



TEST REPORT

1163-05-GG-05-PB001

<i>Product</i>	: Lüftersäule mit Einsatz für Duftstäbe / pillar-fan with fixing for scent- parts
<i>Customer</i>	: Biothys GmbH Gewerbestraße 6 77731 Willstätt, Deutschland
<i>Manufacturer</i>	: Volkswagen Bildungsinstitut GmbH, Bildungszentrum Zwickau Reichenbacher Straße 76 08056 Zwickau, Deutschland
<i>Model / Type ref.</i>	: Biothys Gel-O-Star Version 2005
<i>Details of the sample</i> <small>(Rating and principal characteristics)</small>	: 230V; 4,0W; IP20; SKII
<i>Trade mark</i>	: Biothys GmbH
<i>Additional information</i>	: Biothys Gel-O-Star Version 2005 is a fan with a form of an pillar. Inside is a fixing for scent- parts.
<i>A sample of the product was tested and found to be in conformity with</i>	: EN 60335-2-80:2003 (DIN EN 60335-2-80:2004-12) EN 60335-1:2002 +A11: 2004 (DIN EN 60335-1:2003-07+ Berichtigung 1:2004-07) EN 50366:2003 (DIN EN 50366:2003-11)
<i>Test protocol no.</i>	: 1163-05-GG-05-PP001; 1163-05-GE-05-PB002

Hartmannsdorf, 27.07.2005

M. Brunner
Head of Department Appliance Safety



TEST PROTOCOL

EN 60335-2-80

Safety of household and similar electrical appliances

Part 2-80: Particular requirements for fans

Protocol

Protocol No..... : 1163-05-GG-05-PP001

Tested by (+ signature)..... : Knabe

Approved by (+ signature)..... : Brunner

Date of issue..... : 27.07.2005

Contents : 64 pages

..... :

Knabe
Brunner

Testing laboratory

Name..... : SLG Prüf- und Zertifizierungs GmbH

Address : Burgstädter Straße 20, D-09232 Hartmannsdorf, Germany

Testing location : as above

Client

Name..... : Biothys GmbH

Address : Gewerbestraße 6

..... : 77731 Willstätt, Deutschland

Test specification

Standard..... : EN 60335-2-80:2003 (DIN EN 60335-2-80: 2004-12)
EN 60335-1:2002 +A11: 2004 (DIN EN 60335-1: 2003-07+
Berichtigung 1: 2004-07)

Test procedure : CE-scheme

Protocol update : 20.07.2005

Test item

Description..... : Lüftersäule mit Einsatz für Duftstäbe / pillar-fan with fixing for scent-parts

Trademark : Biothys GmbH

Model and/or type reference : Biothys Gel-O-Star Version 2005

Ratingings..... : 230V; 4,0W; IP20; SKII

:

Manufacturer : Volkswagen Bildungsinstitut GmbH, Bildungszentrum Zwickau
Reichenbacher Straße 76
08056 Zwickau, Deutschland

Particulars: test item vs. test requirements

Nature of supply.....	: AC
Class of protection against electrical shock.....	: II (with class III parts)
Degree of protection against moisture.....	: IP20
Type of cord attachment	: Z (direct plug-in adaptor)
Portable appliances	: Yes
Fixed appliances.....	: No
Type of mounting.....	: None
- floor-mounting	: No
- wall-mounting	: No
- at high level.....	: No
- other than at high level	: No
- key-hole slots, hooks and similar means.....	: No
- ceiling-mounting	: No
- with outlets at floor.....	: No
- with outlets at sill level.....	: No
Self-resetting thermal cut-out.....	: No
Non-self-resetting thermal cut-out.....	: Yes (part of the direct plug-in adaptor)
Contact opening 3 mm in each pole.....	: Yes (with plug)
Thermal link.....	: No
Electronic circuit	: Yes
Programme controller	: No
Timer	: No
Switching devices	: Yes
Appliances with supply cord	: Yes (from direct plug-in adaptor to the appliance)
Appliances with supply cord fitted with a plug.....	: Yes (from direct plug-in adaptor to the appliance)
Motor with capacitor in auxiliary winding	: No
Detachable part with earth connector	: No
Appliance inlet provided.....	: No

Test case verdicts

Test case does not apply to the test object.....	: N(.A.)
Test item does meet the requirement.....	: P(ass)
Test item does not meet the requirement.....	: F(ail)

Testing

Date of receipt of test item : 1163-05-G/001 13.07.2005
 1163-05-G/002 13.07.2005

Date(s) of performance of test : 20.07.2005 – 27.07.2005

General remarks

This test report shall not be reproduced except in full without the written approval of the testing laboratory.

The test results presented in this report relate only to the item tested.

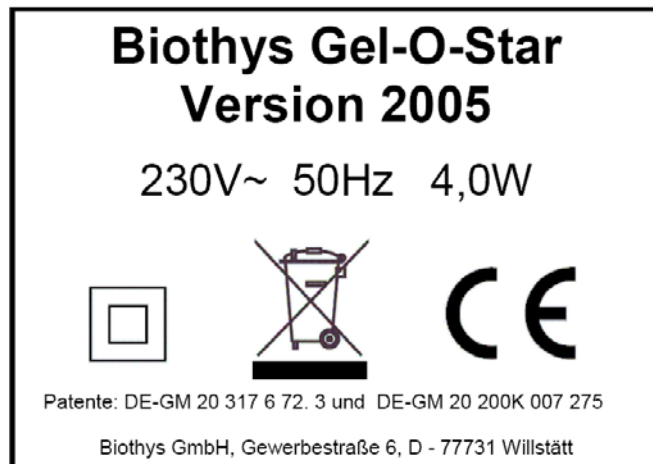
"(see remark #)" refers to a remark appended to the report.

"(see appended table)" refers to a table appended to the report.

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

Type characteristics

Biothys Gel-O-Star Version 2005 is a fan with a form of an pillar. Inside is a fixing for scent- parts.

Remarks**COPY OF MARKING PLATE**

EN 60335-2-80			
Clause	Requirement – Test	Result – Remark	Verdict

5	GENERAL CONDITIONS FOR THE TESTS		
	Tests performed according to cl. 5, e.g. nature of supply, sequence of testing, etc.		P
5.7	Fans to be used in tropical climates, the tests of clause 10,11 and 13 are carried out at 40 °C +/- 2 °C (EN 60335-2-80)	No such fan	N

6	CLASSIFICATION		
6.1	Protection against electric shock: Class I, II, III : (EN 60335-1)	II	P
6.101	Classification to climatic conditions : temperature climats, tropical climats (EN 60335-2-80)	Temperature climates	P
6.2	Protection against harmful ingress of water	Ordinary; IP20	P

7	MARKING AND INSTRUCTIONS		
7.1	Rated voltage or voltage range (V)..... :	230V	P
	Nature of supply	~	P
	Rated frequency (Hz)	50Hz	P
	Rated power input (W):..... :	4,2W	P
	Rated current (A)	-----	N
	Manufacturer's or responsible vendor's name, trademark or identification mark	Biothys GmbH	P
	Model or type reference..... :	Biothys Gel-O-Star Version 2005	P
	Symbol 5172 of IEC 60417, for Class II appliances		P
	IP number, other than IPX0	Ordinary; IP20; no marking	N
	For tropical climates marked with letter T (EN 60335-2-80)		N
7.2	Warning for stationary appliances for multiple supply	Appliance not for multiple supply	N
	Warning placed in vicinity of terminal cover		N
7.3	Range of rated values marked with the lower and upper limits separated by a hyphen		N
	Different rated values marked with the values separated by an oblique stroke		N

EN 60335-2-80			
Clause	Requirement – Test	Result – Remark	Verdict
7.4	Appliances adjustable for different rated voltages, the voltage setting is clearly discernible		N
7.5	Appliances with more than one rated voltage or one or more rated voltage ranges, marked with rated input or rated current for each rated voltage or range, unless		N
	the power input is related to the mean value of the rated voltage range		N
	Relation between marking for upper and lower limits of rated power input or rated current and voltage is clear		N
7.6	Correct symbols used		P
7.7	Connection diagram fixed to appliances to be connected to more than two supply conductors and appliances for multiple supply		N
7.8	Except for type Z attachment, terminals for connection to the supply mains indicated as follows:		
	- marking of terminals exclusively for the neutral conductor (N)	Type Z	N
	- marking of protective earthing terminals (symbol 5019 of IEC 60417)		N
	- marking not placed on removable parts		N
7.9	Marking or placing of switches which may cause a hazard		P
7.10	Indications of switches on stationary appliances and controls on all appliances by use of figures, letters or other visual means..... :	0 and 1 on the switch symbol for different revolutions per minute of the fan	P
	The figure 0 indicates only OFF position, unless no confusion with the OFF position		P
7.11	Indication for direction of adjustment of controls		P
7.12	Instructions for safe use provided		P
7.12.1	Sufficient details for installation supplied		P
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	No stationary appliance	N

EN 60335-2-80			
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 stating that the fixed wiring must be protected	No such parts	N
7.12.4	Instructions for built-in appliances:		
	- dimensions of space	No built-in appliance	N
	- dimensions and position of supporting means		N
	- distances between parts and surrounding structure		N
	- dimensions of ventilation openings and arrangement		N
	- connection to supply mains and interconnection of separate components		N
	- plug accessible after installation, unless		N
	a switch complying with 24.3		N
7.12.5	Replacement cord instructions, type X attachment with a specially prepared cord	Type Z	N
	Replacement cord instructions, type Y attachment	Type Z	N
	Replacement cord instructions, type Z attachment	No supply cord used, a direct plug-in adaptor is used, this part is not to be replaced by the user	P
7.13	Instructions and other texts in an official language	German	P
7.14	Marking clearly legible and durable		P
7.15	Marking on a main part		P
	Marking clearly discernible from the outside, if necessary after removal of a cover		P
	For portable appliances, cover can be removed or opened without a tool		N
	For stationary appliances, name, trademark or identification mark and model or type reference visible after installation	No stationary appliance	N
	For fixed appliances, name, trademark or identification mark and model or type reference visible after installation according to the instructions	No fixed appliance	N
	Indications for switches and controls placed on or near the components. Marking not on parts which can be positioned or repositioned in such a way that the marking is misleading		P

EN 60335-2-80			
Clause	Requirement – Test	Result – Remark	Verdict
7.16	Marking of a possible replaceable thermal link or fuse link clearly visible with regard to replacing the link	No replaceable thermal link	N
8	PROTECTION AGAINST ACCESS TO LIVE PARTS		
8.1	Adequate protection against accidental contact with live parts		P
8.1.1	Requirement applies for all positions, detachable parts removed		P
	Insertion or removal of lamps, protection against contact with live parts of the lamp cap	No such lamps	N
	Use of test probe B of IEC 61032: no contact with live parts		P
8.1.2	Use of test probe 13 of IEC 61032 through openings in class 0 appliances and class II appliances/ constructions: no contact with live parts	Class II parts only in the direct plug-in adaptor, no detachable live parts	P
	Test probe 13 also applied through openings in earthed metal enclosures having a non-conductive coating: no contact with live parts	Class II construction	N
8.1.3	For appliances other than class II, use of test probe 41 of IEC 61032: no contact with live parts of visible glowing heating elements		N
8.1.4	Accessible part not considered live if:		
	- safety extra-low a.c. voltage: peak value not exceeding 42.4 V		N
	- safety extra-low d.c. voltage: not exceeding 42.4 V	12V	P
	- or separated from live parts by protective impedance		N
	If protective impedance: d.c. current not exceeding 2 mA, and		N
	a.c. peak value not exceeding 0.7 mA		N
	- for peak values over 42.4 V up to and including 450 V, capacitance not exceeding 0,1 μ F		N
	- for peak values over 450 V up to and including 15 kV, discharge not exceeding 45 μ C		N
8.1.5	Live parts protected at least by basic insulation before installation or assembly:		
	- built-in appliances		N

