



Test Report issued under the responsibility of:



TEST REPORT
IEC 60335-1
Safety of household and similar electrical appliances

Report Number: 3158753.50A

Date of issue: 2015-08-19

Total number of pages: 72 pages

Applicant's name: LEE YEONG INDUSTRIAL CO., LTD.

Address: No.2, Kejia Rd., Douliu City, Yunlin County 64057, Taiwan

Test specification:

Standard: IEC 60335-1:2010 (Fifth Edition)

Test procedure: CB Scheme

Non-standard test method: N/A

Test Report Form No: IEC60335_1R

Test Report Form(s) Originator: Nemko AS

Master TRF: Dated 2012-03

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Test item description: HVLP TURBINE SPRAYER

Trade Mark: AGP

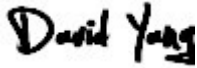
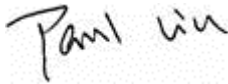
Manufacturer: LEE YEONG INDUSTRIAL CO., LTD.

No.2, Kejia Rd., Douliu City, Yunlin County 64057, Taiwan

Model/Type reference: T328; HVLP-3000; HT3; T1428; HT4; HT5; HT6; HT7; HT8; GR-T328; Q-T3; 113110-1; 113240-1; 890 Z SERIES; 680599; 680500; 450 000 55; ST3283; 45125

Ratings: 110-120 V or 220-240 V;50-60 Hz; 1400 W

Class I

| | | |
|--|--|---|
| Testing procedure and testing location: | | |
| <input checked="" type="checkbox"/> | CB Testing Laboratory: | DEKRA Testing and Certification (Shanghai) Ltd. |
| Testing location/ address..... : | | 3F #250 Jiangchangsan Road Building 16 Headquarter Economy Park Shibe Hi-Tech Park, Zhabei District Shanghai 200436 CHINA |
| <input type="checkbox"/> | Associated CB Laboratory: | |
| Testing location/ address..... : | | - |
| | Tested by (name + signature) | David Yang  |
| | Approved by (name + signature) .. : | Paul Liu  |
| <input type="checkbox"/> | Testing procedure: TMP | |
| Testing location/ address..... : | | |
| | Tested by (name + signature) | |
| | Approved by (name + signature) .. : | |
| <input type="checkbox"/> | Testing procedure: WMT | |
| Testing location/ address..... : | | |
| | Tested by (name + signature) | |
| | Witnessed by (name + signature) . : | |
| | Approved by (name + signature) .. : | |
| <input type="checkbox"/> | Testing procedure: SMT | |
| Testing location/ address..... : | | |
| | Tested by (name + signature) | |
| | Approved by (name + signature) .. : | |
| | Supervised by (name + signature) : | |
| <input type="checkbox"/> | Testing procedure: RMT | |
| Testing location/ address..... : | | |
| | Tested by (name + signature) | |
| | Approved by (name + signature) .. : | |
| | Supervised by (name + signature) : | |

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

Test report constituents:

- 3158753.50A covering IEC 60335-1 and pictures (total 72 pages)
- 3158753.50B covering EU group differences to IEC 60335-1 (total 15 pages)
- 3158753.50C covering EN 50580 (except clause 6; total 7 pages)

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

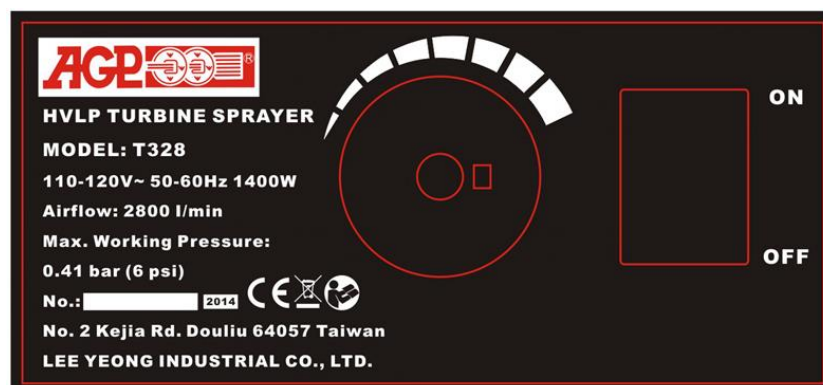
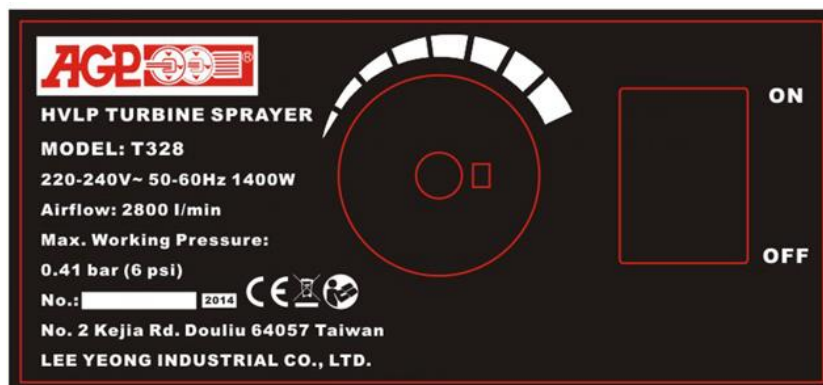
All appl. clauses of the standard have been done at CBTL.

Testing location:

DEKRA Testing and Certification (Shanghai) Ltd.
 3F #250 Jiangchangsan Road Building 16
 Headquarter Economy Park Shibe Hi-Tech Park,
 Zhabei District Shanghai 200436 CHINA

Summary of compliance with National Differences

This appliance is tested to and complies with EN 60335-1:2012+A11:2014 and EN 50580:2012+A1:2013 (except clause 6) thus complying with the EU group differences.


Copy of marking plate

The labels of HVLP-3000; HT3; T1428; HT4; HT5; HT6; HT7; HT8; GR-T328; Q-T3; 113110-1; 113240-1; 890 Z SERIES; 680599; 680500; 450 000 55; ST3283; 45125 are same as T328, only the models' name are different.

| | |
|---|--|
| Test item particulars | HVLP TURBINE SPRAYER |
| Classification of installation and use | Stationary appliance |
| Supply Connection | Type Y attachment |
| | Non-detachable flexible cord with plug |
| Possible test case verdicts: | |
| - test case does not apply to the test object | N/A |
| - test object does meet the requirement | P (Pass) |
| - test object does not meet the requirement..... | F (Fail) |
| Testing | |
| Date of receipt of test item | 2015-07-05 |
| Date (s) of performance of tests | 2015-07-05~2015-08-18 |
| General remarks: | |
| <p>The test results presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory. "(see Enclosure #)" refers to additional information appended to the report. "(see appended table)" refers to a table appended to the report.</p> <p>Throughout this report a <input checked="" type="checkbox"/> comma / <input type="checkbox"/> point is used as the decimal separator.</p> <p>The appliance also comply with the following standards: IEC 60335-1:2010 and EN 60335-1:2012+A11:2014 EN 50580:2012+A1:2013 (except clause 6) EN 62233:2008</p> | |
| Manufacturer's Declaration per sub-clause 6.2.5 of IEC 60335-1: | |
| <p>The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided.....</p> <p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> Not applicable</p> | |
| When differences exist; they shall be identified in the General product information section. | |
| Name and address of factory (ies) | |
| <p>LEE YEONG INDUSTRIAL CO., LTD. No.2, Kejia Rd., Douliu City, Yunlin County 64057, Taiwan</p> | |
| General product information: | |
| <p>The HVLP turbine sprayer can only use guns for spraying non-flammable materials. HVLP-3000; HT3; T1428; HT4; HT5; HT6; HT7; HT8; GR-T328; Q-T3; 113110-1; 113240-1; 890 Z SERIES; 680599; 680500; 450 000 55; ST3283; 45125 and T328 are identical, only the models' name are different.</p> | |

| IEC 60335-1 | | | |
|-------------|---|--|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| 5 | GENERAL CONDITIONS FOR THE TESTS | | P |
| | Tests performed according to clause 5, e.g. nature of supply, sequence of testing, etc. | | P |
| 6 | CLASSIFICATION | | P |
| 6.1 | Protection against electric shock: Class 0, 0I, I, II, III..... : | Class I | P |
| 6.2 | Protection against harmful ingress of water | | N/A |
| 7 | MARKING AND INSTRUCTIONS | | |
| 7.1 | Rated voltage or voltage range (V)..... : | 110-120 or 220-240 | P |
| | Symbol for nature of supply, or..... : | ~ | P |
| | Rated frequency (Hz) | 50-60 | P |
| | Rated power input (W), or | 1400 W | P |
| | Rated current (A) | -- | N/A |
| | Manufacturer's or responsible vendor's name, trademark or identification mark..... : | LEE YEONG INDUSTRIAL CO., LTD. No.2, Kejia Rd., Douliu City, Yunlin County 64057, Taiwan | P |
| | Model or type reference..... : | T328; HVLP-3000; HT3; T1428; HT4; HT5; HT6; HT7; HT8; GR-T328; Q-T3; 113110- 1; 113240-1; 890 Z SERIES; 680599; 680500; 450 000 55; ST3283; 45125 | P |
| | Symbol IEC 60417-5172, for class II appliances | - | N/A |
| | IP number, other than IPX0..... : | | N/A |
| | Symbol IEC 60417-5180, for class III appliances, unless | | N/A |
| | the appliance is operated by batteries only | | N/A |
| | Symbol IEC 60417-5036, for the enclosure of electrically-operated water valves in external hose- sets for connection of an appliance to the water mains, if the working voltage exceeds extra-low voltage | | N/A |
| 7.2 | Warning for stationary appliances for multiple supply | | N/A |
| | Warning placed in vicinity of terminal cover | | N/A |

| IEC 60335-1 | | | |
|-------------|---|-----------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| 7.3 | Range of rated values marked with the lower and upper limits separated by a hyphen | | P |
| | Different rated values marked with the values separated by an oblique stroke | | N/A |
| 7.4 | Appliances adjustable for different rated voltages, the voltage setting is clearly discernible | | N/A |
| | Requirement met if frequent changes are not required and the rated voltage to which the appliance is to be adjusted is determined from a wiring diagram | | N/A |
| 7.5 | Appliances with more than one rated voltage or one or more rated voltage ranges, marked with rated input or rated current for each rated voltage or range, unless | | N/A |
| | the power input is related to the arithmetic mean value of the rated voltage range | | N/A |
| | Relation between marking for upper and lower limits of rated power input or rated current and voltage is clear | | N/A |
| 7.6 | Correct symbols used | | P |
| | Symbol for nature of supply placed next to rated voltage | | P |
| | Symbol for class II appliances placed unlikely to be confused with other marking | | N/A |
| | Units of physical quantities and their symbols according to international standardized system | | P |
| 7.7 | Connection diagram fixed to appliances to be connected to more than two supply conductors and appliances for multiple supply, unless | | N/A |
| | correct mode of connection is obvious | | N/A |
| 7.8 | Except for type Z attachment, terminals for connection to the supply mains indicated as follows: | | P |
| | - marking of terminals exclusively for the neutral conductor (letter N) | | N/A |
| | - marking of protective earthing terminals (symbol IEC 60417-5019) | | P |
| | - marking not placed on removable parts | | P |
| 7.9 | Marking or placing of switches which may cause a hazard | | N/A |

| IEC 60335-1 | | | |
|-------------|---|---|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| 7.10 | Indications of switches on stationary appliances and controls on all appliances by use of figures, letters or other visual means |  | P |
| | This applies also to switches which are part of a control | | N/A |
| | If figures are used, the off position indicated by the figure 0 | | N/A |
| | The figure 0 indicates only OFF position, unless no confusion with the OFF position | ON/OFF | N/A |
| 7.11 | Indication for direction of adjustment of controls | | N/A |
| 7.12 | Instructions for safe use provided | | P |
| | Details concerning precautions during user maintenance | | P |
| | The instructions state that: | | P |
| | - the appliance is not to be used by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction | | P |
| | - children being supervised not to play with the appliance | | P |
| | For a part of class III construction supplied from a detachable power supply unit, the instructions state that the appliance is only to be used with the unit provided | | N/A |
| | Instructions for class III appliances state that it must only be supplied at SELV, unless | | N/A |
| | it is a battery-operated appliance, the battery being charged outside the appliance | | N/A |
| 7.12.1 | Sufficient details for installation supplied | | P |
| | For an appliance intended to be permanently connected to the water mains and not connected by a hose-set, this is stated | | N/A |
| 7.12.2 | Stationary appliances not fitted with means for disconnection from the supply mains having a contact separation in all poles that provide full disconnection under overvoltage category III, the instructions state that means for disconnection must be incorporated in the fixed wiring in accordance with the wiring rules | | N/A |

| IEC 60335-1 | | | |
|-------------|---|-----------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| 7.12.3 | Insulation of the fixed wiring in contact with parts exceeding 50 K during clause 11; instructions state that the fixed wiring must be protected | | N/A |
| 7.12.4 | Instructions for built-in appliances: | | N/A |
| | - dimensions of space | | N/A |
| | - dimensions and position of supporting and fixing | | N/A |
| | - minimum distances between parts and surrounding structure | | N/A |
| | - minimum dimensions of ventilating openings and arrangement | | N/A |
| | - connection to supply mains and interconnection of separate components | | N/A |
| | - allow disconnection of the appliance after installation, by accessible plug or a switch in the fixed wiring, unless | | N/A |
| | a switch complying with 24.3 | | N/A |
| 7.12.5 | Replacement cord instructions, type X attachment with a specially prepared cord | | N/A |
| | Replacement cord instructions, type Y attachment | | P |
| | Replacement cord instructions, type Z attachment | | N/A |
| 7.12.6 | Caution in the instructions for appliances incorporating a non-self-resetting thermal cut-out that is reset by disconnection of the supply mains, if this cut-out is required to comply with the standard | | N/A |
| 7.12.7 | Instructions for fixed appliances stating how the appliance is to be fixed | | N/A |
| 7.12.8 | Instructions for appliances connected to the water mains: | | N/A |
| | - max. inlet water pressure (Pa) : | | N/A |
| | - min. inlet water pressure, if necessary (Pa) : | | N/A |
| | Instructions concerning new and old hose-sets for appliances connected to the water mains by detachable hose-sets | | N/A |
| 7.13 | Instructions and other texts in an official language | | P |
| 7.14 | Marking clearly legible and durable, rubbing test as specified | | P |
| 7.15 | Markings on a main part | | P |
| | Marking clearly discernible from the outside, if necessary after removal of a cover | | P |

