




TEST REPORT EN 60335-2-80 Household and similar electrical appliances - Safety - - Part 2-80: Particular requirements for fans	
Report reference No. :	UNIA19010909SR-01
Tested by (+signature) :	Steven 
Approved by (+ signature) .. :	Liuze 
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Testing laboratory	
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Test location	(Same as above)
Client	
Name	V-TAC EXPORTS LIMITED
Address	ROOM NO.301, KAM ON BUILDING 176A QUEENS ROAD CENTRAL, CENTRAL, HONGKONG
Test specification	
Standard	EN 60335-1:2012+A11:2014 EN 60335-2-80:2003+A1:2004+A2:2009 EN 62233:2008
Test procedure	LVD
Non-standard test method.... :	N.A.
Test Report Form No	IECEN 60335_2_80E
TRF originator	SGS
Master TRF	Dated 2013-02
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Test item	
Description	Tower Fan
Model No. :	7901, 7900, 7902
Trade Mark	N/A
Manufacturer	V-TAC EXPORTS LIMITED
Address	ROOM NO.301, KAM ON BUILDING 176A QUEENS ROAD CENTRAL, CENTRAL, HONGKONG
Rating(s)	220-240V~, 50Hz, 55W

Test item particulars	
Classification of installation and use.....	Stationary appliance
Supply Connection.....	Supply cord with plug
Protection against electric shock	Class I appliance
IP Number	IPX0

General remarks
 The test results presented in this report relate only to the object tested.
 This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.
 "(see appendix #)" refers to additional information appended to the report.
 "(see appended table)" refers to a table appended to the report.
 Throughout this report a comma (point) is used as the decimal separator.

Possible test case verdicts:

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


Testing.....

Date of receipt of test item : Jan. 03, 2019

Date (s) of performance of tests : Jan. 03, 2019- Jan. 09, 2019

Copy of marking plate:

Tower Fan
 Model: 7901
 Rated voltage: 220-240V~, 50Hz
 Rated power: 55W





V-TAC EXPORTS LIMITED

Remark: marking labels of all other models are same as above except for differences in model number.

General product information:

The appliances is Class I Axial Flow Fan for household or similar purposes, indoor use.
 There is no other difference except for model no. and appearance. Model 7901 was selected as representative sample for full test.

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
5	GENERAL CONDITIONS FOR THE TESTS		—
	Tests performed according to cl. 5, e.g. nature of supply, sequence of testing, etc.		P
5.2	If the test of Annex D has to be carried out, an additional appliance may be used. (IEC 60335-1)		P
5.7	Fans to be used in tropical climates, the tests of clause 10,11 and 13 are carried out at 40 °C +/- 2 °C. (IEC 60335-2-80)		N
	Fans marked with an ambient operating temperature, tests of clauses 10, 11 and 13 are carried out at the marked value +/- 2 °C. (IEC 60335-2-80)		N
6	CLASSIFICATION		—
6.1	Protection against electric shock: Class I, II, III : (IEC 60335-1)	Class II	P
6.101	Classification to climatic conditions : temperate climates, tropical climates (IEC 60335-2-80)		N
6.2	Duct fans shall be at least IPX2		N
7	MARKING AND INSTRUCTIONS		—
7.1	Rated voltage or voltage range (V):	220-240V	P
	Nature of supply:	~	P
	Rated frequency (Hz):	50Hz	P
	Rated power input (W):	55W	P
	Rated current (A):		N
	Manufacturer's or responsible vendor's name, trademark or identification mark:	See Marking plate	P
	Model or type reference:	See Marking plate	P
	Symbol 5172 of IEC 60417, for Class II appliances		N
	IP number, other than IPX0:		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		N
	For tropical climates marked with letter T (IEC 60335-2-80)		N

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
	Fans operating at local temperature exceeding 40 °C marked with ambient operating temperature (IEC 60335-2-80)		N
	The enclosure of electrically-operated water valves incorporated in external hose-sets for connection of an appliance to the water mains shall be marked with symbol IEC 60417-5036 (DB:2002-10) if their working voltage exceeds extra-low voltage (IEC 60335-1)		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	220-240V	P
	Different rated values marked with the values separated by an oblique stroke	50Hz	N
7.4	Appliances adjustable for different rated voltages or rated frequencies, the voltage setting is clearly discernible		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		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 IEC 60417-5021 (DB:2002-10)] equipotentiality		N
	[symbol IEC 60417-5036 (DB:2002-10)] dangerous voltage		N
7.7	Connection diagram fixed to appliances to be connected to more than two supply conductors and appliances for multiple supply		N
7.8	Except for type Z attachment, terminals for connection to the supply mains indicated as follows:		—
	- marking of terminals exclusively for the neutral conductor (N)		P
	- marking of protective earthing terminals (symbol 5019 of IEC 60417)		P
	- marking of functional earthing terminals (symbol 5019 of IEC 60417)		N
	- marking not placed on removable parts		P

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
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		N
	The instructions state that:		—
	- the appliance is not to be used by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction		P
	- children being supervised not to play with the appliance		P
	For a part of class III construction supplied from a detachable power supply unit, the instructions state that the appliance is only to be used with the unit provided		N
	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
	For appliances for altitudes exceeding 2000 m, the maximum altitude is stated.....:		N
	The instructions for appliances incorporating a functional earth states that the appliance incorporates an earth connection for functional purposes only		N

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
	If the instructions state that the guard has to be removed for cleaning purposes, the instructions shall state the substance of the following: (IEC 60335-2-80/A1)		—
	Ensure that the fan is switched off from the supply mains before removing the guard. (IEC 60335-2-80/A1)		N
	The instructions for ceiling fans shall include the substance of the following warning:		—
	WARNING: If unusual oscillating movement is observed, immediately stop using the ceiling fan and contact the manufacturer, its service agent or suitably qualified persons. (IEC 60335-2-80/A1)		N
	The instructions for ceiling fans shall include the substance of the following: (IEC 60335-2-80/A1)		—
	– the maintenance cycle and method of maintenance; (IEC 60335-2-80/A1)		N
	– the weight of the appliance in kilograms; (IEC 60335-2-80/A1)		N
	– that the replacement of parts of the safety suspension system device shall be performed by the manufacturer, its service agent or suitably qualified persons. (IEC 60335-2-80/A1)		N
	The instructions for fans incorporating motors containing brushes shall include the substance of the following: (IEC 60335-2-80/A1)		—
	If it is necessary to replace the live or neutral brushes to ensure operation of the motor then both brushes and the earth brush shall be replaced at the same time. The brushes shall only be replaced by a suitably qualified person. (IEC 60335-2-80/A1)	No burshes	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

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
	The installation instructions for ceiling fans shall include the substance of the following: (IEC 60335-2-80)		—
	– the fixing means for attachment to the ceiling such as hooks or other devices shall be fixed with a sufficient strength to withstand 4 times the weight of the ceiling fan; (IEC 60335-2-80)		P
	– that the mounting of the suspension system shall be performed by the manufacturer, its service agent or suitably qualified persons; (IEC 60335-2-80)		P
	– that the fan is to be installed so that the blades are more than 2,3 m above the floor; (IEC 60335-2-80)		P
	– the model or type reference of a luminaire that may be installed in a fan constructed for this purpose. (IEC 60335-2-80)		P
	The instructions for other fans shall include the substance of the following: (IEC 60335-2-80)		—
	– whether the fan is intended for mounting in outside windows or walls (for partition fans); (IEC 60335-2-80)		N
	– that the fan is to be installed so that the blades are more than 2,3 m above the floor (for fans intended to be mounted at high level); (IEC 60335-2-80)		N
	– that precautions must be taken to avoid the back-flow of gases into the room from the open flue of gas or other fuel-burning appliances (for duct and partition fans). (IEC 60335-2-80)		P
	If different rated voltages or different rated frequencies are marked, the instructions state what action to be taken to adjust the appliance		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		P
7.12.4	Instructions for built-in appliances:		—
	- dimensions of space		N
	- dimensions and position of supporting means		N
	- distances between parts and surrounding structure		N
	- dimensions of ventilation openings and arrangement		N

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
	- connection to supply mains and interconnection of separate components		N
	- necessity to allow disconnection of the appliance from the supply after installation, unless the appliance incorporates a switch complying with 24.3		N
	- The disconnection may be achieved by having the plug accessible or by incorporating a switch in the fixed wiring in accordance with the wiring rules		N
7.12.5	Replacement cord instructions, type X attachment with a specially prepared cord		N
	Replacement cord instructions, type Y attachment	Type Y	P
	Replacement cord instructions, type Z attachment		N
7.12.6	Caution in the instructions for heating appliances with a non-self-resetting thermal cut-out		N
	The instructions for heating appliances incorporating a non-self-resetting thermal cut-out that is reset by disconnection of the supply mains shall contain the substance of the following:	No heating element	N
	CAUTION: In order to avoid a hazard due to inadvertent resetting of the thermal cut-out, this appliance must not be supplied through an external switching device, such as a timer, or connected to a circuit that is regularly switched on and off by the utility.		N
7.12.7	The instructions for fixed appliances shall state how the appliance is to be fixed to its support		P
	NOTE The method of fixing is not to depend on the use of adhesives since they are not considered to be a reliable fixing means.		N
7.12.8	The instructions for appliances connected to the water mains shall state (IEC60335-1)		N
	- the maximum inlet water pressure, in pascals;		N
	- the minimum inlet water pressure, in pascals, if this is necessary for the correct operation of the appliance.		N
	The instructions for appliances connected to the water mains by detachable hose-sets shall state that the new hose-sets supplied with the		N

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
	appliance are to be used and that old hose-sets should not be reused. (IEC60335-1)		
7.13	Instructions and other texts in an official language	English	P
7.14	Marking clearly legible and durable	Rubbing the marking by hand for 15s with a piece of cloth soaked with water and again for 15s with a piece of cloth soaked with petroleum spirit	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		P
	Indications for switches and controls placed on or near the components. Marking not on parts which can be positioned or repositioned in such a way that the marking is misleading		P
7.16	Marking of a possible replaceable thermal link or fuse link clearly visible with regard to replacing the link		N

8	PROTECTION AGAINST ACCESS TO LIVE PARTS		—
8.1	Adequate protection against accidental contact with live parts		P
8.1.1	Requirement applies for all positions, detachable parts removed		P
	Insertion or removal of lamps, protection against contact with live parts of the lamp cap		N
	Use of test probe B of IEC 61032: no contact with live parts		P
	Lamps are not removed. However, during insertion or removal of lamps, no contact with live parts of the lamp cap. (IEC 60335-2-80)		N
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

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
	Test probe 13 also applied through openings in earthed metal enclosures having a non-conductive coating: no contact with live parts		N
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:		—
	- 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		N
	- 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		N
	- for peak values over 42.4 V up to and including 450 V, capacitance not exceeding 0,1 μ F		N
	- for peak values over 450 V up to and including 15 kV, discharge not exceeding 45 μ C		N
	The quantity of electricity in the discharge is measured using a resistor having a nominal non-inductive resistance of 2 000 Ω . (IEC60335-1)		N
	Number the existing note as Note 1 and add the following note: (IEC60335-1)		N
	NOTE 2 The quantity of electricity is calculated from the sum of all areas recorded on the voltage/time graph without taking voltage polarity into account. (IEC60335-1)		—
8.1.5	Live parts protected at least by basic insulation before installation or assembly:		—
	- built-in appliances		N
	- fixed appliances		P
	- 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

