



APPLICATION FOR LOW VOLTAGE DIRECTIVE
On Behalf of
Ningbo Star Win Actuators Manufacture Co., LTD.
Electric Actuator
Model: TS05-230S
Other models see the list on Page 3 of the report

Prepared for : Ningbo Star Win Actuators Manufacture Co., LTD.
No.16, Guofan Road, Sanheng Development Zone, Fenghua
Area, Ningbo City, China(315504)

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Date of Test: Apr.11,2019-Apr.19,2019

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Report No.: EZT20190418096SR

Test Report

EN60335-1

Household and similar electrical appliances-safety part 1:General requirements

Report reference No EZT20190418096SR

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Date of issue Apr.19,2019

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Applicant's Name Ningbo Star Win Actuators Manufacture Co., LTD.

Address No.16, Guofan Road, Sanheng Development Zone, Fenghua Area,
Ningbo City, China(315504)

Standard..... EN 60335-1:2012+A11:2014
EN 62233:2008

Test procedure LVD Approval

Procedure deviation N/A

Non-standard test method N/A

Test item description Electric Actuator

Manufacturer Ningbo Star Win Actuators Manufacture Co., LTD.

Manufacturer address No.16, Guofan Road, Sanheng Development Zone, Fenghua Area,
Ningbo City, China(315504)

Trademark N/A

Model and/or type reference TS05-230S (other model see list)

Rating(s) 230V~ 50Hz 5W







Test item particulars :	
Equipment mobility	Portable equipment
Operating condition.....	Continuous
Tested for IT power systems	N/A
IT testing, phase-phase voltage (V)	N/A
Class of equipment	Class II
Protection against ingress of water	IP54
Test case verdicts:	
Test case does not apply to the test object	N(/A.)
Test item does meet the requirement.....	P(ass)
Test item does not meet the requirement.....	F(ail)
Testing:	
Date of receipt of test item :	Apr.11,2019
Date(s) of performance of test :	Apr.11,2019-Apr.19,2019

Model List

Model List	
Test Model	TS05-230S
Other Models	BLF230-5, BFL230-5
1. All tests are carried out on TS05-230S 2. All models have same diagram circuit, PCB layout, except different model names and components relevant to different power	

Marking Label

Electric Actuator Model: TS05-230S Rated: 230V~ 50Hz 5W     Ningbo Star Win Actuators Manufacture Co., LTD. MADE IN CHINA
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<p>General remarks:</p> <p>"(see remark #)" refers to a remark appended to the report.</p> <p>"(see appended table)" refers to a table appended to the report.</p> <p>Throughout this report a comma is used as the decimal separator.</p> <p>The test results presented in this report relate only to the object tested.</p> <p>This report shall not be reproduced except in full without the written approval of the testing laboratory.</p> <p>When determining the test conclusion, the Measurement Uncertainty of test has been considered.</p> <p>.</p> <p>Unless otherwise specified, test are made under normal conditions at an ambient temperature within the range of 15°C to 35°C, RH45% to 75% and an air pressure of 860mbar of 1060mbar</p>	<p>Attachment with:</p> <ol style="list-style-type: none">1.EN62233:2008 Measurement methods for electromagnetic fields of household appliances and similar apparatus with regard to human exposure2.Equipment list3.photo documentation
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EN 60335-1			
Clause	Requirement - Test	Result - Remark	Verdict
5	GENERAL CONDITIONS FOR THE TESTS		P
	Tests performed according to Cl. 4, e.g. nature of supply, sequence of testing, etc.		P
5.1	Tests according to this standard are type tests		P
5.2	Test are carried out on a single appliance that shall withstand all the relevant test however ,the tests of clauses		P
	Additional sample may be required if the appliance has to be tested under different conditions ,for example if it can be supplied with different voltage		P
	If an intentionally weak part becomes open circuit during the tests of clause 19,an additional appliance may be needed		N/A
5.3	The test are carried out in the order of the clause .however ,the test of 22.11 on the appliance at room temperature is carried out before the test of clause 8.		P
5.4	When test appliance that are also supplied by other energies such as gas ,the influence of their consumption has to be taken into account		P
5.5	The tests are carried out with the appliance or any movable part of it placed in the most unfavourable position that may occur in normal use		N/A
5.6	Appliances provided with controls or switching devices are tested with these controls or devices adjusted to their most unfavourable setting, if the setting can be altered by the user		P
5.7	The tests are carried out in a draught-free location at an ambient temperature of $20^{\circ}\text{C} \pm 5^{\circ}\text{C}$	23.5 °C	P
5.8	Test conditions relating to frequency and voltage		P
5.8.1	Appliances for a.c. only are tested with a.c. at rated frequency, and those for a.c. and d.c. are tested at the more unfavourable supply		P
5.8.1	Appliances having more than one rated voltage are tested on the basis of the most unfavourable voltage		N/A
5.8.3	For heating appliances, and combined appliances, marked with a rated power input range, when it is specified that the power input is equal to the rated power input multiplied by a factor, the appliance is operated at		N/A
	the upper limit of the rated power input range multiplied by this factor, if greater than 1;		N/A
	the lower limit of the rated power input range multiplied by this factor, if smaller than 1.		N/A



EN 60335-1			
Clause	Requirement - Test	Result - Remark	Verdict
5.9	When alternative heating elements or accessories are made available by the appliance manufacturer, the appliance is tested with those elements or accessories which give the most unfavourable results.		N/A
5.10	The tests are carried out on the appliance as supplied. However, an appliance constructed as a single appliance but supplied in a number of units is tested after assembly in accordance with the instructions provided with the appliance		P
5.11	Appliances intended to be connected to fixed wiring by means of a flexible cord are tested with the appropriate flexible cord connected to the appliance		N/A
5.12	For heating appliances and combined appliances, when it is specified that the appliance has to operate at a power input multiplied by a factor, this applies only to heating elements without appreciable positive temperature coefficient of resistance		N/A
5.13	The tests for appliances with PTC heating elements and for heating appliances and combined appliances where the heating elements are supplied via a switch mode power supply are carried out at a voltage corresponding to the specified power input		N/A
5.14	If class 0I appliances or class I appliances have accessible metal parts that are not earthed and are not separated from live parts by an intermediate metal part that is earthed, such parts are checked for compliance with the appropriate requirements specified for class II construction		N/A
5.15	If appliances have parts operating at safety extra-low voltage, such parts are checked for compliance with the appropriate requirements specified for class III construction		N/A
5.16	When testing electronic circuits, the supply is to be free from perturbations from external sources that can influence the results of the tests		N/A
5.17	Appliances powered by rechargeable batteries are tested in accordance with Annex B		P

