		N
	-readily adjustable without the use of tools		N
22.ZE.8	In case of interruption, re-establishment after an interruption or fluctuation in whatever manner of the power supply, the appliance shall not restart, 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
22.ZE.9	Appliances shall be fitted with means to isolate them from all energy sources (e.g. hot water, steam, compressed air). Such isolators must be clearly identified. They shall be capable of being locked if reconnection could endanger persons		N

	ANNEX ZF (INFORMATIVE) (EN 60335-1) **CRITERIA APPLIED FOR THE ALLOCATION OF PRODUCTS COVERED BY STANDARDS IN THE EN 60335 SERIES UNDER LVD OR MD**		**P**
	EN 60335-2-29, Battery chargers	LVD	P

	ANNEX ZG (INFORMATIVE) (EN 60335-1) **UV APPLIANCES**		**P**
7	Marking and instructions		N

EN 60335-2-29			
Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
7.12.ZG	The instructions for appliances incorporating UVC emitters shall include the substance of the following:		N
	WARNING This appliance contains a UV emitter. Do not stare at the light source		N
32	Radiation, toxicity and similar hazards		N
	For appliances incorporating UV emitters the manufacturer's shall deliver a declaration providing evidence that the plastic material exposed to the radiation is UV resistant.		N
	ANNEX ZZ (INFORMATIVE) (EN 60335-1) **COVERAGE OF ESSENTIAL REQUIREMENTS OF EC DIRECTIVES**		**P**

EN 60335-2-29			
Clause	**Requirement + Test**	**Result - Remark**	**Verdict**

ANNEX 1
EN 62233
MEASUREMENT METHODS FOR ELECTROMAGNETIC FIELDS OF HOUSEHOLD APPLIANCES AND SIMILAR APPARATUS WITH REGARD TO HUMAN EXPOSURE

ANNEX 1	**TABLE: ELECTROMAGNETIC FIELDS (EMF)**		**P**
	The test product also complies with the requirements of EN 62233: 2008		P
	Limit (100%)..... :	2.4 %	P

EN 60335-2-29			
Clause	**Requirement + Test**	**Result - Remark**	**Verdict**

ANNEX 2
LIST OF CRITICAL COMPONENTS

24.1	List of critical components				P
Object/part No.	**Manufacturer/ trademark**	**Type/model(s)**	**Technical data**	**Standard(s)**	**Mark(s) of conformity**
Power plug	Hong Shan Chuan Industry (Hong Kong) Limited	HSC-402	16 A, 250 V	VDE 0620-1	VDE 40021749
Power cord	Shenzhen Baohing Electric Wire & Cable Manufacture Co., Ltd.	H05VV-F	3 x 0.75 mm^2	VDE 0281-5	VDE 103727
Power coupler	Guangdong Xiongrun Electrical Co., Ltd.	JT-ST3	10 A, 250 V	EN 60320-1	VDE 40025292
AC inlet	Zhe Jiang Bei Er Jia Electronic Co., Ltd.	ST-A01-003J	10 A, 250 V	EN 60320-1	VDE 40013388
Fuse (F1)	Dong guan Better Electronic Technology Co., Ltd.	523-series	3.15 A, 250 V	EN 60127-1 EN 60127-2	VDE 40025669
(Alternative)	Suzhou Littelfuse OVS Ltd.	216.XXX	3.15 A, 250 V	EN 60127-1 EN 60127-2	VDE 40013834
(Alternative)	Sun Electric Co. O/B Heroday Ltd.	5C-Series	3.15 A, 250 V	EN 60127-1 EN 60127-2	VDE 40007751
(Alternative)	Shenzhen Lanson Electronics Co., Ltd.	5M-Series	3.15 A, 250 V	EN 60127-1 EN 60127-2	VDE 40016332
X-capacitor (CX1)	Tenta Electric Industrial Co., Ltd.	MEX	0,33 uF, 275V, 100 °C, X2	EN 60384-14	VDE 119119
(Alternative)	Farad Electronics Co., Ltd.	PXK	0,33 uF, 275V, 100 °C, X2	EN 60384-14	VDE 40030152
(Alternative)	Wuxi Tongrong Electronics Co., Ltd.	MKP	0,33 uF, 275V, 100 °C, X2	EN 60384-14	VDE 40018989
X-capacitor (CX2)	Tenta Electric Industrial Co., Ltd	MEX	0,1 uF, 275V, 100 °C, X2	EN 60384-14	VDE 119119
(Alternative)	Farad Electronics Co., Ltd.	PXK	0,1 uF, 275V, 100 °C, X2	EN 60384-14	VDE 40030152
(Alternative)	Wuxi Tongrong Electronics Co., Ltd.	MKP	0,1 uF, 275V, 85 °C, X2	EN 60384-14	VDE 40018989
X-capacitor (CX3)	Tenta Electric Industrial Co., Ltd	MEX	0,22 uF, 275V, 100 °C, X2	EN 60384-14	VDE 119119
(Alternative)	Farad Electronics Co., Ltd.	PXK	0,22 uF, 275V, 100 °C, X2	EN 60384-14	VDE 40030152

