
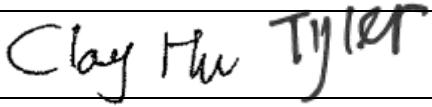





TEST REPORT IEC 60335-2-35 Part 1: Safety of household and similar electrical appliances Part 2: Particular requirements for instantaneous water heaters	
Report Number..... :	GZES191202867731
Date of issue	2020-04-12
Total number of pages	102
Name of Testing Laboratory preparing the Report	SGS-CSTC Standards Technical Services Co., Ltd. Shunde Branch
Applicant's name	ORIGINS ULTIMATE
Address..... :	# 60, Khuba Plots, Gulbarga, 585102, India
Test specification:	
Standard	IEC 60335-2-35:2012, IEC 60335-2-35:2012/AMD1:2016 in conjunction with IEC 60335-1:2010, IEC 60335-1:2010/COR1:2010, IEC 60335-1:2010/COR2:2010, IEC 60335-1:2010/AMD1:2013, IEC 60335-1:2010/AMD1:2013/COR1:2014, IEC 60335-1:2010/AMD2:2016, IEC 60335-1:2010/AMD2:2016/COR1:2016
Test procedure..... :	CB Scheme
Non-standard test method..... :	N/A
Test Report Form No. :	IEC60335_2_35H
Test Report Form(s) Originator.... :	VDE Prüf- und Zertifizierungsinstitut GmbH
Master TRF	Dated 2017-04
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General disclaimer:	
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Test item description	Instantaneous Water Heater (Instant Electric Water Heater)	
Trade Mark		
Manufacturer.....	Same as applicant	
Model/Type reference	FD68P; FD55P	
Ratings	220 V – 240 V; 50 Hz / 60 Hz; Class I; IP25; 0,6 MPa; FD68P: 6800 W; FD55P: 5500 W.	
Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):		
<input checked="" type="checkbox"/> CB Testing Laboratory:	SGS-CSTC Standards Technical Services Co., Ltd. Shunde Branch	
Testing location/ address	Building 1, European Industrial Park, No.1, Shunhe South Road, Wusha, Daliang, Shunde District, Foshan, Guangdong, China	
Tested by (name, function, signature)	Clay Hu / Tyler Li / Project engineer	
Approved by (name, function, signature) ..	Mike Liu / Reviewer	
<input type="checkbox"/> Testing procedure: CTF Stage 1:		
Testing location/ address		
Tested by (name, function, signature)		
Approved by (name, function, signature) ..		
<input type="checkbox"/> Testing procedure: CTF Stage 2:		
Testing location/ address		
Tested by (name + signature)		
Witnessed by (name, function, signature) . :		
Approved by (name, function, signature) .. :		
<input type="checkbox"/> Testing procedure: CTF Stage 3:		
<input type="checkbox"/> Testing procedure: CTF Stage 4:		
Testing location/ address		
Tested by (name, function, signature)		
Witnessed by (name, function, signature) . :		
Approved by (name, function, signature) .. :		
Supervised by (name, function, signature) :		

<p>List of Attachments (including a total number of pages in each attachment): Attachment 1: 3 pages of GCC National Difference Attachment 2: 21 pages of IEC 61558-2-16 Annex BB Attachment 3: 3 pages of circuit diagram Attachment 4: 17 pages of photo document</p>															
<p>Summary of testing:</p>															
<p>Tests performed (name of test and test clause): IEC 60335-2-35: 2012 + A1: 2016 IEC 60335-1: 2010 + A1: 2013 + A2: 2016</p> <p>After reviewing, Test were carried out as following:</p> <table border="1"> <thead> <tr> <th>Model</th> <th>DC Water Pump</th> <th>Test Clause</th> </tr> </thead> <tbody> <tr> <td rowspan="2">FD68P</td> <td>P607724F</td> <td>Full test</td> </tr> <tr> <td>CG0324112002 (alternative)</td> <td>10, 11, 13, 19.7, 30</td> </tr> <tr> <td rowspan="2">FD55P</td> <td>P607724F</td> <td>10</td> </tr> <tr> <td>CG0324112002 (alternative)</td> <td></td> </tr> </tbody> </table>		Model	DC Water Pump	Test Clause	FD68P	P607724F	Full test	CG0324112002 (alternative)	10, 11, 13, 19.7, 30	FD55P	P607724F	10	CG0324112002 (alternative)		<p>Testing location: See page 2</p>
Model	DC Water Pump	Test Clause													
FD68P	P607724F	Full test													
	CG0324112002 (alternative)	10, 11, 13, 19.7, 30													
FD55P	P607724F	10													
	CG0324112002 (alternative)														
<p>The test data were based on original report GZES191202867601.</p> <p>The submitted appliances complied with the above standards.</p>															
<p>Summary of compliance with National Differences (List of countries addressed): Including national differences for Kingdom of Bahrain, United Arab Emirates, State of Qatar, State of Kuwait, Sultanate of Oman, Republic of Yemen and Kingdom of Saudi Arabia.</p>															

Copy of marking plate:

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



Manufacturer:

ORIGINS ULTIMATE


60, Khuba Plots, Gulbarga, 585102, India

1) As declared by the applicant, the importer (and manufacturer, if it is different)'s name, registered trade name or registered trade mark and the postal address will be marked on the products before being place on the market. The contact details shall be in a language easily understood by end-users and market surveillance authorities.

2) Marking on the packaging or in a document accompanying the electrical equipment is only acceptable if it is not possible to place such markings on the product.

Test item particulars..... :	
Supply connection.....:	Fixed wiring
Nature of supply.....:	a.c.
Class of protection against electric shock.....:	I
Degree of protection against moisture.....:	IP25
Type of cord attachment.....:	No
Instantaneous water heater.....:	<input checked="" type="checkbox"/>
Bare-element water heater.....:	<input type="checkbox"/>
Closed water heater.....:	<input checked="" type="checkbox"/>
Open-outlet water heater.....:	<input type="checkbox"/>
Intended to supply water for showering.....:	<input checked="" type="checkbox"/>
Switch.....:	<input type="checkbox"/>
Flow switch.....:	<input type="checkbox"/>
Pressure relief device.....:	<input type="checkbox"/>
Non-self-resetting thermal cut-out.....:	<input type="checkbox"/>
Self-resetting thermal cut-out.....:	<input checked="" type="checkbox"/>
Non-self-resetting pressure switch.....:	<input type="checkbox"/>
Non-self-resetting protective device.....:	<input type="checkbox"/>
Voltage-maintained non-self-resetting thermal cut-out.....:	<input type="checkbox"/>
All-pole disconnection (multi-phase).....:	<input type="checkbox"/>
Thermal link.....:	<input type="checkbox"/>
Electronic circuit.....:	<input checked="" type="checkbox"/>
with software class.....:	No
Protective electronic circuit.....:	<input type="checkbox"/>
with software class.....:	No
Programmer, timer, switching devices.....:	<input type="checkbox"/>
Remote operation.....:	<input type="checkbox"/>
Appliances - with supply cord.....:	<input checked="" type="checkbox"/>
- with supply cord fitted with a plug.....:	<input type="checkbox"/>
Motor with capacitor in auxiliary winding.....:	<input type="checkbox"/>
Series motors incorporated.....:	<input type="checkbox"/>
Mercury switch provided.....:	<input type="checkbox"/>
Used in vehicles or on board ships or aircraft, additional requirements may be necessary.....:	<input type="checkbox"/>
Additional requirements are specified by the national health authorities.....:	<input type="checkbox"/>
the national authorities responsible for the protection of labour.....:	<input type="checkbox"/>
the national water supply authorities.....:	<input type="checkbox"/>
similar authorities.....:	<input type="checkbox"/>
In many countries regulations exist for the installation of equipment connected to the water mains.....:	<input type="checkbox"/>
.....:	<input type="checkbox"/>
.....:	<input type="checkbox"/>

Possible test case verdicts:	
- test case does not apply to the test object	N/A
- test object does meet the requirement.....	P (Pass)
- test object does not meet the requirement	F (Fail)
Testing	
Date of receipt of test item.....	2019-12-10; 2019-12-10
Date (s) of performance of tests	2019-12-10 to 2020-01-15
General remarks:	
<p>"(See Enclosure #)" refers to additional information appended to the report. "(See appended table)" refers to a table appended to the report.</p> <p>Throughout this report a <input checked="" type="checkbox"/> comma / <input type="checkbox"/> point is used as the decimal separator. This document is issued by the Company subject to its General Conditions of Service, available on request or accessible at http://www.sgs.com/en/Terms-and-Conditions.aspx and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Document.aspx. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.</p> <p>Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.</p> <p>Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 3 months only.</p>	
Manufacturer's Declaration per sub-clause 4.2.5 of IEC60335-2-31:	
The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> Not applicable
When differences exist; they shall be identified in the General product information section.	
Name and address of factory (ies)	Foshan Shunde JNOD Electrical Appliance Co., Ltd. 5th Building, Wisdom Create Wealth Industrial Park, 8 Second Ring Road, Xingtan, Shunde, Foshan, Guangdong, China
General product information:	
Fixed instantaneous water heater mounted on the wall intended for household and indoor use only. Fixed instantaneous water heater intended to supply water for showering Model FD68P was the same as FD55P expect the Rated power.	

IEC 60335-2-35			
Clause	Requirement + Test	Result - Remark	Verdict
5	GENERAL CONDITIONS FOR THE TESTS		—
	Tests performed according to clause 5, e.g. nature of supply, sequence of testing, etc.		P
5.3	When the tests are carried out on a single appliance, tests of clause 22.107, 22.108 and 24.102 carried out before the tests of 19 (IEC 60335-2-35/AMD1)		P
5.7	Inlet water having temperature of 15 °C ± 5 °C used for tests (IEC 60335-2-35/AMD1)		P
	unless the inlet water temperature marked on the appliance will give a more unfavourable result, in which case inlet water at the marked temperature used. (IEC 60335-2-35/AMD1)		N/A
6	CLASSIFICATION		—
6.1	Protection against electric shock (IEC 60335-2-35):		—
	- Bare element water heaters are class I or III (IEC 60335-2-35)		N/A
	- Other water heaters are class I, II or III (IEC 60335-2-35)	Instantaneous water heater: class I	P
6.2	Water heaters be at least IPX1 (IEC 60335-2-35)	IP25	P
7	MARKING AND INSTRUCTIONS		—
7.1	Rated voltage or voltage range (V)	220 V – 240 V	P
	Symbol for nature of supply, or		N/A
	Rated frequency (Hz)	50 Hz / 60 Hz	P
	Rated power input (W), or	FD68P: 6800 W, FD55P: 5500 W	P
	Rated current (A)		N/A
	Manufacturer's or responsible vendor's name, trademark or identification mark.....		P
	Model or type reference	FD68P; FD55P	P
	Symbol IEC 60417-5172, for class II appliances		N/A
	IP number, other than IPX0.....	IP25	P
	Symbol IEC 60417-5180, for class III appliances, unless		N/A
	the appliance is operated by batteries only, or		N/A
	for appliances powered by rechargeable batteries recharged in the appliance		N/A
	Symbol IEC 60417-5018, for class II and class III appliances incorporating a functional earth		N/A
	Marked rated frequency for bare-element water heaters shall not be less than 50 Hz. (IEC 60335-2-35)		N/A

IEC 60335-2-35			
Clause	Requirement + Test	Result - Remark	Verdict
	Appliances are marked with rated pressure in pascals (MPa) (IEC 60335-2-35)	0,6 MPa	P
	If the appliance is intended for use as a booster for inlet water heated by other water heating systems, the maximum inlet water temperature is marked. (IEC 60335-2-35/AMD1)		N/A
	Bare-element water heaters are marked with the minimum water resistivity with which the appliance may be used, and the marked value is not greater than 1 300 Ω cm. (IEC 60335-2-35)		N/A
	Symbol IEC 60417-5036, for the enclosure of electrically-operated water valves in external hose-sets for connection of an appliance to the water mains, if the working voltage exceeds extra-low voltage		N/A
7.2	Warning for stationary appliances for multiple supply		N/A
	Warning placed in vicinity of terminal cover		N/A
7.3	Range of rated values marked with the lower and upper limits separated by a hyphen		P
	Different rated values marked with the values separated by an oblique stroke		P
7.4	Appliances adjustable for different rated voltages or rated frequencies, the voltage or the frequency setting is clearly discernible		N/A
	Requirement met if frequent changes are not required and the rated voltage or rated frequency to which the appliance is to be adjusted is determined from a wiring diagram		N/A
7.5	Appliances with more than one rated voltage or one or more rated voltage ranges, marked with rated input or rated current for each rated voltage or range, unless		N/A
	the power input or current are related to the arithmetic mean value of the rated voltage range		P
	Relation between marking for upper and lower limits of rated power input or rated current and voltage is clear		N/A
7.6	Correct symbols used		P
	Symbol for nature of supply placed next to rated voltage		N/A
	Symbol for class II appliances placed unlikely to be confused with other marking		N/A
	Units of physical quantities and their symbols according to international standardized system		P

IEC 60335-2-35			
Clause	Requirement + Test	Result - Remark	Verdict
7.7	Connection diagram fixed to appliances to be connected to more than two supply conductors and appliances for multiple supply, unless		N/A
	correct mode of connection is obvious		N/A
7.8	Except for type Z attachment, terminals for connection to the supply mains indicated as follows:		—
	- marking of terminals exclusively for the neutral conductor (letter N)		N/A
	- marking of protective earthing terminals (symbol IEC 60417-5019)		P
	- marking of functional earthing terminals (symbol IEC 60417-5018)		N/A
	- marking not placed on removable parts		P
7.9	Marking or placing of switches which may cause a hazard		N/A
7.10	Indications of switches on stationary appliances and controls on all appliances by use of figures, letters or other visual means	by use letters or other visual means	P
	This applies also to switches which are part of a control		N/A
	If figures are used, the off position indicated by the figure 0		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
	Details concerning precautions during user maintenance		P
	The instructions state that:		—
	- the appliance is not to be used by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction		P
	- children being supervised not to play with the appliance		P
	For a part of class III construction supplied from a detachable power supply unit, the instructions state that the appliance is only to be used with the unit provided		N/A
	Instructions for class III appliances state that it must only be supplied at SELV, unless		N/A
	it is a battery-operated appliance, the battery being charged outside the appliance		N/A

IEC 60335-2-35			
Clause	Requirement + Test	Result - Remark	Verdict
	For appliances for altitudes exceeding 2000 m, the maximum altitude is stated.....:		N/A
	The instructions for appliances incorporating a functional earth states that the appliance incorporates an earth connection for functional purposes only		N/A
7.12.1	Sufficient details for installation supplied		P
	For an appliance intended to be permanently connected to the water mains and not connected by a hose-set, this is stated		N/A
	If different rated voltages or different rated frequencies are marked, the instructions state what action to be taken to adjust the appliance		N/A
	The installation instructions for open outlet water heaters shall state that the outlet must not be connected to any tap or fitting other than those specified. (IEC 60335-2-35)		N/A
	If a pressure relief device is required for closed water heaters, the instructions shall state that it must be fitted during Installation, unless it is incorporated in the appliance. (IEC 60335-2-35)		P
	If the appliance is not marked with an inlet water temperature, the installation instructions state the substance of the following (IEC 60335-2-35/AMD1):		—
	The water inlet of this appliance shall not be connected to inlet water obtained from any other water heating system. (IEC 60335-2-35/AMD1)		P
	Installation instructions for bare element water heaters state substance of following (IEC 60335-2-35):		—
	- the resistivity of the water supply must not be less than ... Ωcm (IEC 60335 2 35)		N/A
	- the appliance must be permanently connected to fixed wiring (not necessary if it complies with the requirements for the connection by a supply cord fitted with a plug specified in 13.2 and 24.101) (IEC 60335-2-35)		N/A
	- the appliance must be earthed (for class I appliances only) (IEC 60335-2-35)		N/A
	When bare element water heaters cannot be emptied, installation instruction state that appliance is not to be installed in locations where freezing can occur (IEC 60335-2-35)		N/A
	In a multiple water outlet system where the water temperature can be set at each individual water outlet, the instructions state the substance of the following: (IEC 60335-2-35)		—

IEC 60335-2-35			
Clause	Requirement + Test	Result - Remark	Verdict
	The system shall be installed so that the control for setting the water temperature in normal use installed at a shower outlet shall take priority over any other controls in the system that set the water temperature in normal use at other water outlets. (IEC 60335-2-35)		N/A
	For appliances not intended for potable water heating, such as for heating water for a waterbased space heating system, the instructions shall state the substance of the following (IEC 60335-2-35/AMD1):		—
	WARNING: This appliance is not to be used for a potable water supply. (IEC 60335-2-35/AMD1)		N/A
7.12.2	Stationary appliances not fitted with means for disconnection from the supply mains having a contact separation in all poles that provide full disconnection under overvoltage category III, the instructions state that means for disconnection must be incorporated in the fixed wiring in accordance with the wiring rules		P
7.12.3	Insulation of the fixed wiring in contact with parts exceeding 50 K during clause 11; instructions state that the fixed wiring must be protected		N/A
7.12.4	Instructions for built-in appliances:		—
	- dimensions of space		N/A
	- dimensions and position of supporting and fixing		N/A
	- minimum distances between parts and surrounding structure		N/A
	- minimum dimensions of ventilating openings and arrangement		N/A
	- connection to supply mains and interconnection of separate components		N/A
	- allow disconnection of the appliance after installation, by accessible plug or a switch in the fixed wiring, unless		N/A
	a switch complying with 24.3		N/A
7.12.5	Replacement cord instructions, type X attachment with a specially prepared cord		N/A
	Replacement cord instructions, type Y attachment		P
	Replacement cord instructions, type Z attachment		N/A
7.12.6	Caution in the instructions for appliances incorporating a non-self-resetting thermal cut-out that is reset by disconnection of the supply mains, if this cut-out is required to comply with the standard		N/A
7.12.7	Instructions for fixed appliances stating how the appliance is to be fixed		P
7.12.8	Instructions for appliances connected to the water mains:		—

IEC 60335-2-35			
Clause	Requirement + Test	Result - Remark	Verdict
	- max. inlet water pressure (Pa)	0,02 MPa	P
	- min. inlet water pressure, if necessary (Pa)	0,6 MPa	P
	Instructions concerning new and old hose-sets for appliances connected to the water mains by detachable hose-sets		N/A
7.12.9	Instructions specified in 7.12 and from 7.12.1 to 7.12.8 appear together before any other instructions supplied with the appliance		P
	These instructions may be supplied with the appliance separately from any functional use booklet		P
	They may follow the description of the appliance that identifies parts, or follow the drawings/sketches		P
	In addition, instructions are also available in an alternative format such as on a website or on request from the user in a format such as a DVD		P
	In addition, instructions are also available in an alternative format such as on a website or in a format such as a DVD	website	P
7.13	Instructions and other texts in an official language	English	P
7.14	Markings clearly legible and durable:		—
	Signal words WARNING, CAUTION, DANGER in uppercase having a height as specified		N/A
	Uppercase letter of the text explaining the signal word not smaller than 1,6 mm		N/A
	Moulded in, engraved, or stamped markings either raised above or have a depth below the surface of at least 0,25 mm, unless		N/A
	contrasting colours are used		N/A
	Markings checked by inspection, measurement and rubbing test as specified		P
7.15	Markings on a main part		P
	Marking clearly discernible from the outside, if necessary after removal of a cover		P
	For portable appliances, cover can be removed or opened without a tool		N/A
	For stationary appliances, name, trademark or identification mark and model or type reference visible after installation		N/A
	For fixed appliances, name, trademark or identification mark and model or type reference visible after installation according to the instructions		P

IEC 60335-2-35			
Clause	Requirement + Test	Result - Remark	Verdict
	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
	The symbol IEC 60417-5018 placed next to the symbol IEC 60417-5172 or IEC 60417-5180		N/A
	Additional markings for bare element water heaters visible during installation of appliance (IEC 60335-2-35)		N/A
7.16	Marking of a possible replaceable thermal link or fuse link clearly visible with regard to replacing the link		N/A
7.101	Water inlet and water outlet have to be identified (IEC 60335-2-35)		P
	Identification is not on detachable parts (IEC 60335-2-35)		P
	If colours are used, blue shall be used for the inlet and red for the outlet. (IEC 60335-2-35)		P
	Arrows showing the direction of the water flow. (IEC 60335-2-35)		P
7.102	Class I bare-element water heaters are marked to state that appliance must be earthed (IEC 60335-2-35)		N/A
	The use of a removable label or tag attached to the appliance is an acceptable means of meeting this requirement. (IEC 60335-2-35)		N/A
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
	Lamps behind a detachable cover not removed, if conditions met		N/A
	Insertion or removal of lamps, protection against contact with live parts of the lamp cap		N/A
	Use of test probe B of IEC 61032, with a force not exceeding 1 N: no contact with live parts		P
	Use of test probe B of IEC 61032 through openings, with a force of 20 N: no contact with live parts		P
8.1.2	Use of test probe 13 of IEC 61032, with a force not exceeding 1 N, through openings in class 0 appliances and class II appliances/constructions: no contact with live parts		P

IEC 60335-2-35			
Clause	Requirement + Test	Result - Remark	Verdict
	Test probe 13 also applied through openings in earthed metal enclosures having a non-conductive coating: no contact with live parts		P
8.1.3	For appliances other than class II, use of test probe 41 of IEC 61032, with a force not exceeding 1 N: no contact with live parts of visible glowing heating elements or supporting parts		N/A
	For a single switching action obtained by a switching device, requirements as specified		N/A
	For appliances with a supply cord and without a switching device, the single switching action may be obtained by the withdrawal of the plug		N/A
8.1.4	Accessible part not considered live if:		—
	- safety extra-low a.c. voltage: peak value not exceeding 42,4 V	Max. 20,15 V	P
	- safety extra-low d.c. voltage: not exceeding 42,4 V		N/A
	- or separated from live parts by protective impedance		P
	If protective impedance: d.c. current not exceeding 2 mA, and	0,21 mA	P
	a.c. peak value not exceeding 0,7 mA		N/A
	- for peak values over 42,4 V up to and including 450 V, capacitance not exceeding 0,1 μ F		N/A
	- for peak values over 450 V up to and including 15 kV, discharge not exceeding 45 μ C		N/A
	- for peak values over 15 kV, the energy in the discharge not exceeding 350 mJ		N/A
8.1.5	Live parts protected at least by basic insulation before installation or assembly:		—
	- built-in appliances		N/A
	- fixed appliances		P
	- appliances delivered in separate units		N/A
	The connections to the water mains and electrical supply are assumed to be in position during the test. (IEC 60335-2-35)		N/A
	Requirement does not apply to wall mounted appliances intended to be permanently connected to fixed wiring by cables having nominal cross sectional more than 2,5 mm ² (IEC 60335-2-35)		P
	However, the cross sectional area of cable entry does not exceed 25 cm ² and there are no accessible live parts within projection of the opening (IEC 60335-2-35)		N/A

IEC 60335-2-35			
Clause	Requirement + Test	Result - Remark	Verdict
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
	If the power input varies throughout the operating cycle and the maximum value of the power input exceeds, by a factor greater than two, the arithmetic mean value of the power input occurring during a representative period, the power input is the maximum value that is exceeded for more than 10 % of the representative period		N/A
	Otherwise the power input is the arithmetic mean value		N/A
	Test carried out at upper and lower limits of the ranges for appliances with one or more rated voltage ranges, unless		N/A
	the rated power input is related to the arithmetic mean value		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..... :		N/A
	If the current varies throughout the operating cycle and the maximum value of the current exceeds, by a factor greater than two, the arithmetic mean value of the current occurring during a representative period, the current is the maximum value that is exceeded for more than 10 % of the representative period		N/A
	Otherwise the current is the arithmetic mean value		N/A
	Test carried out at upper and lower limits of the ranges for appliances with one or more rated voltage ranges, unless		N/A
	the rated current is related to the arithmetic mean value of the range		N/A
11	HEATING		—
11.1	No excessive temperatures in normal use		P
11.2	The appliance is held, placed or fixed in position as described	fixed on the wall	P
11.3	Temperature rises, other than of windings, determined by thermocouples		P

IEC 60335-2-35			
Clause	Requirement + Test	Result - Remark	Verdict
	Temperature rises of windings determined by resistance method, unless	transformer	P
	the windings are non-uniform or it is difficult to make the necessary connections		N/A
11.4	Heating appliances operated under normal operation at 1,15 times rated power input (W)	$1,15 \times (240/230)^2 \times 6800 \text{ W} = 8514,78 \text{ W}$	P
11.5	Motor-operated appliances operated under normal operation at most unfavourable voltage between 0,94 and 1,06 times rated voltage (V)		N/A
11.6	Combined appliances operated under normal operation at most unfavourable voltage between 0,94 and 1,06 times rated voltage (V)		N/A
11.7	Appliance is operated until steady conditions established (IEC 60335-2-35)		P
11.8	Temperature rises monitored continuously and not exceeding the values in table 3	(see appended table)	P
	If the temperature rise of a motor winding exceeds the value of table 3, or		N/A
	if there is doubt with regard to classification of insulation,		N/A
	tests of annex C are carried out		N/A
	Sealing compound does not flow out		P
	Protective devices do not operate, except		P
	components in protective electronic circuits tested for the number of cycles specified in 24.1.4		N/A
13	LEAKAGE CURRENT AND ELECTRIC STRENGTH AT OPERATING TEMPERATURE		—
13.1	Leakage current not excessive and electric strength adequate		P
	Heating appliances operated at 1,15 times the rated power input (W)	$1,15 \times (240/230)^2 \times 6800 \text{ W} = 8514,78 \text{ W}$	P
	Motor-operated appliances and combined appliances supplied at 1,06 times the rated voltage (V)		N/A
	Protective impedance and radio interference filters disconnected before carrying out the tests		N/A
13.2	The leakage current is measured by means of the circuit described in figure 4 of IEC 60990:1999		P
	For class 0I appliances and class I appliances, except parts of class II construction, C may be replaced by a low impedance ammeter		P
	Leakage current measurements	(see appended table)	P

IEC 60335-2-35			
Clause	Requirement + Test	Result - Remark	Verdict
	Bare element water heaters are tested with water having the resistivity marked on the appliance (IEC 60335-2-35)		N/A
	Inlet water with the appropriate resistivity is prepared with the water at a temperature of $15\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$. (IEC 60335-2-35/AMD1)		N/A
	For class I bare-element water heaters, the leakage current is measured between a metal sieve positioned in the water 10 mm from the orifice of the outlet, and the earthing terminal. (IEC 60335-2-35)		N/A
	For single-phase appliances, the terminals of the heating element are connected through the selector switch to each pole of the supply in turn, as shown in Figure 101. (IEC 60335-2-35)		N/A
	For three-phase appliances, the earthing terminal is connected to the neutral conductor, as shown in Figure 102. (IEC 60335-2-35)		N/A
	Leakage current does not exceed 0,25 mA (IEC 60335-2-35)		N/A
	For bare-element water heaters intended to be connected to the power supply by a supply cord fitted with a plug, the leakage current test is repeated. (IEC 60335-2-35)		N/A
	During this test, the leakage current is measured between the earthing terminal of the appliance and the neutral conductor, as shown in Figure 103. (IEC 60335-2-35)		N/A
	Leakage current, measured with the selector switch in each position, does not exceed 2,75 mA. (IEC 60335-2-35)		N/A
13.3	The appliance is disconnected from the supply		P
	Electric strength tests according to table 4 :	(see appended table)	P
	No breakdown during the tests		P
14	TRANSIENT OVERVOLTAGES		—
	Appliances withstand the transient over-voltages to which they may be subjected		N/A
	Clearances having a value less than specified in table 16 subjected to an impulse voltage test, the test voltage specified in table 6 :		N/A
	No flashover during the test, unless		N/A
	of functional insulation if the appliance complies with clause 19 with the clearance short-circuited		N/A
15	MOISTURE RESISTANCE		—

IEC 60335-2-35			
Clause	Requirement + Test	Result - Remark	Verdict
15.1	Enclosure provides the degree of moisture protection according to classification of the appliance		P
	Compliance checked as specified in 15.1.1, taking into account 15.1.2, followed by the electric strength test of 16.3		P
	No trace of water on insulation which can result in a reduction of clearances or creepage distances below values specified in clause 29		P
15.1.1	Appliances, other than IPX0, subjected to tests as specified in IEC 60529	IP25	P
	Water valves containing live parts in external hoses for connection of an appliance to the water mains tested as specified for IPX7 appliances		N/A
15.1.2	Hand-held appliance turned continuously through the most unfavourable positions during the test		N/A
	Built-in appliances installed according to the instructions		N/A
	Appliances placed or used on the floor or table placed on a horizontal unperforated support		N/A
	Appliances normally fixed to a wall and appliances with pins for insertion into socket-outlets are mounted on a wooden board		N/A
	For IPX3 appliances, the base of wall mounted appliances is placed at the same level as the pivot axis of the oscillating tube		N/A
	For IPX4 appliances, the horizontal centre line of the appliance is aligned with the pivot axis of the oscillating tube, and		N/A
	for appliances normally used on the floor or table, the movement is limited to two times 90° for a period of 5 min, the support being placed at the level of the pivot axis of the oscillating tube		N/A
	Wall-mounted appliances, take into account the distance to the floor stated in the instructions		P
	Appliances normally fixed to a ceiling are mounted underneath a horizontal unperforated support, the pivot axis of the oscillating tube located at the level of the underside of the support, and		N/A
	for IPX4 appliances, the movement of the tube is limited to two times 90° from the vertical for a period of 5 min		N/A
	Appliances with type X attachment fitted with a flexible cord as described		N/A
	Detachable parts subjected to the relevant treatment with the main part		N/A

IEC 60335-2-35			
Clause	Requirement + Test	Result - Remark	Verdict
	However, if a part has to be removed for user maintenance and a tool is needed, this part is not removed		N/A
	Wall mounted appliances fixed at distance of 3 mm from mounting surface, unless (IEC 60335-2-35)		P
	installation instructions specify a larger value (IEC 60335-2-35)		N/A
15.2	Spillage of liquid does not affect the electrical insulation		N/A
	Spillage solution comprising water containing approximately 1 % NaCl and 0,6 % rinsing agent		N/A
	Appliances with type X attachment fitted with a flexible cord as described		N/A
	Appliances incorporating an appliance inlet tested with or without an connector, whichever is most unfavourable		N/A
	Detachable parts are removed		N/A
	Overfilling test with additional amount of the solution, over a period of 1 min (l).....:		N/A
	The appliance withstands the electric strength test of 16.3		N/A
	No trace of water on insulation that can result in a reduction of clearances or creepage distances below values specified in clause 29		N/A
15.3	Appliances proof against humid conditions		P
	Checked by test Cab: Damp heat steady state in IEC 60068-2-78		P
	Detachable parts removed and subjected, if necessary, to the humidity test with the main part		P
	Humidity test for 48 h in a humidity cabinet	25 °C; 93 % RH	P
	Reassembly of those parts that may have been removed		P
	The appliance withstands the tests of clause 16		P
16	LEAKAGE CURRENT AND ELECTRIC STRENGTH		—
16.1	Leakage current not excessive and electric strength adequate		P
	Protective impedance disconnected from live parts before carrying out the tests		N/A
	Tests carried out at room temperature and not connected to the supply		P
16.2	Single-phase appliances: test voltage 1,06 times rated voltage (V).....:	240 V x 1,06 = 254,4 V	P
	Three-phase appliances: test voltage 1,06 times rated voltage divided by $\sqrt{3}$ (V).....:		N/A

IEC 60335-2-35			
Clause	Requirement + Test	Result - Remark	Verdict
	Bare element water heaters are tested with water having the resistivity marked on the appliance (IEC 60335-2-35)		N/A
	Inlet water with the appropriate resistivity is prepared with the water at a temperature of 15 °C ± 5 °C. (IEC 60335-2-35/AMD1)		N/A
	Leakage current measurements	(see appended table)	P
	Limit values doubled if:		—
	- all controls have an off position in all poles, or		N/A
	- the appliance has no control other than a thermal cut-out, or		N/A
	- all thermostats, temperature limiters and energy regulators do not have an off position, or		N/A
	- the appliance has radio interference filters		N/A
	With the radio interference filters disconnected, the leakage current do not exceed limits specified :	(see appended table)	P
16.3	Electric strength tests according to table 7	(see appended table)	P
	Test voltage applied between the supply cord and inlet bushing and cord guard and cord anchorage as specified..... :	(see appended table)	P
	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)	P
	Appliance supplied with 1,06 or 0,94 times rated voltage under the most unfavourable short-circuit or overload likely to occur in normal use (V)	240 V x 1,06 = 254,4 V	P
	Basic insulation is not short-circuited		N/A
	Temperature rise of insulation of the conductors of safety extra-low voltage circuits not exceeding the relevant value specified in table 3 by more than 15 K		N/A
	Temperature of the winding not exceeding the value specified in table 8		P
	However, limits do not apply to fail-safe transformers complying with sub-clause 15.5 of IEC 61558-1		N/A
18	ENDURANCE		—
	Requirements and tests are specified in part 2 when necessary		N/A
19	ABNORMAL OPERATION		—

IEC 60335-2-35			
Clause	Requirement + Test	Result - Remark	Verdict
19.1	The risk of fire, mechanical damage or electric shock under abnormal or careless operation obviated		P
	Electronic circuits so designed and applied that a fault will not render the appliance unsafe	(see appended table)	P
	Appliances incorporating heating elements subjected to the tests of 19.2 and 19.3, and		N/A
	if the appliance also has a control that limit the temperature during clause 11 it is subjected to the test of 19.4, and		P
	if applicable, to the test of 19.5		P
	Appliances incorporating PTC heating elements are also subjected to the test of 19.6		N/A
	Appliances incorporating motors subjected to the tests of 19.7 to 19.10, as applicable		P
	Appliances incorporating electronic circuits subjected to the tests of 19.11 and 19.12, as applicable		P
	Appliances incorporating contactors or relays subjected to the test of 19.14, being carried out before the tests of 19.11		N/A
	Appliances incorporating voltage selector switches subjected to the test of 19.15		N/A
	Unless otherwise specified, the tests are continued until a non-self-resetting thermal cut-out operates, or		P
	until steady conditions are established		P
	If a heating element or intentionally weak part becomes open-circuited, the relevant test is repeated on a second sample		N/A
19.4	Test conditions as in clause 11, any control limiting the temperature during tests of clause 11 short-circuited		P
	For open-outlet water heaters, flow switches and pressure switches that operate during the test of Clause 11 are short-circuited, the water-control valve being adjusted to the most unfavourable position. (IEC 60335-2-35)		N/A
	Flow switches of closed water heaters are short-circuited and any pressure relief device rendered inoperative, the outlet valve being closed. (IEC 60335-2-35)		P
	However, if the appliance has no flow switch and back-siphonage is likely to occur, the water heater is filled with just sufficient water to cover the heating element and operated with the outlet valve open. (IEC 60335-2-35)		N/A