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
	Only possible to touch parts separated from live parts by double or reinforced insulation		P
	Removal of detachable parts after user maintenance, basic insulation may be touched provided that wiring is electrically equivalent with IEC 60227 or IEC 60245 (IEC 60335-2-80)		P
9	STARTING OF MOTOR-OPERATED APPLIANCES		—
	Requirements and tests are specified in part 2 when necessary		N
10	POWER INPUT AND CURRENT		—
10.1	Power input at normal operating temperature, rated voltage and normal operation not deviating from rated power input by more than shown in table 1	(see appended table)	P
	Additon:Appliances are tested with shutters or similar devices in the open position(IEC 60335-2-80)		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)	N
	Additon:Appliances are tested with shutters or similar devices in the open position(IEC 60335-2-80)		N
11	HEATING		—
11.1	No excessive temperatures in normal use		P
11.2	Placing and mounting of appliance as described		P
11.3	Temperature rises, other than of windings, determined by thermocouples		P
	Temperature rises of windings determined by resistance method, unless		P
	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	Motor-operated appliances operated under normal operation at most unfavourable voltage between 0.94 and 1.06 times rated voltage:	220V*0.94=206.8V 240V*1.06=254.4V	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	Appliances are operated until steady conditions are established. (IEC 60335-2-80)		P

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
11.8	Temperature rises not exceeding values in table 3	(see appended tables)	P
	Sealing compound does not flow out		P
	Protective devices do not operate, except		N
	However, components in protective electronic circuits are allowed to operate provided they are tested for the number of cycles of operation specified in 24.1.4.	No such component.	N
	Additon:The temperature rise limits for appliances for tropical climates are reduced by 15 K(IEC 60335-2-80)		P
	The temperature rise limits for fans marked with an ambient operating temperature are reduced by the difference between the marked value and 25 °C. (IEC 60335-2-80)		N
13	LEAKAGE CURRENT AND ELECTRIC STRENGTH AT OPERATING TEMPERATURE		—
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:		P
	Protective impedance and radio interference filters disconnected before carrying out the tests	No such part.	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)	P
13.3	The appliance is disconnected from the supply and the insulation is immediately subjected to a voltage having a frequency of 50 Hz or 60 Hz for 1 min, in accordance with IEC 61180-1. (IEC60335-1)		P
	The high-voltage source used for the test is to be capable of supplying a short circuit current I_s between the output terminals after the output voltage has been adjusted to the appropriate test voltage. (IEC60335-1)		P
	The overload release of the circuit is not to be operated by any current below the tripping current I_r . The values of I_s and I_r are given in Table 5 for various high-voltage sources. (IEC60335-1)		P
	Electric strength tests according to table 4	(see appended table)	P

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict

	No breakdown during the tests	No breakdown	P
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14	TRANSIENT OVERVOLTAGES		—
	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	(see appended table)	N
	No flashover during the test, unless of functional insulation		N
	In case of flashover of functional insulation, the appliance complies with clause 19 with the clearance short circuited		N

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

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
	The outer part of fans to be installed in the external structure is subjected to subclause 14.2.4(a) of IEC 60529:1989. The part of fans that is not mounted on the outside surface is protected against the spray water from the oscillating tube. (IEC 60335-2-80)		N
	The test is carried out with the appliance in the rest position and then in operation while supplied at rated voltage, shutters or similar devices being in the open position. (IEC 60335-2-80)		N
	Fans marked with the second numeral of the IP system are subjected to the appropriate test of IEC 60529 both at rest and in operation while supplied at rated voltage. (IEC 60335-2-80)		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		N
	However, 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

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
	Appliances normally fixed to a ceiling are mounted underneath a horizontal unperforated support that is constructed to prevent water spraying onto its top surface. The pivot axis of the oscillating tube is located at the same level as the underside of the support and aligned centrally with the appliance. The spray is directed upwards. (IEC60335-1)		N
	For IPX4 appliances, the movement of the tube is limited to two times 90° from the vertical for a period of 5 min. (IEC60335-1)		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
	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%, 48 h	P
	The appliance withstands the tests of clause 16		P
16	LEAKAGE CURRENT AND ELECTRIC STRENGTH		—
16.1	Leakage current not excessive and electric strength adequate		P
	Protective impedance disconnected from live parts before carrying out the tests	No such part	N
16.2	Single-phase appliances: test voltage 1.06 times rated voltage:		P
	Three-phase appliances: test voltage 1.06 times rated voltage divided by $\sqrt{3}$:		N
	Leakage current measurements	(see appended table)	P
16.3	Electric strength tests according to table 7	(see appended table)	P

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
	No breakdown during the tests		P
17	OVERLOAD PROTECTION OF TRANSFORMERS AND ASSOCIATED CIRCUITS		—
	No excessive temperatures in transformer or associated circuits in event of short-circuits likely to occur in normal use	(see appended table)	N
	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:		N
	Temperature rise of insulation of the conductors of safety extra-low voltage circuits not exceeding the relevant value specified in table 3 by more than 15 K		N
	Temperature of the winding not exceeding the value specified in table 8,		N
	however limits do not apply to fail-safe transformers complying with sub-clause 15.5 of IEC 61558-1		N
18	ENDURANCE		—
	Requirements and tests are specified in part 2 when necessary		N
19	ABNORMAL OPERATION		—
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		N
	Additon: Fans incorporating shutters or similar devices operated by a control are also subjected to the test of 19.101(IEC 60335-2-80)		N
19.2	Test of appliance with heating elements with restricted heat dissipation; test voltage (V): power input of 0.85 times rated power input:		N
	NOTE Controls that operate during the test of Clause 11 are allowed to operate (IEC60335-1)		—
19.3	Test of 19.2 repeated; test voltage (V): power input of 1.24 times rated power input:		N
	NOTE Controls that operate during the test of Clause 11 are allowed to operate		—
19.4	Test conditions as in cl. 11, any control limiting the temperature during tests of cl. 11 short-circuited		N

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
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		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		P
	Locked rotor, motor capacitors open-circuited or short-circuited, if required		P
	Locked rotor, capacitors open-circuited one at a time		P
	Test repeated with capacitors short-circuited one at a time, if required		P
	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		P
	Winding temperatures not exceeding values specified in table 8	(see appended table)	P

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
	Mounting of separate control (IEC 60335-2-80)		N
	Approximately 50 % of the area of each ventilating opening is blocked. (IEC 60335-2-80)		N
	Winding temperatures not exceeding values specified in table 8 (IEC 60335-2-80)	(see appended table)	N
	The temperature rise of the board not exceed: (IEC 60335-2-80)		—
	– 50 K, for appliances with T marking; (IEC 60335-2-80)		P
	– 65 K, for other appliances. (IEC 60335-2-80)		N
19.8	Three-phase motors operated at rated voltage with one phase disconnected		N
19.9	Not applicable. (IEC 60335-2-80)		N
	Winding temperatures not exceeding values as specified	(see appended table)	N
19.10	Series motor operated at 1.3 times rated voltage for 1 min:		N
	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		N
	Appliances incorporating a protective electronic circuit are subjected to the tests of 19.11.3 and 19.11.4. (IEC60335-1)		N
	Appliances having a switch with an off position obtained by electronic disconnection, or a switch that can place the appliance in a stand-by mode, are subjected to the tests of 19.11.4. (IEC60335-1)		N
	NOTE 1a The sequence of tests for the evaluation of electronic circuits is given in Annex Q.		—
19.11.1	Before applying the fault conditions a) to f) in 19.11.2, it is checked if circuits or parts of circuit meet both of the following conditions:		—
	- the electronic circuit is a low-power circuit, that is, the maximum power at low-power points does not exceed 15 W according to the tests specified		N
	- 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 (IEC60335-1)		N

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
19.11.2	Fault conditions applied one at a time, the appliance operated under conditions specified in cl. 11, but 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		N
	c) short circuit of capacitors, unless they comply with IEC 60384-14		N
	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		N
	e) failure of triacs in the diode mode		N
	f) failure of an integrated circuit		N
	In this case the possible hazardous		N
	In each case, the test is ended if a non-self-resetting interruption of the supply occurs within the appliance (IEC60335-1)		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 f) of 19.11.2		N
	During and after each test the following is checked:		—
	- the temperature rise of the windings do not exceed the values specified in table 8		N
	- the appliance complies with the conditions specified in 19.13		N
	- any current flowing through protective impedance not exceeding the limits specified in 8.1.4		N
	If a conductor of a printed board becomes open-circuited, the appliance is considered to have withstood the particular test, provided all three of the following conditions are met:		—
	- the material of the printed circuit board withstands the burning test of annex E		N
	- any loosened conductor does not reduce the clearances or creepage distances between live parts and accessible metal parts below the values specified in cl. 29		N
	- the appliance withstands the tests of 19.11.2 with open-circuited conductor bridged		N

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
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		N
	Appliances incorporating a protective electronic circuit subjected to the tests of 19.11.4.1 to 19.11.4.7, 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
	Appliances having a switch with an off position obtained by electronic disconnection, or a switch that can be placed in the stand-by mode, are subjected to the tests of 19.11.4.1 to 19.11.4.7. The tests are carried out with the appliance supplied at rated voltage, the switch being set in the off position or in the stand-by mode. (IEC60335-1)		N
	Appliances incorporating a protective electronic circuit are subjected to the tests of 19.11.4.1 to 19.11.4.7. The tests are carried out after the protective electronic circuit has operated during the relevant tests of Clause 19 except 19.2, 19.6 and 19.11.3. However, appliances that are operated for 30 s or 5 min during the test of 19.7 are not subjected to the tests for electromagnetic phenomena. (IEC60335-1)		N
	The tests are carried out with surge arresters disconnected, unless they incorporate spark gaps. (IEC60335-1)		N
19.11.4.1	The appliance is subjected to electrostatic discharges in accordance with IEC 61000-4-2, test level 4		N
	The appliance is subjected to electrostatic discharges in accordance with IEC 61000-4-2, test level 4 being applicable. Ten discharges having a positive polarity and ten discharges having a negative polarity are applied at each preselected point. (IEC60335-1)		N
19.11.4.2	The appliance is subjected to radiated fields in accordance with IEC 61000-4-3, test level 3		N
	The appliance is subjected to radiated fields in accordance with IEC 61000-4-3, test level 3 being applicable. (IEC60335-1)		N

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
	NOTE The dwell time for each frequency is to be sufficient to observe a possible malfunction of the protective electronic circuit		—
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
	The appliance is subjected to fast transient bursts in accordance with IEC 61000-4-4.(IEC60335-1)		N
	Test level 3 is applicable for signal and control lines. (IEC60335-1)		N
	Test level 4 is applicable for the power supply lines. (IEC60335-1)		N
	The bursts are applied for 2 min with a positive polarity and for 2 min with a negative polarity. (IEC60335-1)		N
19.11.4.4	The power supply terminals of the appliance subjected to voltage surges in accordance with IEC 61000-4-5, test an open circuit test voltage of 2kV or an open circuit test voltage of 4kV as specified		N
	Earthed heating elements in class I appliances disconnected		N
	The power supply terminals of the appliance are subjected to voltage surges in accordance with IEC 61000-4-5, five positive impulses and five negative impulses being applied at the selected points. (IEC60335-1)		N
	Test level 3 is applicable for the line-to-line coupling mode, a generator having a source impedance of 2 Ω being used. (IEC60335-1)		N
	Test level 4 is applicable for the line-to-earth coupling mode, a generator having a source impedance of 12 Ω being used. (IEC60335-1)		N
	Earthed heating elements in class I appliances are disconnected during this test. (IEC60335-1)		N
	NOTE: If a feedback system depends on inputs related to a disconnected heating element, an artificial network may be needed. (IEC60335-1)		—
	For appliances having surge arresters incorporating spark gaps, the test is repeated at a level that is 95 % of the flashover voltage. (IEC60335-1)		N

