TEST REPORT

EN 60335-2-51
Safety of Household and similar electrical appliances
Part 2-51: Particular requirements for stationary circulation pumps for heating and service water installations
EN 62233
Measurement methods for electromagnetic fields of household appliances and similar apparatus with regard to human exposure IEC 62233:2005
EN 60034-1
Rotating electrical machines
Part 1:Rating and performance

Report Number.....	OViS202405008L-R1
Date of Issue.....	May 17, 2024
Update date.....	Jun. 11, 2024(More details refer to page 8)
number of pages.....	81
Testing Laboratory.....	OViS Testing Technology (Zhejiang) Co., Ltd.
Address.....	Building 31, Feiyue Park, Xiachen Street, Jiaojiang District, Taizhou City, Zhejiang Province, China
Testing location/procedure.....	The same as above
Applicant's Name.....	Worimex Iklimlendirme Sistemleri Sanayi ve Ticaret A.s.
Address.....	Zafer Mahallesi 146.sokak No: 13A Esenyurt/istanbul
Manufacturer.....	Worimex Iklimlendirme Sistemleri Sanayi ve Ticaret A.s.
Address.....	Zafer Mahallesi 146.sokak No: 13A Esenyurt/istanbul
Factory.....	Worimex Iklimlendirme Sistemleri Sanayi ve Ticaret A.s.
Address.....	Zafer Mahallesi 146.sokak No: 13A Esenyurt/istanbul
Test specification:	
Standard.....	EN 60335-1:2012+A11:2014+A13:2017+A1:2019+A14:2019+A2:2019 +A15:2021+A16:2023, EN 60335-2-51:2003+A2:2012, EN 62233:2008+AC:2008, EN 60034-1:2010+AC:2010, BS EN 60335-1:2012+A11:2014+A13:2017+A1:2019+A14:2019+ A2:2019+A15:2021+A16:2023, BS EN 60335-2-51:2003+A2:2012, BS EN 62233:2008+AC:2008, BS EN 60034-1:2010+AC:2010
Test procedure.....	CE approval
Non-standard test method.....	N/A
Test Report Form No.....	IEC 60335_2_51
Test Report Form(s) Originator.....	VDE
Master TRF.....	/
Test item description.....	Circulation Pump
Trade Mark.....	DUCA®
Model/Type reference.....	COSMO-C 32-12-180(Cover models see models list)
Ratings.....	220-240V,50/60Hz

Testing procedure and testing location:			
☐	**Testing Laboratory:**	OViS Testing Technology (Zhejiang) Co., Ltd.	
Testing Location/address.....		Building 31, Feiyue Park, Xiachen Street, Jiaojiang District, Taizhou City, Zhejiang Province, China	
☐	**Associated Laboratory:**	N/A	
Testing Location/address.....			
☒	**Tested by(name+signature):**	Peniel Xu	Peniel Xu
☒	**Approved by(+signature)....:**	Kim Luo	Kim Luo
☐	**Testing procedure:TMP**	N/A	
☐	**Tested by(name+signature):**	N/A	
☐	**Approved by(+signature)....:**	N/A	
Testing Location/address.....		N/A	
☐	**Testing procedure:WMT**	N/A	
☐	**Tested by(name+signature):**	N/A	
☐	**Witnessed by(+signature)..:**	N/A	
☐	**Approved by(+signature)....:**	N/A	
Testing Location/address.....		N/A	
☐	**Testing procedure:SMT**	N/A	
☐	**Tested by(name+signature):**	N/A	
☐	**Approved by(+signature)....:**	N/A	
☐	**Supervised by(+signature).:**	N/A	
Testing Location/address.....		N/A	
☐	**Testing procedure:RMT**	N/A	
☐	**Tested by(name+signature):**	N/A	
☐	**Approved by(+signature)....:**	N/A	
☐	**Supervised by(+signature).:**	N/A	

OVIS TESTING TECHNOLOGY (ZHEJIANG) CO. LTD OViS TEST SEAL *

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

Appendix I – Photo documentation – attachment 5 pages.

Summary of testing:

Tests performed (name of test and test clause):

The provided samples were tested and found to meet the below standards:
EN 60335-1:2012+A11:2014+A13:2017+ A1:2019+A14:2019+A2:2019+A15:2021+ A16:2023,
EN 60335-2-51:2003+A2:2012,
EN 62233:2008+AC:2008,
EN 60034-1:2010+AC:2010,
BS EN 60335-1:2012+A11:2014+A13:2017+ A1:2019+A14:2019+A2:2019+A15:2021 +A16:2023,
BS EN 60335-2-51:2003+A2:2012,
BS EN 62233:2008+AC:2008,
BS EN 60034-1:2010+AC:2010

Full tests were carried out on model:
COSMO-C 32-12-180.

Testing location:

OViS Testing Technology (Zhejiang) Co., Ltd.
Building 31, Feiyue Park, Xiachen Street,
Jiaojiang District, Taizhou City, Zhejiang Province, China

Summary of compliance with National Differences:

The requirements of national differences of The Europe Union were taken into account.

Copy of marking plate:

The artwork below may be only a draft.

Test item particulars:	
Supply connection	Supply cord with plug
Nature of supply	a.c.
Class of protection against electric shock	I
Degree of protection against moisture	IP44
Type of cord attachment	Y
Portable appliances	☐
Fixed appliances	☒
Built-in appliances	☐
Switch	☐
Thermostat	☐
without an OFF position	☐
Self-resetting thermal cut-out	☐
Non-self-resetting thermal cut-out	☐
Voltage-maintained non-self-resetting thermal cut-out	☐
Contact opening > 3 mm in each pole	☐
Thermal link	☐
Electronic circuit	☒
with software class	No
Protective electronic circuit	☒
with software class	No
Programmer, timer, switching devices	☐
Remote operation	☐
Appliances - with supply cord	☒
- with supply cord fitted with a plug	☐
Motor with capacitor in auxiliary winding	☐
Series motors incorporated	☐
Three-phase motor	☒
with protective device	☐
Used in vehicles or on board ships or aircraft, additional requirements may be necessary	☐
Additional requirements are specified by the national health authorities	☐
the national authorities responsible for the protection of labour	☐
the national water supply authorities	☐
similar authorities	☐

Possible test case verdicts:

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

Summary of testing:

Date of receipt of test item.....:	Apr. 25, 2024
Date(s) of performance of test.....:	May 10, 2024 to May 16, 2024
Sample appearance and function are in normal condition, yes or no.....:	Yes
Ambient temperature.....:	15-20℃
Ambient humidity.....:	55-65%

The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.
"(See Enclosure #)" refers to additional information appended to the report.
"(See appended table)" refers to a table appended to the report.

Throughout this report a ☐ comma / ☒ point is used as the decimal separator.

The samples under test are in good condition.
The test items comply with the requirements of the standard.

General product information:

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

For detail,see relrbant information on General product information
BS standards are identical with EN standards

These models listed in this report, them shared the very similar construction/appearance and most critical components, the used motors for them were from the same manufacturer with very similar manufacturing process and shared the same working principle
All models:50/60Hz,I.C.F,Max. liquid temperature:95℃

Model	Rated Voltage (V)	Input Power (W)	H.max. (m)	Q.max. (m^3/h)	IP
GEX-H 15-70-130	220-240	65	8	3.5	42
MASTER-H 15-70-130	220-240	65	8	3.5	42
GEX-H 15-80-130	220-240	65	8	3.5	42
MASTER-H 15-80-130	220-240	65	8	3.5	42
GEX-H 25-70-130	220-240	65	8	3.5	42
MASTER-H 25-70-130	220-240	65	8	3.5	42
GEX-H 25-80-130	220-240	65	8	3.5	42

MASTER-H 25-80-130	220-240	65	8	3.5	42
GEX-S 15-70-130	220-240	50	8	3.2	42
MASTER-S 15-70-130	220-240	50	8	3.2	42
GEX-S 15-75-130	220-240	50	8	3.2	42
MASTER-S 15-75-130	220-240	50	8	3.2	42
GEX-S 25-70-130	220-240	50	8	3.2	42
MASTER-S 25-70-130	220-240	50	8	3.2	42
GEX-S 25-75-130	220-240	50	8	3.2	42
MASTER-S 25-75-130	220-240	50	8	3.2	42
GEX-C 15-80-130	220-240	65	8	3.5	42
MASTER-C 15-80-130	220-240	65	8	3.5	42
GEX-C 25-80-180	220-240	65	8	3.5	42
MASTER-C 25-80-180	220-240	65	8	3.5	42
GEX-C 25-80-130	220-240	65	8	3.5	42
MASTER-C 25-80-130	220-240	65	8	3.5	42
GEX-C 32-80-180	220-240	65	8	3.5	42
MASTER-C 32-80-180	220-240	65	8	3.5	42
GEX-C 15-60-130	220-240	45	6	3	42
MASTER-C 15-60-130	220-240	45	6	3	42
GEX-C 25-60-130	220-240	45	6	3	42
MASTER-C 25-60-130	220-240	45	6	3	42
GEX-C 25-60-180	220-240	45	6	3	42
MASTER-C 25-60-180	220-240	45	6	3	42
GEX-C 25-70-130	220-240	55	7	3.2	42
MASTER-C 25-70-130	220-240	55	7	3.2	42
GEX-C 32-60-180	220-240	45	6	3	42
MASTER-C 32-60-180	220-240	45	6	3	42
GEX-C 15-40-130	220-240	25	4	2.5	42
MASTER-C 15-40-130	220-240	25	4	2.5	42
GEX-C 25-40-130	220-240	25	4	2.5	42
MASTER-C 25-40-130	220-240	25	4	2.5	42
GEX-C 25-40-180	220-240	25	4	2.5	42
MASTER-C 25-40-180	220-240	25	4	2.5	42
GEX-C 32-40-180	220-240	25	4	2.5	42
MASTER-C 32-40-180	220-240	25	4	2.5	42
GEX-C 25-100-130	220-240	70	10	4	42

MASTER-C 25-100-130	220-240	70	10	4	42
GEX-C 15-100-130	220-240	70	10	4	42
MASTER-C 15-100-130	220-240	70	10	4	42
GEX-C 32-100-180	220-240	70	10	4	42
MASTER-C 32-100-180	220-240	70	10	4	42
COSMO-C 25-8-180	220-240	140	8	8	44
COSMO-C 25-10-180	220-240	120	10	9	44
COSMO-C 25-12-180	220-240	185	12	10	44
COSMO-C 32-8-180	220-240	140	8	8	44
COSMO-C 32-10-180	220-240	160	10	9	44
COSMO-C 32-12-180	220-240	180	12	10	44
COSMO-S 15-80-130	220-240	140	8	8	44
COSMO-S 25-80-130	220-240	140	8	8	44
GEX	230	60	8	2.1	42
GEX-MSS	230	60	8	2.1	42
GEX-FCI	230	60	8	2.1	42
GEX-NER	230	60	8	2.1	42
WEX	230	60	8	2.1	42
WEX-FCI	230	60	8	2.1	42
WEX-INT	230	60	8	2.1	42
TEX-FCI	230	60	8	2.1	42
TEX-C5	230	60	8	2.1	42
TEX-SMART	230	60	8	2.1	42
TEX-AR	230	60	8	2.1	42
TEX-SMART-R	230	60	8	2.1	42

Modification on the appliances:

The original Test Report No. OViS202405008L issued on May 17, 2024 was modified on Jun. 11, 2024 to include the following changes :

1.The manufacturer and factory information was modified.

2.The trademark was added.

After construction review and verification of electrical spacing, no additional tests were considered necessary.

The added contents Report No. is OViS202405008L-R1.

EN 60335-2-51+ EN 60335-1			
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
5.7	The water temperature at the inlet is maintained between 0 °C and –5 °C of the value corresponding to the TF class of the pump (IEC 60335-2-51)	95℃	P
	For circulation pumps intended to be located within the enclosure of a boiler, the tests of Clauses 10, 11 and 13 are carried out at an ambient temperature of 55 °C or at the temperature specified in the instructions, whichever is higher (IEC 60335-2-51)		N/A
5.101	Circulation pumps having a three-phase motor that does not incorporate a protective device are installed with an appropriate device, in accordance with the instructions (IEC 60335-2-51)		N/A
6	**CLASSIFICATION**		
6.1	Circulation pumps shall be class I, class II or class III (IEC 60335-2-51)	Class I	P
	For a class III construction with a detachable power supply part the appliance is classified according to the detachable power supply part		N/A
6.2	Circulation pumps shall be at least IPX2 (IEC 60335-2-51)	IP44	P
	Protection against harmful ingress of water		P
6.101	Circulation pumps shall be of one of the classes shown in Table 101		P
7	**MARKING AND INSTRUCTIONS**		
7.1	Rated voltage or voltage range (V).....:	220-240V	P
	Symbol for nature of supply, or.....:		N/A
	Rated frequency (Hz).....:	50/60Hz	P
	Rated power input (W), or.....:	180W	P
	Rated current (A) .....:	1.53A	P
	Manufacturer's or responsible vendor's name, trademark or identification mark.....:	See copy of marking plate	P
	Model or type reference.....:	COSMO-C 32-12-180	P
	Symbol IEC 60417-5172, for class II appliances		N/A
	IP number, other than IPX0.....:	IP44	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