IEC 60335-2-35			
Clause	Requirement + Test	Result - Remark	Verdict
19.5	Test of 19.4 repeated on class 0I and I appliances with tubular sheathed or embedded heating elements. No short-circuiting, but one end of the element connected to the sheath		N/A
	The test repeated with reversed polarity and the other end of the heating element connected to the sheath		N/A
	The test is not carried out on appliances intended to be permanently connected to fixed wiring and on appliances where an all-pole disconnection occurs during the test of 19.4		P
19.6	Appliances with PTC heating elements tested at rated voltage, establishing steady conditions		N/A
	The working voltage of the PTC heating element is increased by 5 % and the appliance is operated until steady conditions are re-established. The voltage is then increased in similar steps until 1,5 times working voltage or until the PTC heating element ruptures (V)..... :		N/A
19.7	Stalling test by locking the rotor if the locked rotor torque is smaller than the full load torque, or		N/A
	locking moving parts of other appliances		P
	Locked rotor, capacitors open-circuited one at a time		N/A
	Test repeated with capacitors short-circuited one at a time, unless		N/A
	the capacitor is of class S2 or S3 of IEC 60252-1		N/A
	Appliances with timer or programmer supplied with rated voltage for each of the tests, for a period equal to the maximum period allowed..... :		N/A
	An electronic timer or programmer that operates to ensure compliance with the test before the maximum period under the conditions of clause 11 is reached, is a protective electronic circuit		N/A
	Other appliances supplied with rated voltage for a period as specified	(see appended table)	P
	Winding temperatures not exceeding values specified in table 8..... :	(see appended table)	P
19.8	Multi-phase motors operated at rated voltage with one phase disconnected		N/A
19.9	Running overload test on appliances incorporating motors intended to be remotely or automatically controlled or liable to be operated continuously		N/A

IEC 60335-2-35			
Clause	Requirement + Test	Result - Remark	Verdict
	Motor-operated and combined appliances for which 30.2.3 is applicable and that use overload protective devices relying on electronic circuits to protect the motor windings, are also subjected to the test		N/A
	Winding temperatures not exceeding values as specified		N/A
19.10	Series motor operated at 1,3 times rated voltage for 1 min (V).....		N/A
	During the test, parts not being ejected from the appliance		N/A
19.11	Electronic circuits, compliance checked by evaluation of the fault conditions specified in 19.11.2 for all circuits or parts of circuits, unless		P
	they comply with the conditions specified in 19.11.1		P
	Appliances incorporating an electronic circuit that relies upon a programmable component to function correctly, subjected to the test of 19.11.4.8, unless		N/A
	restarting does not result in a hazard		N/A
	Appliances having a device with an off position obtained by electronic disconnection, or a device placing the appliance in a stand-by mode, subjected to the tests of 19.11.4		N/A
	If the safety of the appliance under any of the fault conditions depends on the operation of a miniature fuse-link complying with IEC 60127, the test of 19.12 is carried out		P
	During and after each test the following is checked:		—
	- the temperature of the windings do not exceed the values specified in table 8		P
	- the appliance complies with the conditions specified in 19.13		P
	- any current flowing through protective impedance not exceeding the limits specified in 8.1.4		P
	If a conductor of a printed board becomes open-circuited, the appliance is considered to have withstood the particular test, provided both of the following conditions are met:		—
	- the base material of the printed circuit board withstands the test of annex E		N/A
	- any loosened conductor does not reduce clearance or creepage distances between live parts and accessible metal parts below the values specified in clause 29		N/A
19.11.1	Fault conditions a) to g) in 19.11.2 are not applied to circuits or parts of circuits meeting both of the following conditions:		—

IEC 60335-2-35			
Clause	Requirement + Test	Result - Remark	Verdict
	- 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	After C7: 6,5 W	P
	- the protection against electric shock, fire hazard, mechanical hazard or dangerous malfunction of other parts of the appliance does not rely on the correct functioning of the electronic circuit		P
19.11.2	Fault conditions applied one at a time, the appliance operating under conditions specified in clause 11, but supplied at rated voltage, duration of the tests as specified:		—
	a) short circuit of functional insulation if clearances or creepage distances are less than the values specified in clause 29		N/A
	b) open circuit at the terminals of any component	RV1, CX2, C3: normal operation, DB1, EC1, C2, T1, EC2: not operation	P
	c) short circuit of capacitors, unless		N/A
	they comply with IEC 60384-14		P
	d) short circuit of any two terminals of an electronic component, other than integrated circuits	RV1, DB1: fuse broken, , EC1, C2, T1, EC2: not operation	P
	This fault condition is not applied between the two circuits of an optocoupler		N/A
	e) failure of triacs in the diode mode		N/A
	f) failure of microprocessors and integrated circuits		N/A
	g) failure of an electronic power switching device		N/A
	Each low power circuit is short-circuited by connecting the low-power point to the pole of the supply source from which the measurements were made		P
19.11.3	If the appliance incorporates a protective electronic circuit that operates to ensure compliance with clause 19, the appliance is tested as specified		N/A
19.11.4	Appliances having a device with an off position obtained by electronic disconnection, or		N/A
	a device that can be placed in the stand-by mode,		N/A
	subjected to the tests of 19.11.4.1 to 19.11.4.7, the device being set in the off position or in the stand-by mode		N/A
	Appliances incorporating a protective electronic circuit subjected to the tests of 19.11.4.1 to 19.11.4.7, the tests being carried out after the protective electronic circuit has operated, except that		N/A
	appliances operated for 30 s or 5 min during the test of 19.7 are not subjected to the tests for electromagnetic phenomena.		N/A

IEC 60335-2-35			
Clause	Requirement + Test	Result - Remark	Verdict
	Surge protective devices disconnected, unless		N/A
	They incorporate spark gaps		N/A
19.11.4.1	The appliance is subjected to electrostatic discharges in accordance with IEC 61000-4-2, test level 4		N/A
19.11.4.2	The appliance is subjected to radiated fields in accordance with IEC 61000-4-3, at frequency ranges specified		N/A
19.11.4.3	The appliance is subjected to fast transient bursts in accordance with IEC 61000-4-4, test level 3 or 4 as specified		N/A
19.11.4.4	The power supply terminals of the appliance subjected to voltage surges in accordance with IEC 61000-4-5, test level 3 or 4 as specified		N/A
	An open circuit test voltage of 2 kV is applicable for the line-to-line coupling mode		N/A
	An open circuit test voltage of 4 kV is applicable for the line-to-earth coupling		N/A
	Earthed heating elements in class I appliances disconnected		N/A
19.11.4.5	The appliance is subjected to injected currents in accordance with IEC 61000-4-6, test level 3		N/A
19.11.4.6	Appliances having a rated current not exceeding 16 A are subjected to the class 3 voltage dips and interruptions in accordance with IEC 61000-4-11		N/A
	Appliances having a rated current exceeding 16 A are subjected to the class 3 voltage dips and interruptions in accordance with IEC 61000-4-34		N/A
19.11.4.7	The appliance is subjected to mains signals in accordance with IEC 61000-4-13, test level class 2		N/A
19.11.4.8	The appliance is supplied at rated voltage and operated under normal operation. After 60 s the power supply is reduced to a level such that the appliance ceases to respond or parts controlled by the programmable component cease to operate		N/A
	The appliance continues to operate normally, or		N/A
	requires a manual operation to restart		N/A
19.12	If the safety of the appliance for any of the fault conditions specified in 19.11.2 depends on the operation of a miniature fuse-link complying with IEC 60127, the test is repeated, measuring the current flowing through the fuse-link; measured current (A); rated current of the fuse-link (A)..... :	Rated current: 5,0 A measured current: 16,3 A	P
19.13	During the tests the appliance does not emit flames, molten metal, poisonous or ignitable gas in hazardous amounts		P

IEC 60335-2-35			
Clause	Requirement + Test	Result - Remark	Verdict
	Temperature rises not exceeding the values shown in table 9..... :	(see appended table)	P
	During the test of 19.4, the water container does not rupture and the water temperature does not exceed (IEC 60335-2-35)		—
	- 99 °C, for open outlet water heaters having a capacity exceeding 1 l (IEC 60335-2-35)		N/A
	- 140 °C, for closed water heaters having a capacity exceeding 1 l (IEC 60335-2-35)		N/A
	Compliance with clause 8 not impaired		P
	If the appliance can still be operated it complies with 20.2		P
	Insulation, other than of class III appliances or class III constructions that do not contain live parts, withstands the electric strength test of 16.3, the test voltage as specified in table 4:		—
	- basic insulation (V).....:	1000 V	P
	- supplementary insulation (V).....:		N/A
	- reinforced insulation (V).....:	3000 V	P
	After operation or interruption of a control, clearances and creepage distances across the functional insulation withstand the electric strength test of 16.3, the test voltage being twice the working voltage		P
	The appliance does not undergo a dangerous malfunction, and		N/A
	no failure of protective electronic circuits, if the appliance is still operable		N/A
	Appliances tested with an electronic switch in the off position, or in the stand-by mode:		—
	- do not become operational, or		N/A
	- if they become operational, do not result in a dangerous malfunction during or after the tests of 19.11.4		N/A
	If the appliance contains lids or doors that are controlled by one or more interlocks, one of the interlocks may be released provided that:		—
	- the lid or door does not move automatically to an open position when the interlock is released, and		N/A
	- the appliance does not start after the cycle in which the interlock was released		N/A
19.14	Appliances operated under the conditions of clause 11, any contactor or relay contact operating under the conditions of clause 11 being short-circuited		N/A
	For a relay or contactor with more than one contact, all contacts are short-circuited at the same time		N/A

IEC 60335-2-35			
Clause	Requirement + Test	Result - Remark	Verdict
	A relay or contactor operating only to ensure the appliance is energized for normal use is not short-circuited		N/A
	If more than one relay or contactor operates in clause 11, they are short-circuited in turn		N/A
19.15	For appliances with a mains voltage selector switch, the switch is set to the lowest rated voltage position and the highest value of rated voltage is applied		N/A
20	STABILITY AND MECHANICAL HAZARDS		—
20.1	Appliances having adequate stability	Fix appliance	N/A
	Tilting test through an angle of 10°, appliance placed on an inclined plane/horizontal support, not connected to the supply mains; appliance does not overturn		N/A
	Tilting test repeated on appliances with heating elements, angle of inclination increased to 15°		N/A
	Possible heating test in overturned position; temperature rise does not exceed values shown in table 9		N/A
20.2	Moving parts adequately arranged or enclosed as to provide protection against personal injury		P
	Protective enclosures, guards and similar parts are non-detachable, and		P
	have adequate mechanical strength		P
	Enclosures that can be opened by overriding an interlock are considered to be detachable parts		N/A
	Self-resetting thermal cut-outs and overcurrent protective devices not causing a hazard by unexpected closure		N/A
	Not possible to touch dangerous moving parts with the test probe described		P
21	MECHANICAL STRENGTH		—
21.1	Appliance has adequate mechanical strength and is constructed as to withstand rough handling		P
	Checked by applying 3 blows to every point of the enclosure like to be weak, in accordance with test Ehb of IEC 60068-2-75, spring hammer test, with an impact energy of 0,5 J	(see appended table)	P
	The appliance shows no damage impairing compliance with this standard, and		P
	compliance with 8.1, 15.1 and clause 29 not impaired		P
	If doubt, supplementary or reinforced insulation subjected to the electric strength test of 16.3		N/A

IEC 60335-2-35			
Clause	Requirement + Test	Result - Remark	Verdict
	If necessary, repetition of groups of three blows on a new sample		N/A
21.2	Accessible parts of solid insulation having strength to prevent penetration by sharp implements		P
	Test not applicable if the thickness of supplementary insulation is at least 1 mm and reinforced insulation at least 2 mm		P
	The insulation is tested as specified, and does withstand the electric strength test of 16.3		N/A
22	CONSTRUCTION		—
22.1	Appliance marked with the first numeral of the IP system, relevant requirements of IEC 60529 are fulfilled	IP25	P
22.2	Stationary appliance: means to ensure all-pole disconnection from the supply being provided:		—
	- a supply cord fitted with a plug, or		N/A
	- a switch complying with 24.3, or		N/A
	- a statement in the instruction sheet that a disconnection incorporated in the fixed wiring is to be provided, or		P
	- an appliance inlet		N/A
	Single-pole switches and single-pole protective devices for the disconnection of heating elements in single-phase, permanently connected class 01 and class I appliances, connected to the phase conductor		N/A
22.3	Appliance provided with pins: no undue strain on socket-outlets		N/A
	Applied torque not exceeding 0,25 Nm		N/A
	Pull force of 50 N 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 1 mm		N/A
	Each pin subjected to a torque of 0,4 Nm; the pins are not rotating, unless		N/A
	rotating does not impair compliance with this standard		N/A
22.4	Appliance for heating liquids and appliance causing undue vibration not provided with pins for insertion into socket-outlets		P
22.5	No risk of electric shock when touching pins, for appliances having a capacitor with rated capacitance equal to or greater than 0,1 μ F, the appliance being disconnected from the supply at the instant of voltage peak		N/A

IEC 60335-2-35			
Clause	Requirement + Test	Result - Remark	Verdict
	Voltage not exceeding 34 V (V)		N/A
	If compliance relies on the operation of an electronic circuit, the electromagnetic phenomena tests of 19.11.4.3 and 19.11.4.4 are applied		N/A
	The discharge test is then repeated three times, voltage not exceeding 34 V (V)		N/A
22.6	Electrical insulation not affected by condensing water or leaking liquid		P
	Electrical insulation of class II appliances not affected if a hose ruptures or seal leaks		N/A
	In case of doubt, test as described		N/A
	Enclosure have a drain hole positioned so that the water can drain without impairing the electrical insulation, unless (IEC 60335-2-35)		N/A
	water cannot accumulate within the enclosure in normal use. (IEC 60335-2-35)		P
	Hole is at least 5 mm in diameter or (IEC 60335-2-35)		N/A
	20 mm ² in area with width of at least 3 mm (IEC 60335-2-35)		N/A
22.7	Adequate safeguards against the risk of excessive pressure in appliances containing liquid or gases or having steam-producing devices		N/A
22.8	Electrical connections not subject to pulling during cleaning of compartments to which access can be gained without the aid of a tool, and that are likely to be cleaned in normal use		P
22.9	Insulation, internal wiring, windings, commutators and slip rings not exposed to oil, grease or similar substances, unless		P
	the substance has adequate insulating properties		N/A
22.10	Not possible to reset voltage-maintained non-self-resetting thermal cut-outs by the operation of an automatic switching device incorporated within the appliance, if:		N/A
	- a non-self-resetting thermal cut-out is required by the standard, and		N/A
	- a voltage maintained non-self-resetting thermal cut-out is used to meet it		N/A
	Non-self-resetting thermal motor protectors have a trip-free action, unless		N/A
	they are voltage maintained		N/A
	Reset buttons of non-self-resetting controls so located or protected that accidental resetting is unlikely		N/A

IEC 60335-2-35			
Clause	Requirement + Test	Result - Remark	Verdict
22.11	Reliable fixing of non-detachable parts that provide the necessary degree of protection against electric shock, moisture or contact with moving parts		P
	Obvious locked position of snap-in devices used for fixing such parts		N/A
	No deterioration of the fixing properties of snap-in devices used in parts that are likely to be removed during installation or servicing		N/A
	Tests as described		P
22.12	Handles, knobs etc. fixed in a reliable manner, if loosening result in a hazard		P
	Removing or fixing in wrong position of handles, knobs etc. indicating position of switches or similar components not possible, if resulting in a hazard		P
	A choking hazard does not apply to appliances for commercial use		N/A
	Axial force 15 N applied to parts, the shape being so that an axial pull is unlikely to be applied		N/A
	Axial force 30 N applied to parts, the shape being so that an axial pull is likely to be applied		P
	If the part is removed and can be contained within the small parts cylinder, it is considered to be a choking hazard		N/A
22.13	Unlikely that handles, when gripped as in normal use, make the operator's hand touch parts having a temperature rise exceeding the value specified for handles which are held for short periods only		N/A
22.14	No ragged or sharp edges creating a hazard for the user in normal use, or during user maintenance		P
	No exposed pointed ends of self-tapping screws or other fasteners, likely to be touched by the user in normal use or during user maintenance		P
22.15	Storage hooks and the like for flexible cords smooth and well rounded		N/A
22.16	Automatic cord reels cause no undue abrasion or damage to the sheath of the flexible cord, no breakage of conductors strands and no undue wear of contacts		N/A
	Cord reel tested with 6000 operations, as specified		N/A
	Electric strength test of 16.3, voltage of 1000 V applied		N/A
22.17	Spacers not removable from the outside by hand or by means of a screwdriver or a spanner		N/A
22.18	Current-carrying parts and other metal parts resistant to corrosion		P

IEC 60335-2-35			
Clause	Requirement + Test	Result - Remark	Verdict
22.19	Driving belts not relied upon to provide the required level of insulation, unless		N/A
	constructed to prevent inappropriate replacement		N/A
22.20	Direct contact between live parts and thermal insulation effectively prevented, unless		N/A
	material used is non-corrosive, non-hygroscopic and non-combustible		N/A
22.21	Wood, cotton, silk, ordinary paper and fibrous or hygroscopic material not used as insulation, unless		P
	impregnated		N/A
	This requirement does not apply to magnesium oxide and mineral ceramic fibres used for the electrical insulation of heating elements		P
22.22	Appliances not containing asbestos		P
22.23	Oils containing polychlorinated biphenyl (PCB) not used		P
22.24	Bare heating elements, except in class III appliances or class III constructions that do not contain live parts, adequately supported		N/A
	In case of rupture, the heating conductor is unlikely to come in contact with accessible metal parts		N/A
22.25	Sagging heating conductors, except in class III appliances or class III constructions that do not contain live parts, cannot come into contact with accessible metal parts		N/A
22.26	For class III constructions the insulation between parts operating at safety extra-low voltage and other live parts complies with the requirements for double or reinforced insulation		N/A
22.27	Parts connected by protective impedance separated by double or reinforced insulation		P
22.28	Metal parts of class II appliances conductively connected to gas pipes or in contact with water, separated from live parts by double or reinforced insulation		N/A
22.29	Class II appliances permanently connected to fixed wiring so constructed that the required degree of access to live parts is maintained after installation		N/A
22.30	Parts serving as supplementary or reinforced insulation fixed so that they cannot be removed without being seriously damaged, or		P
	so constructed that they cannot be replaced in an incorrect position, and so that if they are omitted, the appliance is rendered inoperable or manifestly incomplete		N/A

IEC 60335-2-35			
Clause	Requirement + Test	Result - Remark	Verdict
22.31	Neither clearances nor creepage distances over supplementary and reinforced insulation reduced below values specified in clause 29 as a result of wear		P
	Neither clearances nor creepage distances between live parts and accessible parts reduced below values for supplementary insulation if wires, screws etc. become loose		P
22.32	Supplementary and reinforced insulation constructed or protected against pollution so that clearances or creepage distances are not reduced below the values in clause 29.		P
	Supplementary insulation of natural or synthetic rubber resistant to ageing, or arranged and dimensioned so that creepage distances are not reduced below values specified in 29.2		N/A
	Ceramic material not tightly sintered, similar materials or beads alone not used as supplementary or reinforced insulation		N/A
	Ceramic and similar porous material in which heating conductors are embedded is considered to be basic insulation, not reinforced insulation		N/A
	Oxygen bomb test at 70 °C for 96 h and 16 h at room temperature		N/A
22.33	Conductive liquids that are or may become accessible in normal use and conductive liquids that are in contact with unearthed accessible metal parts are not in direct contact with live parts, or		P
	unearthed metal parts separated from live parts by basic insulation only		N/A
	Electrodes not used for heating liquids		N/A
	For class II constructions, conductive liquids that are or may become accessible in normal use and conductive liquids that are in contact with unearthed accessible metal parts, not in direct contact with basic or reinforced insulation, unless		P
	the reinforced insulation consists of at least 3 layers		N/A
	For class II constructions, conductive liquids which are in contact with live parts, not in direct contact with reinforced insulation, unless		N/A
	the reinforced insulation consists of at least 3 layers		N/A
	An air layer not used as basic or supplementary insulation in a double insulation system if likely to be bridged by leaking liquid		P
	Requirement does not apply to bare-element water heaters. (IEC 60335-2-35)		N/A

IEC 60335-2-35			
Clause	Requirement + Test	Result - Remark	Verdict
22.34	Shafts of operating knobs, handles, levers etc. not live, unless		P
	the shaft is not accessible when the part is removed		N/A
22.35	For other than class III constructions, handles, levers and knobs, held or actuated in normal use, not becoming live in the event of a failure of basic insulation		P
	Such parts being of metal, and their shafts or fixings are likely to become live in the event of a failure of basic insulation, are either adequately covered by insulation material or their accessible parts are separated from their shafts or fixings by supplementary insulation		N/A
	This requirement does not apply to handles, levers and knobs on stationary appliances and cordless appliances, other than those of electrical components, provided they are reliably connected to an earthing terminal or earthing contact, or separated from live parts by earthed metal		N/A
	Insulating material covering metal handles, levers and knobs withstand the electric strength test of 16.3 for supplementary insulation		N/A
22.36	For appliances other than class III, handles continuously held in the hand in normal use so constructed that when gripped as in normal use, the operators hand is not likely to touch metal parts, unless		N/A
	they are separated from live parts by double or reinforced insulation		N/A
22.37	Capacitors in class II appliances not connected to accessible metal parts and their casings, if of metal, separated from accessible metal parts by supplementary insulation, unless		N/A
	the capacitors comply with 22.42		N/A
22.38	Capacitors not connected between the contacts of a thermal cut-out		P
22.39	Lamp holders used only for the connection of lamps		N/A
22.40	Motor-operated appliances and combined appliances intended to be moved while in operation, or having accessible moving parts, fitted with a switch to control the motor. The actuating member of the switch being easily visible and accessible		N/A

IEC 60335-2-35			
Clause	Requirement + Test	Result - Remark	Verdict
	If the appliance cannot operate continuously, automatically or remotely without giving rise to a hazard, appliances for remote operation being fitted with a switch for stopping the operation. The actuating member of the switch being easily visible and accessible		N/A
22.41	No components, other than lamps, containing mercury		P
22.42	Protective impedance consisting of at least two separate components		P
	Values specified in 8.1.4 not exceeded if any one of the components are short-circuited or open-circuited		P
	Resistors checked by the test of 14.1 a) in IEC 60065		N/A
	Capacitors checked by the tests for class Y capacitors in IEC 60384-14		P
22.43	Appliances adjustable for different voltages, accidental changing of the setting of the voltage unlikely to occur		N/A
22.44	Appliances not having an enclosure that is shaped or decorated like a toy		P
22.45	When air is used as reinforced insulation, clearances not reduced below the values specified in 29.1.3 due to deformation as a result of an external force applied to the enclosure		P
22.46	For programmable protective electronic circuits used to ensure compliance with the standard, the software contains measures to control the fault/error conditions in table R.1		N/A
	Software that contains measures to control the fault/error conditions specified in table R.2 is to be specified in parts 2 for particular constructions or to address specific hazards		N/A
	These requirements are not applicable to software used for functional purpose or compliance with clause 11		N/A
22.47	Appliances withstand the water pressure occurring in normal use. (IEC 60335-2-35)		P
	Compliance is checked by subjecting the appliance to a water pressure of: (IEC 60335-2-35)		—
	- twice the rated pressure, for closed water heaters; (IEC 60335-2-35)		P
	- 0,15 MPa, for open-outlet water heaters. (IEC 60335-2-35)		N/A

IEC 60335-2-35			
Clause	Requirement + Test	Result - Remark	Verdict
	If an open-outlet water heater incorporates a valve that regulates the water flow, a water pressure of 2 MPa is applied to the inlet of the appliance, the valve being closed. (IEC 60335-2-35)		N/A
	Pressure-relief devices are rendered inoperative. The pressure is raised at a rate of 0,13 MPa/s to the specified value and is maintained at that value for 5 min. (IEC 60335-2-35)		P
	Water shall not leak from the appliance and there shall be no permanent deformation to such an extent that compliance with this standard is impaired. (IEC 60335-2-35)		P
22.49	For remote operation, the duration of operation is to be set before the appliance can be started, unless		N/A
	the appliance switches off automatically or can operate continuously without hazard		N/A
22.50	Controls incorporated in the appliance take priority over controls actuated by remote operation		N/A
	Requirement is not applicable provided the maximum temperature of the water from the system cannot exceed 55 °C in normal use. (IEC 60335-2-35)		N/A
	If the maximum temperature of the water from the system exceeds 55 °C in normal use then the requirement is not applicable provided that the system is such that a shower outlet normal use water temperature control takes precedence in setting the system temperature. (IEC 60335-2-35)		N/A
	In the case of systems with multiple shower outlets, the shower with the lowest temperature setting shall take precedence, the other shower outlets taking precedence over non-shower outlets. (IEC 60335-2-35)		N/A
22.51	There is a control on the appliance manually adjusted to the setting for remote operation before the appliance can be operated in this mode		N/A
	There is a visual indication showing that the appliance is adjusted for remote operation		N/A
	These requirements not necessary on appliances that can operate as follows, without giving rise to a hazard:		—
	- continuously, or		N/A
	- automatically, or		N/A
	- remotely		N/A
	Requirement is not applicable provided the maximum temperature of the water from the system cannot exceed 55 °C in normal use. (IEC 60335-2-35)		N/A

IEC 60335-2-35			
Clause	Requirement + Test	Result - Remark	Verdict
	If the maximum temperature of the water from the system exceeds 55 °C in normal use then the requirement is not applicable provided that the system is such that the shower outlet normal use water temperature control takes precedence in setting the system temperature. (IEC 60335-2-35)		N/A
	In the case of systems with multiple shower outlets, a shower with the lowest temperature setting shall take precedence, the other shower outlets taking precedence over non-shower outlets. (IEC 60335-2-35)		N/A
22.52	Socket-outlets on appliances accessible to the user in accordance with the socket-outlet system used in the country in which the appliance is sold		N/A
22.53	Class II appliances and class III appliances that incorporate functionally earthed parts have at least double insulation or reinforced insulation between live parts and the functionally earthed parts		N/A
22.54	Button cells and batteries designated R1 not accessible without the aid of a tool, unless		N/A
	the cover of their compartment can only be opened after at least two independent movements have been applied simultaneously		N/A
22.55	Devices operated to stop the intended function of the appliance, if any, are distinguished from other manual devices by means of shape, size, surface texture or position	by means of shape, size, surface texture or position	P
	The requirement concerning position does not preclude use of a push on push off switch		P
	An indication when the device has been operated is given by:		—
	- tactile feedback from the actuator or from the appliance, or		N/A
	- reduction in heat output; or		N/A
	- audible and visible feedback		P
22.56	Detachable power supply part provided with the part of class III construction		N/A
22.57	The properties of non-metallic materials do not degrade from exposure to UV-C radiation, as specified in annex T		N/A
	This requirement does not apply to glass, ceramics or similar materials		N/A
22.101	Rated pressure of closed water heaters is at least 0,6 MPa (IEC 60335-2-35)		P
	Rated pressure of closed water heaters intended to be supplied by a pressure reducing valve is at least 0,1 MPa (IEC 60335-2-35)		N/A

IEC 60335-2-35			
Clause	Requirement + Test	Result - Remark	Verdict
22.102	VOID (IEC 60335-2-35)		N/A
22.103	Closed water heaters having a capacity exceeding 3 l are supplied with a pressure relief device that prevents excessive pressure (IEC 60335-2-35)		N/A
	Compliance is checked by inspection and by subjecting the appliance to a slowly increasing water pressure. (IEC 60335-2-35)		N/A
	Pressure relief device operates before the water pressure exceeds the rated pressure by more than 0,1 MPa (IEC 60335-2-35)		N/A
22.104	Outlet of open-outlet water heaters are constructed so that the water flow is not limited to such an extent that the container is subjected to significant pressure in normal use (IEC 60335-2-35)		N/A
	Requirement is considered to be met if the cross-sectional area of the water outlet is not less than that of the inlet. (IEC 60335-2-35)		N/A
22.105	Open outlet water heaters incorporating a flow switch shall be constructed so that if there is no water flow, the heating element cannot be switched on, and it is switched off if the water flow ceases. (IEC 60335-2-35)		N/A
	However, if compliance with this sub clause relies on the correct operation of an electronic circuit, the appliance is further tested as follows. (IEC 60335-2-35)		—
	a) The appliance is operated for one cycle. In addition, the electromagnetic phenomena tests of 19.11.4.1 to 19.11.4.7 are applied during the test. The tests are carried out with surge protective devices disconnected, unless they incorporate spark gaps. (IEC 60335-2-35)		N/A
	If there is no water flow, the heating element shall not be switched on, and it is switched off without delay if the water flow ceases. (IEC 60335-2-35)		N/A
	b) The appliance is operated for one cycle. The fault conditions in a) to g) of 19.11.2 are then considered and applied one at a time to the electronic circuit (IEC 60335-2-35)		N/A
	If there is no water flow, the heating element shall not be switched on, and it is switched off without delay if the water flow ceases. (IEC 60335-2-35)		N/A
	One cycle consists of opening and closing of the water tap. (IEC 60335-2-35)		N/A
	If the electronic circuit is programmable, the software shall contain measures to control the fault/error conditions specified in Table R.1 and is evaluated in accordance with the relevant requirements of Annex R. (IEC 60335-2-35)		N/A

IEC 60335-2-35			
Clause	Requirement + Test	Result - Remark	Verdict
22.106	Closed water heaters incorporate a thermal cut-out that operates independently from a thermostat or flow switch (IEC 60335-2-35)		P
	It is only possible to reset thermal cut-out after removal of a non-detachable cover (IEC 60335-2-35)		P
	If the capacity does not exceed 1 l and the appliance incorporates a flow switch, a pressure switch, may be used instead of the thermal cut-out. (IEC 60335-2-35/AMD1)		P
22.107	Water does not attain an excessive temperature in normal use (IEC 60335-2-35)		P
	Appliance is operated at rated power input. Any regulating valve is fully opened and the water flow is adjusted so that flow switch or pressure switch is on the verge of operating (IEC 60335-2-35)		P
	Temperature of the outlet water (°C) is not higher than 95 °C and (IEC 60335-2-35)..... :	Measured: 56,3 °C	P
	not exceed the temperature of the inlet water (°C) by more than 75 K (IEC 60335-2-35)..... :	Measured: 36,3 K	P
	For appliances intended to supply water for showering the test is carried out under normal operation and with a water pressure of 0,2 MPa. Temperature of the water at the outlet (°C) does not exceed 55 °C (IEC 60335-2-35)..... :		N/A
22.108	Outlet water of the appliances shall not attain an excessive temperature due to sudden pressure drop in the water supply (IEC 60335-2-35/AMD1)		P
	Appliance is supplied with water at pressure of 0,4 MPa. It is operated at rated power input with the regulating valve adjusted so that outlet water temperature is 25 K ± 1 K above the inlet water temperature. Water pressure is then reduced to 0,2 MPa within 1 s (IEC 60335-2-35)		P
	Outlet water temperature does not rise by more than 25 K within 10 s (IEC 60335-2-35)		P
	Outlet water temperature is measured by means of a fine-wire thermocouple placed in centre of plastic cylindrical receptacle having diameter of 30 mm and a height of 12 mm (IEC 60335-2-35)		P
	Receptacle is positioned 25 mm below shower head (IEC 60335-2-35)		P
	If compliance relies on the operation of an electronic circuit, the test is repeated under the following conditions applied separately: (IEC 60335-2-35)		—
	- the fault conditions in a) to g) of 19.11.2 applied one at a time to the electronic circuit; (IEC 60335-2-35)		N/A

IEC 60335-2-35			
Clause	Requirement + Test	Result - Remark	Verdict
	- the electromagnetic phenomena tests of 19.11.4.1 to 19.11.4.7 applied to the appliance. (IEC 60335-2-35)		N/A
	The outlet water temperature does not rise by more than 25 K within 10 s during or after each of the tests. (IEC 60335-2-35)		N/A
	If the electronic circuit is programmable, the software shall contain measures to control the fault/error conditions specified in Table R.1 and is evaluated in accordance with the relevant requirements of Annex R. (IEC 60335-2-35)		N/A
22.109	Water containers of open-outlet water heaters having a pressure switch not rupture due to excessive internal pressure (IEC 60335-2-35)		N/A
	- appliances having a weak part that is ejected or ruptures when the pressure is excessive, by the test of clause 22.109.1 (IEC 60335-2-35);		N/A
	- appliances having other means for relieving pressure, by the tests of clause 22.109.1 and 22.109.3 (IEC 60335-2-35);		N/A
	- appliances having heating elements that (IEC 60335-2-35):		N/A
	- rupture before the internal pressure is excessive, or (IEC 60335-2-35)		N/A
	- cannot be energized when the internal pressure is excessive (IEC 60335-2-35)		N/A
	By the tests of clause 22.109.2 and 22.109.3 (IEC 60335-2-35)		N/A
	After the tests, appliance complies with clauses 8 and 16.2 (IEC 60335-2-35)		N/A
22.109.1	Appliance is filled with water, the water outlet being sealed. Water pressure is then steadily increased (IEC 60335-2-35)		N/A
	Weak part shall be ejected or rupture, or the pressure relief device operate, before internal pressure reaches 1,1 MPa (IEC 60335-2-35)		N/A
	After the pressure has been relieved, water is allowed to flow for period of 1 min (IEC 60335-2-35)		N/A
22.109.2	Appliance is filled with water, the water outlet being sealed and the inlet valve is closed. Controls are short-circuited or open-circuited, whichever is more unfavourable (IEC 60335-2-35)		N/A
	Appliance is then operated at rated power input (IEC 60335-2-35)		N/A
	Heating element ruptures without causing a hazard unless it remains de-energized (IEC 60335-2-35)		N/A