EN 60335-2-29			
Clause	**Requirement + Test**	**Result - Remark**	**Verdict**

(Alternative)	Wuxi Tongrong Electronics Co., Ltd.	MKP	0,22 uF, 275V, 85 °C, X2	EN 60384-14	VDE 40018989
Varistor	Hongzhi Enterprises Ltd.	HEL-10D471K	470 V	IEC 61051-1 IEC 61051-2-2	VDE 40008621
(Alternative)	Shantou High-New Technology Dev. Zone Songtian Enterprise Co., Ltd.	STE-10D471K	470 V	IEC 61051-1 IEC 61051-2-2	VDE 40023049
(Alternative)	Nanjing Shagon Electronic Co., Ltd.	MYG10K471	470 V	IEC 61051-1 IEC 61051-2-2	TUV SUD Z1 12 03 79712 001
Bridge Diode (BG1)	Various	Various	Min. 10 A, 600 V	EN 60335-2-29, EN 60335-1	Test in appliance
Ripple Capacitor (C1)	Various	Various	Min. 150 uF, 400 V, 105 °C	EN 60335-2-29, EN 60335-1	Test in appliance
Mosfet (Q1)	Various	Various	Min. 7 A, 600 V	EN 60335-2-29, EN 60335-1	Test in appliance
Line choke (FL1)	Wuxi Zhongtong Electronics Co., Ltd.	SSL-03	Class B	EN 60335-2-29, EN 60335-1	Tested with appliance
Line choke (FL2)	Wuxi Zhongtong Electronics Co., Ltd.	SSL-01	Class B	EN 60335-2-29, EN 60335-1	Tested with appliance
Transformer (T1)	Wuxi Zhongtong Electronics Co., Ltd.	SSB109V55-ER35-CE	Class B	EN 60335-1 EN 60335-2-29	Tested with appliance
-Bobbin	CHANG CHUN PLASTICS CO LTD	T375J	V-0, 150 °C	--	UL E59481
-Magnet wire	WUXI JUFENG COMPOUND LINE CO LTD	xUEWN*	130°C	--	UL E206882
-Tube	Dah Jin Technology Co., Ltd	TLW-B	600 V, 200 °C, VW-1	--	UL E236542
(Alternative)	Fluo Tech Industries Co., Ltd	TFL	600 V, 200 °C, VW-1	--	UL E175982
-Margin tape	Jing Jiang YaHua Pressure Sensitive Glue Co., Ltd.	WF	130 °C	--	UL E178516
-Insulation tape	Jing Jiang YaHua Pressure Sensitive Glue Co Ltd	PZ	130 °C	--	UL E165111
Y-Capacitor (CY1, CY2)	Success Electronics Co., Ltd.	SE	4700 pF, 250 V, 125 °C, Y1	EN 60384-14	VDE 40008996
Alternative	Hsuan Tai Electronic Co., Ltd.	CY	4700 pF, 400 V, 125 °C, Y1	EN 60384-14	VDE 40008912
Alternative	Kunshan Micro Capacitors Electronic Co., Ltd.	E-Series	4700 pF, 250 V, 125 °C, Y1	EN 60384-14	VDE 40016537

EN 60335-2-29			
Clause	**Requirement + Test**	**Result - Remark**	**Verdict**

Alternative	Yinan Don's Electronic Components Co., Ltd.	CT81	4700 pF, 250 V, 125 °C, Y1	EN 60384-14	VDE 135256
Y-Capacitor (CY3, CY4)	Success Electronics Co., Ltd.	SE	2200 pF, 250 V, 125 °C, Y1	EN 60384-14	VDE 40008996
Alternative	Hsuan Tai Electronic Co., Ltd.	CY	2200 pF, 400 V, 125 °C, Y1	EN 60384-14	VDE 40008912
Alternative	Kunshan Micro Capacitors Electronic Co., Ltd.	E-Series	2200 pF, 250 V, 125 °C, Y1	EN 60384-14	VDE 40016537
Alternative	Yinan Don's Electronic Components Co., Ltd.	CT81	2200 pF, 250 V, 125 °C, Y1	EN 60384-14	VDE 135256
Photo coupler	Sharp Corporation Electronic Components and Devices Group	PC817	Int.: > 7.6 mm, Ext.: > 7.6mm, Dti: > 0.4 mm; 110 °C	EN 60747-5-2	VDE 40008087
Alternative	Lite-On Technology Corporation	LTV-817	Int.: > 7 mm, Ext.: > 7 mm, Dti: > 0.4 mm; 110 °C	EN 60747-5-2	VDE 40015248
Alternative	Everlight Electronics Co., Ltd.	EL817 V	Int.: > 7.6 mm, Ext.: > 7.6mm, Dti: > 0.4 mm; 110 °C	EN 60747-5-2	VDE 132249
Output Cord	ZhenJiang Huayin Instrument And Electrical Equipment Co., Ltd.	H03VV-F	2 x 0.75 mm^2, 300 V, 60 °C	VDE 0281-5	VDE 116312
Alternative	Shenzhen Dongju Wire & Cable Co., Ltd.	H03VV-F	2 x 0.75 mm^2, 300 V, 60 °C	VDE 0281-5	VDE 129988
Alternative	Shenzhen Bao Hing Electric Wire & Cable Manufacture Co. Ltd.	H05VV-F	2 x 0.75 mm^2, 300 V, 60 °C	VDE 0281-5	VDE 131689
Alternative	SUZHOU DIOUDE ELECTRONICS CO LTD	2464	20 AWG, 300 V, 60 °C, VW-1	--	UL E336191
PCB	CHANGZHOU SHUANGJIN ELECTRONIC CO LTD	CCEM-1	V-0, 130 °C	--	UL E190089
Alternative	SUZHOU XIANGCHENG DISTRICT CULTURE & EDUCATION COMMUNICATIONS	KY-2	V-0, 130 °C	--	UL E254931
Alternative	CHANGZHOU ZIYIN ELECTRONIC CIRCUIT CO LTD	CY-10	V-0, 130 °C	--	UL E148151