EN 60335-2-51+ EN 60335-1			
Clause	Requirement + Test	Result - Remark	Verdict
	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
	Circulation pumps shall be marked with (IEC 60335-2-51):		P
	- the TF class (IEC 60335-2-51)	TF95	P
	- the direction of the water flow (IEC 60335-2-51)		P
	- the direction of rotation (for pumps having three-phase motors) (IEC 60335-2-51)		N/A
	- the rated current (for pumps having three-phase motors if a protective device has to be installed in the fixed wiring) (IEC 60335-2-51)		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		N/A
	Different rated values marked with the values separated by an oblique stroke		N/A
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 is related to the arithmetic mean value of the rated voltage range		N/A
	Relation between marking for upper and lower limits of rated power input or rated current and voltage is clear		N/A
7.6	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
7.7	Connection diagram fixed to appliances to be connected to more than two supply conductors and appliances for multiple supply, unless		N/A
	correct mode of connection is obvious		N/A
7.8	Except for type Z attachment, terminals for connection to the supply mains indicated as follows:		P
	- marking of terminals exclusively for the neutral conductor (letter N)		N/A

EN 60335-2-51+ EN 60335-1			
Clause	Requirement + Test	Result - Remark	Verdict
	- 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..... :		N/A
	This applies also to switches which are part of a control		N/A
	If figures are used, the off position indicated by the figure 0		N/A
	The figure 0 indicates only OFF position, unless no confusion with the OFF position		N/A
7.11	Indication for direction of adjustment of controls		N/A
7.12	Instructions for safe use provided		P
	Details concerning precautions during user maintenance		P
	The instructions state that:		P
	-The instruction concerning persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge is not applicable (IEC 60335-2-51)		P
	-The instruction regarding supervision of children is not applicable (IEC 60335-2-51)		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
	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 shall state the substance of the following: (IEC 60335-2-51)		P

EN 60335-2-51+ EN 60335-1			
Clause	Requirement + Test	Result - Remark	Verdict
	- the maximum flow rate or total head		N/A
	- the maximum ambient temperature at which the pump is to be used		P
	- the maximum system pressure, which shall not be less than:		P
	• 0.6MPa for pumps for heating systems		P
	• 1.0MPa for pumps for service water systems		N/A
	- the intended orientation of the pump		P
	- a protective device is to be installed in the fixed wiring and its characteristics are to be specified (for pumps having a three-phase motor not incorporating a protective device)		N/A
	- for the thermal insulation of circulation pumps in heating systems, only the supplied kit or a kit made available by the manufacturer shall be used. It shall be ensured that the drain openings of the motor are not sealed after installation of the thermal insulation		N/A
7.12.2	Stationary appliances not fitted with means for disconnection from the supply mains having a contact separation in all poles that provide full disconnection under overvoltage category III, the instructions state that means for disconnection must be incorporated in the fixed wiring in accordance with the wiring rules		N/A
7.12.3	Insulation of the fixed wiring in contact with parts exceeding 50 K during clause 11; instructions state that the fixed wiring must be protected		N/A
7.12.4	Instructions for built-in appliances:		N/A
	- dimensions of space		N/A
	- dimensions and position of supporting and fixing		N/A
	- minimum distances between parts and surrounding structure		N/A
	- minimum dimensions of ventilating openings and arrangement		N/A
	- connection to supply mains and interconnection of separate components		N/A
	- allow disconnection of the appliance after installation, by accessible plug or a switch in the fixed wiring, unless		N/A
	a switch complying with 24.3		N/A
7.12.5	Replacement cord instructions, type X attachment with a specially prepared cord		N/A
	Replacement cord instructions, type Y attachment		P
	Replacement cord instructions, type Z attachment		N/A
7.12.6	Caution in the instructions for appliances incorporating a non-self-resetting thermal cut-out that is reset by disconnection of the supply mains, if this cut-out is required to comply with the standard		N/A
7.12.7	Instructions for fixed appliances stating how the appliance is to be fixed		P

EN 60335-2-51+ EN 60335-1			
Clause	Requirement + Test	Result - Remark	Verdict
7.12.8	Instructions for appliances connected to the water mains:		P
	- max. inlet water pressure (Pa).....:		P
	- min. inlet water pressure, if necessary (Pa).....:		N/A
	Instructions concerning new and old hose-sets for appliances connected to the water mains by detachable hose-sets		N/A
7.12.9	Instructions specified in 7.12 and from 7.12.1 to 7.12.8 appear together before any other instructions supplied with the appliance		N/A
	These instructions may be supplied with the appliance separately from any functional use booklet		N/A
	They may follow the description of the appliance that identifies parts, or follow the drawings/sketches		N/A
	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		N/A
	In addition, instructions are also available in an alternative format such as on a website or in a format such as a DVD.....:		N/A
7.13	Instructions and other texts in an official language	English	P
7.14	Marking clearly legible and durable, rubbing test as specified		P
	Signal words WARNING, CAUTION, DANGER in uppercase having a height as specified.....:		P
	Uppercase letter of the text explaining the signal word not smaller than 1,6 mm .....:		P
	Moulded in, engraved, or stamped markings either raised above or have a depth below the surface of at least 0,25 mm, unless		P
	contrasting colours are used		N/A
	Markings checked by inspection, measurement and rubbing test as specified		N/A
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
	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
	Symbol IEC 60417-5018 is placed next to the symbol IEC 60417-5172 or IEC 60417-5180		N/A
7.16	Marking of a possible replaceable thermal link or fuse link clearly visible with regard to replacing the link		P

EN 60335-2-51+ EN 60335-1			
Clause	Requirement + Test	Result - Remark	Verdict
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		N/A
	Test probe 13 also applied through openings in earthed metal enclosures having a non-conductive coating: no contact with live parts		N/A
8.1.3	For appliances other than class II, use of test probe 41 of IEC 61032, with a force not exceeding 1 N: no contact with live parts of visible glowing heating elements.		N/A
	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:		P
	- safety extra-low a.c. voltage: peak value not exceeding 42,4 V		N/A
	- safety extra-low d.c. voltage: not exceeding 42,4 V	0.6V	P
	- or separated from live parts by protective impedance		N/A
	If protective impedance: d.c. current not exceeding 2 mA, and		N/A
	a.c. peak value not exceeding 0,7 mA		N/A
	- for peak values over 42,4 V up to and including 450 V, capacitance not exceeding 0,1 μF		N/A
	- for peak values over 450 V up to and including 15 kV, discharge not exceeding 45 μC		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:		P
	- built-in appliances		N/A
	- fixed appliances		P
	- appliances delivered in separate units		N/A

EN 60335-2-51+ EN 60335-1			
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
9	**STARTING OF MOTOR-OPERATED APPLIANCES**		
	Requirements and tests are specified in part 2 when necessary		N/A
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.		P
	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		N/A
10.2	Current at normal operating temperature, rated voltage and normal operation not deviating from rated current by more than shown in table 2.....:	(see appended table)	P
	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.		P
	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.....:		P
	Circulation pumps that are only fixed by the water pipes are positioned against one wall of the test corner and away from the other (IEC 60335-2-51)		N/A
11.3	Temperature rises, other than of windings, determined by thermocouples		P

EN 60335-2-51+ EN 60335-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Temperature rises of windings determined by resistance method, unless		N/A
	the windings are non-uniform or it is difficult to make the necessary connections		P
	The temperatures t1 and t2 are the ambient temperatures of the environment in which the pump is installed, for instance inside the enclosure of a boiler (IEC 60335-2-51)		N/A
11.4	Heating appliances operated under normal operation at 1,15 times rated power input (W) ..... :		N/A
11.5	Motor-operated appliances operated under normal operation at most unfavourable voltage between 0,94 and 1,06 times rated voltage (V)..... :		P
11.6	Combined appliances operated under normal operation at most unfavourable voltage between 0,94 and 1,06 times rated voltage (V)..... :		N/A
11.7	Circulation pumps are operated until steady conditions are established (IEC 60335-2-51)		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		P
	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
	The temperature rise limits of pumps located within the enclosure of a boiler are reduced by the difference between the ambient temperature at which the test is carried out and 25 °C (IEC 60335-2-51)		N/A
	The temperature rise of the external enclosure is not measured (IEC 60335-2-51)		P
	For circulation pumps in which water flows through the motor, the temperature rise limits for windings are increased by 5K. The temperature rise limits are increased further by: (IEC 60335-2-51)		N/A
	- 5K, if the winding insulation is class 130(B)		N/A
	- 10K, if the winding insulation is class 155(F) or 180(H)		N/A
	For circulation pumps in which water flows through the motor, the increase of 5 K allowed by footnote a to Table 3 does not apply (IEC 60335-2-51)		N/A
13	**LEAKAGE CURRENT AND ELECTRIC STRENGTH AT OPERATING TEMPERATURE**		
13.1	Leakage current not excessive and electric strength adequate		P

EN 60335-2-51+ EN 60335-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Heating appliances operated at 1,15 times the rated power input (W).....:		N/A
	Motor-operated appliances and combined appliances supplied at 1,06 times the rated voltage (V).....:	230X1.06=243.8V	P
	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
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..... :	(see appended table)	N/A
	No flashover during the test, unless		N/A
	of functional insulation if the appliance complies with clause 19 with the clearance short-circuited		N/A
15	**MOISTURE RESISTANCE**		
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.....:	IP44	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

EN 60335-2-51+ EN 60335-1			
Clause	Requirement + Test	Result - Remark	Verdict
	For IPX4 appliances, the horizontal centre line of the appliance is aligned with the pivot axis of the oscillating tube, and		N/A
	for appliances normally used on the floor or table, the movement is limited to two times 90° for a period of 5 min, the support being placed at the level of the pivot axis of the oscillating tube		N/A
	Wall-mounted appliances, take into account the distance to the floor stated in the instructions		N/A
	Appliances normally fixed to a ceiling are mounted underneath a horizontal unperforated support, the pivot axis of the oscillating tube located at the level of the underside of the support, and		N/A
	for IPX4 appliances, the movement of the tube is limited to two times 90° from the vertical for a period of 5 min		N/A
	Appliances with type X attachment fitted with a flexible cord as described		N/A
	Detachable parts subjected to the relevant treatment with the main part		N/A
	However, if a part has to be removed for user maintenance and a tool is needed, this part is not removed		N/A
15.2	Spillage of liquid does not affect the electrical insulation		N/A
	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 water, 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		P
	Reassembly of those parts that may have been removed		P
	The appliance withstands the tests of clause 16		P
16	**LEAKAGE CURRENT AND ELECTRIC STRENGTH**		P
16.1	Leakage current not excessive and electric strength adequate		P

EN 60335-2-51+ EN 60335-1			
Clause	Requirement + Test	Result - Remark	Verdict
	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)..... :		P
	Three-phase appliances: test voltage 1,06 times rated voltage divided by √3 (V)..... :		N/A
	Leakage current measurements..... :	(see appended table)	P
	Limit values doubled if:		N/A
	- all controls have an off position in all poles, or		N/A
	- the appliance has no control other than a thermal cut-out, or		N/A
	-all thermostats, temperature limiters and energy regulators do not have an off position, or		N/A
	- the appliance has radio interference filters		N/A
	With the radio interference filters disconnected, the leakage current do not exceed limits specified..... :		N/A
16.3	Electric strength tests according to table 7..... :		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)	N/A
	Appliance supplied with 1,06 or 0,94 times rated voltage under the most unfavourable short-circuit or overload likely to occur in normal use (V)..... :		N/A
	Basic insulation is not short-circuited		N/A
	Temperature rise of insulation of the conductors of safety extra-low voltage circuits not exceeding the relevant value specified in table 3 by more than 15 K		N/A
	Temperature of the winding not exceeding the value specified in table 8		N/A
	However, limits do not apply to fail-safe transformers complying with sub-clause 15.5 of IEC 61558-1		N/A
18	**ENDURANCE**		
	Requirements and tests are specified in part 2 when necessary		N/A
19	**ABNORMAL OPERATION**		
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

EN 60335-2-51+ EN 60335-1			
Clause	Requirement + Test	Result - Remark	Verdict
	if the appliance also has a control that limit the temperature during clause 11 it is subjected to the test of 19.4, and		N/A
	if applicable, to the test of 19.5		N/A
	Appliances incorporating PTC heating elements are also subjected to the test of 19.6		N/A
	Appliances incorporating motors subjected to the tests of 19.7 to 19.10, as applicable		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		N/A
	until steady conditions are established		N/A
	If a heating element or intentionally weak part becomes open-circuited, the relevant test is repeated on a second sample		N/A
	Circulation pumps are also subjected to the test of 19.101 (IEC 60335-2-51)		P
19.2	Test of appliances with heating elements with restricted heat dissipation; test voltage (V), power input of 0,85 times rated power input (W).....:		N/A
19.3	Test of 19.2 repeated; test voltage (V), power input of 1,24 times rated power input (W)..... :		N/A
19.4	Test conditions as in clause 11, any control limiting the temperature during tests of clause 11 short-circuited		N/A
19.5	Test of 19.4 repeated on class 0I and I appliances with tubular sheathed or embedded heating elements. No short-circuiting, but one end of the element connected to the sheath		N/A
	The test repeated with reversed polarity and the other end of the heating element connected to the sheath		N/A
	The test is not carried out on appliances intended to be permanently connected to fixed wiring and on appliances where an all-pole disconnection occurs during the test of 19.4		N/A
19.6	Appliances with PTC heating elements tested at rated voltage, establishing steady conditions		N/A
	The working voltage of the PTC heating element is increased by 5 % and the appliance is operated until steady conditions are re-established. The voltage is then increased in similar steps until 1,5 times working voltage or until the PTC heating element ruptures (V).....:		N/A
19.7	Stalling test by locking the rotor if the locked rotor torque is smaller than the full load torque, or		P