6	CLASSIFICATION		P
6.1	Appliances shall be of one of the following classes with respect to protection against electric shock: class I, class II, class III.	Class II	P
6.2	Appliances shall have the appropriate degree of protection against harmful ingress of water		P



EN 60335-1			
Clause	Requirement - Test		Verdict
7	Marking and instructions		P
7.1	rated voltage or rated voltage range	See marking table	P
	symbol for nature of supply, unless the rated frequency is marked		P
	rated power input in watts or rated current in amperes	See marking table	P
	name, trade mark or identification mark of the manufacturer or responsible vendor	See marking table	P
	model or type reference	See marking table	P
	symbol IEC 60417-5172 (2003-02) for class II appliances only	See marking table	P
	IP number according to degree of protection against ingress of water, other than IPX0	IP54	P
7.2	Stationary appliances for multiple supply shall be marked with the substance of the following		N/A
	Before obtaining access to terminals, all supply circuits must be disconnected. This warning shall be placed in the vicinity of the terminal cover		N/A
7.3	Range of rated values correctly marked		N/A
7.4	Voltage setting clearly discernible		N/A
7.5	Marking of rated input for each rated voltage		N/A
	Marking for upper and lower limits of rated input		N/A
7.6	Correct symbols used		P
7.7	Correct connection diagram, fixed to the appliance		N/A
7.8	Not for type Z attachment:		N/A
	- marking of terminals for the neutral conductor (N)		N/A
	- marking of earthing terminals		N/A
	- marking not placed on removable parts		N/A
	- marking of terminal for single-pole protective device		N/A
7.9	Marking or placing of switches which may cause a hazard	Switches did not cause a hazard	N/A
7.10	Indications of switches and regulating devices by use of figures, letters or other		P
	The figure 0 indicates only OFF position, unless no confusion with the OFF position		P
7.11	Indication for direction of adjustment of controls		P
7.12	Instructions for safe use provided		P
7.12.1	Sufficient details for installation or maintenance supplied		P



EN 60335-1			
Clause	Requirement - Test	Result - Remark	Verdict
7.12.2	Means for disconnection with contact separation at least 3 mm		N/A
7.12.3	Insulation in contact with parts exceeding 50 K; instruction		N/A
7.12.4	Information with regard to building-in:		N/A
	- dimensions of space		N/A
	- dimensions and position of support		N/A
	- ventilation openings		N/A
	- connection/interconnection plug accessible		N/A
7.12.5	Replacement cord, type X attachment		N/A
	Replacement cord, type Y attachment		P
	Replacement cord, type Z attachment		N/A
7.12.6	The instructions for heating appliances incorporating a non-self-resetting thermal cut-out		N/A
7.12.7	The instructions for fixed appliances shall state how the appliance is to be fixed to its support		N/A
7.12.8	The instructions for appliances connected to the water mains shall state		N/A
	the maximum inlet water pressure, in pascals		N/A
	the minimum inlet water pressure, in pascals, if this is necessary for the correct operation of the appliance		N/A
7.13	Instructions and other texts in official language	English	P
7.14	Marking easily legible and durable		P
7.15	Marking on a main part		P
	Marking clearly discernible from outside		P
	Stationary appliance: name or trademark and model or type reference visible after installation		P
	Indication for switches and controls in vicinity of components; not on removable parts if misleading		P
7.16	Marking of a possible replaceable thermal link or fuse link clearly visible with regard to replacing the link.		N/A
8	PROTECTION AGAINST ACCESSIBILITY TO LIVE PARTS		P
8.1	Adequate protection against accidental contact with live parts		P
8.1.1	All positions; detachable parts removed		N/A
	Removal of lamps: protection against contact with live parts		N/A

EN 60335-1			
Clause	Requirement - Test	Result - Remark	Verdict
	Use of test finger: no contact with live parts		N/A
8.1.2	Use of test pin: no contact with live parts		P
8.1.3	Use of test probe 41 : no contact with live parts of visible glowing heating elements	No visible glowing heating elements	N/A
8.1.4	Accessible part not considered live if:		N/A
	- extra-low a.c. voltage: peak values not exceeding 42,4 V		N/A
	- extra-low d.c. voltage: not exceeding 42,4 V		N/A
	- or separated from live parts by protective impedance, d.c. current not exceeding 2 mA		N/A
	- or separated from live parts by protective impedance, a.c. peak value not exceeding 0,7 mA		N/A
	- for peak value 42,4 V up to and including 450 V capacitance not exceeding 0,1 μ F		N/A
	- for peak value 450 V up to and including 15 kV capacitance not exceeding 0,1 μ F		N/A
8.1.5	Live parts of built-in appliances, fixed appliances and appliances delivered in separate units, shall be protected at least by basic insulation before installation or assembly.		N/A
	- built-in appliances		N/A
	- fixed appliances		N/A
	- separate units		N/A
8.2	Class II appliances and constructions adequately protected against accidental contact with basic insulation and metal parts separated from live parts with only basic insulation		N/A
10	POWER INPUT AND CURRENT		P
10.1	Power input at rated voltage and normal operating temperature not deviating from rated input by more than shown in table; measured power input (W); rated input (W); deviation	(see appended table)	P
10.2	Current at normal operating temperature not deviating from rated current by more than shown in table; measured current at rated voltage under normal operation (A); rated current (A); deviation		N/A
11	HEATING		P
11.1	No excessive temperatures in normal use		P
11.2	Hand-held appliances are held in their normal position of use		N/A