EN 60335-2-80			
Clause	Requirement – Test	Result – Remark	Verdict

	- fixed appliances		N
	- appliances delivered in separate units		P
8.2	Class II appliances and constructions constructed so that there is adequate protection against accidental contact with basic insulation and metal parts separated from live parts by basic insulation only		P
	Only possible to touch parts separated from live parts by double or reinforced insulation		P

10	POWER INPUT AND CURRENT		
10.1	Power input at normal operating temperature, rated voltage and normal operation not deviating from rated power input by more than shown in table 1	(see appended table)	P
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

11	HEATING		
11.1	No excessive temperatures in normal use		P
11.2	Placing and mounting of appliance as described		P
11.3	Temperature rises, other than of windings, determined by thermocouples		P
	Temperature rises of windings determined by resistance method, unless		N
	the windings makes it difficult to make the necessary connections		P
11.4	Heating appliances operated under normal operation at 1.15 times rated power input	-----	N
11.5	Motor-operated appliances operated under normal operation at most unfavourable voltage between 0.94 and 1.06 times rated voltage.....	1,06 x 230V = 244V	P
11.6	Combined appliances operated under normal operation at most unfavourable voltage between 0.94 and 1.06 times rated voltage.....	-----	N
11.7	Operation duration corresponding to the most unfavourable conditions of normal use		P
11.8	Temperature rises not exceeding values in table 3	(see appended tables)	P

EN 60335-2-80			
Clause	Requirement – Test	Result – Remark	Verdict
	Protective devices do not operate		P
	Sealing compound does not flow out		P
13	LEAKAGE CURRENT AND ELECTRIC STRENGTH AT OPERATING TEMPERATURE		
13.1	Leakage current not excessive and electric strength adequate		P
	Heating appliances operated at 1.15 times rated power input..... :	-----	N
	Motor-operated appliances and combined appliances supplied at 1.06 times rated voltage.. :	1,06 x 230V = 244V	P
	Protective impedance and radio interference filters disconnected before carrying out the tests	Class II; no such components to earthed parts	N
13.2	Leakage current measured by means of the circuit described in figure 4 of IEC 60990		P
	Leakage current measurements	(see appended table)	P
13.3	Electric strength tests according to table 4	(see appended table)	P
	No breakdown during the tests		P
14	TRANSIENT OVERVOLTAGES		
	Appliances withstand the transient overvoltages to which they may be subjected	No such test possible	N
	Clearances having a value less than specified in table 16 subjected to an impulse voltage test, the test voltage specified in table 6	(see appended table)	N
	No flashover during the test, unless of functional insulation		N
	In case of flashover of functional insulation, the appliance complies with clause 19 with the clearance short circuited		N
15	MOISTURE RESISTANCE		
15.1	Enclosure provides the degree of moisture protection according to classification of the appliance	No protection against moisture, classification of the appliance is IP20	N
	Compliance checked as specified in 15.1.1, taking into account 15.1.2, followed by the electric strength test of 16.3		N

EN 60335-2-80			
Clause	Requirement – Test	Result – Remark	Verdict
	No trace of water on insulation which can result in a reduction of clearances and creepage distances below values specified in clause 29		N
15.1.1	Appliances, other than IPX0, subjected to tests as specified in IEC 60529..... :	IP20	N
15.1.2	Hand-held appliance turned continuously through the most unfavourable positions during the test		N
	Built-in appliances installed according to the instructions		N
	Appliances placed or used on the floor or table placed on a horizontal unperforated support		N
	Appliances normally fixed to a wall and appliances with pins for insertion into socket-outlets are mounted on a wooden board		N
	For IPX3 appliances, the base of wall mounted appliances is placed at the same level as the pivot axis of the oscillating tube		N
	For IPX4 appliances, the horizontal centre line of the appliance is aligned with the pivot axis of the oscillating tube		N
	However, for appliances normally used on the floor or table, the movement is limited to two times 90° for a period of 5 min, the support being placed at the level of the pivot axis of the oscillating tube		N
	Wall-mounted appliances, take into account the distance to the floor stated in the instructions		N
	Appliances with type X attachment fitted with a flexible cord as described		N
	Detachable parts tested as specified		N
15.2	Spillage of liquid does not affect the electrical insulation	Appliance without liquids	N
	Appliances with type X attachment fitted with a flexible cord as described		N
	Appliances incorporating an appliance inlet tested with or without an connector, whichever is most unfavourable		N
	Detachable parts removed		N
	Overfilling test with additional amount of water, over a period of 1 min (l)..... :	----	N

EN 60335-2-80			
Clause	Requirement – Test	Result – Remark	Verdict
	The appliance withstands the electric strength test of 16.3		N
	No trace of water on insulation that can result in a reduction of clearances and creepage distances below values specified in clause 29		N
15.3	Appliances proof against humid conditions		P
	Humidity test for 48 h in a humidity cabinet		P
	The appliance withstands the tests of clause 16		P

16	LEAKAGE CURRENT AND ELECTRIC STRENGTH		
16.1	Leakage current not excessive and electric strength adequate		P
	Protective impedance disconnected from live parts before carrying out the tests		P
16.2	Single-phase appliances: test voltage 1.06 times rated voltage	1,06 x 230V = 244V	P
	Three-phase appliances: test voltage 1.06 times rated voltage divided by $\sqrt{3}$	-----	N
	Leakage current measurements	(see appended table)	P
16.3	Electric strength tests according to table 7	(see appended table)	P
	No breakdown during the tests		P

17	OVERLOAD PROTECTION OF TRANSFORMERS AND ASSOCIATED CIRCUITS		
	No excessive temperatures in transformer or associated circuits in event of short-circuits likely to occur in normal use	(see appended table) approved transformer in the direct plug-in adaptor used, no tests necessary	N
	Appliance supplied with 1.06 or 0.94 times rated voltage and the most unfavourable short-circuit or overload likely to occur in normal use applied	-----	N
	Temperature rise of insulation of the conductors of safety extra-low voltage circuits not exceeding the relevant value specified in table 3 by more than 15 K		N
	Temperature of the winding not exceeding the value specified in table 8,		N

EN 60335-2-80			
Clause	Requirement – Test	Result – Remark	Verdict
	however limits do not apply to fail-safe transformers complying with sub-clause 15.5 of IEC 61558-1		N
18	ENDURANCE		
	Requirements and tests are specified in part 2 when necessary	No tests necessary	N
19	ABNORMAL OPERATION		
19.1	The risk of fire or mechanical damage under abnormal or careless operation obviated		P
	Electronic circuits so designed and applied that a fault will not render the appliance unsafe		P
	Fans incorporating shutters or similar subjected to the test of cl. 19.101 (EN 60335-2-80)	No such parts	N
19.2	Test of appliance with heating elements with restricted heat dissipation; test voltage (V): power input of 0.85 times rated power input..... :	-----	N
19.3	Test of 19.2 repeated; test voltage (V): power input of 1.24 times rated power input..... :	-----	N
19.4	Test conditions as in cl. 11, any control limiting the temperature during tests of cl. 11 short-circuited	No such temperature limiting control	N
19.5	Test of 19.4 repeated on Class 0I and I appliances with tubular sheathed or embedded heating elements. No short-circuiting, but one end of the element connected to the elements sheath	Class II without heating elements	N
	The test repeated with reversed polarity and the other end of the heating element connected to the sheath		N
	The test is not carried out on appliances intended to be permanently connected to fixed wiring and on appliances where an all-pole disconnection occurs during the test of 19.4		N
19.6	Appliances with PTC heating elements tested at rated voltage, establishing steady conditions		N

EN 60335-2-80			
Clause	Requirement – Test	Result – Remark	Verdict
	The working voltage of the PTC heating element is increased by 5% and the appliance is operated until steady conditions are re-established. The voltage is then increased in similar steps until 1.5 times working voltage or until the PTC heating element ruptures		N
19.7	Stalling test by locking the rotor if the locked rotor torque is smaller than the full load torque or locking moving parts of other appliances		P
	Locked rotor, motor capacitors open-circuited or short-circuited, if required	No such motor	N
	Locked rotor, capacitors open-circuited one at a time		N
	Test repeated with capacitors short-circuited one at a time, if required		N
	Appliances with timer or programmer supplied with rated voltage for each of the tests, for a period equal to the maximum period allowed		N
	Other appliances supplied with rated voltage for a period as specified		P
	Winding temperatures not exceeding values specified in table 8	(see appended table)	P
19.8	Three-phase motors operated at rated voltage with one phase disconnected	DC- motor	N
19.10	Series motor operated at 1.3 times rated voltage for 1 min..... :	-----	N
	During the test, parts not being ejected from the appliance		N
19.11	Electronic circuits, compliance checked by evaluation of the fault conditions specified in 19.11.2 for all circuits or parts of circuits, unless they comply with the conditions specified in 19.11.1		P
19.11.1	Before applying the fault conditions a) to f) in 19.11.2, it is checked if circuits or parts of circuit meet both of the following conditions:		
	- the electronic circuit is a low-power circuit, that is, the maximum power at low-power points does not exceed 15 W according to the tests specified	The maximum power outlet of the direct plug-in adaptor is 7,2W; no fault condition tests necessary	P

EN 60335-2-80			
Clause	Requirement – Test	Result – Remark	Verdict
	- the protection against electric shock, fire hazard, mechanical hazard or dangerous malfunction in other parts of the appliance does not rely on the correct functioning of the electronic circuit		P
19.11.2	Fault conditions applied one at a time, the appliance operated under conditions specified in cl. 11, but supplied at rated voltage, the duration of the tests as specified:		
	a) short circuit of functional insulation if clearances or creepage distances are less than the values specified in 29		N
	b) open circuit at the terminals of any component		N
	c) short circuit of capacitors, unless they comply with IEC 60384-14		N
	d) short circuit of any two terminals of an electronic component, other than integrated circuits. This fault condition is not applied between the two circuits of an optocoupler		N
	e) failure of triacs in the diode mode		N
	f) failure of an integrated circuit. The possible hazardous situations of the appliance are assessed to ensure that safety does not rely on the correct functioning of such a component		N
19.11.3	If the appliance incorporates a protective electronic circuit which operates to ensure compliance with clause 19, the relevant test is repeated with a single fault simulated, as indicated in a) to f) of 19.11.2		N
	During and after each test the following is checked:		
	- the temperature rise of the windings do not exceed the values specified in table 8		N
	- the appliance complies with the conditions specified in 19.13		N
	- any current flowing through protective impedance not exceeding the limits specified in 8.1.4		N
	If a conductor of a printed board becomes open-circuited, the appliance is considered to have withstood the particular test, provided all three of the following conditions are met:		
	- the material of the printed circuit board withstands the burning test of annex E		N

EN 60335-2-80			
Clause	Requirement – Test	Result – Remark	Verdict
	- any loosened conductor does not reduce the clearances or creepage distances between live parts and accessible metal parts below the values specified in cl. 29		N
	- the appliance withstands the tests of 19.11.2 with open-circuited conductor bridged		N
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)..... :	There is a fuse with 200mAT placed on the PCB, but all parts are in a low power circuit, no tests necessary	N
19.13	During the tests the appliance does not emit flames, molten metal, poisonous or ignitable gas in hazardous amounts		P
	Temperature rises not exceeding the values shown in table 9	(see appended table)	P
	Enclosures not deformed to such an extent that compliance with cl. 8 is impaired		P
	If the appliance can still be operated it complies with 20.2		P
	Insulation, other than of class III appliance, withstand the electric strength test of 16.3, the test voltage specified in table 4:		
	- basic insulation..... :	500	P
	- supplementary insulation..... :	-----	N
	- reinforced insulation..... :	3000	P
19.101	Fans incorporating shutters or similar that are operated automatically are supplied at rated voltage in the closed or open position, whichever is more unfavourable (EN 60335-2-80)	No such parts	N
20	STABILITY AND MECHANICAL HAZARDS		
20.1	Adequate stability		P
	Tilting test through an angle of 10° (appliance placed on an inclined plane/horizontal plane); appliance does not overturn		P
	Tilting test repeated on appliances with heating elements, angle of inclination increased to 15°	Appliance without heating element	N