EN 60335-2-51+ EN 60335-1			
Clause	Requirement + Test	Result - Remark	Verdict
	locking moving parts of other appliances		N/A
	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..... :		P
	Winding temperatures not exceeding values specified in table 8.....:	(see appended table)	P
	The test is carried out with the water flow stopped or reduced to 5L/min, whichever is more unfavourable (IEC 60335-2-51)		P
19.8	Multi-phase motors operated at rated voltage with one phase disconnected		P
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		N/A
	Appliances incorporating an electronic circuit that relies upon a programmable component to function correctly, subjected to the test of 19.11.4.8, unless		N/A
	restarting does not result in a hazard		N/A
	Appliances having a device with an off position obtained by electronic disconnection, or a device placing the appliance in a stand-by mode, subjected to the tests of 19.11.4		N/A
	If the safety of the appliance under any of the fault conditions depends on the operation of a miniature fuse-link complying with IEC 60127, the test of 19.12 is carried out		N/A
	During and after each test the following is checked:		N/A
	- the temperature of the windings do not exceed the values specified in table 8		N/A
	- the appliance complies with the conditions specified in 19.13		N/A
	- any current flowing through protective impedance not exceeding the limits specified in 8.1.4		N/A
	If a conductor of a printed board becomes open-circuited, the appliance is considered to have withstood the particular test, provided both of the following conditions are met:		N/A

EN 60335-2-51+ EN 60335-1			
Clause	Requirement + Test	Result - Remark	Verdict
	- 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:		P
	- the electronic circuit is a low-power circuit, that is, the maximum power at low-power points does not exceed 15 W according to the tests specified		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		N/A
19.11.2	Fault conditions applied one at a time, the appliance operating under conditions specified in clause 11, but supplied at rated voltage, duration of the tests as specified:		P
	a) short circuit of functional insulation if clearances or creepage distances are less than the values specified in clause 29		P
	b) open circuit at the terminals of any component		P
	c) short circuit of capacitors, unless		P
	they comply with IEC 60384-14		N/A
	d) short circuit of any two terminals of an electronic component, other than integrated circuits		P
	This fault condition is not applied between the two circuits of an optocoupler		N/A
	e) failure of triacs in the diode mode		P
	f) failure of microprocessors and integrated circuits		P
	g) failure of an electronic power switching device		P
	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

EN 60335-2-51+ EN 60335-1			
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).....:	40.68A	P
19.13	During the tests the appliance does not emit flames, molten metal, poisonous or ignitable gas in hazardous amounts		P
	Temperature rises not exceeding the values shown in table 9.....:	(see appended table)	P
	Compliance with clause 8 not impaired		P
	If the appliance can still be operated it complies with 20.2		P

EN 60335-2-51+ EN 60335-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Insulation, other than of class III appliances or class III constructions that do not contain live parts, withstands the electric strength test of 16.3, the test voltage as specified in table 4:		P
	- basic insulation (V).....:	1000	P
	- supplementary insulation (V).....:	1750	P
	- reinforced insulation (V).....:	3000	P
	After operation or interruption of a control, clearances and creepage distances across the functional insulation withstand the electric strength test of 16.3, the test voltage being twice the working voltage		N/A
	The appliance does not undergo a dangerous malfunction, and		P
	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:		N/A
	- do not become operational, or		N/A
	- if they become operational, do not result in a dangerous malfunction during or after the tests of 19.11.4		N/A
	If the appliance contains lids or doors that are controlled by one or more interlocks, one of the interlocks may be released provided that:		N/A
	- the lid or door does not move automatically to an open position when the interlock is released, and		N/A
	- the appliance does not start after the cycle in which the interlock was released		N/A
19.14	Appliances operated under the conditions of clause 11, any contactor or relay contact operating under the conditions of clause 11 being short-circuited		N/A
	For a relay or contactor with more than one contact, all contacts are short-circuited at the same time		N/A
	A relay or contactor operating only to ensure the appliance is energized for normal use is not short-circuited		N/A
	If more than one relay or contactor operates in clause 11, they are short-circuited in turn		N/A
19.15	For appliances with a mains voltage selector switch, the switch is set to the lowest rated voltage position and the highest value of rated voltage is applied		N/A
19.101	Pump supplied at rated voltage and operated at approximately half at maximum total head for 5min (IEC 60335-2-51)		P
	after which the water is drained off and the operation continued for 7h (IEC 60335-2-51)		P
	The system is replenished with water and the pump operated again for 5min at approximately half the maximum system pressure (IEC 60335-2-51)		P

EN 60335-2-51+ EN 60335-1			
Clause	Requirement + Test	Result - Remark	Verdict
	If the pump becomes inoperable during test, it is disconnected from supply and filled with water (IEC 60335-2-51)		N/A
20	**STABILITY AND MECHANICAL HAZARDS**		
20.1	Appliances having adequate stability		P
	Tilting test through an angle of 10°, appliance placed on an inclined plane/horizontal support, not connected to the supply mains; appliance does not overturn		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		P
	Self-resetting thermal cut-outs and overcurrent protective devices not causing a hazard by unexpected closure		P
	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
	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	2.03mm	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	IP44	P

EN 60335-2-51+ EN 60335-1			
Clause	Requirement + Test	Result - Remark	Verdict
22.2	Stationary appliance: means to ensure all-pole disconnection from the supply being provided:		P
	- a supply cord fitted with a plug, or		P
	- a switch complying with 24.3, or		N/A
	- a statement in the instruction sheet that a disconnection incorporated in the fixed wiring is to be provided, or		N/A
	- an appliance inlet		N/A
	Singe-pole switches and single-pole protective devices for the disconnection of heating elements in single-phase, permanently connected class 01 and class I appliances, connected to the phase conductor		N/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		N/A
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 μF, the appliance being disconnected from the supply at the instant of voltage peak		P
	Voltage not exceeding 34 V (V).....:	4.7V	P
	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		P
	In case of doubt, test as described		P
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		N/A

EN 60335-2-51+ EN 60335-1			
Clause	Requirement + Test	Result - Remark	Verdict
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
22.11	Reliable fixing of non-detachable parts that provide the necessary degree of protection against electric shock, moisture or contact with moving parts		P
	Obvious locked position of snap-in devices used for fixing such parts		P
	No deterioration of the fixing properties of snap-in devices used in parts that are likely to be removed during installation or servicing		P
	Tests as described		N/A
22.12	Handles, knobs etc. fixed in a reliable manner, if loosening result in a hazard		N/A
	Removing or fixing in wrong position of handles, knobs etc. indicating position of switches or similar components not possible, if resulting in a hazard		N/A
	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		N/A
	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

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Clause	Requirement + Test	Result - Remark	Verdict
22.16	Automatic cord reels cause no undue abrasion or damage to the sheath of the flexible cord, no breakage of conductors strands and no undue wear of contacts		N/A
	Cord reel tested with 6000 operations, as specified		N/A
	Electric strength test of 16.3, voltage of 1000 V applied		N/A
22.17	Spacers not removable from the outside by hand or by means of a screwdriver or a spanner		N/A
22.18	Current-carrying parts and other metal parts resistant to corrosion		P
22.19	Driving belts not relied upon to provide the required level of insulation, unless		N/A
	constructed to prevent inappropriate replacement		N/A
22.20	Direct contact between live parts and thermal insulation effectively prevented, unless		N/A
	material used is non-corrosive, non-hygroscopic and non-combustible		N/A
22.21	Wood, cotton, silk, ordinary paper and fibrous or hygroscopic material not used as insulation, unless impregnated		P
	This requirement does not apply to magnesium oxide and mineral ceramic fibres used for the electrical insulation of heating elements		N/A
22.22	Appliances not containing asbestos		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

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Clause	Requirement + Test	Result - Remark	Verdict
	so constructed that they cannot be replaced in an incorrect position, and so that if they are omitted, the appliance is rendered inoperable or manifestly incomplete		P
22.31	Neither clearances nor creepage distances over supplementary and reinforced insulation reduced below values specified in clause 29 as a result of wear		P
	Neither clearances nor creepage distances between live parts and accessible parts reduced below values for supplementary insulation if wires, screws etc. become loose		P
22.32	Supplementary and reinforced insulation constructed or protected against pollution so that clearances or creepage distances are not reduced below the values in clause 29		P
	Supplementary insulation of natural or synthetic rubber resistant to ageing, or arranged and dimensioned so that creepage distances are not reduced below values specified in 29.2		N/A
	Ceramic material not tightly sintered, similar materials or beads alone not used as supplementary or reinforced insulation		N/A
	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		N/A
	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		N/A
	the reinforced insulation consists of at least 3 layers		N/A
	For class II constructions, conductive liquids which are in contact with live parts, not in direct contact with reinforced insulation, unless		N/A
	the reinforced insulation consists of at least 3 layers		N/A
	An air layer not used as basic or supplementary insulation in a double insulation system if likely to be bridged by leaking liquid		N/A
22.34	Shafts of operating knobs, handles, levers etc. not live, unless		P
	the shaft is not accessible when the part is removed		P

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Clause	Requirement + Test	Result - Remark	Verdict
22.35	For other than class III constructions, handles, levers and knobs, held or actuated in normal use, not becoming live in the event of a failure of basic insulation		N/A
	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
	If the appliance cannot operate continuously, automatically or remotely without giving rise to a hazard, appliances for remote operation being fitted with a switch for stopping the operation. The actuating member of the switch being easily visible and accessible		N/A
22.41	No components, other than lamps, containing mercury		P
22.42	Protective impedance consisting of at least two separate components		N/A
	Values specified in 8.1.4 not exceeded if any one of the components are short-circuited or open-circuited		N/A
	Resistors checked by the test of 14.1 a) in IEC 60065		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Capacitors checked by the tests for class Y capacitors in IEC 60384-14		N/A
22.43	Appliances adjustable for different voltages, accidental changing of the setting of the voltage unlikely to occur		N/A
22.44	Appliances not having an enclosure that is shaped or decorated like a toy		P
22.45	When air is used as reinforced insulation, clearances not reduced below the values specified in 29.1.3 due to deformation as a result of an external force applied to the enclosure		N/A
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 connected to the water mains withstand the water pressure expected in normal use		P
	No leakage from any part, including any inlet water hose		P
22.48	Appliances connected to the water mains constructed to prevent backsiphonage of non-potable water		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
22.51	There is a control on the appliance manually adjusted to the setting for remote operation before the appliance can be operated in this mode		N/A
	There is a visual indication showing that the appliance is adjusted for remote operation		N/A
	These requirements not necessary on appliances that can operate as follows, without giving rise to a hazard:		N/A
	- continuously, or		N/A
	- automatically, or		N/A
	- remotely		N/A
22.52	Socket-outlets on appliances accessible to the user in accordance with the socket-outlet system used in the country in which the appliance is sold		P
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

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Clause	Requirement + Test	Result - Remark	Verdict
	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 be distinguished from other manual devices by means of shape, size, surface texture or position .....:		N/A
	The requirement concerning position does not preclude use of a push on push off switch		N/A
	An indication when the device has been operated is given by:		N/A
	- tactile feedback from the actuator or from the appliance, or		N/A
	- reduction in heat output; or		N/A
	- audible and visible feedback		N/A
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	Circulation pumps shall withstand the water pressure occurring in normal use (IEC 60335-2-51)		P
	Compliance is checked by subjecting the pump to a water pressure equal to 1,2 times the maximum system pressure for 1 min (IEC 60335-2-51)	1.2X0.6=0.72MPa	P
	The pump shall not leak (IEC 60335-2-51)		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		P
23.2	Beads etc. on live wires cannot change their position, and are not resting on sharp edges		N/A
	Beads inside flexible metal conduits contained within an insulating sleeve		N/A
23.3	Electrical connections and internal conductors movable relatively to each other not exposed to undue stress		N/A
	Flexible metallic tubes not causing damage to insulation of conductors		N/A
	Open-coil springs not used		N/A
	Adequate insulating lining provided inside a coiled spring, the turns of which touch one another		N/A
	No damage after 10 000 flexings for conductors flexed during normal use, or		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	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		P
	no breakdown when a voltage of 2000 V is applied for 15 min between the conductor and metal foil wrapped around the insulation		P
	For class II construction, the requirements for supplementary insulation and reinforced insulation apply,		P
	except that the sheath of a cord complying with IEC 60227 or IEC 60245 may provide supplementary insulation.		P
	A single layer of internal wiring insulation does not provide reinforced insulation		P
23.6	Sleeving used as supplementary insulation on internal wiring retained in position by clamping at both ends, or		P
	be such that it can only be removed by breaking or cutting		P
23.7	The colour combination green/yellow only used for earthing conductors		N/A
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		N/A
	the contact pressure is provided by spring terminals		N/A
23.10	The insulation and sheath of internal wiring, incorporated in external hoses for the connection of an appliance to the water mains, at least equivalent to that of light polyvinyl chloride sheathed flexible cord (60227 IEC 52)		N/A
24	**COMPONENTS**		
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		N/A
	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