IEC 60335-2-35			
Clause	Requirement + Test	Result - Remark	Verdict
	If heating element ruptures, the inlet valve is opened and the water pressure steadily increased until it reaches 1,1 MPa. Pressure is maintained for 1 min (IEC 60335-2-35)		N/A
22.109.3	Appliance is filled with water, the water inlet and outlet being sealed. Controls are short-circuited or open-circuited, whichever is more unfavourable (IEC 60335-2-35)		N/A
	Appliance is placed as in an normal use in an ambient having a temperature not exceeding -5 °C until the water is frozen (IEC 60335-2-35)		N/A
	Appliance is then placed in the normal ambient and operated at rated power input (IEC 60335-2-35)		N/A
	Heating element ruptures without causing a hazard or any excessive pressure shall be relieved by means of a pressure relief device, unless the heating element remains de-energized (IEC 60335-2-35)		N/A
	Appliance is switched off and allowed to reach room temperature (IEC 60335-2-35)		N/A
	If the heating element remains de-energized or ruptured, water is supplied through the inlet and the pressure is steadily increased until it reaches 1,1 MPa. Pressure maintained for 1 min (IEC 60335-2-35)		N/A
	If a pressure relief device has operated, the appliance is connected to the water supply for a period of 1 min with outlet still sealed (IEC 60335-2-35)		N/A
22.110	Appliances for wall-mounting have reliable provision for fixing to a wall, independent of the connection to the water mains (IEC 60335-2-35)		P
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		P
	Wiring effectively prevented from coming into contact with moving parts		N/A
23.2	Beads etc. on live wires cannot change their position, and are not resting on sharp edges		N/A
	Beads inside flexible metal conduits contained within an insulating sleeve		N/A
23.3	Electrical connections and internal conductors movable relatively to each other not exposed to undue stress		N/A

IEC 60335-2-35			
Clause	Requirement + Test	Result - Remark	Verdict
	Flexible metallic tubes not causing damage to insulation of conductors		N/A
	Open-coil springs not used		N/A
	Adequate insulating lining provided inside a coiled spring, the turns of which touch one another		N/A
	No damage after 10 000 flexings for conductors flexed during normal use, or		N/A
	100 flexings for conductors flexed during user maintenance		N/A
	Electric strength test of 16.3, 1000 V between live parts and accessible metal parts		N/A
	Not more than 10 % of the strands of any conductor broken, and		N/A
	not more than 30 % for wiring supplying circuits that consume no more than 15 W		N/A
23.4	Bare internal wiring sufficiently rigid and fixed		N/A
23.5	The insulation of internal wiring subjected to the supply mains voltage withstanding the electrical stress likely to occur in normal use		P
	Basic insulation electrically equivalent to the basic insulation of cords complying with IEC 60227 or IEC 60245, or		N/A
	no breakdown when a voltage of 2000 V is applied for 15 min between the conductor and metal foil wrapped around the insulation		P
	For class II construction, the requirements for supplementary insulation and reinforced insulation apply,		N/A
	except that the sheath of a cord complying with IEC 60227 or IEC 60245 may provide supplementary insulation.		N/A
	A single layer of internal wiring insulation does not provide reinforced insulation		N/A
23.6	Sleeving used as supplementary insulation on internal wiring retained in position by clamping at both ends, or		N/A
	be such that it can only be removed by breaking or cutting		N/A
23.7	The colour combination green/yellow only used for earthing conductors		P
23.8	Aluminium wires not used for internal wiring		P
23.9	Stranded conductors not consolidated by soldering where they are subjected to contact pressure, unless		P
	the contact pressure is provided by spring terminals		N/A

IEC 60335-2-35			
Clause	Requirement + Test	Result - Remark	Verdict
23.10	The insulation and sheath of internal wiring, incorporated in external hoses for the connection of an appliance to the water mains, at least equivalent to that of light polyvinyl chloride sheathed flexible cord (60227 IEC 52)		N/A
24	COMPONENTS		—
24.1	Components comply with safety requirements in relevant IEC standards		P
	List of components	(see appended table)	P
	Motors not required to comply with IEC 60034-1, they are tested as part of the appliance		P
	Relays tested as part of the appliance, or		N/A
	alternatively acc. to IEC 60730-1, and meeting the additional requirements in IEC 60335-1		N/A
	The requirements of clause 29 apply between live parts of components and accessible parts of the appliance		P
	Components can comply with the requirements for clearances and creepage distances for functional insulation in the relevant component standard		P
	30.2 of this standard apply to parts of non-metallic material in components including parts of non-metallic material supporting current-carrying connections		P
	Components that have not been previously tested to comply with the IEC standard for the relevant component are tested according to the requirements of 30.2		P
	Components that have been previously tested to comply with the resistance to fire requirements in the IEC standard for the relevant component need not be retested provided the specified conditions are met		P
	If these conditions are not satisfied, the component is tested as part of the appliance.		P
	Power electronic converter circuits not required to comply with IEC 62477-1, they are tested as part of the appliance		N/A
	If components have not been tested and found to comply with relevant IEC standard for the number of cycles specified, they are tested in accordance with 24.1.1 to 24.1.9		N/A
	For components mentioned in 24.1.1 to 24.1.9 no additional tests specified in the relevant component standard are necessary other than those specified in 24.1.1 to 24.1.9		P

IEC 60335-2-35			
Clause	Requirement + Test	Result - Remark	Verdict
	Components not tested and found to comply with relevant IEC standard and components not marked or not used in accordance with its marking, tested under the conditions occurring in the appliance		P
	Lampholders and starterholders that have not being tested and found to comply with the relevant IEC standard, tested as a part of the appliance and additionally according to the gauging and interchangeability requirements of the relevant IEC standard		N/A
	No additional tests specified for nationally standardized plugs such as those detailed in IEC/TR 60083 or connectors complying with the standard sheets of IEC 60320-1 and IEC 60309		N/A
24.1.1	Capacitors likely to be permanently subjected to the supply voltage and used for radio interference suppression or for voltage dividing, comply with IEC 60384-14		P
	If the capacitors have to be tested, they are tested according to annex F		N/A
24.1.2	Transformers in associated switch mode power supplies comply with annex BB of IEC 61558-2-16		P
	Safety isolating transformers comply with IEC 61558-2-6		N/A
	If they have to be tested, they are tested according to annex G		N/A
24.1.3	Switches comply with IEC 61058-1, the number of cycles of operation being at least 10 000		N/A
	If they have to be tested, they are tested according to annex H		N/A
	If the switch operates a relay or contactor, the complete switching system is subjected to the test		N/A
	If the switch only operates a motor starting relay complying with IEC 60730-2-10 with the number of cycles of a least 10 000 as specified, the complete switching system need not be tested		N/A
	Flow switches are tested for 50000 cycles of operation (IEC 60335-2-35)		N/A
	Pressure switches for open-outlet water heaters and pressure switches for appliances intended to supply water for showering only are tested for 20 000 cycles of operation (IEC 60335-2-35)		N/A
	Pressure switches for other water heaters are tested for 50 000 cycles of operation (IEC 60335-2-35)		N/A
24.1.4	Automatic controls comply with IEC 60730-1 with the relevant part 2. The number of cycles of operation being at least:		—

IEC 60335-2-35			
Clause	Requirement + Test	Result - Remark	Verdict
	- thermostats:..... 10 000		N/A
	- temperature limiters:..... 1 000		N/A
	- self-resetting thermal cut-outs:..... 300		N/A
	- voltage maintained non-self-resetting thermal cut-outs:..... 1 000		N/A
	- other non-self-resetting thermal cut-outs: 30		P
	- timers:..... 3 000		N/A
	- energy regulators: 10 000		N/A
	Thermal cut-outs incorporated in closed water heaters complies with the requirements for type 2B controls in Clauses 13, 15, 16, 17 and 20 of IEC 60730-1, unless they are tested with the appliance (IEC 60335-2-35)		P
	If self-resetting thermal cut-out operates during the test of clause 22.107, the number of cycles of operation increased to (IEC 60335-2-35):		—
	- 3000, for waters heaters intended to supply water for showering (IEC 60335-2-35);		N/A
	- 1000, for other appliances (IEC 60335-2-35)		N/A
	The number of cycles for controls operating during clause 11 need not be declared, if the appliance meets the requirements of this standard when they are short-circuited		N/A
	Thermal motor protectors are tested in combination with their motor under the conditions specified in annex D		N/A
	For water valves containing live parts and that are incorporated in external hoses for connection of an appliance to the water mains, the degree of protection declared for subclause 6.5.2 of IEC 60730-2-8 is IPX7		N/A
	Thermal cut-outs of the capillary type comply with the requirements for type 2.K controls in IEC 60730-2-9		N/A
24.1.5	Appliance couplers comply with IEC 60320-1		N/A
	However, for class II appliances classified higher than IPX0, the appliance couplers comply with IEC 60320-2-3		N/A
	Interconnection couplers comply with IEC 60320-2-2		N/A
24.1.6	Small lamp holders similar to E10 lampholders comply with IEC 60238, the requirements for E10 lampholders being applicable		N/A

IEC 60335-2-35			
Clause	Requirement + Test	Result - Remark	Verdict
24.1.7	For remote operation of the appliance via a telecommunication network, the relevant standard for the telecommunication interface circuitry in the appliance is IEC 62151		N/A
24.1.8	The relevant standard for thermal links is IEC 60691		N/A
	Thermal links not complying with IEC 60691 are considered to be an intentionally weak part for the purposes of clause 19		N/A
24.1.9	Contactors and relays, other than motor starting relays, tested as part of the appliance		N/A
	They are also tested in accordance with clause 17 of IEC 60730-1, the number of cycles of operations in 24.1.4 selected according to the contactor or relay function in the appliance.....:		N/A
24.2	Appliances not fitted with:		—
	- switches, automatic controls or power supplies in flexible cords		P
	- devices causing the protective device in the fixed wiring to operate in the event of a fault in the appliance		P
	- thermal cut-outs that can be reset by soldering, unless		P
	the solder has a melting point of at least 230 °C		N/A
24.3	Switches intended for all-pole disconnection of stationary appliances are directly connected to the supply terminals and have a contact separation in all poles, providing full disconnection under overvoltage category III conditions		N/A
24.4	Plugs and socket-outlets for extra-low voltage circuits and heating elements, not interchangeable with plugs and socket-outlets listed in IEC/TR 60083 or IEC 60906-1 or with connectors and appliance inlets complying with the standard sheets of IEC 60320-1		N/A
24.5	Capacitors in auxiliary windings of motors marked with their rated voltage and capacitance, and used accordingly		N/A
	Voltage across capacitors in series with a motor winding does not exceed 1,1 times rated voltage, when the appliance is supplied at 1,1 times rated voltage under minimum load		N/A
24.6	Working voltage of motors connected to the supply mains and having basic insulation that is inadequate for the rated voltage of the appliance, not exceeding 42 V		N/A
	In addition, the motors comply with the requirements of annex I		N/A

IEC 60335-2-35			
Clause	Requirement + Test	Result - Remark	Verdict
24.7	Detachable hose-sets for connection of appliances to the water mains comply with IEC 61770		N/A
	They are supplied with the appliance		N/A
	Appliances intended to be permanently connected to the water mains not connected by a detachable hose-set		P
24.8	Motor running capacitors in appliances for which 30.2.3 is applicable and that are permanently connected in series with a motor winding, not causing a hazard in event of a failure		N/A
	One or more of the following conditions are to be met:		—
	- the capacitors are of class S2 or S3 according to IEC 60252-1		N/A
	- the capacitors are housed within a metallic or ceramic enclosure		N/A
	- the distance of separation of the outer surface to adjacent non-metallic parts exceeds 50 mm		N/A
	- adjacent non-metallic parts within 50 mm withstand the needle-flame test of annex E		N/A
	- adjacent non-metallic parts within 50 mm classified as at least V-1 according to IEC 60695-11-10		N/A
24.101	Thermal cut-out or other protective device incorporated to comply with clause 22.106 shall be non-self resetting and, for multi-phase appliances, provide all-pole disconnection (IEC 60335-2-35)		P
	For bare-element water heaters intended to be connected to power supply by a supply cord fitted with a non-polarized plug (IEC 60335-2-35),		N/A
	the thermal cut-out or other protected device incorporated in the appliance shall provide all-pole disconnection (IEC 60335-2-35)		N/A
24.102	Thermal cut-out or other protective device, incorporated for compliance with clause 22.106 in closed water heaters having a capacity not exceeding 1 l, shall maintain its operating characteristics (IEC 60335-2-35)		P
	Appliance is supplied at rated voltage and operated under normal operation but with any control operates during test of clause 11 short-circuited (IEC 60335-2-35)		P
	Water flow is adjusted so that temperature of water increases by approximately 1 K per minute (IEC 60335-2-35)		P
	Thermal cut-out is caused to operate five times, temperatures at which it operates are measured and the mean value determined (IEC 60335-2-35):	$\frac{1}{5} \sum_{i=1}^5 x_i = 99,48$	P

IEC 60335-2-35			
Clause	Requirement + Test	Result - Remark	Verdict
	Thermal cut-out is subjected to 50 000 cycles of temperature fluctuation (IEC 60335-2-35)		P
	Each cycle consists of a variation in temperature between the maximum value measured during the test of clause 22.107 and half this value (IEC 60335-2-35)		P
	Thermal cut-out is then caused to operate 20 times and the mean value of the temperatures at which it operates not deviate by more than 20 % from mean value previously determined (IEC 60335-2-35).....:	$\frac{1}{20} \sum_{i=1}^{20} x_i = 99,78$ Deviation: 0,30%	P
	If the protective device is sensitive to pressure, appliance is not energized and is subjected to slowly increasing water pressure (IEC 60335-2-35)		N/A
	Mean operating pressure of protective device is determined over five cycles (IEC 60335-2-35).....:	$\frac{1}{5} \sum_{i=1}^5 x_i =$	N/A
	Protective device is subjected to 50 000 cycles of pressure fluctuation (IEC 60335-2-35)		N/A
	Each cycle consists of a variation in pressure between the rated pressure of the appliance and half this value (IEC 60335-2-35)		N/A
	Protective device is then caused to operate 20 times and the mean value of pressures at which it operates not deviate by more than 20 % from the mean value previously determined (IEC 60335-2-35).....:	$\frac{1}{20} \sum_{i=1}^{20} x_i =$ Deviation:	N/A
25	SUPPLY CONNECTION AND EXTERNAL FLEXIBLE CORDS		—
25.1	Appliance not intended for permanent connection to fixed wiring, means for connection to the supply:		—
	- supply cord fitted with a plug, the current rating and voltage rating of the plug being not less than the corresponding ratings of its associated appliance		N/A
	- an appliance inlet having at least the same degree of protection against moisture as required for the appliance, or		N/A
	- pins for insertion into socket-outlets		N/A
25.2	Appliance not provided with more than one means of connection to the supply mains		P
	Stationary appliance for multiple supply may be provided with more than one means of connection, provided electric strength test of 1250 V for 1 min between each means of connection causes no breakdown		N/A
25.3	Appliance intended to be permanently connected to fixed wiring provided with one of the following means for connection to the supply mains:		—
	- a set of terminals allowing the connection of a flexible cord		N/A

IEC 60335-2-35			
Clause	Requirement + Test	Result - Remark	Verdict
	- a fitted supply cord		P
	- a set of supply leads accommodated in a suitable compartment		N/A
	- a set of terminals for the connection of cables of fixed wiring, cross-sectional areas specified in 26.6, and the appliance allows the connection of the supply conductors after the appliance has been fixed to its support		N/A
	- a set of terminals and cable entries, conduit entries, knock-outs or glands, allowing connection of appropriate types of cable or conduit, and the appliance allows the connection of the supply conductors after the appliance has been fixed to its support		N/A
	For a fixed appliance constructed so that parts can be removed to facilitate easy installation, this requirement is met if it is possible to connect the fixed wiring without difficulty after a part of the appliance has been fixed to its support		N/A
25.4	Cable and conduit entries, rated current of appliance not exceeding 16 A, dimension according to table 10 (mm)		N/A
	Introduction of conduit or cable does not reduce clearances or creepage distances below values specified in clause 29		N/A
25.5	Method for assembling the supply cord to the appliance:		—
	- type X attachment		N/A
	- type Y attachment		P
	- type Z attachment, if allowed in relevant part 2		N/A
	Type X attachment, other than those with a specially prepared cord, not used for flat twin tinsel cords		N/A
	For multi-phase appliances supplied with a supply cord and that are intended to be permanently connected to fixed wiring, the supply cord is assembled to the appliance by type Y attachment		N/A
25.6	Plugs fitted with only one flexible cord		N/A
25.7	Supply cords, other than for class III appliances, being one of the following types:		—
	- rubber sheathed (at least 60245 IEC 53)		N/A
	- polychloroprene sheathed (at least 60245 IEC 57)		N/A
	- polyvinyl chloride sheathed. Not used if they are likely to touch metal parts having a temperature rise exceeding 75 K during the test of clause 11		—
	- light polyvinyl chloride sheathed cord (60227 IEC 52), for appliances not exceeding 3 kg		N/A

IEC 60335-2-35			
Clause	Requirement + Test	Result - Remark	Verdict
	- ordinary polyvinyl chloride sheathed cord (60227 IEC 53), for other appliances	H05VV-F 60227 IEC 53	P
	- heat resistant polyvinyl chloride sheathed. Not used for type X attachment other than specially prepared cords		—
	- heat-resistant light polyvinyl chloride sheathed cord (60227 IEC 56), for appliances not exceeding 3 kg		N/A
	- heat-resistant polyvinyl chloride sheathed cord (60227 IEC 57), for other appliances		N/A
	- halogen-free, low smoke, thermoplastic insulated and sheathed		—
	- light duty halogen-free low smoke flexible cable (62821 IEC 101) for circular cable and (62821 IEC 101f) for flat cable		N/A
	- Ordinary duty halogen-free low smoke flexible cable (62821 IEC 102) for circular cable and (62821 IEC 102f) for flat cable		N/A
	Supply cords for class III appliances adequately insulated		N/A
	Test with 500 V for 2 min for supply cords of class III appliances that contain live parts		N/A
25.8	Nominal cross-sectional area of supply cords not less than table 11; rated current (A); cross-sectional area (mm ²).....:	FD68P: 28,7 A; 6 mm ² ; FD55P: 23,7 A; 4 mm ²	P
25.9	Supply cords not in contact with sharp points or edges		P
25.10	Supply cord of class I appliances have a green/yellow core for earthing		P
	In multi-phase appliances, the colour of the neutral conductor of the supply cord is blue		N/A
	Where additional neutral conductors are provided in the supply cord:		—
	- other colours may be used for these additional neutral conductors;		N/A
	- all of the neutral conductors and line conductors are identified by marking using the alpha numeric notation specified in IEC 60445		N/A
	- the supply cord is fitted to the appliance		N/A
25.11	Conductors of supply cords not consolidated by soldering where they are subject to contact pressure, unless		P
	the contact pressure is provided by spring terminals		N/A
25.12	Insulation of the supply cord not damaged when moulding the cord to part of the enclosure		N/A
25.13	Inlet openings so constructed as to prevent damage to the supply cord		P

IEC 60335-2-35			
Clause	Requirement + Test	Result - Remark	Verdict
	If it is not evident that the supply cord can be introduced without risk of damage, a non-detachable lining or bushing complying with 29.3 for supplementary insulation provided		N/A
	If unsheathed supply cord, a similar additional bushing or lining is required, unless the appliance is		N/A
	class 0, or		N/A
	a class III appliance not containing live parts		N/A
25.14	Supply cords moved while in operation adequately protected against excessive flexing		N/A
	Flexing test, as described:		—
	- applied force (N).....:		N/A
	- number of flexings.....:		N/A
	The test does not result in:		—
	- short-circuit between the conductors, such that the current exceeds a value of twice the rated current		N/A
	- breakage of more than 10% of the strands of any conductor		N/A
	- separation of the conductor from its terminal		N/A
	- loosening of any cord guard		N/A
	- damage to the cord or the cord guard		N/A
	- broken strands piercing the insulation and becoming accessible		N/A
25.15	For appliances with supply cord and appliances to be permanently connected to fixed wiring by a flexible cord, conductors of the supply cord relieved from strain, twisting and abrasion by use of cord anchorage		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:		—
	- fixed appliances: pull 100 N; torque (not on automatic cord reel) (Nm)	100 N; 0,35 Nm	P
	- other appliances: values shown in table 12: mass (kg); pull (N); torque (not on automatic cord reel) (Nm)		N/A
	Cord not damaged and max. 2 mm displacement of the cord	0,5 mm	P
25.16	Cord anchorages for type X attachments constructed and located so that:		—
	- replacement of the cord is easily possible		N/A
	- it is clear how the relief from strain and the prevention of twisting are obtained		N/A

IEC 60335-2-35			
Clause	Requirement + Test	Result - Remark	Verdict
	- they are suitable for different types of supply cord		N/A
	- cord cannot touch the clamping screws of cord anchorage if these screws are accessible, unless		N/A
	they are separated from accessible metal parts by supplementary insulation		N/A
	- the cord is not clamped by a metal screw which bears directly on the cord		N/A
	- at least one part of the cord anchorage securely fixed to the appliance, unless		N/A
	it is part of a specially prepared cord		N/A
	- screws which have to be operated when replacing the cord do not fix any other component, unless		N/A
	the appliance becomes inoperative or incomplete or the parts cannot be removed without a tool		N/A
	- if labyrinths can be bypassed the test of 25.15 is nevertheless withstood		N/A
	- for class 0, 0I and I appliances they are of insulating material or are provided with an insulating lining, unless		N/A
	failure of the insulation of the cord does not make accessible metal parts live		N/A
	- for class II appliances they are of insulating material, or		N/A
	if of metal, they are insulated from accessible metal parts by supplementary insulation		N/A
	After the test of 25.15, under the conditions specified, the conductors have not moved by more than 1 mm in the terminals		N/A
25.17	Adequate cord anchorages for type Y and Z attachment, test with the cord supplied with the appliance		P
25.18	Cord anchorages only accessible with the aid of a tool, or		P
	Constructed so that the cord can only be fitted with the aid of a tool		N/A
25.19	Type X attachment, glands not used as cord anchorage in portable appliances		N/A
	Tying the cord into a knot or tying the cord with string not used		N/A
25.20	The conductors of the supply cord for type Y and Z attachment insulated from accessible metal parts		P
25.21	Space for supply cord for type X attachment or for connection of fixed wiring constructed:		—

IEC 60335-2-35			
Clause	Requirement + Test	Result - Remark	Verdict
	- to permit checking of conductors with respect to correct positioning and connection before fitting any cover		N/A
	- so there is no risk of damage to the conductors or their insulation when fitting the cover		N/A
	- for portable appliances, so that the uninsulated end of a conductor, if it becomes free from the terminal, prevented from contact with accessible metal parts		N/A
	2 N test to the conductor for portable appliances; no contact with accessible metal parts		N/A
25.22	Appliance inlets:		—
	- live parts not accessible during insertion or removal		N/A
	Requirement not applicable to appliance inlets complying with IEC 60320-1		N/A
	- connector can be inserted without difficulty		N/A
	- the appliance is not supported by the connector		N/A
	- not for cold conditions if temp. rise of external metal parts exceeds 75 K during clause 11, unless		N/A
	the supply cord is unlikely to touch such metal parts		N/A
25.23	Interconnection cords comply with the requirements for the supply cord, except that:		—
	- the cross-sectional area of the conductors is determined on the basis of the maximum current during clause 11		N/A
	- the thickness of the insulation may be reduced		N/A
	- for class I or class II appliance with class III construction, the cross sectional areas of the conductors need not comply with 25.8 if specified conditions are met		N/A
	If necessary, electric strength test of 16.3		N/A
25.24	Interconnection cords not detachable without the aid of a tool if compliance with this standard is impaired when they are disconnected		N/A
25.25	Dimensions of pins that are inserted into socket-outlets compatible with the dimensions of the relevant socket-outlet.		N/A
	Dimensions of pins and engagement face in accordance with the dimensions of the relevant plug in IEC/TR 60083		N/A
26	TERMINALS FOR EXTERNAL CONDUCTORS		—
26.1	Appliances provided with terminals or equally effective devices for connection of external conductors		P

IEC 60335-2-35			
Clause	Requirement + Test	Result - Remark	Verdict
	Terminals only accessible after removal of a non-detachable cover, except		P
	for class III appliances that do not contain live parts		N/A
	Earthing terminals may be accessible if a tool is required to make the connections and means are provided to clamp the wire independently from its connection		N/A
26.2	Appliances with type X attachment and appliances for the connection of cables of fixed wiring provided with terminals in which connections are made by means of screws, nuts or similar devices, unless		N/A
	the connections are soldered		N/A
	Screws and nuts not used to fix any other component, except		N/A
	internal conductors, if so arranged that they are unlikely to be displaced when fitting the supply conductors		N/A
	If soldered connections used, the conductor so positioned or fixed that reliance is not placed on soldering alone, unless		N/A
	barriers provided so that neither clearances nor creepage distances between live parts and other metal parts reduced below the values for supplementary insulation if the conductor becomes free at the soldered joint		N/A
26.3	Terminals for type X attachment and for connection of cables of fixed wiring so constructed that the conductor is clamped between metal surfaces with sufficient contact pressure but without damaging the conductor		N/A
	Terminals fixed so that when the clamping means is tightened or loosened:		—
	- the terminal does not become loose		N/A
	- internal wiring is not subjected to stress		N/A
	- neither clearances nor creepage distances are reduced below the values in clause 29		N/A
	Compliance checked by inspection and by the test of subclause 9.6 of IEC 60999-1, the torque applied being equal to two-thirds of the torque specified (Nm)		N/A
	No deep or sharp indentations of the conductors		N/A
26.4	Terminals for type X attachment, except those having a specially prepared cord and those for the connection of cables of fixed wiring, no special preparation of conductors such as by soldering, use of cable lugs, eyelets or similar, and		N/A

IEC 60335-2-35			
Clause	Requirement + Test	Result - Remark	Verdict
	so constructed or placed that conductors prevented from slipping out when clamping screws or nuts are tightened		N/A
26.5	Terminals for type X attachment so located or shielded that if a wire of a stranded conductor escapes, no risk of accidental connection to other parts that result in a hazard		N/A
	Stranded conductor test, 8 mm insulation removed		N/A
	No contact between live parts and accessible metal parts and,		N/A
	for class II constructions, between live parts and metal parts separated from accessible metal parts by supplementary insulation only		N/A
26.6	Terminals for type X attachment and for connection of cables of fixed wiring suitable for connection of conductors with cross-sectional area according to table 13; rated current (A); nominal cross-sectional area (mm ²).....:		N/A
	If a specially prepared cord is used, terminals need only be suitable for that cord		N/A
26.7	Terminals for type X attachment, except in class III appliances not containing live parts, accessible after removal of a cover or part of the enclosure		N/A
26.8	Terminals for the connection of fixed wiring, including the earthing terminal, located close to each other		N/A
26.9	Terminals of the pillar type constructed and located as specified		N/A
26.10	Terminals with screw clamping and screwless terminals not used for flat twin tinsel cords, unless		N/A
	conductors ends fitted with means suitable for screw terminals		N/A
	Pull test of 5 N to the connection		N/A
26.11	For type Y and Z attachment, soldered, welded, crimped or similar connections may be used		P
	For class II appliances, the conductor so positioned or fixed that reliance is not placed on soldering, welding or crimping alone		N/A
	If soldering, welding or crimping alone used, barriers provided so that clearances and creepage distances between live parts and other metal parts are not reduced below the values for supplementary insulation if the conductor becomes free		N/A
27	PROVISION FOR EARTHING		—

IEC 60335-2-35			
Clause	Requirement + Test	Result - Remark	Verdict
27.1	Accessible metal parts of class 0I and I appliances permanently and reliably connected to an earthing terminal or earthing contact of the appliance inlet		P
	Earthing terminals and earthing contacts not connected to the neutral terminal		P
	Class 0, II and III appliances have no provision for protective earthing		N/A
	Class II appliances and class III appliances can incorporate an earth for functional purposes		N/A
	Safety extra-low voltage circuits not earthed, unless		P
	protective extra-low voltage circuits		N/A
	For class I appliances, the sheath of heating element shall be permanently and reliably connected to the earthing terminal, unless (IEC 60335-2-35)		P
	- container is provided with inlet and outlet pipes of metal, which are permanently and reliably connected to the earthing terminal, and (IEC 60335-2-35)		N/A
	- other accessible metal parts of the container in contact with water are permanently and reliably connected to the earthing terminal (IEC 60335-2-35)		P
	For class I bare-element water heaters, water enters and leaves through metal pipes that are permanently and reliably connected to the earthing terminal or flow over metal parts that are similarly earthed (IEC 60335-2-35)		N/A
27.2	Clamping means of earthing terminals adequately secured against accidental loosening		P
	Terminals for the connection of external equipotential bonding conductors allow connection of conductors of 2,5 to 6 mm ² , and		N/A
	- do not provide earthing continuity between different parts of the appliance, and		N/A
	- conductors cannot be loosened without the aid of a tool		N/A
	Requirements not applicable to class II appliances and class III appliances that incorporate an earth for functional purposes		N/A
27.3	For a detachable part having an earth connection and being plugged into another part of the appliance, the earth connection is made before and separated after current-carrying connections when removing the part		N/A

IEC 60335-2-35			
Clause	Requirement + Test	Result - Remark	Verdict
	For appliances with supply cords, current-carrying conductors become taut before earthing conductor, if the cord slips out of the cord anchorage		P
	Requirements not applicable to class II appliances and class III appliances that incorporate an earth for functional purposes		N/A
27.4	No risk of corrosion resulting from contact between parts of the earthing terminal and the copper of the earthing conductor or other metal		P
	Parts providing earthing continuity, other than parts of a metal frame or enclosure, have adequate resistance to corrosion		P
	If of steel, these parts provided with an electroplated coating with a thickness at least 5 μm		N/A
	Adequate protection against rusting of parts of coated or uncoated steel, only intended to provide or transmit contact pressure		N/A
	In the body of the earthing terminal is a part of a frame or enclosure of aluminium or aluminium alloys, precautions taken to avoid risk of corrosion		N/A
	Requirements not applicable to class II appliances and class III appliances that incorporate an earth for functional purposes		N/A
27.5	Low resistance of connection between earthing terminal and earthed metal parts		P
	This requirement does not apply to connections providing earthing continuity in the protective extra-low voltage circuit, provided the clearances of basic insulation are based on the rated voltage of the appliance		N/A
	Requirements not applicable to class II appliances and class III appliances that incorporate an earth for functional purposes		N/A
	Resistance not exceeding 0,1 Ω at the specified low-resistance test (Ω)	0,014 Ω	P
27.6	The printed conductors of printed circuit boards not used to provide earthing continuity in hand-held appliances.		N/A
	They may be used to provide earthing continuity in other appliances if at least two tracks are used with independent soldering points and the appliance complies with 27.5 for each circuit		N/A
	Requirements not applicable to class II appliances and class III appliances that incorporate an earth for functional purposes		N/A
28	SCREWS AND CONNECTIONS		—

IEC 60335-2-35			
Clause	Requirement + Test	Result - Remark	Verdict
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		N/A
	Diameter of screws of insulating material min. 3 mm		N/A
	Screws of insulating material not used for any electrical connections or connections providing earthing continuity		N/A
	Screws used for electrical connections or connections providing earthing continuity screwed into metal		P
	Screws not of insulating material if their replacement by a metal screw can impair supplementary or reinforced insulation		P
	For type X attachment, screws to be removed for replacement of supply cord or for user maintenance, not of insulating material if their replacement by a metal screw impairs basic insulation		N/A
	For screws and nuts; torque-test as specified in table 14.....:	(see appended table)	P
28.2	Electrical connections and connections providing earthing continuity constructed so that contact pressure is not transmitted through non-ceramic insulating material liable to shrink or distort, unless		P
	there is resiliency in the metallic parts to compensate for shrinkage or distortion of the insulating material		N/A
	This requirement does not apply to electrical connections in circuits of appliances for which:		—
	- 30.2.2 is applicable and that carry a current not exceeding 0,5 A		N/A
	- 30.2.3 is applicable and that carry a current not exceeding 0,2 A		N/A
28.3	Space-threaded (sheet metal) screws only used for electrical connections if they clamp the parts together		N/A
	Thread-cutting (self-tapping) screws and thread rolling screws only used for electrical connections if they generate a full form standard machine screw thread		N/A
	Thread-cutting (self-tapping) screws not used if they are likely to be operated by the user or installer		N/A