EN 60335-1			
Clause	Requirement - Test	Result - Remark	Verdict
	With pins for insertion into socket-outlets are plugged into an appropriate wallmounted socket-outlet		N/A
	Built-in appliances are installed in accordance with the instructions		N/A
	Other heating appliances and other combined appliances are placed in a test corner		N/A
	appliances normally fixed to a wall are fixed to one of the walls, as near to the other wall and floor or ceiling as is likely to occur, taking into account the instructions		
	appliances normally fixed to a ceiling are fixed to the ceiling as near to the walls as is likely to occur, taking into account in the instructions		N/A
	Other motor-operated appliances are positioned as follows		N/A
	placed on a floor or table in use are placed on a horizontal support		P
	fixed to a wall are fixed to a vertical support		N/A
	fixed to a ceiling are fixed underneath a horizontal support		N/A
11.3	Temperature rises determined by thermocouples or resistance method	By thermocouples	P
11.5	Motor-operated appliances operated under normal operation at most unfavourable voltage between 0,94 and 1,06 times rated voltage		P
11.7	Operation duration corresponding to the most unfavourable conditions of normal use		P
11.8	During the test, the temperature rises are monitored continuously and shall not exceed the values shown in Table 3	(see appended table)	P
	Protective devices shall not operate and sealing compound shall not flow out		P
13	Leakage current and electric strength at operating temperature		P
13.1	Leakage current not excessive and electric strength adequate		P
13.2	Leakage current measured by means of circuit described in Annex G		P
	Leakage current measurements		P
13.3	Electric strength test of insulation		P
	No breakdown during the test		P



EN 60335-1			
Clause	Requirement - Test	Result - Remark	Verdict

15	MOISTURE RESISTANCE		P
15.1	Enclosure provides the degree of moisture protection according to classification of appliance		N/A
15.1.1	Appliance subjected to test as specified		N/A
	Withstand electric strength test specified in 16.3		N/A
	No trace of water on insulation which can result in a reduction of distances and clearances below values specified in 29.1		N/A
15.1.2	Hand-held appliance turned continuously through the most unfavourable positions during the test		N/A
	Built-in appliance installed according to the manufacturer's instruction		N/A
	Other appliances tested as specified		N/A
15.3	Humidity treatment for 48 h	93%, 25 °C, 48hrs	P
	Withstanding the test of Cl. 16		P

16	LEAKAGE CURRENT AND ELECTRIC STRENGTH		P
16.1	No excessive leakage current and adequate insulation and electric strength (tests 16.2 and 16.3)		P
16.2	Leakage current measurements		P
16.3	Electric strength tests (values in table 5)		P

17	OVERLOAD PROTECTION OF TRANSFORMERS AND ASSOCIATED CIRCUITS		N/A
	No excessive temperatures in transformer or associated circuits in event of short-circuits likely to occur in normal use		N/A
	Appliance supplied with 1,06 or 0,94 times rated voltage and the most unfavourable short-circuit or overload likely to occur in normal use applied		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 6		N/A



Clause	Requirement - Test	Result - Remark	Verdict
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19	ABNORMAL OPERATION		P
19.1	Appliances shall be constructed so that as a result of abnormal or careless operation, the risk of fire, mechanical damage impairing safety or protection against electric shock is obviated as far as is practicable		P
	Electronic circuits shall be designed and applied so that a fault condition will not render the appliance unsafe with regard to electric shock, fire hazard, mechanical hazard or dangerous malfunction		P
19.2	Test of appliance with heating elements with restricted heat dissipation; test voltage (V): power input of 0.85 times rated power input :		N/A
19.3	Test of 19.2 repeated; test voltage (V): power input of 1.24 times rated power input :		N/A
19.4	The appliance is tested under the conditions specified in Clause 11. Any control that limits the temperature during the test of Clause 11 is 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 elements 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 are supplied at rated voltage until steady conditions with regard to power input and temperature are established	No PTC heating	N/A
19.7	Stalling test by locking the rotor if the locked rotor torque is smaller than the full load torque or locking moving parts		P
	Locked rotor, motor capacitors open circuited or short-circuited, if required		N/A
	Appliances with timer or controller supplied with rated voltage for each of the tests, for a period equal to the maximum period allowed		N/A
	Test period at rated voltage (s or min) or until steady state conditions established	Steady state conditions established	P
	Winding temperatures not exceeding limiting temperature; type of appliance; insulation class; measured temperature (°C)		P



EN 60335-1			
Clause	Requirement - Test	Result - Remark	Verdict
19.8	Three-phase motors operated at rated voltage with one phase disconnected		N/A
19.10	Series motor operated at 1,3 times rated voltage for 1 min Parts not ejected from the appliance during test		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 they comply with the conditions specified in 19.11.1		P
19.11.1	Before applying the fault conditions a) to f) in 19.11.2, it is checked if circuits or parts of circuit meet both of the following conditions:		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		N/A
	the protection against electric shock, fire hazard, mechanical hazard or dangerous malfunction in other parts of the appliance does not rely on the correct functioning of the electronic circuit		N/A
19.11.2	Fault conditions applied one at a time, the appliance operated under conditions specified in Cl. 11, but supplied at rated voltage, the duration of the tests as specified:		P
	a) short-circuit of creepage distances and clearances between live parts of different potential, if these distances are less than the values specified in 29.1, unless the relevant part is adequately encapsulated		P
	b) open circuit at the terminals of any component		P
	c) short-circuit of capacitors, unless they comply with EN384-14 or 14.2 of EN65		P
	d) short-circuit of any two terminals of an electronic component, other than integrated circuits. This fault condition is not applied between the circuits of an optocoupler		N/A
	e) failure of triacs in the diode mode		N/A
	f) failure of an integrated circuit. In this case the possible hazardous situations of the appliance are assessed to ensure that safety does not rely on the correct functioning of such a component		N/A
	During and after each test the following is checked:		---
	- the temperature rise of the windings do not exceed the values specified in table 6		P
	- the appliance complies with the conditions specified in 19.13		P
	- live parts not accessible to the test finger or test pin as specified in Cl. 8		P