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Clause	Requirement + Test	Result - Remark	Verdict
	The requirements of Clause 29 apply between live parts of components and accessible parts of the appliance		N/A
	Components can comply with the requirements for clearances and creepage distances for functional insulation in the relevant component standard		N/A
	30.2 of this standard apply to parts of non-metallic material in components including parts of non-metallic material supporting current-carrying connections		N/A
	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		N/A
	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		N/A
	If these conditions are not satisfied, the component is tested as part of the appliance.		N/A
	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		N/A
	Components not tested and found to comply with relevant IEC standard and components not marked or not used in accordance with its marking, tested under the conditions occurring in the appliance		N/A
	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, complying with IEC 60384-14		N/A
	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		N/A
	Safety isolating transformers complying with IEC 61558-2-6		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	If they have to be tested, they are tested according to annex G		N/A
24.1.3	Switches complying with IEC 61058-1, the number of cycles of operation being at least 10 000		N/A
	Switches that are only intended to be operated during installation of the pump are subjected to 100 cycles of operation (IEC 60335-2-51)		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 staring relay complying with IEC 60730-2-10 with the number of cycles of a least 10000 as specified, the complete switching system need not be tested		N/A
24.1.4	Automatic controls complying with IEC 60730-1 with the relevant part 2. The number of cycles of operation being at least:		N/A
	- thermostats:..... 10 000		N/A
	- temperature limiters:..... 1 000		N/A
	- self-resetting thermal cut-outs:.....300		N/A
	- voltage maintained non-self-resetting thermal cut-outs:..... 1 000		N/A
	- other non-self-resetting thermal cut-outs:.....30		N/A
	- timers:.....3 000		N/A
	- energy regulators:..... 10 000		N/A
	The number of cycles for controls operating during clause 11 need not be declared, if the appliance meets the requirements of this standard when they are short-circuited		N/A
	Thermal motor protectors are tested in combination with their motor under the conditions specified in annex D		N/A
	For water valves containing live parts and that are incorporated in external hoses for connection of an appliance to the water mains, the degree of protection declared for subclause 6.5.2 of IEC 60730-2-8 is IPX7		N/A
	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 complying with IEC 60320-1		N/A
	However, for class II appliances classified higher than IPX0, the appliance couplers complying with IEC 60320-2-3		N/A
	Interconnection couplers complying with IEC 60320-2-2		N/A
24.1.6	Small lamp holders similar to E10 lampholders complying with IEC 60238, the requirements for E10 lampholders being applicable		N/A

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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:		P
	- switches, automatic controls, power supplies and the like in flexible cords;		P
	- devices causing the protective device in the fixed wiring to operate in the event of a fault in the appliance		P
	- thermal cut-outs that can be reset by soldering, unless		P
	the solder has a melding point of at least 230 °C		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
24.7	Detachable hose-sets for connection of appliances to the water mains comply with IEC 61770		N/A
	They are supplied with the appliance		N/A
	Appliances intended to be permanently connected to the water mains not connected by a detachable hose-set		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
24.8	Motor running capacitors in appliances for which 30.2.3 is applicable and that are permanently connected in series with a motor winding, not causing a hazard in event of a failure		N/A
	One or more of the following conditions are to be met:		N/A
	- the capacitors are of class 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
25	**SUPPLY CONNECTION AND EXTERNAL FLEXIBLE CORDS**		
25.1	Appliance not intended for permanent connection to fixed wiring, means for connection to the supply:		N/A
	- 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		N/A
	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:		P
	- a set of terminals allowing the connection of a flexible cord		N/A
	- 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

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Clause	Requirement + Test	Result - Remark	Verdict
	For a fixed appliance constructed so that parts can be removed to facilitate easy installation, this requirement is met if it is possible to connect the fixed wiring without difficulty after a part of the appliance has been fixed to its support		N/A
25.4	Cable and conduit entries, rated current of appliance not exceeding 16 A, dimension according to table 10 (mm).....:		N/A
	Introduction of conduit or cable does not reduce clearances or creepage distances below values specified in clause 29		N/A
25.5	Method for assembling the supply cord to the appliance:		P
	- type X attachment		N/A
	- type Y attachment		P
	- type Z attachment		N/A
	Type Z attachment is allowed (IEC 60335-2-51)		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:		N/A
	- rubber sheathed (at least 60245 IEC 53)	H05RN-F	P
	- polychloroprene sheathed (at least 60245 IEC 57)		P
	- polyvinyl chloride sheathed. Not used if they are likely to touch metal parts having a temperature rise exceeding 75 K during the test of clause 11		N/A
	- light polyvinyl chloride sheathed cord (60227 IEC 52), for appliances not exceeding 3 kg		N/A
	- ordinary polyvinyl chloride sheathed cord (60227 IEC 53), for other appliances	H05VV-F	P
	- heat resistant polyvinyl chloride sheathed. Not used for type X attachment other than specially prepared cords		N/A
	- 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		N/A
	- 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

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Clause	Requirement + Test	Result - Remark	Verdict
	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 (mm²)..... :	3G 0.75mm²	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:		N/A
	- 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		P
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
	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		P
	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
	- 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

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Clause	Requirement + Test	Result - Remark	Verdict
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:		P
	- fixed appliances: pull 100 N; torque (not on automatic cord reel) (Nm).....:		N/A
	- other appliances: values shown in table 12: mass (kg); pull (N); torque (not on automatic cord reel) (Nm) :		N/A
	Pull and torque test of supply cord, 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	1.2mm	P
25.16	Cord anchorages for type X attachments constructed and located so that:		N/A
	- replacement of the cord is easily possible		N/A
	- it is clear how the relief from strain and the prevention of twisting are obtained		N/A
	- they are suitable for different types of supply cord		N/A
	- cord cannot touch the clamping screws of cord anchorage if these screws are accessible, unless		N/A
	they are separated from accessible metal parts by supplementary insulation		N/A
	- the cord is not clamped by a metal screw which bears directly on the cord		N/A
	- at least one part of the cord anchorage securely fixed to the appliance, unless		N/A
	it is part of a specially prepared cord		N/A
	- screws which have to be operated when replacing the cord do not fix any other component, unless		N/A
	the appliance becomes inoperative or incomplete or the parts cannot be removed without a tool		N/A
	- if labyrinths can be bypassed the test of 25.15 is nevertheless withstood		N/A
	- for class 0, 0I and I appliances they are of insulating material or are provided with an insulating lining, unless		N/A
	failure of the insulation of the cord does not make accessible metal parts live		N/A
	- for class II appliances they are of insulating material, or		N/A
	if of metal, they are insulated from accessible metal parts by supplementary insulation		N/A
	After the test of 25.15, under the conditions specified, the conductors have not moved by more than 1 mm in the terminals		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
25.17	Adequate cord anchorages for type Y and Z attachment, test with the cord supplied with the appliance		P
25.18	Cord anchorages only accessible with the aid of a tool, or		P
	Constructed so that the cord can only be fitted with the aid of a tool		P
25.19	Type X attachment, glands not used as cord anchorage in portable appliances		N/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:		N/A
	- to permit checking of conductors with respect to correct positioning and connection before fitting any cover		N/A
	- so there is no risk of damage to the conductors or their insulation when fitting the cover		N/A
	- for portable appliances, so that the uninsulated end of a conductor, if it becomes free from the terminal, prevented from contact with accessible metal parts		N/A
	2 N test to the conductor for portable appliances; no contact with accessible metal parts		N/A
25.22	Appliance inlets:		N/A
	- live parts not accessible during insertion or removal		N/A
	Requirement not applicable to appliance inlets complying with IEC 60320-1		N/A
	- connector can be inserted without difficulty		N/A
	- the appliance is not supported by the connector		N/A
	- not for cold conditions if temp. rise of external metal parts exceeds 75 K during clause 11, unless		N/A
	the supply cord is unlikely to touch such metal parts		N/A
25.23	Interconnection cords comply with the requirements for the supply cord, except that:		N/A
	- 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.		P

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

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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 (mm²)..... :		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		N/A
	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**		
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		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	protective extra-low voltage circuits		N/A
27.2	Clamping means of earthing terminals adequately secured against accidental loosening		P
	Terminals for the connection of external equipotential bonding conductors allow connection of conductors of 2,5 to 6 mm², and		N/A
	do not provide earthing continuity between different parts of the appliance, and		P
	conductors cannot be loosened without the aid of a tool		P
	Requirements not applicable to class II appliances and class III appliances that incorporate an earth for functional purposes		P
27.3	For a detachable part having an earth connection and being plugged into another part of the appliance, the earth connection is made before and separated after current-carrying connections when removing the part		N/A
	For appliances with supply cords, current-carrying conductors become taut before earthing conductor, if the cord slips out of the cord anchorage		P
	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		P
	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		P
	Requirements not applicable to class II appliances and class III appliances that incorporate an earth for functional purposes		P
27.5	Low resistance of connection between earthing terminal and earthed metal parts		N/A
	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)..... :	0.004	P

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Clause	Requirement + Test	Result - Remark	Verdict
27.6	The printed conductors of printed circuit boards not used to provide earthing continuity in hand-held appliances.		P
	They may be used to provide earthing continuity in other appliances if at least two tracks are used with independent soldering points and the appliance complies with 27.5 for each circuit		P
	Requirements not applicable to class II appliances and class III appliances that incorporate an earth for functional purposes		N/A
28	**SCREWS AND CONNECTIONS**		
28.1	Fixings, electrical connections and connections providing earthing continuity withstand mechanical stresses		P
	Screws not of soft metal liable to creep, such as zinc or aluminium		P
	Diameter of screws of insulating material min. 3 mm		N/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		N/A
	For type X attachment, screws to be removed for replacement of supply cord or for user maintenance, not of insulating material if their replacement by a metal screw impairs basic insulation		N/A
	For screws and nuts; torque-test as specified in table 14.....:	(see appended table)	P
28.2	Electrical connections and connections providing earthing continuity constructed so that contact pressure is not transmitted through non-ceramic insulating material liable to shrink or distort, unless		P
	there is resiliency in the metallic parts to compensate for shrinkage or distortion of the insulating material		N/A
	This requirement does not apply to electrical connections in circuits of appliances for which:		N/A
	- 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

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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:		N/A
	- in normal use,		N/A
	- during user maintenance,		N/A
	- when replacing a supply cord having a type X attachment, or		N/A
	- during installation		N/A
	At least two screws being used for each connection providing earthing continuity, unless		N/A
	the screw forms a thread having a length of at least half the diameter of the screw		N/A
28.4	Screws and nuts that make mechanical connection secured against loosening if they also make electrical connections or connections providing earthing continuity		P
	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		P
	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.....:		N/A
29.1	Clearances not less than the values specified in table 16, taking into account the rated impulse voltage for the overvoltage categories of table 15, unless..... :	(see appended table)	P
	for basic insulation and functional insulation they comply with the impulse voltage test of clause 14		N/A
	However, if the distances are affected by wear, distortion, movement of the parts or during assembly, the clearances for rated impulse voltages of 1500 V and above are increased by 0,5 mm and the impulse voltage test is not applicable		N/A
	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:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- when the microenvironment is pollution degree 3, or		N/A
	- for basic insulation of class 0 and class 01 appliances		N/A
	- to appliances intended for use at altitudes exceeding 2 000 m		N/A
	Appliances are in overvoltage category II		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
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)	N/A
	Clearance at the terminals of tubular sheathed heating elements may be reduced to 1,0 mm if the microenvironment is pollution degree 1		N/A
	Lacquered conductors of windings considered to be bare conductors		N/A
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:		P
	- table 16 based on the rated impulse voltage.....:	(see appended table)	P
	- table F.7a in IEC 60664-1, frequency not exceeding 30 kHz		N/A
	- clause 4 of IEC 60664-4, frequency exceeding 30 kHz		N/A
	If values of table 16 are largest, the impulse voltage test of clause 14 may be applied instead, unless		N/A
	the microenvironment is pollution degree 3, or		N/A
	the distances can be affected by wear, distortion, movement of the parts or during assembly		N/A
	However, clearances are not specified if the appliance complies with clause 19 with the functional insulation short-circuited		N/A
	Lacquered conductors of windings considered to be bare conductors		N/A
	However, clearances at crossover points are not measured		N/A
	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:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- table 16 based on the rated impulse voltage..... :		N/A
	- table F.7a in IEC 60664-1, frequency not exceeding 30 kHz		N/A
	- clause 4 of IEC 60664-4, frequency exceeding 30 kHz		N/A
	If clearances for basic insulation are selected from Table F.7a of IEC 60664-1 or clause 4 of IEC 60664-4, the clearances of supplementary insulation are not less than those specified for basic insulation		N/A
	If clearances for basic insulation are selected from Table F.7a of IEC 60664-1, the clearances of reinforced insulation dimensioned as specified in Table F.7a are to withstand 160 % of the withstand voltage required for basic insulation		N/A
	If clearances for basic insulation are selected from clause 4 of IEC 60664-4, the clearances of reinforced insulation are twice the value required for basic insulation		N/A
	If the secondary winding of a step-down transformer is earthed, or if there is an earthed screen between the primary and secondary windings, clearances of basic insulation on the secondary side not less than those specified in table 16, but using the next lower step for rated impulse voltage		N/A
	Circuits supplied with a voltage lower than rated voltage, clearances of functional insulation are based on the working voltage used as the rated voltage in table 15		N/A
29.2	Creepage distances not less than those appropriate for the working voltage, taking into account the material group and the pollution degree..... :	(see appended table)	P
	Pollution degree 2 applies, unless		P
	- precautions taken to protect the insulation; pollution degree 1		N/A
	- insulation subjected to conductive pollution; pollution degree 3		N/A
	A force of 2 N is applied to bare conductors, other than heating elements		P
	A force of 30 N is applied to accessible surfaces		P
	In a double insulation system, the working voltage for both the basic and supplementary insulation is taken as the working voltage across the complete double insulation system		N/A
29.2.1	Creepage distances of basic insulation not less than specified in table 17..... :	(see appended table)	P
	However, if the working voltage is periodic and has a frequency exceeding 30 kHz, the creepage distances are also determined from table 2 of IEC 60664-4, these values being used if exceeding the values in table 17..... :		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Except for pollution degree 1, corresponding creepage distance not less than the minimum specified for the clearance in table 16, if the clearance has been checked according to the test of clause 14.....:		P
29.2.2	Creepage distances of supplementary insulation at least those specified for basic insulation in table 17, or.....:	(see appended table)	P
	Table 2 of IEC 60664-4, as applicable.....:		N/A
29.2.3	Creepage distances of reinforced insulation at least double those specified for basic insulation in table 17, or.....:	(see appended table)	P
	Table 2 of IEC 60664-4, as applicable.....:		N/A
29.2.4	Creepage distances of functional insulation not less than specified in table 18.....:	(see appended table)	N/A
	However, if the working voltage is periodic and has a frequency exceeding 30 kHz, the creepage distances are also determined from table 2 of IEC 60664-4, these values being used if exceeding the values in table 18.....:		N/A
	Creepage distances may be reduced if the appliance complies with clause 19 with the functional insulation short-circuited		N/A
29.3	Supplementary and reinforced insulation have adequate thickness, or a sufficient number of layers, to withstand the electrical stresses		N/A
	Compliance checked:		P
	- by measurement, in accordance with 29.3.1, or		P
	- by an electric strength test in accordance with 29.3.2, or		N/A
	- 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		N/A
	- 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		P
	Reinforced insulation have a thickness of at least 2 mm		P
29.3.2	Each layer of material withstand the electric strength test of 16.3 for supplementary insulation		N/A
	Supplementary insulation consist of at least 2 layers		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Reinforced insulation consist of at least 3 layers		N/A
29.3.3	The insulation is subjected to the dry heat test Bb of IEC 60068-2-2, followed by		N/A
	the electric strength test of 16.3		N/A
	If the temperature rise during the tests of clause 19 does not exceed the value specified in table 3, the test of IEC 60068-2-2 is not carried out		N/A
29.3.4	Thickness of accessible parts of reinforced insulation consisting of a single layer not less than specified in table 19.....:		N/A
30	**RESISTANCE TO HEAT AND FIRE**		
30.1	External parts of non-metallic material,		P
	parts supporting live parts, and		P
	parts of thermoplastic material providing supplementary or reinforced insulation		P
	sufficiently resistant to heat		P
	Ball-pressure test according to IEC 60695-10-2		P
	External parts tested at 40 °C plus the maximum temperature rise determined during the test of clause 11, or at 75 °C, whichever is the higher; temperature (°C).....:	(see appended table)	P
	Parts supporting live parts tested at 40 °C plus the maximum temperature rise determined during the test of clause 11, or at 125 °C, whichever is the higher; temperature (°C).....:	(see appended table)	P
	Parts of thermoplastic material providing supplementary or reinforced insulation tested at 25 °C plus the maximum temperature rise determined during clause 19, if higher; temperature (°C).....:	(see appended table)	N/A
30.2	Parts of non-metallic material resistant to ignition and spread of fire		P
	This requirement does not apply to:		N/A
	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		N/A
30.2.1	Parts of non-metallic material subjected to the glow-wire test of IEC 60695-2-11 at 550 °C		P