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
19.11.4.5	The appliance is subjected to injected currents in accordance with IEC 61000-4-6, test level 3 being applicable. (IEC60335-1)		N
	During the test, all frequencies between 0,15 MHz to 80 MHz are covered. (IEC60335-1)		N
	NOTE The dwell time for each frequency is to be sufficient to observe a possible malfunction of the protective electronic circuit . (IEC60335-1)		—
19.11.4.6	The appliance is subjected to voltage dips and interruptions in accordance with IEC 61000-4-11 (IEC60335-1)		N
	The durations specified in Table 1 of IEC 61000-4-11 are applied to each test level, the dips and interruptions being applied at zero crossing of the supply voltage. (IEC60335-1)		N
19.11.4.7	The appliance is subjected to mains signals in accordance with IEC 61000-4-13, test level class 2 being applicable (IEC60335-1)		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):		N
19.13	During the tests the appliance does not emit flames, molten metal, poisonous or ignitable gas in hazardous amounts		P
	Temperature rises not exceeding the values shown in table 9	(see appended table)	P
	Enclosures not deformed to such an extent that compliance with cl. 8 is impaired		N
	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:		—
	- basic insulation:	1000	P
	- supplementary insulation:		N
	- reinforced insulation:	3000	P
	The appliance does not undergo a dangerous malfunction, and (IEC60335-1)		N
	no failure of protective electronic circuits, if the appliance is still operable (IEC60335-1)		N

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
	Appliances tested with an electronic switch in the off position or in the stand-by mode, do not become operational (IEC60335-1)		N
19.101	Fans incorporating shutters or similar that are operated automatically are supplied at rated voltage in the closed or open position, whichever is more unfavourable (IEC 60335-2-80)		N

20	STABILITY AND MECHANICAL HAZARDS		—
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
	Portable pedestal fans exceeding 1,7 m and exceeding 10 kg tested with a force of 40 N at 1,5 m (IEC 60335-2-80)		N
20.2	Moving parts adequately arranged or enclosed as to provide protection against personal injury		P
	Protective enclosures, guards and similar parts are non-detachable		P
	Adequate mechanical strength and fixing of protective enclosures		N
	Self-resetting thermal cut-outs and overcurrent protective devices not causing a hazard, by unexpected reclosure		N

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
	Not possible to touch dangerous moving parts with test probe		P
20.101	Fan blades, other than those of fans for mounting at high level, shall be guarded unless their leading edges and tips are rounded with a radius of not less than 0,5 mm (IEC 60335-2-80)		N
	- they have a hardness less than D 60 Shore, or (IEC 60335-2-80)		N
	- they have a peripheral speed less than 15 m/s when the fan is supplied at rated voltage, or (IEC 60335-2-80)		N
	- the fan has a power output not exceeding 2 W when supplied at rated voltage. (IEC 60335-2-80)		N
20.102	There shall be no risk of entrapment or injury caused by movement of the oscillating head of pedestal fans or table fans (IEC 60335-2-80)		N

21	MECHANICAL STRENGTH		—
21.1	Compliance is checked by applying blows to the appliance in accordance with test Ehb of IEC 60068-2-75, the spring hammer test. (IEC 60335-1)		P
	The appliance is rigidly supported and three blows, having an impact energy of 0,5 J, are applied to every point of the enclosure that is likely to be weak. (IEC 60335-1)		P
	If necessary, supplementary or reinforced insulation subjected to the electric strength test of 16.3		N
	If necessary, repetition of groups of three blows on a new sample		N
21.101	Fan guards are subjected to a push and pull force of 20 N. Dangerous moving parts are not accessible (IEC 60335-2-80)	Not accessible	P
21.102	Ceiling fans have adequate strength. Load four times mass (IEC 60335-2-80)		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 mm and reinforced insulation is at least 2 mm		P

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
22	CONSTRUCTION		—
22.1	Appliance marked with the first numeral of the IP system, relevant requirements of IEC 60529 are fulfilled	IPX0	N
	NOTE 101 The enclosure defined in IEC 60529 does not include guards for fan blades. (IEC 60335-2-80)		N
22.2	Stationary appliance: means to provide all-pole disconnection from the supply provided, the following means being available:		—
	- a supply cord fitted with a plug		P
	- 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 I appliances, connected in 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 with the standard		N
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, the appliance being disconnected from the supply at the instant of voltage peak.		P
	The appliance is supplied at rated voltage . Any switch is then placed in the off position and the appliance is disconnected from the supply mains at the instant of voltage peak. One second after disconnection, the voltage between the pins of the plug is measured with an instrument that does not appreciably affect the value to be measured (IEC60335-1))		P

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
	The voltage shall not exceed 34 V (IEC60335-1)		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
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		P
	Adequate insulating properties of oil or grease to which insulation is exposed		N
22.10	It shall not be possible to reset voltage-maintained non-self-resetting thermal cut-outs by the operation of an automatic switching device incorporated within the appliance. (IEC60335-1)		N
	NOTE 1 Voltage-maintained controls will automatically reset if they become de-energized.		—
	Non-self-resetting thermal motor protectors shall have a trip-free action unless they are voltage maintained. (IEC60335-1)		N
	NOTE 2 Trip-free is an automatic action that is independent of manipulation or position of the actuating member. (IEC60335-1)		—
	Reset buttons of non-self-resetting controls shall be located or protected so that their accidental resetting is unlikely to occur if this could result in a hazard. (IEC60335-1)		N
	NOTE 3 For example, this requirement precludes the location of reset buttons on the back of an appliance, which could result in them being reset by pushing the appliance against a wall. (IEC60335-1)		—
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		P

EN60335-2-80			
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		P
	The 50 N force is not applied to clips used to fasten fan guards. (IEC 60335-2-80)		P
	Instead, a force of 15 N is applied in any direction to the clips in an attempt to release them. (IEC 60335-2-80)		P
	Tests as described		P
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		N
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 under normal conditions of use		P
22.19	Driving belts not used as electrical insulation		N

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
22.20	Direct contact between live parts and thermal insulation effectively prevented, unless material used is non-corrosive, non-hygroscopic and non-combustible		N
	Compliance is checked by inspection and, if necessary, by appropriate test		N
22.21	Wood, cotton, silk, ordinary paper and fibrous or hygroscopic material not used as insulation, unless impregnated	No such material	N
22.22	Appliances not containing asbestos		P
22.23	Oils containing polychlorinated biphenyl (PCB) not used		P
22.24	Bare heating elements 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 cannot come into contact with accessible metal parts		N
22.26	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		N
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		N
	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		N
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

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
	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 designed or protected against deposition of dirt or dust		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
	Oxygen bomb test at 70 °C for 96 h and 16 h at room temperature		N
22.33	Conductive liquids that are or may become accessible in normal use are not in direct contact with live parts or unearthed metal parts that are separated from live parts by basic insulation only		N
	Electrodes not used for heating liquids		N
	For class II constructions, conductive liquids that are or may become accessible in normal use, not in direct contact with basic or reinforced insulation		N
	For class II constructions, conductive liquids which are in contact with live parts, not in direct contact with reinforced insulation		N
22.34	Shafts of operating knobs, handles, levers etc. not live, unless the shaft is not accessible when the part is removed		P
22.35	Handles, levers and knobs, held or actuated in normal use, not becoming live in the event of an insulation fault		P
	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

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
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, unless complying with 22.42		P
	Metal casings of capacitors in Class II appliances separated from accessible metal parts by supplementary insulation, unless complying with 22.42		N
22.38	Capacitors not connected between the contacts of a thermal cut-out		P
22.39	Lamp holders used only for the connection of lamps		P
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
22.41	No components, other than lamps, containing mercury		P
22.42	Protective impedance consisting of at least two separate components		N
	Values specified in 8.1.4 not exceeded if any one of the components are short-circuited or open-circuited		N
22.43	Appliances adjustable for different voltages, accidental changing of the setting of the voltage unlikely to occur		N
22.44	Appliances are not allowed to have an enclosure that is shaped and decorated so that the appliance is likely to be treated as a toy by children		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	Software used in protective electronic circuits is software class B or C :		N
	Software used in protective electronic circuits shall be software class B or software class C . (IEC60335-1)		N

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
	NOTE 1 Failure of software class B in the presence of another fault in the appliance, or failure of software class C alone, could result in dangerous malfunction , electric shock, fire, mechanical or other hazards. Software class A denotes software used for functional purposes. (IEC60335-1)		—
	<i>Compliance is checked by evaluating the software in accordance with Annex R.</i> (IEC60335-1)		N
	NOTE 2 If the software program is modified, the evaluation and relevant tests are repeated if the modification can influence the results of the test involving protective electronic circuits . (IEC60335-1)		—
22.47	Appliances intended to be connected to the water mains shall withstand the water pressure expected in normal use. (IEC60335-1)		N
	No leakage from any part, including any inlet water hose (IEC60335-1)		N
	Compliance is checked by connecting the appliance to a water supply having a static pressure equal to twice the maximum inlet water pressure or 1,2 MPa, whichever is higher, for a period of 5 min.(IEC60335-1)		N
	There shall be no leakage from any part, including any inlet water hose.(IEC60335-1)		N
22.48	Appliances intended to be connected to the water mains shall be constructed to prevent backsiphonage of non-potable water into the water mains. (IEC60335-1)		N
	Compliance is checked by the relevant tests of IEC 61770 (IEC60335-1)		N
22.49	For remote operation, the duration of operation is to be set before the appliance can be started, unless		N
	the appliance switches off automatically or can operate continuously without hazard		N
22.50	Controls incorporated in the appliance take priority over controls actuated by remote operation		N
22.51	There is a control on the appliance manually adjusted to the setting for remote operation before the appliance can be operated in this mode		N
	There is a visual indication showing that the appliance is adjusted for remote operation		N
	These requirements not necessary on appliances that can operate as follows, without giving rise to a hazard:		N
	- continuously, or		N

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
	- automatically, or		N
	- 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
22.53	Class II appliances and Class III appliances that incorporate functionally earthed parts shall have at least double insulation or reinforced insulation between live parts and the functionally earthed parts		N
22.54	Button cells and batteries designated R1 shall not be accessible without the aid of a tool unless the cover of their compartment can only be opened after at least two independent movements have been applied simultaneously		N
22.101	Appliances having provision for attaching a luminaire incorporate appropriate terminals and internal wiring (IEC 60335-2-80)		N
22.102	The ceiling fan shall be constructed so that a failure of the fixing device of the motor to the mounting rod could not give rise to risk of injury to the user or surroundings. (IEC 60335-2-80)		N
22.102.1	The ceiling fan shall incorporate a device that disconnects the fan from the supply before the suspension system fails. (IEC 60335-2-80)		N
22.102.2	The fan motor and blades do not fall more than 300 mm after failure of the suspension system and the fan shall be disconnected from the supply. (IEC 60335-2-80)		N
22.102.3	The fan blades and motor are connected to the suspension system via a threaded down rod that is locked by means of one or more setscrews(IEC 60335-2-80)		N
22.102.4	An additional through bolt, lock washer and nut, or the like limits the distance of drop by no more than 75 mm in case of the suspension system failure. (IEC 60335-2-80)		N
22.102.5	All components required to prevent the failure of the suspension system are treated or coated to resist corrosion. (IEC 60335-2-80)		N
23	INTERNAL WIRING		—
23.1	Wireways smooth and free from sharp edges		P
	Wires protected against contact with burrs, cooling fins etc.		P