EN 60335-2-29					
Clause	**Requirement + Test**		**Result - Remark**		**Verdict**
Enclosure	SABIC INNOVATIVE PLASTICS B V	945(GG)	V-0, 120 °C	--	UL E45329
Bonding conductor	Various	Various	18 AWG, 300 V, 80 °C, VW-1	--	UL

EN 60335-2-29			
Clause	**Requirement + Test**	**Result - Remark**	**Verdict**

ANNEX 3
TABLES OF TEST RESULTS

10.1	TABLE: Power input deviation				N
Input deviation of/at:	**P rated (W)**	**P measured (W)**	**dP (%)**	**Required dP (%)**	**Remark**
--	--	--	--	--	--

10.2	TABLE: Current deviation				P
Current deviation of/at:	**I rated (A)**	**I measured (A)**	**dI (%)**	**Required dI (%)**	**Remark**
100 V AC, 47 Hz	2	1.838	-8.1	+ 20	--
100 V AC, 63 Hz	2	1.847	-7.7	+ 20	--
240 V AC, 47 Hz	2	0.987	-50.7	+ 20	--
240 V AC, 63 Hz	2	0.998	-50.1	+ 20	--

10.101	TABLE: No load output voltage			P
Current deviation of/at:	**U_o rated (V)**	**U_o measured (V)**	**Required (V)**	**Remark**
100 V AC, 47 Hz	54.6	0	42.4	--
100 V AC, 63 Hz	54.6	0	42.4	--
240 V AC, 47 Hz	54.6	0	42.4	--
240 V AC, 63 Hz	54.6	0	42.4	--

Remark:
The sample normal output at loading battery mode.

10.102	TABLE: Output current deviation					P
Current deviation of/at:	**U_o rated (V)**	**I_o rated (A)**	**I_o measured (A)**	**dI_o (%)**	**Required I_o (%)**	**Remark**
100 V AC, 47 Hz	54.6	2	1.835	-8.3	10	--
100 V AC, 63 Hz	54.6	2	1.835	-8.3	10	--
240 V AC, 47 Hz	54.6	2	1.837	-8.2	10	--
240 V AC, 63 Hz	54.6	2	1.837	-8.2	10	--

EN 60335-2-29			
Clause	**Requirement + Test**	**Result - Remark**	**Verdict**

11.8	**TABLE: Heating test, thermocouples measurements**						**P**
	Test voltage (V) ..... :	94	254.4	--	--	--	
	Ambient t1 (°C)..... :	24.3	24.5	--	--	--	
	Ambient t2(°C)..... :	24.2	24.1	--	--	--	
Thermocouple locations:		**dT (K)**					**Allowed dT max. (K)**
Power cord		3.2	2.8	--	--		45
AC inlet		38.1	17.4	--	--		45
Varistor		48.0	25.8	--	--		60
Line chock (FL1)		69.3	33.8	--	--		85
X-capacitor (CX1)		61.8	32.2	--	--		75
X-capacitor (CX2)		42.4	21.9	--	--		75
Line chock (FL2)		71.4	36.0	--	--		85
PCB near BG1		95.1	49.7	--	--		105
Capacitor (C1)		78.2	44.8	--	--		80
Transformer (T1) winding		83.2	75.5	--	--		85
Transformer (T1) core		81.7	73.7	--	--		--
Y-capacitor		61.9	41.4	--	--		100
Opto-coupler		46.1	35.7	--	--		85
PCB near SD1		58.8	60.8	--	--		105
Line chock (L1)		57.6	58.6	--	--		85
Output cord		17.8	18.2	--	--		45
Enclosure inside		50.0	42.9	--	--		95
Enclosure outside		33.6	25.8	--	--		60
Test corner		48.2	36.5	--	--		65

Temperature rise dT of winding:	**t1 (°C)**	**R1 (Ω)**	**t2 (°C)**	**R2 (Ω)**	**dT (K)**	**Allowed dT max. (K)**	**Insulation class**
--	--	--	--	--	--	--	--

EN 60335-2-29			
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)**	**Allowed I max. (mA)**
Live/Neutral – plastic enclosure	0.001	3.5
Live/Neutral – output terminal	0.239	3.5

13.3	**TABLE: Electric strength**		**P**

Test voltage applied between:	**Voltage (V)**	**Breakdown (Yes/No)**
Live/Neutral – plastic enclosure	3000	No
Live/Neutral – output terminal	3000	No
Live/Neutral – earth	1000	No
Transformer primary to secondary(T1)	3000	No
Insulation tape for 1 layer	3000	No

14	**TABLE: Transient overvoltages**		**N**

Clearance between:	**Cl (mm)**	**Required Cl (mm)**	**Rated impulse voltage (V)**	**Impulse test voltage (V)**	**Flashover (Yes/No)**
--	--	--	--	--	--

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 √3 (V)..... :	--	--

Leakage current between:	**I (mA)**	**Allowed I max. (mA)**
Live/Neutral – plastic enclosure	0.001	3.5
Live/Neutral – output terminal	0.239	3.5