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Clause	Requirement + Test	Result - Remark	Verdict
	However, test not carried out if the material is classified as having a glow-wire flammability index according to IEC 60695-2-12 of at least 550 °C, or		N/A
	the material is classified at least HB40 according to IEC 60695-11-10		N/A
	Parts for which the glow-wire test cannot be carried out need to meet the requirements in ISO 9772 for material classified HBF		N/A
30.2.2	Appliances operated while attended, parts of non-metallic material supporting current-carrying connections, and		N/A
	parts of non-metallic material within a distance of 3 mm of such connections,		N/A
	subjected to the glow-wire test of IEC 60695-2-11		N/A
	The test severity is:		
	- 750 °C, for connections carrying a current exceeding 0,5 A during normal operation		N/A
	- 650 °C, for other connections		N/A
	Glow-wire applied to an interposed shielding material, if relevant		N/A
	The glow-wire test is not carried out on parts of material classified as having a glow-wire flammability index according to IEC 60695-2-12 of at least:		N/A
	- 750 °C, for connections carrying a current exceeding 0,5 A during normal operation		N/A
	- 650 °C, for other connections		N/A
	The glow-wire test is also not carried out on small parts. These parts are to:		N/A
	- comprise material having a glow-wire flammability index of at least 750 °C, or 650 °C as appropriate, or		N/A
	- comply with the needle-flame test of annex E, or		N/A
	- comprise material classified as V-0 or V-1 according to IEC 60695-11-10..... :		N/A
	Glow-wire test not applicable to conditions as specified..... :		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	Parts of non-metallic material supporting connections carrying a current exceeding 0,2 A during normal operation, and		N/A
	parts of non-metallic material, other than small parts, within a distance of 3 mm,		N/A
	subjected to the glow-wire test of IEC 60695-2-11 with a test severity of 850 °C		N/A
	Glow-wire applied to an interposed shielding material, if relevant		N/A
	The glow-wire test is not carried out on parts of material classified as having a glow-wire flammability index according to IEC 60695-2-12 of at least 850 °C		N/A
30.2.3.2	Parts of non-metallic material supporting connections, and		P

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Clause	Requirement + Test	Result - Remark	Verdict
	parts of non-metallic material within a distance of 3 mm,		P
	subjected to glow-wire test of IEC 60695-2-11		N/A
	The test severity is:		N/A
	- 750 °C, for connections carrying a current exceeding 0,2 A during normal operation		N/A
	- 650 °C, for other connections		N/A
	Glow-wire applied to an interposed shielding material, if relevant		N/A
	However, the glow-wire test of 750 °C or 650 °C as appropriate, is not carried out on parts of material fulfilling both or either of the following classifications:		N/A
	- a glow-wire ignition temperature according to IEC 60695-2-13 of at least:		N/A
	- 775 °C, for connections carrying a current exceeding 0,2 A during normal operation		N/A
	- 675 °C, for other connections		N/A
	- a glow-wire flammability index according to IEC 60695-2-12 of at least:		N/A
	- 750 °C, for connections carrying a current exceeding 0,2 A during normal operation		N/A
	- 650 °C, for other connections		N/A
	The glow-wire test is also not carried out on small parts. These parts are to:		N/A
	- comprise material having a glow-wire ignition temperature of at least 775 °C or 675 °C as appropriate, or		N/A
	- comprise material having a glow-wire flammability index of at least 750 °C or 650 °C as appropriate, or		N/A
	- comply with the needle-flame test of annex E, or		N/A
	- comprise material classified as V-0 or V-1 according to IEC 60695-11-10		N/A
	The consequential needle-flame test of annex E applied to non-metallic parts that encroach within the vertical cylinder placed above the centre of the connection zone and on top of the non-metallic parts supporting current-carrying connections, and parts of non-metallic material within a distance of 3 mm of such connections if these parts are those:		N/A
	- parts that withstood the glow-wire test of IEC 60695-2-11 of 750 °C or 650 °C as appropriate, but produce a flame that persist longer than 2 s, or		N/A
	- parts that comprised material having a glow-wire flammability index of at least 750 °C or 650 °C as appropriate, or		N/A
	- small parts, that comprised material having a glow-wire flammability index of at least 750 °C or 650 °C as appropriate, or		N/A
	- small parts for which the needle-flame test of annex E was applied, or		N/A
	- small parts for which a material classification of V-0 or V-1 was applied		N/A
	However, the consequential needle-flame test is not carried out on non-metallic parts, including small parts, within the cylinder that are:		N/A
	- parts having a glow-wire ignition temperature of at least 775 °C or 675 °C as appropriate, or		N/A

EN 60335-2-51+ EN 60335-1			
Clause	Requirement + Test	Result - Remark	Verdict
	- parts comprising material classified as V-0 or V-1 according to IEC 60695-11-10, or		N/A
	- parts shielded by a flame barrier that meets the needle-flame test of annex E or that comprises material classified as V-0 or V-1 according to IEC 60695-11-10		N/A
30.2.4	Base material of printed circuit boards subjected to the needle-flame test of annex E		N/A
	Test not applicable to conditions as specified.....:		N/A
31	**RESISTANCE TO RUSTING**		
	Relevant ferrous parts adequately protected against rusting		P
	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

EN 60335-2-51+ EN 60335-1			
Clause	Requirement + Test	Result - Remark	Verdict
EN 60335-1:2012+A11:2014+A13:2017+A1:2019+A14:2019+A2:2019+A15:2021+A16:2023			—
	CENELEC COMMON MODIFICATIONS (EN)		
20.2	*Replace* “dangerous” *with* “hazardous” (twice).		P
22.44	*In sub Clause 22.44, replace the text by the following:*		—
	An appliance is child-appealing if one of the following criteria is present:		—
	— appliance decorated using faces, cartoon like characters, or similar images;		N/A
	— appliance using shapes representing animals, characters, persons or scale models.		N/A
	An appliance is child-appealing if more than one of the following criteria are present:		—
	— using non-functional light (functional light is e.g. illumination of an object or area, signal indicating status of an appliance);		N/A
	— using non-functional sound (e.g. music);		N/A
	— using non-functional movement.		N/A
	If the appliance is child-appealing and:		—
	— has a mass less than 4 kg; and		N/A
	— is mounted or normally intended for use at a height less than 850 mm, the following conditions shall be met:		N/A
	— No surface (both **functional surfaces** and non-functional) that are accessible by means of test probe 19 of IEC 61032 located at a height less than 850 mm shall exceed the temperature rises stated below: *Temperature rise* *– of bare metal* 38K *– of coated metal* 42K *– of glass and ceramic* 51K *– of plastic having a thickness exceeding 0,4 mm* 58K		N/A
	— Hazardous **moving parts** shall not be accessible by means of test probe 19 of IEC 61032 under the conditions specified for test probe 18 in Clause 20.2.		N/A
	— **Live parts** shall not be accessible by means of test probe 19 of IEC 61032 under the conditions specified for test probe 18 in Clause 8.1.1.		N/A
	— Liquid in the appliance shall not exceed 38 °C in normal use when it is accessible by means of test probe 19 under the conditions specified for test probe 18 in Clause 20.2 or can get out of the appliance when positioned in different positions. Vessels in which two independent and sequential actions are needed to access the liquid are considered to meet the requirement.		N/A

EN 60335-2-51+ EN 60335-1			
Clause	Requirement + Test	Result - Remark	Verdict
	— The requirement of 22.12 is applicable for all accessible parts of the appliance.		P
	The requirement is not applicable to appliances where there is a toy shaped like the appliance.		P
22.ZE.10	Noise reduction is an integral part of the design process and should be achieved by taking special measures to control noise sources, such as EN ISO 11688-1:2009. The successful noise reduction measures adopted are evaluated based on the actual noise emission values of other machines of the same type with comparable non acoustic technology data. Compliance is checked through the noise testing specifications (if any) provided in Part 2.		N/A
24.1.7	*Replace the sub clause with the following:*		—
	If the **remote operation** of the appliance is via a telecommunication network, the relevant standard for the telecommunication interface circuitry in the appliance is IEC 62151.		N/A

10.1	TABLE: Power input deviation				P
Input deviation of/at:	P rated (W)	P measured (W)	Δ P	Required Δ P	Remark
230V 50Hz	180	162.36	-9.8%	+15%	—

10.2	TABLE: Current deviation				P
Current deviation of/at:	I rated (A)	I measured (A)	Δ I	Required Δ I	Remark
230V 50Hz	1.53	1.55	+1.2%	+15%	—

11.8	TABLE: Heating test			P
	Test voltage (V)..... :	206.8	254.4	
	Ambient (°C)..... :	t_1=21.1 t_2=21.4	t_1=21.1 t_2=22.1	

Thermocouple locations	Max. temperature rise measured, Δ T (K)		Max. temperature rise limit, Δ T (K)
	206.8V	254.4V	
Electrolytic capacitor	32.6	31.1	T105-25=80
Terminal block	34.8	33.3	For 30.1
Y capacitor	36.6	36.0	50
X2 capacitor	34.0	33.1	50
Varistor	42.0	41.6	For Ref.
Internal wire	44.6	41.4	50
Supply cord	12.8	11.0	50
NTC	43.9	41.9	For Ref.
CBB capacitor	30.4	29.9	50
IC(U1)	59.8	56.0	For Ref.
Relay(K1)	22.8	22.1	For Ref.
PCB	34.5	32.8	120
Water tempereture	94.9℃		TF95(90-95℃)

11.8	TABLE: Heating test, resistance method				P
	Test voltage (V)		254.4		—
	Ambient, t1 (°C)		21.0		—
	Ambient, t2 (°C)		21.4		—
Temperature rise of winding	R1 (Ω)	R2 (Ω)	Δ T (K)	Max. Δ T (K)	Insulation class
Motor winding	72.8	95.6	79.6	90	Class 155(F)
Supplementary information: —					

13.2	TABLE: Leakage current		P
Heating appliances: 1,15 x rated input (W) :		—	—
Motor- operated and combined appliances: 1,06 x rated voltage (V):		254.4	—
Leakage current between		I (mA)	Max. allowed I (mA)
L/N and accessible unearthed parts		0.01	0.35 peak
L/N and accessible metal enclosure		0.12	3.5
Supplementary information: —			

13.3	TABLE: Electric strength		P
Test voltage applied between:		Voltage (V)	Breakdown (Yes/No)
Live part and earthed parts		1000	No
Live part to accessible unearthed parts		3000	No
Supplementary information: —			

14	TABLE: Transient overvoltages				N/A
Clearance between:	Cl (mm)	Required Cl (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 .:		254.4	—
Three phase appliances 1.06 x rated voltage divided by √3: .....:		—	—
Leakage current between		I (mA)	Max. allowed I (mA)
Live part and accessible unearthed parts		0.01	0.25
Live part and accessible metal enclosure		0.17	3.5
Supplementary information: —			

16.3	TABLE: Dielectric strength	P

Test voltage applied between:	Voltage (V)	Breakdown (Yes/No)
Live part and earthed metal enclosure	1250	No
Live part to accessible plastic enclosure	3000	No
Supplementary information: —		

17	TABLE: Overload protection	N/A

Thermocouple locations	Max. temperature rise measured, Δ T (K)	Max. temperature rise limit,Δ T (K)
Supplementary information:		