EN 60335-2-80			
Clause	Requirement – Test	Result – Remark	Verdict
	Possible heating test in overturned position; temperature rise does not exceed values shown in table 9		N
	Portable pedestal fans exceeding 1,7 m and exceeding 10 kg tested with a force of 40 N at 1,5 m (EN 60335-2-8)	No such fan	N
20.2	Moving parts adequately arranged or enclosed as to provide protection against personal injury		P
	Protective enclosures, guards and similar parts are non-detachable		P
	Adequate mechanical strength and fixing of protective enclosures		P
	Self-resetting thermal cut-outs and overcurrent protective devices not causing a hazard, by unexpected reclosure	No such parts	N
	Not possible to touch dangerous moving parts with test probe		P
20.101	Fan blades, other than those for mounting at high level, shall be guarded, unless (EN 60335-2-80)	Two grilles used, power of the fan 1,4W, rounded fan blades used	P
21	MECHANICAL STRENGTH		
	Appliance has adequate mechanical strength and is constructed as to withstand rough handling		P
	No damage after three blows applied to various parts of the enclosure, impact energy $0,5 \pm 0,04$ J		P
	If necessary, supplementary or reinforced insulation subjected to the electric strength test of 16.3	Only for the approved direct plug-in adaptor	N
	If necessary, repetition of groups of three blows on a new sample		N
21.101	Fan guards are subjected to a push and pull force of 20 N. Dangerous moving parts are not accessible (EN 60335-2-80)		P
21.102	Ceiling fans have adequate strength. Load four times mass (.....) (EN 60335-2-80)	No such fan	N
22	CONSTRUCTION		

EN 60335-2-80			
Clause	Requirement – Test	Result – Remark	Verdict
22.1	Appliance marked with the first numeral of the IP system, relevant requirements of IEC 60529 are fulfilled		P
22.2	Stationary appliance: means to provide all-pole disconnection from the supply provided, the following means being available:		
	- a supply cord fitted with a plug	No stationary appliance	N
	- a switch complying with 24.3		N
	- a statement in the instruction sheet that a disconnection incorporated in the fixed wiring is to be provided		N
	- an appliance inlet		N
	Single-pole switches and single-pole protective devices for the disconnection of heating elements in single-phase permanently connected class I appliances, connected in the phase conductor		N
22.3	Appliance provided with pins: no undue strain on socket-outlets		P
	Applied torque not exceeding 0.25 Nm		P
	Pull force of 50N to each pin after the appliance has being placed in the heating cabinet; when cooled to room temperature the pins are not displaced by more than 1mm	Approved part, test not necessary	N
	Each pin subjected to a torque of 0.4Nm; the pins are not rotating unless rotating does not impair compliance with the standard	Approved part, test not necessary	N
22.4	Appliance for heating liquids and appliance causing undue vibration not provided with pins for insertion into socket-outlets	No such appliance	N
22.5	No risk of electric shock when touching the pins of the plug		P
22.6	Electrical insulation not affected by condensing water or leaking liquid		P
	Electrical insulation of Class II appliances not affected in case of a hose rupture or seal leak	Appliance without liquid	N
22.7	Adequate safeguards against the risk of excessive pressure in appliances provided with steam-producing devices	Appliance without steam	N

EN 60335-2-80			
Clause	Requirement – Test	Result – Remark	Verdict
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		P
	Adequate insulating properties of oil or grease to which insulation is exposed		N
22.10	Location or protection of reset buttons of non-self-resetting controls is so that accidental resetting is unlikely	No such parts	N
22.11	Reliable fixing of non-detachable parts that provide the necessary degree of protection against electric shock, moisture or contact with moving parts		P
	Obvious locked position of snap-in devices used for fixing such parts	No snap-in devices	N
	No deterioration of the fixing properties of snap-in devices used in parts that are likely to be removed during installation or servicing		N
	Tests as described		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	Knob for the indication of the revolutions per minute is fixed with a screw	P
	Axial force 15 N applied to parts, the shape being so that an axial pull is unlikely to be applied		N
	Axial force 30 N applied to parts, the shape being so that an axial pull is likely to be applied		P
22.13	Unlikely that handles, when gripped as in normal use, make the operators hand touch parts having a temperature rise exceeding the value specified for handles which are held for short periods only		P
22.14	No ragged or sharp edges creating a hazard for the user in normal use, or during user maintenance		P
	No exposed pointed ends of self tapping screws etc., liable to be touched by the user in normal use or during user maintenance		P
22.15	Storage hooks and the like for flexible cords smooth and well rounded	No such parts	N

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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, no undue wear of contacts		N
	Cord reel tested with 6000 operations, as specified		N
	Electric strength test of 16.3, voltage of 1000 V applied		N
22.17	Spacers not removable from the outside by hand or by means of a screwdriver or a spanner		N
22.18	Current-carrying parts and other metal parts resistant to corrosion under normal conditions of use		P
22.19	Driving belts not used as electrical insulation	Appliance without driving belts	N
22.20	Direct contact between live parts and thermal insulation effectively prevented, unless material used is non-corrosive, non-hygroscopic and non-combustible		N
	Compliance is checked by inspection and, if necessary, by appropriate test		N
22.21	Wood, cotton, silk, ordinary paper and fibrous or hygroscopic material not used as insulation, unless impregnated		P
22.22	Appliances not containing asbestos		P
22.23	Oils containing polychlorinated biphenyl (PCB) not used		P
22.24	Bare heating elements adequately supported	No heating elements	N
	In case of rupture, the heating conductor is unlikely to come in contact with accessible metal parts		N
22.25	Sagging heating conductors cannot come into contact with accessible metal parts		N
22.26	The insulation between parts operating at safety extra-low voltage and other live parts complies with the requirements for double or reinforced insulation	Approved direct plug-in adaptor, no other live parts	P
22.27	Parts connected by protective impedance separated by double or reinforced insulation		N
22.28	Metal parts of Class II appliances conductively connected to gas pipes or in contact with water: separated from live parts by double or reinforced insulation		N

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Clause	Requirement – Test	Result – Remark	Verdict
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	No such appliance	N
22.30	Parts serving as supplementary or reinforced insulation fixed so that they cannot be removed without being seriously damaged, or		N
	so constructed that they cannot be replaced in an incorrect position, and so that if they are omitted, the appliance is rendered inoperable or manifestly incomplete	Only for the direct plug-in adaptor	P
22.31	Clearances and creepage distances over supplementary and reinforced insulation not reduced below values specified for supplementary insulation		P
	Creepage distances and clearances over supplementary or reinforced insulation not reduced to less than 50% of values specified in 29 if wires, screws etc. becomes loose		P
22.32	Supplementary and reinforced insulation designed or protected against deposition of dirt or dust		P
	Supplementary insulation of natural or synthetic rubber resistant to ageing, or arranged and dimensioned so that creepage distances are not reduced below values specified in 29.2		N
	Ceramic material not tightly sintered, similar material or beads alone not used as supplementary or reinforced insulation		N
	Oxygen bomb test at 70 °C for 96 h and 16 h at room temperature		N
22.33	Conductive liquids that are or may become accessible in normal use are not in direct contact with live parts	Appliance without liquids	N
	Electrodes not used for heating liquids		N
	For class II constructions, conductive liquids that are or may become accessible in normal use, not in direct contact with basic or reinforced insulation		N
	For class II constructions, conductive liquids which are in contact with live parts, not in direct contact with reinforced insulation		N
22.34	Shafts of operating knobs, handles, levers etc. not live, unless the shaft is not accessible when the part is removed		P

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Clause	Requirement – Test	Result – Remark	Verdict
22.35	Handles, levers and knobs, held or actuated in normal use, not becoming live in the event of an insulation fault		P
	Such parts being of metal, and their shafts or fixings are likely to become live in the event of an insulation fault, they are either adequately covered by insulation material, or their accessible parts are separated from their shafts or fixings by supplementary insulation	Only safety extra low voltage on this parts	N
	This requirement does not apply to handles, levers and knobs on stationary appliances other than those of electrical components, provided they are either reliably connected to an earthing terminal or earthing contact, or separated from live parts by earthed metal		N
22.36	Handles continuously held in the hand in normal use are so constructed that when gripped as in normal use, the operators hand is not likely to touch metal parts, unless they are separated from live parts by double or reinforced insulation	No such handles	N
22.37	Capacitors in Class II appliances not connected to accessible metal parts, unless complying with 22.42		P
	Metal casings of capacitors in Class II appliances separated from accessible metal parts by supplementary insulation, unless complying with 22.42	No such capacitors	N
22.38	Capacitors not connected between the contacts of a thermal cut-out	Appliance without thermal cut-out	N
22.39	Lamp holders used only for the connection of lamps	No lampholder	N
22.40	Motor-operated appliances and combined appliances intended to be moved while in operation, or having accessible moving parts, fitted with a switch to control the motor. The actuating member of the switch being easily visible and accessible	Appliance not to be moved while in operation and without accessible moving parts	N
22.41	No components, other than lamps, containing mercury	No mercury used	P
22.42	Protective impedance consisting of at least two separate components		N

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Clause	Requirement – Test	Result – Remark	Verdict
	Values specified in 8.1.4 not exceeded if any one of the components are short-circuited or open-circuited		N
22.43	Appliances adjustable for different voltages, accidental changing of the setting of the voltage unlikely to occur		N
22.44	Appliances are not allowed to have an enclosure that is shaped and decorated so that the appliance is likely to be treated as a toy by children		P
22.45	When air is used as reinforced insulation, clearances not reduced below the values specified in 29.1.4 due to deformation as a result of an external force applied to the enclosure		N
22.101	Appliances having provision for attaching a luminaire incorporate appropriate terminals and internal wiring (EN 60335-2-80)	Appliance not for using with luminaire	N

23	INTERNAL WIRING		
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	No holes in metal	N
	Wiring effectively prevented from coming into contact with moving parts		P
23.2	Beads etc. on live wires cannot change their position, and are not resting on sharp edges or corners	No beads etc.	N
	Beads inside flexible metal conduits contained within an insulating sleeve		N
23.3	Electrical connections and internal conductors movable relatively to each other not exposed to undue stress		P
	Flexible metallic tubes not causing damage to insulation of conductors	No flexible metallic tubes	N
	Open-coil springs not used	No open coil spring	N
	Adequate insulating lining provided inside a coiled spring, the turns of which touch one another		N

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Clause	Requirement – Test	Result – Remark	Verdict
	No damage after 100 000 flexings for conductors flexed during normal use and at rated voltage (EN 60335-2-80)		N
	Electric strength test, 1000 V between live parts and accessible metal parts		N
23.4	Bare internal wiring sufficiently rigid and fixed	No bare internal wiring	N
23.5	The insulation of internal wiring withstanding the electrical stress likely to occur in normal use	Internal wiring only for safety extra low voltage	P
	No breakdown when a voltage of 2000 V is applied for 15 min between the conductor and metal foil wrapped around the insulation		N
23.6	Sleeving used as supplementary insulation on internal wiring retained in position by positive means	No sleeving used	N
23.7	The colour combination green/yellow used only for earthing conductors	Class II (with class III parts)	N
23.8	Aluminium wires not used for internal wiring		P
23.9	No lead-tin soldering of stranded conductors where they are subject to contact pressure, unless		P
	clamping means so constructed that there is no risk of bad contact due to cold flow of the solder	No such construction	N