IEC 60335-2-35			
Clause	Requirement + Test	Result - Remark	Verdict
	Thread-cutting, thread rolling and space threaded screws may be used in connections providing earthing continuity provided it is not necessary to disturb the connection:		—
	- in normal use,		N/A
	- during user maintenance,		N/A
	- when replacing a supply cord having a type X attachment, or		N/A
	- during installation		N/A
	At least two screws being used for each connection providing earthing continuity, unless		N/A
	the screw forms a thread having a length of at least half the diameter of the screw		N/A
28.4	Screws and nuts that make mechanical connection secured against loosening if they also make electrical connections or connections providing earthing continuity		N/A
	This requirement does not apply to screws in the earthing circuit if at least two screws are used, or		N/A
	if an alternative earthing circuit is provided		N/A
	Rivets for electrical connections or connections providing earthing continuity secured against loosening if the connections are subjected to torsion		N/A
29	CLEARANCES, CREEPAGE DISTANCES AND SOLID INSULATION		—
	Clearances, creepage distances and solid insulation withstand electrical stress		P
	For coatings used on printed circuits boards to protect the microenvironment (Type 1) or to provide basic insulation (Type 2), annex J applies		N/A
	The microenvironment is pollution degree 1 under type 1 protection		N/A
	For type 2 protection, the spacing between the conductors before the protection is applied is not less than the values specified in Table 1 of IEC 60664-3		N/A
	These values apply to functional, basic, supplementary and reinforced insulation		P
29.1	Clearances not less than the values specified in table 16, taking into account the rated impulse voltage for the overvoltage categories of table 15, unless	(see appended table)	P
	for basic insulation and functional insulation they comply with the impulse voltage test of clause 14		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	However, if the distances are affected by wear, distortion, movement of the parts or during assembly, the clearances for rated impulse voltages of 1500 V and above are increased by 0,5 mm and the impulse voltage test is not applicable		P
	For appliances intended for use at altitudes exceeding 2 000 m, the clearances in Table 16 is increased according to the relevant multiplier values in Table A.2 of IEC 60664-1		N/A
	Impulse voltage test is not applicable:		—
	- when the microenvironment is pollution degree 3, or		N/A
	- for basic insulation of class 0 and class 01 appliances, or		N/A
	- to appliances intended for use at altitudes exceeding 2 000 m		N/A
	Appliances are in overvoltage category II		P
	A force of 2 N is applied to bare conductors, other than heating elements		P
	A force of 30 N is applied to accessible surfaces		P
29.1.1	Clearances of basic insulation withstand the overvoltages, taking into account the rated impulse voltage		P
	The values of table 16 or the impulse voltage test of clause 14 are applicable	(see appended table)	P
	Clearance at the terminals of tubular sheathed heating elements may be reduced to 1,0 mm if the microenvironment is pollution degree 1		P
	Lacquered conductors of windings considered to be bare conductors		P
29.1.2	Clearances of supplementary insulation not less than those specified for basic insulation in table 16	(see appended table)	P
29.1.3	Clearances of reinforced insulation not less than those specified for basic insulation in table 16, using the next higher step for rated impulse voltage	(see appended table)	P
	For double insulation, with no intermediate conductive part between basic and supplementary insulation, clearances are measured between live parts and the accessible surface, and the insulation system is treated as reinforced insulation		P
29.1.4	Clearances for functional insulation are the largest values determined from:		—
	- table 16 based on the rated impulse voltage	(see appended table)	P

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Clause	Requirement + Test	Result - Remark	Verdict
	- table F.7a in IEC 60664-1, frequency not exceeding 30 kHz		P
	- clause 4 of IEC 60664-4, frequency exceeding 30 kHz		N/A
	If values of table 16 are largest, the impulse voltage test of clause 14 may be applied instead, unless		P
	the microenvironment is pollution degree 3, or		N/A
	the distances can be affected by wear, distortion, movement of the parts or during assembly		P
	However, clearances are not specified if the appliance complies with clause 19 with the functional insulation short-circuited		N/A
	Lacquered conductors of windings considered to be bare conductors		P
	However, clearances at crossover points are not measured		P
	Clearance between surfaces of PTC heating elements may be reduced to 1 mm		N/A
29.1.5	Appliances having higher working voltages than rated voltage, clearances for basic insulation are the largest values determined from:		—
	- table 16 based on the rated impulse voltage		P
	- table F.7a in IEC 60664-1, frequency not exceeding 30 kHz		P
	- clause 4 of IEC 60664-4, frequency exceeding 30 kHz		N/A
	If clearances for basic insulation are selected from Table F.7a of IEC 60664-1 or clause 4 of IEC 60664-4, the clearances of supplementary insulation are not less than those specified for basic insulation		N/A
	If clearances for basic insulation are selected from Table F.7a of IEC 60664-1, the clearances of reinforced insulation dimensioned as specified in Table F.7a are to withstand 160 % of the withstand voltage required for basic insulation		N/A
	If clearances for basic insulation are selected from clause 4 of IEC 60664-4, the clearances of reinforced insulation are twice the value required for basic insulation		N/A
	If the secondary winding of a step-down transformer is earthed, or if there is an earthed screen between the primary and secondary windings, clearances of basic insulation on the secondary side not less than those specified in table 16, but using the next lower step for rated impulse voltage		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Circuits supplied with a voltage lower than rated voltage, clearances of functional insulation are based on the working voltage used as the rated voltage in table 15		N/A
29.2	Creepage distances not less than those appropriate for the working voltage, taking into account the material group and the pollution degree	(see appended table)	P
	Pollution degree 2 applies, unless		P
	- precautions taken to protect the insulation; pollution degree 1		N/A
	- insulation subjected to conductive pollution; pollution degree 3		N/A
	A force of 2 N is applied to bare conductors, other than heating elements		P
	A force of 30 N is applied to accessible surfaces		P
	In a double insulation system, the working voltage for both the basic and supplementary insulation is taken as the working voltage across the complete double insulation system		P
29.2.1	Creepage distances of basic insulation not less than specified in table 17	(see appended table)	P
	However, if the working voltage is periodic and has a frequency exceeding 30 kHz, the creepage distances are also determined from table 2 of IEC 60664-4, these values being used if exceeding the values in table 17		N/A
	Except for pollution degree 1, corresponding creepage distance not less than the minimum specified for the clearance in table 16, if the clearance has been checked according to the test of clause 14		N/A
29.2.2	Creepage distances of supplementary insulation at least those specified for basic insulation in table 17, or	(see appended table)	P
	Table 2 of IEC 60664-4, as applicable		N/A
29.2.3	Creepage distances of reinforced insulation at least double those specified for basic insulation in table 17, or	(see appended table)	P
	Table 2 of IEC 60664-4, as applicable		N/A
29.2.4	Creepage distances of functional insulation not less than specified in table 18	(see appended table)	P
	However, if the working voltage is periodic and has a frequency exceeding 30 kHz, the creepage distances are also determined from table 2 of IEC 60664-4, these values being used if exceeding the values in table 18		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Creepage distances may be reduced if the appliance complies with clause 19 with the functional insulation short-circuited		N/A
29.3	Supplementary and reinforced insulation have adequate thickness, or a sufficient number of layers, to withstand the electrical stresses		P
	Compliance checked:		—
	- by measurement, in accordance with 29.3.1, or		P
	- by an electric strength test in accordance with 29.3.2, or		P
	- for insulation, other than single layer internal wiring insulation, by an assessment of the thermal quality of the material combined with an electric strength test, in accordance with 29.3.3, and		P
	for accessible parts of reinforced insulation consisting of a single layer, by measurement in accordance with 29.3.4, or		N/A
	- by an assessment of the thermal quality of the material according to 29.3.3 combined with an electric strength test in accordance with 23.5, for each single layer internal wiring insulation touching each other, or		N/A
	- as specified in subclause 6.3 of IEC 60664-4 for insulation that is subjected to any periodic voltage having a frequency exceeding 30 kHz		N/A
29.3.1	Supplementary insulation have a thickness of at least 1 mm	Control panel: 1,5 mm	P
	Reinforced insulation have a thickness of at least 2 mm	Enclosure: 2,3 mm Control Panel: 1,5 mm	P
29.3.2	Each layer of material withstand the electric strength test of 16.3 for supplementary insulation		P
	Supplementary insulation consist of at least 2 layers		N/A
	Reinforced insulation consist of at least 3 layers	Transformer 3 layers insulation tape	P
29.3.3	The insulation is subjected to the dry heat test Bb of IEC 60068-2-2, followed by		N/A
	the electric strength test of 16.3		N/A
	If the temperature rise during the tests of clause 19 does not exceed the value specified in table 3, the test of IEC 60068-2-2 is not carried out		P
29.3.4	Thickness of accessible parts of reinforced insulation consisting of a single layer not less than specified in table 19.....:		N/A
30	RESISTANCE TO HEAT AND FIRE		—

IEC 60335-2-35			
Clause	Requirement + Test	Result - Remark	Verdict
30.1	External parts of non-metallic material,		P
	parts supporting live parts, and		P
	parts of thermoplastic material providing supplementary or reinforced insulation		P
	sufficiently resistant to heat		P
	Ball-pressure test according to IEC 60695-10-2		P
	External parts tested at 40 °C plus the maximum temperature rise determined during the test of clause 11, or at 75 °C, whichever is the higher; temperature (°C).....:	(see appended table 30.1)	P
	Parts supporting live parts tested at 40 °C plus the maximum temperature rise determined during the test of clause 11, or at 125 °C, whichever is the higher; temperature (°C)	(see appended table 30.1)	P
	Parts of thermoplastic material providing supplementary or reinforced insulation tested at 25 °C plus the maximum temperature rise determined during clause 19, if higher; temperature (°C)		N/A
30.2	Parts of non-metallic material resistant to ignition and spread of fire		P
	This requirement does not apply to:		—
	parts having a mass not exceeding 0,5 g, provided the cumulative effect is unlikely to propagate flames that originate inside the appliance by propagating flames from one part to another, or		N/A
	decorative trims, knobs and other parts unlikely to be ignited or to propagate flames that originate inside the appliance		N/A
	Compliance checked by the test of 30.2.1, and in addition:		P
	- for attended appliances, 30.2.2 applies		N/A
	- for unattended appliances, 30.2.3 applies		P
	For appliances for remote operation, 30.2.3 applies		N/A
	For base material of printed circuit boards, 30.2.4 applies		P
30.2.1	Parts of non-metallic material subjected to the glow-wire test of IEC 60695-2-11 at 550 °C	(see appended table 30.2)	P
	However, test not carried out if the material is classified as having a glow-wire flammability index according to IEC 60695-2-12 of at least 550 °C, or		N/A
	the material is classified at least HB40 according to IEC 60695-11-10		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Parts for which the glow-wire test cannot be carried out need to meet the requirements in ISO 9772 for material classified HBF		N/A
30.2.3	Appliances operated while unattended, tested as specified in 30.2.3.1 and 30.2.3.2		P
	The tests are not applicable to conditions as specified		N/A
30.2.3.1	Not applicable to parts of insulating material supporting the heating elements and their connections of bare element water heaters (IEC 60335-2-35)		N/A
	Parts of non-metallic material supporting connections carrying a current exceeding 0,2 A during normal operation, and		P
	parts of non-metallic material, other than small parts, within a distance of 3 mm,		P
	subjected to the glow-wire test of IEC 60695-2-11 with a test severity of 850 °C	(see appended table 30.2)	P
	Glow-wire applied to an interposed shielding material, if relevant		N/A
	The glow-wire test is not carried out on parts of material classified as having a glow-wire flammability index according to IEC 60695-2-12 of at least 850 °C		N/A
30.2.3.2	For bare element water heaters, glow wire test is carried out on parts of insulating material supporting the heating elements and their connections as specified for other connections (IEC 60335-2-35)		N/A
	Parts of non-metallic material supporting connections, and		P
	parts of non-metallic material within a distance of 3 mm,		P
	subjected to the glow-wire test of IEC 60695-2-11 with appropriate severity level:	(see appended table 30.2)	P
	- 750 °C, for connections carrying a current exceeding 0,2 A during normal operation		P
	- 650 °C, for other connections		P
	Glow-wire applied to an interposed shielding material, if relevant		N/A
	However, the glow-wire test of 750 °C or 650 °C as appropriate, is not carried out on parts of material fulfilling both or either of the following classifications:		—
	- a glow-wire ignition temperature according to IEC 60695-2-13 of at least:		N/A
	- 775 °C, for connections carrying a current exceeding 0,2 A during normal operation		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- 675 °C, for other connections		N/A
	- a glow-wire flammability index according to IEC 60695-2-12 of at least:		N/A
	- 750 °C, for connections carrying a current exceeding 0,2 A during normal operation		N/A
	- 650 °C, for other connections		N/A
	The glow-wire test is also not carried out on small parts. These parts are to:		—
	- comprise material having a glow-wire ignition temperature of at least 775 °C or 675 °C as appropriate, or		N/A
	- comprise material having a glow-wire flammability index of at least 750 °C or 650 °C as appropriate, or		N/A
	- comply with the needle-flame test of annex E, or		N/A
	- comprise material classified as V-0 or V-1 according to IEC 60695-11-10		N/A
	The consequential needle-flame test of annex E applied to non-metallic parts that encroach within the vertical cylinder placed above the centre of the connection zone and on top of the non-metallic parts supporting current-carrying connections, and parts of non-metallic material within a distance of 3 mm of such connections if these parts are those:		—
	- parts that withstood the glow-wire test of IEC 60695-2-11 of 750 °C or 650 °C as appropriate, but produce a flame that persist longer than 2 s, or		N/A
	- parts that comprised material having a glow-wire flammability index of at least 750 °C or 650 °C as appropriate, or		N/A
	- small parts, that comprised material having a glow-wire flammability index of at least 750 °C or 650 °C as appropriate, or		N/A
	- small parts for which the needle-flame test of annex E was applied, or		N/A
	- small parts for which a material classification of V-0 or V-1 was applied		N/A
	However, the consequential needle-flame test is not carried out on non-metallic parts, including small parts, within the cylinder that are:		—
	- parts having a glow-wire ignition temperature of at least 775 °C or 675 °C as appropriate, or		N/A
	- parts comprising material classified as V-0 or V-1 according to IEC 60695-11-10, or		N/A
	- parts shielded by a flame barrier that meets the needle-flame test of annex E or that comprises material classified as V-0 or V-1 according to IEC 60695-11-10		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
30.2.4	Base material of printed circuit boards subjected to the needle-flame test of annex E	(see appended table 30.2/30.2.4)	P
	Test not applicable to conditions as specified.....:		N/A
31	RESISTANCE TO RUSTING		—
	Relevant ferrous parts adequately protected against rusting		N/A
	Tests specified in part 2 when necessary		N/A
32	RADIATION, TOXICITY AND SIMILAR HAZARDS		—
	Appliance does not emit harmful radiation or present a toxic or similar hazard due to their operation in normal use		P
	Compliance is checked by the limits or tests specified in part 2, if relevant		P
A	ANNEX A (INFORMATIVE) ROUTINE TESTS		—
	Description of routine tests to be carried out by the manufacturer (IEC 60335-1, IEC 60335-2-35)		N/A
B	ANNEX B (NORMATIVE) APPLIANCES POWERED BY RECHARGEABLE BATTERIES THAT ARE RECHARGED IN THE APPLIANCE		—
	The following modifications to this standard are applicable for appliances powered by batteries that are recharged in the appliance		N/A
	Three forms of construction covered:		—
	a) Appliance supplied directly from the supply mains or a renewable energy source, the battery charging circuitry and other supply unit circuitry incorporated within the appliance		N/A
	b) The part of the appliance incorporating the battery is supplied from the supply mains or a renewable energy source, via a detachable supply unit. The battery charging circuitry is incorporated within the part of the appliance containing the battery		N/A
	c) The part of the appliance incorporating the battery is supplied from the supply mains or a renewable energy source, via a detachable supply unit. The battery charging circuitry is incorporated within the detachable supply unit		N/A
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/A
	- the battery is charged, the battery being initially discharged to such an extent that the appliance cannot operate		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- 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/A
	- if the appliance incorporates inductive coupling between two parts that are detachable from each other, the appliance is supplied from the supply mains with the detachable part removed		N/A
3.6.2	Part to be removed in order to discard the battery is not considered to be detachable		N/A
5.B.101	Appliances supplied from the supply mains tested as specified for motor-operated appliances		N/A
7.1	Battery compartment for batteries intended to be replaced by the user, marked with battery voltage (V) and polarity of the terminals		N/A
	:		
	The positive terminal indicated by symbol IEC 60417-5005 and the negative terminal by symbol IEC 60417-5006		N/A
	Appliances intending to be supplied from a detachable supply unit marked with symbol IEC 60417-6181 and its type reference along with symbol ISO 7000-0790 (2004-01), or		N/A
	use only with <model designation> supply unit		N/A
7.6	Additional symbols		N/A
7.12	The instructions give information regarding charging		N/A
	Instructions for appliances incorporating batteries intended to be replaced by the user include required information		N/A
	Instructions for appliances containing non user-replaceable batteries state the substance of the following:		—
	This appliance contains batteries that are only replaceable by skilled persons		N/A
	Instructions for appliances containing non-replaceable batteries shall state the substance of the following:		—
	This appliance contains batteries that are non-replaceable		N/A
	For appliances intending to be supplied from a detachable supply unit for the purposes of recharging the battery, the type reference of the detachable supply unit is stated along with the following:		—
	WARNING: For the purposes of recharging the battery, only use the detachable supply unit provided with this appliance		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	If the symbol for detachable supply unit is used, its meaning is explained		N/A
7.15	Markings placed on the part of the appliance connected to the supply mains		N/A
	The type reference of the detachable supply unit is placed in close proximity to the symbol		N/A
8.2	Appliances having batteries that according to the instruction may be replaced by the user need only have basic insulation between live parts and the inner surface of the battery compartment		N/A
	If the appliance can be operated without batteries, double or reinforced insulation required		N/A
11.7	The battery is charged for the period stated in the instructions or 24 h		N/A
11.8	Temperature rise of the battery surface does not exceed the limit in the battery manufacturer's specification; measured (K); limit (K)		N/A
	If no limit specified, the temperature rise does not exceed 20 K; measured (K)		N/A
19.1	Appliances subjected to tests of 19.B.101, 19.B.102 and 19.B.103		N/A
19.10	Not applicable		N/A
19.B.101	Appliances supplied at rated voltage for 168 h, the battery being continually charged		N/A
19.B.102	For appliances having batteries that can be removed without the aid of a tool, short-circuit of the terminals of the battery, the battery being fully charged,		N/A
19.B.103	Appliances having batteries replaceable by the user supplied at rated voltage under normal operation with the battery removed or in any position allowed by the construction		N/A
19.13	The battery does not rupture or ignite		N/A
21.B.101	Appliances having pins for insertion into socket-outlets have adequate mechanical strength		N/A
	Part of the appliance incorporating the pins subjected to the free fall test, procedure 2, of IEC 60068-2-31, the number of falls being:		—
	- 100, if the mass of the part does not exceed 250 g (g)		N/A
	- 50, if the mass of the part exceeds 250 g		N/A
	After the test, the requirements of 8.1, 15.1.1, 16.3 and clause 29 are met		N/A
22.3	Appliances having pins for insertion into socket-outlets tested as fully assembled as possible		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
25.13	An additional lining or bushing not required for interconnection cords in class III appliances or class III constructions operating at safety extra-low voltage not containing live parts		N/A
30.2	For parts of the appliance connected to the supply mains during the charging period, 30.2.3 applies		N/A
	For other parts, 30.2.2 applies		
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/A
	Test conditions as specified		N/A
D	ANNEX D (NORMATIVE) THERMAL MOTOR PROTECTORS		—
	Applicable to appliances having motors that incorporate thermal motor protectors necessary for compliance with the standard		N/A
	Test conditions as specified		N/A
E	ANNEX E (NORMATIVE) NEEDLE-FLAME TEST		—
	Needle-flame test carried out in accordance with IEC 60695-11-5, with the following modifications:		—
7	Severities		—
	The duration of application of the test flame is 30 s ± 1 s		P
9	Test procedure		—
9.1	The specimen so arranged that the flame can be applied to a vertical or horizontal edge as shown in the examples of figure 1		P
9.2	The first paragraph does not apply		P
	If possible, the flame is applied at least 10 mm from a corner		P
9.3	The test is carried out on one specimen		P
	If the specimen does not withstand the test, the test may be repeated on two additional specimens, both withstanding the test		N/A
11	Evaluation of test results		—
	The duration of burning not exceeding 30 s		N/A
	However, for printed circuit boards, the duration of burning not exceeding 15 s		P
F	ANNEX F (NORMATIVE) CAPACITORS		—

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Clause	Requirement + Test	Result - Remark	Verdict
	Capacitors likely to be permanently subjected to the supply voltage, and used for radio interference suppression or voltage dividing, comply with the following clauses of IEC 60384-14, with the following modifications:		—
1.5	Terms and definitions		—
1.5.3	Class X capacitors tested according to subclass X2		N/A
1.5.4	This subclause is applicable		N/A
1.6	Marking		—
	Items a) and b) are applicable		N/A
3.4	Approval testing		—
3.4.3.2	Table 3 is applicable as described		N/A
4.1	Visual examination and check of dimensions		—
	This subclause is applicable		N/A
4.2	Electrical tests		—
4.2.1	This subclause is applicable		N/A
4.2.5	This subclause is applicable		N/A
4.2.5.2	Only table 11 is applicable		N/A
	Values for test A apply		N/A
	However, for capacitors in heating appliances the values for test B or C apply		N/A
4.12	Damp heat, steady state		—
	This subclause is applicable		N/A
	Only insulation resistance and voltage proof are checked		N/A
4.13	Impulse voltage		—
	This subclause is applicable		N/A
4.14	Endurance		—
	Subclauses 4.14.1, 4.14.3, 4.14.4 and 4.14.7 are applicable		N/A
4.14.7	Only insulation resistance and voltage proof are checked		N/A
	No visible damage		N/A
4.17	Passive flammability test		—
	This subclause is applicable		N/A
4.18	Active flammability test		—
	This subclause is applicable		N/A
G	ANNEX G (NORMATIVE) SAFETY ISOLATING TRANSFORMERS		—
	The following modifications to this standard are applicable for safety isolating transformers:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
7	Marking and instructions		—
7.1	Transformers for specific use marked with:		—
	- name, trademark or identification mark of the manufacturer or responsible vendor		N/A
	- model or type reference		N/A
17	Overload protection of transformers and associated circuits		—
	Fail-safe transformers comply with subclause 15.5 of IEC 61558-1		N/A
22	Construction		—
	Subclauses 19.1 and 19.1.2 of IEC 61558-2-6 are applicable		N/A
29	Clearances, creepage distances and solid insulation		—
29.1, 29.2, 29.3	The distances specified in items 2a, 2c and 3 in table 13 of IEC 61558-1 apply		N/A
	For insulated winding wires complying with subclause 19.12.3 of IEC 61558-1 there are no requirements for clearances or creepage distances		N/A
	For windings providing reinforced insulation, the distance specified in item 2c of table 13 of IEC 61558-1 is not assessed		N/A
	For safety isolating transformers subjected to periodic voltages with a frequency exceeding 30 kHz, the clearances, creepage distances and solid insulation values specified in IEC 60664-4 are applicable, if greater than the values specified in items 2a, 2c and 3 in table 13 of IEC 61558-1		N/A
H	ANNEX H (NORMATIVE) SWITCHES		—
	Switches comply with the following clauses of IEC 61058-1, as modified below:		—
	The tests of IEC 61058-1 carried out under the conditions occurring in the appliance		N/A
	Before being tested, switches are operated 20 times without load		N/A
8	Marking and documentation		—
	Switches are not required to be marked		N/A
	However, a switch that can be tested separately from the appliance marked with the manufacturer's name or trade mark and the type reference		N/A
13	Mechanism		—
	The tests may be carried out on a separate sample		N/A
15	Insulation resistance and dielectric strength		—
15.1	Not applicable		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
15.2	Not applicable		N/A
15.3	Applicable for full disconnection and micro-disconnection		N/A
17	Endurance		—
	Compliance is checked on three separate appliances or switches		N/A
	For 17.2.4.4, the number of cycles declared according to 7.1.4 is 10 000, unless		N/A
	otherwise specified in 24.1.3 of the relevant part 2 of IEC 60335		N/A
	Switches for operation under no load and which can be operated only by a tool, and		N/A
	switches operated by hand that are interlocked so that they cannot be operated under load,		N/A
	are not subjected to the tests		N/A
	However, switches without this interlock are subjected to the test of 17.2.4.4 for 100 cycles of operation		N/A
	Subclauses 17.2.2 and 17.2.5.2 not applicable		N/A
	The ambient temperature during the test is that occurring in the appliance during the test of clause 11 in IEC 60335-1		N/A
	The temperature rise of the terminals not more than 30 K above the temperature rise measured in clause 11 of IEC 60335-1 (K).....:		N/A
20	Clearances, creepage distances, solid insulation and coatings of rigid printed board assemblies		—
	Clause 20 is applicable to clearances across full disconnection and micro-disconnection		N/A
	It is also applicable to creepage distances for functional insulation, across full disconnection and micro-disconnection, as stated in Table 24		N/A
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:		—
8	Protection against access to live parts		—
8.1	Metal parts of the motor are considered to be bare live parts		N/A
11	Heating		—
11.3	The temperature rise of the body of the motor is determined instead of the temperature rise of the windings		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
11.8	The temperature rise of the body of the motor, where in contact with insulating material, not exceeding values in table 3 for the relevant insulating material		N/A
16	Leakage current and electric strength		—
16.3	Insulation between live parts of the motor and its other metal parts is not subjected to the test		N/A
19	Abnormal operation		—
19.1	The tests of 19.7 to 19.9 are not carried out		N/A
19.1.101	Appliance operated at rated voltage with each of the following fault conditions:		—
	- short circuit of the terminals of the motor, including any capacitor incorporated in the motor circuit		N/A
	- short circuit of each diode of the rectifier		N/A
	- open circuit of the supply to the motor		N/A
	- open circuit of any parallel resistor, the motor being in operation		N/A
	Only one fault simulated at a time, the tests carried out consecutively		N/A
22	Construction		—
22.1.101	For class I appliances incorporating a motor supplied by a rectifier circuit, the d.c. circuit being insulated from accessible parts of the appliance by double or reinforced insulation		N/A
	Compliance checked by the tests specified for double and reinforced insulation		N/A
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:		—
5.7	Conditioning of the test specimens		—
	When production samples are used, three samples of the printed circuit board are tested		N/A
5.7.1	Cold		—
	The test is carried out at -25 °C		N/A
5.7.3	Rapid change of temperature		—
	Severity 1 is specified		N/A
5.9	Additional tests		—
	This subclause is not applicable		N/A
K	ANNEX K (NORMATIVE) OVERVOLTAGE CATEGORIES		—
	The information on overvoltage categories is extracted from IEC 60664-1		P

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Clause	Requirement + Test	Result - Remark	Verdict
	Overvoltage category is a numeral defining a transient overvoltage condition		P
	Equipment of overvoltage category IV is for use at the origin of the installation		N/A
	Equipment of overvoltage category III is equipment in fixed installations and for cases where the reliability and the availability of the equipment is subject to special requirements		N/A
	Equipment of overvoltage category II is energy consuming equipment to be supplied from the fixed installation		P
	If such equipment is subjected to special requirements with regard to reliability and availability, overvoltage category III applies		N/A
	Equipment of overvoltage category I is equipment for connection to circuits in which measures are taken to limit transient overvoltages to an appropriate low level		N/A
L	ANNEX L (INFORMATIVE) GUIDANCE FOR THE MEASUREMENT OF CLEARANCES AND CREEPAGE DISTANCES		—
	Information for the determination of clearances and creepage distances		P
M	ANNEX M (NORMATIVE) POLLUTION DEGREE		—
	The information on pollution degrees is extracted from IEC 60664-1		P
	Pollution		—
	The microenvironment determines the effect of pollution on the insulation, taking into account the macroenvironment		P
	Means may be provided to reduce pollution at the insulation by effective enclosures or similar		N/A
	Minimum clearances specified where pollution may be present in the microenvironment		P
	Degrees of pollution in the microenvironment		—
	For evaluating creepage distances, the following degrees of pollution in the microenvironment are established:		—
	- pollution degree 1: no pollution or only dry, non-conductive pollution occurs. The pollution has no influence		N/A
	- pollution degree 2: only non-conductive pollution occurs, except that occasionally a temporary conductivity caused by condensation is to be expected		P

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Clause	Requirement + Test	Result - Remark	Verdict
	- pollution degree 3: conductive pollution occurs or dry non-conductive pollution occurs that becomes conductive due to condensation that is to be expected		N/A
	- pollution degree 4: the pollution generates persistent conductivity caused by conductive dust or by rain or snow		N/A
N	ANNEX N (NORMATIVE) PROOF TRACKING TEST		—
	The proof tracking test is carried out in accordance with IEC 60112 with the following modifications:		—
7	Test apparatus		—
7.3	Test solutions		—
	Test solution A is used		P
10	Determination of proof tracking index (PTI)		—
10.1	Procedure		—
	The proof voltage is 100 V, 175 V, 400 V or 600 V	175 V for transformer bobbin, power cord anchorage, water flow sensor, DC water pump bobbins, connectors on PCB, PCB support, Inductance, mutual inductor, capacitors, control panel, enclosure	P
	The test is carried out on five specimens		P
	In case of doubt, additional test with proof voltage reduced by 25 V, the number of drops increased to 100		N/A
10.2	Report		—
	The report states if the PTI value was based on a test using 100 drops with a test voltage of (PTI-25) V		N/A
O	ANNEX O (INFORMATIVE) SELECTION AND SEQUENCE OF THE TESTS OF clause 30		—
	Description of tests for determination of resistance to heat and fire		P
P	ANNEX P (INFORMATIVE) GUIDANCE FOR THE APPLICATION OF THIS STANDARD TO APPLIANCES USED IN TROPICAL CLIMATES		—
	Modifications applicable for class 0 and 01 appliances having a rated voltage exceeding 150 V, intended to be used in countries having a tropical climate and that are marked with symbol IEC 60417-6332		—
	Modifications may also be applied to class 1 appliances having a rated voltage exceeding 150 V, intended to be used in countries having a tropical climate and that are marked with symbol IEC 60417-6332, if liable to be connected to a supply mains that excludes the protective earthing conductor		—

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Clause	Requirement + Test	Result - Remark	Verdict
5.7	The ambient temperature for the tests of clauses 11 and 13 is 40 +3/0 °C		N/A
7.1	The appliance marked with symbol IEC 60417-6332		N/A
7.12	The instructions state that the appliance is to be supplied through a residual current device (RCD) having a rated residual operating current not exceeding 30 mA		N/A
	The instructions state that the appliance is considered to be suitable for use in countries having a tropical climate, but may also be used in other countries		N/A
	If symbol IEC 60417-6332 is used, its meaning is explained		N/A
11.8	The values of Table 3 are reduced by 15 K		N/A
13.2	The leakage current for class I appliances not exceeding 0,5 mA		N/A
15.3	The value of t is 37 °C		N/A
16.2	The leakage current for class I appliances not exceeding 0,5 mA (mA):		N/A
19.13	The leakage current test of 16.2 is applied in addition to the electric strength test of 16.3		N/A
Q	ANNEX Q (INFORMATIVE) SEQUENCE OF TESTS FOR THE EVALUATION OF ELECTRONIC CIRCUITS		—
	Description of tests for appliances incorporating electronic circuits		—
R	ANNEX R (NORMATIVE) SOFTWARE EVALUATION		—
	Programmable electronic circuits requiring software incorporating measures to control the fault/error conditions specified in table R.1 or R.2 validated in accordance with the requirements of this annex		N/A
R.1	Programmable electronic circuits using software		—
	Programmable electronic circuits requiring software incorporating measures to control the fault/error conditions specified in table R.1 or R.2 constructed so that the software does not impair compliance with the requirements of this standard		N/A
R.2	Requirements for the architecture		—
	Programmable electronic circuits requiring software incorporating measures to control the fault/error conditions specified in table R.1 or R.2 use measures to control and avoid software-related faults/errors in safety-related data and safety-related segments of the software		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
R.2.1.1	Programmable electronic circuits requiring software incorporating measures to control the fault/error conditions specified in table R.2 have one of the following structures:		—
	- single channel with periodic self-test and monitoring		N/A
	- dual channel (homogenous) with comparison		N/A
	- dual channel (diverse) with comparison		N/A
	Programmable electronic circuits requiring software incorporating measures to control the fault/error conditions specified in table R.1 have one of the following structures:		—
	- single channel with functional test		N/A
	- single channel with periodic self-test		N/A
	- dual channel without comparison		N/A
R.2.2	Measures to control faults/errors		—
R.2.2.1	When redundant memory with comparison is provided on two areas of the same component, the data in one area is stored in a different format from that in the other area		N/A
R.2.2.2	Programmable electronic circuits with functions requiring software incorporating measures to control the fault/error conditions specified in table R.2 and that use dual channel structures with comparison, have additional fault/error detection means for any fault/errors not detected by the comparison		N/A
R.2.2.3	For programmable electronic circuits with functions requiring software incorporating measures to control the fault/error conditions specified in table R.1 or R.2, means are provided for the recognition and control of errors in transmissions to external safety-related data paths		N/A
R.2.2.4	For programmable electronic circuits with functions requiring software incorporating measures to control the fault/error conditions specified in table R.1 or R.2, the programmable electronic circuits incorporate measures to address the fault/errors in safety-related segments and data indicated in table R.1 and R.2 as appropriate		N/A
R.2.2.5	For programmable electronic circuits with functions requiring software incorporating measures to control the fault/error conditions specified in table R.1 or R.2, detection of a fault/error occurs before compliance with clause 19, 22.105 and 22.108 is impaired (IEC 60335-2-35)		N/A
R.2.2.6	The software is referenced to relevant parts of the operating sequence and the associated hardware functions		N/A
R.2.2.7	Labels used for memory locations are unique		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
R.2.2.8	The software is protected from user alteration of safety-related segments and data		N/A
R.2.2.9	Software and safety related hardware under its control is initialized and terminates before compliance with clause 19, 22.105 and 22.108 is impaired (IEC 60335-2-35)		N/A
R.3	Measures to avoid errors		—
R.3.1	General		—
	For programmable electronic circuits with functions requiring software incorporating measures to control the fault/error conditions specified in table R.1 or R.2, the following measures to avoid systematic fault in the software are applied		—
	Software that incorporates measures used to control the fault/error conditions specified in table R.2 is inherently acceptable for software required to control the fault/error conditions specified in table R.1		N/A
R.3.2	Specification		—
R.3.2.1	Software safety requirements:	Software Id:	N/A
	The specification of the software safety requirements includes the descriptions listed		N/A
R.3.2.2	Software architecture		—
R.3.2.2.1	The specification of the software architecture includes the aspects listed - techniques and measures to control software faults/errors (refer to R.2.2); - interactions between hardware and software; - partitioning into modules and their allocation to the specified safety functions; - hierarchy and call structure of the modules (control flow); - interrupt handling; - data flow and restrictions on data access; - architecture and storage of data; - time-based dependencies of sequences and data	Document ref. No:	N/A
R.3.2.2.2	The architecture specification is validated against the specification of the software safety requirements by static analysis		N/A
R.3.2.3	Module design and coding		—
R.3.2.3.1	Based on the architecture design, software is suitably refined into modules		N/A
	Software module design and coding is implemented in a way that is traceable to the software architecture and requirements		N/A
R.3.2.3.2	Software code is structured		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
R.3.2.3.3	Coded software is validated against the module specification by static analysis		N/A
	The module specification is validated against the architecture specification by static analysis		N/A
R.3.3.3	Software validation		—
	The software is validated with reference to the requirements of the software safety requirements specification		N/A
	Compliance is checked by simulation of:		—
	- input signals present during normal operation		N/A
	- anticipated occurrences		N/A
	- undesired conditions requiring system action		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