19	Abnormal operation conditions	P

Operational characteristics	YES/NO	Operational conditions
Are there electronic circuits to control the appliance operation?	YES	—
Are there “off” “or “stand-by”, position	YES	—
The unintended operation of the appliance results in dangerous malfunction	N/A	—

Sub-clause	Operating conditions description	Test results description	PEC description	EMP 19.11.4	Software type required	19.11.3 PEC	Final result
19.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A
19.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A
19.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A
19.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A
19.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A
19.7	240V,Refer to Clause 19.7	No hazard	N/A	N/A	N/A	N/A	P
19.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A
19.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A
19.10	N/A	N/A	N/A	N/A	N/A	N/A	N/A
19.11.2	240V, Refer to Clause 19.11.2	No hazard	N/A	N/A	N/A	N/A	P
19.11.4.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A
19.101	240V, Refer to Clause 19.101	No hazard	N/A	N/A	N/A	N/A	P
Supplementary information: —							

19.7	TABLE: Abnormal operation, locked rotor/moving parts				P
	Test voltage (V) ..... :	240			—
	Ambient, t1 (°C) ..... :	23.2			—
	Ambient, t2 (°C) ..... :	23.7			—
Temperature rise of winding	R1 (Ω)	R2 (Ω)	Δ T (K)	T (°C)	Max. T (°C)
Motor winding (rotor locked)	—	—	—	38.9	190
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	15.2	150
Electrical box	11.2	For 30.1
Supplementary information: —		

21.1	TABLE: Impact resistance			P
Impacts per surface	Surface tested	Impact energy (J)	Comments	
3	Wire box	1.0	No damage	
3	Enclosure	1.0	No damage	
Supplementary information: —				

24.1	TABLE: Critical components information				N/A
Object / part No.	Manufacturer/ trademark[2)]	Type / model[2)]	Technical data	Standard	Mark(s) of conformity[1)]
—	—	—	—	—	—
—	—	—	—	—	—
—	—	—	—	—	—
—	—	—	—	—	—

28.1	TABLE: Threaded part torque test			P
Threaded part identification	Diameter of thread (mm)	Column number (I, II, or III)	Applied torque (Nm)	
Screw	2.15	II	0.4	

29.1	TABLE: Clearances		P
	Overvoltage category..... :	II	---
	Type of insulation:		--

Rated impulse voltage (V):	Min. cl (mm)	Basic (mm)	Functional (mm)	Supplementary (mm)	Reinforced (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	0,2/0,5/0,8***	---	---	---	---	N/A
2 500	1,5/**2.0****	B1	S1	---	---	P
4 000	3,0/**3.5****	---	---	R1	---	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

Supplementary information: —

*)For tracks on printed circuit boards if pollution degree 1 and 2

**)For pollution degree 3

***)If the construction is affected by wear, distortion, movement of the parts or during assembly

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

B1: Between live part and earthed metal: Cl.=Cr.= 2,8 mm

F1: Between L/N terminals: Cl.=Cr.> 2,6 mm

R1: Between live part and electric box enclosure: Cl.=Cr.>8.0 mm

29.1	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**	
≤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	2,5	3,2	3,6	**4,0**	B1		—	P
250	0,56	1,25	1,8	2,5	3,2	3,6	**4,0**	—		—	N/A
250	1,12	2,5	3,6	5,0	6,4	7,2	**8,0**	—	—	R1	P
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
>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

Supplementary information:

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

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

B1: Between live part and earthed metal: Cl.=Cr.= 2,8 mm

R1: Between live part and electric box enclosure: Cl.=Cr.>8.0 mm

29.2 TABLE: Creepage distances, functional insulation — P

Working voltage (V)	Creepage distance (mm) Pollution degree							Verdict / Remark
	1	2			3			
		Material group			Material group			
		I	II	IIIa/IIIb	I	II	IIIa/IIIb*	
≤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
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

F1: Between L/N terminals: Cl.=Cr.> 2,6 mm

30.1	TABLE: Ball Pressure Test of Thermoplastics		P
Allowed impression diameter (mm) ..... :		2.0	—
Object/ Part No./ Material	Manufacturer/ trademark	Test temperature (°C)	Impression diameter (mm)
Plasic enclosure	—	125	1.02
Appliance inlet	—	125	0.84
Motor bobbin	—	125	0.76
Wire connector	—	125	0.78
PCB	—	125	0.88
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			
Plastic enclosure	—	X	—	—	—	—	—		P
Motor bobbin	—	—	—	—	0	0	X		P
Relay	—	—	—	—	0	0	X		P
VDR	—	—	—	—	0	0	X		P
Y capacitor	—	—	—	—	0	0	X		P
X2 capacitor	—	—	—	—	0	0	X		P
Wire connector	—	—	—	—	0	0	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 [(te – ti) ≤ 2s] (Yes/No):									Yes
If no, then surrounding parts passed the needle-flame test of annex E (Yes/No).....:									N/A
The test specimen passed the test by virtue of most of the flaming material being withdrawn with the glow-wire (Yes/No)?.....:									N/A
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									

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
PCB	See table 24.1	0	No	0	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					

1 – EN62233(EMF)

1.1 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number
HIOKI	Magnetic field probe	100 cm^2	3471
HIOKI	Exposure level tester	FT3470-50	141234935

1.2 Compliance Criteria

Appliances are deemed to comply with the basic restriction if the reference levels are not exceeded.

If a value exceeds the reference level, the coupling factor can be taken into account to show compliance with the basic restriction. The coupling factor has been determined to cover the worst case for the same type of appliances.

If the value still exceeds the reference level, this does not necessarily mean that the basic restriction is exceeded. Calculation methods can be used to verify whether the basic restriction is fulfilled.

1.3 Test Setup

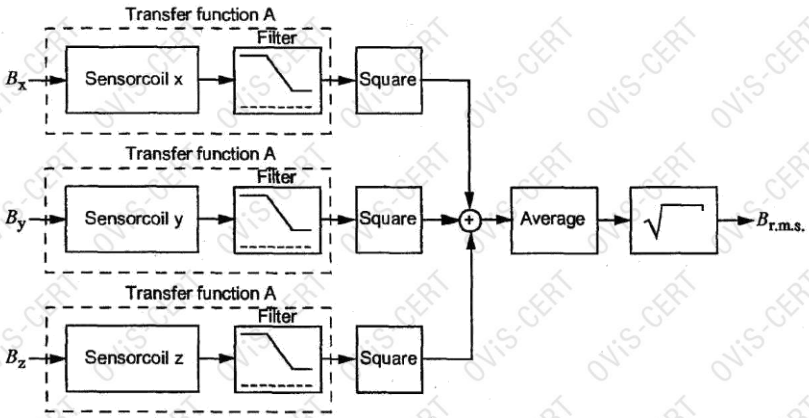
Test procedure: IEC 62233;
Frequency range : 10Hz to 400 kHz;
Limits: EN 62233;
Sensor Location: Around the EUT

1.4 Test Methods

Frequency range of the used field-probe is 10 Hz – 400 kHz, area of probe is 100 cm^2.

Directly on the enclosure of the EUT (distance = 30 cm) the maximum magnetic field strength was searched. At these points the measurements are done in the distance given by the standard. Observation time is in minimum 3 s on each point.

The schematic diagram of the reference method is as follows:



The weighted result is obtained from the following formula:

$$W = \frac{a_c(r_1)B_{r.m.s.}}{B_{RL}}$$

1.5 Test Conditions

Ambient Temperature : 18 ℃/ 18 ℃ (**Before Test /After Test**);
Relative Humidity: 57 %/ 57 % (**Before Test /After Test**);
Background noise level (% limit) : 0.211% (**Shielding Room)**
Measure distance : 30cm
Couple factor: N/A **(N/A=not applicable)**
Power Supply: 254.4V / 50 Hz
Operating conditions: Continuously, lowest temperature setting

1.6 Test Data and Records

Sensor Location	$B_{r.m.s}$ / B_{RL}
Front	1.535%
Rear	1.561%
Left	1.577%
Right	1.542%

Note:

The limits are the reference levels taken from the EU-COUNCIL RECOMMENDATION in accordance with the requirements of the standard EN 62233.

$B_{r.m.s}$ is the r.m.s. value of the magnetic flux density;

B_{RL} is the reference level of the magnetic flux density at 50 Hz.

1.7 Verdict

The EUT met the requirement.

EN 60034-1			
Cl.	Requirement - Test	Result - Remark	Verdict
4	**DUTY**		P
4.1	Declaration of duty		P
	It is the responsibility of the purchaser to declare the duty. The purchaser may describe the duty by one of the following: numerically, where the load does not vary or where it varies in a known manner; as a time sequence graph of the variable quantities; by selecting one of the duty types S1 to S10 that is no less onerous than the expected duty.	S1	P
	Where the purchaser does not declare a duty, the manufacturer shall assume that duty type S1 (continuous running duty) applies.		P
4.2	Duty types		P
4.2.1	Duty type S1 – Continuous running duty	Duty type : S1	P
4.2.2	Duty type S2 – Short-time duty		N/A
4.2.3	Duty type S3 – Intermittent periodic duty		N/A
4.2.4	Duty type S4 – Intermittent periodic duty with starting		N/A
4.2.5	Duty type S5 – Intermittent periodic duty with electric braking		N/A
4.2.6	Duty type S6 – Continuous-operation periodic duty		N/A
4.2.7	Duty type S7 – Continuous-operation periodic duty with electric breaking		N/A
4.2.8	Duty type S8 – Continuous-operation periodic duty with related load/speed changes		N/A
4.2.9	Duty type S9 – Duty with non-periodic load and speed variations		N/A
4.2.10	Duty type S10 – Duty with discrete constant loads		N/A

5	**RATING**		**P**
5.1	Assignment of rating		P
	Rating assigned by manufacturer		P
5.2	Classes of rating		P
5.2.1	Rating for continuous running duty	S1	P
5.2.2	Rating for short-time duty		N/A
5.2.3	Rating for periodic duty		N/A
5.2.4	Rating for non-periodic duty		N/A
5.2.5	Rating for duty with discrete constant loads		N/A

EN 60034-1			
Cl.	Requirement - Test	Result - Remark	Verdict
5.2.6	Rating for equivalent loading		N/A
5.3	Selection of a class of rating		P
	General purpose machine has rating for continuous running duty		N
	If duty not specified by purchaser S1 applies		P
	Short-time duty, S2 applies		N/A
	Varying loads and no-load, S3 to S8 applies		N/A
	Non-periodical variable loads at variable speeds, S9 applies		N/A
	Discrete constant loads, S10 applies		N/A
5.4	Allocation of outputs to class of rating		P
	For duty types S1 to S8, the specified value(s) of the constant load(s) shall be the rated output(s), see 4.2.1 to 4.2.8.	All models are S1	P
	For duty types S9 and S10, the reference value of the load based on duty type S1 shall be taken as the rated output, see 4.2.9 and 4.2.10.		N/A
5.5	Rated output		P
5.5.1	DC generators		N/A
	Output at terminals (W) ..... :		N/A
5.5.2	AC generators		N/A
	Apparent power at terminals (VA) ..... :		N/A
	Power factor ..... :		N/A
	Rated power factor for synchronous generators 0.8 lagging (over-exited)		N/A
5.5.3	Motors		P
	Mechanical power at shaft (W)..... :		P
5.5.4	Synchronous condensers		N/A
	Reactive power at terminals (var) ..... :		N/A
5.6	Rated voltage		N/A
5.6.1	DC generators		N/A
	For small range of voltage, rated output and output factor applies at any voltage within range		N/A
5.6.2	AC generators		N/A
	Small range of voltage, rated output and output factor applying at any voltage within range		N/A
5.7	Coordination of voltages and outputs		N/A

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Cl.	Requirement - Test	Result - Remark	Verdict
	For machines with rated voltages above 1 kV, preferred rated voltages are selected according to rated output as stated in table		N/A
5.8	Machines with more than one rating		N/A
	Complying with standard for each rating		N/A
	Multi-speed motors rating assigned for each speed		N/A
	For varying rated quantities rating s stated at limits		N/A
6	**SITE OPERATING CONDITIONS**		P
6.1	General		P
	Machine suitable for operating conditions as stated in section 5		P
6.2	Altitude		P
	Not exceeding 1 000 m		P
6.3	Maximum ambient air temperature		P
	Not exceeding +40 ℃	See the manual	P
6.4	Minimum ambient air temperature		P
	Not less than –15 ℃	See the manual	P
	Not less than 0 ℃ if one or more exceptions apply		N/A
6.5	Water coolant temperature		N/A
	For the reference water coolant temperature see Table 4. For other water coolant temperatures see Table 9. The water coolant temperature shall not be less than +5 ℃.	No water-cooling.	N/A
6.6	Storage and transport		P
	Minimum specified temperature if different from that in 5.4 (℃) ..... :		P
6.7	Purity of hydrogen coolant		N/A
	Operation at hydrogen content of ≥ 95 %	No hydrogen cooling.	N/A
	For calculating efficiency in accordance with IEC 60034-2 (all parts), the standard composition of the gaseous mixture shall be 98 % hydrogen and 2 % air by volume, at the specified values of pressure and temperature of the re-cooled gas, unless otherwise agreed. Windage losses shall be calculated at the corresponding density.		N/A
7	**ELECTRICAL OPERATING CONDITIONS**		**P**