EN 60335-1			
Clause	Requirement - Test	Result - Remark	Verdict
	- any current flowing through protective impedance not exceeding the limits specified in 8.14		P
	If a conductor of a printed board becomes open circuited, the appliance is considered to have withstood the particular test, provided all three of the following conditions are met:		---
	- the material of the printed circuit board withstands the burning test of 20.1 of EN65		N/A
	- any loosened conductor does not reduce the creepage distances or clearances between live part and accessible metal parts		N/A
	- the appliance withstands the tests of 19.11.2 with open circuited conductor bridged		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 EN127, the test is repeated, measuring the current flowing through the fuse-link; measured current (A); rated current of the fuse-link (A)		N/A
19.13	During the tests the appliance does not emit flames, molten metal, poisonous or ignitable gas in hazardous amounts		P
	Temperature rises not exceeding the values shown in table 7		N/A
	Enclosures not deformed to such an extent that compliance with Cl. 8 is impaired		P
	Appliance still operable and complying with 20.2		P
	Appliance, other than Class III, withstands the electric strength test of 16.3, however, the test voltage being:		P
	- basic insulation: 1000 V		P
	- supplementary insulation: 1750 V		N/A
	- reinforced insulation: 3000 V		N/A
20	STABILITY AND MECHANICAL HAZARDS		P
20.1	Adequate stability		P
	Tilting test through an angle of 10° (appliance placed on an inclined plane/horizontal plane); appliance does not overturn		P
	The test is repeated on appliances with heating elements with the angle of inclination increased to 15°. If the appliance overturns in one or more positions, it is subjected to the tests of Clause 11 in each of these overturned positions		N/A



EN 60335-1			
Clause	Requirement - Test	Result - Remark	Verdict
20.2	Moving parts adequately arranged or enclosed as to provide protection against personal injury		P
	Protective enclosures, guards and similar parts are non-detachable		P
	Adequate mechanical strength and fixing of protective enclosures		P
	Self-resetting thermal cut-outs and overcurrent protective devices not causing a hazard, if unexpectedly reclosed		P
	Not possible to touch dangerous moving parts with test finger		P
21	MECHANICAL STRENGTH		P
	Appliance has adequate mechanical strength and is constructed as to withstand rough handling		P
	No damage after three blows applied to various parts of the enclosure, impact energy $0,5 \pm 0,04$ J		P
	If necessary, supplementary or reinforced insulation subjected to the electric strength test of 16.3		P
	If necessary, repetition of groups of three blows on a new sample		P
22	CONSTRUCTION		P
22.1	Appliance marked with the first numeral of the IP system: relevant requirements of EN60529 are fulfilled	IP20	N/A
22.2	Stationary appliance: means to provide all-pole disconnection from the supply provided, the following means being available:		N/A
	- a supply cord fitted with a plug		N/A
	- a switch complying with 24.3		N/A
	- a statement in the instruction sheet that a disconnection incorporated in the fixed wiring is to be provided		N/A
	- an appliance coupler		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



EN 60335-1			
Clause	Requirement - Test	Result - Remark	Verdict
	The appliance is placed in a heating cabinet for 1 h at a temperature of $70\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$. The appliance is then removed from the heating cabinet and a pull force of 50 N is immediately applied for 1 min to each pin along their longitudinal axes		N/A
	When the appliance has cooled down to room temperature, the pins shall not have been displaced by more than 1 mm		P
22.4	Appliance for heating liquids and appliance causing undue vibration not provided with pins for insertion into socket-outlets		N/A
22.5	No risk of electric shock when touching the pins of the plug	.No charged capacitor	P
22.6	Electrical insulation not affected by condensing water or leaking liquid		N/A
	Electrical insulation of Class II appliances not affected in case of a hose rupture or seal leak		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 which are likely to be cleaned in normal use	No such connections.	N/A
22.9	Insulation, internal wiring, windings, commutators and slip rings not exposed to oil, grease or similar substances		P
	Adequate insulating properties of oil or grease to which insulation is exposed		N/A
22.10	Location or protection of reset buttons of non-self-resetting controls is so that accidental resetting is unlikely		N/A
22.11	Reliable fixing of non-detachable parts which 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 which are likely to be removed during installation or servicing		N/A
	Parts that are likely to be removed during installation or servicing are disassembled and assembled 10 times before the test is carried out		N/A
	The test is applied to all parts that are likely to be detachable whether or not they are fixed by screws, rivets or similar parts		N/A
	push force, 50 N;		P



EN 60335-1			
Clause	Requirement - Test	Result - Remark	Verdict
	pull		P
	if the shape of the part is such that the fingertips cannot easily slip off, 50 N;		P
	if the projection of the part that is gripped is less than 10 mm in the direction of removal, 30 N		N/A
22.12	Handles, knobs etc. fixed in a reliable manner		N/A
	Fixing in wrong position of handles, knobs etc. indicating position of switches or similar components not possible		N/A
	Axial force 15 N applied to parts, the shape of which being so that an axial pull is unlikely to be applied		N/A
	Axial force 30 N applied to parts, the shape of which being so that an axial pull is likely to be applied		N/A
22.13	Unlikely that handles, when gripped as in normal use, make the operators 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 etc., liable to be touched by the user in normal use or during user maintenance		P
22.15	Storage hooks and the like for flexible cords smooth and well rounded		P
22.16	Automatic cord reels cause no undue abrasion or damage to the sheath of the flexible cord, no breakage of conductors strands, no undue wear of contacts		N/A
	Cord reel tested with 6000 operations, as specified		N/A
	Electric strength test of 16.3, voltage of 1000 V applied		P
22.17	Spacers not removable from the outside by hand or by means of a screwdriver or a spanner	No such spacers	N/A
22.18	Current-carrying parts and other metal parts resistant to corrosion under normal conditions of use		P
22.19	Driving belts not used as electrical insulation	No driving belts	N/A
22.20	Direct contact between live parts and thermal insulation effectively prevented, unless material used is non-corrosive, non-hygroscopic and non-combustible		N/A