TABLE R.1 ^e – GENERAL FAULT/ERROR CONDITIONS						
Component ^a	Fault/error	Acceptable measures ^{b, c}	Definitions	Document reference for applied measure	Document reference for applied test	Verdict
1 CPU						N/A
1.1 Registers	Stuck at	Functional test, or periodic self-test using either: - static memory test, or - word protection with single bit redundancy	H.2.16.5 H.2.16.6 H.2.19.6 H.2.19.8.2			
1.2 VOID						N/A
1.3 Programme counter	Stuck at	Functional test, or Periodic self-test, or Independent time-slot monitoring, or Logical monitoring of the programme sequence	H.2.16.5 H.2.16.6 H.2.18.10.4 H.2.18.10.2			N/A
2 Interrupt handling and execution	No interrupt or too frequent interrupt	Functional test, or time-slot monitoring	H.2.16.5 H.2.18.10.4			N/A
3 Clock	Wrong frequency (for quartz synchronized clock: harmonics/sub-harmonics only)	Frequency monitoring, or time slot monitoring	H.2.18.10.1 H.2.18.10.4			N/A
4. Memory						N/A
4.1 Invariable memory	All single bit faults	Periodic modified checksum, or multiple checksum, or word protection with single bit redundancy	H.2.19.3.1 H.2.19.3.2 H.2.19.8.2			
4.2 Variable memory	DC fault	Periodic static memory test, or word protection with single bit redundancy	H.2.19.6 H.2.19.8.2			N/A

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Clause	Requirement + Test		Result - Remark			Verdict
4.3 Addressing (relevant to variable and invariable memory)	Stuck at	Word protection with single bit redundancy including the address	H.2.19.8.2			N/A
5 Internal data path	Stuck at	Word protection with single bit redundancy	H.2.19.8.2			N/A
5.1 VOID						N/A
5.2 Addressing	Wrong address	Word protection with single bit redundancy including the address	H.2.19.8.2			N/A
6 External communication	Hamming distance 3	Word protection with multi-bit redundancy, or CRC – single work, or Transfer redundancy, or Protocol test	H.2.19.8.1 H.2.19.4.1 H.2.18.2.2 H.2.18.14			N/A
6.1 VOID						N/A
6.2 VOID						N/A
6.3 Timing	Wrong point in time Wrong sequence	Time-slot monitoring, or scheduled transmission Time-slot and logical monitoring, or comparison of redundant communication channels by either: - reciprocal comparison - independent hardware comparator Logical monitoring, or time-slot monitoring, or Scheduled transmission	H.2.18.10.4 H.2.18.18 H.2.18.10.3 H.2.18.15 H.2.18.3 H.2.18.10.2 H.2.18.10.4 H.2.18.18			N/A
7 Input/output periphery	Fault conditions specified in 19.11.2	Plausibility check	H.2.18.13			N/A
7.1 VOID						N/A
7.2 Analog I/O						N/A
7.2.1 A/D and D/A-converter	Fault conditions specified in 19.11.2	Plausibility check	H.2.18.13			N/A
7.2.2 Analog multiplexer	Wrong addressing	Plausibility check	H.2.18.13			N/A

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Clause	Requirement + Test		Result - Remark			Verdict
8 VOID						N/A
9 Custom chips ^d e.g. ASIC, GAL, gate array	Any output outside the static and dynamic functional specification	Periodic self-test	H.2.16.6			N/A
NOTE A Stuck-at fault model denotes a fault model representing an open circuit or a non-varying signal level. A DC fault model denotes a stuck-at fault model incorporating short circuit between signal lines.						
<p>a) For fault/error assessment, some components are divided into their sub-functions.</p> <p>b) For each sub-function in the table, the Table R.2 measure will cover the software fault/error.</p> <p>c) Where more than one measure is given for a sub-function, these are alternatives.</p> <p>d) To be divided as necessary by the manufacturer into sub-functions.</p> <p>e) Table R.1 is applied according to the requirements of R.1 to R.2.2.9 inclusive.</p>						

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

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Clause	Requirement + Test	Result - Remark	Verdict
	If appliances use more than one battery, they are marked to indicate correct polarity connection of the batteries		N/A
7.6	Additional symbols		N/A
7.12	The instructions contain the following, as applicable:		—
	- the types of batteries that may be used		N/A
	- how to remove and insert the batteries		N/A
	- non-rechargeable batteries are not to be recharged		N/A
	- rechargeable batteries are to be removed from the appliance before being charged		N/A
	- different types of batteries or new and used batteries are not to be mixed		N/A
	- batteries are to be inserted with the correct polarity		N/A
	- exhausted batteries are to be removed from the appliance and safely disposed of		N/A
	- if the appliance is to be stored unused for a long period, the batteries are removed		N/A
	- the supply terminals are not to be short-circuited		N/A
11.5	Appliances are supplied with the most unfavourable supply voltage between		—
	- 0,55 and 1,0 times the battery voltage, if the appliance can be used with non-rechargeable batteries		N/A
	- 0,75 and 1,0 times battery voltage, if the appliance is designed for use with rechargeable batteries only		N/A
	The values specified in Table S.101 for the internal resistance per cell of the battery is taken into account		N/A
19.1	The tests are carried out with the battery fully charged unless otherwise specified		N/A
19.13	The battery does not rupture or ignite		N/A
19.S.101	Appliances are supplied with the voltage specified in 11.5. The supply terminals having an indication of polarity are connected to the opposite polarity, unless		N/A
	such a connection is unlikely to occur due to the construction of the appliance		N/A
19.S.102	For appliances with provision for multiple batteries, one or more of the batteries are reversed and the appliance is operated, if reversal of batteries is allowed by the construction		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
25.5	The flexible leads or flexible cord used to connect an external battery or battery box in is connected to the appliance by a type X attachment		N/A
25.13	This requirement is not applicable to the flexible leads or flexible cord connecting external batteries or a battery box with an appliance		N/A
25.S.101	Appliances have suitable means for connection of the battery. If the type of battery is marked on the appliance, the means of connection is suitable for this type of battery		N/A
26.5	Terminal devices in an appliance for the connection of the flexible leads or flexible cord connecting an external battery or battery box are so located or shielded that there is no risk of accidental connection between supply terminals		N/A
30.2.3.2	There is no battery in the area of the vertical cylinder used for the consequential needle flame test, unless		N/A
	the battery is shielded by a barrier that meets the needle flame test of annex E, or		N/A
	that comprises material classified as V-0 or V-1 according to IEC 60695-11-10		N/A
T	ANNEX T (NORMATIVE) UV-C RADIATION EFFECT ON NON-METALLIC MATERIALS		—
	Requirements for non-metallic materials subject to direct or reflected UV-C radiation exposure and whose mechanical and electrical properties are relied upon for compliance with the		N/A
	Does not apply to glass, ceramic and similar materials		N/A
	Tested as specified in ISO 4892-1 and ISO 4892-2, with the following modifications:		—
	Modifications to ISO 4892-1:		—
5.1.6	The UV-C emitter is a low pressure mercury lamp with a quartz envelope having a continuous spectral irradiance of 10 W/m ² at 254 nm		N/A
	Subclause 5.1.6.1 and Table 1 are not applicable		N/A
5.2.4	The black-panel temperature shall be 63 °C +/- 3 °C		N/A
5.3.1	Humidification of the chamber air is specified in part 2 when necessary		N/A
9	This clause is not applicable		N/A
	Modifications to ISO 4892-2:		—
7.1	At least three test specimens are tested		N/A
	Ten samples of internal wiring is tested		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
7.2	The specimens are attached to the specimen holders such that they are not subject to any stress		N/A
7.3	Apparatus prepared as specified		N/A
	The test specimens and, if used, the irradiance-measuring instrument are exposed for 1 000 h		N/A
7.4	If used, a radiometer is mounted and calibrated such that it measures the irradiance at the exposed surface of the test specimen		N/A
7.5	Material properties and test methods for parts providing mechanical support or impact resistance as specified in Table T.1		N/A
	Material properties and test method for electrical insulation of internal wiring as specified in Table T.2		N/A
8	This clause is not applicable		N/A

10.1	TABLE: Power input deviation					P
Input deviation of/at:	P rated (W)	P measured (W)	ΔP	Required ΔP	Remark	
230 V; 50 Hz	6800	6639	-2,37%	-10%, +5 %	FD68P with water pump P607724F	
230 V; 60 Hz	6800	6641	-2,34%	-10%, +5 %	FD68P with water pump P607724F	
230 V; 50 Hz	6800	6646	-2,26%	-10%, +5 %	FD68P alternative with water pump CG0324112002	
230 V; 60 Hz	6800	6647	-2,25%	-10%, +5 %	FD68P alternative with water pump CG0324112002	
230 V; 50 Hz	5500	5488	-0,22%	-10%, +5 %	FD55P with water pump P607724F	
230 V; 60 Hz	5500	5489	-0,20%	-10%, +5 %	FD55P with water pump P607724F	
230 V; 50 Hz	5500	5488	-0,22%	-10%, +5 %	FD55P alternative with water pump CG0324112002	
230 V; 60 Hz	5500	5486	-0,25%	-10%, +5 %	FD55P alternative with water pump CG0324112002	
Supplementary information:						

10.2	TABLE: Current deviation					N/A
Current deviation of/at:	I rated (A)	I measured (A)	ΔI	Required ΔI	Remark	
Supplementary information:						

11.8	TABLE: Heating test			P
	Test voltage (V).....	264,5 V		—
	Ambient (°C).....	t1= 22,1; t2= 22,2		—
Thermocouple locations:		Max. temperature rise measured, ΔT (K)	Max. temperature rise limit, ΔT (K)	
Power cord		39,5	50	
Supply cord sheath		34,2	Ref.	
Internal wire		62,0	T90-25=65	
Main PCB		20,7	120	
Display PCB		12,7	120	

PCB box	24,7	For 30.1
Mutual inductor	27,4	For 30.1
Bobbin / winding of Transformer	41,3	85/For 30.1
Bobbin / winding of Inductance	37,0	For 30.1
Varistor	28,7	T85-25=60
X2 Capacitor	28,6	T85-25=60
Optocoupler	28,3	T100-25=75
Y Capacitor	32,9	T125-25=100
Power Connector on main PCB	26,9	For 30.1
Other Connectors on PCB	20,6	For 30.1
Bobbin / winding of water pump motor	25,0	115/For 30.1
Thermal cut-out	37,8	T170-25=145
Water flow sensor	7,6	For 30.1
Control panel	4,2	60
Enclosure	11,6	For 30.1
Test wall	0,9	65
Test floor	15,1	65
Outlet Water	30,3	Ref.
Supplementary information: For FD68P with water pump P607724F.		

11.8	TABLE: Heating test, resistance method					N/A
	Test voltage (V).....:					—
	Ambient, t1 (°C)					—
	Ambient, t2 (°C)					—
Temperature rise of winding:		R1 (Ω)	R2 (Ω)	Δ T (K)	Max. Δ T (K)	Insulation class
Supplementary information:						

11.8	TABLE: Heating test					P	
	Test voltage (V).....:					264,5 V	—
	Ambient (°C).....:					t1= 21,8; t2= 23,2	—
Thermocouple locations:			Max. temperature rise measured, Δ T (K)		Max. temperature rise limit, Δ T (K)		
Power cord			36,9		50		
Supply cord sheath			31,6		Ref.		
Internal wire			60,9		T90-25=65		
Main PCB			21,8		120		
Display PCB			25,3		120		
PCB box			24,7		For 30.1		
Mutual inductor			28,5		For 30.1		
Bobbin / winding of Transformer			48,3		85/For 30.1		
Bobbin / winding of Inductance			41,3		For 30.1		
Varistor			31,5		T85-25=60		
X2 Capacitor			30,0		T85-25=60		
Optocoupler			27,6		T100-25=75		
Y Capacitor			32,0		T125-25=100		
Power Connector on main PCB			28,4		For 30.1		
Other Connectors on PCB			9,5		For 30.1		
Bobbin / winding of water pump motor			23,0		115/For 30.1		
Thermal cut-out			36,2		T170-25=145		

Water flow sensor	7,0	For 30.1
Control panel	3,7	60
Enclosure	5,4	For 30.1
Test wall	1,2	65
Test floor	6,3	65
Outlet Water	24,2	Ref.
Supplementary information: For FD68P alternative with water pump CG0324112002.		

11.8	TABLE: Heating test, resistance method					N/A
	Test voltage (V).....:					—
	Ambient, t1 (°C)					—
	Ambient, t2 (°C)					—
Temperature rise of winding:		R1 (Ω)	R2 (Ω)	Δ T (K)	Max. Δ T (K)	Insulation class
Supplementary information:						

13.2	TABLE: Leakage current			P
	Heating appliances: 1,15 x rated input (W).. :		$1,15 \times (240/230)^2 \times 6800 \text{ W} = 8514,78 \text{ W}$	—
	Motor-operated and combined appliances: 1,06 x rated voltage (V)		—	—
Leakage current between:			I (mA)	Max. allowed I (mA)
Between live part and accessible part			0,02 (peak)	0,35 (peak)
Between live part and earthed metal part			0,208	5
Supplementary information: For FD68P with water pump P607724F.				

13.2	TABLE: Leakage current			P
	Heating appliances: 1,15 x rated input (W).. :		$1,15 \times (240/230)^2 \times 6800 \text{ W} = 8514,78 \text{ W}$	—
	Motor-operated and combined appliances: 1,06 x rated voltage (V)		—	—
Leakage current between:			I (mA)	Max. allowed I (mA)
Between live part and accessible part			0,03 (peak)	0,35 (peak)
Between live part and earthed metal part			0,207	5
Supplementary information: For FD68P alternative with water pump CG0324112002.				

13.3	TABLE: Dielectric strength		P
Test voltage applied between:		Test potential applied (V)	Breakdown / flashover (Yes/No)
Between live part and accessible part		3000	No
Between live part and earthed metal enclosure		1000	No
Supplementary information:			

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

16.2	TABLE: Leakage current			P
	Single phase appliances: 1,06 x rated voltage (V)..... :	254,4 V		—
	Three phase appliances 1,06 x rated voltage divided by $\sqrt{3}$ (V)..... :	—		—
Leakage current between:		I (mA)	Max. allowed I (mA)	
Between live part and accessible part		0,08	0,25	
Between live part and earthed metal part		0,308	5	
Supplementary information:				

16.3	TABLE: Dielectric strength		P
Test voltage applied between:		Test potential applied (V)	Breakdown / flashover (Yes/No)
Between live part and accessible part		3000	No
Between live part and earthed metal enclosure		1250	No
Supplementary information:			

17	TABLE: Overload protection		P
Thermocouple locations:		Max. temperature rise measured, ΔT (K)	Max. temperature rise limit, ΔT (K)
Transformer winding		99,2	175-25=150 (class F)
Supplementary information:			

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

19	Abnormal operation conditions						P
Operational characteristics			YES/NO	Operational conditions			
Are there electronic circuits to control the appliance operation?			YES	Rating voltage input			
Are there “off” or “stand-by” position?			YES	Rating voltage input			
The unintended operation of the appliance results in dangerous malfunction?			NO	—			
Sub-clause	Operating conditions description	Test results description	PEC description	EMP 19.11.4	Software type required	19.11.3 PEC	Final result
19.2	—	—	—	—	—	—	—
19.3	—	—	—	—	—	—	—
19.4	Flow Sensor was short-circuited	No hazard	—	—	—	—	Pass
19.5	—	—	—	—	—	—	—
19.6	—	—	—	—	—	—	—
19.7	Locked the pump motor	No hazard	—	—	—	—	Pass
19.8	—	—	—	—	—	—	—
19.9	—	—	—	—	—	—	—
19.10	—	—	—	—	—	—	—
19.11.2	Fault condition for electronic component	No hazard	—	—	—	—	Pass
19.11.4.8	—	—	—	—	—	—	—
19.10X	—	—	—	—	—	—	—
Supplementary information:							

19.7	TABLE: Abnormal operation, locked rotor/moving parts					P
	Test voltage (V).....:	240			—	
	Ambient, t1 (°C)	23,1 / 23,1			—	
	Ambient, t2 (°C)	23,9 / 24,7			—	
Temperature of winding:		R1 (Ω)	R2 (Ω)	Δ T (K)	T (°C)	Max. T (°C)
Supplementary information: See Table 19.13.						

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

19.13	TABLE: Abnormal operation, temperature rises			P
Thermocouple locations:		Max. temperature rise measured, Δ T (K)		Max. temperature rise limit, Δ T (K)
Power cord		21,4		150
Water pump winding		7,3		190-25=165
Thermal cut-out		39,6		For Ref.
Optocoupler		5,9		T100-25=75
Enclosure		11,1		For 30.1
Test wall		1,0		150
Test floor		13,8		150
Supplementary information: For Clause 19.4. (FD68P with water pump P607724F)				

19.13	TABLE: Abnormal operation, temperature rises			P
Thermocouple locations:		Max. temperature rise measured, Δ T (K)		Max. temperature rise limit, Δ T (K)
Power cord		1,8		150
Water pump winding		23,1		190-25=165
Thermal cut-out		2,3		For Ref.
Optocoupler		1,0		T100-25=75
Enclosure		1,3		For 30.1
Test wall		1,4		150
Test floor		1,8		150
Supplementary information: For 19.7, (FD68P with water pump P607724F)				

19.13	TABLE: Abnormal operation, temperature rises			P
Thermocouple locations:		Max. temperature rise measured, Δ T (K)		Max. temperature rise limit, Δ T (K)
Power cord		2,9		150
Water pump winding		30,3		190-25=165
Thermal cut-out		0,5		For Ref.
Optocoupler		2,8		T100-25=75
Enclosure		1,3		For 30.1
Test wall		0,9		150
Test floor		1,0		150
Supplementary information: For 19.7, (FD68P alternative with water pump CG0324112002)				

21.1		TABLE: Impact resistance			P
Impacts per surface	Surface tested	Impact energy (Nm)	Comments		
3	Plastic Enclosure	0,5 J	Pass		
3	Control panel	0,5 J	Pass		
Supplementary information:					

24.1		TABLE: Critical components information				P
Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity ¹	
Power cord for Model FD68P	Guangdong Huasheng Electrical Appliances Co., Ltd.	H05VV-F 60227 IEC 53	3G 4 mm ²	IEC 60227-5: 2011 EN 50525-2-11: 2011	VDE 40005362	
Power cord for Model FD55P	Guangdong Huasheng Electrical Appliances Co., Ltd.	H05VV-F 60227 IEC 53	3G 2,5 mm ²	IEC 60227-5: 2011 EN 50525-2-11: 2011	VDE 40005362	
Internal wire 1#	Hanstar Fluoro-Plastic Insulated Electric Wires	1015	AC 600 V, T105, 8 AWG -24 AWG	IEC/EN 60335-1 IEC/EN 60335-2-35	Tested with appliance UL E159007	
Internal wire 2#	Hanstar Fluoro-Plastic Insulated Electric Wires	S-6YY	AC 300 V/ 500 V, T90, 10 AWG	IEC/EN 60335-1 IEC/EN 60335-2-35	Tested with appliance VDE 40023045	
Alternative	Hanstar Fluoro-Plastic Insulated Wires Co., Ltd.	HX	AC 300 V/ 500 V, T180, 10 AWG	IEC/EN 60335-1 IEC/EN 60335-2-35	Tested with appliance VDE 131483	
Heat-Shrinkage Tube	Dongguang Salipt Co., Ltd.	SALIPT S-901-150	150 V, T125	IEC/EN 60335-1 IEC/EN 60335-2-35	Tested with appliance UL E209436	
Heating element Model FD55P	Tamman Electric Heating Elements Co., Ltd.	FD55P	AC 220-240 V, 5500W	IEC/EN 60335-1 IEC/EN 60335-2-35	Tested with appliance	
Heating element Model FD68P	Tamman Electric Heating Elements Co., Ltd.	FD68P	AC 220-240 V, 6800 W	IEC/EN 60335-1 IEC/EN 60335-2-35	Tested with appliance	
Thermal cut-out	Foshan Tianpeng Thermostats Co., Ltd.	T7	AC 250 V, 50 Hz / 60 Hz, 60 A, T170, 1E4; Type 2.A	EN 60730-1: 2000 EN 60730-2-9: 2010 IEC 60730-1: 2013 + A1 IEC 60730-2-9: 2015 + A1	TÜV R 50256977	

NTC thermistor	Foshan Shunde Menlo Sensor Technic Co., Ltd	---	-20 °C – 105 °C, R25 °C=50 KΩ ± 1%	IEC/EN 60335-1 IEC/EN 60335-2-35	Tested with appliance
DC water pump motor	DONGGUAN SHEN PENG ELECTRONICS CO., LTD	P607724F	DC 24 V, 48 W, 20 L/min, 11m, Class F	IEC/EN 60335-1 IEC/EN 60335-2-35	Tested with appliance
Alternative	FOSHANSHI LICHENH ELECTRONICS CO., LTD	CG0324112002	DC 24 V, 48 W, 20 L/min, 11m, Class F	IEC/EN 60335-1 IEC/EN 60335-2-35	Tested with appliance
Flow Sensor	Foshan Shunde Jingrui Electronics Co., Ltd.	JR-A168-4	DC 5V, F=(39*Q) ± 10%, Q=L/Min	IEC/EN 60335-1 IEC/EN 60335-2-35	Tested with appliance
Plastic enclosure (Front cover)	Chi Mei Corporation	PA-746(+)	ABS	IEC/EN 60335-1 IEC/EN 60335-2-35	Tested with appliance UL E56070
Plastic enclosure (Bottom cover)	Chi Mei Corporation	PA-765(+)	ABS	IEC/EN 60335-1 IEC/EN 60335-2-35	Tested with appliance UL E56070
PCB Material	Jiangmen Jiantao Laminate Material Ltd	KB-5152	0,8 mm – 1,6 mm, FV0	IEC/EN 60335-1 IEC/EN 60335-2-35	Tested with appliance CQC 11001061103
Transformer	Zhongshan xinyoutai Electronic Technology Co., Ltd	XXT-E26185	Class B ; Pri. Winding : N1(Pin 1-2) : Φ 0,4 mm X 46TS X 1P N2(Pin 4-5) : Φ 0,2 mm X 51TS X 1P N4(Pin 2-3) : Φ 0,4mm X 22TS X 1P N5(Pin 5-6) : Φ 0,2 mm X 13TS X 1P Sec. Winding : N3(Pin 7-12) : Φ 0,5 mm X 18TS X 2P	IEC/EN 60335-1 IEC/EN 60335-2-35	Tested with appliance CQC 17001178513
Triple insulated wire	Huizhou Huaying Electronic Technology Co., Ltd.	MIW-B	T130, Reinforced	IEC/EN 61558-1: 2014 IEC/EN 61558-2-16: 2009 + A1: 2013	VDE 40047994

Inductance	Foshan Shunde Shuoli Electronics & Electrical Appliance Co., Ltd.	DR2W6*8-68uH	68uH±20%	IEC/EN 60335-1 IEC/EN 60335-2-35	Tested with appliance
Mutual inductor	Shenzhen Lanson Electronics Co., Ltd	PT002A-001	2 mA; 50 Hz / 60 Hz	IEC/EN 60335-1 IEC/EN 60335-2-35	Tested with appliance
Optocoupler	Fairchild Semiconductor Pte Ltd	MOC3022	850 V, T100	IEC 60747-5-5: 2007+A1: 2013 DIN EN 60747-5-5 EN 60747-5-5	VDE 102497
X2 capacitor	Guangdong Fengming Electronic Tech. Co., Ltd.	MKP-X2	AC275V, 0,15uF, T85	IEC 60384-14: 2013 + A1 EN 60384-14: 2013	VDE 40025702
Alternative	Foshan Piner Electronic Co., Ltd.	MKP	AC275V, 0,15uF, T105	IEC 60384-14: 2013 + A1 EN 60384-14: 2013	VDE 40046358
Y capacitor	South China Electronic Co., Ltd.	CY	Y1, AC 250V, 4700 pF, T125	IEC 60384-14: 2013 + A1 EN 60384-14: 2013	VDE 40045823
Fuse	LITTELFUSE PHILIPPINES INC.	T5A	250 V, T5,0 A	IEC 60127-1: 2006 IEC 60127-2:2014	CQC 0701202116 2
Varistor	Shantou Hongzhi Electronic Co., Ltd.	10D	82 V – 1600 V, K=± 10%, T85	IEC 61052-1: 2007 IEC 61051-2: 1991 + A1 IEC 61051-2-2: 1991 DIN EN 61051-1: 2009	CQC 0400101084 6
Alternative	Kangtai Industrial Co., Ltd	05D	18 V – 750 V, K=± 10%, T85	IEC 61052-1: 2007 IEC 61051-2: 1991 + A1 IEC 61051-2-2: 1991 DIN EN 61051-1: 2009	CQC 1200107647 7
Supplementary information: 1) Provided evidence ensures the agreed level of compliance. See OD-CB2039.					

28.1	TABLE: Threaded part torque test			P
Threaded part identification:	Diameter of thread (mm)	Column number (I, II, or III)	Applied torque (Nm)	
Earth metal	3,8	II	1,2	
Supplementary information:				

29.1	TABLE: Clearances					P
	Overvoltage category	II			—	
		Type of insulation:				
Rated impulse voltage (V):	Min. cl (mm)	Basic (mm)	Supplementary (mm)	Reinforced (mm)	Functional (mm)	Verdict / Remark
330	0,2* / 0,5 / 0,8**					N/A
500	0,2* / 0,5 / 0,8**					N/A
800	0,2* / 0,5 / 0,8**					N/A
1 500	0,5 / 0,8** / 1,0***					N/A
2 500	1,5 / 2,0***	(1) 5,0 (6) 5,16	(2) 5,1 (7) 5,16	--	(4) 3,4	P
4 000	3,0 / 3,5***	--	--	(3) 8,1 (5) 5,0 (8) 9,34	--	P
6 000	5,5 / 6,0***					N/A
8 000	8,0 / 8,5***					N/A
10 000	11,0 / 11,5***					N/A
<p>Supplementary information:</p> <p>*) For tracks on printed circuit boards if pollution degree 1 and 2</p> <p>**) For pollution degree 3</p> <p>***) If the construction is affected by wear, distortion, movement of the parts or during assembly</p> <p>(1) Live parts and earthed metal</p> <p>(2) Internal wire to accessible part</p> <p>(3) Live parts and accessible part</p> <p>(4) L and N on PCB</p> <p>(5) Live part and SELV on main control PCB</p> <p>(6) Between two pints of CY1 capacitor on main control PCB</p> <p>(7) Between two pints of CY2 capacitor on main control PCB</p> <p>(8) Between primary winding and secondary winding on transformer</p>						

29.2	TABLE: Creepage distances, basic, supplementary and reinforced insulation										P
Working voltage (V):	Creepage distance (mm) Pollution degree							Type of insulation			Verdict
	1	2			3			Type of insulation			
Material group			Material group								
	I	II	IIIa/IIIb	I	II	IIIa/IIIb*	B**	S**	R**		
≤50	0,18	0,6	0,85	1,2	1,5	1,7	1,9		—	—	N/A
≤50	0,18	0,6	0,85	1,2	1,5	1,7	1,9	—		—	N/A
≤50	0,36	1,2	1,7	2,4	3,0	3,4	3,8	—	—		N/A
125	0,28	0,75	1,05	1,5	1,9	2,1	2,4		—	—	N/A
125	0,28	0,75	1,05	1,5	1,9	2,1	2,4	—		—	N/A
125	0,56	1,5	2,1	3,0	3,8	4,2	4,8	—	—		N/A
250	0,56	1,25	1,8	<u>2,5</u>	3,2	3,6	4,0	5,0 5,16	—	—	P (1) (6)
250	0,56	1,25	1,8	<u>2,5</u>	3,2	3,6	4,0	—	5,1 5,16	—	P (2) (7)
250	1,12	2,5	3,6	<u>5,0</u>	6,4	7,2	8,0	—	—	8,1 8,1 9,34	P (3) (5) (8)
400	1,0	2,0	2,8	4,0	5,0	5,6	6,3		—	—	N/A
400	1,0	2,0	2,8	4,0	5,0	5,6	6,3	—		—	N/A
400	2,0	4,0	5,6	8,0	10,0	11,2	12,6	—	—		N/A
500	1,3	2,5	3,6	5,0	6,3	7,1	8,0		—	—	N/A
500	1,3	2,5	3,6	5,0	6,3	7,1	8,0	—		—	N/A
500	2,6	5,0	7,2	10,0	12,6	14,2	16,0	—	—		N/A
>630 and ≤800	1,8	3,2	4,5	6,3	8,0	9,0	10,0		—	—	N/A
>630 and ≤800	1,8	3,2	4,5	6,3	8,0	9,0	10,0	—		—	N/A
>630 and ≤800	3,6	6,4	9,0	12,6	16,0	18,0	20,0	—	—		N/A
>800 and ≤1000	2,4	4,0	5,6	8,0	10,0	11,0	12,5		—	—	N/A
>800 and ≤1000	2,4	4,0	5,6	8,0	10,0	11,0	12,5	—		—	N/A
>800 and ≤1000	4,8	8,0	11,2	16,0	20,0	22,0	25,0	—	—		N/A
>1000 and ≤1250	3,2	5,0	7,1	10,0	12,5	14,0	16,0		—	—	N/A
>1000 and ≤1250	3,2	5,0	7,1	10,0	12,5	14,0	16,0	—		—	N/A
>1000 and ≤1250	6,4	10,0	14,2	20,0	25,0	28,0	32,0	—	—		N/A
>1250 and ≤1600	4,2	6,3	9,0	12,5	16,0	18,0	20,0		—	—	N/A
>1250 and ≤1600	4,2	6,3	9,0	12,5	16,0	18,0	20,0	—		—	N/A
>1250 and ≤1600	8,4	12,6	18,0	25,0	32,0	36,0	40,0	—	—		N/A
>1600 and ≤2000	5,6	8,0	11,0	16,0	20,0	22,0	25,0		—	—	N/A
>1600 and ≤2000	5,6	8,0	11,0	16,0	20,0	22,0	25,0	—		—	N/A

29.2	TABLE: Creepage distances, basic, supplementary and reinforced insulation										P
Working voltage (V):	Creepage distance (mm) Pollution degree							Type of insulation			Verdict
	1	2			3			Type of insulation			
Material group			Material group								
	I	II	IIIa/IIIb	I	II	IIIa/IIIb*	B**	S**	R**		
>1600 and ≤2000	11,2	16,0	22,0	32,0	40,0	44,0	50,0	—	—		N/A
>2000 and ≤2500	7,5	10,0	14,0	20,0	25,0	28,0	32,0		—	—	N/A
>2000 and ≤2500	7,5	10,0	14,0	20,0	25,0	28,0	32,0	—		—	N/A
>2000 and ≤2500	15,0	20,0	28,0	40,0	50,0	56,0	64,0	—	—		N/A
>2500 and ≤3200	10,0	12,5	18,0	25,0	32,0	36,0	40,0		—	—	N/A
>2500 and ≤3200	10,0	12,5	18,0	25,0	32,0	36,0	40,0	—		—	N/A
>2500 and ≤3200	20,0	25,0	36,0	50,0	64,0	72,0	80,0	—	—		N/A
>3200 and ≤4000	12,5	16,0	22,0	32,0	40,0	45,0	50,0		—	—	N/A
>3200 and ≤4000	12,5	16,0	22,0	32,0	40,0	45,0	50,0	—		—	N/A
>3200 and ≤4000	25,0	32,0	44,0	64,0	80,0	90,0	100,0	—	—		N/A
>4000 and ≤5000	16,0	20,0	28,0	40,0	50,0	56,0	63,0		—	—	N/A
>4000 and ≤5000	16,0	20,0	28,0	40,0	50,0	56,0	63,0	—		—	N/A
>4000 and ≤5000	32,0	40,0	56,0	80,0	100,0	112,0	126,0	—	—		N/A
>5000 and ≤6300	20,0	25,0	36,0	50,0	63,0	71,0	80,0		—	—	N/A
>5000 and ≤6300	20,0	25,0	36,0	50,0	63,0	71,0	80,0	—		—	N/A
>5000 and ≤6300	40,0	50,0	72,0	100,0	126,0	142,0	160,0	—	—		N/A
>6300 and ≤8000	25,0	32,0	45,0	63,0	80,0	90,0	100,0		—	—	N/A
>6300 and ≤8000	25,0	32,0	45,0	63,0	80,0	90,0	100,0	—		—	N/A
>6300 and ≤8000	50,0	64,0	90,0	126,0	160,0	180,0	200,0	—	—		N/A
>8000 and ≤10000	32,0	40,0	56,0	80,0	100,0	110,0	125,0		—	—	N/A
>8000 and ≤10000	32,0	40,0	56,0	80,0	100,0	110,0	125,0	—		—	N/A
>8000 and ≤10000	64,0	80,0	112,0	160,0	200,0	220,0	250,0	—	—		N/A
>10000 and ≤12500	40,0	50,0	71,0	100,0	125,0	140,0	160,0		—	—	N/A
>10000 and ≤12500	40,0	50,0	71,0	100,0	125,0	140,0	160,0	—		—	N/A
>10000 and ≤12500	80,0	100,0	142,0	200,0	250,0	280,0	320,0	—	—		N/A

29.2	TABLE: Creepage distances, basic, supplementary and reinforced insulation										P
Working voltage (V):	Creepage distance (mm) Pollution degree										
	1	2			3			Type of insulation			Verdict
		Material group			Material group						
		I	II	IIIa/IIIb	I	II	IIIa/IIIb*	B**	S**	R**	
<p>Supplementary information:</p> <p>*) Material group IIIb is allowed if the working voltage does not exceed 50 V</p> <p>**) B = Basic insulation, S = Supplementary insulation, R = Reinforced insulation</p> <p>(1) Live parts and earthed metal</p> <p>(2) Internal wire to accessible part</p> <p>(3) Live parts and accessible part</p> <p>(5) Live part and SELV on main control PCB</p> <p>(6) Between two pints of C3 capacitor on main control PCB</p> <p>(7) Between two pints of C11 capacitor on main control PCB</p> <p>(8) Between primary winding and secondary winding on transformer</p>											

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

Supplementary information:
 *) Material group IIIb is allowed if the working voltage does not exceed 50 V
 (4) L and N on PCB, 3,4mm.