EN 60034-1			
Cl.	Requirement - Test	Result - Remark	Verdict
7.1	Electrical supply		P
	Rated voltage of three-phase machines derived from IEC 60038	Pass muster comply with the requirements	P
7.2	Form and symmetry of voltages and currents		P
7.2.1	AC motors		P
7.2.1.1	AC motors supplied from power supply (AC generator) of fixed frequency suitable for operation on supply voltage having harmonic voltage factor not exceeding:		P
	0.02 for single and three phase motors	Pass muster	P
	0.03 for design N motors		N/A
7.2.1.2	AC motors supplied from static converters		P
7.2.2	AC generators		N/A
	Complying with requirements	Single phase motor	N/A
7.2.3	Synchronous machines		N/A
	Maximum I2/IN value for continuous operation .. :		N/A
	Maximum (I2/IN)2 x t in seconds at single fault condition ..... :		N/A
7.2.4	DC motors supplied from static power converters		N/A
	Complying with requirements		N/A
7.3	Voltage and frequency variations during operation		P
	Figure 11 used for generators and synchronous condensers		N/A
	Figure 12 used for motors		N/A
	Machine capable of performing its primary function within Zone A	Tested and passed	P
	Machine capable of performing its primary function within Zone B with deviations	Tested and passed	P
7.4	Three-phase AC machines operating on unearthed systems		N/A
	Machine able to operate at earthed neutral		N/A
	Machine able to operate at unearthed systems with one line at earth potential for short duration		N/A
7.5	Voltage (peak and gradient) withstand levels		P
	Limiting value for peak voltage (V) ..... :		N/A
	Limiting value for voltage gradient ..... :		N/A
	For cage induction motors within the scope of IEC 60034-12		N/A
	For high-voltage a.c. motor		N/A

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Cl.	Requirement - Test	Result - Remark	Verdict
	For creepage and clearance distances of bare live copper, see IEC 60664-1.	Creepage distances: 6.6mm	P
8	**THERMAL PERFORMANCE AND TESTS**		P
8.1	Thermal class		P
	Thermal classification of windings according to IEC 60085 ..... :	Class F	P
8.2	Reference coolant		P
	Primary coolant ..... :	Air	P
	Method of cooling ..... :		P
	Secondary coolant ..... :	Air	P
	Table number..... :		P
8.3	Conditions for thermal tests		P
8.3.1	Electrical supply		N/A
	Complying with requirements		N/A
8.3.2	Temperature of machine before test		P
	Temperature of winding measured before the test shall not different from the coolant temperature by more than 2K	Not differ from the coolant by more than 2 K	P
	For short-time rating (S2) temperature of winding measured before the test within 5 K of coolant temperature		N/A
8.3.3	Temperature of coolant		P
	A machine may be tested at any convenient value of coolant temperature.	Be tested at any convenient value of coolant temperature	P
8.3.4	Measurement of coolant temperature during test		P
	Mean value of readings during last quarter taken as value; variations of temperature of coolant minimized		P
8.3.4.1	Open machines or closed machines without heat exchangers (cooled by surrounding ambient air or gas)		P
	Several detectors placed around the machine at halfway at distance of 1 m to 2 m; detectors protected from radiant heat and draught		P
8.3.4.2	Machines cooled by air or gas from a remote source through ventilation ducts and machines with separately mounted heat exchangers		N/A
	Temperature of the primary coolant measured where it enters the machine		N/A
8.3.4.3	Closed machines with machine-mounted or internal-heat exchangers		N/A

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Cl.	Requirement - Test	Result - Remark	Verdict
	Temperature of primary coolant measured where it enters the machine; for machines having water-cooled or air-cooled heat exchangers, temperature of secondary coolant measured where it enters the heat exchanger		N/A
8.4	Temperature rise of a part of a machine		P
	Temperature measured at the end of the test		P
8.5	Methods of measurement of temperature		P
	Recognized method used	Resistance method for winding temperature rise, ETD method for other parts of motor	P
8.6	Determination of winding temperature		P
8.6.1	Choice of method		P
	Rated output (W or VA) ..... :		P
	Method for measuring winding temperature ..... :	Resistance method	P
	Thermometer method only used in following cases:		N/A
	a) When not practicable to determine temperature rise by resistance method		N/A
	b) Single layer windings, rotating or stationary.		N/A
	c) During routine tests on machines manufactured in large numbers		N/A
8.6.2	Determination by resistance method		P
8.6.2.1	Measurement		P
	One of following methods used:		P
	Direct measurement	Applied.	P
	Measurement by DC current/voltage in DC	Not applied.	N/A
	measurement by DC. current/voltage in DC	Not applied.	N/A
	Superstition method	Not applied.	N/A
8.6.2.2	Calculation		P
	Temperature (θ_1) of winding (cold) at moment of initial resistance measurement (℃) ..... :	See appended table	P
	Temperature (θ_1) of coolant at end of test (℃).... :	See appended table	P
	Resistance (R_1) of winding (cold) at temperature θ_1 (Ω) ..... :	See appended table	P
	Resistance (R2) of winding (hot) at end of test / at temperature θ_2 (Ω) ..... :	See appended table	P
	Reciprocal of temperature coefficient (k) ..... :	235	P
	Temperature rise ($\theta_2 - \theta_a$) (K) ..... :	See appended table	P

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Cl.	Requirement - Test	Result - Remark	Verdict
8.6.2.3	Correction for stopping time		P
8.6.2.3.1	General		P
8.6.2.3.2	Short stopping time		P
	Initial reading obtained within time interval specified in table 4	Initial measurement made within 30 s	P
8.6.2.3.3	Extended stopping time		N/A
	Initial reading obtained within twice the time interval specified in table 4		N/A
	Value at time of shutdown determined through extrapolation		N/A
8.6.2.3.4	Windings with one coil-side per slot		N/A
	Direct measurement only used if machine comes to stop within time interval specified in table 4		N/A
8.6.3	Determination by ETD method		N/A
8.6.3.1	General		N/A
8.6.3.2	Two or more coil-sides per slot		N/A
	Detectors located between insulated coil-sides within slot in positions which highest temperature are likely to occur		N/A
8.6.3.3	One coil-side per slot		N/A
	Detectors located between wedge and outside of winding insulation in positions which highest temperature are likely to occur		N/A
8.6.3.4	End windings		N/A
	Detectors located between two adjacent coil-sides within end windings in positions where highest temperature are likely to occur; sensing point in close contact with surface of coil-side and adequately protected against influence of coolant		N/A
8.6.4	Determination by thermometer method		N/A
	Thermometer placed at hottest accessible spot	Not used for winding temperature determination.	N/A
8.7	Duration of thermal tests		P
8.7.1	Rating for continuous running duty		N/A
	Test continued until thermal equilibrium has been reached		N/A
8.7.2	Rating for short-time duty		P
	Test duration as specified in rating		P
8.7.3	Rating for periodic duty		N/A
	Rated for equivalent loading applied until thermal equilibrium has been reached		N/A

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Cl.	Requirement - Test	Result - Remark	Verdict
	Test on actual duty load cycle and continued until practically identical temperature cycles are obtained		N/A
8.7.4	Rating for non-periodic duty and for duty with discrete constant loads		N/A
	Rated for equivalent loading applied until thermal equilibrium has been reached		N/A
8.8	Determination of the thermal equivalent time constant for machines of duty type S9		N/A
	Thermal equivalent time constant determined from plotted cooling curve		N/A
8.9	Measurement of bearing temperature		P
	Thermometer method or ETD method used		P
	Measuring point for as near as possible to one of the two locations specified in table 5		P
	Thermal resistance between temperature detector and object minimized		P
8.10	Limits of temperature and temperature rise		P
8.10.1	Indirect cooled windings		P
	Temperature rises not exceeding limits of table 7 or 8	Not exceed 110℃	P
	For other operating site conditions, ratings other than continuous running duty, rated voltages greater than 12 000 V, limits adjusted according to table 9 and 10	Ordinary operating conditions.	N/A
	For test site conditions differing from operating site conditions, limits adjusted according to table 11	Not differing extensively.	N/A
8.10.2	Direct cooled windings		N/A
	Temperatures not exceeding limits of table 12		N/A
	For other operating site conditions limits adjusted according to table 13		N/A
	For test site conditions differing from operating site conditions, limits adjusted according to table 14		N/A
8.10.3	Adjustment to take account of hydrogen purity on test		N/A
	Hydrogen content between 95 – 100 %		N/A
8.10.4	Permanently short-circuited windings, magnetic cores and all structural components (other than bearings) whether or not in contact with insulation		P
	Temperature rise / Temperature not detrimental to insulation		P
8.10.5	Commutators and sliprings, open or enclosed and their brushes and brushgear		N/A
	Temperature rise / Temperature not detrimental to insulation		N/A

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Cl.	Requirement - Test	Result - Remark	Verdict
	Temperature rise / Temperature not exceeding that at which combination of brush grade and commutator or slipring material can handle current over full operating range		N/A
9	**OTHER PERFORMANCE AND TESTS**		P
9.1	Routine tests		P
9.2	Withstand voltage test		P
	Test Voltage applied between windings under test and frame of machine		P
	Withstand voltage test carried out immediately after the thermal test		P
	Polyphase machines with rated voltages above 1 kV having both ends of each phase individually accessible, test carried out for each phase	Rated voltage 254.4V AC	N/A
	Test voltage applied for 1 min		P
	Test voltage (V)..... :	2U+1000V=1480V	P
9.3	Occasional excess current		P
9.3.1	General		P
9.3.2	Generators		N/A
	AC generators with output not exceeding 1 200 MVA capable of withstanding current of 1.5 times rated current for 30 s		N/A
	AC generators with output exceeding 1 200 MVA capable of withstanding current of 1.5 times rated current for at least 15 s		N/A
9.3.3	Motors (except commutator motors and permanent magnet motors)		P
	Polyphase motors having rated outputs not exceeding 315 kW and rated voltages not exceeding 1 kV capable of withstanding current equal to 1.5 times rated current for not less than 2 min	Pass muster	P
9.3.4	Commutator machines		N/A
	Capable of withstanding 1.5 times rated current for 60 s for specified conditions		N/A
9.4	Momentary excess torque for motors		P
9.4.1	Polyphase induction motors and DC motors		N/A
	Capable of withstanding for 15 s excess torque of 60 % of rated torque; motor for duty type S9 capable of withstanding momentarily excess torque determined according to duty specified		N/A
	For d.c. motors, the torque shall be expressed in terms of overload current.		N/A

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Cl.	Requirement - Test	Result - Remark	Verdict
	Motors for duty type S9 shall be capable of withstanding momentarily an excess torque determined according to the duty specified.		N/A
	Motors intended for specific applications that require a high torque (for example for hoisting) shall be the subject of agreement.		P
	For cage-type induction motors specially designed to ensure a starting current of less than 4,5 times the rated current, the excess torque can be below the value of 60 % given in paragraph 1, but not less than 50 %.		N/A
	In the case of special types of induction motors with special inherent starting properties, for example motors intended for use at variable frequency or induction motors supplied from static converters, the value of the excess torque shall be the subject of agreement.		N/A
9.4.2	Polyphase synchronous motors		N/A
	Unless otherwise agreed, a polyphase synchronous motor, irrespective of the duty, shall be capable of withstanding an excess torque as specified below for 15 s without falling out of synchronism, the excitation being maintained at the value corresponding to rated load. When automatic excitation is used, the limits of torque shall be the same values with the excitation equipment operating under normal conditions:		N/A
	– synchronous (wound rotor) induction motors: 35 % excess torque;		N/A
	– synchronous (cylindrical rotor) motors: 35 % excess torque;		N/A
	– synchronous (salient pole) motors: 50 % excess torque.		N/A
9.4.3	Other moters		P
	The momentary excess torque for single-phase, commutator and other motors shall be the subject of agreement.		P
9.5	Pull-up torque		P
	Unless otherwise specified (for example machines according to IEC 60034-12), the pull-up torque of cage induction motors under full voltage shall be not less than 0,3 times the rated torque.:	Not less than 0.3 times the rated torque.	P
9.6	Safe operating speed of cage induction motor		P
	All three-phase single cage induction motors of frame number up to and including 315, shall be capable of safe continuous operation at speed up to the appropriate speed given in table 17, unless otherwise stated on rating plate.	1.2 times the maximum safe operating speed	P
9.7	Overspeed		P
	Withstanding speed specified in table 18	1,2 times rated speed for 2min	P
9.8	Short-circuit current for synchronous machines		N/A

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Cl.	Requirement - Test	Result - Remark	Verdict
	Peak value of short-circuit current of synchronous machines not exceeding 15 times peak value or 21 times the r.m.s. value of rated current		N/A
	Rated current (peak / r.m.s.) (A)..... :		N/A
	Measured / calculated short-circuit current (A) .. :		N/A
9.9	Short-circuit withstand test for synchronous machines		N/A
	Requested by purchaser		N/A
	Machine running on no-load with excitation corresponding to rated voltage, short circuit maintained for 3 s		N/A
	No harmful deformation, dielectric strength test not resulting in breakdown		N/A
9.10	Commutation test for commutator machines		N/A
	Capable of operating from no-load to operation with excess current or excess torque specified in 8.2 and 8.3 without permanent damage to surface of commutator and brushes, no injurious sparking, brushes remaining in same set position		N/A
9.11	Total Harmonic Distortion (THD) for synchronous machines		N/A
9.11.1	General		N/A
9.11.2	Limits		N/A
	Not exceeding limit		N/A
9.11.3	Tests		N/A
	THD limit (%)..... :		N/A
	THD measured (%)..... :		N/A
10	**RATING PLATES**		P
10.1	General		P
	Machine provided with rating plate, durable and securely mounted		P
	Rating plate mounted on frame, easily legible		P
	Second rating label requested by purchaser		N/A
10.2	Marking		P
	Machines with rated output not exceeding 750 W (VA) and special-purpose built-in machines with rated output not exceeding 3 kW (kVA) marked with items 1, 2, 11, 12, (26) as minimum	See copy of marking plate	P
	Other machines marked with the following as far as applicable:		P
	a) Manufacturer's name or mark..... :	See copy of marking plate	P