EN 60335-1			
Clause	Requirement - Test	Result - Remark	Verdict
22.21	Wood, cotton, silk, ordinary paper and fibrous or hygroscopic material not used as insulation, unless impregnated	No such material.	P
22.22	Asbestos not used in the construction of the appliance	No asbestos	P
	Asbestos is used, but the liberation of dust of impregnated asbestos or of asbestos fibres into the surrounding air adequately prevented		P
22.23	Oils containing polychlorinated biphenyl (PCB) not used	No oils	P
22.26	The insulation between parts operating at safety extra-low voltage and other live parts complies with the requirements for double or reinforced insulation		N/A
22.27	Parts connected by protective impedance separated by double or reinforced insulation		N/A
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		P
22.29	Class II appliances permanently connected to fixed wiring so constructed that the required degree of protection against electric shock 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		N/A
	so constructed that they cannot be replaced in an incorrect position, and so that if they are omitted, the appliance is rendered inoperable or manifestly incomplete		N/A
22.31	Creepage distances and clearances over supplementary and reinforced insulation not reduced below values specified in 29.1 as a result of wear		P
	Creepage distances and clearances over supplementary or reinforced insulation not reduced to less than 50% of values specified in 29.1 if wires, screws etc. becomes loose		P
22.32	Supplementary and reinforced insulation designed or protected against deposition of dirt or dust		P
	Ceramic material not tightly sintered, similar material or beads alone not used as supplementary or reinforced insulation (EN60335-1:08)		N/A



EN 60335-1			
Clause	Requirement - Test	Result - Remark	Verdict
	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 29.1		N/A
	Oxygen bomb test at 70 °C for 96 h and 16 h at room temperature		N/A
22.33	Conductive liquids which are or may become accessible in normal use are not in direct contact with live parts		N/A
	Conductive liquids are not in direct contact with basic insulation or reinforced insulation in Class II constructions		N/A
	Conductive liquids in contact with live parts, not in direct contact with reinforced insulation		N/A
22.34	Shafts of operating knobs, handles, levers etc. not live, unless the shaft is not accessible when the part is removed		P
22.35	Handles, levers and knobs, held or actuated in normal use, not becoming live in the event of an insulation fault		P
	Such parts being of metal, and their shafts or fixings are likely to become live in the event of an insulation fault, they are either adequately covered by insulation material, or their accessible parts are separated from their shafts or fixings by supplementary insulation		N/A
	This requirement does not apply to handles, levers and knobs on stationary appliances other than those of electrical components, provided they are either reliably connected to an earthing terminal or earthing contact, or separated from live parts by earthed metal		N/A
22.36	Handles continuously held in the hand in normal use are so constructed that when gripped as in normal use, the operators hand is not likely to touch metal parts, unless they are separated from live parts by double or reinforced insulation		N/A
22.37	Capacitors in Class II appliances not connected to accessible metal parts, unless complying with 22.42		P
	Metal casings of capacitors in Class II appliances separated from accessible metal parts by supplementary insulation, unless complying with 22.42		N/A
22.38	Capacitors not connected between the contacts of a thermal cut-out		N/A
22.39	Lampholders only used for the connection of lamps		P



EN 60335-1			
Clause	Requirement - Test	Result - Remark	Verdict
22.40	Motor-operated appliances and combined appliances, intended to be moved while in operation or which have accessible moving parts, are fitted with a switch to control the motor		P
	The actuating member of this switch easily visible and accessible		P
22.41	Mercury switches mounted according to the requirement		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 is short-circuited or open circuited		N/A
22.43	Appliances adjustable for different voltages, accidental changing of the setting of the voltage unlikely to occur		N/A
22.101	Appliances shall not have openings on the underside that would allow small items to penetrate and touch live parts EN60335-2-65		P
22.102	Interlock switches that prevent access to live parts during user maintenance shall be connected in the input circuit and located to prevent unintentional operation. EN60335-2-65		N/A
23	INTERNAL WIRING		P
23.1	Wireways smooth and free from sharp edges		P
	Wires protected against contact with burrs, cooling fins etc.		P
	Wire holes in metal well rounded or provided with bushings		N/A
	Wiring effectively prevented from coming into contact with moving parts		P
23.2	Beads etc. on live wires cannot change their position, and are not resting on sharp edges or corners		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



EN 60335-1			
Clause	Requirement - Test	Result - Remark	Verdict
	Adequate insulating lining provided inside a coiled spring, the turns of which touch one another		N/A
	No damage after 10 000 flexings		N/A
	Electric strength test, 1000 V between live parts and metal parts		N/A
23.4	Bare internal wiring sufficiently rigid and fixed		P
23.5	The basic insulation of internal wiring withstanding the electrical stress likely to occur in normal use (EN60 335-1:08)		P
	No breakdown when a voltage of 2000 V is applied for 15 min between the conductor and metal foil wrapped around the insulation		P
23.6	Sleeving used as supplementary insulation on internal wiring retained in position by positive means		P
23.7	Only the colour combination green/yellow used for earthing conductors		N/A
23.8	Aluminium wires not used for internal wiring		P
23.9	No lead-tin soldering of stranded conductors where they are subject to contact pressure, unless		P
	clamping means so constructed that there is no risk of bad contact due to cold flow of the solder		N/A
24	COMPONENTS		P
24.1	Components comply with safety requirements in relevant EN standards (EN 60 335-1:08)		P
24.1.1	Capacitors likely to be subjected to the supply mains voltage and used for radio interference suppression or voltage dividing, comply with Annex ZC (EN60 335-1:08)		P
	Small lampholders: compliance with requirements for E10 lampholders		N/A
	Isolating transformers and safety isolating transformers comply with EN742		P
	Safety isolating transformers tested with the appliance comply with Annex ZD (EN60 335-1:08)		P
	Appliance couplers for IPx0 appliances: compliance with EN320		N/A
	Automatic controls: compliance with EN730, unless tested with the appliance		N/A
	Other appliance couplers: compliance with EN309		N/A