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
	Wire holes in metal well rounded or provided with bushings		P
	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 or corners		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
	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 100 000 flexings for conductors flexed during normal use and at rated voltage (IEC 60335-2-80)		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
	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 positive means		N
23.7	The colour combination green/yellow used only for earthing conductors		P
23.8	Aluminium wires not used for internal wiring		N
23.9	No lead-tin soldering of stranded conductors where they are subject to contact pressure, unless		N
	clamping means so constructed that there is no risk of bad contact due to cold flow of the solder		N

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
23.10	The insulation and sheath of internal wiring, incorporated in external hoses for the connection of an appliance to the water mains, shall be at least equivalent to that of light polyvinyl chloride sheathed flexible cord (code designation 60227 IEC 52) (IEC60335-1)		N
	<i>Compliance is checked by inspection.</i>		N
	NOTE The mechanical characteristics specified in IEC 60227 are not evaluated. (IEC60335-1)		—

24	COMPONENTS		—
24.1	Components comply with safety requirements in relevant IEC standards		P
	List of components	(see appended table)	P
	Components not tested and found to comply with relevant IEC standard for the number of cycles specified are tested in accordance with 24.1.1 to 24.1.6		N
	Components not tested and found to comply with relevant IEC standard, components not marked or not used in accordance with its marking, tested under the conditions occurring in the appliance		N
	Motors are not required to comply with IEC 60034-1. (IEC60335-1)		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		N
	tested according to annex F		N
24.1.2	The relevant standard for transformers in associated switch mode power supplies is Annex BB of IEC 61558-2-16		N
	Safety isolating transformers complying with IEC 61558-2-6, or		N
	tested according to annex G		N
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 (IEC60335-1)		N
24.1.4	Automatic controls complying with IEC 60730-1 with relevant part 2. The number of cycles of operation being:		—

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
	- thermostats:	10 000	N
	- temperature limiters:	1 000	N
	- self-resetting thermal cut-outs:	300	N
	- voltage maintained non-self-resetting thermal cut-outs: (IEC60335-1)	1000	N
	- other non-self-resetting thermal cut-outs: (IEC60335-1)	30	N
	- timers:	3 000	N
	- energy regulators:	10 000	N
	NOTE 3 The ambient temperature during the test of Clause 17 of IEC 60730-1 is that occurring during the test of Clause 11 in the appliance, as specified in footnote b of Table 3. (IEC60335-1)		—
	Thermal motor protectors are tested in combination with their motor under the conditions specified in Annex D (IEC60335-1)		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 (IEC60335-1)		N
24.1.5	Appliance couplers complying with IEC 60320-1		N
	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
	The relevant standard for interconnection couplers is IEC 60320-2-2 (IEC60335-1)		N
24.1.6	Small lamp holders similar to E10 lampholders complying with IEC 60238, the requirements for E10 lampholders being applicable		N
	If the remote operation of the appliance is via a telecommunication network, the relevant standards for the telecommunication interface circuitry in the appliance are EN 41003 and EN 60950-1:2006, Subclause 6.3 (EN 60335-1/A13)		N
24.2	Appliances not fitted with:		P
	- switches or automatic controls in flexible cords		N
	- devices causing the protective device in the fixed wiring to operate in the event of a fault in the appliance		N

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
	- thermal cut-outs that can be reset by soldering, unless		N
	the solder has a melting point of at least 230 °C		N
	Switches or automatic controls in flexible cords are allowed for appliances not exceeding 25 W. (IEC 60335-2-80)		N
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
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		N
24.5	Capacitors in auxiliary windings of motors marked with their rated voltage and capacitance and used accordingly		P
	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		P
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 (IEC60335-1)		N
	<i>Compliance is checked by inspection</i>		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		P

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
	One or more of the following conditions are to be met:		--
	- 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		P
	- adjacent non-metallic parts within 50 mm classified as at least V-1 according to IEC 60695-11-10		N
24.101	Thermal cut-outs in duct fans in order to comply with cl. 19 are not self-resetting (IEC 60335-2-80)		P

25	SUPPLY CONNECTION AND EXTERNAL FLEXIBLE CORDS		—
25.1	Appliance not intended for permanent connection to fixed wiring, means for connection to the supply:		—
	- supply cord fitted with a plug, The current rating and voltage rating of the plug being not less than the corresponding ratings of its associated appliance		P
	- an appliance inlet having at least the same degree of protection against moisture as required for the appliance		N
	- 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	Connection of supply conductors for appliance intended to be permanently connected to fixed wiring possible after the appliance has been fixed to its support		P
	Appliance provided with a set of terminals for the connection of cables or fixed wiring, cross-sectional areas specified in 26.6		N
	Appliance provided with a set of terminals allowing the connection of a flexible cord		N
	Appliance provided with a set of supply leads accommodated in a suitable compartment		P

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
	Appliance provided with a set of terminals and cable entries, conduit entries, knock-outs or glands, allowing connection of appropriate type of cable or conduit		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:		—
	- 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
	Addition: Type Z attachment is allowed for portable fans(IEC 60335-2-80)		N
25.6	Plugs fitted with only one flexible cord		P
	Supply cords of single-phase portable appliances having a rated current not exceeding 16A shall be fitted with a plug complying with the following standard sheets of IEC 60083:1975: (IEC 60335-1)		—
	- for class I appliances		N
	- for class II appliances		P
25.7	Supply cord not lighter than:		—
	- braided cord (60245 IEC 51)		N
	- ordinary tough rubber sheathed cord (60245 IEC 53)		N
	- flat twin tinsel cord (60227 IEC 41)		N
	- light polyvinyl chloride sheathed cord (60227 IEC 52), appliance not exceeding 3 kg		N
	- ordinary polyvinyl chloride sheathed cord (60227 IEC 53), appliance exceeding 3 kg		P
	Temperature rise of external metal parts exceeding 75 K, PVC cord not used, unless		N
	appliance so constructed that the supply cord is not likely to touch external metal parts in normal use, or		N
	the supply cord is appropriate for higher temperatures, type Y or type Z attachment used		N

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
25.8	Nominal cross-sectional area of supply cords according to table 11; rated current (A); cross-sectional area (mm ²):	See component list of 24.1	P
25.9	Supply cord not in contact with sharp points or edges		P
25.10	Green/yellow core for earthing purposes in Class I appliance		P
	In multi-phase appliance, Blue for neutral conductor		N
25.11	Conductors of supply cords not consolidated by lead-tin soldering where they are subject to contact pressure, unless		P
	clamping means so constructed that there is no risk of bad contacts due to cold flow of the solder		N
25.12	Moulding the cord to part of the enclosure does not damage the insulation of the supply cord		P
25.13	Inlet opening so shaped as to prevent damage to the supply cord		P
	If it is not evident from the construction of the appliance that the supply cord can be introduced without risk of damage, a non-detachable lining or bushing complying with 29.3 for supplementary insulation provided		P
	If unsheathed supply cord, a similar additional bushing or lining is required, unless		N
	the appliance is class 0		N
25.14	Supply cords adequately protected against excessive flexing		N
	Flexing test:		—
	- applied force (N):		N
	- number of flexings:		N
	The test does not result in:		—
	- short circuit between the conductors		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, within the meaning of the standard, to the cord or the cord guard		N
	- broken strands piercing the insulation and becoming accessible		N

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
25.15	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):	100N, 0.25 Nm	P
	Max. 2 mm displacement of the cord, and conductors not moved more than 1 mm in the terminals	<2 mm	P
	Creepage distances and clearances not reduced below values specified in 29.1		P
25.16	Cord anchorages for type X attachments constructed and located so that:		—
	- 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 to the appliance, unless part of a specially prepared cord		N
	- 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		P
25.18	Cord anchorages only accessible with the aid of a tool, or		N

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
	so constructed 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	Conductors of the supply cord for type Y and Z attachment adequately additionally insulated		P
25.21	Space for supply cord for type X attachment or for connection of fixed wiring constructed to permit checking of conductors with respect to correct positioning and connection before fitting any cover, no risk of damage to the conductors when fitting the cover, no contact with accessible metal parts if a conductor becomes loose, etc.		N
	For portable appliances, the uninsulated end of a conductor prevented from any contact with accessible metal parts, unless the end of the cord is such that the conductors are unlikely to slip free		N
25.22	Appliance inlet:		—
	- 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
25.23	Interconnection cords comply with the requirements for the supply cord, except as specified		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		P
26	TERMINALS FOR EXTERNAL CONDUCTORS		—
26.1	Appliances provided with terminals or equally effective devices for connection of external conductors		P

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
	Terminals only accessible after removal of a non-detachable cover		P
	However, 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 (IEC60335-1)		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		P
	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
	Soldering alone used, barriers provided, clearances and creepage distances satisfactory 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 for type X attachment and those for connection to fixed wiring so fixed that when tightening or loosening the clamping means:		—
	- 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 8.6 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

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
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		P
	Pull test of 5 N to the connection		P
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		N
	For Class II appliances: soldering, welding or crimping alone used, barriers provided, clearances and creepage distances satisfactory if the conductor becomes free		N
27	PROVISION FOR EARTHING		—
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		N

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
	Earthing terminals not connected to neutral terminal		N
	Class 0, II and III appliance have no provision for earthing, class II appliances and class III appliances may incorporate an earth for functional purposes	Class II appliance	P
	Safety extra-low voltage circuits not earthed, unless protective extra-low voltage circuits		N
27.2	Clamping means adequately secured against accidental loosening		N
	Terminals used for the connection of external equipotential bonding conductors allow connection of conductors of 2.5 to 6 mm ² , and		N
	do not provide earthing continuity between different parts of the appliance		N
	Conductors cannot be loosened without the aid of a tool		N
27.3	If a detachable part having an earth connection is plugged into another part of the appliance, the earth connection shall be made before the current-carrying connections are established. (IEC60335-1)		N
	The current-carrying connections shall be separated before the earth connection when removing the part (IEC60335-1)		N
	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		N
	For appliances with supply cord, current-carrying conductors become taut before earthing conductor, if the cord slips out of the cord anchorage		N
	Addition: The allowed travel of the live and neutral brushes due to wear shall be less than the allowed travel of the earth brush so that the earthing circuit is maintained even after the appliance ceases to operate due to live and neutral brush wear. (IEC 60335-2-80)		N
27.4	No risk of corrosion resulting from contact between metal of earthing terminal and other metal		N
	Adequate resistance to corrosion of coated or uncoated parts providing earthing continuity, other than parts of a metal frame or enclosure		N

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
	Parts of steel providing earthing continuity provided at the essential areas with an electroplated coating, thickness at least 5 μm		N
	Adequate protection against rusting of parts of coated or uncoated steel, only intended to provide or transmit contact pressure		N
	In case of aluminium alloys precautions taken to avoid risk of corrosion		N
27.5	Low resistance of connection between earthing terminal and earthed metal parts		N
	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 appliance		N
	Resistance not exceeding 0,1 Ω at the specified low-resistance test	(see appended table)	N
27.6	The printed conductors of printed circuit boards not used to provide earthing continuity in hand held appliances		N
	They may be used in other appliances if:		—
	- at least two tracks are used with independent soldering points and the appliance complies with requirements of 27.5 for each circuit		N
	- the material of the printed circuit board complies with IEC 60249-2-4 or IEC 60249-2-5		N

28	SCREWS AND CONNECTIONS		—
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		N
	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		P
	Screws not of insulating material if their replacement by a metal screw can impair supplementary or reinforced insulation		N