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Cl.	Requirement - Test	Result - Remark	Verdict
	b) Manufacturer's serial number, or identification mark ..... :	See copy of marking plate	P
	c) Year of manufacture (or as code as part of item 2))..... :	See copy of marking plate	P
	d) Manufacturer's machine code..... :	See copy of marking plate	P
	e) For AC machines, number of phases ..... :	See copy of marking plate	P
	f) Number(s) of rating and performance standard(s) which are applicable (IEC 60034-X and/or equivalent national standard(s))..... :	See copy of marking plate	P
	g) Degree of protection provided by enclosures (IP code) in accordance with IEC 60034-5 ..... :		P
	h a) Thermal classification or permissible temperature rise ..... :	F	P
	h b) If necessary, method of measurement, followed in case of machine with water-cooled heat exchanger by “P” or “S”..... :	Air-cooled	N/A
	i) Class(es) of rating of machine if designed for other than rating for continuous running duty type S1 ..... :	S1	N/A
	j) Rated output(s) (W or VA)..... :		P
	k) Rated voltage(s) or range of rated voltage (V) . :	220-240V	P
	l a) For AC machines rated frequency or range of rated frequencies (Hz) ..... :	50/60Hz	P
	m b) For universal motors, rated frequency (Hz) followed by appropriate symbol ..... :		N/A
	o) Rated current(s) (A)..... :		N/A
	p) Rated speed(s) or range of rated speeds (min-1 or 1/min)..... :		N/A
	q) Permissible overspeed, if other than specified in 9.7 (min-1 or 1/min)..... :		N/A
	r) For DC machines with separate excitation or with shunt excitation and for synchronous machines, rated field voltage (V) and rated field current (A)..... :		N/A
	s) For AC machines, rated power factor(s) ..... :		N/A
	t) For wound-motor induction machines rated open-circuit voltage (V) between slip-rings and rated slip-ring current (A)..... :		N/A

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Cl.	Requirement - Test	Result - Remark	Verdict
	u) For DC motors with armatures intended to be supplied by static power converters, identification code of static power converter in accordance with IEC 60971 (alternatively for motors not exceeding 5 kW, rated form factor and rated alternating voltage at input terminals of static power converter, when this exceeds rated direct voltage of motor armature circuit)		N/A
	v) Maximum permissible ambient temperature, if other than 40 ℃; maximum permissible water temperature, if other than 25℃ (℃)..... :		N/A
	w) Minimum permissible ambient temperature if other than specified in 6.4 (℃) ..... :		N/A
	x) Altitude for which machine is designed (if exceeding 1 000 m above sea level) ..... :	1000m	N/A
	y) For hydrogen-cooled machines, hydrogen pressure at rated output (Pa or bar) ..... :	Air-cooled.	N/A
	z) When specified, approximate total mass of machine, if exceeding 30 kg (kg)..... :	see the nameplate	P
	aa) For machines suitable for operation in only one direction of rotation, direction of rotation, indicated by arrow; arrow easily visible		P
	bb) The connecting instructions in accordance with IEC 60034-8 by means of a diagram or text located near the terminals.	Paste in the terminal box	P
	Two different rated values shall be indicated by		N/A
	If winding of machine is partially or totally repaired or changed by other than manufacturer, additional plate provided indicating repair contractor's name, year of repair and changes made.	New machine	N/A
11	**MISCELLANEOUS REQUIREMENTS**		**P**
11.1	Protective earthing of machines		P
	Machines shall be provided with an earthing terminal or another device to permit the connection of a protective conductor or an earthing conductor		P
	Appropriate symbol or legend used		P
	However , machines shall neither be earthed nor be provide with an earthing terminal when:		N/A
	1) they are fitted with supplementary insulation, or		N/A

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Cl.	Requirement - Test	Result - Remark	Verdict
	2) they are intended for assembly in apparatus having supplementary insulation, or		N/A
	3) they have rated voltages up to 50V a.c. or 120V d.c. and are intended for use on SELV circuits.		N/A
	Machines with rated voltages greater than AC 50 V or DC 120 V, but not exceeding AC 1 000 V or DC 1 500 V terminal for earth conductor situated in vicinity of terminals for line conductors, inside terminal box (if provided); machines having rated outputs exceeding 100 kW provided with in addition, with earth terminal fitted on frame	Earth terminal fitted on frame covered by terminal box.	P
	Machines with rated voltages greater than AC 1 000 V or DC 1 500 V provided with earth terminal on frame and in addition, means inside terminal box for connecting conducting cable sheath (if any)	Rated voltage not exceeding 1 000 V.	N/A
	Accessible conducting parts have good electrically conducting connection with earth terminal; if all bearings and rotor winding of machine are insulated, shaft electrically connected to earth terminal (unless manufacturer and purchaser agree to alternative means of protection)	Bearings not insulated	P
	If earth terminal provided in terminal box, earth conductor made of same metal as live conductors		N/A
	If earth terminal provided on frame, earth conductor made of another metal, proper consideration given to conductivity of conductor		P
	Earth terminal designed to accommodate earth conductor of cross-sectional area in accordance with table 19		N/A
	Cross-sectional area of live conductors (mm2) ... :		N/A
	Cross-sectional area of earth conductor (mm2) .. :		N/A
	The earth terminals shall be identified in accordance with IEC60445		P
11.2	Shaft-end key(s)		N/A
	If machine shaft end provided with one or more keyways, keyway provided with full key of normal shape and length		N/A
12	**TOLERANCES**		**P**
	Tolerances as specified in table 20		P
13	**Electromagnetic compatibility (EMC)**	See EMC test report	N/A
13.1	General (**see the EMC test reports)**		N/A

EN 60034-1			
Cl.	Requirement - Test	Result - Remark	Verdict
	Rotating machine with rated voltage not exceeding AC 1 000 V or DC 1 500 V		N/A
	Electronic components mounted inside rotating electrical machine and essential for its operation	No electronic components mounted inside rotating	N/A
13.2	Immunity		N/A
13.2.1	Machines not incorporating electronic circuits		
	Machines without electronic circuits are not sensitive to electromagnetic emissions, no immunity tests are required.		N/A
13.2.2	Machines incorporating electronic circuits		N/A
	As electronic circuits which are incorporated in machines generally utilize components that are passive, immunity tests are not required.		N/A
13.3	Emission		N/A
13.3.1	Machines without brushes		N/A
	Radiated and conducted emissions shall comply with the requirements of CISPR 11, Class B, Group 1, see Table B.1		N/A
13.3.2	Machines with brushes		N/A
	Radiated and conducted (if applicable) emissions shall comply with the requirements of CISPR 11, Class A, Group 1, see Table B.2		N/A
13.4	Immunity tests		N/A
	Immunity tests are not required.		N/A
13.5	Emission tests		N/A
	Type tests shall be carried out in accordance with CISPR 11, CISPR 14 and CISPR 16 as applicable		N/A
13.5.1	Machines without brushes		N/A
	Machines without brushes shall comply with the emission limits of 13.3.1.		N/A
13.5.2	Machines with brushes		N/A
	Machines with brushes, when tested at no-load, shall comply with the emission limits of 13.3.2		N/A

Appendix I
Photo documentation
Circulation Pump
COSMO-C 32-12-180

Detail of: COSMO-C 32-12-180

View:

[X] general

[ ] front

[ ] rear

[ ] right

[ ] left

[ ] top

[ ] bottom

Detail of: COSMO-C 32-12-180

View:

[ ] general

[ ] front

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Appendix I
Photo documentation
Circulation Pump
COSMO-C 32-12-180

Detail of: COSMO-C 32-12-180

View:

[ ] general

[ ] front

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Detail of: COSMO-C 32-12-180

View:

[ ] general

[ ] front

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Appendix I
Photo documentation
Circulation Pump
COSMO-C 32-12-180

Detail of: COSMO-C 32-12-180

View:

[ ] general

[ ] front

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[ ] top

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Detail of: Internal view for COSMO-C 32-12-180

View:

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Appendix I
Photo documentation
Circulation Pump
COSMO-C 32-12-180

Detail of: Earthing for COSMO-C 32-12-180

View:

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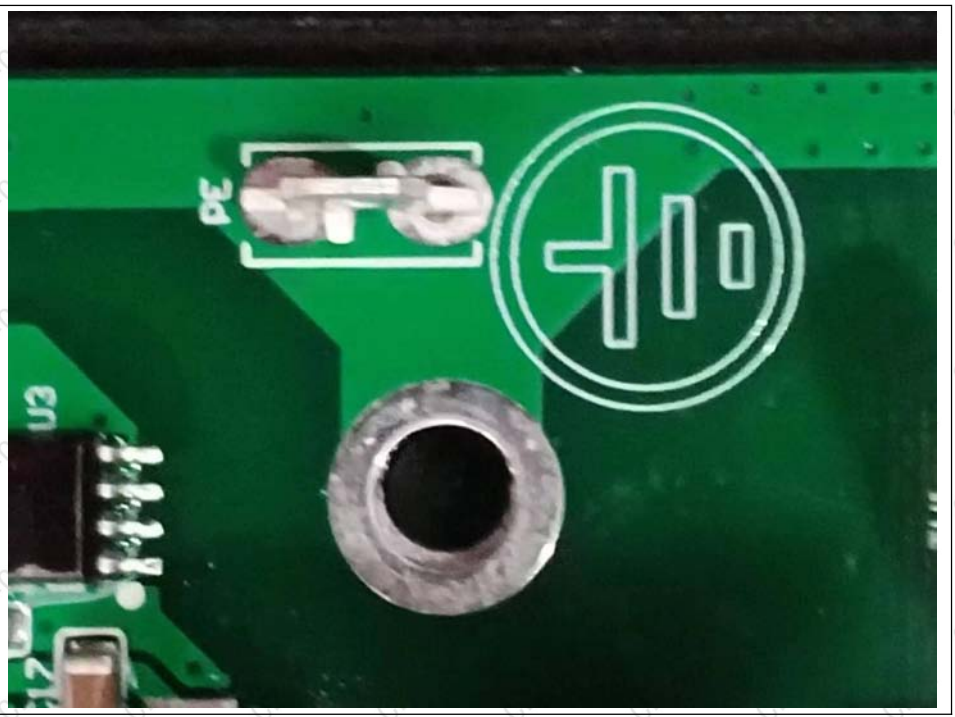

Detail of: Control panel for COSMO-C 32-12-180

View:

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Appendix I
Photo documentation
Circulation Pump
COSMO-C 32-12-180

Detail of: Power cord for COSMO-C 32-12-180

View:

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Detail of: Plug for COSMO-C 32-12-180

View:

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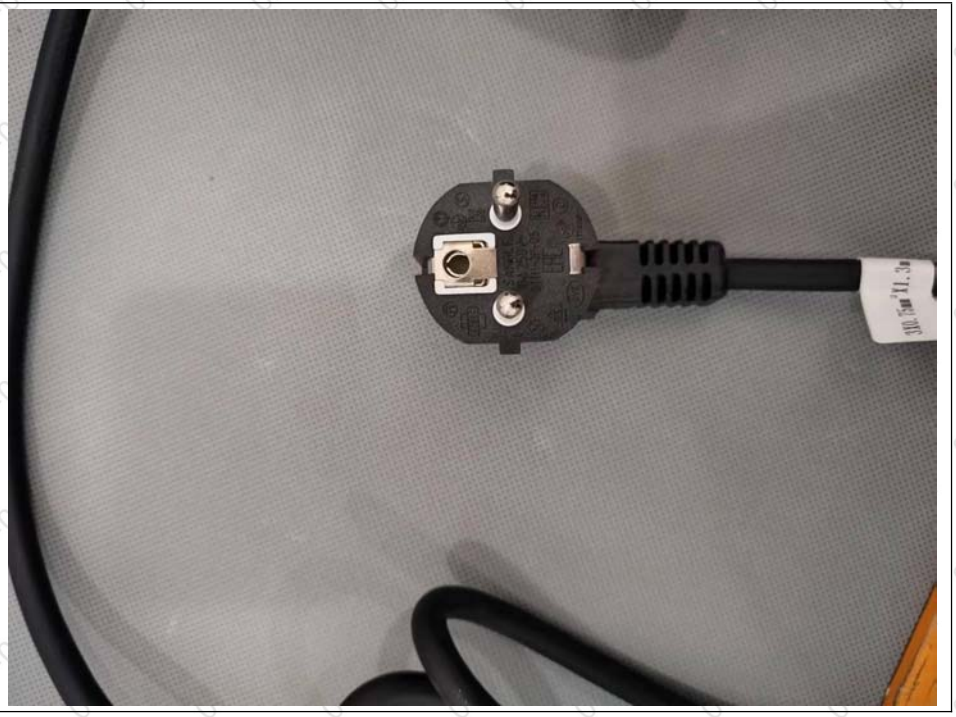
[ ] top
[ ] bottom



REMARKS

1. This report is invalid without the seal of special stamp for OViS test report and invalid if altered.

2. The copy of this report is invalid without a new seal of special stamp for OViS test report and invalid if altered.

3. This report is invalid without seals or signatures of Tester,Checker and Approval.

4. If there is no special announcement in this report,the informat ion of producer and samples is not identified by OViS,the customer is responsible for truth of the samples.

5. Objections to the test report must be submitted to OViS within 15 days.

6. The test results shown in this report is only applicable for the samples supplied directly by the customer and accepted by the test organization,the customer shall not propagandize improperly without permission by OViS.

7. “P” means “pass” , “F” means “fail”, “N/A`” or “—” means “not applicable” and “ / ”means “not test”.

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