EN 60335-1			
Clause	Requirement - Test	Result - Remark	Verdict
	Switches: compliance with EN1058, unless tested with the appliance (EN60 335-1:04)		N/A
24.1.2	Automatic controls complying with EN730: additional tests according to this standard and 11.3.5 to 11.3.8 and Cl. 17 of EN730 as type 1 controls, the cycles of operation being:		P
	- thermostats: 10 000		N/A
	- temperature limiters: 1000		N/A
	- self-resetting thermal cut-outs: 300		P
	- non-self-resetting thermal cut-outs: 30		N/A
	- energy regulators: 3000 (EN60 335-1:04)		N/A
	- timers: 10 000 (EN60 335-1:04)		N/A
24.1.3	For switches, the test of 17.2.7 of EN1058-1 carried out for 10000 cycles of operation (EN60 335-1:04)		P
	Switches not separately tested and found to comply with EN1058-1 under conditions covering those occurring in the appliance, comply with Annex ZE (EN60335-1:04)		N/A
	Switches for no-load-operation and operable only with the aid of a tool, are not subjected to the tests of Cl. 17 of EN1058-1 (EN60335-1:04)		N/A
	This applies also to switches operated by hand, and with interlock for no-load-operation (EN60 335-1:04)		N/A
	Switches without this interlock subjected to the test of 17.2.7 of EN1058-1 for 100 cycles of operation (EN60 335-1:04)		N/A
24.1.4	Components marked with their operating characteristics are used in the appliance in accordance with these markings		P
	Components which have to comply with other standards are tested separately, according to the relevant standard		N/A
	Components used within the limits of its marking, tested in accordance with conditions occurring in the appliance		P
	Components not marked, or not used in accordance with its marking, or no Enstandard exists, tested under the conditions occurring in the appliance		N/A
	Components not mentioned in table 3 tested as part of the appliance		P
24.5	Voltage across capacitors in series with a motor winding does not exceed 1,1 times rated voltage, when the appliance is supplied at 1,1 times rated voltage under minimum load		P

EN 60335-1			
Clause	Requirement - Test	Result - Remark	Verdict
	List of components	(see appended table)	P
24.2	No switches or automatic controls in flexible cords (not required for appliances with rated power input not exceeding 25 W		P
	No devices causing the protective device in the fixed wiring to operate in the event of a fault in the appliance		P
	No thermal cut-outs which can be reset by soldering		P
24.3	Switch intended for all-pole disconnection of stationary appliances is directly connected to the supply terminals, having a contact separation of at least 3 mm in each pole		N/A
24.4	Plugs and socket-outlets for heating elements and extra-low voltage circuits, not interchangeable with plugs, and		N/A
	socket-outlets or with connectors and appliance inlets complying with EN83 or EN320, respectively		N/A
24.5	Plugs and socket-outlets etc. for interconnection cords, not interchangeable with plugs and socket-outlets or connectors and appliance inlets complying with EN83 or EN320, respectively, if direct supply from the mains could give rise to a hazard		N/A
24.6	Motors connected to the supply mains and having inadequate basic insulation for the rated voltage of the appliance, comply with the requirements of Annex F		N/A
	The components are listed on an appended table		N/A
24.101	Interlock switches that prevent access to live parts during user maintenance shall EN60335-2-65		N/A
	– disconnect all poles		N/A
	– have a contact separation		N/A
25	SUPPLY CONNECTION AND EXTERNAL FLEXIBLE CORDS		N/A
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		N/A
	an appliance inlet having at least the same degree of protection against moisture as required for the appliance		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		N/A



EN 60335-1			
Clause	Requirement - Test	Result - Remark	Verdict
	Stationary appliance for multiple supply may be provided with more than one means of connection, provided electric strength test of 1250 V for 1 min between each means of connection causes no breakdown	No breakdown shall occur	N/A
25.3	Connection of supply wires for appliance intended to be permanently connected to fixed wiring possible after the appliance has been fixed to its support		N/A
	Appliance provided with a set of terminals for the connection of cables or fixed wiring, cross-sectional areas specified in 26.2		N/A
	Appliance provided with a set of terminals allowing the connection of a flexible cord		N/A
	Appliance provided with a set of terminals and cable entries, conduit entries, knock-outs or glands, allowing connection of appropriate type of cable or conduit		N/A
25.4	Cable and conduit entries, rated current of appliance not exceeding 16 A, dimensions according to table 8	<16A	N/A
	Introduction of conduit or cable does not affect the protection against electric shock or reduce creepage distances and clearances below values specified in 29.1		N/A
25.5	Method for assemble supply cord with the appliance:		N/A
	- type X attachment		N/A
	- type Y attachment		N/A
	- type Z attachment, if allowed in part 2		N/A
	Type X attachment: specially prepared cord		N/A
	Type X attachment not used for flat twin tinsel cord		N/A
25.6	Plugs fitted with only one flexible cord		N/A
	Supply cords of single-phase portable appliances having a rated current not exceeding 16 A, provided with a plug complying with the following Standard Sheets of EN83		N/A
	- for Class I appliances: Standard Sheet C2b, C3b or C4		N/A
	- for Class II appliances: Standard Sheet C5 or C6		N/A
25.7	Appliance supply cord not lighter than:		P
	- braided cord (245 EN51)		N/A
	- ordinary tough rubber sheathed cord (245 EN53)		N/A
	- ordinary polychloroprene sheathed flexible cord (245 EN57) (EN60 335-1:08)		N/A



EN 60335-1			
Clause	Requirement - Test	Result - Remark	Verdict
	- flat twin tinsel cord (227 EN41)		N/A
	- light polyvinyl chloride sheathed cord (227 EN52), appliance not exceeding 3 kg		N/A
	- ordinary polyvinyl chloride sheathed cord (227 EN53), appliance exceeding 3 kg (EN60 335-1:04)		P
	Temperature rise of external metal parts exceeding 75 K, PVC cord not used		N/A
	PVC cord used: appliance so constructed that the supply cord is not likely to touch external metal parts in normal use		N/A
	PVC supply cord appropriate for higher temperatures, type Y or type Z attachment used		N/A
25.8	Nominal cross-sectional area of supply cords according to table 9; rated current (A); cross-sectional area (mm ²) (EN60 335-1:08)		N/A
25.9	Supply cord not in contact with sharp points or edges		P
25.10	Green/yellow core for earthing purposes in Class I appliance		N/A
25.11	Conductors of supply cords not consolidated by lead-tin soldering where they are subject to contact pressure, unless		P
	clamping means so constructed that there is no risk of bad contacts due to cold flow of the solder		N/A
25.12	Moulding the cord to part of the enclosure does not damage the insulation of the supply cord		N/A
25.13	Inlet opening provided with a bushing, or is so constructed, that there is no risk of damage to the supply cord when introduced		P
25.13.1	Inlet bushing so shaped as to prevent damage to the supply cord		P
	Inlet bushing not detachable		P
25.13.2	At inlet openings, the insulation between the conductor of a supply cord and the enclosure of the appliance is consisting of the insulation of the conductor, and in addition:		N/A
	- for Class 0 appliances: at least one separate insulation		N/A
	- for other appliances: at least two separate insulations		N/A
	Only one separate insulation is required if the enclosure at the inlet opening is of insulating material		N/A
	The separate insulation consists of:		N/A