24	COMPONENTS		
24.1	Components comply with safety requirements in relevant IEC standards		P
	List of components	(see appended table)	P
	Components not tested and found to comply with relevant IEC standard for the number of cycles specified are tested in accordance with 24.1.1 to 24.1.6		P
	Components not tested and found to comply with relevant IEC standard, components not marked or not used in accordance with its marking, tested under the conditions occurring in the appliance		P
24.1.1	Capacitors likely to be permanently subjected to the supply voltage and used for radio interference suppression or for voltage dividing, complying with IEC 60384-14, or	No such capacitor	N
	tested according to annex F		N

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Clause	Requirement – Test	Result – Remark	Verdict
24.1.2	Safety isolating transformers complying with IEC 61558-2-6, or	Approved transformer	P
	tested according to annex G		N
24.1.3	Switches complying with IEC 61058-1, the number of cycles of operation being at least 10 000, or		P
	tested according to annex H		N
24.1.4	Automatic controls complying with IEC 60730-1 with relevant part 2. The number of cycles of operation being:		
	- thermostats: 10 000		N
	- temperature limiters: 1 000		N
	- self-resetting thermal cut-outs: 300		N
	- non-self-resetting thermal cut-outs: 30		N
	- timers: 3 000		N
	- energy regulators: 10 000		N
24.1.5	Appliance couplers complying with IEC 60320-1	No appliance coupler	N
	However, appliances classified higher than IPX0, the appliance couplers complying with IEC 60320-2-3		N
24.1.6	Small lamp holders similar to E10 lampholders complying with IEC 60238, the requirements for E10 lampholders being applicable	No lampholder	N
24.2	Switches or automatic controls in flexible cords are allowed for appliances not exceeding 25 W (EN 60335-2-80)	Switch not in the supply cord, switch in the SELV wire from the direct plug-in adaptor to the appliance	P
	No devices causing the protective device in the fixed wiring to operate in the event of a fault in the appliance		P
	No thermal cut-outs that can be reset by soldering		P
24.3	Switches intended for all-pole disconnection of stationary appliances are directly connected to the supply terminals and having a contact separation in all poles, providing full disconnection under overvoltage category III conditions	No stationary appliance	N

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Clause	Requirement – Test	Result – Remark	Verdict
24.4	Plugs and socket-outlets for extra-low voltage circuits and heating elements, not interchangeable with plugs and socket-outlets listed in IEC 60083 or IEC 60906-1 or with connectors and appliance inlets complying with the standard sheets of IEC 60320-1	Internal plug and socket for extra-low voltage circuits	P
24.5	Capacitors in auxiliary windings of motors marked with their rated voltage and capacitance and used accordingly	No capacitor in auxiliary windings	N
	Capacitors in appliances for which 30.2.3 is applicable and that are permanently connected in series with a motor winding, are of class P1 or P2 of IEC 60252	No such capacitor	N
	Voltage across capacitors in series with a motor winding does not exceed 1,1 times rated voltage, when the appliance is supplied at 1,1 times rated voltage under minimum load		N
24.6	Working voltage of motors connected to the supply mains and having basic insulation that is inadequate for the rated voltage of the appliance, not exceeding 42V.	Working voltage of the motor is 12V	N
	In addition, the motors are complying with the requirements of Annex I		N
24.101	Thermal cut-outs in duct fans in order to comply with cl. 19 are not self-resetting (EN 60335-2-80)	No such fan, no thermal cut-out	N
25	SUPPLY CONNECTION AND EXTERNAL FLEXIBLE CORDS		
25.1	Appliance not intended for permanent connection to fixed wiring, means for connection to the supply:		
	- supply cord fitted with a plug		N
	- an appliance inlet having at least the same degree of protection against moisture as required for the appliance		N
	- pins for insertion into socket-outlets		P
25.2	Appliance not provided with more than one means of connection to the supply mains		P
	Stationary appliance for multiple supply may be provided with more than one means of connection, provided electric strength test of 1250 V for 1 min between each means of connection causes no breakdown	No stationary appliance, no multiple supply	N

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Clause	Requirement – Test	Result – Remark	Verdict
25.3	Connection of supply conductors for appliance intended to be permanently connected to fixed wiring possible after the appliance has been fixed to its support	No permanently connection to fixed wiring	N
	Appliance provided with a set of terminals for the connection of cables or fixed wiring, cross-sectional areas specified in 26.6		N
	Appliance provided with a set of terminals allowing the connection of a flexible cord		N
	Appliance provided with a set of supply leads accommodated in a suitable compartment		N
	Appliance provided with a set of terminals and cable entries, conduit entries, knock-outs or glands, allowing connection of appropriate type of cable or conduit		N
25.4	Cable and conduit entries, rated current of appliance not exceeding 16 A, dimensions according to table 10	No permanently connection to fixed wiring	N
	Introduction of conduit or cable does not reduce clearances or creepage distances below values specified in 29		N
25.5	Method for assemble supply cord with the appliance:		
	- type X attachment		N
	- type Y attachment		N
	- type Z attachment is allowed for portable fans (IEC 60335-2-80)	For the direct plug-in adaptor	P
	Type X attachment, other than those with a specially prepared cord, not used for flat twin tinsel cords		N
25.6	Plugs fitted with only one flexible cord and complying with IEC 60083:1975 standard sheet C.. (EN 60335-1)	No supply cord	N
25.7	Supply cord not lighter than:		
	- braided cord (60245 IEC 51)		N
	- ordinary tough rubber sheathed cord (60245 IEC 53)		N
	- ordinary polychloroprene sheathed cord (60245 IEC 57) (EN 60335-1)		N
	- flat twin tinsel cord (60227 IEC 41)		N

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Clause	Requirement – Test	Result – Remark	Verdict
	- light polyvinyl chloride sheathed cord (60227 IEC 52), appliance not exceeding 3 kg		N
	- ordinary polyvinyl chloride sheathed cord (60227 IEC 53), appliance exceeding 3 kg		N
	Supply cords having high flexibility are of 60245 IEC 86, 60245 IEC 87 or 60245 IEC 88 (EN 60335-1)		N
	Temperature rise of external metal parts exceeding 75 K, PVC cord not used, unless		N
	appliance so constructed that the supply cord is not likely to touch external metal parts in normal use, or		N
	the supply cord is appropriate for higher temperatures, type Y or type Z attachment used		N
25.8	Nominal cross-sectional area of supply cords according to table 11; rated current (A); cross-sectional area (mm ²)	-----	N
25.9	Supply cord not in contact with sharp points or edges		N
25.10	Green/yellow core for earthing purposes in Class I appliance		N
25.11	Conductors of supply cords not consolidated by lead-tin soldering where they are subject to contact pressure, unless		N
	clamping means so constructed that there is no risk of bad contacts due to cold flow of the solder		N
25.12	Moulding the cord to part of the enclosure does not damage the insulation of the supply cord		N
25.13	Inlet opening so shaped as to prevent damage to the supply cord		N
	Unless the enclosure at the inlet opening is of insulation material, a non-detachable lining or bushing complying with 29.3 for supplementary insulation provided		N
	If unsheathed supply cord, a similar additional bushing or lining is required, unless		N
	the appliance is class 0		N
25.14	Supply cords adequately protected against excessive flexing		N
	Flexing test:		

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Clause	Requirement – Test	Result – Remark	Verdict
	- applied force (N) :	----	N
	- number of flexings..... :	----	N
	The test does not result in:		
	- short circuit between the conductors		N
	- breakage of more than 10% of the strands of any conductor		N
	- separation of the conductor from its terminal		N
	- loosening of any cord guard		N
	- damage, within the meaning of the standard, to the cord or the cord guard		N
	- broken strands piercing the insulation and becoming accessible		N
25.15	Conductors of the supply cord relieved from strain, twisting and abrasion by use of cord anchorage	For the interconnection cords: - from the adaptor to the electronic - from the electronic to the ventilator	P
	The cord cannot be pushed into the appliance to such an extent that the cord or internal parts of the appliance can be damaged		P
	Pull and torque test of supply cord, values shown in table 10: pull (N); torque (not on automatic cord reel) (Nm)..... :	Only for fixing inside the appliance of the interconnection cords	N
	Max. 2 mm displacement of the cord, and conductors not moved more than 1 mm in the terminals		P
	Creepage distances and clearances not reduced below values specified in 29.1		P
25.16	Cord anchorages for type X attachments constructed and located so that:		
	- replacement of the cord is easily possible		N
	- it is clear how the relief from strain and the prevention of twisting are obtained		N
	- they are suitable for different types of cord		N
	- cord cannot touch the clamping screws of cord anchorage if these screws are accessible, unless separated from accessible metal parts by supplementary insulation		N
	- the cord is not clamped by a metal screw which bears directly on the cord		N

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Clause	Requirement – Test	Result – Remark	Verdict
	- at least one part of the cord anchorage securely fixed to the appliance, unless part of a specially prepared cord		N
	- screws which have to be operated when replacing the cord do not fix any other component, if applicable		N
	- if labyrinths can be bypassed the test of 25.15 is nevertheless withstood		N
	- for Class 0, 0I and I appliances: they are of insulating material or are provided with an insulating lining, unless a failure of the insulation of the cord does not make accessible metal parts live		N
	- for Class II appliances: they are of insulating material, or if of metal, they are insulated from accessible metal parts by supplementary insulation	Insulation material	P
25.17	Adequate cord anchorages for type Y and Z attachment		P
25.18	Cord anchorages only accessible with the aid of a tool, or		N
	so constructed that the cord can only be fitted with the aid of a tool		P
25.19	Type X attachment, glands not used as cord anchorage in portable appliances		P
	Tying the cord into a knot or tying the cord with string not used		P
25.20	Conductors of the supply cord for type Y and Z attachment adequately additionally insulated	No supply cord	N
25.21	Space for supply cord for type X attachment or for connection of fixed wiring constructed to permit checking of conductors with respect to correct positioning and connection before fitting any cover, no risk of damage to the conductors when fitting the cover, no contact with accessible metal parts if a conductor becomes loose, etc.		N
	For portable appliances, the uninsulated end of a conductor prevented from any contact with accessible metal parts, unless the end of the cord is such that the conductors are unlikely to slip free		N
25.22	Appliance inlet:		
	- live parts not accessible during insertion or removal	No appliance inlet	N

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Clause	Requirement – Test	Result – Remark	Verdict
	- connector can be inserted without difficulty		N
	- the appliance is not supported by the connector		N
	- is not for cold conditions if temp. rise of external metal parts exceeds 75 K, unless the supply cord is not likely to touch such metal parts		N
25.23	Interconnection cords comply with the requirements for the supply cord, except as specified		P
	If necessary, electric strength test of 16.3	Interconnection cords only with safety extra low voltage	N
25.24	Interconnection cords not detachable without the aid of a tool if compliance with the standard is impaired when they are disconnected	The compliance of the standard is not impaired when they are disconnected	N
25.25	Dimensions of pins compatible with the dimensions of the relevant socket-outlet. Dimensions of pins and engagement face in accordance with the relevant plug in IEC 60083	Pins on the approved adaptor	P

26	TERMINALS FOR EXTERNAL CONDUCTORS		
26.1	Appliances provided with terminals or equally effective devices for connection of external conductors	No terminals for external conductor	N
	Terminals only accessible after removal of a non-detachable cover		N
26.2	Appliances with type X attachment and appliances for connection to fixed wiring provided with terminals in which connections are made by means of screws, nuts or similar devices, unless the connections are soldered		N
	Screws and nuts serve only to clamp supply conductors, except		N
	internal conductors, if so arranged that they are unlikely to be displaced when fitting the supply conductors		N
	If soldered connections used, the conductor so positioned or fixed that reliance is not placed on soldering alone		N
	Soldering alone used, barriers provided, clearances and creepage distances satisfactory if the conductor becomes free at the soldered joint		N