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|-------------|---|-----------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| | For portable appliances, cover can be removed or opened without a tool | | N/A |
| | For stationary appliances, name, trademark or identification mark and model or type reference visible after installation | | P |
| | For fixed appliances, name, trademark or identification mark and model or type reference visible after installation according to the instructions | | N/A |
| | Indications for switches and controls placed on or near the components. Marking not on parts which can be positioned or repositioned in such a way that the marking is misleading | | P |
| 7.16 | Marking of a possible replaceable thermal link or fuse link clearly visible with regard to replacing the link | | N/A |
| 8 | PROTECTION AGAINST ACCESS TO LIVE PARTS | | P |
| 8.1 | Adequate protection against accidental contact with live parts | | P |
| 8.1.1 | Requirement applies for all positions, detachable parts removed | | P |
| | Lamps behind a detachable cover not removed, if conditions met | | N/A |
| | Insertion or removal of lamps, protection against contact with live parts of the lamp cap | | N/A |
| | Use of test probe B of IEC 61032, with a force not exceeding 1 N: no contact with live parts | | P |
| 8.1.2 | Use of test probe 13 of IEC 61032, with a force not exceeding 1 N, through openings in class 0 appliances and class II appliances/constructions: no contact with live parts | | P |
| | Test probe 13 also applied through openings in earthed metal enclosures having a non-conductive coating: no contact with live parts | | P |
| 8.1.3 | For appliances other than class II, use of test probe 41 of IEC 61032, with a force not exceeding 1 N: no contact with live parts of visible glowing heating elements | | N/A |
| 8.1.4 | Accessible part not considered live if: | | N/A |
| | - safety extra-low a.c. voltage: peak value not exceeding 42.4 V | | N/A |
| | - safety extra-low d.c. voltage: not exceeding 42.4 V | | N/A |

| IEC 60335-1 | | | |
|-------------|--|----------------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| | - or separated from live parts by protective impedance | | N/A |
| | If protective impedance: d.c. current not exceeding 2 mA, and | | N/A |
| | a.c. peak value not exceeding 0.7 mA | | N/A |
| | - for peak values over 42.4 V up to and including 450 V, capacitance not exceeding 0,1 μ F | | N/A |
| | - for peak values over 450 V up to and including 15 kV, discharge not exceeding 45 μ C | | N/A |
| | - for peak values over 15kV, the energy in the discharge not exceeding 350 mJ | | N/A |
| 8.1.5 | Live parts protected at least by basic insulation before installation or assembly: | | N/A |
| | - built-in appliances | | N/A |
| | - fixed appliances | | N/A |
| | - appliances delivered in separate units | | N/A |
| 8.2 | Class II appliances and constructions constructed so that there is adequate protection against accidental contact with basic insulation and metal parts separated from live parts by basic insulation only | | N/A |
| | Only possible to touch parts separated from live parts by double or reinforced insulation | | N/A |
| 9 | STARTING OF MOTOR-OPERATED APPLIANCES | | N/A |
| | Requirements and tests are specified in part 2 when necessary | | N/A |
| 10 | POWER INPUT AND CURRENT | | P |
| 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 |
| | Test carried out at upper and lower limits of the ranges for appliances with one or more rated voltage ranges, unless | | P |
| | the rated power input is related to the arithmetic mean value | | N/A |
| 10.2 | Current at normal operating temperature, rated voltage and normal operation not deviating from rated current by more than shown in table 2 : | (see appended table) | N/A |
| | Test carried out at upper and lower limits of the ranges for appliances with one or more rated voltage ranges, unless | | N/A |

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|-------------|--|-----------------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| | the rated current is related to the arithmetic mean value of the range | | N/A |
| 11 | HEATING | | P |
| 11.1 | No excessive temperatures in normal use | | P |
| 11.2 | The appliance is held, placed or fixed in position 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 are non-uniform or it is difficult to make the necessary connections | | P |
| 11.4 | Heating appliances operated under normal operation at 1.15 times rated power input (W) : | | N/A |
| 11.5 | Motor-operated appliances operated under normal operation at most unfavourable voltage between 0.94 and 1.06 times rated voltage (V) | (see appended tables) | P |
| 11.6 | Combined appliances operated under normal operation at most unfavourable voltage between 0.94 and 1.06 times rated voltage (V) | | N/A |
| 11.7 | Operation duration corresponding to the most unfavourable conditions of normal use | | P |
| 11.8 | Temperature rises monitored continuously and not exceeding the values in table 3 | (see appended table) | P |
| | If the temperature rise of a motor winding exceeds the value of table 3, or | | N/A |
| | if there is doubt with regard to classification of insulation, | | N/A |
| | tests of Annex C are carried out | | N/A |
| | Sealing compound does not flow out | | P |
| | Protective devices do not operate, except | | P |
| | components in protective electronic circuits tested for the number of cycles specified in 24.1.4 | | N/A |
| 13 | LEAKAGE CURRENT AND ELECTRIC STRENGTH AT OPERATING TEMPERATURE | | P |
| 13.1 | Leakage current not excessive and electric strength adequate | | P |
| | Heating appliances operated at 1.15 times the rated power input (W) | | N/A |

| IEC 60335-1 | | | |
|-------------|--|----------------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| | Motor-operated appliances and combined appliances supplied at 1.06 times the rated voltage (V)..... : | 127 V and 254 V | P |
| | Protective impedance and radio interference filters disconnected before carrying out the tests | | P |
| 13.2 | For class 0, class II and class III appliances, leakage current measured by means of the circuit described in figure 4 of IEC 60990 | | P |
| | For other appliances, a low impedance ammeter may be used | | N/A |
| | Leakage current measurements : | (see appended table) | P |
| 13.3 | The appliance is disconnected from the supply | | P |
| | Electric strength tests according to table 4..... : | (see appended table) | P |
| | No breakdown during the tests | | P |
| 14 | TRANSIENT OVERVOLTAGES | | N/A |
| | Appliances withstand the transient over-voltages to which they may be subjected | | N/A |
| | Clearances having a value less than specified in table 16 subjected to an impulse voltage test, the test voltage specified in table 6 : | (see appended table) | N/A |
| | No flashover during the test, unless | | N/A |
| | of functional insulation if the appliance complies with clause 19 with the clearance short-circuited | | N/A |
| 15 | MOISTURE RESISTANCE | | P |
| 15.1 | Enclosure provides the degree of moisture protection according to classification of the appliance | IPX0 | N/A |
| | Compliance checked as specified in 15.1.1, taking into account 15.1.2, followed by the electric strength test of 16.3 | | N/A |
| | No trace of water on insulation which can result in a reduction of clearances or creepage distances below values specified in clause 29 | | N/A |
| 15.1.1 | Appliances, other than IPX0, subjected to tests as specified in IEC 60529..... : | IPX0 | N/A |
| | Water valves containing live parts in external hoses for connection of an appliance to the water mains tested as specified for IPX7 appliances | | N/A |
| 15.1.2 | Hand-held appliance turned continuously through the most unfavourable positions during the test | | N/A |

| IEC 60335-1 | | | |
|-------------|---|-----------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| | Built-in appliances installed according to the instructions | | N/A |
| | Appliances placed or used on the floor or table placed on a horizontal unperforated support | | N/A |
| | Appliances normally fixed to a wall and appliances with pins for insertion into socket-outlets are mounted on a wooden board | | N/A |
| | For IPX3 appliances, the base of wall mounted appliances is placed at the same level as the pivot axis of the oscillating tube | | N/A |
| | For IPX4 appliances, the horizontal centre line of the appliance is aligned with the pivot axis of the oscillating tube, and | | N/A |
| | for appliances normally used on the floor or table, the movement is limited to two times 90° for a period of 5 min, the support being placed at the level of the pivot axis of the oscillating tube | | N/A |
| | Wall-mounted appliances, take into account the distance to the floor stated in the instructions | | N/A |
| | Appliances normally fixed to a ceiling are mounted underneath a horizontal unperforated support, the pivot axis of the oscillating tube located at the level of the underside of the support, and | | N/A |
| | for IPX4 appliances, the movement of the tube is limited to two times 90° from the vertical for a period of 5 min | | N/A |
| | Appliances with type X attachment fitted with a flexible cord as described | | N/A |
| | Detachable parts subjected to the relevant treatment with the main part | | N/A |
| | However, if a part has to be removed for user maintenance and a tool is needed, this part is not removed | | N/A |
| 15.2 | Spillage of liquid does not affect the electrical insulation | | N/A |
| | Appliances with type X attachment fitted with a flexible cord as described | | N/A |
| | Appliances incorporating an appliance inlet tested with or without an connector, whichever is most unfavourable | | N/A |
| | Detachable parts are removed | | N/A |
| | Overfilling test with additional amount of water, over a period of 1 min (l)..... : | - | N/A |

| IEC 60335-1 | | | |
|-------------|--|----------------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| | The appliance withstands the electric strength test of 16.3 | | N/A |
| | No trace of water on insulation that can result in a reduction of clearances or creepage distances below values specified in clause 29 | | N/A |
| 15.3 | Appliances proof against humid conditions | | P |
| | Checked by test Cab: Damp heat steady state in IEC 60068-2-78 | | P |
| | Detachable parts removed and subjected, if necessary, to the humidity test with the main part | | P |
| | Humidity test for 48 h in a humidity cabinet | 25 °C, 93 % | P |
| | Reassembly of those parts that may have been removed | | P |
| | The appliance withstands the tests of clause 16 | | P |
| 16 | LEAKAGE CURRENT AND ELECTRIC STRENGTH | | P |
| 16.1 | Leakage current not excessive and electric strength adequate | | P |
| | Protective impedance disconnected from live parts before carrying out the tests | | N/A |
| | Tests carried out at room temperature and not connected to the supply | | P |
| 16.2 | Single-phase appliances: test voltage 1.06 times rated voltage (V) | 127 V and 254 V | P |
| | Three-phase appliances: test voltage 1.06 times rated voltage divided by $\sqrt{3}$ (V) | | N/A |
| | Leakage current measurements | (see appended table) | P |
| | Limit values doubled if: | | N/A |
| | - all controls have an off position in all poles, or | | N/A |
| | - the appliance has no control other than a thermal cut-out, or | | N/A |
| | - all thermostats, temperature limiters and energy regulators do not have an off position, or | | N/A |
| | - the appliance has radio interference filters | | N/A |
| | With the radio interference filters disconnected, the leakage current do not exceed limits specified..... | | N/A |
| 16.3 | Electric strength tests according to table 7..... | (see appended table) | P |
| | Test voltage applied between the supply cord and inlet bushing and cord guard and cord anchorage as specified..... | (see appended table) | P |

| IEC 60335-1 | | | |
|-------------|---|-----------------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| | No breakdown during the tests | | P |
| 17 | OVERLOAD PROTECTION OF TRANSFORMERS AND ASSOCIATED CIRCUITS | | N/A |
| | No excessive temperatures in transformer or associated circuits in event of short-circuits likely to occur in normal use | -- | N/A |
| | Appliance supplied with 1.06 or 0.94 times rated voltage under the most unfavourable short-circuit or overload likely to occur in normal use (V)..... | | N/A |
| | Basic insulation is not short-circuited | | N/A |
| | Temperature rise of insulation of the conductors of safety extra-low voltage circuits not exceeding the relevant value specified in table 3 by more than 15 K | | N/A |
| | Temperature of the winding not exceeding the value specified in table 8 | | N/A |
| | However, limits do not apply to fail-safe transformers complying with sub-clause 15.5 of IEC 61558-1 | | N/A |
| 18 | ENDURANCE | | P |
| | Requirements and tests are specified in part 2 when necessary | Refer to EN 50580 | P |
| 19 | ABNORMAL OPERATION | | P |
| 19.1 | The risk of fire, mechanical damage or electric shock under abnormal or careless operation obviated | | P |
| | Electronic circuits so designed and applied that a fault will not render the appliance unsafe | (see appended table) | P |
| | Appliances incorporating heating elements subjected to the tests of 19.2 and 19.3, and | | N/A |
| | if the appliance also has a control that limit the temperature during clause 11 it is subjected to the test of 19.4, and | | N/A |
| | if applicable, to the test of 19.5 | | N/A |
| | Appliances incorporating PTC heating elements are also subjected to the test of 19.6 | | N/A |
| | Appliances incorporating motors subjected to the tests of 19.7 to 19.10, as applicable | (see appended tables) | P |
| | Appliances incorporating electronic circuits subjected to the tests of 19.11 and 19.12, as applicable | | P |

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| Clause | Requirement - Test | Result - Remark | Verdict |
| | Appliances incorporating contactors or relays subjected to the test of 19.14, being carried out before the tests of 19.11 | | N/A |
| | Appliances incorporating voltage selector switches subjected to the test of 19.15 | | N/A |
| | Unless otherwise specified, the tests are continued until a non-self-resetting thermal cut-out operates, or | | N/A |
| | until steady conditions are established | | P |
| | If a heating element or intentionally weak part becomes open-circuited, the relevant test is repeated on a second sample | | N/A |
| 19.2 | Test of appliances with heating elements with restricted heat dissipation; test voltage (V), power input of 0.85 times rated power input (W) : | | N/A |
| 19.3 | Test of 19.2 repeated; test voltage (V), power input of 1.24 times rated power input (W) : | | N/A |
| 19.4 | Test conditions as in clause 11, any control limiting the temperature during tests of clause 11 short-circuited | | N/A |
| 19.5 | Test of 19.4 repeated on Class 0I and I appliances with tubular sheathed or embedded heating elements. No short-circuiting, but one end of the element connected to the sheath | | N/A |
| | The test repeated with reversed polarity and the other end of the heating element connected to the sheath | | N/A |
| | The test is not carried out on appliances intended to be permanently connected to fixed wiring and on appliances where an all-pole disconnection occurs during the test of 19.4 | | N/A |
| 19.6 | Appliances with PTC heating elements tested at rated voltage, establishing steady conditions | | N/A |
| | The working voltage of the PTC heating element is increased by 5% and the appliance is operated until steady conditions are re-established. The voltage is then increased in similar steps until 1.5 times working voltage or until the PTC heating element ruptures (V)..... : | | N/A |
| 19.7 | Stalling test by locking the rotor if the locked rotor torque is smaller than the full load torque, or | | N/A |
| | locking moving parts of other appliances | | P |
| | Locked rotor, capacitors open-circuited one at a time | | N/A |

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| Clause | Requirement - Test | Result - Remark | Verdict |
| | Test repeated with capacitors short-circuited one at a time, unless | | N/A |
| | capacitor is of class P2 of IEC 60252-1 | | N/A |
| | Appliances with timer or programmer supplied with rated voltage for each of the tests, for a period equal to the maximum period allowed..... : | | N/A |
| | Other appliances supplied with rated voltage for a period as specified..... : | 30 s | P |
| | Winding temperatures not exceeding values specified in table 8..... : | (see appended table) | P |
| 19.8 | Multi-phase motors operated at rated voltage with one phase disconnected | | N/A |
| 19.9 | Running overload test on appliances incorporating motors intended to be remotely or automatically controlled or liable to be operated continuously | | N/A |
| | Motor-operated and combined appliances for which 30.2.3 is applicable and that use overload protective devices relying on electronic circuits to protect the motor windings, are also subjected to the test | | N/A |
| | Winding temperatures not exceeding values as specified | | N/A |
| 19.10 | Series motor operated at 1.3 times rated voltage for 1 min (V)..... : | 156 V 312 V | P |
| | During the test, parts not being ejected from the appliance | | P |
| 19.11 | Electronic circuits, compliance checked by evaluation of the fault conditions specified in 19.11.2 for all circuits or parts of circuits, unless | | P |
| | they comply with the conditions specified in 19.11.1 | | N/A |
| | Appliances incorporating an electronic circuit that relies upon a programmable component to function correctly, subjected to the test of 19.11.4.8, unless | | N/A |
| | restarting does not result in a hazard | | N/A |
| | Appliances having a device with an off position obtained by electronic disconnection, or a device placing the appliance in a stand-by mode, subjected to the tests of 19.11.4 | | N/A |
| | If the safety of the appliance under any of the fault conditions depends on the operation of a miniature fuse-link complying with IEC 60127, the test of 19.12 is carried out | | N/A |