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
	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; test as specified	(see appended table)	P
28.2	Electrical connections and connections providing earthing continuity constructed so that contact pressure not transmitted through insulating material liable to shrink or distort, unless shrinkage or distortion compensated		P
	This requirement does not apply to electrical connections in circuits carrying a current not exceeding 0.5A		N
28.3	Space-threaded (sheet metal) screws only used for electrical connections if they clamp the parts together		N
	Thread-cutting (self-tapping) screws only used for electrical connections if they generate a full form standard machine screw thread		N
	Such screws not used if they are likely to be operated by the user or installer unless the thread is formed by a swaging action		N
	Thread-cutting and space-threaded screws may be used in connections providing earthing continuity, provided unnecessary to disturb the connection and at least two screws are used for each connection		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		—
	Clearances, creepage distances and solid insulation withstand electrical stress		P
	If coatings are used on printed circuit boards to protect the microenvironment (Type A coating) or to provide basic insulation (Type B coating), Annex J applies.(IEC60335-1)		N
	The microenvironment is pollution degree 1 under Type A coating. (IEC60335-1)		N

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
	There are no creepage distance or clearance requirements under Type B coating. (IEC60335-1))		N
	The microenvironment is pollution degree 1 under Type A coating		N
	No creepage distance or clearance requirements under Type B coating		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 for basic insulation and functional insulation they comply with the impulse voltage test of clause 14 (IEC60335-1)		P
	However, if the construction is 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 (IEC60335-1)		P
	For appliances intended for use at altitudes exceeding 2000m, the clearances in Table 16 shall be increased according to the relevant multiplier values in Table A.2 of IEC 60064-1		N
	The impulse voltage test is not applicable when the microenvironment is pollution degree 3 or for basic insulation of class 0 appliances and class 0I appliances (IEC60335-1)	pollution degree 3	P
	Impulse voltage test not applicable:		—
	- when the microenvironment is pollution degree 3		P
	- for basic insulation of class 0 and class 0I appliances		N
	Appliances are in overvoltage category II		P
	Clearances less than specified in table 16 not allowed for basic insulation of class 0 and class 0I appliances,		N
	or if pollution degree 3 is applicable		P
	Compliance is checked by inspection and measurements as specified		P
29.1.1	Clearances of basic insulation withstand the overvoltages, taking into account the rated impulse voltage		P
	Clearance at the terminals of tubular sheathed heating elements may be reduced to 1mm if the microenvironment is pollution degree 1		N

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
	Lacquered conductors of windings considered to be bare conductors (IEC60335-1)		N
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, but using the next higher step for rated impulse voltage		P
29.1.4	For functional insulation, the values of table 16 are applicable, unless		P
	the appliance complies with clause 19 with the functional insulation short-circuited		P
	Lacquered conductors of windings considered to be bare conductors (IEC60335-1)		P
	However, clearances at crossover points are not measured (IEC60335-1)		P
	Clearance between surfaces of PTC heating elements may be reduced to 1mm		N
29.1.5	Appliances having higher working voltage than rated voltage, the voltage used for determining clearances from table 16 is the sum of the rated impulse voltage and the difference between the peak value of the working voltage and the peak value of the rated voltage		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 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		P
	Pollution degree 2 applies, unless		N
	precautions taken to protect the insulation; pollution degree 1		N
	insulation subjected to conductive pollution; pollution degree 3		P

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
	Compliance is checked by inspection and measurements as specified		P
	Microenvironment is pollution degree 3 unless insulation is enclosed or located that it is unlikely to be exposed to pollution during normal use (IEC 60335-2-80)	pollution degree 3	P
29.2.1	Creepage distances of basic insulation not less than specified in table 17		P
	For pollution degree 1, 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 as specified for basic insulation in table 17		N
29.2.3	Creepage distances of reinforced insulation at least double as specified for basic insulation in table 17		P
29.2.4	Creepage distances of functional insulation not less than specified in table 18		N
	Creepage distances may be reduced if the appliance complies with clause 19 with the functional insulation short-circuited		N
29.3	Supplementary insulation and reinforced insulation shall have adequate thickness, or have a sufficient number of layers, to withstand the electrical stresses that can be expected during the use of the appliance. (IEC60335-1)		P
	Compliance checked by: (A1:2004)		—
	- measurement, in accordance with 29.3.1, or	See 29.3.Z1	P
	- an electric strength test in accordance with 29.3.2, if the insulation consists of more than one separate layer, other than natural mica or similar flaky material, or by (IEC60335-1)		N
	- for insulation, other than single layer internal wiring insulation, by an assessment of the thermal quality of the material combined with an electric strength test, in accordance with 29.3.3 (IEC60335-1)		N
	-by an assessment of the thermal quality of the material according to 29.3.3 combined with an electric strength test in accordance with 23.5, or		N
	-as specified in subclause 6.3 of IEC 60664-4 for insulation that is subjected to any periodic voltage having a frequency that exceeds 30kHz		N

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
29.3.1	<i>The thickness of the insulation shall be at least (IEC60335-1)</i>		—
	- 1 mm for supplementary insulation; - 2 mm for reinforced insulation.		P
29.3.2	Each layer of material shall withstand the electric strength test of 16.3 for supplementary insulation. (IEC60335-1)		N
	Supplementary insulation shall consist of at least 2 layers of material and reinforced insulation of at least 3 layers(IEC60335-1)		N
29.3.3	The insulation is subjected to the dry heat test Bb of IEC 60068-2-2 for 48 h at a temperature of 50 K in excess of the maximum temperature rise measured during the test of Clause 19. (IEC60335-1)		N
	At the end of the period, the insulation is subjected to the electric strength test of 16.3 at the conditioning temperature and also after it has cooled down to room temperature (IEC60335-1)		N
	If the temperature rise of the insulation measured 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. (IEC60335-1)		N
29.3.4	Thickness of accessible parts of reinforced insulation consisting of a single layer not less than specified in table 19 :		

30	RESISTANCE TO HEAT AND FIRE		—
30.1	External parts of non-metallic material,		P
	parts supporting live parts, and		P
	thermoplastic material providing supplementary or reinforced insulation,		N
	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):		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):		P

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
	Parts of thermoplastic material providing supplementary or reinforced insulation, 25°C plus the maximum temperature rise determined during clause 19, if higher; temperature (°C):		N
30.2	Relevant parts of non-metallic material adequately resistant to ignition and spread of fire		P
30.2.1	Glow-wire test of IEC 60695-2-11 at 550 °C, unless		P
	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 ISO9772 for category HBF material		N
30.2.2	Appliances operated while attended, parts of insulating material supporting current-carrying connections and parts within a distance of 3mm subjected to the glow-wire test of IEC 60695-2-11 at a temperature of:		—
	-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
	Test 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		P
	parts of insulating material within a distance of 3mm,		P
	having a glow-wire flammability index of at least 850°C according to IEC 60695-2-12		P
30.2.3.2	Parts of insulating material supporting current-carrying connections, and		P
	parts of insulating 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 as specified		P
	Glow-wire test of IEC 60695-2-11, the temperature being:		—
	-750°C, for connections carrying a current exceeding 0,2A during normal operation		P
	-650°C, for other connections		P

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
	Parts that during the test produce a flame persisting longer than 2 s, tested as specified		P
	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		N
	Test not applicable to conditions as specified		N
31	RESISTANCE TO RUSTING		—
	Relevant ferrous parts adequately protected against rusting		P
32	RADIATION, TOXICITY AND SIMILAR HAZARDS		—
	Appliance does not emit harmful radiation		P
	Appliance does not present a toxic or similar hazard		P

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

B	ANNEX B (NORMATIVE) APPLIANCES POWERED BY RECHARGEABLE BATTERIES THAT ARE RECHARGED IN THE APPLIANCE		—
	The following modifications to this standard are applicable for appliances powered by batteries that are recharged in the appliance		N
	This annex does not apply to battery chargers		N
	These appliances take one of the following three forms of construction:		N
	a)The appliance can be supplied directly from supply mains or a renewable energy source such as a solar cell		N
	b)the complete appliance is the detachable supply unit plus the part of the appliance containing the battery and the battery charging circuitry		N
	c)the complete appliance is the detachable supply unit with the battery charging circuitry plus the part of the appliance containing the battery		N

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
3.1.9	Appliance operated under the following conditions:		—
	-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
	Appliances intending to be supplied from a detachable supply unit for the purposes of recharging the battery shall be marked with symbol iec 60417 and type reference along with symbol ISO 7000		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
	The type reference of the detachable supply unit shall be placed in close proximity to the symbol		N
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

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
11.8	Temperature rise of the battery surface shall not exceed the temperature rise limit in the battery manufacturer's specification for the type of battery supplied, not exceed 20K		N
19.1	Appliances subjected to tests of 19.101, 19.102 and 19.103		N
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 construction		N
19.13	The battery shall not rupture or ignite		N
21.101	Appliances having pins for insertion into socket-outlets have adequate mechanical strength, checked according to procedure 2 of IEC 68-2-32		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:		—
	- 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		—
	Tests, as described, carried out when doubt with regard to the temperature classification of the insulation of a motor winding		N

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
D	ANNEX D (NORMATIVE) THERMAL MOTOR PROTECTORS		—
	Thermal motor protectors		—
	This annex is applicable to appliances having motors that incorporate thermal motor protectors (A1:2004).		N
	The appliance is supplied at rated voltage with the rotor of the motor locked. (IEC60335-1)		N
	The duration of the test is as follows: (IEC60335-1)		—
	- motors having self-resetting thermal motor protectors are operated for 300 cycles or for 72 h, whichever occurs first, unless they are likely to be permanently subjected to the supply voltage in which case the duration is 432 h; (IEC60335-1)		N
	- motors having non-self-resetting thermal motor protectors are operated for 30 cycles, the thermal motor protector being reset as soon as possible after each operation, but in not less than 30 s; (IEC60335-1)		N
	During the test, temperatures shall not exceed the values specified in 19.7 and the appliance shall comply with 19.13. (IEC60335-1)		N
	NOTE This test may be carried out on a separate appliance. (IEC60335-1)		—

E	ANNEX E (NORMATIVE) NEEDLE-FLAME TEST		—
	Needle-flame test carried out in accordance with IEC 60695-2-2, with the following modifications:		N
5	Severities		—
	The duration of application of the test flame is 30 s ± 1 s		N
8	Test procedure		—
8.2	The specimen so arranged that the flame can be applied to a vertical or horizontal edge as shown in the examples of figure 1		N
8.4	The first paragraph does not apply		N
	If possible, the flame is applied at least 10 mm from a corner		N
8.5	The test is carried out on one specimen		N

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
	If the specimen does not withstand the test, the test may be repeated on two further specimens, both withstanding the test		N
10	Evaluation of test results		—
	The duration of burning not exceeding 30 s		N
	However, for printed circuit boards, the duration of burning not exceeding 15 s		N
F	ANNEX F (NORMATIVE) CAPACITORS		—
	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		—
1.5.3	Class X capacitors tested according to subclass X2		N
1.5.4	This subclause is applicable		N
1.6	Marking		—
	Items a) and b) are applicable		N
3.4	Approval testing		—
3.4.3.2	Table II is applicable as described		N
4.1	Visual examination and check of dimensions		—
	This subclause is applicable		N
4.2	Electrical tests		—
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		—
	This subclause is applicable		N
	Only insulation resistance and voltage proof are checked		N
4.13	Impulse voltage		—
	This subclause is applicable		N

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
4.14	Endurance		—
	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		—
	This subclause is applicable		N
4.18	Active flammability test		—
	This subclause is applicable		N