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Clause	Requirement – Test	Result – Remark	Verdict
26.3	Terminals for type X attachment and for connection to fixed wiring so constructed that the conductor is clamped between metal surfaces with sufficient contact pressure and without damaging the conductor		N
	Terminals for type X attachment and those for connection to fixed wiring so fixed that when tightening or loosening the clamping means:		
	- the terminal does not loosen		N
	- internal wiring is not subjected to stress		N
	- clearances and creepage distances are not reduced below the values in 29		N
	Compliance checked by inspection and by the test of subclause 8.6 of IEC 60999-1, the torque applied being equal to two-thirds of the torque specified. Nominal diameter of thread (mm); screw category; torque (Nm)..... :	----	N
26.4	Terminals for type X attachment, except those with a specially prepared cord, and those for connection to fixed wiring, no special preparation of conductors required, and so constructed or placed that conductors prevented from slipping out		N
26.5	Terminals for type X attachment so located or shielded that if a wire of a stranded conductor escapes, no risk of accidental connection to other parts that result in a hazard		N
	Stranded conductor test, 8 mm insulation removed		N
	No contact between live parts and accessible metal parts and, for class II constructions, between live parts and metal parts separated from accessible metal parts by supplementary insulation only		N
26.6	Terminals for type X attachment and for connection to fixed wiring suitable for connection of conductors with required cross-sectional area according to table 13; rated current (A); nominal cross-sectional area (mm ²) :	----	N
	Terminals only suitable for a specially prepared cord		N
26.7	Terminals for type X attachment accessible after removal of a cover or part of the enclosure		N
26.8	Terminals for the connection to fixed wiring, including the earthing terminal, located close to each other		N

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Clause	Requirement – Test	Result – Remark	Verdict
26.9	Terminals of the pillar type constructed and located as specified		N
26.10	Terminals with screw clamping and screwless terminals not used for flat twin tinsel cords, unless conductors ends fitted with a device suitable for screw terminals		N
	Pull test of 5 N to the connection		N
26.11	For type Y and Z attachment: soldered, welded, crimped and similar connections may be used		N
	For Class II appliances: the conductor so positioned or fixed that reliance is not placed on soldering, welding or crimping alone		N
	For Class II appliances: soldering, welding or crimping alone used, barriers provided, clearances and creepage distances satisfactory if the conductor becomes free		N
27	PROVISION FOR EARTHING		
27.1	Accessible metal parts of Class 0I and I appliances, permanently and reliably connected to an earthing terminal or contact of the appliance inlet	Class II with class III parts, no earthing	N
	Earthing terminals not connected to neutral terminal		N
	Class 0, II and III appliance have no provision for earthing		P
	Safety extra-low voltage circuits not earthed, unless protective extra-low voltage circuits		N
27.2	Clamping means adequately secured against accidental loosening		N
	Terminals used for the connection of external equipotential bonding conductors allow connection of conductors of 2.5 to 6 mm ² , and		N
	do not provide earthing continuity between different parts of the appliance		N
	Conductors cannot be loosened without the aid of a tool		N
27.3	For appliances with supply cord, current-carrying conductors become taut before earthing conductor, if the cord slips out of the cord anchorage		N

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Clause	Requirement – Test	Result – Remark	Verdict
27.4	No risk of corrosion resulting from contact between metal of earthing terminal and other metal		N
	Adequate resistance to corrosion of coated or uncoated parts providing earthing continuity, other than parts of a metal frame or enclosure		N
	Parts of steel providing earthing continuity provided at the essential areas with an electroplated coating, thickness at least 5 µm		N
	Adequate protection against rusting of parts of coated or uncoated steel, only intended to provide or transmit contact pressure		N
	In case of aluminium alloys precautions taken to avoid risk of corrosion		N
27.5	Low resistance of connection between earthing terminal and earthed metal parts		N
	This requirement does not apply to connections providing earthing continuity in the protective extra-low voltage circuit, provided that clearances of basic insulation are based on the rated voltage of the appliance		N
	Resistance not exceeding 0,1 Ω at the specified low-resistance test		N
27.6	The printed conductors of printed circuit boards not used to provide earthing continuity in hand held appliances		N
	They may be used in other appliances if:		N
	- at least two tracks are used with independent soldering points and the appliance complies with requirements of 27.5 for each circuit		N
	- the material of the printed circuit board complies with IEC 60249-2-4 or IEC 60249-2-5		N

28	SCREWS AND CONNECTIONS		
28.1	Fixings, electrical connections and connections providing earthing continuity withstand mechanical stresses		P
	Screws not of soft metal liable to creep, such as zinc or aluminium		P
	Diameter of screws of insulating material min. 3 mm	No screws of insulation material	N

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Clause	Requirement – Test	Result – Remark	Verdict
	Screws of insulating material not used for any electrical connection or connections providing earthing continuity		N
	Screws used for electrical connections or connections providing earthing continuity screw into metal	No screws for electrical connection or earthing	N
	Screws not of insulating material if their replacement by a metal screw can impair supplementary or reinforced insulation	No screws of insulation material	N
	Type X attachment, screws to be removed for replacement of supply cord or for user maintenance, not of insulating material if their replacement by a metal screw can impair basic insulation		N
	For screws and nuts; test as specified	(see appended table) no such screw	N
28.2	Electrical connections and connections providing earthing continuity constructed so that contact pressure not transmitted through insulating material liable to shrink or distort, unless shrinkage or distortion compensated		P
	This requirement does not apply to electrical connections in circuits carrying a current not exceeding 0.5A		P
28.3	Space-threaded (sheet metal) screws only used for electrical connections if they clamp the parts together	No such screws used	N
	Thread-cutting (self-tapping) screws only used for electrical connections if they generate a full form standard machine screw thread	No such screws used	N
	Such screws not used if they are likely to be operated by the user or installer unless the thread is formed by a swaging action		N
	Thread-cutting and space-threaded screws may be used in connections providing earthing continuity, provided unnecessary to disturb the connection and at least two screws are used for each connection		N
28.4	Screws and nuts that make mechanical connection secured against loosening if they also make electrical connections or connections providing earthing continuity	No such screws used	N

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Clause	Requirement – Test	Result – Remark	Verdict
	Rivets for electrical connections or connections providing earthing continuity secured against loosening if subjected to torsion		N
29	CLEARANCES, CREEPAGE DISTANCES AND SOLID INSULATION		
	Clearances, creepage distances and solid insulation withstand electrical stress		P
	For coatings used on printed circuits boards to protect the microenvironment or to provide basic insulation, annex J applies	No coating used	N
29.1	Clearances not less than the values specified in table 16, taking into account the rated impulse voltage for the overvoltage categories of table 15		P
	The values specified may be smaller for basic insulation and functional insulation if the clearance meets the impulse voltage test of clause 14		N
	Appliances are in overvoltage category II		P
	Clearances less than specified in table 16 not allowed for basic insulation of class 0 and class 0I appliances,	Appliance in class II with class III parts	N
	or if pollution degree 3 is applicable		N
	Compliance is checked by inspection and measurements as specified		P
29.1.1	Clearances of basic insulation withstand the overvoltages, taking into account the rated impulse voltage		P
	Clearance at the terminals of tubular sheathed heating elements may be reduced to 1mm if the microenvironment is pollution degree 1	No heating element	N
	Lacquered conductors of windings assumed to be bare conductors, but the clearances specified in table 16 are reduced by 0.5mm for rated impulse voltages of at least 1500V		P
29.1.2	Clearances of supplementary insulation not less than those specified for basic insulation in table 16	Supplementary insulation only in the approved adaptor, no additional tests necessary	N
29.1.3	Clearances of reinforced insulation not less than those specified for basic insulation in table 16, but using the next higher step for rated impulse voltage	Reinforced insulation only in the approved adaptor, no additional tests necessary	N

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Clause	Requirement – Test	Result – Remark	Verdict
29.1.4	For functional insulation, the values of table 16 are applicable, unless		P
	the appliance complies with clause 19 with the functional insulation short-circuited		P
	Clearances at crossover points of lacquered conductors not measured		P
	Clearance between surfaces of PTC heating elements may be reduced to 1mm		N
	Lacquered conductors of windings assumed to be bare conductors, but the clearances specified in table 16 are reduced by 0.5mm for rated impulse voltages of at least 1500V		P
29.1.5	Appliances having higher working voltage than rated voltage, the voltage used for determining clearances from table 16 is the sum of the rated impulse voltage and the difference between the peak value of the working voltage and the peak value of the rated voltage		N
	If the secondary winding of a step-down transformer is earthed, or if there is an earthed screen between the primary and secondary windings, clearances of basic insulation on the secondary side not less than those specified in table 16, but using the next lower step for rated impulse voltage	Adaptor with the step-down converter is in class II	N
	Circuits supplied with a voltage lower than rated voltage, clearances of functional insulation based on the working voltage used as the rated voltage in table 15		P
29.2	Creepage distances not less than those appropriate for the working voltage, taking into account the material group and the pollution degree		P
	Pollution degree 2 applies, unless		P
	precautions taken to protect the insulation; pollution degree 1		N
	insulation subjected to conductive pollution; pollution degree 3		N
	Compliance is checked by inspection and measurements as specified		P

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Clause	Requirement – Test	Result – Remark	Verdict
	Microenvironment is pollution degree 3 unless insulation is enclosed or located that it is unlikely to be exposed to pollution during normal use (EN 60335-2-80)		P
29.2.1	Creepage distances of basic insulation not less than specified in table 17		P
	For pollution degree 1, creepage distance not less than the minimum specified for the clearance in table 16, if the clearance has been checked according to the test of clause 14	Some creepage distances of the functional insulation are smaller than the values in table 18, but only for low power circuits, no additional tests necessary	N
29.2.2	Creepage distances of supplementary insulation at least as specified for basic insulation in table 17	Supplementary insulation only in the approved adaptor, no additional tests necessary	N
29.2.3	Creepage distances of reinforced insulation at least double as specified for basic insulation in table 17	Reinforced insulation only in the approved adaptor, no additional tests necessary	N
29.2.4	Creepage distances of functional insulation not less than specified in table 18		P
	Creepage distances may be reduced if the appliance complies with clause 19 with the functional insulation short-circuited		P
29.3	Solid insulation having a minimum thickness of 1mm for supplementary insulation,	Supplementary insulation only in the approved adaptor, no additional tests necessary	N
	and 2mm for reinforced insulation	Reinforced insulation only in the approved adaptor, no additional tests necessary	N
	This requirement does not apply if the supplementary insulation, other than mica or similar scaly material, consists of at least two layers, each of the layers withstands the electric strength test of 16.3		N
	This requirement does not apply if the reinforced insulation, other than mica or similar scaly material, consists of at least three layers, any two layers together withstand the electric strength test of 16.3		N
	This requirement also does not apply to inaccessible insulation and does not exceed the maximum permissible temperature values, or		N

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Clause	Requirement – Test	Result – Remark	Verdict
	if the insulation, after conditioning as specified, withstands the electric strength test of 16.3		N
30	RESISTANCE TO HEAT AND FIRE		
30.1	External parts of non-metallic material,		P
	parts supporting live parts, and	Live parts only inside the approved adaptor, no additional tests necessary	N
	thermoplastic material providing supplementary or reinforced insulation,		N
	sufficiently resistant to heat		P
	Ball-pressure test according to IEC 60695-10-2		P
	External parts: at 40 °C plus the maximum temperature rise determined during the test of clause 11, or at 75 °C, whichever is the higher; temperature (°C)	75°C	P
	Parts supporting live parts: at 40°C plus the maximum temperature rise determined during the test of clause 11, or at 125°C, whichever is the higher; temperature (°C).....	Live parts only inside the approved adaptor, no additional tests necessary	N
	Parts of thermoplastic material providing supplementary or reinforced insulation, 25°C plus the maximum temperature rise determined during clause 19, if higher; temperature (°C)	Supplementary and reinforced insulation only in the approved adaptor, no additional tests necessary	N
30.2	Relevant parts of non-metallic material adequately resistant to ignition and spread of fire		P
30.2.1	Glow-wire test of IEC 60695-2-11 at 550 °C, unless	Plastic materials of the enclosure and plastic material of the plug and socket connector	P
	the material is classified at least HB40 according to IEC 60695-11-10		N
	Parts for which the glow-wire test cannot be carried out meet the requirements in ISO9772 for category FH3 material		N
30.2.3	Appliances operated while unattended, tested as specified in 30.2.3.1 and 30.2.3.2		P
	Test not applicable to conditions as specified	All circuits after the approved adaptor are low power circuits	P