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

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| Clause | Requirement - Test | Result - Remark | Verdict |
| | Each low power circuit is short-circuited by connecting the low-power point to the pole of the supply source from which the measurements were made | | N/A |
| 19.11.3 | If the appliance incorporates a protective electronic circuit which operates to ensure compliance with clause 19, the relevant test is repeated with a single fault simulated, as indicated in a) to g) of 19.11.2 | | N/A |
| 19.11.4 | Appliances having a device with an off position obtained by electronic disconnection, or | | N/A |
| | a device that can be placed in the stand-by mode, | | N/A |
| | subjected to the tests of 19.11.4.1 to 19.11.4.7, the device being set in the off position or in the stand-by mode | | N/A |
| | Appliances incorporating a protective electronic circuit subjected to the tests of 19.11.4.1 to 19.11.4.7, the tests being carried out after the protective electronic circuit has operated, except that | | N/A |
| | appliances operated for 30 s or 5 min during the test of 19.7 are not subjected to the tests for electromagnetic phenomena. | | N/A |
| | Surge protective devices disconnected, unless | | N/A |
| | They incorporate spark gaps | | N/A |
| 19.11.4.1 | The appliance is subjected to electrostatic discharges in accordance with IEC 61000-4-2, test level 4 | | N/A |
| 19.11.4.2 | The appliance is subjected to radiated fields in accordance with IEC 61000-4-3, test level 3 | | N/A |
| 19.11.4.3 | The appliance is subjected to fast transient bursts in accordance with IEC 61000-4-4, test level 3 or 4 as specified | | N/A |
| 19.11.4.4 | The power supply terminals of the appliance subjected to voltage surges in accordance with IEC 61000-4-5, test level 3 or 4 as specified | | N/A |
| | Earthed heating elements in class I appliances disconnected | | N/A |
| 19.11.4.5 | The appliance is subjected to injected currents in accordance with IEC 61000-4-6, test level 3 | | N/A |
| 19.11.4.6 | Appliances having a rated current not exceeding 16 A are subjected to the Class 3 voltage dips and interruptions in accordance with IEC 61000-4-11 | | N/A |

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| Clause | Requirement - Test | Result - Remark | Verdict |
| | Appliances having a rated current exceeding 16 A are subjected to the Class 3 voltage dips and interruptions in accordance with IEC 61000-4-34 | | N/A |
| 19.11.4.7 | The appliance is subjected to mains signals in accordance with IEC 61000-4-13, test level class 2 | | N/A |
| 19.11.4.8 | The appliance is supplied at rated voltage and operated under normal operation. After 60s the power supply is reduced to a level such that the appliance ceases to respond or parts controlled by the programmable component cease to operate | | N/A |
| | The appliance continues to operate normally, or | | N/A |
| | requires a manual operation to restart | | N/A |
| 19.12 | If the safety of the appliance for any of the fault conditions specified in 19.11.2 depends on the operation of a miniature fuse-link complying with IEC 60127, the test is repeated, measuring the current flowing through the fuse-link; measured current (A); rated current of the fuse-link (A)..... : | | N/A |
| 19.13 | During the tests the appliance does not emit flames, molten metal, poisonous or ignitable gas in hazardous amounts | | P |
| | Temperature rises not exceeding the values shown in table 9 | (see appended table) | P |
| | Compliance with clause 8 not impaired | | P |
| | If the appliance can still be operated it complies with 20.2 | | N/A |
| | Insulation, other than of class III appliances or class III constructions that do not contain live parts, withstands the electric strength test of 16.3, the test voltage as specified in table 4: | | P |
| | - basic insulation (V) | 1000 V | P |
| | - supplementary insulation (V) | 1750 V | N/A |
| | - reinforced insulation (V) | 3000 V | P |
| | After operation or interruption of a control, clearances and creepage distances across the functional insulation withstand the electric strength test of 16.3, the test voltage being twice the working voltage | | N/A |
| | The appliance does not undergo a dangerous malfunction, and | | N/A |
| | no failure of protective electronic circuits, if the appliance is still operable | | N/A |

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| Clause | Requirement - Test | Result - Remark | Verdict |
| | Appliances tested with an electronic switch in the off position, or in the stand-by mode: | | N/A |
| | - do not become operational, or | | N/A |
| | - if they become operational, do not result in a dangerous malfunction during or after the tests of 19.11.4 | | N/A |
| | If the appliance contains lids or doors that are controlled by one or more interlocks, one of the interlocks may be released provided that: | | N/A |
| | - the lid or door does not move automatically to an open position when the interlock is released, and | | N/A |
| | - the appliance does not start after the cycle in which the interlock was released | | N/A |
| 19.14 | Appliances operated under the conditions of clause 11, any contactor or relay contact operating under the conditions of clause 11 being short-circuited | | N/A |
| | For a relay or contactor with more than one contact, all contacts are short-circuited at the same time | | N/A |
| | A relay or contactor operating only to ensure the appliance is energized for normal use is not short-circuited | | N/A |
| | If more than one relay or contactor operates in clause 11, they are short-circuited in turn | | N/A |
| 19.15 | For appliances with a mains voltage selector switch, the switch is set to the lowest rated voltage position and the highest value of rated voltage is applied | | N/A |
| 20 | STABILITY AND MECHANICAL HAZARDS | | P |
| 20.1 | Appliances having adequate stability | | P |
| | Tilting test through an angle of 10°, appliance placed on an inclined plane/horizontal support, not connected to the supply mains; appliance does not overturn | | P |
| | Tilting test repeated on appliances with heating elements, angle of inclination increased to 15° | | N/A |
| | Possible heating test in overturned position; temperature rise does not exceed values shown in table 9 | | N/A |
| 20.2 | Moving parts adequately arranged or enclosed as to provide protection against personal injury | | P |
| | Protective enclosures, guards and similar parts are non-detachable, and | | P |
| | have adequate mechanical strength | | P |

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| Clause | Requirement - Test | Result - Remark | Verdict |
| | Enclosures that can be opened by overriding an interlock are considered to be detachable parts | | N/A |
| | Self-resetting thermal cut-outs and overcurrent protective devices not causing a hazard by unexpected closure | | N/A |
| | Not possible to touch dangerous moving parts with the test probe described | | P |
| 21 | MECHANICAL STRENGTH | | P |
| 21.1 | Appliance has adequate mechanical strength and is constructed as to withstand rough handling | | P |
| | Checked by applying 3 blows to every point of the enclosure like to be weak, in accordance with test Ehb of IEC 60068-2-75, spring hammer test, with an impact energy of 0,5 J | | P |
| | The appliance shows no damage impairing compliance with this standard, and | | P |
| | compliance with 8.1, 15.1 and clause 29 not impaired | | P |
| | If doubt, supplementary or reinforced insulation subjected to the electric strength test of 16.3 | | N/A |
| | If necessary, repetition of groups of three blows on a new sample | | N/A |
| 21.2 | Accessible parts of solid insulation having strength to prevent penetration by sharp implements | | P |
| | Test not applicable if the thickness of supplementary insulation is at least 1 mm and reinforced insulation at least 2 mm | | P |
| | The insulation is tested as specified, and does withstand the electric strength test of 16.3 | | N/A |
| 22 | CONSTRUCTION | | P |
| 22.1 | Appliance marked with the first numeral of the IP system, relevant requirements of IEC 60529 are fulfilled | IPX0 | N/A |
| 22.2 | Stationary appliance: means to ensure all-pole disconnection from the supply being provided: | | P |
| | - a supply cord fitted with a plug, or | | P |
| | - a switch complying with 24.3, or | | N/A |
| | - a statement in the instruction sheet that a disconnection incorporated in the fixed wiring is to be provided, or | | N/A |
| | - an appliance inlet | | N/A |

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| Clause | Requirement - Test | Result - Remark | Verdict |
| | Single-pole switches and single-pole protective devices for the disconnection of heating elements in single-phase, permanently connected class 01 and class I appliances, connected to the phase conductor | | N/A |
| 22.3 | Appliance provided with pins: no undue strain on socket-outlets | | N/A |
| | Applied torque not exceeding 0.25 Nm | | N/A |
| | Pull force of 50N to each pin after the appliance has been placed in the heating cabinet; when cooled to room temperature the pins are not displaced by more than 1mm | | N/A |
| | Each pin subjected to a torque of 0.4Nm; the pins are not rotating, unless | | N/A |
| | rotating does not impair compliance with this standard | | N/A |
| 22.4 | Appliance for heating liquids and appliance causing undue vibration not provided with pins for insertion into socket-outlets | | N/A |
| 22.5 | No risk of electric shock when touching the pins of the plug, for appliances having a capacitor with rated capacitance exceeding 0,1 μ F, the appliance being disconnected from the supply at the instant of voltage peak | | P |
| | Voltage not exceeding 34 V (V)..... : | 0,2 V | P |
| 22.6 | Electrical insulation not affected by condensing water or leaking liquid | | P |
| | Electrical insulation of Class II appliances not affected if a hose ruptures or seal leaks | | N/A |
| | In case of doubt, test as described | | N/A |
| 22.7 | Adequate safeguards against the risk of excessive pressure in appliances containing liquid or gases or having steam-producing devices | | P |
| 22.8 | Electrical connections not subject to pulling during cleaning of compartments to which access can be gained without the aid of a tool, and that are likely to be cleaned in normal use | | P |
| 22.9 | Insulation, internal wiring, windings, commutators and slip rings not exposed to oil, grease or similar substances, unless | No such substances used | P |
| | the substance has adequate insulating properties | | N/A |

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| Clause | Requirement - Test | Result - Remark | Verdict |
| 22.10 | Not possible to reset voltage-maintained non-self-resetting thermal cut-outs by the operation of an automatic switching device incorporated within the appliance, if: | | N/A |
| | - a non-self-resetting thermal cut-out is required by the standard, and | | N/A |
| | - a voltage maintained non-self-resetting thermal cut-out is used to meet it | | N/A |
| | Non-self-resetting thermal motor protectors have a trip-free action, unless | | N/A |
| | they are voltage maintained | | N/A |
| | Reset buttons of non-self-resetting controls so located or protected that accidental resetting is unlikely | | N/A |
| 22.11 | Reliable fixing of non-detachable parts that provide the necessary degree of protection against electric shock, moisture or contact with moving parts | | P |
| | Obvious locked position of snap-in devices used for fixing such parts | | N/A |
| | No deterioration of the fixing properties of snap-in devices used in parts that are likely to be removed during installation or servicing | | N/A |
| | Tests as described | | P |
| 22.12 | Handles, knobs etc. fixed in a reliable manner | | P |
| | Fixing in wrong position of handles, knobs etc. indicating position of switches or similar components not possible | | P |
| | Axial force 15 N applied to parts, the shape being so that an axial pull is unlikely to be applied | | P |
| | Axial force 30 N applied to parts, the shape being so that an axial pull is likely to be applied | | N/A |
| 22.13 | Unlikely that handles, when gripped as in normal use, make the operator's hand touch parts having a temperature rise exceeding the value specified for handles which are held for short periods only | | N/A |
| 22.14 | No ragged or sharp edges creating a hazard for the user in normal use, or during user maintenance | | P |
| | No exposed pointed ends of self-tapping screws or other fasteners, likely to be touched by the user in normal use or during user maintenance | | P |
| 22.15 | Storage hooks and the like for flexible cords smooth and well rounded | | P |

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| Clause | Requirement - Test | Result - Remark | Verdict |
| 22.16 | Automatic cord reels cause no undue abrasion or damage to the sheath of the flexible cord, no breakage of conductors strands and no undue wear of contacts | | N/A |
| | Cord reel tested with 6000 operations, as specified | | N/A |
| | Electric strength test of 16.3, voltage of 1000 V applied | | N/A |
| 22.17 | Spacers not removable from the outside by hand or by means of a screwdriver or a spanner | | N/A |
| 22.18 | Current-carrying parts and other metal parts resistant to corrosion | | P |
| 22.19 | Driving belts not relied upon to provide the required level of insulation, unless | | N/A |
| | constructed to prevent inappropriate replacement | | N/A |
| 22.20 | Direct contact between live parts and thermal insulation effectively prevented, unless | | N/A |
| | material used is non-corrosive, non-hygroscopic and non-combustible | | N/A |
| 22.21 | Wood, cotton, silk, ordinary paper and fibrous or hygroscopic material not used as insulation, unless | No such material | N/A |
| | impregnated | | N/A |
| | This requirement does not apply to magnesium oxide and mineral ceramic fibres used for the electrical insulation of heating elements | | N/A |
| 22.22 | Appliances not containing asbestos | No asbestos | P |
| 22.23 | Oils containing polychlorinated biphenyl (PCB) not used | No oils | P |
| 22.24 | Bare heating elements, except in class III appliances or class III constructions that do not contain live parts, adequately supported | | N/A |
| | In case of rupture, the heating conductor is unlikely to come in contact with accessible metal parts | | N/A |
| 22.25 | Sagging heating conductors, except in class III appliances or class III constructions that do not contain live parts, cannot come into contact with accessible metal parts | | N/A |
| 22.26 | For class III constructions the insulation between parts operating at safety extra-low voltage and other live parts complies with the requirements for double or reinforced insulation | | N/A |
| 22.27 | Parts connected by protective impedance separated by double or reinforced insulation | | N/A |

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| Clause | Requirement - Test | Result - Remark | Verdict |
| 22.28 | Metal parts of Class II appliances conductively connected to gas pipes or in contact with water, separated from live parts by double or reinforced insulation | | N/A |
| 22.29 | Class II appliances permanently connected to fixed wiring so constructed that the required degree of access to live parts is maintained after installation | | N/A |
| 22.30 | Parts serving as supplementary or reinforced insulation fixed so that they cannot be removed without being seriously damaged, or | | P |
| | so constructed that they cannot be replaced in an incorrect position, and so that if they are omitted, the appliance is rendered inoperable or manifestly incomplete | | P |
| 22.31 | Neither clearances nor creepage distances over supplementary and reinforced insulation reduced below values specified in clause 29 as a result of wear | | P |
| | Neither clearances nor creepage distances between live parts and accessible parts reduced below values for supplementary insulation if wires, screws etc. become loose | | P |
| 22.32 | Supplementary and reinforced insulation constructed or protected against pollution so that clearances or creepage distances are not reduced below the values in clause 29 | | P |
| | Supplementary insulation of natural or synthetic rubber resistant to ageing, or arranged and dimensioned so that creepage distances are not reduced below values specified in 29.2 | | N/A |
| | Ceramic material not tightly sintered, similar materials or beads alone not used as supplementary or reinforced insulation | | N/A |
| | Insulating material in which heating conductors are embedded is considered to be basic insulation, not reinforced insulation | | N/A |
| | Oxygen bomb test at 70 °C for 96 h and 16 h at room temperature | | N/A |
| 22.33 | Conductive liquids that are or may become accessible in normal use and conductive liquids that are in contact with unearthed accessible metal parts are not in direct contact with live parts | | N/A |
| | Electrodes not used for heating liquids | | N/A |