EN 60335-2-29			
Clause	**Requirement + Test**	**Result - Remark**	**Verdict**

16.3	TABLE: Electric strength		P
Test voltage applied between:		**Voltage (V)**	**Breakdown (Yes/No)**
Live/Neutral – plastic enclosure		3000	No
Live/Neutral – output terminal		3000	No
Live/Neutral – earth		1250	No
Transformer primary to secondary(T1)		3000	No
Insulation tape for 1 layer		3000	No

17	TABLE: Overload protection, temperature rise		P
	Motor-operated and combined appliances: 1.06 or 0.94 x rated voltage (V) ..... :	254.4	--

Thermocouple locations:	**dT (°C)**				**Allowed dT max. (°C)**
Transformer (T1) winding	113.2	--	--	--	225
Output cord	45.4	--	--	--	90

Temperature rise dT of winding:	**t1 (°C)**	**R1 (Ω)**	**t2 (°C)**	**R2 (Ω)**	**dT (K)**	**Allowed dT max. (K)**	**Insulation class**
--	--	--	--	--	--	--	--

EN 60335-2-29			
Clause	**Requirement + Test**	**Result - Remark**	**Verdict**

19.11.2	TABLE: Abnormal operation, fault conditions		P
	Ambient temperature (°C)..... :	24.2	--

Component No.	Fault	Test voltage (V)	Test time	Fuse #	Input current (A)	Observation
Bridge rectifier (BG1) pin 1-3	Short-circuits	254.4	1 s	F1	>7	Fuse opened. No hazards.
Capacitor (C1)	Short-circuits	254.4	1 s	F1	>7	Fuse opened. No hazards.
Transistor (Q3) pin D-S	Short-circuits	254.4	1 s	F1	>7	Fuse opened. No hazards.
Transistor (Q3) pin D-G	Short-circuits	254.4	1 s	F1	>7	Fuse opened. No hazards.
Transistor (Q3) pin G-S	Short-circuits	254.4	10 min.	F1	0.046	Unit shutdown. No hazards.
Transformer (T1) pin 1-3	Short-circuits	254.4	10 min.	F1	0.046	Unit shutdown. No hazards.
Transformer (T1) pin 5-6	Short-circuits	254.4	1 s	F1	>7	Fuse opened. No hazards.
Transformer (T1) pin 7-8	Short-circuits	254.4	10 min.	F1	0.046	Unit shutdown. No hazards.
Transformer (T1) pin 9-10	Short-circuits	254.4	10 min.	F1	0.046	Unit shutdown. No hazards.
Transformer (T1) pin 11-12	Short-circuits	254.4	10 min.	F1	0.046	Unit shutdown. No hazards.
Opto-coupler (IC3) pin 1-2	Short-circuits	254.4	10 min.	F1	0.046	Unit shutdown. No hazards.
Opto-coupler (IC3) pin 3-4	Short-circuits	254.4	10 min.	F1	0.046	Unit shutdown. No hazards.
Opto-coupler (IC3) pin 1	open-circuits	254.4	10 min.	F1	0.046	Unit shutdown. No hazards.
Opto-coupler (IC3) pin 3	open-circuits	254.4	10 min.	F1	0.046	Unit shutdown. No hazards.
Diode (SD1)	Short-circuits	254.4	10 min.	F1	0.046	Unit shutdown. No hazards.
Output terminal	Short-circuits	254.4	10 min.	F1	0.046	Unit shutdown. No hazards.

EN 60335-2-29			
Clause	**Requirement + Test**	**Result - Remark**	**Verdict**

19.13	TABLE: Abnormal operation, temperature rise					N
Thermocouple locations:		**dT (°C)**				**Allowed dT max. (°C)**
--						
--		--	--	--	--	--

28.1	TABLE: Threaded part torque test			P
Threaded part identification:	**Diameter of thread (mm)**	**Column number (I, II, or III)**	**Applied torque (Nm)**	
Screws to fix enclosure	2.9	II	0.5	

29.1	TABLE: Clearances		P
--	Overvoltage category.....:	II	--

Rated impulse voltage (V)	Min. cl (mm)	Type of insulation				Verdict/ Remark
		Basic	Functional	Supplementary	Reinforced	
330	0.5	--	--	--	--	N
500	0.5	--	--	--	--	N
800	0.5	--	--	--	--	N
1500	0.5	--	--	--	--	N
2500	1.5	P	P	P	--	P
4000	3.0	--	--	--	P	P
6000	5.5	--	--	--	--	N
8000	8.0	--	--	--	--	N
10000	11.0	--	--	--	--	N

EN 60335-2-29			
Clause	**Requirement + Test**	**Result - Remark**	**Verdict**

29.2	**TABLE: Creepage distances, basic, supplementary and reinforced insulation**		**P**
--	Overvoltage category.....:	II	--