G	ANNEX G (NORMATIVE) SAFETY ISOLATING TRANSFORMERS		—
	The following modifications to this standard are applicable for safety isolating transformers:		N
7	Marking and instructions		—
7.1	Transformers for specific use marked with:		—
	-name, trademark or identification mark of the manufacturer or responsible vendor		N
	-model or type reference		N
17	Overload protection of transformers and associated circuits		—
	Fail-safe transformers comply with subclause 15.5 of IEC 61558-1		N
22	Construction		—
	Subclauses 19.1 and 19.1.2 of IEC 61558-2-6 are applicable		N
29	Clearances, creepage distances and solid insulation		—
29.1, 29.2 and 29.3	The distances specified in items 2a, 2c and 3 in table 13 of IEC 61558-1 apply		N

H	ANNEX H (NORMATIVE) SWITCHES		—
	Switches comply with the following clauses of IEC 61058-1, as modified:		—
	-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		—
	Switches are not required to be marked		N

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
	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		—
	The tests may be carried out on a separate sample		N
15	Insulation resistance and dielectric strength		—
15.1	Not applicable		N
15.2	Not applicable		N
15.3	Applicable for full disconnection and micro-disconnection		N
17	Endurance		—
	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 IEC 60335		N
	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
	Subclauses 17.2.2 and 17.2.5.2 are not applicable. The ambient temperature during the test is that occurring in the appliance during the test of Clause 11 in IEC 60335-1, as specified in footnote b of Table 3. (A1:2004)		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		—
	Clause 20 is applicable to clearances across full disconnection and microdisconnection, it is also applicable to creepage distances for functional insulation, across full disconnection and micro-disconnection, as stated in table 24		N

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
I	ANNEX I (NORMATIVE) MOTORS HAVING BASIC INSULATION THAT IS INADEQUATE FOR THE RATED VOLTAGE OF THE APPLIANCE		—
	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		—
8.1	Metal parts of the motor are considered to be bare live parts		N
11	Heating		—
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		—
16.3	Insulation between live parts of the motor and its other metal parts not subjected to the test		N
19	Abnormal operation		—
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:		—
	- 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		—
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

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
J	ANNEX J (NORMATIVE) COATED PRINTED CIRCUIT BOARDS		—
	Testing of protective coatings of printed circuit boards carried out in accordance with IEC 60664-3 with the following modifications:		N
6.6	Climatic sequence		—
	When production samples are used, three samples of the printed circuit board are tested		N
6.6.1	Cold		—
	The test is carried out at -25°C		N
6.6.3	Rapid change of temperature		—
	Severity 1 is specified		N
6.8.6	Partial discharge extinction voltage		—
	Type A coatings not subjected to a partial discharge test		N
6.9	Additional tests		—
	This subclause is not applicable		N

K	ANNEX K (NORMATIVE) OVERVOLTAGE CATEGORIES		—
	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 requirements		N
	Equipment of overvoltage category II is energy consuming equipment to be supplied from the fixed installation		P
	If such equipment is subjected to special requirements with regard to reliability and availability, overvoltage category III applies		N
	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

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
L	ANNEX L (INFORMATIVE) GUIDANCE FOR THE MEASUREMENT OF CLEARANCES AND CREEPAGE DISTANCES		—
	Sequences for the determination of clearances and creepage distances		P
M	ANNEX M (NORMATIVE) POLLUTION DEGREE		—
	The information on pollution degrees is extracted from IEC 60664-1		P
	Pollution		—
	The microenvironment determines the effect of pollution on the insulation, taking into account the 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		—
	For evaluating creepage distances, the following degrees of pollution in the microenvironment are established:		—
	- pollution degree 1: no pollution or only dry, non-conductive pollution occurs. The pollution has no influence		N
	- pollution degree 2: only non-conductive pollution occurs, except that occasionally a temporary conductivity caused by condensation is to be expected		N
	- pollution degree 3: conductive pollution occurs or dry non-conductive pollution occurs that becomes conductive due to condensation that is to be expected		P
	- pollution degree 4: the pollution generates persistent conductivity caused by conductive dust or by rain or snow		N
N	ANNEX N (NORMATIVE) PROOF TRACKING TEST		—
	The proof tracking test is carried out in accordance with IEC 60112 with the following modifications: (IEC60335-1)		N
7	Test apparatus (IEC60335-1)		—
7.3	Test solutions (IEC60335-1)		—

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
	Test solution A is used (IEC60335-1)		N
10	Determination of proof tracking index (PTI) (IEC60335-1)		—
10.1	Procedure		—
	The proof voltage is 100 V, 175 V, 400V or 600 V, as appropriate.		N
	The last paragraph of Clause 3 applies (A1:2004)		N
	The test is carried out on five specimens (A1:2004)		N
	In case of doubt, a material is considered to have a PTI of the specified value if it withstands the test at a voltage equal to the proof voltage reduced by 25 V, the number of drops being increased to 100. (IEC60335-1)		N
10.2	Report		—
	The report shall state if the PTI value was based on a test using 100 drops with a test voltage of (PTI-25) V (IEC60335-1)		N

O	ANNEX O (INFORMATIVE) SELECTION AND SEQUENCE OF THE TESTS OF CLAUSE 30		—
	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		—
	The following modifications to this standard are applicable for class 0 appliances and class OI appliances having a rated voltage exceeding 150 V, that are intended to be used in countries having a warm damp equable climate and that are marked WDaE. (IEC60335-1)		N
	NOTE Warm damp equable climates are characterized by high humidity and high ambient temperatures with little variation, as specified in IEC 60721-2-1. (IEC60335-1)		—
	They may also be applied to class I appliances having a rated voltage exceeding 150 V that are intended to be used in countries having a warm damp equable climate and that are marked WDaE, if they are able to be connected to a supply mains that excludes the protective earthing conductor due to deficiencies in the fixed wiring system. (IEC60335-1)		—

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
5	General conditions for the tests		—
5.7	The ambient temperature for the tests of Clauses 11 and 13 is 40 ⁺³ / ₀ (IEC60335-1)		N
7	Marking and instructions		—
7.1	The appliance marked with the letters WdaE (IEC60335-1)		N
7.12	The instructions shall state that the appliance is to be supplied through a residual current device (RCD) having a rated residual operating current not exceeding 30 mA. (IEC60335-1)		N
	The instructions shall state the substance of the following: (IEC60335-1)		—
	This appliance is considered to be suitable for use in countries having a warm damp equable climate. It may also be used in other countries.		N
11	Heating		—
11.8	The values of Table 3 are reduced by 15 K (IEC60335-1)		N
13	Leakage current and electric strength at operating temperature		—
13.2	The leakage current for class I appliances not exceeding 0,5 mA (IEC60335-1)		N
15	Moisture resistance		—
15.3	The value of t is 37 °C (IEC60335-1)		N
16	Leakage current and electric strength		—
16.2	The leakage current for class I appliances not exceeding 0,5 mA (IEC60335-1)		N
19	Abnormal operation		—
19.13	The leakage current test of 16.2 is applied in addition to the electric strength test of 16.3 (IEC60335-1)		N
Q	ANNEX Q (INFORMATIVE) SEQUENCE OF TESTS FOR THE EVALUATION OF ELECTRONIC CIRCUITS		—
	Description of tests for appliances incorporating electronic circuits		N
R	ANNEX R (NORMATIVE) SOFTWARE EVALUATION		N
	Requirement not applicable to the evaluated product.		—

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
S	Battery-operated appliances powered by batteries that are non-rechargeable or not recharged in the appliance		N
5	General conditions for the tests		N
5.8.1	Where the supply terminals for the connection of the battery have no indication of polarity, the more unfavourable polarity shall be applied		N
5.S.10 1	Battery-operated appliances intended for use with a battery box are tested with the battery box supplied with the appliance or with the battery box recommended in the instructions		N
5.S.10	Battery-operated appliances are tested as motor-operated appliances		N
7	Marking and instructions		N
7.1	Battery-operated appliances shall also be marked with be:		N
	-name, trade mark or identification mark of the manufacturer or responsible vendor;		N
	-model or type reference;		N
	-IP number according to degree of protection against ingress of water, other than IPX0;		N
	-type reference of battery or batteries		N
7.12	The instructions for battery-operated appliances shall contain the substance of the following, as applicable;		N
	- the types of batteries that may be used;		N
	- how to remove and insert the batteries;		N
	- non-rechargeable batteries are not to be recharged;		N
	- rechargeable batteries are to be removed from the appliance before being charged;		N
	- different types of batteries or new and used batteries are not to be mixed;		N
	- batteries are to be inserted with the correct polarity		N
	- exhausted batteries are to be removed from the appliance and safety disposed of;		N
	- if the appliance is to be stored unused for a long period, the batteries should be removed;		N
	- the supply terminals are not to be short-circuited		N
11	Heating		N

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
11.5	Battery-operated appliances are supplied at the terminals for the connection of the battery with most unfavourable supply voltage between		N
	- 0.55 and 1.0 times the battery voltage for use non-rechargeable batteries		N
	- 0.75 and 1.0 times battery voltage for use rechargeable batteries only		N
	The values specified in Table S.101 for the internal resistance per cell of the battery shall be take into account		N
19	Abnormal operation		N
19.1	For battery-operated appliances, the test are carried out with battery fully charged unless otherwire specified		N
19.13	The battery shall not rupture or ignite		N
19.S.1 01	Battery-operated appliances are supplied with the voltage specified in 11.5		N
19.S.1 02	For battery-operated appliances with provision for multiple batteries, one or more of the batteries shall be reversed and the appliance shall be operated		N
25	Supply connection and external flexible cords		N
25.5	The flexible leads or flexible cord used to connected an external battery or battery box in battery-operated appliances shall be connected to the appliance by a type X attachment		N
25.13	Not applicacable to flexible leads or flexible cord connecting external batteries or a batter box with an appliance		N
25.S.1 01	Battery-operated appliances shall have suitable means for connection of the battery		N
26	Terminals for external conductors		N
26.5	Terminals devices in an appliance for the connection of the flexible leads or flexible cord connecting an external battery or battery box shall be so located or shielded that there is no risk		N
30	Resistance to heat and fire		N

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
30.2.3.2	Additon: There shall be no battery in the area of the vertical cylinder used for the consequential needle flame test unless the battery is shielded by a barrier that meets the needle flame test of Annex E or that comprises material classified as V-0 of V-1 according to IEC 60695-11-10 provided that the test sample used for the classification was no thicker than the relevant part of the appliance		N

ZA	ANNEX ZA (NORMATIVE) SPECIAL NATIONAL CONDITIONS		—
7.12	DENMARK: Requirements regarding marking tag of power supply cord and connection of earthing wire for class I appliances delivered without a plug		N
19.5	NORWAY: The test is also applicable to appliances intended to be permanently connected to fixed wiring		N
22.2	FRANCE, NORWAY: The second paragraph of this subclause, dealing with single-phase, permanently connected class I appliances having heating elements, is not applicable due to the supply system		N
25.6	BELGIUM, FRANCE, SPAIN, UNITED KINGDOM: Plugs according to standard sheet C2b not allowed		N
	AUSTRIA, FINLAND, GERMANY, ICELAND, IRELAND, ITALY, LUXEMBOURG, NETHERLANDS, NORWAY, PORTUGAL, SPAIN, SWEDEN, SWITZERLAND, UNITED KINGDOM: Plugs according to standard sheet C3b not allowed		N
	DENMARK: Supply cords of single-phase portable appliances having a rated current not exceeding 13 A provided with a plug according to the following:		N
	Class I appliances: Section 107-2-D1, ed.3 1998, Standard Sheet DK 2-1a		N
	For appliances covered by a Part 2 of EN 60335, also plugs in accordance with Section 107-2-D1, ed. 3, 1998, Standard Sheet C2b, C3b or C4 are allowed		N
	Class II appliances: Section 107-2-D1, ed.3 1998, Standard Sheet C1b, C5, C6, DKA 2-1a and DKA 2-1b		N
	Stationary single-phase appliances, having a rated current not exceeding 13 A, and provided with a supply cord and a plug, the plug is in accordance with the requirements above		N