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| Clause | Requirement - Test | Result - Remark | Verdict |
| | For class II constructions, conductive liquids that are or may become accessible in normal use and conductive liquids that are in contact with unearthed accessible metal parts, not in direct contact with basic or reinforced insulation, unless | | N/A |
| | the reinforced insulation consists of at least 3 layers | | N/A |
| | For class II constructions, conductive liquids which are in contact with live parts, not in direct contact with reinforced insulation, unless | | N/A |
| | the reinforced insulation consists of at least 3 layers | | N/A |
| | An air layer not used as basic or supplementary insulation in a double insulation system if likely to be bridged by leaking liquid | | N/A |
| 22.34 | Shafts of operating knobs, handles, levers etc. not live, unless | | P |
| | the shaft is not accessible when the part is removed | | N/A |
| 22.35 | For other than class III constructions, handles, levers and knobs, held or actuated in normal use, not becoming live in the event of a failure of basic insulation | | P |
| | Such parts being of metal, and their shafts or fixings are likely to become live in the event of a failure of basic insulation, are either adequately covered by insulation material or their accessible parts are separated from their shafts or fixings by supplementary insulation | | N/A |
| | This requirement does not apply to handles, levers and knobs on stationary appliances, other than those of electrical components, provided they are reliably connected to an earthing terminal or earthing contact, or separated from live parts by earthed metal | | P |
| | Insulating material covering metal handles, levers and knobs withstand the electric strength test of 16.3 for supplementary insulation | | N/A |
| 22.36 | For appliances other than class III, handles continuously held in the hand in normal use so constructed that when gripped as in normal use, the operators hand is not likely to touch metal parts, unless | | N/A |
| | they are separated from live parts by double or reinforced insulation | | N/A |

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| Clause | Requirement - Test | Result - Remark | Verdict |
| 22.37 | Capacitors in Class II appliances not connected to accessible metal parts and their casings, if of metal, separated from accessible metal parts by supplementary insulation, unless | | N/A |
| | the capacitors comply with 22.42 | | N/A |
| 22.38 | Capacitors not connected between the contacts of a thermal cut-out | | N/A |
| 22.39 | Lamp holders used only for the connection of lamps | | N/A |
| 22.40 | Motor-operated appliances and combined appliances intended to be moved while in operation, or having accessible moving parts, fitted with a switch to control the motor. The actuating member of the switch being easily visible and accessible | | P |
| | If the appliance cannot operate continuously, automatically or remotely without giving rise to a hazard, appliances for remote operation being fitted with a switch for stopping the operation. The actuating member of the switch being easily visible and accessible | | N/A |
| 22.41 | No components, other than lamps, containing mercury | | P |
| 22.42 | Protective impedance consisting of at least two separate components | | N/A |
| | Values specified in 8.1.4 not exceeded if any one of the components are short-circuited or open-circuited | | N/A |
| | Resistors checked by the test of 14.1 a) in IEC 60065 | | N/A |
| | Capacitors checked by the tests for class Y capacitors in IEC 60384-14 | | N/A |
| 22.43 | Appliances adjustable for different voltages, accidental changing of the setting of the voltage unlikely to occur | | N/A |
| 22.44 | Appliances not having an enclosure that is shaped or decorated like a toy | | P |
| 22.45 | When air is used as reinforced insulation, clearances not reduced below the values specified in 29.1.3 due to deformation as a result of an external force applied to the enclosure | | P |
| 22.46 | For programmable protective electronic circuits used to ensure compliance with the standard, the software contains measures to control the fault/error conditions in table R.1 | | N/A |

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| Clause | Requirement - Test | Result - Remark | Verdict |
| | Software that contains measures to control the fault/error conditions specified in table R.2 is to be specified in parts 2 for particular constructions or to address specific hazards | | N/A |
| | These requirements are not applicable to software used for functional purpose or compliance with clause 11 | | N/A |
| 22.47 | Appliances connected to the water mains withstand the water pressure expected in normal use | | N/A |
| | No leakage from any part, including any inlet water hose | | N/A |
| 22.48 | Appliances connected to the water mains constructed to prevent backsiphonage of non-potable water | | N/A |
| 22.49 | For remote operation, the duration of operation is to be set before the appliance can be started, unless | | N/A |
| | the appliance switches off automatically or can operate continuously without hazard | | N/A |
| 22.50 | Controls incorporated in the appliance take priority over controls actuated by remote operation | | N/A |
| 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/A |
| | There is a visual indication showing that the appliance is adjusted for remote operation | | N/A |
| | These requirements not necessary on appliances that can operate as follows, without giving rise to a hazard: | | N/A |
| | - continuously, or | | N/A |
| | - automatically, or | | N/A |
| | - remotely | | N/A |
| 22.52 | Socket-outlets on appliances accessible to the user in accordance with the socket-outlet system used in the country in which the appliance is sold | | N/A |
| 23 | INTERNAL WIRING | | P |
| 23.1 | Wireways smooth and free from sharp edges | | P |
| | Wires protected against contact with burrs, cooling fins etc. | | P |
| | Wire holes in metal well-rounded or provided with bushings | | N/A |
| | Wiring effectively prevented from coming into contact with moving parts | | P |

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| Clause | Requirement - Test | Result - Remark | Verdict |
| 23.2 | Beads etc. on live wires cannot change their position, and are not resting on sharp edges | | N/A |
| | Beads inside flexible metal conduits contained within an insulating sleeve | | N/A |
| 23.3 | Electrical connections and internal conductors movable relatively to each other not exposed to undue stress | | N/A |
| | Flexible metallic tubes not causing damage to insulation of conductors | | N/A |
| | Open-coil springs not used | | N/A |
| | Adequate insulating lining provided inside a coiled spring, the turns of which touch one another | | N/A |
| | No damage after 10 000 flexings for conductors flexed during normal use, or | | N/A |
| | 100 flexings for conductors flexed during user maintenance | | N/A |
| | Electric strength test of 16.3, 1000 V between live parts and accessible metal parts | | N/A |
| | Not more than 10% of the strands of any conductor broken, and | | N/A |
| | not more than 30% for wiring supplying circuits that consume no more than 15W | | N/A |
| 23.4 | Bare internal wiring sufficiently rigid and fixed | | N/A |
| 23.5 | The insulation of internal wiring subjected to the supply mains voltage withstanding the electrical stress likely to occur in normal use | | P |
| | Basic insulation electrically equivalent to the basic insulation of cords complying with IEC 60227 or IEC 60245, or | | P |
| | no breakdown when a voltage of 2000 V is applied for 15 min between the conductor and metal foil wrapped around the insulation | | P |
| 23.6 | Sleeving used as supplementary insulation on internal wiring retained in position by clamping at both ends, or | | N/A |
| | be such that it can only be removed by breaking or cutting | | N/A |
| 23.7 | The colour combination green/yellow only used for earthing conductors | | P |
| 23.8 | Aluminium wires not used for internal wiring | | P |

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| Clause | Requirement - Test | Result - Remark | Verdict |
| 23.9 | Stranded conductors not consolidated by soldering where they are subjected to contact pressure, unless | | N/A |
| | the contact pressure is provided by spring terminals | | N/A |
| 23.10 | The insulation and sheath of internal wiring, incorporated in external hoses for the connection of an appliance to the water mains, at least equivalent to that of light polyvinyl chloride sheathed flexible cord (60227 IEC 52) | | N/A |
| 24 | COMPONENTS | | P |
| 24.1 | Components comply with safety requirements in relevant IEC standards | | P |
| | List of components : | (see appended table) | P |
| | If components have not been tested and found to comply with relevant IEC standard for the number of cycles specified, they are tested in accordance with 24.1.1 to 24.1.9 | | N/A |
| | For components mentioned in 24.1.1 to 24.1.9 no additional tests specified in the relevant component standard are necessary other than those specified in 24.1.1 to 24.1.9 | | N/A |
| | Components not tested and found to comply with relevant IEC standard and components not marked or not used in accordance with its marking, tested under the conditions occurring in the appliance | | P |
| | Lampholders and starterholders that have not being tested and found to comply with the relevant IEC standard, tested as a part of the appliance and additionally according to the gauging and interchangeability requirements of the relevant IEC standard | | N/A |
| | No additional tests specified for nationally standardized plugs such as those detailed in IEC/TR 60083 or connectors complying with the standard sheets of IEC 60320-1 and IEC 60309 | | P |
| 24.1.1 | Capacitors likely to be permanently subjected to the supply voltage and used for radio interference suppression or for voltage dividing, complying with IEC 60384-14 | | P |
| | If the capacitors have to be tested, they are tested according to Annex F | | N/A |
| 24.1.2 | Safety isolating transformers complying with IEC 61558-2-6 | | N/A |

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| Clause | Requirement - Test | Result - Remark | Verdict |
| | If they have to be tested, they are tested according to Annex G | | N/A |
| 24.1.3 | Switches complying with IEC 61058-1, the number of cycles of operation being at least 10 000 | | P |
| | If they have to be tested, they are tested according to Annex H | | N/A |
| | If the switch operates a relay or contactor, the complete switching system is subjected to the test | | N/A |
| | If the switch only operates a motor starting relay complying with IEC 60730-2-10 with the number of cycles of a least 10 000 as specified, the complete switching system need not be tested | | N/A |
| 24.1.4 | Automatic controls complying with IEC 60730-1 with the relevant part 2. The number of cycles of operation being at least: | | N/A |
| | - thermostats: 10 000 | | N/A |
| | - temperature limiters: 1 000 | | N/A |
| | - self-resetting thermal cut-outs: 300 | | N/A |
| | - voltage maintained non-self-resetting thermal cut-outs: 1 000 | | N/A |
| | - other non-self-resetting thermal cut-outs: 30 | | N/A |
| | - timers: 3 000 | | N/A |
| | - energy regulators: 10 000 | | N/A |
| | The number of cycles for controls operating during clause 11 need not be declared, if the appliance meets the requirements of this standard when they are short-circuited | | N/A |
| | Thermal motor protectors are tested in combination with their motor under the conditions specified in Annex D | | N/A |
| | For water valves containing live parts and that are incorporated in external hoses for connection of an appliance to the water mains, the degree of protection declared for subclause 6.5.2 of IEC 60730-2-8 is IPX7 | | N/A |
| 24.1.5 | Appliance couplers complying with IEC 60320-1 | | N/A |
| | However, for appliances classified higher than IPX0, the appliance couplers complying with IEC 60320-2-3 | | N/A |
| | Interconnection couplers complying with IEC 60320-2-2 | | N/A |

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| Clause | Requirement - Test | Result - Remark | Verdict |
| 24.1.6 | Small lamp holders similar to E10 lampholders complying with IEC 60238, the requirements for E10 lampholders being applicable | | N/A |
| 24.1.7 | For remote operation of the appliance via a telecommunication network, the relevant standard for the telecommunication interface circuitry in the appliance is IEC 62151 | | N/A |
| 24.1.8 | The relevant standard for thermal links is IEC 60691 | | N/A |
| | Thermal links not complying with IEC 60691 are considered to be an intentionally weak part for the purposes of Clause 19 | | N/A |
| 24.1.9 | Contactors and relays, other than motor starting relays, tested as part of the appliance | | N/A |
| | They are also tested in accordance with Clause 17 of IEC 60730-1, the number of cycles of operations in 24.1.4 selected according to the contactor or relay function in the appliance | | N/A |
| 24.2 | Appliances not fitted with: | | P |
| | - switches or automatic controls in flexible cords | | P |
| | - devices causing the protective device in the fixed wiring to operate in the event of a fault in the appliance | | P |
| | - thermal cut-outs that can be reset by soldering, unless | | N/A |
| | the solder has a melting point of at least 230 °C | | N/A |
| 24.3 | Switches intended for all-pole disconnection of stationary appliances are directly connected to the supply terminals and have a contact separation in all poles, providing full disconnection under overvoltage category III conditions | | N/A |
| 24.4 | Plugs and socket-outlets for extra-low voltage circuits and heating elements, not interchangeable with plugs and socket-outlets listed in IEC/TR 60083 or IEC 60906-1 or with connectors and appliance inlets complying with the standard sheets of IEC 60320-1 | | N/A |
| 24.5 | Capacitors in auxiliary windings of motors marked with their rated voltage and capacitance, and used accordingly | | N/A |
| | Voltage across capacitors in series with a motor winding does not exceed 1,1 times rated voltage, when the appliance is supplied at 1,1 times rated voltage under minimum load | | N/A |

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| Clause | Requirement - Test | Result - Remark | Verdict |
| 24.6 | Working voltage of motors connected to the supply mains and having basic insulation that is inadequate for the rated voltage of the appliance, not exceeding 42 V | | N/A |
| | In addition, the motors comply with the requirements of Annex I | | N/A |
| 24.7 | Detachable hose-sets for connection of appliances to the water mains comply with IEC 61770 | | N/A |
| | They are supplied with the appliance | | N/A |
| | Appliances intended to be permanently connected to the water mains not connected by a detachable hose-set | | N/A |
| 24.8 | Motor running capacitors in appliances for which 30.2.3 is applicable and that are permanently connected in series with a motor winding, not causing a hazard in event of a failure | | N/A |
| | One or more of the following conditions are to be met: | | N/A |
| | - the capacitors are of class P2 according to IEC 60252-1 | | N/A |
| | - the capacitors are housed within a metallic or ceramic enclosure | | N/A |
| | - the distance of separation of the outer surface to adjacent non-metallic parts exceeds 50 mm | | N/A |
| | - adjacent non-metallic parts within 50 mm withstand the needle-flame test of Annex E | | N/A |
| | - adjacent non-metallic parts within 50 mm classified as at least V-1 according to IEC 60695-11-10 | | N/A |
| 25 | SUPPLY CONNECTION AND EXTERNAL FLEXIBLE CORDS | | P |
| 25.1 | Appliance not intended for permanent connection to fixed wiring, means for connection to the supply: | | P |
| | - supply cord fitted with a plug, | | P |
| | - an appliance inlet having at least the same degree of protection against moisture as required for the appliance, or | | N/A |
| | - pins for insertion into socket-outlets | | N/A |
| 25.2 | Appliance not provided with more than one means of connection to the supply mains | | P |

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| Clause | Requirement - Test | Result - Remark | Verdict |
| | Stationary appliance for multiple supply may be provided with more than one means of connection, provided electric strength test of 1250 V for 1 min between each means of connection causes no breakdown | | N/A |
| 25.3 | Appliance intended to be permanently connected to fixed wiring provided with one of the following means for connection to the supply mains: | | N/A |
| | - a set of terminals allowing the connection of a flexible cord | | N/A |
| | - a fitted supply cord | | N/A |
| | - a set of supply leads accommodated in a suitable compartment | | N/A |
| | - a set of terminals for the connection of cables of fixed wiring, cross-sectional areas specified in 26.6, and the appliance allows the connection of the supply conductors after the appliance has been fixed to its support | | N/A |
| | - a set of terminals and cable entries, conduit entries, knock-outs or glands, allowing connection of appropriate types of cable or conduit, and the appliance allows the connection of the supply conductors after the appliance has been fixed to its support | | N/A |
| | For a fixed appliance constructed so that parts can be removed to facilitate easy installation, this requirement is met if it is possible to connect the fixed wiring without difficulty after a part of the appliance has been fixed to its support | | N/A |
| 25.4 | Cable and conduit entries, rated current of appliance not exceeding 16 A, dimension according to table 10 (mm) | | N/A |
| | Introduction of conduit or cable does not reduce clearances or creepage distances below values specified in clause 29 | | N/A |
| 25.5 | Method for assembling the supply cord to the appliance: | | P |
| | - type X attachment | | N/A |
| | - type Y attachment | | P |
| | - type Z attachment, if allowed in relevant part 2 | | N/A |
| | Type X attachment, other than those with a specially prepared cord, not used for flat twin tinsel cords | | N/A |