Working voltage (V)	**Creepage distance(mm), Pollution degree**							**Type of insulation**			**Verdict**
	1	**2**			**3**						
		Material group			**Material group**						
		I	**II**	**IIIa/ IIIb**	**I**	**II**	**IIIa/ IIIb**	**B*)**	**S*)**	**R*)**	
≤50	0.2	0.6	0.9	1.2	1.5	1.7	1.9	--	--	--	N
≤50	0.2	0.6	0.9	1.2	1.5	1.7	1.9	--	--	--	N
≤50	0.4	1.2	1.8	2.4	3.0	3.4	3.8	--	--	--	N
>50 and ≤125	0.3	0.8	1.1	1.5	1.9	2.1	2.4	--	--	--	N
>50 and ≤125	0.3	0.8	1.1	1.5	1.9	2.1	2.4	--	--	--	N
>50 and ≤125	0.6	1.6	2.2	3.0	3.8	4.2	4.8	--	--	--	N
>125 and ≤250	0.6	1.3	1.8	**2.5**	3.2	3.6	4.0	P	--	--	P
>125 and ≤250	0.6	1.3	1.8	**2.5**	3.2	3.6	4.0	--	P	--	P
>125 and ≤250	1.2	2.6	3.6	**5.0**	6.4	7.2	8.0	--	--	P	P
>250 and ≤400	1.0	2.0	2.8	4.0	5.0	5.6	6.3	--	--	--	N
>250 and ≤400	1.0	2.0	2.8	4.0	5.0	5.6	6.3	--	--	--	N
>250 and ≤400	2.0	4.0	5.6	8.0	10.0	11.2	12.6	--	--	--	N
>400 and ≤500	1.3	2.5	3.6	5.0	6.3	7.1	8.0	--	--	--	N
>400 and ≤500	1.3	2.5	3.6	5.0	6.3	7.1	8.0	--	--	--	N
>400 and ≤500	2.6	5.0	7.2	10.0	12.6	14.2	16.0	--	--	--	N
>500 and ≤800	1.8	3.2	4.5	6.3	8.0	9.0	10.0	--	--	--	N
>500 and ≤800	1.8	3.2	4.5	6.3	8.0	9.0	10.0	--	--	--	N
>500 and ≤800	3.6	6.4	9.0	12.6	16.0	18.0	20.0	--	--	--	N
>800 and ≤1000	2.4	4.0	5.6	8.0	10.0	11.0	12.5	--	--	--	N
>800 and ≤1000	2.4	4.0	5.6	8.0	10.0	11.0	12.5	--	--	--	N
>800 and ≤1000	4.8	8.0	11.2	16.0	20.0	22.0	25.0	--	--	--	N
>1000 and ≤1250	3.2	5.0	7.1	10.0	12.5	14.0	16.0	--	--	--	N
>1000 and ≤1250	3.2	5.0	7.1	10.0	12.5	14.0	16.0	--	--	--	N
>1000 and ≤1250	6.1	10.0	14.2	20.0	25.0	28.0	32.0	--	--	--	N
>1250 and ≤1600	4.2	6.3	9.0	12.5	16.0	18.0	20.0	--	--	--	N
>1250 and ≤1600	4.2	6.3	9.0	12.5	16.0	18.0	20.0	--	--	--	N
>1250 and ≤1600	8.4	12.6	18.0	25.0	32.0	36.0	40.0	--	--	--	N
>1600 and ≤2000	5.6	8.0	11.0	16.0	20.0	22.0	25.0	--	--	--	N
>1600 and ≤2000	5.6	8.0	11.0	16.0	20.0	22.0	25.0	--	--	--	N
>1600 and ≤2000	11.2	16.0	22.0	32.0	40.0	44.0	50.0	--	--	--	N

EN 60335-2-29											
Clause	**Requirement + Test**							**Result - Remark**			**Verdict**
>2000 and ≤2500	7.5	10.0	14.0	20.0	25.0	28.0	32.0	--	--	--	N
>2000 and ≤2500	7.5	10.0	14.0	20.0	25.0	28.0	32.0	--	--	--	N
>2000 and ≤2500	15.0	20.0	28.0	40.0	50.0	56.0	64.0	--	--	--	N
>2500 and ≤3200	10.0	12.5	18.0	25.0	32.0	36.0	40.0	--	--	--	N
>2500 and ≤3200	10.0	12.5	18.0	25.0	32.0	36.0	40.0	--	--	--	N
>2500 and ≤3200	20.0	25.0	36.0	50.0	64.0	72.0	80.0	--	--	--	N
>3200 and ≤4000	12.5	16.0	22.0	32.0	40.0	45.0	50.0	--	--	--	N
>3200 and ≤4000	12.5	16.0	22.0	32.0	40.0	45.0	50.0	--	--	--	N
>3200 and ≤4000	25.0	32.0	44.0	64.0	80.0	90.0	100.0	--	--	--	N
>4000 and ≤5000	16.0	20.0	28.0	40.0	50.0	56.0	63.0	--	--	--	N
>4000 and ≤5000	16.0	20.0	28.0	40.0	50.0	56.0	63.0	--	--	--	N
>4000 and ≤5000	32.0	40.0	56.0	80.0	100.0	112.0	126.0	--	--	--	N
>5000 and ≤6300	20.0	25.0	36.0	50.0	63.0	71.0	80.0	--	--	--	N
>5000 and ≤6300	20.0	25.0	36.0	50.0	63.0	71.0	80.0	--	--	--	N
>5000 and ≤6300	40.0	50.0	72.0	100.0	126.0	142.0	160.0	--	--	--	N
>6300 and ≤8000	25.0	32.0	45.0	63.0	80.0	90.0	100.0	--	--	--	N
>6300 and ≤8000	25.0	32.0	45.0	63.0	80.0	90.0	100.0	--	--	--	N
>6300 and ≤8000	50.0	64.0	90.0	126.0	160.0	180.0	200.0	--	--	--	N
>8000 and ≤10000	32.0	40.0	56.0	80.0	100.0	110.0	125.0	--	--	--	N
>8000 and ≤10000	32.0	40.0	56.0	80.0	100.0	110.0	125.0	--	--	--	N
>8000 and ≤10000	64.0	80.0	112.0	160.0	200.0	220.0	250.0	--	--	--	N
>10000 and ≤12500	40.0	50.0	71.0	100.0	125.0	140.0	160.0	--	--	--	N
>10000 and ≤12500	40.0	50.0	71.0	100.0	125.0	140.0	160.0	--	--	--	N
>10000 and ≤12500	80.0	100.0	142.0	200.0	250.0	280.0	320.0	--	--	--	N
*), B=Basic, S=Supplementary and R=Reinforced.											