30.1	TABLE: Ball Pressure Test of Thermoplastics			P
Allowed impression diameter (mm)		2		—
Object/ Part No./ Material	Manufacturer/trademark	Test temperature (°C)	Impression diameter (mm)	
Enclosure	Chi Mei Corporation	75	1,15	
Control Panel	—	75	0,96	
PCB Box	—	75	1,27	
Power anchorage	—	75	0,89	
Water flow sensor	Foshan Shunde Jingrui Electronics Co., Ltd.	75	1,08	
DC water pump bobbin	DONGGUAN SHI SHEN PENG ELECTRONICS Co., Ltd.	125	1,16	
DC water pump bobbin (Alt)	FOSHANSHI LICHENH ELECTRONICS Co., Ltd.	125	1,28	
Mutual inductor	Shenzhen Lanson Electronics Co., Ltd	125	1,46	
Power connector on main PCB	—	125	1,28	
Other connectors on PCB	—	125	1,16	
Transformer bobbin (big)	Zhongshan xinyoutai Electronic Technology Co., Ltd	125	0,71	
Inductance	Foshan Shunde Shuoli Electronics & Electrical Appliance Co., Ltd.	125	0,73	
Supplementary information:				

30.2	TABLE: Resistance to heat and fire - Glow wire tests							P
Object/ Part No./ Material	Manufacturer/ trademark	Glow wire test (GWT); (°C)						Verdict
		550	650		750		850	
			te	ti	te	ti		
Enclosure	Chi Mei Corporation	X						P
Control Panel	—	X						P
PCB Box	—	X						P
Power anchorage	—	X						P
Water flow sensor	Foshan Shunde Jingrui Electronics Co., Ltd.		0s	0s				P
DC water pump bobbin	DONGGUAN SHI SHEN PENG ELECTRONICS Co., Ltd.		0s	0s				P
DC water pump bobbin (Alt)	FOSHANSHI LICHENH ELECTRONICS Co., Ltd.		0s	0s				P
Mutual inductor	Shenzhen Lanson Electronics Co., Ltd				0s	0s	X	P
X2 capacitor	Hongzhi Enterprises Ltd.		0s	0s				P
Power connector on main PCB	—				0s	0s	X	P
Other connectors on PCB	—		0s	0s				P
Transformer bobbin	Zhongshan xinyoutai Electronic Technology Co., Ltd				0s	0s	X	P
Inductance	Foshan Shunde Shuoli Electronics & Electrical Appliance Co., Ltd.				0s	0s	X	P
Thread ear of Thermal cut-out	—				0s	0s	X	P

Thermal cut-out	Foshan Tianpeng Thermostats Co., Ltd.				0s	0s	X	P
Object/ Part No./ Material	Manufacturer/ trademark	Glow-wire flammability index (GWFI), °C				GW ignition temp. (GWIT), °C		Verdict
		550	650	750	850	675	775	
The test specimen passed the glow wire test (GWT) with no ignition $[(t_e - t_i) \leq 2s]$ (Yes/No):								Yes
If no, then surrounding parts passed the needle-flame test of annex E (Yes/No)..... :								--
The test specimen passed the test by virtue of most of the flaming material being withdrawn with the glow-wire (Yes/No)?								Yes
Ignition of the specified layer placed underneath the test specimen (Yes/No)								No
Supplementary information: - 550 °C GWT not relevant (or applicable) to parts of material classified at least HB40 or if relevant HBF - The GWIT pre-selection option, the 850 °C GWFI pre-selection option, and the 850 °C GWT are not relevant (or applicable) for attended appliances * Only the unfavourable result for this component was displayed.								

30.2/30.2.4	TABLE: Needle- flame test (NFT)				P
Object/ Part No./ Material	Manufacturer/ trademark	Duration of application of test flame (ta); (s)	Ignition of specified layer Yes/No	Duration of burning (tb) (s)	Verdict
Display PCB	International Laminate Material Ltd	30	No	1,5	P
Main PCB	International Laminate Material Ltd.	30	No	0,6	P
Supplementary information: - NFT not relevant (or applicable) for Parts of material classified as V-0 or V-1 - NFT not relevant (or applicable) for Base material of PCBs classified as V-0 or if relevant VTM-0 * Only the unfavourable result for this component was displayed.					

---End of Report---

Clause	Requirement - Test	Result - Remark	Verdict
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ATTACHMENT 1			
Gulf Technical Regulation for Low Voltage Electrical Equipment and Appliances			
Annex 1 e	Must be taking into account the voltage and frequency of each Member State, as well as the type and shape of the plugs and socket outlets used in each state according to the following:		—
	United Arab Emirates :		—
	Rated voltage(V) : 230V/400V(+10%-6%)		P
	Frequency (Hz): 50 Hz ±0.5Hz(1%)		P
	Type and shape of the plugs and sockets:		N/A
	Kingdom of Bahrain :		—
	Rated voltage(V) : 230V/400V(±6%)		P
	Frequency (Hz): 50 Hz ±0.5Hz(1%)		P
	Type and shape of the plugs and sockets:		N/A
	Kingdom of Saudi Arabia :		—
	Rated voltage(V) : 220V-230V(±5%) For domestic and commercial use 230V/380V-415V (±5%) For industrial use		P
	Frequency (Hz): 60 Hz ± 0.1 Hz		P
	Type and shape of the plugs and sockets:		N/A
	Sultanate of Oman :		—
	Rated voltage(V) : 240V/415V(±6%)		P
	Frequency (Hz): 50 Hz ±0.5Hz(1%)		P
	Type and shape of the plugs and sockets:		N/A
	State of Qatar :		—
	Rated voltage(V) : 240V/415V(±6%)		P
	Frequency (Hz): 50 Hz ±0.5Hz(1%)		P
	Type and shape of the plugs and sockets:		N/A
	State of Kuwait :		—
	Rated voltage(V) : 240V/415V(±6%)		P

Clause	Requirement - Test	Result - Remark	Verdict
	Frequency (Hz): 50 Hz \pm 0.5Hz(1%)		P
	Type and shape of the plugs and sockets:		N/A
	Republic of Yemen :		—
	Rated voltage(V) : 220V/400V(\pm 6%)		P
	Frequency (Hz): 50 Hz		P
	Type and shape of the plugs and sockets:		N/A
Annex 1 f	Electrical equipment intended to operate in non-air-conditioned or external atmospheres shall be designed to work in those atmospheres commensurate with the weather conditions in the Member States.		N/A
ATTACHMENT TO TEST REPORT National Difference			
	National Difference for Kingdom of Saudi Arabia IEC60335-1 ed.5.0		—
	General requirements:		—
	- When any HOUS standards (including all parts of this standard) refer to this standard (IEC 60335-1), you need to consider this Saudi national differences .		P
	- Electrical Appliances which are fitted with a plug , the Plug shall comply with SASO 2203 and IEC 60083:2006 (SA2 only)		N/A
	- The standard voltages and frequency in Saudi Arabia are 220V ac and 230V ac , 60 Hz		P
	- Markings on the name plate shall be either in Arabic or English language.		P
	- Safety instructions and Manuals shall be in Arabic language.		P
	- Country of origin shall be shown on the marking plate.		P
	National Difference for United Arab Emirates (REQUIREMENTS FOR REGISTRATION OF LOW VOLTAGE EQUIPMENT)		—
6.4	Compliance of the equipment plugs to:		N/A
6.4.1	BS 1363. Plugs with earth and fuse for Class I Appliances		N/A
6.4.2	BS 1363 Plugs with a dummy plastic earth pin for Class II Appliances		N/A

Clause	Requirement - Test	Result - Remark	Verdict
6.4.3	BS 546 Plug Configurations for 15 Ampere Appliances.		N/A
6.5	User Manual in Arabic and English language.		P
6.6	Country of Origin marking on the product.		P
6.7	Where applicable, compliance of the product to Tropical Climatic Conditions.		P

— End of attachment 1 —

IEC 61558-2-16:2009+A1:2013			
Clause	Requirement - Test	Result - Remark	Verdict

ATTACHMENT TO TEST REPORT IEC 60335-1 Household and similar electrical appliances – Safety – Part 1: General requirements	
Differences according to:	IEC 61558-2-16:2009+A1: 2013
Attachment Form No.:	IEC61558-2-16 Annex BB _A
Attachment Originator:	SGS-CSTC
Master Attachment:	Date 2015-05

BB	Annex BB		P
	Particular requirements for associated transformers for switch mode power supplies with internal frequencies > 500 Hz		—
	See separate test report-form for these Annex.		P
BB.8	MARKING AND OTHER INFORMATION		N/A

BB.9	PROTECTION AGAINST ELECTRIC SHOCK		N/A
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BB.10	CHANGE OF INPUT VOLTAGE SETTING		N/A
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BB.11	OUTPUT VOLTAGE AND OUTPUT CURRENT UNDER LOAD		N/A
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BB.12	NO-LOAD OUTPUT VOLTAGE (see supplementary requirements in Part 2)		N/A
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BB.13	SHORT-CIRCUIT VOLTAGE		N/A
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BB.14	HEATING		P
BB.14.2	Application of 14.1 or 14.3 according to the insulation system		P
BB.14.2.1	Class of isolating system (classified materials according to IEC 60 085 and IEC 60 216)		P
BB.14.2.2	No classified material, or system but the measured temperature does not exceed the value of Class A		N/A
BB.14.2.3	No classified material or system but the measured temperature exceeds the value for Class A, the live parts of the transformers are submitted to the test of 14.3		N/A
BB.14.3	Accelerated ageing test for undeclared class of isolating system		N/A
	Cycling test (10 cycles):		N/A

IEC 61558-2-16:2009+A1:2013			
Clause	Requirement - Test	Result - Remark	Verdict
	– measuring of the no-load input current (mA)		N/A
BB.14.3.1	– heat run (temperature in table 2)		N/A
BB.14.3.2	– vibration test: 30 min; amplitude 0,35 mm; frequency range: 10 Hz, 55 Hz, 10 Hz		N/A
BB.14.3.3	– moisture treatment (48 h, 17.2)		N/A
BB.14.3.4	Measurements and tests at the beginning and after each test:		N/A
	– deviation of the no-load input current, measured at the beginning of the test is 30%		N/A
	– insulation resistance acc. cl.18.1 and 18.2		N/A
	– electric strength, no breakdown (18.3); 2 min; test voltage 35% of specified value (table VI)		N/A
	– Transformers (50 or 60 Hz version) are tested after the dielectric strength test as follows: under no load; duration: 5 min; Upri(V):1,2 times rated supply voltage; frequency (Hz): 2 times rated frequency		N/A
BB.15	SHORT-CIRCUIT AND OVERLOAD PROTECTION		N/A
BB.16	MECHANICAL STRENGTH		N/A
BB.17	PROTECTION AGAINST HARMFUL INGRESS OF WATER AND MOISTURE		N/A
BB.18	INSULATION RESISTANCE AND ELECTRIC STRENGTH		P
BB.18.2	Insulation resistance between:		P
	– live parts and body for basic insulation $\geq 2 \text{ M}\Omega$		N/A
	– live parts and body for reinforced insulation $\geq 7 \text{ M}\Omega$		N/A
	– input circuits and output circuits for basic insulation $\geq 2 \text{ M}\Omega$		N/A
	– input circuits and output circuits for double or reinforced insulation $\geq 5 \text{ M}\Omega$	500 M Ω	P
	– each input circuit and all other input circuits connected together $\geq 2 \text{ M}\Omega$		N/A
	– each output circuit and all other output circuits connected together $\geq 2 \text{ M}\Omega$		N/A

IEC 61558-2-16:2009+A1:2013			
Clause	Requirement - Test	Result - Remark	Verdict
	– hazardous live parts and metal parts with basic insulation (Class II transformers) $\geq 2 \text{ M}\Omega$		P
	– body and metal parts with basic insulation (Class II transformers) $\geq 5 \text{ M}\Omega$		P
	– metal foil in contact with inner and outer surfaces of enclosures $\geq 2 \text{ M}\Omega$		N/A
BB.18.3	Electric strength test (1 min): no flashover or breakdown:		P
	1) basic insulation between input circuits and output circuits; working voltage (V); test voltage (V)		N/A
	2) double or reinforced insulation between input circuits and output circuits; working voltage (V); test voltage (V)	4200 V	P
	3) basic or supplementary insulation between:		N/A
	a) live parts of different polarity; working voltage (V); test voltage (V)		N/A
	b) live parts and the body if intended to be connected to protective earth		N/A
	c) inlet bushings and cord guards and anchorages		N/A
	d) live parts and an intermediate conductive part		N/A
	e) intermediate conductive parts and body :		N/A
	4) Reinforced insulation between the body and live parts; working voltage (V); test voltage (V)		N/A
	5) Functional insulation for windings intended to be connected in series or parallel (test voltage = working voltage + 500 V) (IEC 61558-2-16:2009)		N/A
18.102 (A1)	Partial discharge tests according IEC 60664-1 , if the working voltage is > 750 V peak		N/A
	Partial discharge is $\leq 10 \text{ pC}$ at time P2 See Fig. 19.101		N/A

BB.19	CONSTRUCTION		P
BB.19.1	Separation of input and output circuits		P
BB.19.1.1	SMPS incorporating auto-transformers (IEC 61558-2-16:2009)		N/A
BB.19.1.2	SMPS incorporating separating transformers (IEC 61558-2-16:2009)		N/A

IEC 61558-2-16:2009+A1:2013			
Clause	Requirement - Test	Result - Remark	Verdict
BB.19.1.2.1	Input and output circuits electrically separated. (IEC 61558-2-16:09)		N/A
BB.19.1.2.2	The insulation between input and output winding(s) consist of basic insulation (IEC 61558-2-16:09)		N/A
	Class I SMPS		N/A
	– Insulation between input windings and body consist of basic insulation		N/A
	– Insulation between output windings and body consist of basic insulation		N/A
	Class II SMPS (IEC 61558-2-16:09)		N/A
	– Insulation between input windings and body consist of double or reinforced insulation		N/A
	– Insulation between output windings and body consist of double or reinforced insulation		N/A
BB.19.1.2.3	The insulation between input windings and intermediate conductive parts and the output windings and intermediate part consist of basic insulation (IEC 61558-2-16:09)		N/A
	For class I SMPS the insulation between input and output windings via the intermediate conductive parts consist of basic insulation (IEC 61558-2-16:09)		N/A
	For class II SMPS the insulation between input winding and the body and between the output windings and the body via the intermediate conductive parts consist of double or reinforced insulation (IEC 61558-2-16:09)		N/A
BB.19.1.2.4	Parts of output circuits may be connected to protective earth (IEC 61558-2-16:09)		N/A
BB.19.1.2.5	No direct contact between output circuits and the body, unless: (IEC 61558-2-16:2009)		N/A
	– Allowed for associated transformers by the equipment standard		N/A
	– Clause 19.8 of part 1 is fulfilled		N/A
BB.19.1.3	SMPS incorporating isolating transformers and safety isolating transformers (IEC 61558-2-16:09)		P
BB.19.1.3.1	Input and output circuits electrically separated (IEC 61558-2-16:09)		P
	No possibility of any connection between these circuits		P
BB.19.1.3.2	The insulation between input and output winding(s) consist of double or reinforced insulation (exception see 19.1.3.4) (IEC 61558-2-16:09)		P

IEC 61558-2-16:2009+A1:2013			
Clause	Requirement - Test	Result - Remark	Verdict
	Class I SMPS not intended for connection to the mains by a plug:		—
	– Insulation between input windings and body connected to earth consist of basic insulation rated to the input voltage		N/A
	– Insulation between output windings and body, connected to earth consist of basic insulation rated for the output voltage		N/A
	Class I SMPS intended for connection to the mains by a plug (EN 61558-2-16:09):		N/A
	– Insulation between input windings and body connected to earth consist of basic insulation rated to the working voltage		N/A
	– Insulation between output windings and body, connected to earth consist of supplementary insulation rated for the working voltage		N/A
	Class II SMPS (IEC 61558-2-16:09)		P
	– Insulation between input windings and body consist of double or reinforced insulation rated to the input voltage		P
	– Insulation between output windings and body consist of double or reinforced insulation, rated to the output voltage		P
BB.19.1.3.3	SMPS with intermediate conductive parts not connected to the body (between input/output) (EN 61558-2-16:09):		N/A
19.1.3.3.1	For class I and class II SMPS the insulation between input and output windings, via intermediate conductive parts, consist of double or reinforced insulation, rated to the working voltage (EN 61558-2-16:09)		P
	– For class II SMPS the insulation between input winding and the body and between the output windings and the body via the intermediate conductive parts consist of double or reinforced insulation. (rated to the input voltage, for SELV circuits only basic insulation to the body))		P
	– For transformers, different from independent, the insulation between input and output windings, via intermediate conductive parts, consist of double or reinforced insulation, rated to the working voltage.		P
BB.19.1.3.3.2	Class I transformers with earthed core, and not allowed for class II equipment (EN 61558-2-16:09)		N/A

IEC 61558-2-16:2009+A1:2013			
Clause	Requirement - Test	Result - Remark	Verdict
	– Insulation from the input to the earthed core: basic insulation rated for the input voltage		N/A
	– Insulation from the output voltage to the earthed core: basic insulation rated for the output voltage		N/A
BB.19.1.3.3.3	Insulation between : input to intermediate conductive parts and output and intermediate parts consist of at least basic insulation (EN 61558-2-16:09)		N/A
	– If the insulation from input or output to the intermediate metal part is less than basic insulation, the part is considered to be connected to input or output.		N/A
BB.19.1.3.4	For class I SMPS, with protective screen, not connected to the mains by a plug the following conditions comply (EN 61558-2-16:09):		N/A
	– The insulation between input winding and protective screen consist of basic insulation (rated input voltage)		N/A
	– The insulation between output winding and protective screen consist of basic insulation (rated output voltage)		N/A
	– The protective screen consist of metal foil or a wire wound screen extending the full width of the windings and has no gaps or holes		N/A
	– Where the protective screen does not cover the entire width of the input winding, additional insulation to ensure double insulation in this area, is used.		N/A
	– If the screen is made by a foil, the turns are isolated, overlap at least 3 mm		N/A
	– The cross-section of the screen and the lead out wire is at least corresponding to the rated current of the overload device		N/A
	– The lead our wire is soldered or fixed to the protective screen.		N/A
	Protective screening is not allowed for SMPS with plug connection to the mains (EN 61558-2-16:09)		N/A
BB.19.1.3.5	No connection between output circuit and protective earth, except of associated transformers (allowed by equipment standard) or 19.8 is fulfilled (EN 61558-2-16:09)		N/A
BB.19.1.3.6	No connection between output circuit and body, except of associated transformers (allowed by equipment standard) (EN 61558-2-16:09)		P

IEC 61558-2-16:2009+A1:2013			
Clause	Requirement - Test	Result - Remark	Verdict
BB.19.1.3.7	The distance between input and output terminals for the connection of external wiring is 25 mm		N/A
BB.19.1.3.8	Portable SMPS having an rated output \leq 630 VA (EN 61558-2-16:09)		N/A
BB.19.1.3.9	No connection between output circuit, and body except of associated transformers (allowed by equipment standard) (EN 61558-2-16:09)		N/A
BB.19.1.3.10	Protective screening is not allowed for SMPS with plug connection to the mains (EN 61558-2-16:09)		N/A
BB.19.11	Handles, levers, knobs, etc.:		N/A
	– insulating material		N/A
	– supplementary insulation covering		N/A
	– separated from shafts or fixing by supplementary insulation		N/A
BB.19.12	Windings construction		P
BB.19.12.1	Undue displacement in all types of transformers not allowed:		P
	– of input or output windings or turns thereof		P
	– of internal wiring or wires for external connection		N/A
	– of parts of windings or of internal wiring in case of rupture or loosening		N/A
BB.19.12.2	Serrated tape:		N/A
	– distance through insulation according to table 13		N/A
	– one additional layer of serrated tape, and		N/A
	– one additional layer without serration		N/A
	– in case of cheek less bobbins the end turns of each layer shall be prevented from being displaced		N/A
BB.19.12.3 (A1)	Insulated windings wires providing basic, supplementary or reinforced insulation, meet the following requirements:		P
	<ul style="list-style-type: none"> • Multi-layer extruded or spirally wrapped insulation, passed the tests of annex K 		N/A
	<ul style="list-style-type: none"> • Basic insulation: two wrapped or one extruded wire 		N/A
	<ul style="list-style-type: none"> • Supplementary insulation: two layers, wrapped or extruded 		N/A
	<ul style="list-style-type: none"> • Reinforced insulation: three layers wrapped or extruded 		P
	Spirally wrapped insulation:		N/A

IEC 61558-2-16:2009+A1:2013			
Clause	Requirement - Test	Result - Remark	Verdict
	<ul style="list-style-type: none"> creepage distances between wrapped layers > cl. 26 _ P1 values 		N/A
	<ul style="list-style-type: none"> path between wrapped layers sealed, the test voltage of K2 is multiplied with 1,35 		N/A
	<ul style="list-style-type: none"> test 26.2.3 – Test A, passed for wrapped layers 		N/A
	<ul style="list-style-type: none"> the finished component pass the electric strength test according to cl. 18.3 		N/A
a)	Insulated winding wire used for basic or supplementary insulation in a wound part:		N/A
	<ul style="list-style-type: none"> comply with annex K 		N/A
	<ul style="list-style-type: none"> two layers for supplementary insulation 		N/A
	<ul style="list-style-type: none"> one layer for basic insulation 		N/A
	<ul style="list-style-type: none"> one layer for mechanical separation between the insulated wires of primary and secondary. This layer fulfils the requirement of basic insulation. 		N/A
b)	Insulated winding wire used for reinforced insulation in a wound part:		P
	<ul style="list-style-type: none"> comply with annex K 		P
	<ul style="list-style-type: none"> three layers 		N/A
	<ul style="list-style-type: none"> relevant dielectric strength test of 18.3 		N/A
	Where the insulated winding wire is wound:		N/A
	<ul style="list-style-type: none"> upon metal or ferrite cores 		N/A
	<ul style="list-style-type: none"> upon enamelled wire 		N/A
	<ul style="list-style-type: none"> under enamelled wire 		N/A
	<ul style="list-style-type: none"> one layer for mechanical separation between the insulated wires and the core or the enamelled wires is required. This layer fulfils the requirement of basic insulation. 		P
	<ul style="list-style-type: none"> both windings shall not touch each other and also not the core. 		P
	100 % routine test of Annex K3 of part 1 is fulfilled		N/A
	no creepage distances and clearances for insulated winding wirers		P
	for TIW wires values of box 2) c) of table 13, table C.1 and table D.1 of part 1 and of clause 26.106 are not required		P
FIW	<u>Transformers which use FIW wire</u>		N/A

IEC 61558-2-16:2009+A1:2013			
Clause	Requirement - Test	Result - Remark	Verdict
BB 19.12.101 (A1)	Max. class F for transformers which use FIW-wire		N/A
BB 19.12.102 (A1)	FIW wires comply with IEC 60851-5, Ed.4.1; IEC 60317-0-7 and IEC 60317-56, Ed.1.		N/A
	<ul style="list-style-type: none"> other nominal diameter as mentioned in table 19.101 can be calculated with the formula after table 19.111 		N/A
	FIW wire used for basic or supplementary insulation for transformers according 19.1.2 (separating-transformers) of IEC 61558-2-16:		N/A
	<ul style="list-style-type: none"> the test voltage of table 8a – part 1, based on the working voltage of basic or supplementary insulation, comply with the min. voltage strength of table 19.111 		N/A
	<ul style="list-style-type: none"> one layer for mechanical separation is located between the insulated wires of primary and secondary. This layer fulfil the requirement of basic insulation 		N/A
	<ul style="list-style-type: none"> between FIW and enamelled wire, no requirements of creepage distances and clearances 		N/A
	<ul style="list-style-type: none"> no touch of FIW and enamelled wires (grad 1, or grad 2 ...) 		N/A
	FIW wire used for double or reinforced insulation for transformers according 19.1.3 (isolating and safety isolating transformers) of IEC 61558-2-16 (PRI and SEC basic insulated FIW-wire):		N/A
	<ul style="list-style-type: none"> the test voltage of table 8a – part 1, based on the working voltage of basic or supplementary insulation, comply with the min. voltage strength of table 19.111 		N/A
	<ul style="list-style-type: none"> for primary and secondary winding FIW-wire for basic insulation is used 		N/A
	<ul style="list-style-type: none"> one layer for mechanical separation is located between the insulated wires of primary and secondary. This layer fulfil the requirement of basic insulation 		N/A
	<ul style="list-style-type: none"> no touch between the basic insulated PRI and SEC FIW-wires 		N/A
	<ul style="list-style-type: none"> between PRI- and SEC-FIW wires, no requirements of creepage distances and clearances 		N/A
	Alternative construction used for reinforced insulation (reinforced insulated FIW wire and enamelled wire)		N/A

IEC 61558-2-16:2009+A1:2013			
Clause	Requirement - Test	Result - Remark	Verdict
	<ul style="list-style-type: none"> the test voltage of table 8a – part 1, based on the working voltage reinforced insulation, comply with the min. voltage strength of table 19.111 		N/A
	<ul style="list-style-type: none"> one layer for mechanical separation is located between the reinforced insulated FIW wire and the enamelled wire. This layer fulfil the requirement of basic insulation 		N/A
	<ul style="list-style-type: none"> no touch between the FIW wire and the enamelled wire 		N/A
	<ul style="list-style-type: none"> between the reinforced FIW wire and any other parts, no requirements of creepage distances and clearances exist 		N/A
	Alternative construction with FIW wires, basic or supplementary insulated for transformers with double or reinforced insulation according to 19.1.3 (basic/supplementary insulated FIW wire + enamelled wire + creepage distance and clearances for basic insulation)		N/A
	<ul style="list-style-type: none"> the test voltage of table 8a – part 1, based on the working voltage of basic or supplementary insulation, comply with the min. voltage strength of table 19.111 		N/A
	<ul style="list-style-type: none"> PRI or SEC basic insulated FIW wire and to the other winding (enamelled wire) requirements of supplementary insulation 		N/A
	<ul style="list-style-type: none"> creepage distances and clearances between the basic insulated FIW wire and the enamelled wire for basic or supplementary insulation are required. 		N/A
	Where the FIW wire is wound		N/A
	<ul style="list-style-type: none"> upon metal or ferrite cores 		N/A
	<ul style="list-style-type: none"> one layer for mechanical separation between the insulated wires and the core or the enamelled wires is required. This layer fulfils the requirement of basic insulation. 		N/A
	<ul style="list-style-type: none"> both windings shall not touch each other and also not the core. 		N/A
BB.20	COMPONENTS		N/A
BB.21	INTERNAL WIRING		N/A
BB.22	SUPPLY CONNECTION AND EXTERNAL FLEXIBLE CABLES AND CORDS		N/A

IEC 61558-2-16:2009+A1:2013			
Clause	Requirement - Test	Result - Remark	Verdict
BB.23	TERMINALS FOR EXTERNAL CONDUCTORS		N/A
BB.24	PROVISION FOR PROTECTIVE EARTHING		N/A
BB.25	SCREWS AND CONNECTIONS		N/A
BB.26	CREEPAGE DISTANCES AND CLEARANCES		P
BB.26.1	See 26.101		P
BB.26.2	Creepage distances (cr) and clearances (cr)		P
BB.26.2.1	Windings covered with adhesive tape		P
	– the values of pollution degree 1 are fulfilled		N/A
	– all isolating material are classified acc. to IEC 60085 and IEC 60216		N/A
	– test A of 26.2.3 is fulfilled		N/A
BB.26.2.2	Uncemented insulating parts pollution degree P2 or P3		P
	– all isolating material are classified acc. to IEC 60085 and IEC 60216		N/A
	– values of pollution degree 1 are not applicable		N/A
BB.26.2.3	Cemented insulating parts		N/A
	– all isolating materials are classified acc. to IEC 60085 and IEC 60216		N/A
	– values of distance through insulation (dti) are fulfilled		N/A
	– creepage distances and clearances are not required		N/A
	– test A of this sub clause is fulfilled		N/A
	Test A		N/A
	– thermal class		N/A
	– working voltage		N/A
	– Test with three specially specimens, with uninsulated wires, without impregnation or potting	(see appended table)	N/A
	Two of the three specimens are subjected to:		N/A
	– the relevant humidity treatment according to 17.2 (48 h)		N/A
	– the relevant dielectric strength test of 18.3 multiplied with factor 1,35		N/A

IEC 61558-2-16:2009+A1:2013			
Clause	Requirement - Test	Result - Remark	Verdict
	– One of the three specimens is subjected to the relevant dielectric strength test of 18.3 multiplied by the factor 1,35 immediately at the end of the last cycle with high temperature		N/A
	Impulse dielectric test according to 4.1.1.2.1 of IEC 60 664-1 (1,2 / 50 s waveform) – see Annex R of IEC 61558-1		N/A
BB.26.2.4	Enclosed parts, by impregnation or potting		N/A
BB.26.2.4.1	– The requirements of reduced values as stated for pollution degree 1 (P1) are fulfilled		N/A
	– all isolating materials are classified acc. to IEC 60085 and IEC 60216		N/A
	Test B		N/A
	– thermal class		N/A
	– working voltage		N/A
	– Test with three specially specimens, potted or impregnated. The dielectric strength test is applied directly to the joint.	(see appended table)	N/A
	Two of the three specimens are subjected to:		N/A
	– the relevant humidity treatment according to 17.2 (48 h)		N/A
	– the relevant dielectric strength test of 18.3 multiplied with factor 1,25		N/A
	– One of the three specimens is subjected to the relevant dielectric strength test of 18.3 multiplied by the factor 1,25 immediately at the end of the last cycle with high temperature		N/A
	The three spacemen pass the Impulse dielectric test according to 4.1.1.2.1 of IEC 60 664-1 (1,2 / 50 s waveform) – see Annex R of IEC 61558-1		N/A
BB.26.2.4.2	– The requirements of distance through insulation (dti) are fulfilled. (P1 values are not required)		N/A
	– all isolating materials are classified acc. to IEC 60085 and IEC 60216		N/A
	Test C		N/A
	– thermal class		N/A
	– working voltage		N/A
	– Test with three specimens, potted or impregnated. (finished components)	(see appended table)	N/A

IEC 61558-2-16:2009+A1:2013			
Clause	Requirement - Test	Result - Remark	Verdict
	– Neither cracks, nor voids in the insulating compounds		N/A
	Two of the three specimens are subjected to:		N/A
	– the relevant humidity treatment according to 17.2 (48 h)		N/A
	– the relevant dielectric strength test of 18.3 multiplied with factor 1,35		N/A
	– One of the three specimens is subjected to the relevant dielectric strength test of 18.3 multiplied by the factor 1,35 immediately at the end of the last cycle with high temperature		N/A
	The three spacemen pass the Impulse dielectric test according to 4.1.1.2.1 of IEC 60 664-1 (1,2 / 50 s waveform) – see Annex R of IEC 61558-1		N/A
BB.26.3	Distance through insulation		P
	For double or reinforced insulation, the required values of Tables 13, C1, and D1 – boxes 2b, 2c and 7 are fulfilled		P
	The insulation fulfil the material classification according IEC 60085 or 60216 or the test of 14.3		P
BB.26.3.1	Reduced values of the thickness of insulation for supplementary or reinforced insulation are allowed if the following conditions are fulfilled:		N/A
	– the isolating materials are classified acc. to IEC 60085 and IEC 60216		N/A
	– the test of 14.3 is fulfilled		N/A
	– If both requirements are fulfilled, the required values for solid insulation can be multiplied by 0,4		N/A
	– Minimum thickness of reinforced insulation $\geq 0,2$ mm		N/A
	– Minimum thickness of supplementary insulation $\geq 0,1$ mm		N/A
BB.26.3.2	Insulation in thin sheet form		N/A
	– If the layers are non-separable (glued together):		N/A
	– The requirement of 3 layers is fulfilled		N/A
	– The mandrel test according 26.3.3 is fulfilled with 150 N		N/A
	– The required values for d.t.i. of Tables 13, C.1 and D.1 – marked by index "e" is fulfilled.		N/A

IEC 61558-2-16:2009+A1:2013			
Clause	Requirement - Test	Result - Remark	Verdict
	– If the layers are separated:		N/A
	– The requirement of 2 layers is fulfilled		N/A
	– If serrated tape is used, 1 additional layer (serrated) and one additional layer without serration is required		N/A
	– The mandrel test according 26.3.3 is fulfilled on each layer with 50 N		N/A
	– The required values for d.t.i. of Tables 13, C.1 and D.1 – marked by index "e" is fulfilled.		N/A
	– If the layers are separated (alternative:		N/A
	- The requirement of 3 layers is fulfilled		N/A
	– If serrated tape is used, 1 additional layer (serrated) and one additional layer without serration is required		N/A
	– The mandrel test according 26.3.3 is fulfilled on 2/3 of the layers with 100 N		N/A
	– The required values for d.t.i. of Tables 13, C.1 and D.1 – marked by index "e" is fulfilled.		N/A
	Test according to 14.3 and if the isolating materials are classified acc. to IEC 60085 and IEC 60216 no distances through insulation are required for insulation in thin sheet form		N/A
	The figures within square brackets in box 2 and 7 of table 13 (C.1/D.1) are used for insulation in thin sheet form as follows:		N/A
	– rated output > 100 VA values in square brackets apply		N/A
	– rated output 25 VA 100 VA 2/3 of the value in square brackets apply		N/A
	– rated output _ 25 VA 1/3 of the value in square brackets apply		N/A
BB.26.3.3	Mandrel test of insulation in thin sheet form (specimen of 70 mm width are necessary):		N/A
	– If the layers are non-separable – at least 3 layers glued together fulfil the test:		N/A
	– pull force of 150 N		N/A
	– high voltage test of 5,0 kV or the test voltage of 18.3 multiplied by 1,25 whatever is the greater. No flashover, no breakdown.		N/A
	– If the layers are separable and 2/3 of at least 3 layers fulfil the test.		N/A