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| Clause | Requirement - Test | Result - Remark | Verdict |
| | For multi-phase appliances supplied with a supply cord and that are intended to be permanently connected to fixed wiring, the supply cord is assembled to the appliance by type Y attachment | | N/A |
| 25.6 | Plugs fitted with only one flexible cord | | P |
| 25.7 | Supply cords, other than for class III appliances, being one of the following types: | | P |
| | - rubber sheathed (at least 60245 IEC 53) | | N/A |
| | - polychloroprene sheathed (at least 60245 IEC 57) | H07RN-F | P |
| | - cross-linked polyvinyl chloride sheathed (at least 60245 IEC 88) | | N/A |
| | - polyvinyl chloride sheathed. Not used if they are likely to touch metal parts having a temperature rise exceeding 75 K during the test of clause 11 | | P |
| | <ul style="list-style-type: none"> light polyvinyl chloride sheathed cord (60227 IEC 52), for appliances not exceeding 3 kg | | N/A |
| | <ul style="list-style-type: none"> ordinary polyvinyl chloride sheathed cord (60227 IEC 53), for other appliances | | N/A |
| | - heat resistant polyvinyl chloride sheathed. Not used for type X attachment other than specially prepared cords | | N/A |
| | <ul style="list-style-type: none"> heat-resistant light polyvinyl chloride sheathed cord (60227 IEC 56), for appliances not exceeding 3 kg | | N/A |
| | <ul style="list-style-type: none"> heat-resistant polyvinyl chloride sheathed cord (60227 IEC 57), for other appliances | | N/A |
| | Supply cords for class III appliances adequately insulated | | N/A |
| | Test with 500 V for 2 min for supply cords of class III appliances that contain live parts | | N/A |
| 25.8 | Nominal cross-sectional area of supply cords not less than table 11; rated current (A); cross-sectional area (mm ²)..... : | For 110-120 V: 1,0 mm ² ; 8,1 A For 220-240 V: 1,0 mm ² ; 4,5 A | P |
| 25.9 | Supply cords not in contact with sharp points or edges | | P |
| 25.10 | Supply cord of class I appliances have a green/yellow core for earthing | | P |
| 25.11 | Conductors of supply cords not consolidated by soldering where they are subject to contact pressure, unless | | N/A |
| | the contact pressure is provided by spring terminals | | P |

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| Clause | Requirement - Test | Result - Remark | Verdict |
| 25.12 | Insulation of the supply cord not damaged when moulding the cord to part of the enclosure | | N/A |
| 25.13 | Inlet openings so constructed as to prevent damage to the supply cord | | P |
| | If the enclosure at the inlet opening is not of insulating material, a non-detachable lining or bushing complying with 29.3 for supplementary insulation provided | | N/A |
| | If unsheathed supply cord, a similar additional bushing or lining is required, unless the appliance is | | N/A |
| | class 0, or | | N/A |
| | a class III appliance not containing live parts | | N/A |
| 25.14 | Supply cords moved while in operation adequately protected against excessive flexing | | N/A |
| | Flexing test, as described: | | N/A |
| | - applied force (N)..... : | | N/A |
| | - number of flexings..... : | | N/A |
| | The test does not result in: | | N/A |
| | - short-circuit between the conductors, such that the current exceeds a value of twice the rated current | | N/A |
| | - breakage of more than 10% of the strands of any conductor | | N/A |
| | - separation of the conductor from its terminal | | N/A |
| | - loosening of any cord guard | | N/A |
| | - damage to the cord or the cord guard | | N/A |
| | - broken strands piercing the insulation and becoming accessible | | N/A |
| 25.15 | For appliances with supply cord and appliances to be permanently connected to fixed wiring by a flexible cord, conductors of the supply cord relieved from strain, twisting and abrasion by use of cord anchorage | | 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 12: mass (kg); pull (N); torque (not on automatic cord reel) (Nm)..... : | 100 N; 0,35 Nm | P |
| | Cord not damaged and max. 2 mm displacement of the cord | | P |

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| Clause | Requirement - Test | Result - Remark | Verdict |
| 25.16 | Cord anchorages for type X attachments constructed and located so that: | | N/A |
| | - replacement of the cord is easily possible | | N/A |
| | - it is clear how the relief from strain and the prevention of twisting are obtained | | N/A |
| | - they are suitable for different types of supply cord | | N/A |
| | - cord cannot touch the clamping screws of cord anchorage if these screws are accessible, unless | | N/A |
| | they are separated from accessible metal parts by supplementary insulation | | N/A |
| | - the cord is not clamped by a metal screw which bears directly on the cord | | N/A |
| | - at least one part of the cord anchorage securely fixed to the appliance, unless | | N/A |
| | it is part of a specially prepared cord | | N/A |
| | - screws which have to be operated when replacing the cord do not fix any other component, unless | | N/A |
| | the appliance becomes inoperative or incomplete or the parts cannot be removed without a tool | | N/A |
| | - if labyrinths can be bypassed the test of 25.15 is nevertheless withstood | | N/A |
| | - for class 0, 0I and I appliances they are of insulating material or are provided with an insulating lining, unless | | N/A |
| | failure of the insulation of the cord does not make accessible metal parts live | | N/A |
| | - for class II appliances they are of insulating material, or | | N/A |
| | if of metal, they are insulated from accessible metal parts by supplementary insulation | | N/A |
| | After the test of 25.15, under the conditions specified, the conductors have not moved by more than 1 mm in the terminals | | N/A |
| 25.17 | Adequate cord anchorages for type Y and Z attachment, test with the cord supplied with the appliance | | P |
| 25.18 | Cord anchorages only accessible with the aid of a tool, or | | N/A |
| | Constructed so that the cord can only be fitted with the aid of a tool | | P |
| 25.19 | Type X attachment, glands not used as cord anchorage in portable appliances | | N/A |

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| Clause | Requirement - Test | Result - Remark | Verdict |
| | Tying the cord into a knot or tying the cord with string not used | | N/A |
| 25.20 | The insulated conductors of the supply cord for type Y and Z attachment additionally insulated from accessible metal parts | Type Y | P |
| 25.21 | Space for supply cord for type X attachment or for connection of fixed wiring constructed: | | N/A |
| | - to permit checking of conductors with respect to correct positioning and connection before fitting any cover | | N/A |
| | - so there is no risk of damage to the conductors or their insulation when fitting the cover | | N/A |
| | - for portable appliances, so that the uninsulated end of a conductor, if it becomes free from the terminal, prevented from contact with accessible metal parts | | N/A |
| | 2 N test to the conductor for portable appliances; no contact with accessible metal parts | | N/A |
| 25.22 | Appliance inlets: | | N/A |
| | - live parts not accessible during insertion or removal | | N/A |
| | Requirement not applicable to appliance inlets complying with IEC 60320-1 | | N/A |
| | - connector can be inserted without difficulty | | N/A |
| | - the appliance is not supported by the connector | | N/A |
| | - not for cold conditions if temp. rise of external metal parts exceeds 75 K during clause 11, unless | | N/A |
| | the supply cord is unlikely to touch such metal parts | | N/A |
| 25.23 | Interconnection cords comply with the requirements for the supply cord, except that: | | P |
| | - the cross-sectional area of the conductors is determined on the basis of the maximum current during clause 11 | | P |
| | - the thickness of the insulation may be reduced | | N/A |
| | If necessary, electric strength test of 16.3 | | N/A |
| 25.24 | Interconnection cords not detachable without the aid of a tool if compliance with this standard is impaired when they are disconnected | | P |
| 25.25 | Dimensions of pins that are inserted into socket-outlets compatible with the dimensions of the relevant socket-outlet. | | N/A |

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| Clause | Requirement - Test | Result - Remark | Verdict |
| | Dimensions of pins and engagement face in accordance with the dimensions of the relevant plug in IEC/TR 60083 | | N/A |
| 26 | TERMINALS FOR EXTERNAL CONDUCTORS | | P |
| 26.1 | Appliances provided with terminals or equally effective devices for connection of external conductors | | P |
| | Terminals only accessible after removal of a non-detachable cover, except | | P |
| | for class III appliances that do not contain live parts | | N/A |
| | Earthing terminals may be accessible if a tool is required to make the connections and means are provided to clamp the wire independently from its connection | | P |
| 26.2 | Appliances with type X attachment and appliances for the connection of cables to fixed wiring provided with terminals in which connections are made by means of screws, nuts or similar devices, unless | | N/A |
| | the connections are soldered | | N/A |
| | Screws and nuts not used to fix any other component, except | | N/A |
| | internal conductors, if so arranged that they are unlikely to be displaced when fitting the supply conductors | | N/A |
| | If soldered connections used, the conductor so positioned or fixed that reliance is not placed on soldering alone, unless | | N/A |
| | barriers provided so that neither clearances nor creepage distances between live parts and other metal parts reduced below the values for supplementary insulation if the conductor becomes free at the soldered joint | | N/A |
| 26.3 | Terminals for type X attachment and for connection of cables of fixed wiring so constructed that the conductor is clamped between metal surfaces with sufficient contact pressure but without damaging the conductor | | N/A |
| | Terminals fixed so that when the clamping means is tightened or loosened: | | N/A |
| | - the terminal does not become loose | | N/A |
| | - internal wiring is not subjected to stress | | N/A |
| | - neither clearances nor creepage distances are reduced below the values in clause 29 | | N/A |

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| Clause | Requirement - Test | Result - Remark | Verdict |
| | Compliance checked by inspection and by the test of subclause 9.6 of IEC 60999-1, the torque applied being equal to two-thirds of the torque specified (Nm)..... : | | N/A |
| | No deep or sharp indentations of the conductors | | N/A |
| 26.4 | Terminals for type X attachment, except those having a specially prepared cord and those for the connection of cables of fixed wiring, no special preparation of conductors such as by soldering, use of cable lugs, eyelets or similar, and | | N/A |
| | so constructed or placed that conductors prevented from slipping out when clamping screws or nuts are tightened | | N/A |
| 26.5 | Terminals for type X attachment so located or shielded that if a wire of a stranded conductor escapes, no risk of accidental connection to other parts that result in a hazard | | N/A |
| | Stranded conductor test, 8 mm insulation removed | | N/A |
| | No contact between live parts and accessible metal parts and, | | N/A |
| | for class II constructions, between live parts and metal parts separated from accessible metal parts by supplementary insulation only | | N/A |
| 26.6 | Terminals for type X attachment and for connection of cables of fixed wiring suitable for connection of conductors with cross-sectional area according to table 13; rated current (A); nominal cross-sectional area (mm ²)..... : | | N/A |
| | If a specially prepared cord is used, terminals need only be suitable for that cord | | N/A |
| 26.7 | Terminals for type X attachment, except in class III appliances not containing live parts, accessible after removal of a cover or part of the enclosure | | N/A |
| 26.8 | Terminals for the connection of fixed wiring, including the earthing terminal, located close to each other | | P |
| 26.9 | Terminals of the pillar type constructed and located as specified | | N/A |
| 26.10 | Terminals with screw clamping and screwless terminals not used for flat twin tinsel cords, unless | | P |
| | conductors ends fitted with means suitable for screw terminals | | N/A |
| | Pull test of 5 N to the connection | | P |

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| Clause | Requirement - Test | Result - Remark | Verdict |
| 26.11 | For type Y and Z attachment, soldered, welded, crimped or 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/A |
| | If soldering, welding or crimping alone used, barriers provided so that clearances and creepage distances between live parts and other metal parts are not reduced below the values for supplementary insulation if the conductor becomes free | | P |
| 27 | PROVISION FOR EARTHING | | P |
| 27.1 | Accessible metal parts of Class 0I and I appliances permanently and reliably connected to an earthing terminal or earthing contact of the appliance inlet | | P |
| | Earthing terminals and earthing contacts not connected to the neutral terminal | | P |
| | Class 0, II and III appliances have no provision for earthing | Class I | N/A |
| | Safety extra-low voltage circuits not earthed, unless | | N/A |
| | protective extra-low voltage circuits | | N/A |
| 27.2 | Clamping means of earthing terminals adequately secured against accidental loosening | | P |
| | Terminals for the connection of external equipotential bonding conductors allow connection of conductors of 2.5 to 6 mm ² , and | | N/A |
| | do not provide earthing continuity between different parts of the appliance, and | | N/A |
| | conductors cannot be loosened without the aid of a tool | | N/A |
| 27.3 | For a detachable part having an earth connection and being plugged into another part of the appliance, the earth connection is made before and separated after current-carrying connections when removing the part | | N/A |
| | For appliances with supply cords, current-carrying conductors become taut before earthing conductor, if the cord slips out of the cord anchorage | | P |
| 27.4 | No risk of corrosion resulting from contact between parts of the earthing terminal and the copper of the earthing conductor or other metal | | P |
| | Parts providing earthing continuity, other than parts of a metal frame or enclosure, have adequate resistance to corrosion | | P |

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| Clause | Requirement - Test | Result - Remark | Verdict |
| | If of steel, these parts provided with an electroplated coating with a thickness at least 5 μm | | N/A |
| | Adequate protection against rusting of parts of coated or uncoated steel, only intended to provide or transmit contact pressure | | N/A |
| | In the body of the earthing terminal is a part of a frame or enclosure of aluminium or aluminium alloys, precautions taken to avoid risk of corrosion | | N/A |
| 27.5 | Low resistance of connection between earthing terminal and earthed metal parts | | P |
| | This requirement does not apply to connections providing earthing continuity in the protective extra-low voltage circuit, provided the clearances of basic insulation are based on the rated voltage of the appliance | | P |
| | Resistance not exceeding 0,1 Ω at the specified low-resistance test (Ω)..... : | 0,06 | P |
| 27.6 | The printed conductors of printed circuit boards not used to provide earthing continuity in hand-held appliances. | | N/A |
| | They may be used to provide earthing continuity in other appliances if at least two tracks are used with independent soldering points and the appliance complies with 27.5 for each circuit | | N/A |
| 28 | SCREWS AND CONNECTIONS | | P |
| 28.1 | Fixings, electrical connections and connections providing earthing continuity withstand mechanical stresses | | P |
| | Screws not of soft metal liable to creep, such as zinc or aluminium | | P |
| | Diameter of screws of insulating material min. 3 mm | | N/A |
| | Screws of insulating material not used for any electrical connections or connections providing earthing continuity | | P |
| | Screws used for electrical connections or connections providing earthing continuity screwed into metal | | N/A |
| | Screws not of insulating material if their replacement by a metal screw can impair supplementary or reinforced insulation | | P |