EN 60335-1			
Clause	Requirement - Test	Result - Remark	Verdict
	- the sheath of a supply cord at least equivalent to that of a cord complying with EN227 or 245		N/A
	- a lining or bushing of insulating material complying with the requirements of 29.2 for supplementary insulation		N/A
25.14	Supply cords adequately protected against excessive flexing		N/A
	Flexing test; applied force (N); number of flexings :		N/A
	The test does not result in:		N/A
	- short-circuit between the conductors		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, within the meaning of the standard, to the cord or the cord guard		N/A
	- broken strands piercing the insulation and becoming accessible		N/A
25.15	Conductors of the supply cord relieved from strain, twisting and abrasion by use of cord anchorages		N/A
	The cord cannot be pushed into the appliance to such an extent that the cord or internal parts of the appliance can be damaged		N/A
	Pull and torque test of supply cord, values shown in table 10: pull (N); torque (Nm) (not on automatic cord reel)		N/A
	Max. 2 mm displacement of the cord, and conductors not moved more than 1 mm in the terminals		N/A
	Creepage distances and clearances not reduced below values specified in 29.1		N/A
25.16	Cord anchorages for type X attachments so constructed and located 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 cord		N/A
	- cord cannot touch the clamping screws of cord anchorage if these screws are accessible, unless separated from		N/A
	- accessible metal parts by supplementary insulation		N/A



EN 60335-1			
Clause	Requirement - Test	Result - Remark	Verdict
	- 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 part of a specially prepared cord		N/A
	- screws which have to be operated when replacing the cord do not fix any other component, if applicable		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 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 if of metal, they are insulated from accessible metal parts by supplementary insulation		N/A
25.17	Adequate cord anchorages for type Y and Z attachment		N/A
25.18	Cord anchorages only accessible with the aid of a tool, or		N/A
	so constructed that the cord only can be fitted with the aid of a tool		N/A
25.19	Type X attachment, glands not used as cord anchorage in portable appliances		N/A
	Tying the cord into a knot or tying the cord with string not used		N/A
25.20	Conductors of the supply cord for type Y and Z attachment adequately additionally insulated		P
25.21	Space for supply cable for fixed wiring or supply cord for type X attachment constructed to permit checking of conductors with respect to correct positioning and connection before fitting any cover, no risk of damage, no contact with accessible metal parts if a conductor becomes loose, etc.		N/A
	For portable appliances, the uninsulated end of a conductor prevented from any contact with accessible metal parts, unless the end of the cord is such that the conductors are unlikely to slip free		N/A
25.22	Appliance inlet:		N/A
	- live parts not accessible during insertion or removal		N/A
	- connector can be inserted without difficulty		N/A
	- the appliance is not supported by the connector		N/A



EN 60335-1			
Clause	Requirement - Test	Result - Remark	Verdict
	- is not for cold conditions if temperature rise of external metal parts exceeds 75 K, unless the supply cord is not likely to touch such metal parts		N/A
25.23	Interconnection cords comply with the requirements for the supply cord, except as specified		N/A
	If necessary, electric strength test of 16.3		N/A
25.24	Interconnection cords not detachable without the aid of a tool		N/A
26	TERMINALS FOR EXTERNAL CONDUCTORS		N/A
26.1.1	Appliances with type X attachment and appliances for connection to fixed wiring provided with terminals in which connection is made by means of screws, nuts or equally effective devices		N/A
	Screws and nuts serve only to clamp supply conductors, except		N/A
	internal conductors, if so arranged that they are unlikely to be displaced when fitting the supply conductors		N/A
26.1.2	For type X attachment soldered connections used, the conductor so positioned or fixed that reliance is not placed on soldering alone		N/A
	Soldering alone used, barriers provided, creepage distances and clearances satisfactory if the conductor becomes free		N/A
	For type Y and Z attachment: soldered, welded, crimped and similar connections 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
	For Class II appliances: soldering, welding or crimping alone used, barriers provided, creepage distances and clearances satisfactory if the conductor becomes free		N/A
26.2	Terminals for type X attachment and for connection to fixed wiring suitable for connection of conductors with required cross-sectional area according to table 11; rated current (A); nominal cross-sectional area (mm ²)		N/A
	Terminals only suitable for a specially prepared cord		N/A
26.3	Terminals for the supply cord suitable for their purpose		N/A



EN 60335-1			
Clause	Requirement - Test	Result - Remark	Verdict
	Terminals with screw clamping and screwless terminals not used for flat twin tinsel cords, unless conductors ends fitted with a device suitable for screw terminals		N/A
	Pull test of 5 N to the connection		N/A
26.4	Terminals for type X attachment and those for connection to fixed wiring so fixed that when tightening or loosening the clamping means:		N/A
	- the terminal does not loosen		N/A
	- internal wiring is not subjected to stress		N/A
	- creepage distances and clearances are not reduced below the values in 29.1		N/A
26.5	Terminals for type X attachment and for connection to fixed wiring so constructed that the conductor is clamped between metal surfaces with sufficient contact pressure and without damaging the conductor		N/A
26.6	Terminals for type X attachment, no special preparation of conductors required, and so constructed and placed that conductors prevented from slipping out, except those with a specially prepared cord and those for connection to fixed wiring		N/A
26.7	Terminals of the pillar type constructed and located as specified		N/A
26.8	Terminals for the connection to fixed wiring located close to each other, including the earthing terminal		N/A
26.9	Terminals for type X attachment accessible after removal of a cover or part of the enclosure		N/A
26.10	Terminals not accessible without the aid of a tool		N/A
26.11	Terminals for type X attachment so located or shielded that if a wire of a stranded conductor escapes, no risk of accidental connection between live parts and accessible metal parts,		N/A
	and for Class II construction, between live parts and metal parts separated from accessible metal parts by supplementary insulation only		N/A
	Stranded conductor test, 8 mm insulation removed		N/A
27	PROVISION FOR EARTHING		N/A
27.1	Accessible metal parts of Class 0I and I appliances, permanently and reliably connected to an earthing terminal	Class III appliances	N/A
	Earthing terminals not connected to neutral terminal		N/A