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Clause	Requirement – Test	Result – Remark	Verdict
30.2.3.1	Parts of insulating material supporting connections carrying a current exceeding 0.2A during normal operation, and		N
	parts of insulating material within a distance of 3mm,		N
	having a glow-wire flammability index of at least 850°C according to IEC 60695-2-12		N
30.2.3.2	Parts of insulating material supporting current-carrying connections, and		N
	parts of insulating material within a distance of 3mm,		N
	subjected to glow-wire test of IEC 60695-2-11		N
	Test not carried out on material having a glow-wire ignition temperature according to IEC 60695-2-13 as specified		N
	Glow-wire test of IEC 60695-2-11, the temperature being:		
	-750°C, for connections carrying a current exceeding 0,2A during normal operation		N
	-650°C, for other connections		N
	Parts that during the test produce a flame persisting longer than 2 s, tested as specified		N
	If a flame persists longer than 2 s during the test, parts above the connection, as specified, subjected to the needle-flame test of annex E, unless		N
	the material is classified as V-0 or V-1 according to IEC 60695-11-10		N
30.2.4	Base material of printed circuit boards subjected to needle-flame test of annex E		N
	Test not applicable to conditions as specified	PCB part of the low power circuit	N
31	RESISTANCE TO RUSTING		
	Relevant ferrous parts adequately protected against rusting		P
32	RADIATION, TOXICITY AND SIMILAR HAZARDS		
	Appliance does not emit harmful radiation		P

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Clause	Requirement – Test	Result – Remark	Verdict
	Appliance does not present a toxic or similar hazard		P
A	ANNEX A (INFORMATIVE) ROUTINE TESTS		
	Description of routine tests to be carried out by the manufacturer		N
B	ANNEX B (NORMATIVE) APPLIANCES POWERED BY RECHARGEABLE BATTERIES		
	The following modifications to this standard are applicable for appliances powered by batteries that are recharged in the appliance	Appliance without batteries	N
	This annex does not apply to battery chargers		N
3.1.9	Appliance operated under the following conditions:		
	-the appliance, supplied by its fully charged battery, operated as specified in relevant part 2		N
	-the battery is charged, the battery being initially discharged to such an extent that the appliance cannot operate		N
	-if possible, the appliance is supplied from the supply mains through its battery charger, the battery being initially discharged to such an extent that the appliance cannot operate. The appliance is operated as specified in relevant part 2		N
	If the appliance incorporates inductive coupling between two parts that are detachable from each other, the appliance is supplied from the supply mains with the detachable part removed		N
3.6.2	Part to be removed in order to discard the battery is not considered to be detachable		N
5.101	Appliances supplied from the supply mains tested as specified for motor-operated appliances		N
7.1	Battery compartment for batteries intended to be replaced by the user, marked with battery voltage and polarity of the terminals		N
7.12	The instructions for appliances incorporating batteries intended to be replaced by the user includes required information		N
	Details about how to remove batteries containing materials hazardous to the environment given		N

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Clause	Requirement – Test	Result – Remark	Verdict
7.15	Markings placed on the part of the appliance connected to the supply mains		N
8.2	Appliances having batteries that according to the instruction may be replaced by the user need only have basic insulation between live parts and the inner surface of the battery compartment		N
	If the appliance can be operated without batteries, double or reinforced insulation required		N
11.7	The battery is charged for the period described		N
19.1	Appliances subjected to tests of 19.101, 19.102 and 19.103		N
19.101	Appliances supplied at rated voltage for 168 h, the battery being continually charged		N
19.102	Short-circuiting of the terminals of the battery, being fully charged, for appliances having batteries that can be removed without the aid of a tool		N
19.103	Appliances having batteries replaceable by the user supplied at rated voltage under normal operation with the battery removed or in any position allowed by the construction		N
21.101	Appliances having pins for insertion into socket-outlets have adequate mechanical strength, checked according to procedure 2 of IEC 68-2-32		N
	Part of the appliance incorporating the pins subjected to the free fall test, procedure 2, of IEC 60068-2-32, the number of falls being:		
	- 100, the mass of part does not exceed 250 g		N
	- 50, the mass of part exceeds 250 g		N
	After the test, the requirements of 8.1, 15.1.1, 16.3 and clause 29 are met		N
22.3	Appliances having pins for insertion into socket-outlets tested as fully assembled as possible		N
25.13	An additional lining or bushing not required for interconnection cords operating at safety extra-low voltage		N
30.2	For parts of the appliance connected to the supply mains during the charging period, 30.2.3 applies		N
	For other parts, 30.2.2 applies		N

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Clause	Requirement – Test	Result – Remark	Verdict
C	ANNEX C (NORMATIVE) AGEING TEST ON MOTORS		
	Tests, as described, carried out when doubt with regard to the temperature classification of the insulation of a motor winding		N
D	ANNEX D (NORMATIVE) ALTERNATIVE REQUIREMENTS FOR PROTECTED MOTORS		
	Applicable to protected motors for unattended use, test of 19.7 carried out on a separate sample according to the specification		N
E	ANNEX E (NORMATIVE) NEEDLE-FLAME TEST		
	Needle-flame test carried out in accordance with IEC 60695-2-2, with the following modifications:	Only low power circuits, needle flame test not necessary	N
5	Severities		
	The duration of application of the test flame is 30 s ± 1 s		N
8	Test procedure		
8.2	The specimen so arranged that the flame can be applied to a vertical or horizontal edge as shown in the examples of figure 1		N
8.4	The first paragraph does not apply		N
	If possible, the flame is applied at least 10 mm from a corner		N
8.5	The test is carried out on one specimen		N
	If the specimen does not withstand the test, the test may be repeated on two further specimens, both withstanding the test		N
10	Evaluation of test results		
	The duration of burning not exceeding 30 s		N
	However, for printed circuit boards, the duration of burning not exceeding 15 s		N

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Clause	Requirement – Test	Result – Remark	Verdict
F	ANNEX F (NORMATIVE) CAPACITORS		
	Capacitors likely to be permanently subjected to the supply voltage, and used for radio interference suppression or voltage dividing, comply with the following clauses of IEC 60384-14, with the following modifications:	No capacitor which is permanently subjected to the supply voltage	N
1.5	Terminology		
1.5.3	Class X capacitors tested according to subclass X2		N
1.5.4	This subclause is applicable		N
1.6	Marking		
	Items a) and b) are applicable		N
3.4	Approval testing		
3.4.3.2	Table II is applicable as described		N
4.1	Visual examination and check of dimensions		
	This subclause is applicable		N
4.2	Electrical tests		
4.2.1	This subclause is applicable		N
4.2.5	This subclause is applicable		N
4.2.5.2	Only table IX is applicable		N
	Values for test A apply		N
	However, for capacitors in heating appliances the values for test B or C apply		N
4.12	Damp heat, steady state		
	This subclause is applicable		N
	Only insulation resistance and voltage proof are checked		N
4.13	Impulse voltage		
	This subclause is applicable		N
4.14	Endurance		
	Subclauses 4.14.1, 4.14.3, 4.14.4 and 4.14.7 applicable		N
4.14.7	Only insulation resistance and voltage proof are checked		N
	Visual examination, no visible damage		N

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Clause	Requirement – Test	Result – Remark	Verdict
4.17	Passive flammability test		
	This subclause is applicable		N
4.18	Active flammability test		
	This subclause is applicable		N
G	ANNEX G (NORMATIVE) SAFETY ISOLATING TRANSFORMERS		
	The following modifications to this standard are applicable for safety isolating transformers:		N
7	Marking and instructions		
7.1	Transformers for specific use marked with:		
	-name, trademark or identification mark of the manufacturer or responsible vendor		N
	-model or type reference		N
17	Overload protection of transformers and associated circuits		N
	Fail-safe transformers comply with subclause 15.5 of IEC 61558-1		N
22	Construction		
	Subclauses 19.1 and 19.1.2 of IEC 61558-2-6 are applicable		N
29	Clearances, creepage distances and solid insulation		
29.1 and 29.2	The distances specified in items 2a, 2c and 3 in table 13 of IEC 61558-1 apply		N
H	ANNEX H (NORMATIVE) SWITCHES		
	Switches comply with the following clauses of IEC 61058-1, as modified:		
	-The tests of IEC 61058-1 carried out under the conditions occurring in the appliance	Approved switch used in an low power circuit, no tests necessary	N
	-Before being tested, switches are operated 20 times without load		N
8	Marking and documentation		
	Switches are not required to be marked		N
	However, switches that can be tested separately from the appliance marked with the manufacturer's name or trade mark and the type reference		N

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Clause	Requirement – Test	Result – Remark	Verdict
13	Mechanism		
	The tests may be carried out on a separate sample		N
15	Insulation resistance and dielectric strength		
15.1	Not applicable		N
15.2	Not applicable		N
15.3	Applicable for full disconnection and micro-disconnection		N
17	Endurance		
	Compliance is checked on three separate appliances or switches		N
	For 17.2.4.4, the number of cycles is 10 000, unless otherwise specified in 24.1.3 of the relevant part 2 of IEC 60335		N
	Switches for operation under no load and which can be operated only by a tool and switches operated by hand that are interlocked so that they cannot be operated under load, are not subjected to the tests		N
	Subclause 17.2.5.2 is not applicable		N
	Temperature rise of the terminals not more than 30 K above the temperature rise measured in clause 11 of IEC 60335-1		N
20	Clearances, creepage distances, solid insulation and coatings of rigid printed board assemblies		
	This clause is applicable to clearances and creepage distances for functional insulation, across full disconnection and micro-disconnection, as stated in table 24		N

I	ANNEX I (NORMATIVE) MOTORS HAVING BASIC INSULATION THAT IS INADEQUATE FOR THE RATED VOLTAGE OF THE APPLIANCE		
	The following modifications to this standard are applicable for motors having basic insulation that is inadequate for the rated voltage of the appliance:	No such motor	N
8	Protection against access to live parts		
8.1	Metal parts of the motor are considered to be bare live parts		N
11	Heating		

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Clause	Requirement – Test	Result – Remark	Verdict
11.3	Temperature rise of the body of the motor is determined instead of the temperature rise of the windings		N
11.8	Temperature rise of the body of the motor, where in contact with insulating material, not exceeding values in table 3 for the relevant insulating material		N
16	Leakage current and electric strength		
16.3	Insulation between live parts of the motor and its other metal parts not subjected to the test		N
19	Abnormal operation		
19.1	The tests of 19.7 to 19.9 not carried out		N
19.101	Appliance operated at rated voltage with each of the following fault conditions:		N
	- short circuit of the terminals of the motor, including any capacitor incorporated in the motor circuit		N
	- short circuit of each diode of the rectifier		N
	- open circuit of the supply to the motor		N
	- open circuit of any parallel resistor, the motor being in operation		N
	Only one fault simulated at a time, the tests carried out consecutively		N
22	Construction		
22.101	For class I appliances incorporating a motor supplied by a rectifier circuit, the d.c. circuit being insulated from accessible parts of the appliance by double or reinforced insulation		N
	Compliance checked by the tests specified for double and reinforced insulation		N
J	ANNEX J (NORMATIVE) COATED PRINTED CIRCUIT BOARDS		
	Testing of protective coatings of printed circuit boards carried out in accordance with IEC 60664-3 with the following modifications:	PCB without coating	N
6.6	Climatic sequence		
	When production samples are used, three samples of the printed circuit board are tested		N
6.6.1	Cold		