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| Clause | Requirement - Test | Result - Remark | Verdict |
| | For type X attachment, screws to be removed for replacement of supply cord or for user maintenance, not of insulating material if their replacement by a metal screw impairs basic insulation | | N/A |
| | For screws and nuts; torque-test as specified in table 14..... : | (see appended table) | P |
| 28.2 | Electrical connections and connections providing earthing continuity constructed so that contact pressure is not transmitted through non-ceramic insulating material liable to shrink or distort, unless | | P |
| | there is resiliency in the metallic parts to compensate for shrinkage or distortion of the insulating material | | N/A |
| | This requirement does not apply to electrical connections in circuits of appliances for which: | | N/A |
| | <ul style="list-style-type: none"> 30.2.2 is applicable and that carry a current not exceeding 0,5 A | | N/A |
| | <ul style="list-style-type: none"> 30.2.3 is applicable and that carry a current not exceeding 0,2 A | | N/A |
| 28.3 | Space-threaded (sheet metal) screws only used for electrical connections if they clamp the parts together | | N/A |
| | Thread-cutting (self-tapping) screws and thread rolling screws only used for electrical connections if they generate a full form standard machine screw thread | | N/A |
| | Thread-cutting (self-tapping) screws not used if they are likely to be operated by the user or installer | | N/A |
| | Thread-cutting, thread rolling and space threaded screws may be used in connections providing earthing continuity provided it is not necessary to disturb the connection: | | N/A |
| | - in normal use, | | N/A |
| | - during user maintenance, | | N/A |
| | - when replacing a supply cord having a type X attachment, or | | N/A |
| | - during installation | | N/A |
| | At least two screws being used for each connection providing earthing continuity, unless | | N/A |
| | the screw forms a thread having a length of at least half the diameter of the screw | | N/A |

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|-------------|---|----------------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| 28.4 | Screws and nuts that make mechanical connection secured against loosening if they also make electrical connections or connections providing earthing continuity | | N/A |
| | This requirement does not apply to screws in the earthing circuit if at least two screws are used, or | | N/A |
| | if an alternative earthing circuit is provided | | N/A |
| | Rivets for electrical connections or connections providing earthing continuity secured against loosening if the connections are subjected to torsion | | N/A |
| 29 | CLEARANCES, CREEPAGE DISTANCES AND SOLID INSULATION | | P |
| | Clearances, creepage distances and solid insulation withstand electrical stress | | P |
| | For coatings used on printed circuits boards to protect the microenvironment (Type 1) or to provide basic insulation (Type 2), Annex J applies | | N/A |
| | The microenvironment is pollution degree 1 under type 1 protection | | N/A |
| | For type 2 protection, the spacing between the conductors before the protection is applied is not less than the values specified in Table 1 of IEC 60664-3 | | N/A |
| | These values apply to functional, basic, supplementary and reinforced insulation..... | | N/A |
| 29.1 | Clearances not less than the values specified in table 16, taking into account the rated impulse voltage for the overvoltage categories of table 15, unless | (see appended table) | P |
| | for basic insulation and functional insulation they comply with the impulse voltage test of clause 14 | | N/A |
| | However, if the distances are affected by wear, distortion, movement of the parts or during assembly, the clearances for rated impulse voltages of 1500V and above are increased by 0,5 mm and the impulse voltage test is not applicable | | N/A |
| | Impulse voltage test is not applicable: | | P |
| | - when the microenvironment is pollution degree 3, or | | N/A |
| | - for basic insulation of class 0 and class 01 appliances | | N/A |
| | Appliances are in overvoltage category II | | P |

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|-------------|--|----------------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| | A force of 2 N is applied to bare conductors, other than heating elements | | P |
| | A force of 30 N is applied to accessible surfaces | | P |
| 29.1.1 | Clearances of basic insulation withstand the overvoltages, taking into account the rated impulse voltage | | P |
| | The values of table 16 or the impulse voltage test of clause 14 are applicable..... : | (see appended table) | P |
| | Clearance at the terminals of tubular sheathed heating elements may be reduced to 1,0 mm if the microenvironment is pollution degree 1 | | N/A |
| | Lacquered conductors of windings considered to be bare conductors | | P |
| 29.1.2 | Clearances of supplementary insulation not less than those specified for basic insulation in table 16: | (see appended table) | P |
| 29.1.3 | Clearances of reinforced insulation not less than those specified for basic insulation in table 16, using the next higher step for rated impulse voltage : | (see appended table) | P |
| | For double insulation, with no intermediate conductive part between basic and supplementary insulation, clearances are measured between live parts and the accessible surface, and the insulation system is treated as reinforced insulation | | N/A |
| 29.1.4 | Clearances for functional insulation are the largest values determined from: | | P |
| | - table 16 based on the rated impulse voltage..... : | (see appended table) | P |
| | - table F.7a in IEC 60664-1, frequency not exceeding 30 kHz | | N/A |
| | - clause 4 of IEC 60664-4, frequency exceeding 30 kHz | | N/A |
| | If values of table 16 are largest, the impulse voltage test of clause 14 may be applied instead, unless | | N/A |
| | the microenvironment is pollution degree 3, or | | N/A |
| | the distances can be affected by wear, distortion, movement of the parts or during assembly | | N/A |
| | However, clearances are not specified if the appliance complies with clause 19 with the functional insulation short-circuited | | P |
| | Lacquered conductors of windings considered to be bare conductors | | P |
| | However, clearances at crossover points are not measured | | P |

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|-------------|--|----------------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| | Clearance between surfaces of PTC heating elements may be reduced to 1mm | | N/A |
| 29.1.5 | Appliances having higher working voltages than rated voltage, clearances for basic insulation are the largest values determined from: | | N/A |
| | - table 16 based on the rated impulse voltage..... : | | N/A |
| | - table F.7a in IEC 60664-1, frequency not exceeding 30 kHz | | N/A |
| | - clause 4 of IEC 60664-4, frequency exceeding 30 kHz | | N/A |
| | If clearances for basic insulation are selected from Table F.7a of IEC 60664-1 or Clause 4 of IEC 60664-4, the clearances of supplementary insulation are not less than those specified for basic insulation | | N/A |
| | If clearances for basic insulation are selected from Table F.7a of IEC 60664-1, the clearances of reinforced insulation dimensioned as specified in Table F.7a are to withstand 160% of the withstand voltage required for basic insulation | | N/A |
| | If clearances for basic insulation are selected from Clause 4 of IEC 60664-4, the clearances of reinforced insulation are twice the value required for basic insulation | | N/A |
| | If the secondary winding of a step-down transformer is earthed, or if there is an earthed screen between the primary and secondary windings, clearances of basic insulation on the secondary side not less than those specified in table 16, but using the next lower step for rated impulse voltage | | N/A |
| | Circuits supplied with a voltage lower than rated voltage, clearances of functional insulation are based on the working voltage used as the rated voltage in table 15 | | N/A |
| 29.2 | Creepage distances not less than those appropriate for the working voltage, taking into account the material group and the pollution degree : | (see appended table) | P |
| | Pollution degree 2 applies, unless | | P |
| | - precautions taken to protect the insulation; pollution degree 1 | | N/A |
| | - insulation subjected to conductive pollution; pollution degree 3 | | N/A |
| | A force of 2 N is applied to bare conductors, other than heating elements | | P |
| | A force of 30 N is applied to accessible surfaces | | P |

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|-------------|--|----------------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| | In a double insulation system, the working voltage for both the basic and supplementary insulation is taken as the working voltage across the complete double insulation system | | N/A |
| 29.2.1 | Creepage distances of basic insulation not less than specified in table 17..... : | (see appended table) | P |
| | However, if the working voltage is periodic and has a frequency exceeding 30 kHz, the creepage distances are also determined from table 2 of IEC 60664-4, these values being used if exceeding the values in table 17..... : | | N/A |
| | Except for pollution degree 1, corresponding creepage distance not less than the minimum specified for the clearance in table 16, if the clearance has been checked according to the test of clause 14..... : | | P |
| 29.2.2 | Creepage distances of supplementary insulation at least those specified for basic insulation in table 17, or..... : | (see appended table) | P |
| | Table 2 of IEC 60664-4, as applicable..... : | | N/A |
| 29.2.3 | Creepage distances of reinforced insulation at least double those specified for basic insulation in table 17, or..... : | (see appended table) | P |
| | Table 2 of IEC 60664-4, as applicable..... : | | N/A |
| 29.2.4 | Creepage distances of functional insulation not less than specified in table 18..... : | (see appended table) | P |
| | However, if the working voltage is periodic and has a frequency exceeding 30 kHz, the creepage distances are also determined from table 2 of IEC 60664-4, these values being used if exceeding the values in table 18..... : | | N/A |
| | Creepage distances may be reduced if the appliance complies with clause 19 with the functional insulation short-circuited | | N/A |
| 29.3 | Supplementary and reinforced insulation have adequate thickness, or a sufficient number of layers, to withstand the electrical stresses | | P |
| | Compliance checked: | | P |
| | - by measurement, in accordance with 29.3.1, or | | P |
| | - by an electric strength test in accordance with 29.3.2, or | | N/A |
| | - by an assessment of the thermal quality of the material combined with an electric strength test, in accordance with 29.3.3, and | | N/A |

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|-------------|--|----------------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| | for accessible parts of reinforced insulation consisting of a single layer, by measurement in accordance with 29.3.4, or | | N/A |
| | - as specified in subclause 6.3 of IEC 60664-4 for insulation that is subjected to any periodic voltage having a frequency exceeding 30 kHz | | N/A |
| 29.3.1 | Supplementary insulation have a thickness of at least 1 mm | 2,1 mm | P |
| | Reinforced insulation have a thickness of at least 2 mm | 2,1 mm | P |
| 29.3.2 | Each layer of material withstand the electric strength test of 16.3 for supplementary insulation | | N/A |
| | Supplementary insulation consist of at least 2 layers | | N/A |
| | Reinforced insulation consist of at least 3 layers | | N/A |
| 29.3.3 | The insulation is subjected to the dry heat test Bb of IEC 60068-2-2, followed by | | N/A |
| | the electric strength test of 16.3 | | N/A |
| | If the temperature rise during the tests of clause 19 does not exceed the value specified in table 3, the test of IEC 60068-2-2 is not carried out | | N/A |
| 29.3.4 | Thickness of accessible parts of reinforced insulation consisting of a single layer not less than specified in table 19..... : | | N/A |
| 30 | RESISTANCE TO HEAT AND FIRE | | P |
| 30.1 | External parts of non-metallic material, | | P |
| | parts supporting live parts, and | | P |
| | parts of thermoplastic material providing supplementary or reinforced insulation | | P |
| | sufficiently resistant to heat | | P |
| | Ball-pressure test according to IEC 60695-10-2 | | P |
| | External parts tested at 40 °C plus the maximum temperature rise determined during the test of clause 11, or at 75 °C, whichever is the higher; temperature (°C)..... : | (see appended table) | P |
| | Parts supporting live parts tested at 40°C plus the maximum temperature rise determined during the test of clause 11, or at 125 °C, whichever is the higher; temperature (°C)..... : | (see appended table) | P |

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|-------------|---|----------------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| | Parts of thermoplastic material providing supplementary or reinforced insulation tested at 25 °C plus the maximum temperature rise determined during clause 19, if higher; temperature (°C) : | (see appended table) | N/A |
| 30.2 | Parts of non-metallic material resistant to ignition and spread of fire | | P |
| | This requirement does not apply to: | | P |
| | parts having a mass not exceeding 0,5 g, provided the cumulative effect is unlikely to propagate flames that originate inside the appliance by propagating flames from one part to another, or | | P |
| | decorative trims, knobs and other parts unlikely to be ignited or to propagate flames that originate inside the appliance | | P |
| | Compliance checked by the test of 30.2.1, and in addition: | | P |
| | - for attended appliances, 30.2.2 applies | | P |
| | - for unattended appliances, 30.2.3 applies | | N/A |
| | For appliances for remote operation, 30.2.3 applies | | N/A |
| | For base material of printed circuit boards, 30.2.4 applies | | P |
| 30.2.1 | Parts of non-metallic material subjected to the glow-wire test of IEC 60695-2-11 at 550 °C | | P |
| | However, test not carried out if the material is classified as having a glow-wire flammability index according to IEC 60695-2-12 of at least 550 °C, or | | N/A |
| | the material is classified at least HB40 according to IEC 60695-11-10 | | N/A |
| | Parts for which the glow-wire test cannot be carried out need to meet the requirements in ISO 9772 for material classified HBF | | N/A |
| 30.2.2 | Appliances operated while attended, parts of non-metallic material supporting current-carrying connections, and | | N/A |
| | parts of non-metallic material within a distance of 3mm of such connections, | | N/A |
| | subjected to the glow-wire test of IEC 60695-2-11 | | N/A |
| | The test severity is: | | N/A |
| | - 750 °C, for connections carrying a current exceeding 0,5 A during normal operation | | N/A |
| | - 650 °C, for other connections | | N/A |

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

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

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|-------------|--|-----------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| | - small parts for which the needle-flame test of Annex E was applied, or | | N/A |
| | - small parts for which a material classification of V-0 or V-1 was applied | | N/A |
| | However, the consequential needle-flame test is not carried out on non-metallic parts, including small parts, within the cylinder that are: | | N/A |
| | - parts having a glow-wire ignition temperature of at least 775 °C or 675 °C as appropriate, or | | N/A |
| | - parts comprising material classified as V-0 or V-1 according to IEC 60695-11-10, or | | N/A |
| | - parts shielded by a flame barrier that meets the needle-flame test of Annex E or that comprises material classified as V-0 or V-1 according to IEC 60695-11-10 | | N/A |
| 30.2.4 | Base material of printed circuit boards subjected to the needle-flame test of Annex E | | N/A |
| | Test not applicable to conditions as specified : | V-0 | P |
| 31 | RESISTANCE TO RUSTING | | N/A |
| | Relevant ferrous parts adequately protected against rusting | | N/A |
| | Tests specified in part 2 when necessary | | N/A |
| 32 | RADIATION, TOXICITY AND SIMILAR HAZARDS | | P |
| | Appliance does not emit harmful radiation or present a toxic or similar hazard due to their operation in normal use | | P |
| | Compliance is checked by the limits or tests specified in part 2, if relevant | | P |
| A | ANNEX A (INFORMATIVE) ROUTINE TESTS | | N/A |
| B | ANNEX B (NORMATIVE) APPLIANCES POWERED BY RECHARGEABLE BATTERIES | | N/A |
| C | ANNEX C (NORMATIVE) AGEING TEST ON MOTORS | | N/A |
| D | ANNEX D (NORMATIVE) THERMAL MOTOR PROTECTORS | | N/A |
| | Applicable to appliances having motors that incorporate thermal motor protectors | | N/A |
| E | ANNEX E (NORMATIVE) NEEDLE-FLAME TEST | | N/A |
| F | ANNEX F (NORMATIVE) CAPACITORS | | N/A |

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| Clause | Requirement - Test | Result - Remark | Verdict |
| G | ANNEX G (NORMATIVE) SAFETY ISOLATING TRANSFORMERS | | N/A |
| H | ANNEX H (NORMATIVE) SWITCHES | | N/A |
| I | ANNEX I (NORMATIVE) MOTORS HAVING BASIC INSULATION THAT IS INADEQUATE FOR THE RATED VOLTAGE OF THE APPLIANCE | | N/A |
| J | ANNEX J (NORMATIVE) COATED PRINTED CIRCUIT BOARDS | | N/A |
| K | ANNEX K (NORMATIVE) OVERVOLTAGE CATEGORIES | | P |
| | The information on overvoltage categories is extracted from IEC 60664-1 | | P |
| | Overvoltage category is a numeral defining a transient overvoltage condition | | P |
| | Equipment of overvoltage category IV is for use at the origin of the installation | | N/A |
| | Equipment of overvoltage category III is equipment in fixed installations and for cases where the reliability and the availability of the equipment is subject to special requirements | | N/A |
| | Equipment of overvoltage category II is energy consuming equipment to be supplied from the fixed installation | | P |
| | If such equipment is subjected to special requirements with regard to reliability and availability, overvoltage category III applies | | N/A |
| | Equipment of overvoltage category I is equipment for connection to circuits in which measures are taken to limit transient overvoltages to an appropriate low level | | N/A |
| L | ANNEX L (INFORMATIVE) GUIDANCE FOR THE MEASUREMENT OF CLEARANCES AND CREEPAGE DISTANCES | | P |
| | Information for the determination of clearances and creepage distances | | P |
| M | ANNEX M (NORMATIVE) POLLUTION DEGREE | | P |
| | The information on pollution degrees is extracted from IEC 60664-1 | | P |
| | Pollution | | P |