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
	Multi-phase appliances and single-phase appliances having a rated current exceeding 13 A, and provided with a supply cord and a plug, the plug is in accordance with the requirements below:		N
	Class I appliances: Section 107-2-D1, Standard Sheet DK 6-1a / EN 60309-2, Standard Sheet 2-II, 2-IV		N
	Class II appliances: Section 107-2-D1, Standard Sheet DK 6-1a / EN 60309-2, Standard Sheet 2-II, 2-IV, the earthing contact not being connected		N
	The current for the plug not exceeding the values specified; standard sheet (no.); current (A)		N
	IRELAND: Only plugs according to Standard Sheets B2 and C5 allowed (see also Annex ZB)		N
	ITALY: Only plugs listed in CENELEC Report R0BT-005:2001 allowed		N
	SPAIN: For appliances for household use, only the following plugs are allowed:		N
	according to UNE 20315: ESC 10-1b, C2b, C4, C6 or ESB 25-5b		N
	according to UNE-EN 50075		N
	SWITZERLAND: supply cords of portable household and similar electrical appliances having a rated current not exceeding 10 A, provided with a plug complying with SEV 1011 or IEC 60884-1 and one of the following dimension sheets:		N
	SEV 6532-2.1991, plug type 15, 3P+N+PE, 250/400 V, 10 A		N
	SEV 6533-2.1991, plug type 11, L+N, 250 V, 10 A		N
	SEV 6534-2.1991 plug type 12, L+N+PE, 250 V, 10 A		N
	UNITED KINGDOM: Only plugs according to Standard Sheets B2 and C5 allowed (see also Annex ZB)		N
25.8	IRELAND, UNITED KINGDOM: replacement of figures (rated current/cross-sectional area) in the table		N
ZB	ANNEX ZB (INFORMATIVE) A-DEVIATIONS		—
4	SWITZERLAND: Information about batteries with carbon-zinc and alkali-manganese		N
7.1	ITALY: The voltage is 220 V/380 V		N

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
25.6	IRELAND: These regulations apply to all plugs for domestic use at a voltage of not less than 200 V and allow only plugs complying with I.S. 401:1997, or equivalent, to be fitted to domestic appliances.		N
	UNITED KINGDOM: These regulations apply to all plugs for domestic use at a voltage of not less than 200 V and allow only plugs to BS 1363 to be fitted to domestic appliances. It also allows plugs to BS 4573 and standard sheet C5 to be fitted to shavers and toothbrushes.		N
ZC	ANNEX ZC (NORMATIVE) NORMATIVE REFERENCES TO INTERNATIONAL PUBLICATIONS WITH THEIR CORRESPONDING EUROPEAN PUBLICATIONS		—
	This Standard incorporates provisions from the publications listed		N
ZD	ANNEX ZD (INFORMATIVE) IEC and CENELEC CODE DESIGNATIONS FOR FLEXIBLE CORDS		—
	A list of code designations for different types of flexible cords		N

ATTACHMENT TO TEST REPORT IEC 60335-1 EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES	
Household and similar electrical appliances – Safety – Part 1: GENERAL REQUIREMENTS	
Differences according to	: EN 60335-1:2012+A11:2014; EN 60335-2-80:2003+A1:2004+A2:2009 EN 62233:2008
Attachment Form No. :	EU_GD_IEC60335_1T
Attachment Originator:	Nemko AS
Master Attachment :	2015-03
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CENELEC COMMON MODIFICATIONS			
6.1	Delete “class 0” and “class 01”		P
7.1	Single-phase appliances to be connected to the supply mains: 230 V covered		P
	Multi-phase appliances to be connected to the supply mains: 400 V covered		N/A

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
7.10	Devices used to start/stop operational functions of the appliance distinguished from other manual devices by means of shape, size, surface texture, position, etc.		P
	An indication that the device has been operated is given by:		P
	<ul style="list-style-type: none"> a tactile feedback, or 		P
	<ul style="list-style-type: none"> an audible and visual feedback 		N/A
7.12	The instructions include the substance of the following:		P
	- this appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved		P
	- children shall not play with the appliance		P
	- cleaning and user maintenance shall not be made by children without supervision		P
7.12.Z1	The specific instructions related to the safe operation of this appliance is collated together in the front section of the user instructions		P
	The height of the characters, measured on the capital letters, is at least 3 mm		P
	These instructions are also available in an alternative format, e.g. on a website		P
8.1.1	Also test probe 18 of EN 61032 is applied		N/A
	The appliance being in every possible position during the test, except that		N/A
	appliances normally used on the floor and having a mass exceeding 40 kg are not tilted		N/A
	The force on the probe in the straight position is increased to 10 N when probe 18 is used		N/A P
	When using test probe 18 the appliance is fully assembled as in normal use without any parts removed, and		N/A
	parts intended to be removed for user maintenance are also not removed		N/A
8.2	Compliance is checked by applying the test probes of EN 61032		N/A
	For built-in appliances and fixed appliances, the test probe B and probe 18 of EN 61032 are applied only after installation		N/A
11.8	Footnotes to "External enclosure of motor-operated appliances" to be taken into account		N/A

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
15.1.2	Appliances with an automatic cord reel tested with the cord in the most unfavourable position so that the reeling of the wet cord may affect electrical insulation during operation, the cord not being dried before reeling		N/A
20.2	When using the test probe similar to test probe B with a circular stop face, the accessories and detachable covers are removed		N/A
	Test probe 18 applied with a force of 2,5N on the appliance fully assembled		N/A
24.1	Components comply with the safety requirements specified in the relevant standards as far as they reasonably apply		P
	The requirements of Clause 29 of this standard apply between live parts of components and accessible parts of the appliance.		P
	The requirements of 30.2 of this standard apply to parts of non-metallic material in components including parts of non-metallic material supporting current-carrying connections inside components		P
	Components that have not been previously tested or do not comply with the standard for the relevant component are tested according to the requirements of 30.2		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, and		P
	- the test report for the component states whether it complied with the standard for the relevant component with or without flame, flames not exceeding 2 s during the test are ignored		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		N/A
	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		N/A
	Components that have not been separately tested and found to comply with the relevant standard, and		N/A
	components that are not marked or not used in accordance with their marking,		N/A

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
	are tested in accordance with the conditions occurring in the appliance, the number of samples being that required by the relevant standard		N/A
	Lamp holders and starter holders that have not been previously tested and found to comply with the relevant standard are tested as a part of the appliance and additionally comply with the gauging and interchangeability requirements of the relevant standard under the conditions occurring in the appliance		N/A
	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/A
	Plugs and socket-outlets and other connecting devices of interconnection cords are not interchangeable with plugs and socket-outlets listed in IEC/TR 60083 or IEC 60906-1, or		N/A
	with connectors and appliance inlets complying with the standard sheets of IEC 60320-1,		N/A
	if direct supply to these parts from the supply mains gives rise to a hazard		N/A
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/A
	Compliance with Clause 8 of this standard is not impaired by connecting the appliance to a device covered by EN 41003		N/A
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/A
25.6	Supply cords of single-phase portable appliances having a rated current not exceeding 16 A, fitted with a plug complying with the following standard sheets of IEC/TR 60083:		N/A
	- for Class I appliances: standard sheet C2b, C3b or C4.....:		N/A
	- for Class II appliances: standard sheet C5 or C6.....:		N/A
25.7	Rubber sheathed cords (60245 IEC 53) are not suitable for appliances intended to be used outdoors or when they are liable to be exposed to significant amount of ultraviolet radiation		N/A
	Halogen-free thermoplastic compound sheathed supply cords have properties at least those of:		N/A

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict
	<ul style="list-style-type: none"> halogen-free thermoplastic compound sheathed cords (H03Z1Z1H2-F or H03Z1Z1-F), for appliances having a mass not exceeding 3 kg 		N/A
	<ul style="list-style-type: none"> halogen-free thermoplastic compound sheathed cords (H05Z1Z1H2-F or H05Z1Z1-F), for other appliances 		N/A
	Cross-linked halogen-free compound sheathed supply cords have properties at least those of cross-linked halogen-free compound sheathed cords (H07ZZ-F)		N/A
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		N/A
29.3.Z1	Appliance constructed so that if there is a possibility of damaging the insulation during installation, the insulation withstands the scratch and penetration test of 21.2		N/A
32	Compliance regarding electromagnetic fields is checked according to EN 62233		P
Annex I, 19.I.101	The appliance is supplied at rated voltage and operated under normal operation with each of the fault conditions specified		N/A
	The duration of the test is as specified in 19.7		N/A

Annex EN 62233:2008			
EMF- ELECTROMAGNETICS FIELDS			
	The tested product also complies with the requirements of EN 62233:2008		—
	Limit100%	Measured max. :1.39%	P

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict

10.1	TABLE: Power input deviation					P
Input deviation of/at:	P rated (W)	P measured (W)	dP	Required dP	Remark	
230V, 50Hz	55	53.6	-2.5%	+20%		

10.2	TABLE: Current deviation					N
Current deviation of/at:	I rated (A)	I measured (A)	dI	Required dI	Remark	
					--	

11.8 (a)	TABLE: Heating test, thermocouple measurements				P
	Test voltage (V)	220V × 0.94=206.8V	240V × 1.06=254.4V	—	
	Ambient (°C)	23.2°C	23.2°C	—	
Thermocouple locations		Max, temperature rise measured, dT (K)		Max, temperature rise limit, dT (K)	
Power supply cord		3.7	3.8	50	
SYNC motor		5.6	5.3	115	
Fan motor winding		56.4	58.5	115	
Internal wire for motor		24.5	24.7	80	
Motor running capacitor		1.2	1.1	60	
PCB		11.6	12.1	Ref.	
X2 capacitor		16.2	15.8	100	
Transformer winding		23.5	24.3	65	
Transformer core		21.2	21.6	65	
Enclosure		1.6	1.5	60	
Control panel		0.5	0.6	60	
Test corner		0.6	0.5	65	
Supplementary information:					
1. Thermocouple method used					

13.2	TABLE: Leakage current				P
	Heating appliances: 1.15 x rated input	--		--	
	Motor-operated and combined appliances: 1.06 x rated voltage (V)	1.06x240=254.4V		--	
	Heat appliacne(W)	--			
Leakage current between			I (r.m.s mA)	Max. allowed I (r.m.s mA)	
Live part to earthed metal			0.08	0.75	

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict

Live part to plastic enclosure	0.01	0.35
--------------------------------	------	------

13.3	TABLE: Electric strength	P
Test voltage applied between:		Breakdown (Yes/No)
Voltage (V)		
Live part to earthed metal		No
Live part to plastic enclosure		No

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

16.2	TABLE: Leakage current	P
Single phase appliances: 1.06 x rated voltage		1.06x240=254.4V
Three phase appliances 1.06 x rated voltage divided by $\sqrt{3}$:		--
Leakage current between		Max. allowed I (r.m.s mA)
I (r.m.s mA)		
Live part to earthed metal		0.75
Live part to plastic enclosure		0.25

16.3	TABLE: Electric strength	P
Test voltage applied between:		Breakdown (Yes/No)
Voltage (V)		
Live part to earthed metal		No
Live part to plastic enclosure		No

17	TABLE: Overload protection, temperature rise	N
Test voltage (V).....:		--
Temperature rise of part/at:		Max. T (°C)
Measure T (°C)		
--		--
Supplementary information:		

19.13	TABLE: Abnormal operation, temperature rises	P
Thermocouple locations:		Max. temperature rise limit, ΔT (K)
Max. temperature rise measured, ΔT (K)		
Power supply cord		150
Motor winding		200°C

EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict

Test corner	0.5	150
Supplementary information:		

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

24.1	TABLE: Critical components information					P
Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity ¹⁾	
Plug	Huizhou Yongda Telecommunicati on Industry Co., Ltd.	YD-01	AC250V, 2,5A	VDE 0620-101 EN 50075	VDE 40026576	
Power cord	Dong Guan Yuan Hui Electric Co.,Ltd	H05VVH2-F	2X0,75mm ²	EN 50525-2-11	VDE 400423 68	
Motor	--	M-36T	220-240V, 50/60Hz, 50W, Class 130	EN60335-1 EN60335-2-80	Tested with appliance	
SYNC motor	FOSHAN SANSHUI HAIXUN MICROMOTOR CO., LTD	TDY 50	220-240V, 50/60Hz, 4W, Class 130	EN60335-1 EN60335-2-80	Tested with appliance	
Motor Running Capacitor	Jinzhou City Capacitor Factory	CBB61	450VAC, 1.2μF, 40/85/21	IEC60252-1	VDE	
Internal wire	ZHONG SHAN KENDA ELECTRICAL FACTORY	1015	20AWG, 105°C, 600V	EN60335-1 EN60335-2-80	Test with appliance	
Transformer	Zhongshan Youtai Electronic accesories factoty	YT-28/100065-XD	Class A	EN60335-1 EN60335-2-80	Test with appliance	
X2 capacitor	Shenzhen Su Rong Capacitors Co.,Ltd.	MPX	280V~, X2, 0.1μF, 40/100/21	EN60384-14	VDE 40008924	
PCB	KINGBOARD LAMINATES HOLDINGS LTD	KB-3151C(without Adhesive	V-0, 130°C	IEC 60335-1 IEC 60335-2-80	UL E123995 Test with appliance	

EN60335-2-80					
Clause	Requirement - Test			Result - Remark	Verdict
Enclosure	FORMOSA CHEMICALS & FIBRE CORP PLASTICS DIV	AG15A1	HB, Min. 1.6mm	EN60335-1 EN60335-2-80	Test with appliance
Supplementary information:					

29.1	TABLE: Clearances						P
	Overvoltage category.....:				II		—
		Type of insulation:					
Rated impulse voltage (V):	Min. CI (mm)	Basic (mm)	Supplementary (mm)	Reinforced (mm)	Functional (mm)	Verdict / Remark	
330	0.5	—	—	—	—	N	
500	0.5	—	—	—	—	N	
800	0.5	—	—	—	—	N	
1500	0.5	—	—	—	—	N	
2500	1.5	>1.5	—	—	—	P	
4000	3.0	—	—	>3.0	—	P	
4136	3.2	—	—	—	—	N	
6000	5.5	—	—	—	—	N	
8000	8.0	—	—	—	—	N	
10000	11.0	—	—	—	—	N	
Supplementary information:							

29.2	TABLE: Creepage distances, basic, supplementary and reinforced insulation										P
Working voltage (V)	Creepage distance (mm)										
	Pollution degree										
	1	2			3			Type of insulation			
		Material group			Material group						
		I	II	IIIa/III b	I	II	IIIa/IIIb*	B**	S**	R**	Verdict
≤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	—	—	—	N
>125 and ≤250	0.6	1.3	1.8	2.5	3.2	3.6	4.0	>2.5	—	—	P



EN60335-2-80												
Clause	Requirement - Test										Result - Remark	Verdict

>125 and ≤250	1.2	1.3	1.8	5.0	6.4	7.2	8.0	—	—	>5.0	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	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	6.4	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
>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

EN60335-2-80												
Clause	Requirement - Test								Result - Remark			Verdict

>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

Supplementary information:

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

**) B = Basic insulation, S = Supplementary insulation, R = Reinforced insulation

29.2	TABLE: Creepage distances, functional insulation								P
Working voltage (V)	Creepage distance (mm)							Verdict / Remark	
	Pollution degree								
	1	2			3				
		Material group			Material group				
		I	II	IIIa/IIIb	I	II	IIIa/IIIb*		
≤10	0,08	0,4	0,4	0,4	1,0	1,0	1,0	N	
50	0,16	0,56	0,8	1,1	1,4	1,6	1,8	N	
125	0,25	0,71	1,0	1,4	1,8	2,0	2,2	N	
250	0,42	1,0	1,4	2,0	2,5	2,8	3,2	P	
400	0,75	1,6	2,2	3,2	4,0	4,5	5,0	N	
500	1,0	2,0	2,8	4,0	5,0	5,6	6,3	N	
>630 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	

Supplementary information:

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

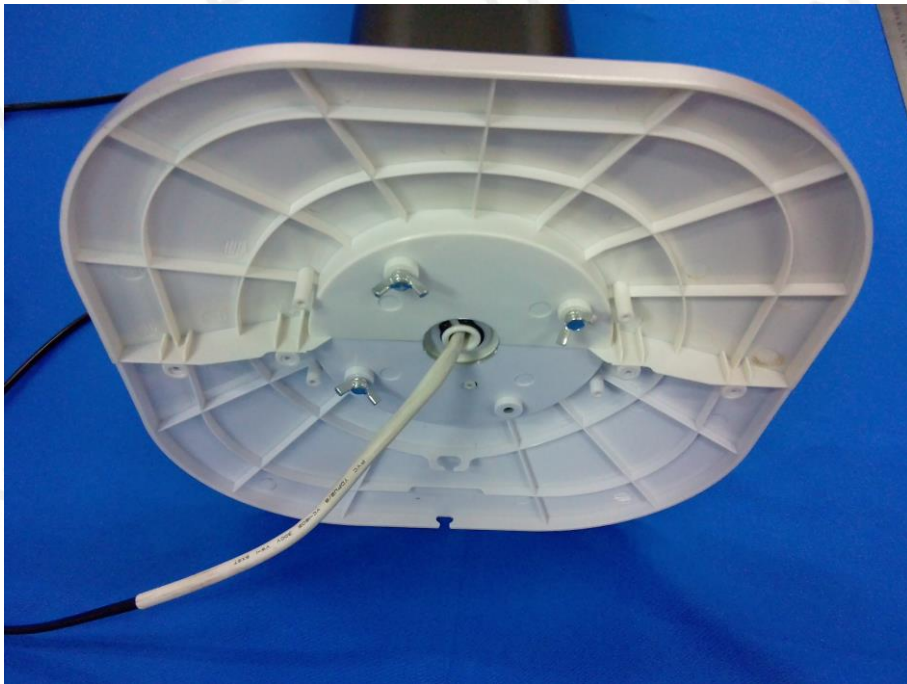
EN60335-2-80			
Clause	Requirement - Test	Result - Remark	Verdict

30.1	TABLE: Ball pressure			P
Part	Test temperature (°C)	Impression diameter (mm)	Allowed impression diameter (mm)	
Enclosure	75	1.1	2	
PCB	125	1.0	2	
Motor bobbin	125	0.8	2	

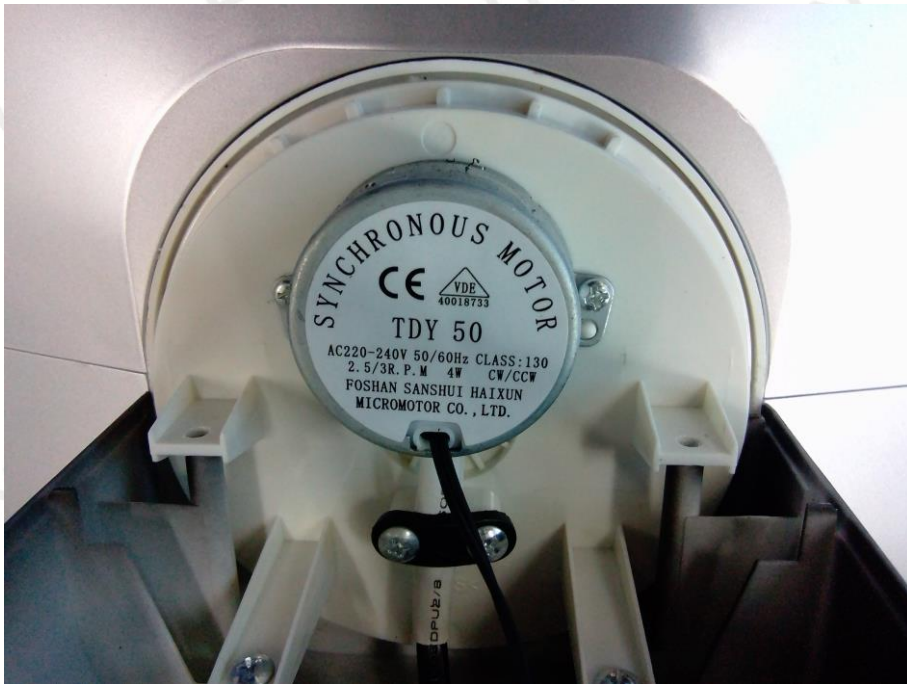
30.2	TABLE: resistance to heat, fire and tracking, tracking and glow-wire test							P	
Part	tracking test (V)		glow-wire test (°C)				GWFI (°C)	Needle Flame	result
	<u>175</u>	<u>250</u>	<u>550</u>	<u>650</u>	<u>750</u>	<u>960</u>	<u>850</u>		
Enclosure	--	--	√	--	--	--	--	--	30s No flame
Motor bobbin	--	--	--	--	√	--	√	--	30s No flame
Connector	--	--	--	--	√	--	√	--	30s No flame

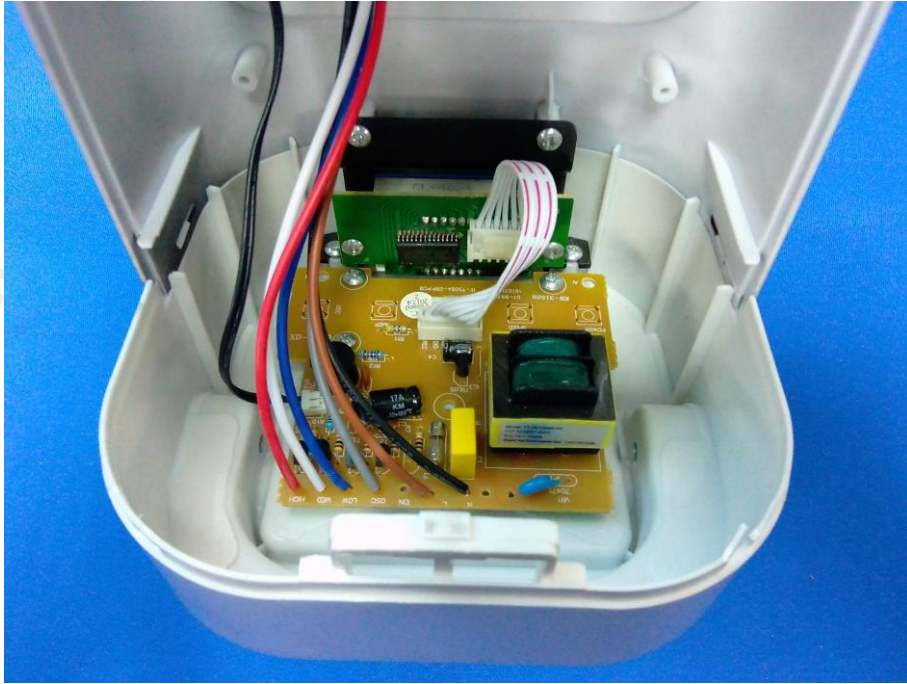
Appendix
Photo documentation











*****End of this report*****