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Clause	Requirement – Test	Result – Remark	Verdict

	The test is carried out at -25°C		N
6.6.3	Rapid change of temperature		
	Severity 1 is specified		N
6.8.6	Partial discharge extinction voltage		
	Type A coatings not subjected to a partial discharge test		N
6.9	Additional tests		
	This subclause is not applicable		N

K	ANNEX K (NORMATIVE) OVERVOLTAGE CATEGORIES		
	The information on overvoltage categories is extracted from IEC 60664-1		P
	Overvoltage category is a numeral defining a transient overvoltage condition		P
	Equipment of overvoltage category IV is for use at the origin of the installation		N
	Equipment of overvoltage category III is equipment in fixed installations and for cases where the reliability and the availability of the equipment is subject to special requirements		N
	Equipment of overvoltage category II is energy consuming equipment to be supplied from the fixed installation		P
	If such equipment is subjected to special requirements with regard to reliability and availability, overvoltage category III applies		N
	Equipment of overvoltage category I is equipment for connection to circuits in which measures are taken to limit transient overvoltages to an appropriate low level		N

L	ANNEX L (INFORMATIVE) GUIDANCE FOR THE MEASUREMENT OF CLEARANCES AND CREEPAGE DISTANCES		
	Sequences for the determination of clearances and creepage distances		P

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Clause	Requirement – Test	Result – Remark	Verdict

M	ANNEX M (NORMATIVE) POLLUTION DEGREE		
	The information on pollution degrees is extracted from IEC 60664-1		P
	Pollution		
	The microenvironment determines the effect of pollution on the insulation, taking into account the microenvironment		P
	Means may be provided to reduce pollution at the insulation by effective enclosures or similar		P
	Minimum clearances specified where pollution may be present in the microenvironment		P
	Degrees of pollution in the microenvironment		
	For evaluating creepage distances, the following degrees of pollution in the microenvironment are established:		
	- pollution degree 1: no pollution or only dry, non-conductive pollution occurs. The pollution has no influence		N
	- pollution degree 2: only non-conductive pollution occurs, except that occasionally a temporary conductivity caused by condensation is to be expected		P
	- pollution degree 3: conductive pollution occurs or dry non-conductive pollution occurs that becomes conductive due to condensation that is to be expected		N
	- pollution degree 4: the pollution generates persistent conductivity caused by conductive dust or by rain or snow		N

N	ANNEX N (NORMATIVE) PROOF TRACKING TEST		
	The proof tracking test is carried out in accordance with IEC 60112 with the following modifications:		N
5	Test apparatus		
5.1	Electrodes		N
	The note does not apply		N
5.4	Test solutions		

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Clause	Requirement – Test	Result – Remark	Verdict
	Test solution A is used		N
6	Procedure		
6.3	Proof tracking test		
	Voltage is 100V, 175V, 400V or 600V..... : -----		N
	Note 3 of clause 3 applies		N
	The test is carried out on five specimens		N
	In case of doubt, additional test with voltage reduced by 25V, the number of drops increased to 100		N
7	Report		
	The report stating if the PTI value was based on a test using 100 drops with a test voltage of (PTI-25) V		N

O	ANNEX O (INFORMATIVE) SELECTION AND SEQUENCE OF THE TESTS OF CLAUSE 30		
	Description of tests for determination of resistance to heat and fire		P

ZA	ANNEX ZA, SPECIAL NATIONAL CONDITIONS (EN 60335-1)		
7.12	DENMARK: requirements regarding marking tag of power supply cord and connecting of earthing wire	Appliance with plug and in class II	N
19.5	NORWAY: the test is also applicable to appliances intended to be permanently connected to fixed wiring	Appliance without heating element	N
22.2	FRANCE, NORWAY: The second paragraph of this subclause dealing with single-phase Class I appliances with heating elements is not applicable due to the supply system	Appliance without heating element	N
25.6	BELGIUM, FRANCE, SPAIN, UNITED KINGDOM: plugs according to Standard Sheet C2b not allowed (delete Greece A16:01)	Plug C5 used	P
	AUSTRIA, GERMANY, FINLAND, ICELAND, IRELAND, ITALY, LUXEMBOURG, NETHERLANDS, NORWAY, PORTUGAL, SPAIN, SWEDEN, SWITZERLAND, UNITED KINGDOM: plugs according to Standard C3b not allowed	Plug C5 used	P
	DENMARK: Supply cords of single-phase portable appliances having a rated current not exceeding 10 A provided with a plug according to the following:		
	Class I appliances: Section 107-2-DI Standard Sheet DK2-1a	Class II	N

	For appliances covered by a Part 2 of EN 60 335, also plugs in accordance with IEC 83, Standard Sheet C2b, C3b or C4 are allowed		N
	Class II appliances: IEC 83, Standard Sheet C5 or C6	C5	P
	Stationary single-phase appliances, having a rated current not exceeding 10 A, and provided with a plug, the plug is in accordance with the requirements above		P
	Multi-phase appliances and single-phase appliances having a rated current exceeding 10 A, and provided with a plug, the plug is in accordance with the requirements below:		
	Class I appliances: Section 107-2-D1, Standard Sheet DK6-1a/EN 60 309-2, Standard Sheet 2-II, 2-IV	Class II	N
	Class II appliances: Section 107-2-D1, Standard Sheet DK6-1a/2-II, 2-IV	Requirement has to be fulfilled if distributed in that country	N
	IRELAND: plug is in accordance with Standard Sheets B2 and C5	C5	P
	ITALY: plug in accordance with CENELEC Report R0BT-005:2001		
	SPAIN: Appliances having a rated current not exceeding 6 A, provided with a plug complying with UNE 20 315 ESC 10-1b, C4, C6 or ESB 25-5b or UNE-EN 50075:		
	SWITZERLAND: supply cords of portable household and similar electrical appliances, rated current not exceeding 10 A, provided with a plug complying with SEV 1011 or IEC 884-1 and one of the following dimension sheets:		
	SEV 6532-2:1991 plug type 15 3P+N+PE 250/400 V, 10 A	Requirement has to be fulfilled if distributed in that country	N
	SEV 6532-2:1991 plug type 11 L+N 250 V, 10 A	Requirement has to be fulfilled if distributed in that country	N
	SEV 6532-2:1991 plug type 12 L+N+PE 250 V, 10 A	Requirement has to be fulfilled if distributed in that country	N
	UNITED KINGDOM: plug according to Standard Sheet B2 or C5 used (refer to Annex ZB)	C5	P
25.8	IRELAND, UNITED KINGDOM: replacement of figures (rated current/cross-sectional area) in the table		P

ZB	ANNEX ZB, A-DEVIATIONS				
4	SWITZERLAND: information about batteries	No batteries			N
7.1	ITALY: the voltage is 220 V/380 V	Requirement has to be fulfilled if distributed in that country			N
25.6	IRELAND and UNITED KINGDOM: regulations concerning plugs to be fitted to domestic appliances	Requirement has to be fulfilled if distributed in that country			N
10.1	TABLE: Power input deviation				P
Input deviation of/at:	P rated (W)	P measured (W)	dP	Required dP	Remark

Normal load, rpm min.	4,0	3,2	- 0,8	+ 0,64	P
Normal load, rpm max.	4,0	4,2	+ 0,2	+ 0,84	P

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

11.8	TABLE: Heating test, thermocouples			P
	Test voltage (V)	244		—
	Ambient (°C).....	25		—
Thermocouple locations	dT (K)		Max. dT (K)	
	max. rpm	min. rpm		
Capacitor (T85)	14	20	60	
Resistor	24	30	95	
IC	15	30	95	
Resistor for the LED	10	19	95	
Diode near the LED	16	19	95	
Wire from adaptor to electronic	2	4	50	
Resistor near the capacitor	14	21	95	
Plug- and socket connector of the ventilator	0	1	*)	
Enclosure of the motor (operation temp. Max. 70°C)	2	2	min. 45	
Contact of the switch	0	1	30	
Enclosure of the adaptor	21	21	60	
Contact of the potentiometer	6	12	95	
*) no limit, ball pressure test				

11.8	TABLE: Heating test, resistance method					N
	Test voltage (V)..... :	-----			-----	---
	Ambient, t_1 (°C)..... :	-----			-----	---
	Ambient, t_2 (°C)..... :	-----			-----	---
	Temperature rise of winding	R_1 (Ω)	R_2 (Ω)	dT (K)	Max. dT (K)	Insulation class
	-----	-----	-----	-----	-----	-----
	-----	-----	-----	-----	-----	-----

13.2	TABLE: Leakage current					P
	Heating appliances: 1.15 x rated input..... :	-----			-----	---
	Motor-operated and combined appliances: 1.06 x rated voltage..... :	244V			-----	---
	Leakage current between	I (mA)		Max. allowed I (mA)		
	Active parts and enclosure with metal foil	< 0,1		0,25		

13.3	TABLE: Electric strength					P
	Test voltage applied between:	Voltage (V)		Breakdown (Yes/No)		
	Active parts and accessible parts	3000		No		
	Active parts and SELV parts	3000		No		
	SELV parts and accessible parts	500		No		

14	TABLE: Transient overvoltages					N
	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.. :	244V			-----	---
	Three phase appliances 1.06 x rated voltage divided by $\sqrt{3}$:..... :	-----			-----	---
	Leakage current between	I (mA)		Max. allowed I (mA)		
	Active parts and enclosure with metal foil	< 0,1		0,25		

16.3	TABLE: Electric strength		P
Test voltage applied between:		Voltage (V)	Breakdown (Yes/No)
Active parts and accessible parts		3000	No
Active parts and SELV parts		3000	No
SELV parts and accessible parts		500	No

17	TABLE: Overload protection, temperature rise		N
Temperature rise of part/at:		dT (K)	Max. dT (K)
----		----	----
----		----	----

19.7	TABLE: Abnormal operation, locked rotor/moving parts				See 19.13	
	Test voltage (V).....:	230V		—		
	Ambient, t_1 (°C).....:	25		—		
	Ambient, t_2 (°C).....:	25		—		
Temperature of winding		R_1 (Ω)	R_2 (Ω)	dT (K)	T (°C)	Max. T (°C)
----		----	----	----	----	----
----		----	----	----	----	----

19.9	TABLE: Abnormal operation, running overload				N	
	Test voltage (V).....:	----		—		
	Ambient, t_1 (°C).....:	----		—		
	Ambient, t_2 (°C).....:	----		—		
Temperature of winding		R_1 (Ω)	R_2 (Ω)	dT (K)	T (°C)	Max. T (°C)
----		----	----	----	----	----
----		----	----	----	----	----

19.13	TABLE: Abnormal operation, temperature rises			P
Thermocouple locations	dT (K)		Max. dT (K)	
	max. rpm	min. rpm		
Capacitor (T85)	23	24	No limit	
Resistor	33	34	No limit	
IC	35	36	No limit	
Resistor for the LED	21	25	No limit	
Diode near the LED	34	24	No limit	
Wire from adaptor to electronic	6	7	150	
Resistor near the capacitor	25	26	No limit	
Plug- and socket connector of the ventilator	2	2	*)	
Enclosure of the motor (operation temp. max. 70°C)	28	8	125 (see 19.7 for the winding)	
Contact of the switch	2	22	No limit	
Enclosure of the adaptor	25	23	No limit	
Contact of the potentiometer	28	22	No limit	