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|-------------|---|-----------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| | The microenvironment determines the effect of pollution on the insulation, taking into account the macroenvironment | | P |
| | Means may be provided to reduce pollution at the insulation by effective enclosures or similar | | P |
| | Minimum clearances specified where pollution may be present in the microenvironment | | P |
| | Degrees of pollution in the microenvironment | | P |
| | For evaluating creepage distances, the following degrees of pollution in the microenvironment are established: | | P |
| | - pollution degree 1: no pollution or only dry, non-conductive pollution occurs. The pollution has no influence | | N/A |
| | - pollution degree 2: only non-conductive pollution occurs, except that occasionally a temporary conductivity caused by condensation is to be expected | | P |
| | - pollution degree 3: conductive pollution occurs or dry non-conductive pollution occurs that becomes conductive due to condensation that is to be expected | | N/A |
| | - pollution degree 4: the pollution generates persistent conductivity caused by conductive dust or by rain or snow | | N/A |
| N | ANNEX N (NORMATIVE) PROOF TRACKING TEST | | P |
| | The proof tracking test is carried out in accordance with IEC 60112 with the following modifications: | | P |
| 7 | Test apparatus | | P |
| 7.3 | Test solutions | | P |
| | Test solution A is used | | P |
| 10 | Determination of proof tracking index (PTI) | | P |
| 10.1 | Procedure | | P |
| | The proof voltage is 100V, 175V, 400V or 600V .. : | 175 V | P |
| | The test is carried out on five specimens | | P |
| | In case of doubt, additional test with proof voltage reduced by 25V, the number of drops increased to 100 | | N/A |
| 10.2 | Report | | N/A |

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|-------------|---|-----------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| | The report states if the PTI value was based on a test using 100 drops with a test voltage of (PTI-25) V | | N/A |
| O | ANNEX O (INFORMATIVE) SELECTION AND SEQUENCE OF THE TESTS OF CLAUSE 30 | | P |
| | Description of tests for determination of resistance to heat and fire | | P |
| P | ANNEX P (INFORMATIVE) GUIDANCE FOR THE APPLICATION OF THIS STANDARD TO APPLIANCES USED IN WARM DAMP EQUABLE CLIMATES | | N/A |
| Q | ANNEX Q (INFORMATIVE) SEQUENCE OF TESTS FOR THE EVALUATION OF ELECTRONIC CIRCUITS | | N/A |
| R | ANNEX R (NORMATIVE) SOFTWARE EVALUATION | | N/A |

| | | | |
|---------------------|---|-------------------------|---|
| Appendix EMF | | | P |
| | TEST: Evaluation of the magnetic fields | | P |
| Applied standards: | IEC 62233:2005, EN 62233:2008 (incl. Corr.1:2008) | | P |
| Method | Used method: 5.5.2 Time domain evaluation | | — |
| Applied Limit | ICNIRP Guidelines | | — |
| | Limit 100% | Measured max.: <10 % | P |

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|-------------|--------------------|-----------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |

| 10.1 | TABLE: Power input deviation for HR2365 | | | | | P |
|------------------------|---|----------------|-------|-------------|--------|---|
| Input deviation of/at: | P rated (W) | P measured (W) | dP | Required dP | Remark | |
| 230 V | 1400 | 951 | -32 % | +15 % | P | |
| 115 V | 1400 | 856 | -39 % | +15 % | P | |
| Notes: - | | | | | | |

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

| 11.8 | TABLE: Heating test, thermocouples: | | | P |
|------------------------------|--|-------------|-------------|---|
| | Test voltage (V): | 103/115/127 | | — |
| | Ambient (°C): | 23,1 | | — |
| Thermocouple locations | | dT (K) | Max. dT (K) | |
| Supply cord | | 8 | 50 | |
| Ambient of switch | | 10 | 30 | |
| Ambient of adjustable switch | | 4 | 30 | |
| X2 capacitor | | 31 | 75(T100) | |
| Plastic enclosure of motor | | 57 | Ref. | |
| Carbon brush holder | | 72 | Ref. | |
| Internal wire | | 37 | 50 | |
| Plastic support PCB | | 20 | Ref | |
| PCB | | 21 | 120 | |
| Plastic enclosure | | 16 | 50 | |
| Switch knob | | 4 | 60 | |
| Adjustable switch knob | | 2 | 60 | |
| 11.8 | TABLE: Heating test, resistance method | | | P |
| | Test voltage (V): | 127 | | — |
| | Ambient, t1 (°C): | 22,4 | | — |
| | Ambient, t2 (°C): | 23,1 | | — |

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|--|--------------------|-----------------|--------|-----------------|------------------|
| Clause | Requirement - Test | | | Result - Remark | Verdict |
| Temperature rise of winding | R1 (Ω) | R2 (Ω) | dT (K) | Max. dT (K) | Insulation class |
| Stator-1 | 0,380 | 0,523 | 96 | 140 | Class 180 |
| Stator-2 | 0,384 | 0,526 | 94 | 140 | Class 180 |
| Rotor(1 st -5 th) | 0,177 | 0,264 | 126 | 140 | Class 180 |

| | | | | | | |
|--|--|-----------------|-----------------|-------------|-------------|------------------|
| 11.8 | TABLE: Heating test, thermocouples: | | | | P | |
| | Test voltage (V): | | 207/230/254 | | — | |
| | Ambient ($^{\circ}\text{C}$): | | 24,2 | | — | |
| Thermocouple locations | | dT (K) | | Max. dT (K) | | |
| Supply cord | | 20 | | 50 | | |
| Ambient of switch | | 15 | | 30 | | |
| Ambient of adjustable switch | | 23 | | 30 | | |
| X2 capacitor | | 25 | | 75(T100) | | |
| Plastic enclosure of motor | | 46 | | Ref. | | |
| Carbon brush holder | | 70 | | Ref. | | |
| Internal wire | | 17 | | 50 | | |
| Plastic support PCB | | 26 | | Ref | | |
| PCB | | 26 | | 120 | | |
| Plastic enclosure | | 12 | | 50 | | |
| Switch knob | | 8 | | 60 | | |
| Adjustable switch knob | | 10 | | 60 | | |
| 11.8 | TABLE: Heating test, resistance method | | | | P | |
| | Test voltage (V): | | 127 | | — | |
| | Ambient, t1 ($^{\circ}\text{C}$): | | 22,8 | | — | |
| | Ambient, t2 ($^{\circ}\text{C}$): | | 24,2 | | — | |
| Temperature rise of winding | | R1 (Ω) | R2 (Ω) | dT (K) | Max. dT (K) | Insulation class |
| Stator-1 | | 1,303 | 1,834 | 103 | 140 | Class 180 |
| Stator-2 | | 1,310 | 1,852 | 105 | 140 | Class 180 |
| Rotor(1 st -5 th) | | 0,626 | 0,934 | 125 | 140 | Class 180 |

| IEC 60335-1 | | | |
|-------------|--------------------|-----------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |

| | | | |
|---------------------------------------|--|-------------|---------------------|
| 13.2 | TABLE: Leakage current | | P |
| | Heating appliances: 1.15 x rated input: | - | — |
| | Motor-operated and combined appliances: 1.06 x rated voltage: | 127 V/254 V | — |
| Leakage current between | | I (mA) | Max. allowed I (mA) |
| L/N and accessible metal part (127 V) | | 0.01 | 3.5 |
| L/N and accessible metal part (254 V) | | 0.02 | 3.5 |

| | | | |
|-------------------------------|--------------------------|-------------|--------------------|
| 13.3 | TABLE: Electric strength | | P |
| Test voltage applied between: | | Voltage (V) | Breakdown (Yes/No) |
| L/N and accessible metal part | | 1000 | No |
| Motor core to accessible part | | 1750 | No |
| L/N and control panel | | 3000 | No |

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

| | | | |
|---------------------------------------|---|-------------|---------------------|
| 16.2 | TABLE: Leakage current | | P |
| | Single phase appliances: 1.06 x rated voltage: | 127 V/254 V | — |
| | Three phase appliances 1.06 x rated voltage divided by $\sqrt{3}$: | - | — |
| Leakage current between | | I (mA) | Max. allowed I (mA) |
| L/N and accessible metal part (254 V) | | 0.02 | 3.5 |
| L/N and accessible metal part (127 V) | | 0.01 | 3.5 |

| | | | |
|-------------------------------|--------------------------|-------------|--------------------|
| 16.3 | TABLE: Electric strength | | P |
| Test voltage applied between: | | Voltage (V) | Breakdown (Yes/No) |
| L/N and accessible metal part | | 1250 | No |
| Motor core to accessible part | | 1750 | No |
| L/N and control panel | | 3000 | No |

| | | | |
|----|--|--|-----|
| 17 | TABLE: Overload protection, temperature rise : | | N/A |
|----|--|--|-----|

| IEC 60335-1 | | | |
|------------------------------|--------------------|-----------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| Temperature rise of part/at: | | dT | Max. dT |
| | | | |
| | | | |
| | | | |

| 19 | Abnormal operation conditions | | | | | | P |
|---|---|--|---|-------------|------------------------|-------------|--------------|
| Operational characteristics | | YES/NO | Operational conditions | | | | |
| Are there electronic circuits to control the appliance operation? | | YES | Electronic circuit encapsulated. Fault condition b) and d). No hazard. | | | | |
| Are there "off" or "stand-by" position? | | NO | - | | | | |
| The unintended operation of the appliance results in dangerous malfunction? | | NO | - | | | | |
| Sub-clause | Operating conditions description | Test results description | PEC description | EMP 19.11.4 | Software type required | 19.11.3 PEC | Final result |
| 19.2 | N.A | N.A | N.A | N.A | N.A | N.A | N.A |
| 19.3 | N.A | N.A | N.A | N.A | N.A | N.A | N.A |
| 19.4 | N.A | N.A | N.A | N.A | N.A | N.A | N.A |
| 19.5 | N.A | N.A | N.A | N.A | N.A | N.A | N.A |
| 19.6 | N.A | N.A | N.A | N.A | N.A | N.A | N.A |
| 19.7 | Locking moving part | See table 19.7 | N.A | N.A | N.A | N.A | P |
| 19.8 | N.A | N.A | N.A | N.A | N.A | N.A | N.A |
| 19.9 | N.A | N.A | N.A | N.A | N.A | N.A | N.A |
| 19.10 | operated at 1.3 times rated voltage for 1 min | parts not being ejected from the appliance | N.A | N.A | N.A | N.A | P |
| 19.11.2 | Fault condition b) and d) | No operation. No hazard. | N.A | N.A | N.A | N.A | P |
| 19.11.4.8 | N.A | N.A | N.A | N.A | N.A | N.A | P |
| 19.10X | N.A | N.A | N.A | N.A | N.A | N.A | N.A |

| IEC 60335-1 | | | |
|-------------|--------------------|-----------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |

| | | | | | | |
|------|---|--------|--------|--------|--------|-------------|
| 19.7 | TABLE: Abnormal operation, locked rotor/moving parts: | | | P | | |
| | Test voltage (V): | 240 | | — | | |
| | Ambient, t1 (°C): | 21,4 | | — | | |
| | Ambient, t2 (°C): | 21,7 | | — | | |
| | Temperature of winding | R1 (Ω) | R2 (Ω) | dT (K) | T (°C) | Max. T (°C) |
| | Rotor (diagonal) | 6,898 | 8,725 | 67,5 | 89,2 | 260 |

| | | | | | | |
|------|---|--------|--------|--------|--------|-------------|
| 19.7 | TABLE: Abnormal operation, locked rotor/moving parts: | | | P | | |
| | Test voltage (V): | 230 | | — | | |
| | Ambient, t1 (°C): | 23,5 | | — | | |
| | Ambient, t2 (°C): | 23,5 | | — | | |
| | Temperature of winding | R1 (Ω) | R2 (Ω) | dT (K) | T (°C) | Max. T (°C) |
| | Winding (by thermocouple) | - | - | - | 133 | 260 |

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

| | | | | |
|-------|--|--------|-------------|-----|
| 19.13 | TABLE: Abnormal operation, temperature rises | | | N/A |
| | Thermocouple locations | dT (K) | Max. dT (K) | |
| | | | | |

| | | | | | | |
|------|-------------------|----------------------------|-------------------------|----------------|-----------|--------------------------|
| 24.1 | TABLE: Components | | | | P | |
| | Object / part No. | Manufacturer/ trademark | Type / model | Technical data | Standard | Mark(s) of conformity |
| | Plug* | TA AN | TP-52 TP-51 TP-50 | 250 Vac; 16A | IEC 60884 | VDE |
| | Alternative | TA AN | TP-66 | 250 Vac; 13A | IEC 60884 | ASTA |

| IEC 60335-1 | | | | | |
|--|---------------------------------------|---------------------|---|-----------------|--------------------------------------|
| Clause | Requirement - Test | | | Result - Remark | Verdict |
| Alternative | TA AN | TP-22 | 250 Vac; 15A | IEC 60884 | SAA |
| Alternative | TA AN | TP-34 | 250 Vac; 10A | IEC 60884 | IRAM |
| Alternative | TA AN | TP-23 | 250 Vac; 10A | IEC 60884 | DEMKO |
| Alternative | TA AN | TP-32 | 250 Vac; 10A | IEC 60884 | SEV |
| Alternative | TA AN | TP-33 | 250 Vac; 10A | IEC 60884 | IMQ |
| Alternative | Ching Cheng wire material Co., Ltd. | EL-208 | 250 Vac; 16A | IEC 60884 | SABS |
| Alternative | Ningbo Znpon | P1134 | 130 Vac; 16A; | IEC 60309 | SEMKO |
| Supply cord* | NEXANS France SA | H07RN-F | 3 x 1,0 mm ² 3 x 1,5 mm ² 3 x 2,5 mm ² | IEC 60245 | LCIE |
| Alternative | TA TUN | H07RN-F | 3 x 1,0 mm ² 3 x 1,5 mm ² | IEC 60245 | VDE |
| Main Switch | Zhejiang Jiaben Electronics Co., Ltd. | KND2-12/2 | 250 Vac; 12(10) A 125 Vac; 18(16) A | IEC 61058-1 | TUV |
| Alternative (only for 220-240 V) | Canal Electronic Co., Ltd. | R Series | 250 Vac; 16(8) A | IEC 61058-1 | VDE |
| X2 Capacitor** | Carli Electronics | MPX | 0.47 µF; 275 Vac; 40/100/56B | IEC 60384-14 | VDE |
| Alternative | Aid Electronics | MEX | 0.47 µF; 275 Vac; 40/100/21 | IEC 60384-14 | VDE |
| PCB | HONG SHIEN | 02V-0 (CCP-3400) | 1,6 mm; 94 V-0 | IEC 60335-1 | Tested with appliance/ UL E119853 |
| <p>1) An asterisk indicates a mark which assures the agreed level of surveillance</p> <p>*) or other certified plugs and cables with the same technical data</p> <p>**) or any other certified brand/type with equivalent ratings and the same construction.</p> | | | | | |