IEC 61558-2-16:2009+A1:2013			
Clause	Requirement - Test	Result - Remark	Verdict
	– pull force of 100 N		N/A
	– high voltage test of 5,0 kV or the test voltage of 18.3 multiplied by 1,25 whatever is the greater. No flashover, no breakdowns.		N/A
	– If the layers are separable 1 of at least 2 layers fulfil the test:		N/A
	– pull force of 50 N		N/A
	– high voltage test of 5,0 kV or the test voltage of 18.3 multiplied by 1,25 whatever is the greater. No flashover, no breakdown.		N/A
BB.26.101	Creepage distances, clearances and distances through insulation, specified values according to (EN 61558-2-16:09):		P
	– table 13, material group IIIa (part 1)		P
	– table C, material group II (part 1)		N/A
	– table D, material group I (part 1)		N/A
	– working voltage		P
	– rated supply frequency 50/60 Hz		N/A
	– rated internal frequency		P
	1. Insulation between input and output circuits (basic insulation):		N/A
	a) measured values specified values (mm)		N/A
	2. Insulation between input and output circuits (double or reinforced insulation):		P
	a) measured values specified values (mm)	Cl=Cr=9,34 mm Limit: (cl., cr.) = (5, 5 mm, 6, 0 mm)	P
	b) measured values specified values (mm)		N/A
	c) measured values specified values (mm)		N/A
	3. Insulation between adjacent input circuits: measured values specified values (mm)		N/A
	Insulation between adjacent output circuits: measured values specified values (mm)		N/A
	4. Insulation between terminals for external connection:		N/A

IEC 61558-2-16:2009+A1:2013			
Clause	Requirement - Test	Result - Remark	Verdict
	a) measured values specified values (mm)		N/A
	b) measured values specified values (mm)		N/A
	c) measured values specified values (mm)		N/A
	5. Basic or supplementary insulation:		N/A
	a) measured values specified values (mm)		N/A
	b) measured values specified values (mm)		N/A
	c) measured values specified values (mm)		N/A
	d) measured values specified values (mm)		N/A
	e) measured values specified values (mm)		N/A
	6. Reinforced or double insulation: measured values specified values (mm)		N/A
	7. Distance through insulation:		N/A
	a) measured values specified values (mm)		N/A
	b) measured values specified values (mm)		N/A
	c) measured values specified values (mm)		N/A
BB.26.102	Values of IEC 61558-2-16 applicable for frequency up to 3 MHz (EN 61558-2-16:09)		P
	For frequency above 3 MHz clause 7 of IEC 60664-4 is applicable (high frequency testing)		N/A
BB.26.103	Clearance (EN 61558-2-16:09)		P
	a.) Clearance for frequency ≥ 30 kHz according figure 101 two determinations are necessary:		N/A
	– determination based on peak working voltage according Table 104 :		N/A
	Peak working voltage		N/A
	Basic insulation: required / measured		N/A
	Double or reinforced insulation: required / measured value		N/A

IEC 61558-2-16:2009+A1:2013			
Clause	Requirement - Test	Result - Remark	Verdict
	– and alternative if applicable for approximately homogeneous field according to Table 102		N/A
	Peak working voltage		N/A
	Basic insulation: required / measured		N/A
	Double or reinforced insulation: required / measured value		N/A
	– determination based on measured r.m.s. working voltage according Tables 13, C1 and D1 (see clause 26.101)		N/A
	The minimum clearance is the greater of the two values.		N/A
	b.) Clearance for frequency ≤ 30 kHz according figure 101 two determinations are necessary:		P
	– determination based on peak working voltage with recurring peak voltages according Table 103 :		P
	– determination based on measured r.m.s. working voltage according Tables 13, C1 and D1 (see clause 26.101)		P
	The minimum clearance is the greater of the two values.		P
BB.26.104	The working voltages of Table 102, 103 and 104 are peak voltages including μ sec peaks EN 61558-2-16:09)		P
	The working voltage according to Table 13 of part 1 are r.m.s. voltages		P
BB.26.105	Creepage distances		P
	Two determinations of creepage distances are necessary (see Figure 102)		P
	– determination based on measured peak working voltage according Tables 105 to 110		P
	Peak working voltage		P
	Pollution degree		P
	Basic or supplementary insulation: required / measured		N/A
	Double or reinforced insulation: required / measured value		P
	– determination based on measured r.m.s. working voltage according Tables 13, C1 and D1 (see clause 26.101)		P

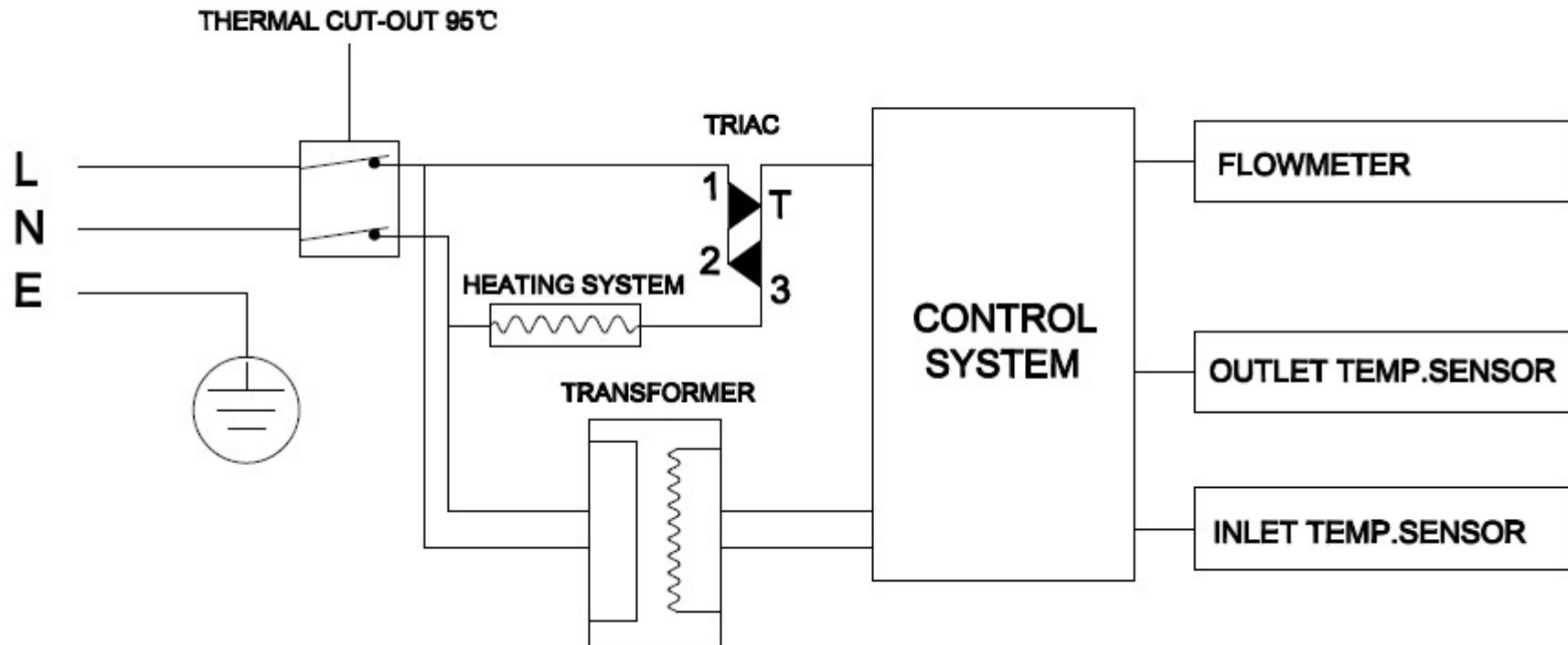
IEC 61558-2-16:2009+A1:2013			
Clause	Requirement - Test	Result - Remark	Verdict
	If the values based on table 105 to 110 are lower than the relevant values in Tables 13, C.1 or D.1, the higher values shall be applicable		P
BB.26.106	Distance through insulation (EN 61558-2-16:09)		N/A
	Instead of partial discharge with high frequency voltage the test of the distance and the calculation of the electric field is applicable under the following conditions:		N/A
	– the max. frequency is < 10 MHz		N/A
	– the field strength approximately comply with Figure 103		N/A
	– no voids or gaps are present in between the solid insulation		N/A
	For thick layers $d1 \geq 0,75$ the peak value of the field strength is ≤ 2 kV/mm		N/A
	For thin layers $d2 \leq 30$ μm the peak value of the field strength is ≤ 10 kV/mm		N/A
	For $d1 > d > d2$ equation (1) is used for calculation the field strength		N/A
BB.26.107 (A1)	For transformers with FIW wires the following test is required		N/A
	<ul style="list-style-type: none"> 10 cycles are required 		N/A
	<ul style="list-style-type: none"> 68 h test at max heating temperature + 10°C or test at max. allowed winding temperature based on the insulation class (required in table 1) + 10°C 		N/A
	<ul style="list-style-type: none"> 1 h at 25° C 		N/A
	<ul style="list-style-type: none"> 2 h at 0° C 		N/A
	<ul style="list-style-type: none"> 1 h at 25° C – (next cycle start again with 68 h max winding temp + 10) 		N/A
	<ul style="list-style-type: none"> during the 10 cycles test 2 x working voltage is connected between PRI and SEC 		N/A
	<ul style="list-style-type: none"> after 10 cycle test 2 transformers are subjected to the 17.2 test for 48 h and direct after the 48 h the dielectric strength test of 18.3 (100 % test voltage) is done 		N/A
	<ul style="list-style-type: none"> after the 10 cycle test the third sample is tested at the end of the last cycle in the hot position with the dielectric strength test of 18.3 (100 % test voltage) 		N/A

IEC 61558-2-16:2009+A1:2013			
Clause	Requirement - Test	Result - Remark	Verdict
	<ul style="list-style-type: none"> the partial discharge test according to 18.101 is done after the cycling test and after the high voltage test, if the peak working voltage is >750 V 		N/A
BB.27	RESISTANCE TO HEAT, FIRE AND TRACKING		N/A
IEC 61558-2-16 Annex BB			
Clause	Requirement + Test	Result - Remark	Verdict
BB.E	ANNEX E , GLOW WIRE TEST		P
	The test is required according to IEC 60695-2-10 and IEC 60695-2-11 with the following additions:		P
BB.E.1	Clause 6, "Severities" of IEC 6095-2-11, apply with the temperature stated in 27.3 of IEC 61558-1		P
BB.E2	Clause 8, "Conditioning", of IEC 60695-2-11 apply, preconditioning is required		P
BB.E3	Clause 10, "Test Procedure", of IEC 60695-2-11 apply, The tip of the glow wire is applied to the flat side of the surface.		P
BB.F	ANNEX F, REQUIREMENTS FOR MANUALLY OPERATED SWITCHES WHICH ARE PARTS OF THE TRANSFORMER		N/A
BB.H	ANNEX H, ELECTRONIC CIRCUITS (IEC 61558-1)		N/A
BB.K 61558-2-16/A1	ANNEX K, INSULATED WINDING WIRES FOR USE AS MULTIPLE LAYER INSULATION		N/A
BB.K.1	Wire construction:		N/A
	<ul style="list-style-type: none"> insulated winding wire for basic or supplementary insulation (see 19.12.3) 		N/A
	<ul style="list-style-type: none"> insulated winding wire for reinforced insulation (see 19.12.3) 		N/A
	<ul style="list-style-type: none"> solid circular winding wires and stranded winding wires with 0,05 to 5 mm diameter 		N/A
	<ul style="list-style-type: none"> spirally wrapped insulation - overlapping 		N/A
BB.K.2	Type tests		N/A
BB.K.2.1	General Tests between ambient temperature between 15° C and 35° C and at an humidity between 45% and 75 %		N/A

IEC 61558-2-16:2009+A1:2013			
Clause	Requirement - Test	Result - Remark	Verdict
BB K.2.2	Electric strength test		N/A
BB K.2.2.1	Solid circular winding wires and stranded winding wires		N/A
	Test samples prepared according to clause 4.4.1 of IEC 60851-5:2008 (twisted pair)		N/A
	Dielectric strength test: 6 kV for reinforced insulation		N/A
	Dielectric strength test: 3 kV for basic or supplementary insulation		N/A
BB K.2.2.2	Square or rectangular wires .		N/A
	Test samples prepared according to clause 4.7.1 of IEC 60851-5:2008		N/A
	Dielectric strength test: 5,5 kV for reinforced insulation		N/A
	Dielectric strength test: 2,75 kV for basic or supplementary insulation		N/A
BB K.2.3	Flexibility and adherence		N/A
	Claus 5.1 in Test 8 of IEC 60851-3:2009 shall be used		N/A
	Test samples prepared according to clause 5.1.1.4 of IEC 60851-3:2009		N/A
	Dielectric strength test: 5,5 kV for reinforced insulation		N/A
	Dielectric strength test: 2,75 kV for basic or supplementary insulation		N/A
	Mandrel diameter according table K.1		N/A
	The tension to the wire during winding on mandrel is 118 N/mm ² (118 MPa)		N/A
BB.K.2.4	Heat shock		N/A
	Test samples prepared according to 3.1.1 (in Test 9) of IEC 60851-6:1996		N/A
	<ul style="list-style-type: none"> high voltage test immediately after this test 		N/A
	<ul style="list-style-type: none"> Dielectric strength test: 5,5 kV for reinforced insulation 		N/A
	<ul style="list-style-type: none"> Dielectric strength test: 2,75 kV for basic or supplementary insulation 		N/A
BB.K.2.5	Retention of dielectric strength after bending (test as specified under test 13 of 4.6.1 c) of IEC 60 851-5)		N/A

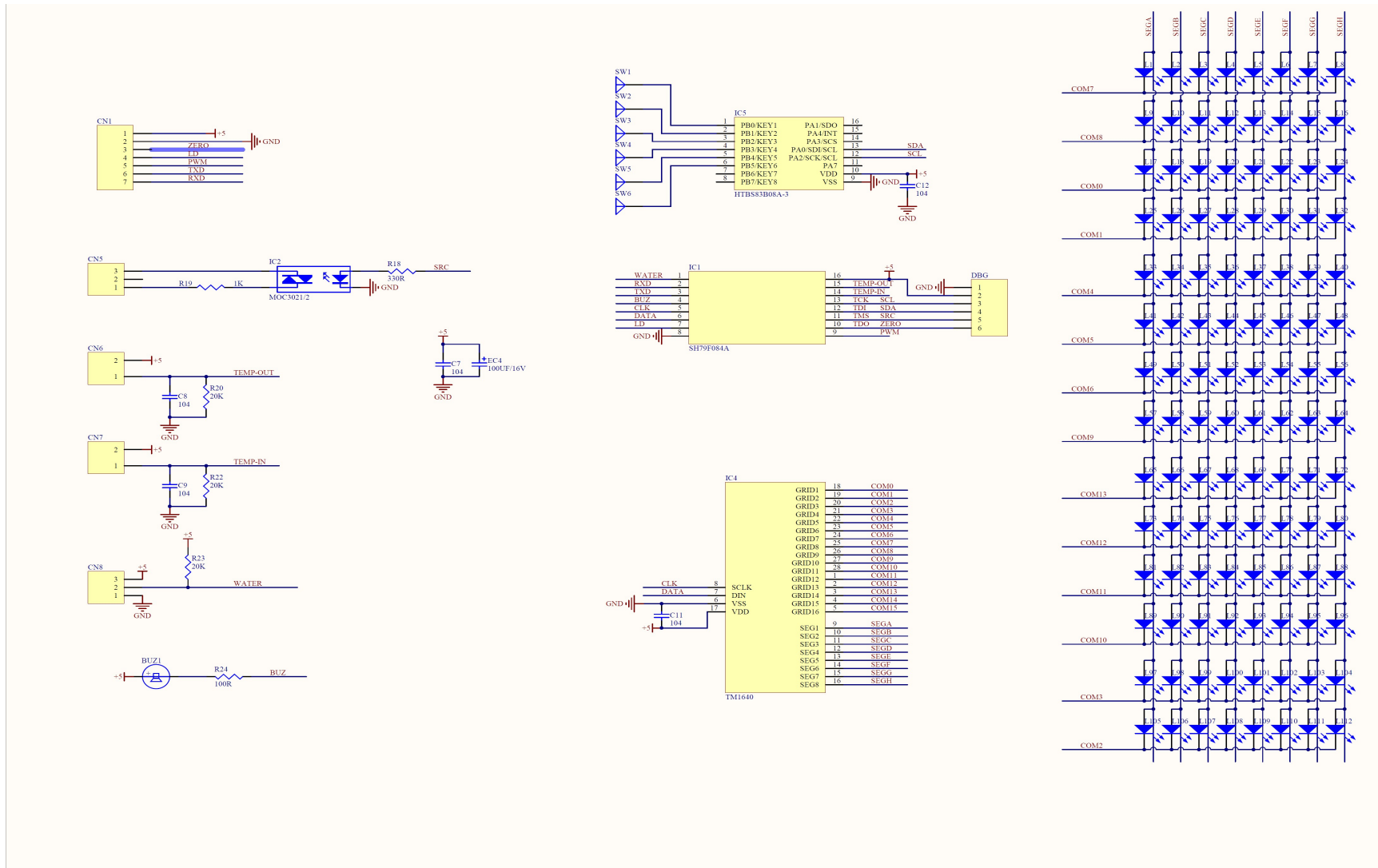
IEC 61558-2-16:2009+A1:2013			
Clause	Requirement - Test	Result - Remark	Verdict
	<ul style="list-style-type: none"> high voltage test immediately after this test Dielectric strength test: 5,5 kV for reinforced insulation Dielectric strength test: 2,75 kV for basic or supplementary insulation 		N/A
BB.K.3	Testing during manufacturing		N/A
BB.K.3.1	General Tests as subjected in K.3.2 and K.3.3		N/A
BB K.3.2	Routine test		N/A
	<ul style="list-style-type: none"> Dielectric strength test: 4,2 kV for reinforced insulation 		N/A
	<ul style="list-style-type: none"> Dielectric strength test: 2,1 kV for basic or supplementary insulation 		N/A
BB K.3.3	Sampling test		N/A
BB K.3.3.1	Solid circular winding wires and stranded winding wires		N/A
	Test with a twisted pair, prepared according clause 4.4.1 of IEC 60851-5:2008		N/A
	<ul style="list-style-type: none"> Dielectric strength test: 6 kV for reinforced insulation 		N/A
	<ul style="list-style-type: none"> Dielectric strength test: 3 kV for basic or supplementary insulation 		N/A
BB K.3.3.2	Square rectangular wire		N/A
	Samples prepared according to clause 4.7.1 of IEC 60851-5:2008		N/A
	<ul style="list-style-type: none"> Dielectric strength test: 5,5 kV for reinforced insulation 		N/A
	<ul style="list-style-type: none"> Dielectric strength test: 3 kV for basic or supplementary insulation 		N/A
BB.U	ANNEX U – INFORMATIVE – OPTIONAL TW – MARKING FOR TRANSFORMERS		N/A
V	ANNEX V, SYMBOLS TO BE USED FOR THERMAL CUT-OUTS		N/A

---End of Attachment 2 ---



Attachment 3 Circuit diagram Test report No. GZES191202867731

Circuit diagram of Display PCB



----- End of Attachment 3 -----

Attachment 4

Photo documentation

Type of equipment, model: Instantaneous Water Heater (Instant Electric Water Heater), FD68P; FD55P

Details of: Appearance

View:

- general
- front
- rear
- right
- left
- top
- bottom



Details of: Appearance

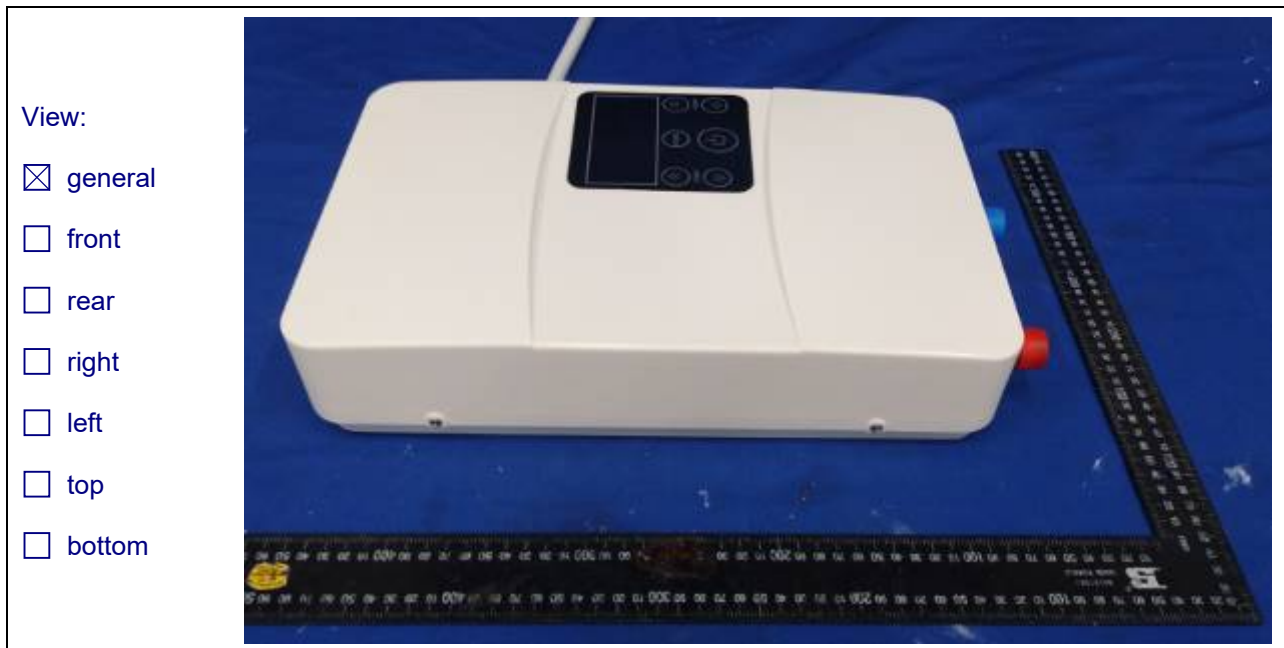
View:

- general
- front
- rear
- right
- left
- top
- bottom



Attachment 4

Details of: Appearance



Details of: Appearance

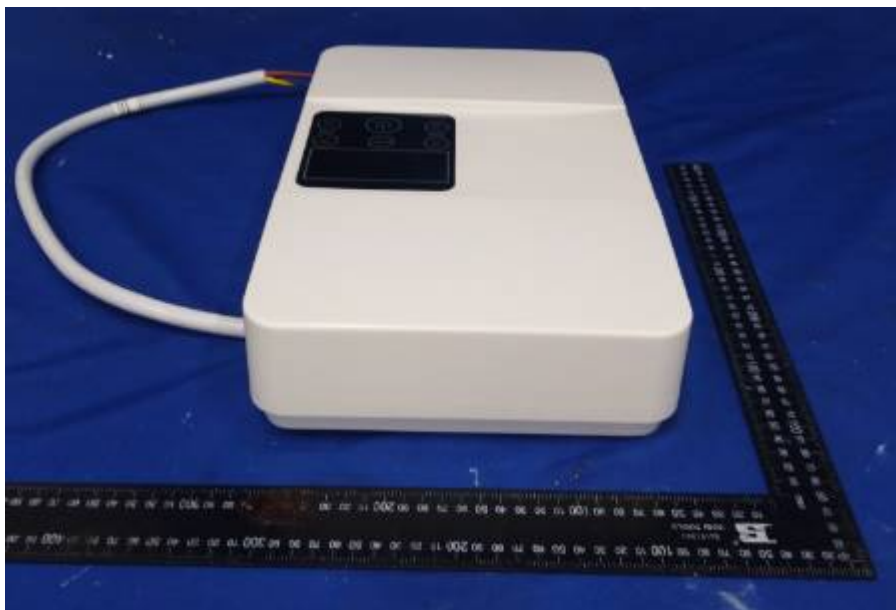


Attachment 4

Details of: Appearance

View:

- general
- front
- rear
- right
- left
- top
- bottom



Details of: Appearance

View:

- general
- front
- rear
- right
- left
- top
- bottom



Attachment 4

Details of: Control Panel (thickness: 1,5 mm)

View:

- general
- front
- rear
- right
- left
- top
- bottom



Details of: Relief hole

View:

- general
- front
- rear
- right
- left
- top
- bottom

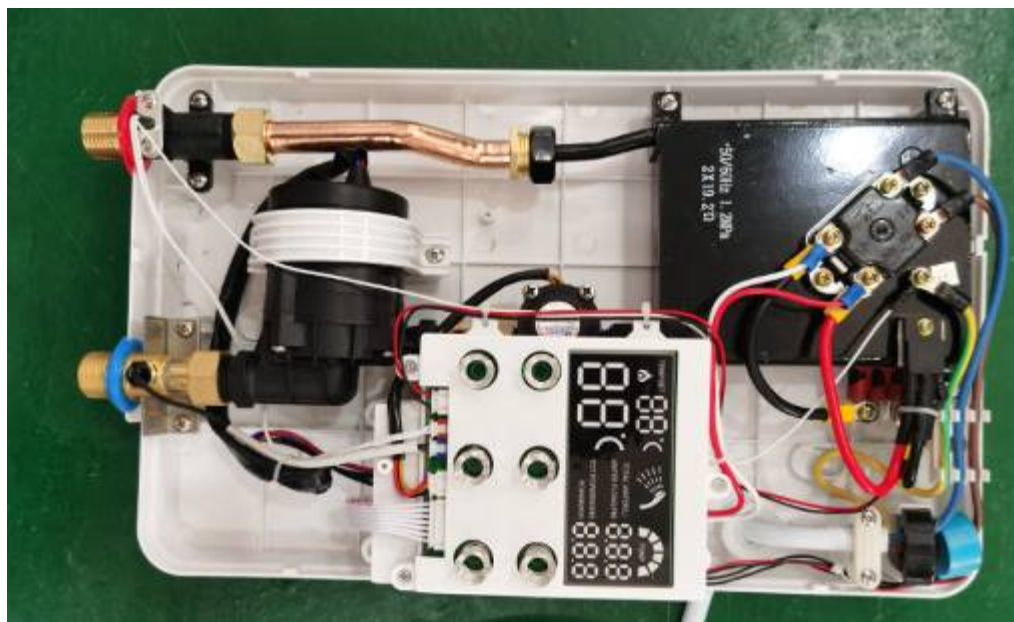


Attachment 4

Details of: Internal view

View:

- general
- front
- rear
- right
- left
- top
- bottom



Details of: Power cord anchorage

View:

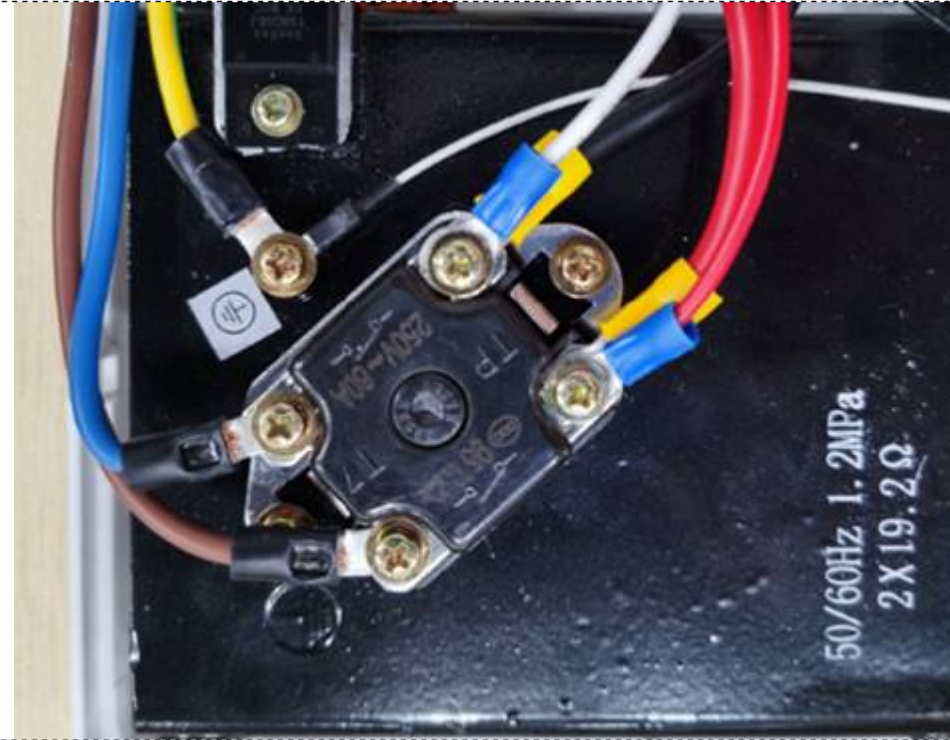
- general
- front
- rear
- right
- left
- top
- bottom



Attachment 4Details of: Earthed symbol and Earthed screw

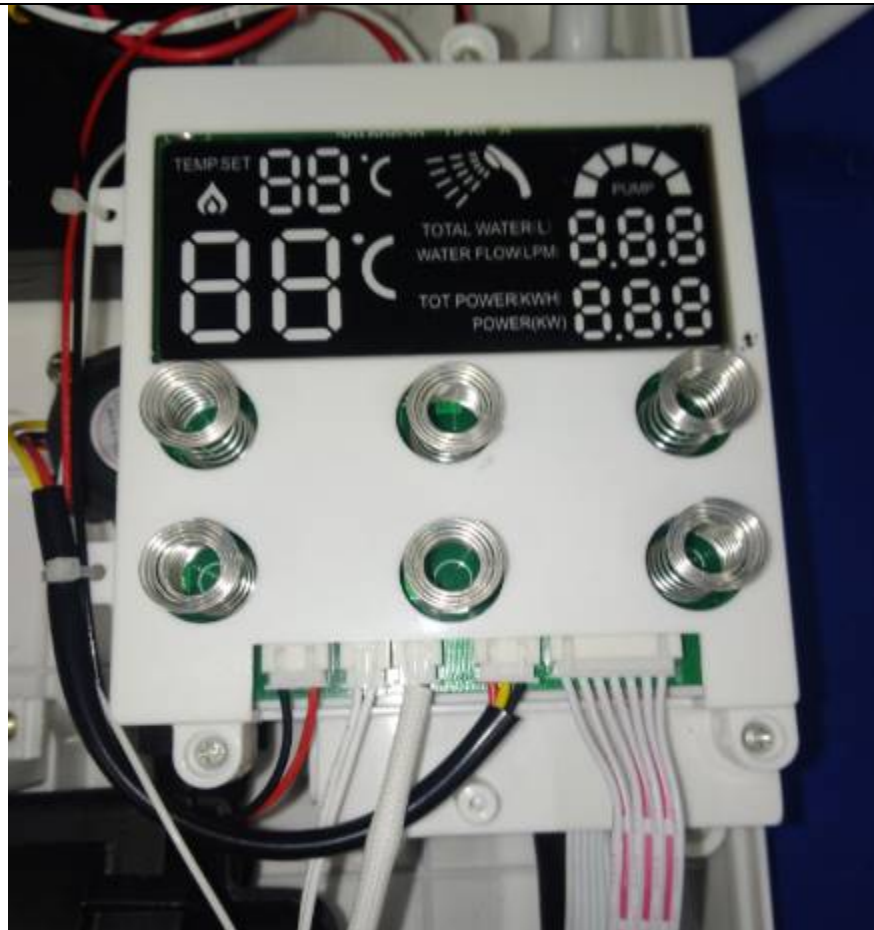
View:

- general
- front
- rear
- right
- left
- top
- bottom

Details of: Display PCB

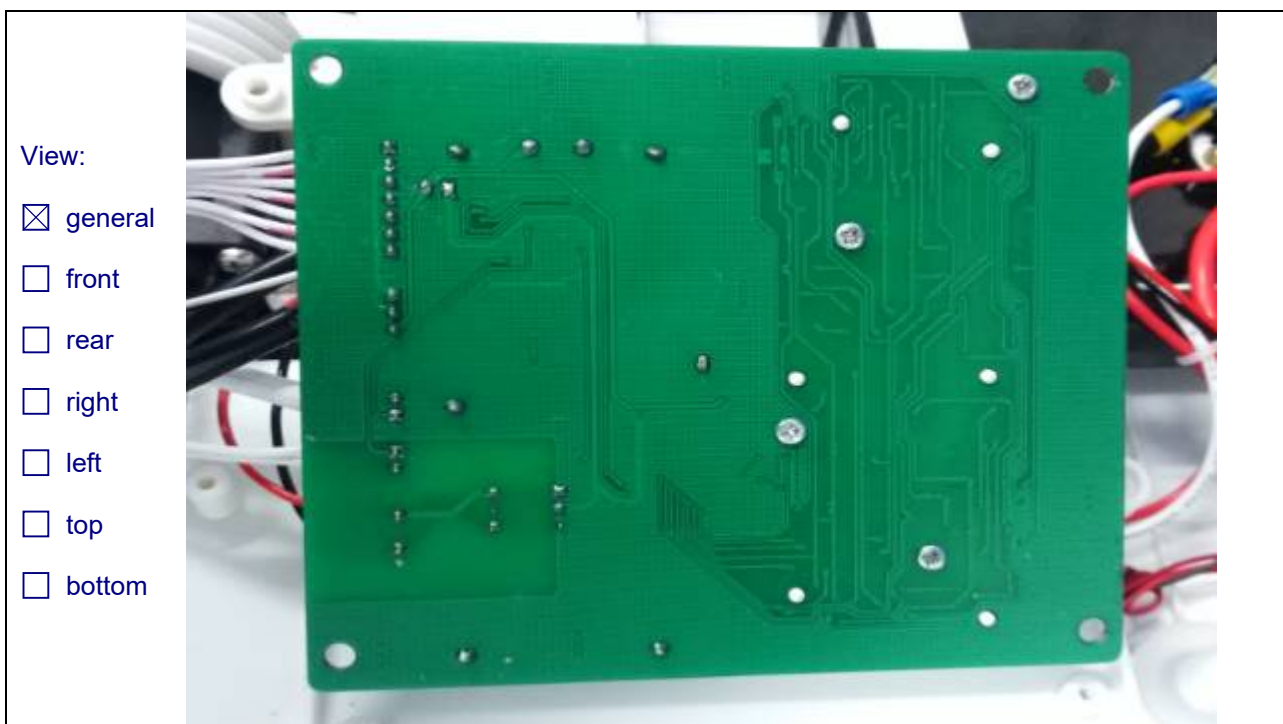
View:

- general
- front
- rear
- right
- left
- top
- bottom

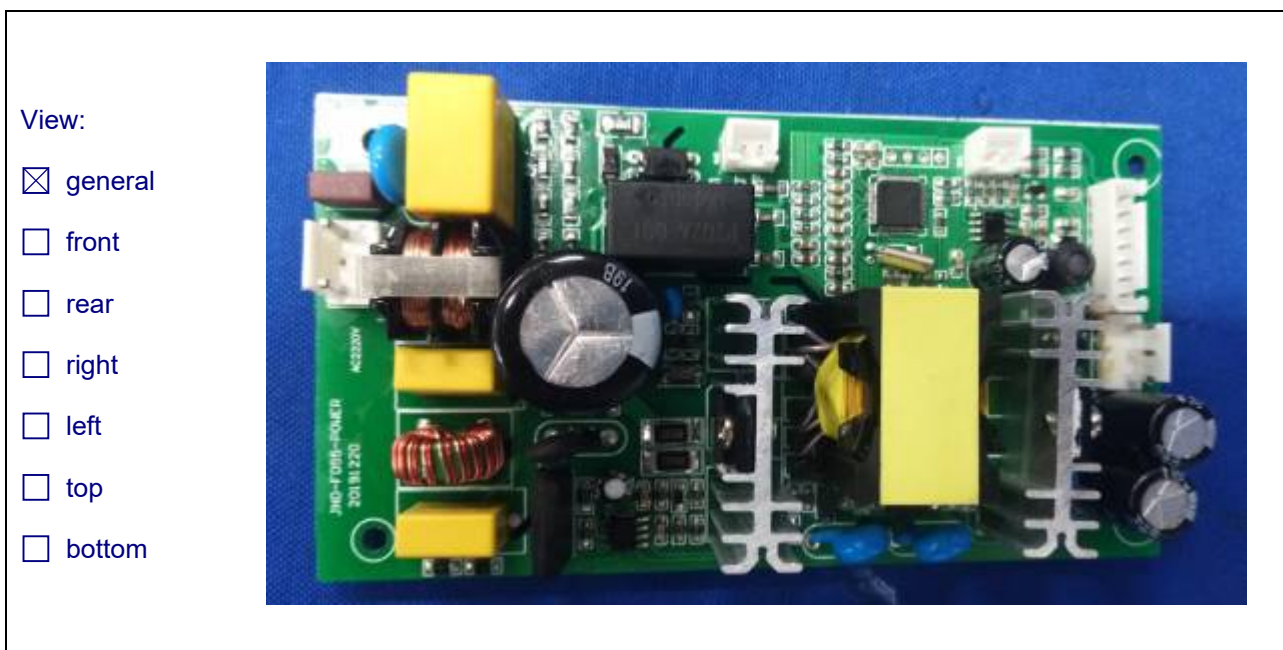


Attachment 4

Details of: Display PCB backboard

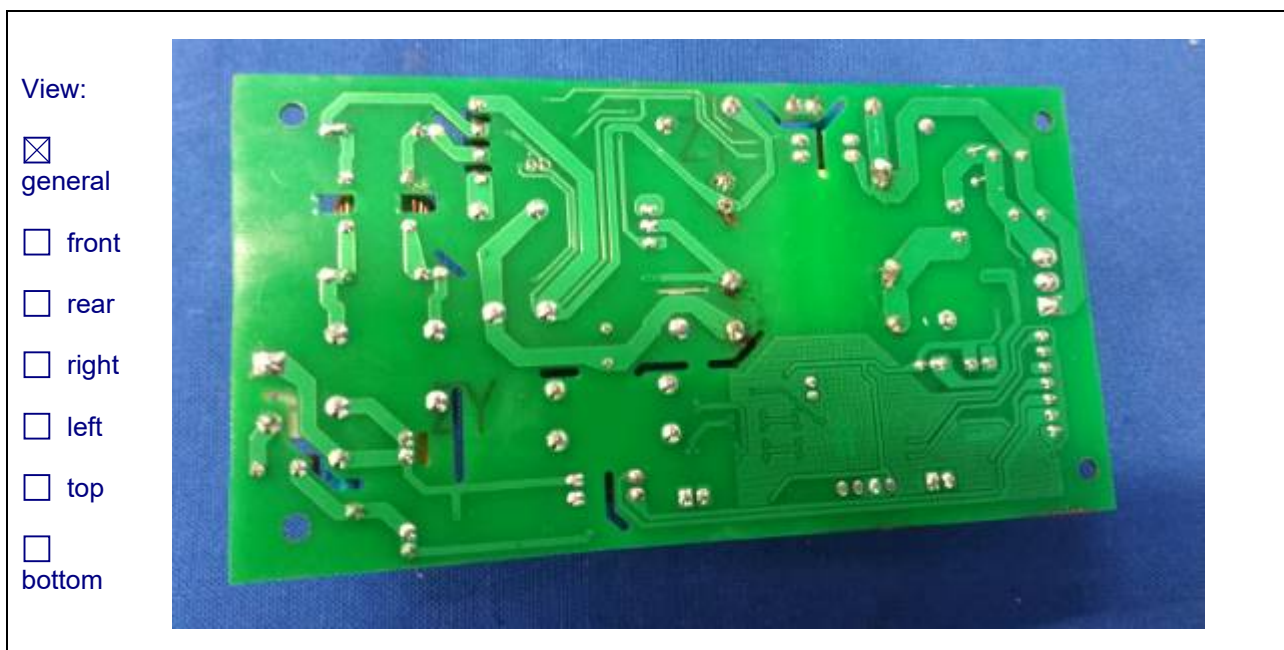


Details of: Main Control PCB

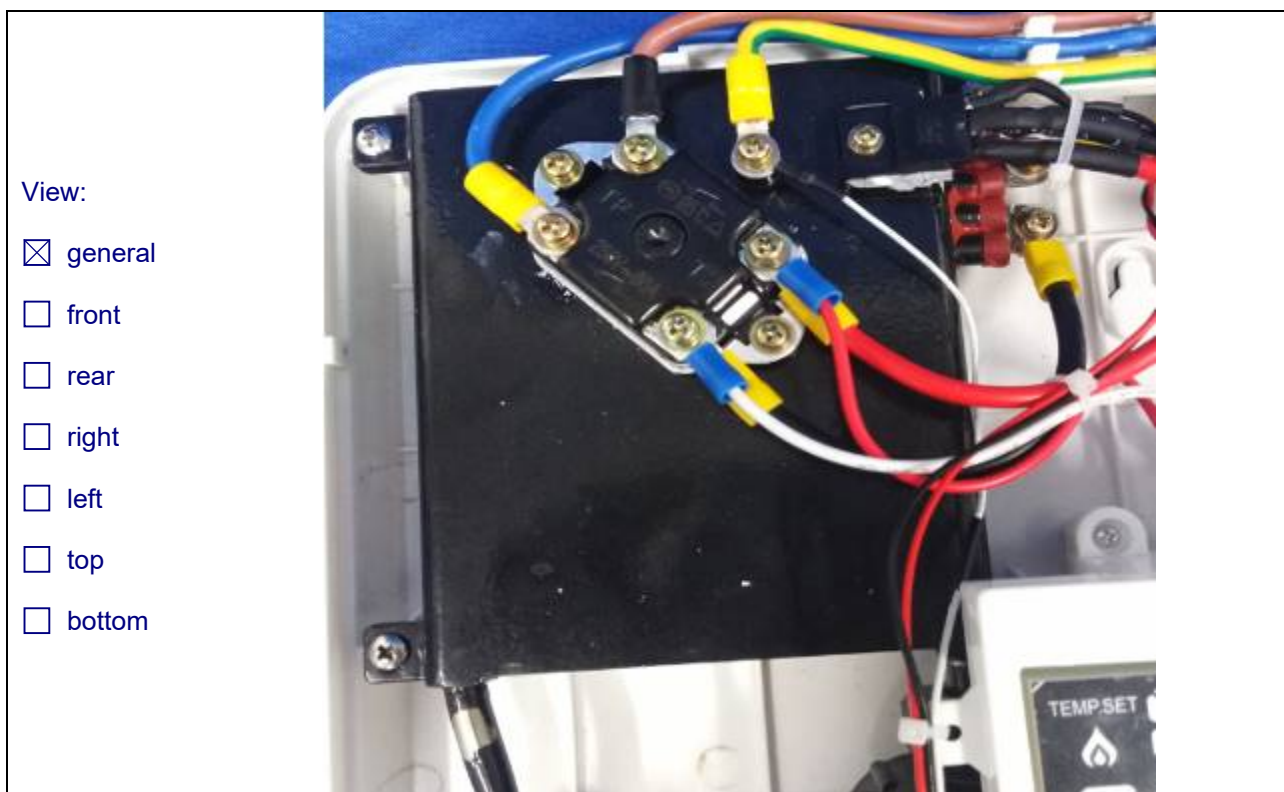


Attachment 4

Details of: Main Control PCB backboard

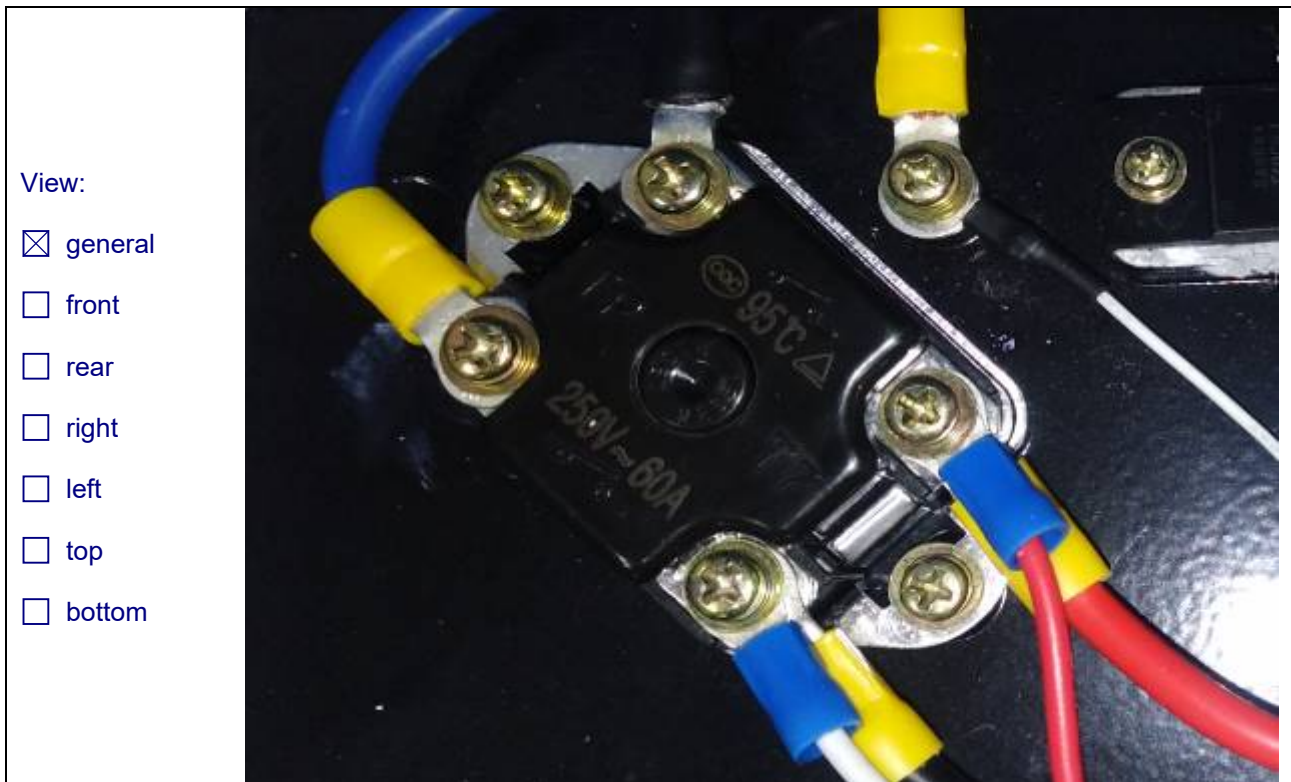


Details of: Heater



Attachment 4

Details of: Thermal cut-out



Details of: Silicon control

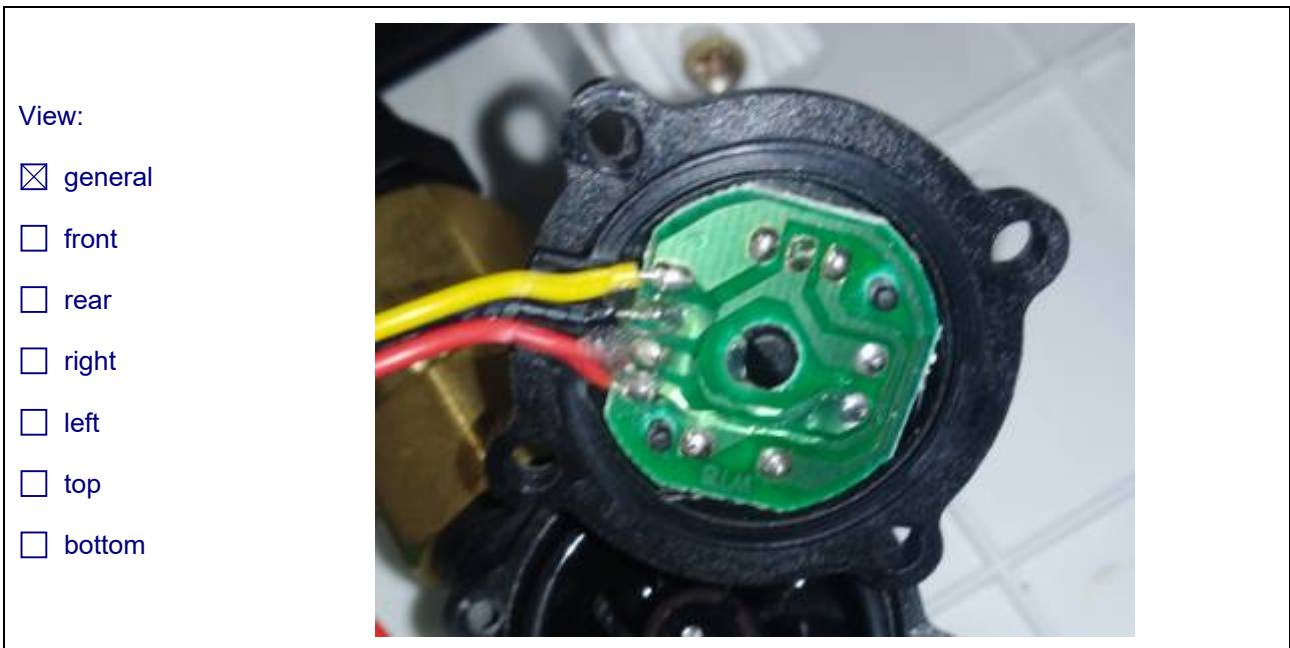


Attachment 4

Details of: Water flower sensor

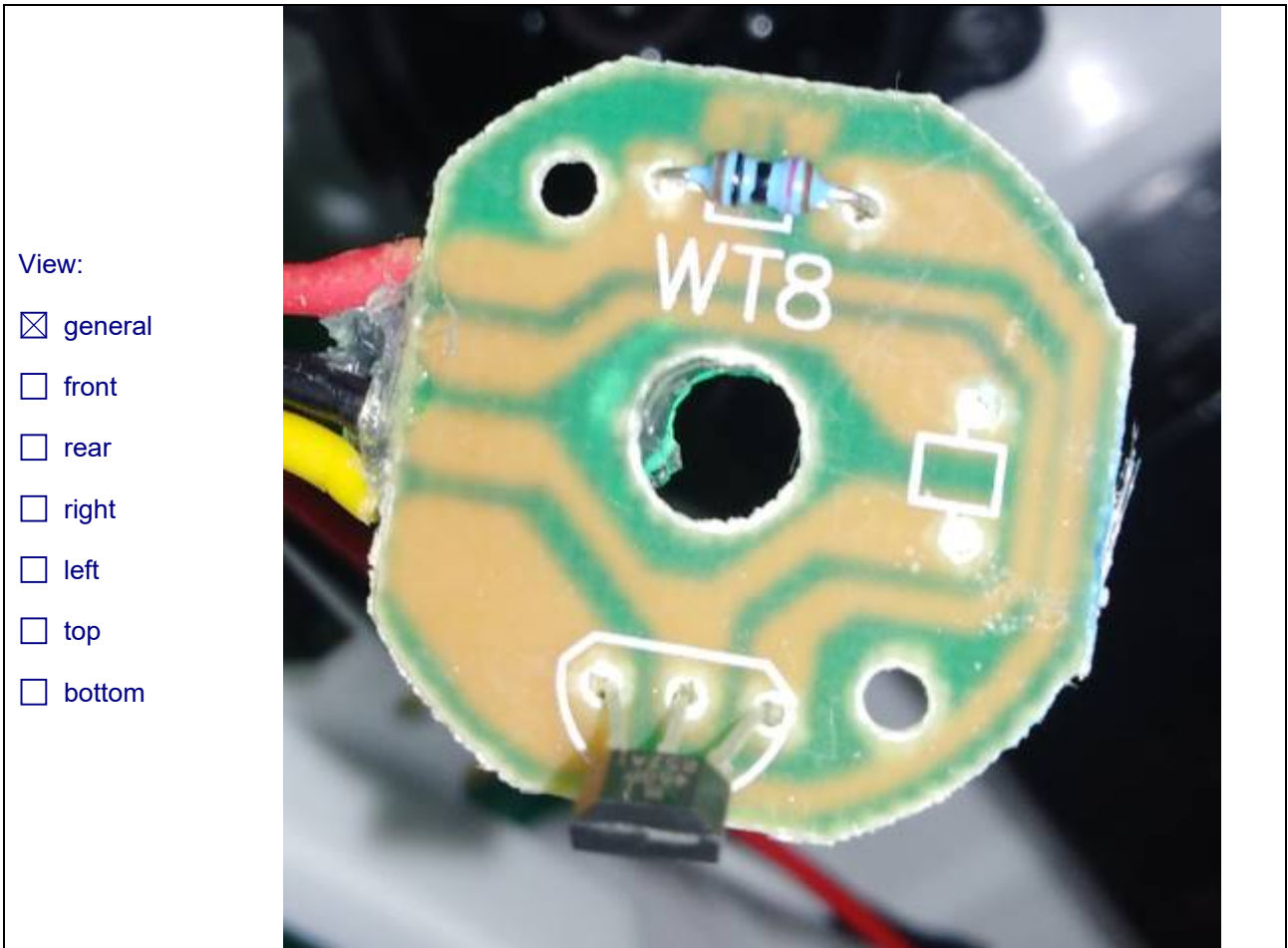


Details of: PCB on water flower sensor



Attachment 4

Details of: PCB backboard on water flower sensor



Details of: Water flower sensor with cover opened



Attachment 4

Details of: Internal view of water flower sensor



Details of: DC Water pump

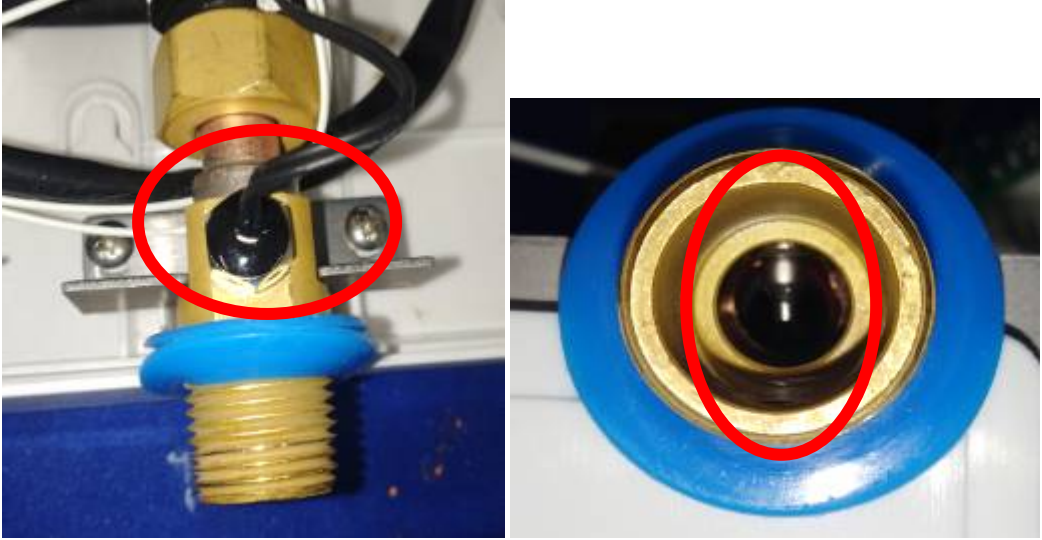


Attachment 4

Details of: Water Inlet NTC

View:

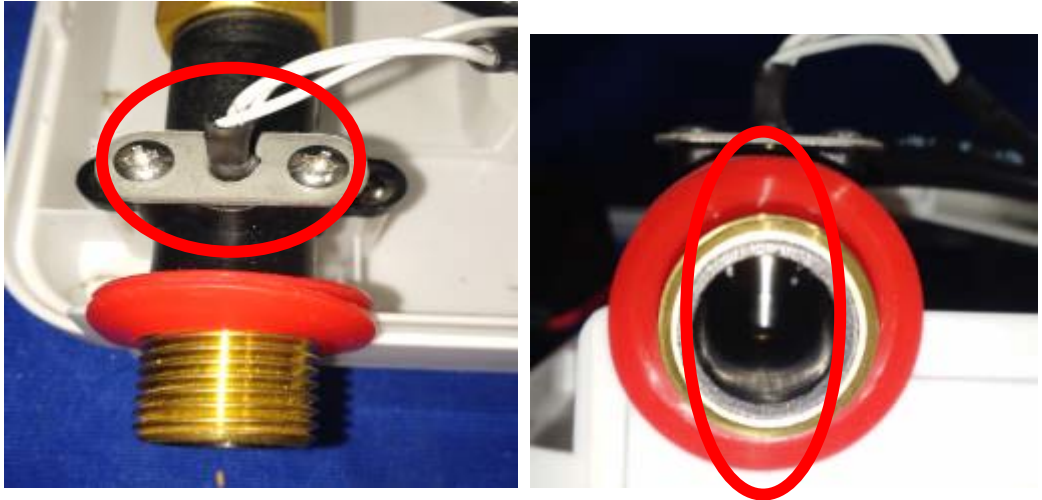
- general
- front
- rear
- right
- left
- top
- bottom



Details of: Water Outlet NTC

View:

- general
- front
- rear
- right
- left
- top
- bottom



Attachment 4

Details of: Water Outlet NTC

View:

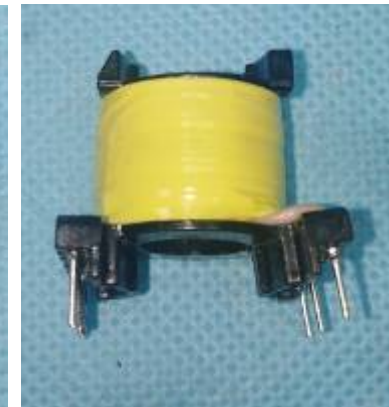
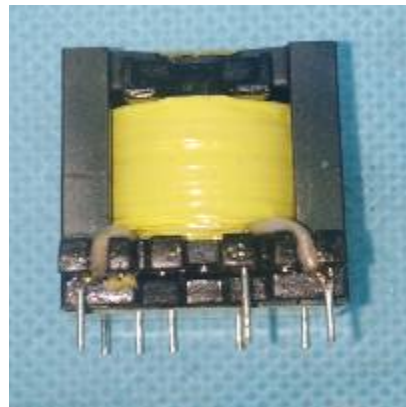
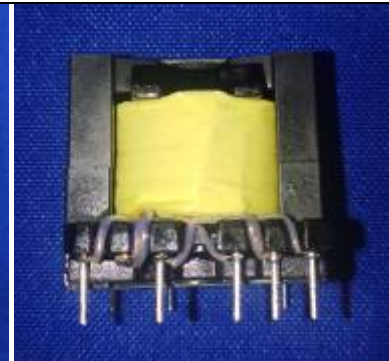
- general
- front
- rear
- right
- left
- top
- bottom



Details of: Transformer view

View:

- general
- front
- rear
- right
- left
- top
- bottom

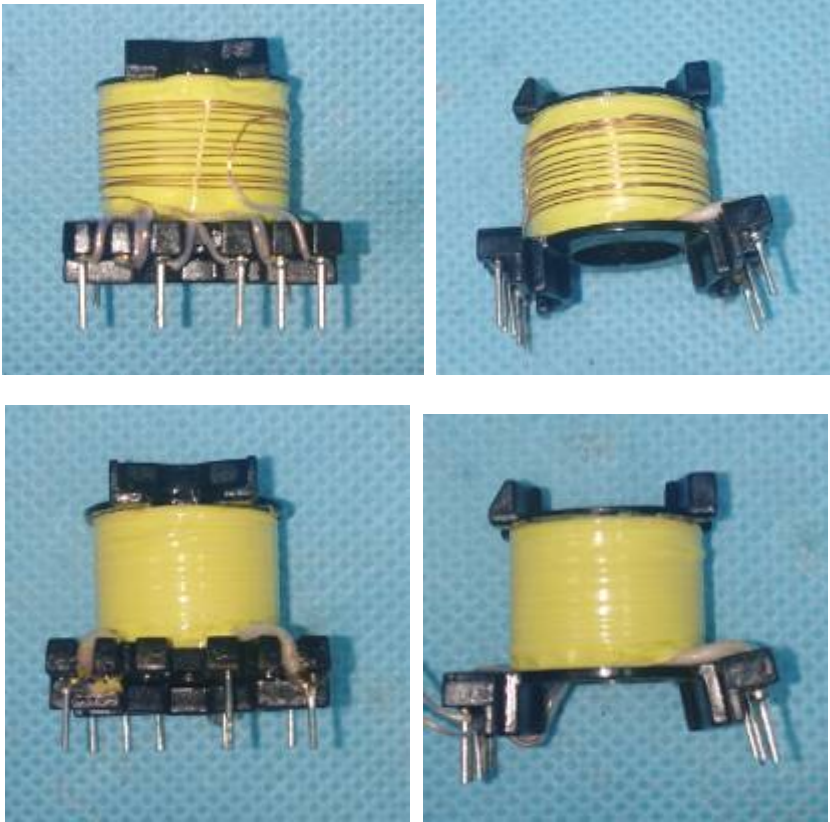


Attachment 4

Details of: Transformer view

View:

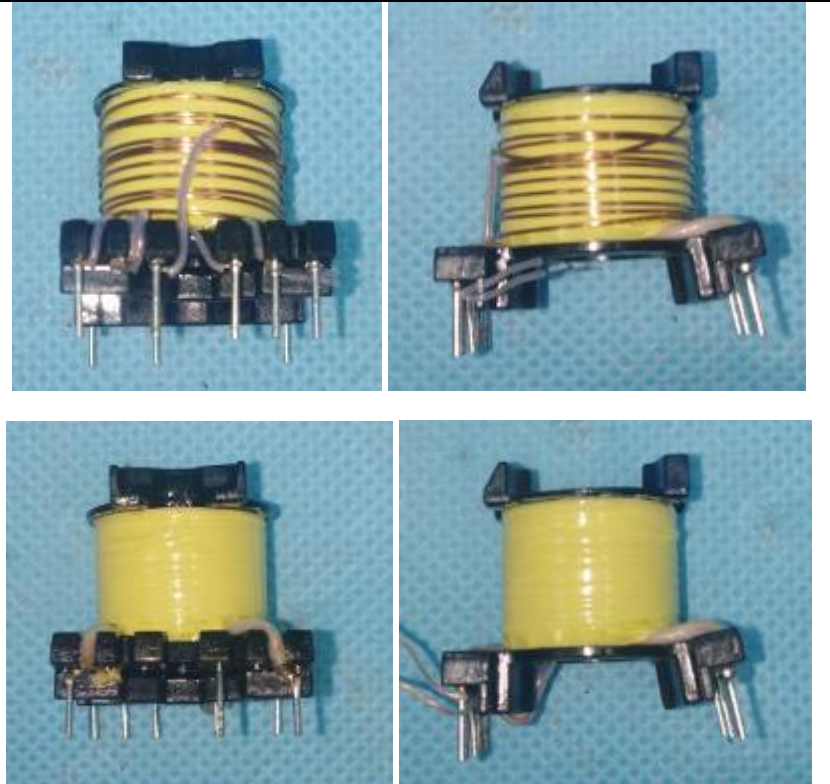
- general
- front
- rear
- right
- left
- top
- bottom



Details of: Transformer view

View:

- general
- front
- rear
- right
- left
- top
- bottom

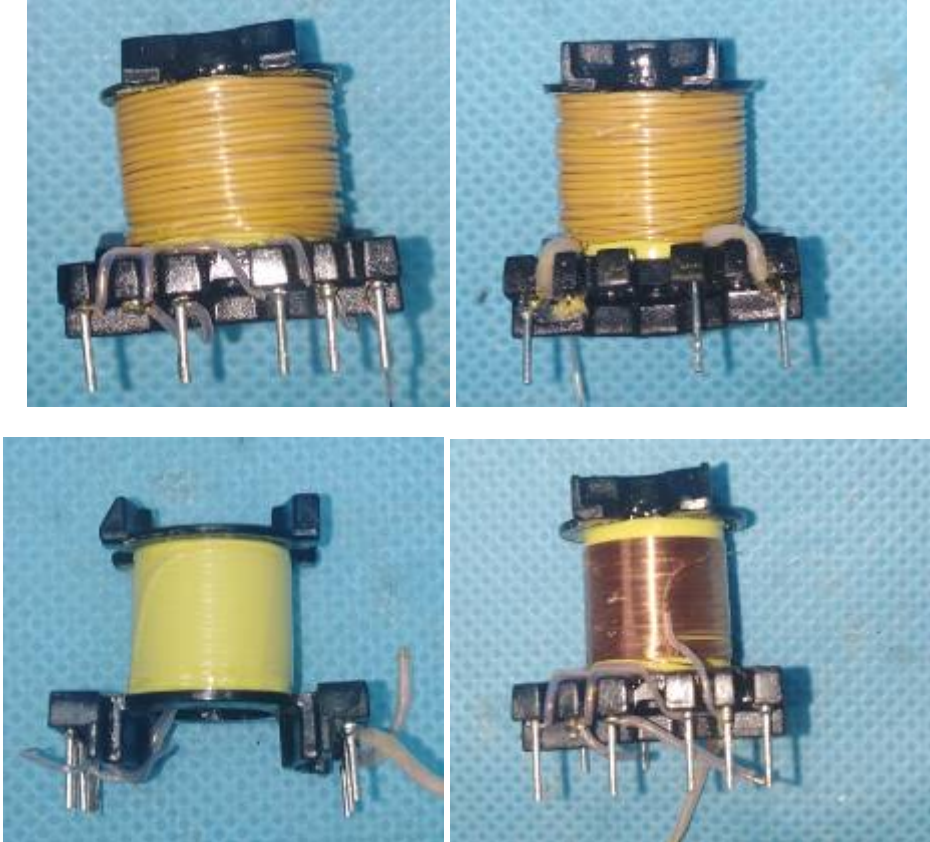


Attachment 4

Details of: Transformer view

View:

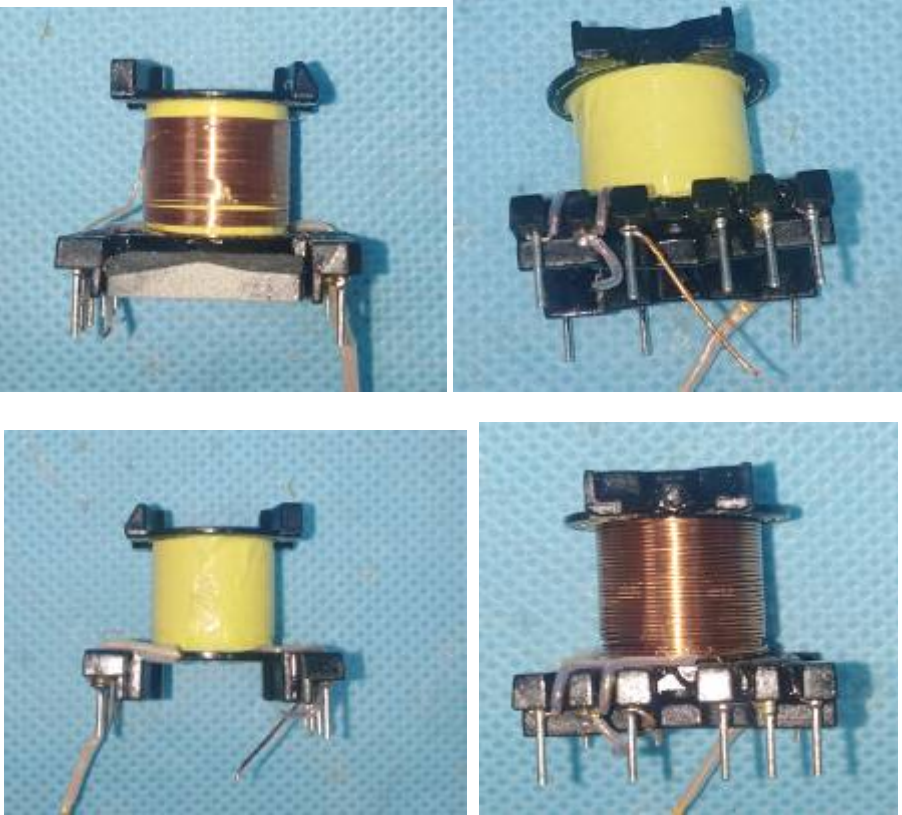
- general
- front
- rear
- right
- left
- top
- bottom



Details of: Transformer view

View:

- general
- front
- rear
- right
- left
- top
- bottom



Attachment 4

Details of: Transformer view

View:

- general
- front
- rear
- right
- left
- top
- bottom



--- End of Attachment 4---