24.1	TABLE: Components					P
Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity	
Direct plug-in adaptor	Ansmann / Minwa Electronics Co., Ltd.	MC120S050	Input: 230V~ 50Hz; 14W Output: 12V DC; 500mA; 6VA	EN 61558-2-6	TÜV Rheinland / S 50023719	
Switch	Lohmann & Welchehold	Typ: 96...	3/6(1)A; 250VAC	-----	VDE / 082924	
Ventilator	Sunonwealth Electric Machine Industry Co., Ltd.	KDE1208PTS 3-6	DC12V; 1,4W	-----	UL / E77551	

¹⁾ An asterisk indicates a mark which assures the agreed level of surveillance

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

29.1	TABLE: Clearances						P
	Overvoltage category.. :	II				—	
		Type of insulation:					
Rated impulse voltage (V):	Min. cl (mm)	Basic	Functional	Supplementary	Reinforced	Verdict / Remark	
	0,5	0,5	0,5	----	----	P	
	0,5	----	----	----	----	N	
	0,5	----	----	----	----	N	
	1,0	----	----	----	----	N	
	2,0	----	----	----	----	N	
	3,5	----	----	----	----	N	
	6,0	----	----	----	----	N	
	8,5	----	----	----	----	N	
	11,5	----	----	----	----	N	

29.2	TABLE: Creepage distances, basic, supplementary and reinforced insulation										P	
Working voltage (V)	Creepage distance (mm)								Pollution degree			Verdict
	1	2			3			Type of insulation				
		Material group			Material group							
		I	II	IIIa/IIIb	I	II	IIIa/IIIb	B ^{*)}	S ^{*)}	R ^{*)}		
≤50	0,2	0,6	0,9	1,2	1,5	1,7	1,9	X	—	—	P	
≤50	0,2	0,6	0,9	1,2	1,5	1,7	1,9	—		—	N	
≤50	0,4	1,2	1,8	2,4	3,0	3,4	3,8	—	—		N	
>50 and ≤125	0,3	0,8	1,1	1,5	1,9	2,1	2,4		—	—	N	
>50 and ≤125	0,3	0,8	1,1	1,5	1,9	2,1	2,4	—		—	N	
>50 and ≤125	0,6	1,6	2,2	3,0	3,8	4,2	4,8	—	—		N	
>125 and ≤250	0,6	1,3	1,8	2,5	3,2	3,6	4,0		—	—	N	
>125 and ≤250	0,6	1,3	1,8	2,5	3,2	3,6	4,0	—		—	N	
>125 and ≤250	1,2	2,6	3,6	5,0	6,4	7,2	8,0	—	—		N	
>250 and ≤400	1,0	2,0	2,8	4,0	5,0	5,6	6,3		—	—	N	
>250 and ≤400	1,0	2,0	2,8	4,0	5,0	5,6	6,3	—		—	N	
>250 and ≤400	2,0	4,0	5,6	8,0	10,0	11,2	12,6	—	—		N	

>400 and ≤500	1,3	2,5	3,6	5,0	6,3	7,1	8,0		—	—	N
>400 and ≤500	1,3	2,5	3,6	5,0	6,3	7,1	8,0	—		—	N
>400 and ≤500	2,6	5,0	7,2	10,0	12,6	14,2	16,0	—	—		N
>500 and ≤800	1,8	3,2	4,5	6,3	8,0	9,0	10,0		—	—	N
>500 and ≤800	1,8	3,2	4,5	6,3	8,0	9,0	10,0	—		—	N
>500 and ≤800	3,6	6,4	9,0	12,6	16,0	18,0	20,0	—	—		N
>800 and ≤1000	2,4	4,0	5,6	8,0	10,0	11,0	12,5		—	—	N
>800 and ≤1000	2,4	4,0	5,6	8,0	10,0	11,0	12,5	—		—	N
>800 and ≤1000	4,8	8,0	11,2	16,0	20,0	22,0	25,0	—	—		N
>1000 and ≤1250	3,2	5,0	7,1	10,0	12,5	14,0	16,0		—	—	N
>1000 and ≤1250	3,2	5,0	7,1	10,0	12,5	14,0	16,0	—		—	N
>1000 and ≤1250	6,4	10,0	14,2	20,0	25,0	28,0	32,0	—	—		N
>1250 and ≤1600	4,2	6,3	9,0	12,5	16,0	18,0	20,0		—	—	N
>1250 and ≤1600	4,2	6,3	9,0	12,5	16,0	18,0	20,0	—		—	N
>1250 and ≤1600	8,4	12,6	18,0	25,0	32,0	36,0	40,0	—	—		N
>1600 and ≤2000	5,6	8,0	11,0	16,0	20,0	22,0	25,0		—	—	N
>1600 and ≤2000	5,6	8,0	11,0	16,0	20,0	22,0	25,0	—		—	N
>1600 and ≤2000	11,2	16,0	22,0	32,0	40,0	44,0	50,0	—	—		N
>2000 and ≤2500	7,5	10,0	14,0	20,0	25,0	28,0	32,0		—	—	N
>2000 and ≤2500	7,5	10,0	14,0	20,0	25,0	28,0	32,0	—		—	N
>2000 and ≤2500	15,0	20,0	28,0	40,0	50,0	56,0	64,0	—	—		N
>2500 and ≤3200	10,0	12,5	18,0	25,0	32,0	36,0	40,0		—	—	N
>2500 and ≤3200	10,0	12,5	18,0	25,0	32,0	36,0	40,0	—		—	N
>2500 and ≤3200	20,0	25,0	36,0	50,0	64,0	72,0	80,0	—	—		N
>3200 and ≤4000	12,5	16,0	22,0	32,0	40,0	45,0	50,0		—	—	N
>3200 and ≤4000	12,5	16,0	22,0	32,0	40,0	45,0	50,0	—		—	N
>3200 and ≤4000	25,0	32,0	44,0	64,0	80,0	90,0	100,0	—	—		N
>4000 and ≤5000	16,0	20,0	28,0	40,0	50,0	56,0	63,0		—	—	N
>4000 and ≤5000	16,0	20,0	28,0	40,0	50,0	56,0	63,0	—		—	N
>4000 and ≤5000	32,0	40,0	56,0	80,0	100,0	112,0	126,0	—	—		N
>5000 and ≤6300	20,0	25,0	36,0	50,0	63,0	71,0	80,0		—	—	N
>5000 and ≤6300	20,0	25,0	36,0	50,0	63,0	71,0	80,0	—		—	N
>5000 and ≤6300	40,0	50,0	72,0	100,0	126,0	142,0	160,0	—	—		N
>6300 and ≤8000	25,0	32,0	45,0	63,0	80,0	90,0	100,0		—	—	N

>6300 and ≤8000	25,0	32,0	45,0	63,0	80,0	90,0	100,0	—	—	—	N
>6300 and ≤8000	50,0	64,0	90,0	126,0	160,0	180,0	200,0	—	—	—	N
>8000 and ≤10000	32,0	40,0	56,0	80,0	100,0	110,0	125,0	—	—	—	N
>8000 and ≤10000	32,0	40,0	56,0	80,0	100,0	110,0	125,0	—	—	—	N
>8000 and ≤10000	64,0	80,0	112,0	160,0	200,0	220,0	250,0	—	—	—	N
>10000 and ≤12500	40,0	50,0	71,0	100,0	125,0	140,0	160,0	—	—	—	N
>10000 and ≤12500	40,0	50,0	71,0	100,0	125,0	140,0	160,0	—	—	—	N
>10000 and ≤12500	80,0	100,0	142,0	200,0	250,0	280,0	320,0	—	—	—	N

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

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

>8000 and ≤10000	32,0	40,0	56,0	80,0	100,0	110,0	125,0	N
>10000 and ≤12500	40,0	50,0	71,0	100,0	125,0	140,0	160,0	N

30.1	TABLE: Ball pressure			P
Part	Test temperature (°C)	Impression diameter (mm)	Allowed impression diameter (mm)	
Plastic material of the enclosure (food of the stand)	75	1,7	2,0	
Plastic material of the enclosure (pipe)	75	2,0	2,0	
Plastic material of the enclosure (material 3)	75	1,5	2,0	
Plastic material of the plug and socket connector (<42,4VDC)	75	1,1	2,0	

 End of the test protocol

ANNEX Photo documentation

Biothys Gel-O-Star Version 2005



Fixing for the pipe



Fixing for the scent- parts





Gate over the ventilator



Control switch for the revolutions per minute



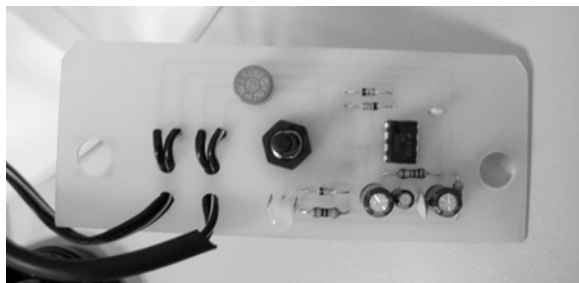
Bottom parts



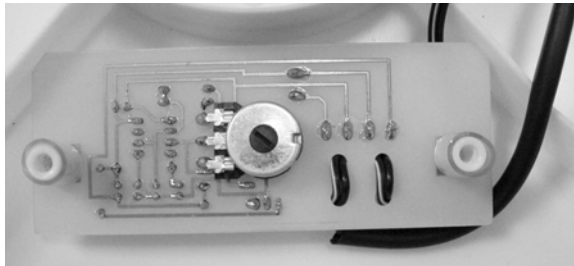
Switch



Inside the switch



PCB



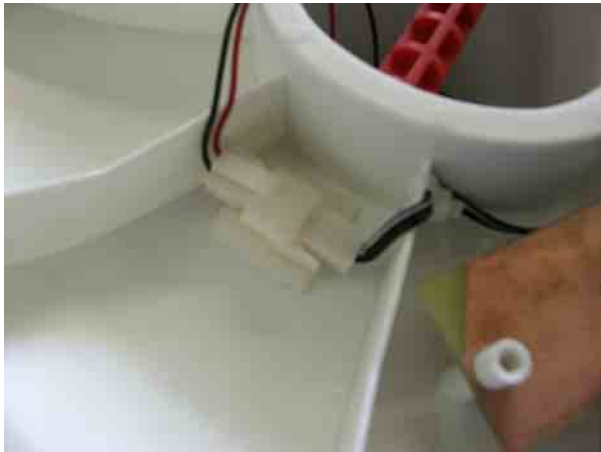
Gate over the ventilator from bellow



Direct plug-in adaptor



Cord anchorages of the wire from the direct plug-in adaptor to the electronic



Plug and socket connector with cord anchorage

ANNEX Used measuring instruments			
Kind of instrument	Manufacturer	Typename	Inventory no.
Temperature recorder	Yokogawa	DR130	1366
Insulation resistance measuring	Meßtechnik Mellenbach	ISO 1000	2092
High-voltage tester	TPW Thalheim	WIP 6	2071
Leakage current measuring	SLG Testing and Certification Co. Ltd.		2168
Digital multimeter	Fluke	189	1386
Power meter	Yokogawa	WT210	1390
Climatic chamber	feutron Greiz	KPK	1309
Spring operated impact hammer	PTL Dr. Grabenhorst	F 22.50	1275
Test finger	PTL Dr. Grabenhorst	Test probe B IEC 61032	1406
Test pin	SLG Testing and Certification Co. Ltd.	Test probe 13 IEC 61032	2222
Torque screwdriver			1225
Inclinate plane	SLG Testing and Certification Co. Ltd.	10 grd, 15 grd	2203
Automatically operated oven	Medizinische Geräte Berlin	TS 100	1217
Ball pressure test device	SLG Testing and Certification Co. Ltd.		1245
Glow wire test device	SLG Testing and Certification Co. Ltd.		2156