| 28.1 | TABLE: Threaded part torque test | | | P |
|------------------------------|----------------------------------|-------------------------------|-----------------------|---|
| Threaded part identification | Diameter of thread (mm) | Column number (I, II, or III) | Applied torque (Nm) | |
| Enclosure | 5,8 | II | 2,5 | |
| Earthing | 3,7 | II | 1,2 | |
| Anchorage | 3,8 | II | 1,2 | |

| IEC 60335-1 | | | | | | |
|--|----------------------------|---------------------|--------------------|-----------------|-----------------|------------------|
| Clause | Requirement - Test | Result - Remark | | | | Verdict |
| 29.1 | TABLE: Clearances | | | | | P |
| | Overvoltage category | II | | | | — |
| | | Type of insulation: | | | | |
| Rated impulse voltage (V): | Min. cl (mm) | Basic (mm) | Supplementary (mm) | Reinforced (mm) | Functional (mm) | Verdict / Remark |
| 2 500 | 1,5 / 2,0*** | X | X | | X | P |
| 4 000 | 3,0 / 3,5*** | | | X | | P |
| Supplementary information: | | | | | | |
| *) For tracks on printed circuit boards if pollution degree 1 and 2 | | | | | | |
| **) For pollution degree 3 | | | | | | |
| ***) If the construction is affected by wear, distortion, movement of the parts or during assembly | | | | | | |

| 29.2 | TABLE: Creepage distances, basic, supplementary and reinforced insulation | | | | | | | | | | P | |
|---|---|----------------|-----|------------|----------------|-----|------------|-----|--------------------|-----|---------|---------|
| Working voltage (V) | Creepage distance (mm) | | | | | | | | Type of insulation | | | Verdict |
| | Pollution degree | | | | | | | | | | | |
| | 1 | 2 | | | 3 | | | | | | | |
| | | Material group | | | Material group | | | | | | | |
| | | I | II | IIIa/IIIb | I | II | IIIa/IIIb* | B** | S** | R** | Verdict | |
| 250 | 0,56 | 1,25 | 1,8 | <u>2,5</u> | 3,2 | 3,6 | 4,0 | X | — | — | P | |
| 250 | 0,56 | 1,25 | 1,8 | <u>2,5</u> | 3,2 | 3,6 | 4,0 | — | X | — | P | |
| 250 | 1,12 | 2,5 | 3,6 | <u>5,0</u> | 6,4 | 7,2 | 8,0 | — | — | X | P | |
| 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) | | | | | | | | Type of insulation | | | Verdict |
| | Pollution degree | | | | | | | | | | | |
| | 1 | 2 | | | 3 | | | | | | | |
| | | Material group | | | Material group | | | | | | | |
| | | I | II | IIIa/IIIb | I | II | IIIa/IIIb* | Verdict / Remark | | | | |
| 250 | 0,42 | 1,0 | 1,4 | <u>2,0</u> | 2,5 | 2,8 | 3,2 | P | | | | |
| Supplementary information: | | | | | | | | | | | | |
| *) Material group IIIb is allowed if the working voltage does not exceed 50 V | | | | | | | | | | | | |

| 30 | | | | | | | | | | | | | | | | | | | | TABLE: Resistance to heat and fire | | | | | | | | | | | | | | | | | | | |
|--|----------------------------|----------------|--------------------------|-----|---------------|---------------|-------------------------------|-----|----|-----|---|-----|---|-----|-----|-----|---|-----|------------------------------------|------------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| Object/ part No. | Manufacturer/ trademark | Type/ model | Ball pressure test °C | | | | Glow wire test (GWT) °C | | | | | | Glow-wire flammability index (GWFI) °C | | | | Glow- wire ignition temp. (GWIT) °C | | Needle - flame test (NFT) | Verdict | | | | | | | | | | | | | | | | | | | |
| | | | 75 | 125 | cl. 11 +40 | cl. 19 +25 | 550 | 650 | | 750 | | 850 | 550 | 650 | 750 | 850 | 675 | 775 | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | te | | ti | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Enclosure | - | - | - | - | 0,9 | - | X | - | - | - | - | - | - | - | - | - | - | - | - | P | | | | | | | | | | | | | | | | | | | |
| Enclosure of motor | - | - | - | 1,2 | - | - | X | - | - | - | - | - | - | - | - | - | - | - | - | P | | | | | | | | | | | | | | | | | | | |
| Plastic support of PCB | - | - | - | 1,0 | - | | X | - | - | - | - | - | - | - | - | - | - | - | - | P | | | | | | | | | | | | | | | | | | | |
| Supplementary information: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <ol style="list-style-type: none"> 1) Parts of material classified at least HB40 or if relevant HBF 2) Parts of material classified as V-0 or V-1 3) Flame persisting longer than 2 s (= te – ti) need only be reported for unattended appliances 4) Surrounding parts subjected to the needle-flame test of annex E 5) Base material classified as V-0 or if relevant VTM-0 6) The GWIT pre-selection option, the 850 °C GWFI pre-selection option, and the 850 °C GWT are not applicable for attended appliances | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

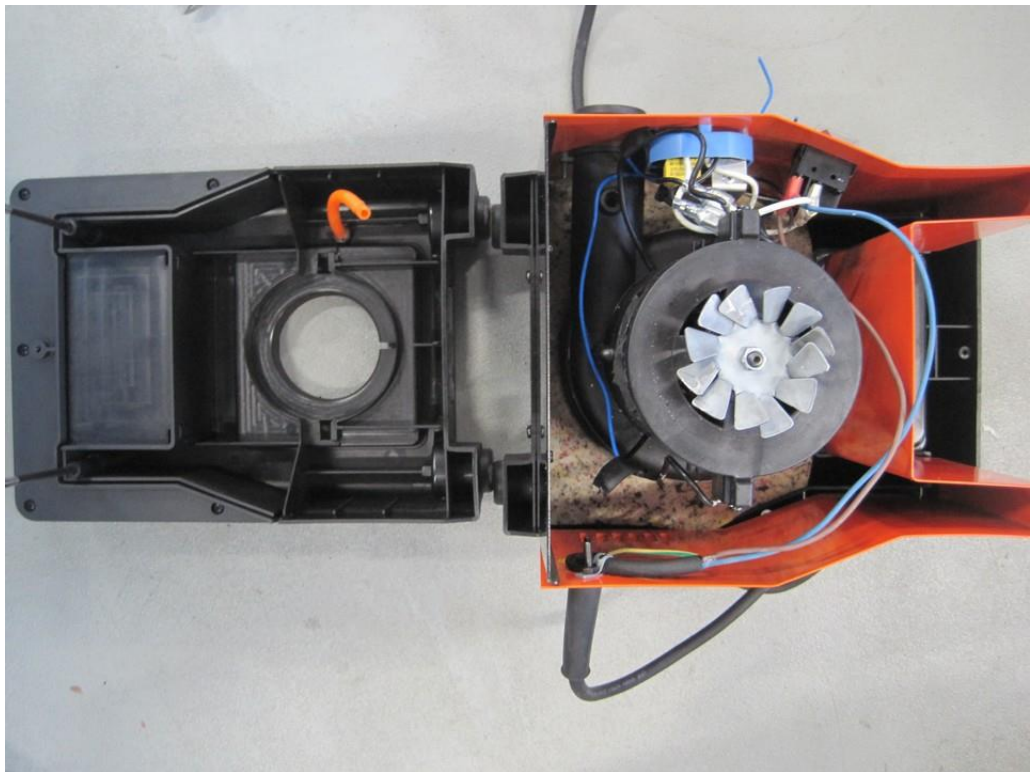
Photos:

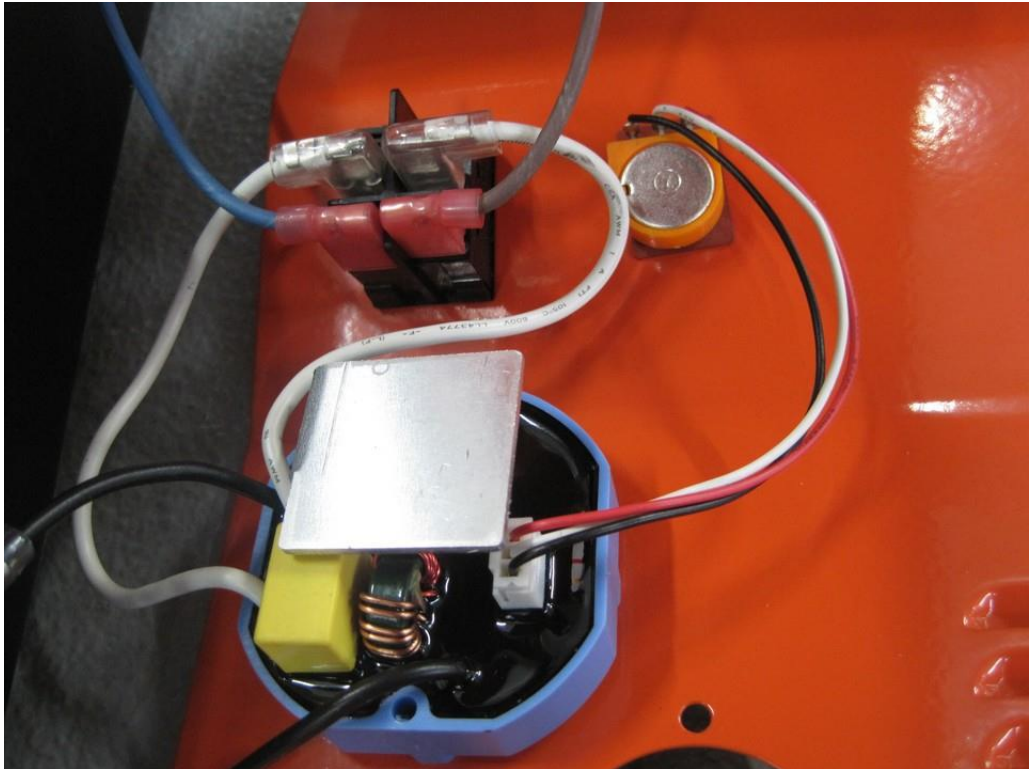


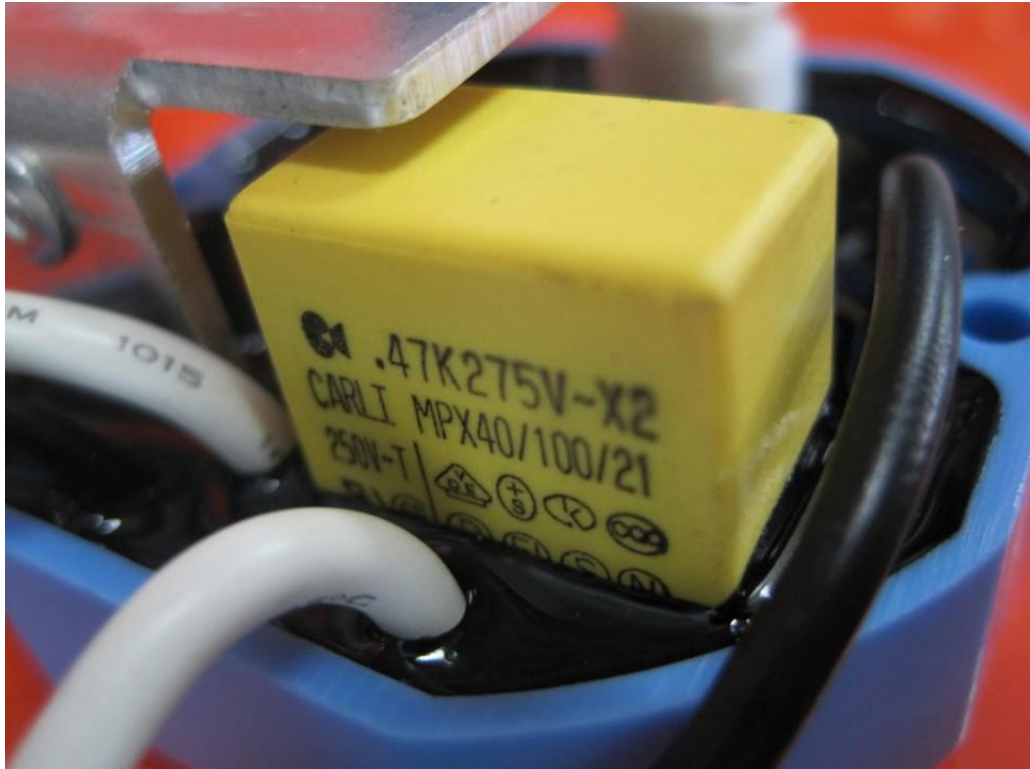
TRF No. IEC60335_1R



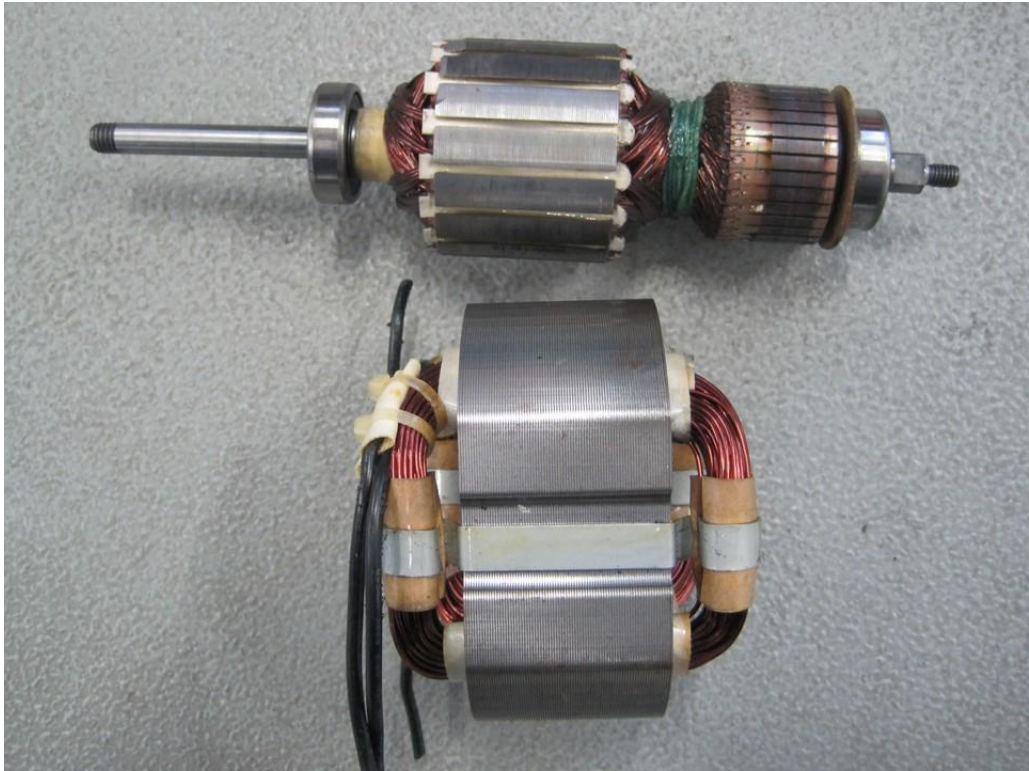












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