EN 60335-2-29			
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	
≤50	0.2	0.6	0.8	1.1	1.4	1.6	1.8	N
>50 and ≤125	0.3	0.7	1.0	1.4	1.8	2.0	2.2	N
>125 and ≤250	0.4	1.0	1.4	**2.0**	2.5	2.8	3.2	P
>250 and ≤400	0.8	1.6	2.2	3.2	4.0	4.5	5.0	N
>400 and ≤500	1.0	2.0	2.8	4.0	5.0	5.6	6.3	N
>500 and ≤800	1.8	3.2	4.5	6.3	8.0	9.0	10.0	N
>800 and ≤1000	2.4	4.0	5.6	8.0	10.0	11.0	12.5	N
>1000 and ≤1250	3.2	5.0	7.1	10.0	12.5	14.0	16.0	N
>1250 and ≤1600	4.2	6.3	9.0	12.5	16.0	18.0	20.0	N
>1600 and ≤2000	5.6	8.0	11.0	16.0	20.0	22.0	25.0	N
>2000 and ≤2500	7.5	10.0	14.0	20.0	25.0	28.0	32.0	N
>2500 and ≤3200	10.0	12.5	18.0	25.0	32.0	36.0	40.0	N
>3200 and ≤4000	12.5	16.0	22.0	32.0	40.0	45.0	50.0	N
>4000 and ≤5000	16.0	20.0	28.0	40.0	50.0	56.0	63.0	N
>5000 and ≤6300	20.0	25.0	36.0	50.0	63.0	71.0	80.0	N
>6300 and ≤8000	25.0	32.0	45.0	63.0	80.0	90.0	100.0	N
>8000 and ≤10000	32.0	40.0	56.0	80.0	100.0	110.0	125.0	N
>10000 and ≤12500	40.0	50.0	71.0	100.0	125.0	140.0	160.0	N

30.1	TABLE: Ball pressure	P

Part:	Test temperature (°C)	Impression diameter (mm)	Allowed impression diameter (mm)
Enclosure	125	1.3	2.0
Bobbin of Transformer (T1)	125	0.6	2.0
PCB	125	0.7	2.0

EN 60335-2-29			
Clause	**Requirement + Test**	**Result - Remark**	**Verdict**

30.2	TABLE: resistance to heat, fire and tracking, tracking and glow-wire test							P
Part:	**Tracking test (V)**		**Glow-wire test (°C)**			**GWFI (°C)**	**Needle flame**	**Result**
	175	**250**	**550**	**650**	**750**	**850**		
Enclosure	--	--	--	--	--	P	--	P
Bobbin of Transformer (T1)	--	--	--	--	--	P	--	P

ANNEX 4
PHOTOGRAPHS

No. 1

- [x] General
- [ ] Appearance
- [ ] Label
- [ ] Internal
- [ ] PCB board
- [ ] Transformer
- [ ] Motor
- [ ] Other:

No. 2

- [ ] General
- [x] Appearance
- [ ] Label
- [ ] Internal
- [ ] PCB board
- [ ] Transformer
- [ ] Motor
- [ ] Other:

ANNEX 4
PHOTOGRAPHS

No. 3

- ☐ General
- ☒ Appearance
- ☐ Label
- ☐ Internal
- ☐ PCB board
- ☐ Transformer
- ☐ Motor
- ☐ Other:

No. 4

- ☐ General
- ☒ Appearance
- ☐ Label
- ☐ Internal
- ☐ PCB board
- ☐ Transformer
- ☐ Motor
- ☐ Other:

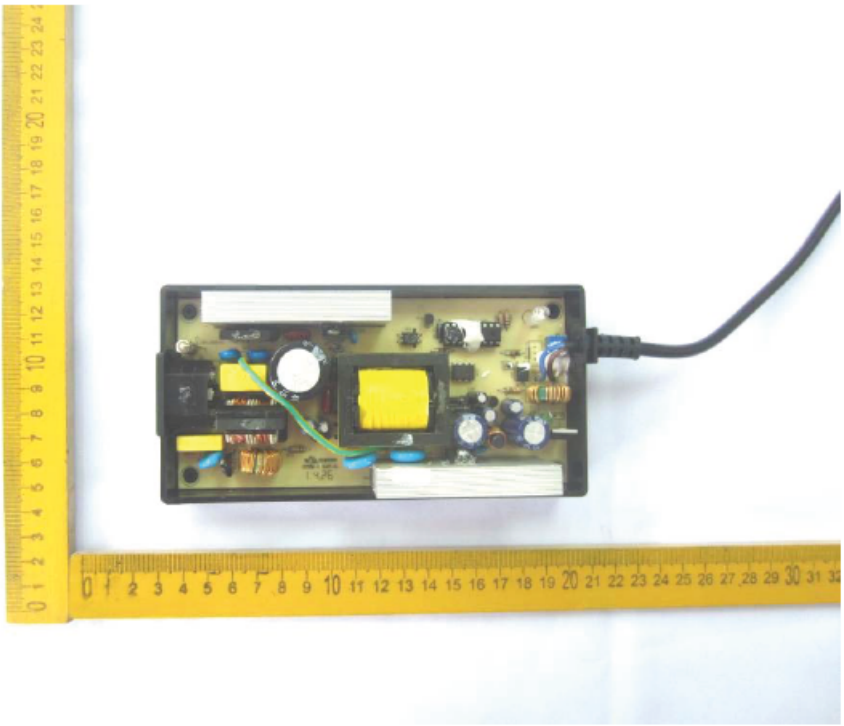
ANNEX 4
PHOTOGRAPHS

No. 5

- ☐ General
- ☐ Appearance
- ☐ Label
- ☒ Internal
- ☐ PCB board
- ☐ Transformer
- ☐ Motor
- ☐ Other:

No. 6

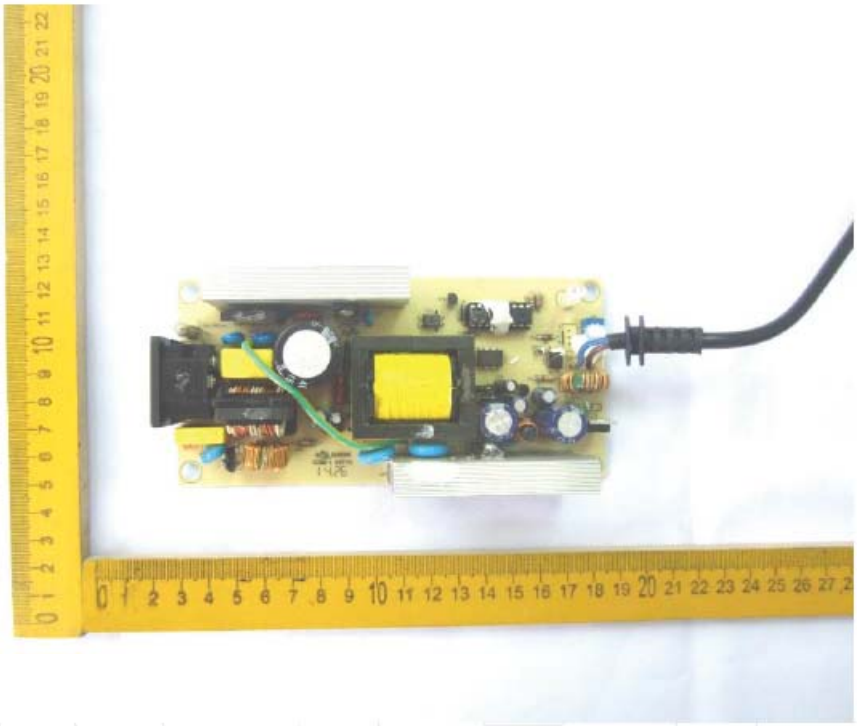
- ☐ General
- ☐ Appearance
- ☐ Label
- ☒ Internal
- ☐ PCB board
- ☐ Transformer
- ☐ Motor
- ☐ Other:



ANNEX 4
PHOTOGRAPHS

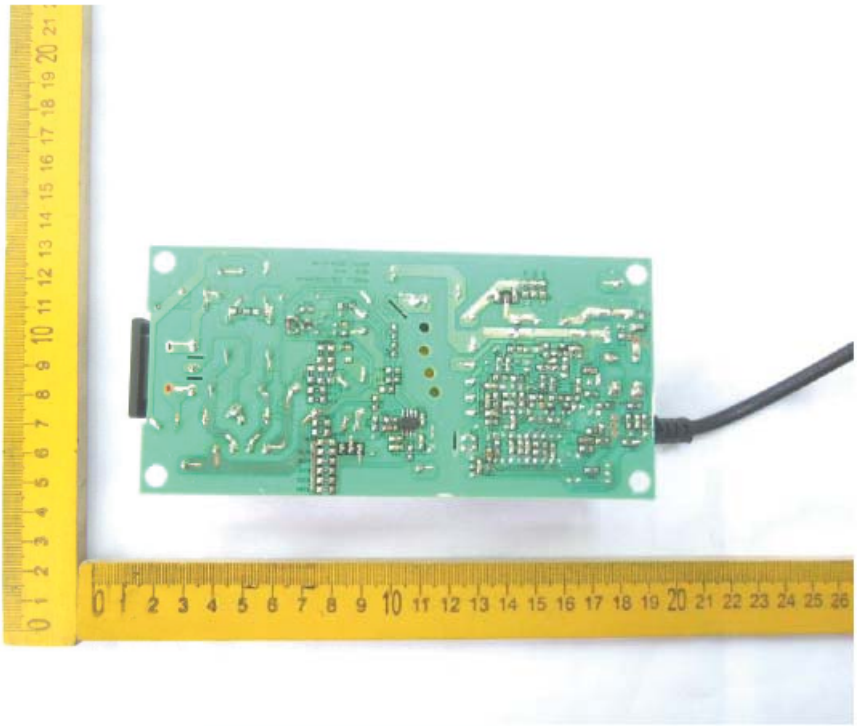
No. 7

- ☐ General
- ☐ Appearance
- ☐ Label
- ☐ Internal
- ☒ PCB board
- ☐ Transformer
- ☐ Motor
- ☐ Other:



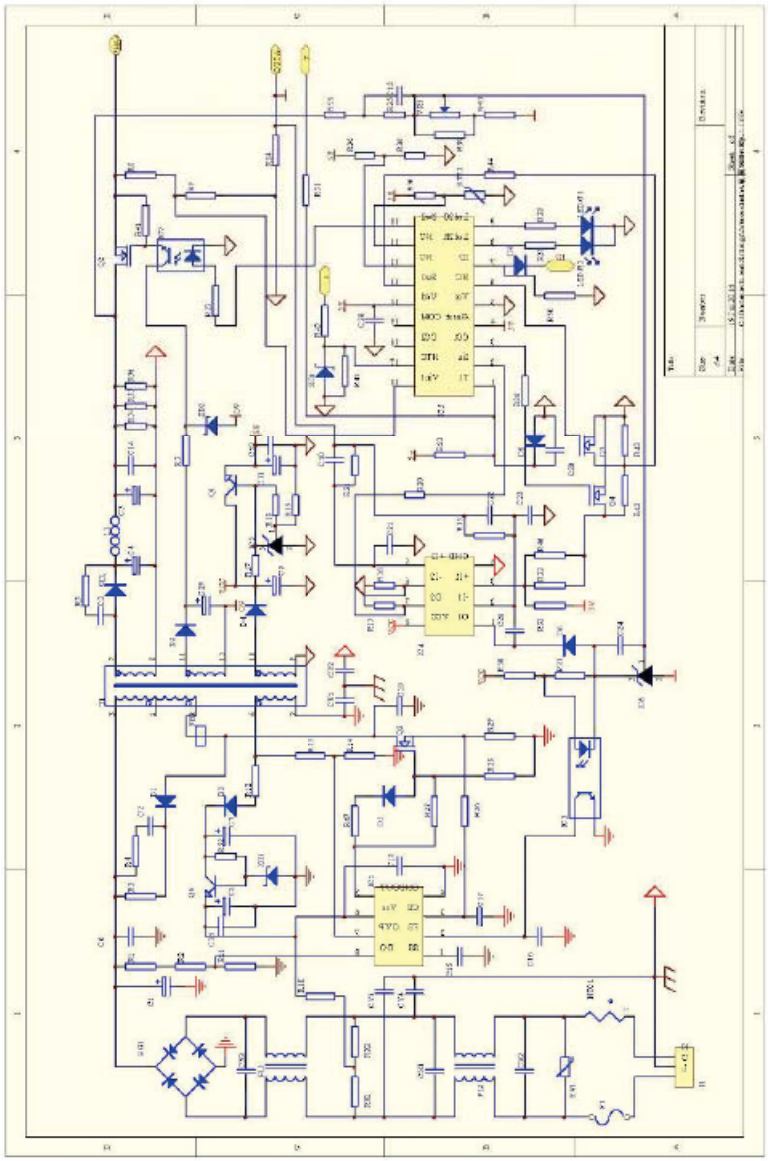
No. 8

- ☐ General
- ☐ Appearance
- ☐ Label
- ☐ Internal
- ☒ PCB board
- ☐ Transformer
- ☐ Motor
- ☐ Other:



ANNEX 5
TECHNICAL DOCUMENTS

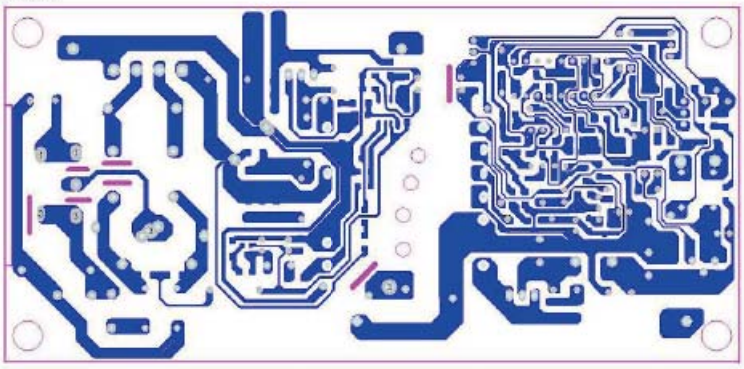
Schematic diagram



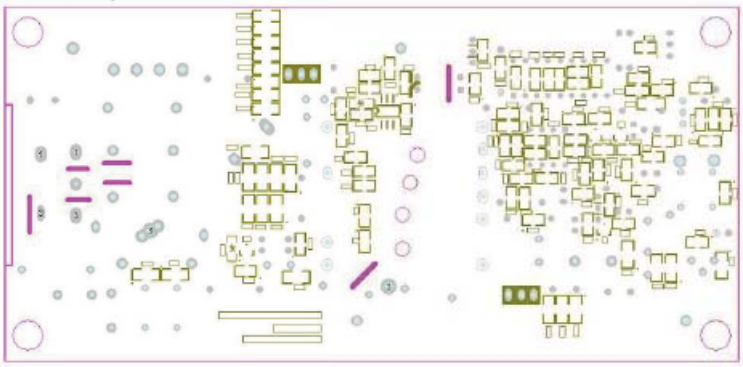
ANNEX 5
TECHNICAL DOCUMENTS

Layout diagram

Bottom



Bottom overlay



Top overlay