EN 60335-1			
Clause	Requirement - Test	Result - Remark	Verdict
	Class 0, II and III appliance have no provision for earthing		N/A
27.2	Screw clamping terminals comply with Cl. 26		N/A
	Screwless terminals comply with EN998-2-2 (EN60335-1:08)		N/A
	Terminals used for the connection of external equipotential bonding conductors allow connection of conductors of 2,5 to 6 mm ² , and		N/A
	do not provide earthing continuity between different parts of the appliance		N/A
	Conductors cannot be loosened without the aid of a tool		N/A
	Clamping means adequately secured against accidental loosening		N/A
27.3	Earth connection "made before" and "separated after" current-carrying connections		N/A
	Current-carrying conductors become taut before earthing conductor, if the cord slips out of the cord anchorage		N/A
27.4	No risk of corrosion resulting from contact between metal of earthing terminal and other metal		N/A
	Adequate resistance to corrosion of coated or uncoated parts providing earthing continuity, other than parts of a metal frame or enclosure		N/A
	Parts of steel providing earthing continuity provided at the essential areas with an electroplated coating, thickness at least 5 µm		N/A
	Adequate protection against rusting of parts of coated or uncoated steel, only intended to provide or transmit contact pressure		N/A
	In case of aluminium alloys precautions taken to avoid risk of corrosion		N/A
27.5	Low resistance of connection between earthing terminal and earthed metal parts		N/A
	Resistance not exceeding 0,1 Ω at the specified low-resistance test		N/A
28	SCREWS AND CONNECTIONS		P
28.1	Fixings and electrical connections withstand mechanical stresses		P
	Screws not of soft metal liable to creep, such as zinc or aluminium		P



EN 60335-1			
Clause	Requirement - Test	Result - Remark	Verdict
	Diameter of screws of insulating material min. 3 mm		P
	Screws of insulating material not used for any electrical connection		P
	Screws transmitting electrical contact only screwing into metal		N/A
	Screws not of insulating material if their replacement by a metal screw can impair supplementary or reinforced insulation		N/A
	Type X attachment, screws to be removed for replacement of supply cord, or for users maintenance, not of insulating material if their replacement by a metal screw can impair basic insulation		N/A
	Screws and nuts transmitting contact pressure subjected to torque test as specified, applying torque as shown in table 12		P
	The test is not carried out on screws and nuts transmitting contact pressure for earthing continuity provided at least two screws or nuts are used (EN60 335-1:08)		P
28.2	Contact pressure not transmitted through insulating material liable to shrink or distort, unless shrinkage or distortion compensated		N/A
	This requirement does not apply to electrical connections in circuits carrying a current not exceeding 0,5 A (EN60 335-1:08)		N/A
28.3	Space-threaded (sheet metal) screws only used for the connection of current-carrying parts if they clamp these parts directly in contact with each other		N/A
	Thread-cutting (self-tapping) screws not used for electrical connection of current-carrying parts, unless generating 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 unless the thread is formed by a swaging action		N/A
	Thread-cutting and space-threaded screws used provide earthing continuity:		N/A
	- it is not necessary to disturb the connection in normal use		N/A
	- two screws used for each connection		N/A
28.4	Screws and nuts making mechanical connection between different parts of the appliance, and also making electrical connection or providing earthing continuity secured against loosening		P
	Rivets for current-carrying connections subject to torsion secured against loosening		N/A



EN 60335-1			
Clause	Requirement - Test	Result - Remark	Verdict
29	CREEPAGE DISTANCES, CLEARANCES AND DISTANCES THROUGH INSULATION		P
29.1	Creepage distances and clearances not less than specified in table 13 (EN60 335-1:04)		P
	Resonant voltage between the point where a winding and a capacitor are connected together and metal parts separated from live parts by basic insulation only, creepage distances and clearances not less than the values specified for the value of the voltage produced by the resonance		N/A
	Values increased by 4 mm in case of reinforced insulation when resonance voltage		N/A
29.2	Distances through insulation not less than 1,0 mm for supplementary insulation, and 2,0 mm for reinforced insulation		P
29.2.1	Supplementary insulation applied in thin sheet form, other than mica or similar scaly material, consists of at least two layers, each of the layers withstands the electric strength test of 16.3 for supplementary insulation		P
	Reinforced insulation applied in thin sheet form, other than mica or similar scaly material, consists of at least three layers, and any two of the layers together withstand the electric strength test of 16.3 for reinforced insulation		N/A
29.2.2	Supplementary or reinforced insulation inaccessible and does not exceed the maximum permissible temperature values		P
	Supplementary or reinforced insulation, after conditioning as specified, withstands the electric strength test as specified in 16.3, both at the oven temperature and room temperature		P
30	RESISTANCE TO HEAT, FIRE AND TRACKING		P
30.1	See Annex H		P
	Relevant external parts of non-metallic material		P
	Parts supporting live parts and parts providing supplementary or reinforced insulation sufficiently resistant to heat		P
	Ball-pressure test with a force of 20 N, diameter of impression not exceeding 2 mm		P
	External parts: at 75 °C		P
	Parts supporting live parts: at 125 °C		P



EN 60335-1			
Clause	Requirement - Test	Result - Remark	Verdict
	Parts providing supplementary or reinforced insulation: temperature (°C)		P
30.2	Relevant parts of non-metallic material adequately resistant to ignition and spread of fire		N/A
30.2.1	Possible burning test of relevant parts according to Annex J		N/A
	Glow-wire test of Annex K made at temperature 550 °C		N/A
30.2.3	Appliances operated while unattended, possible bad-connection test according to Annex L		P
	Glow-wire test of Annex K made at 850 °C (EN60 335-1:04)		N/A
	Possible needle-flame test according to Annex M		N/A
30.2.4	Parts of non-metallic material within a distance of 50 mm from parts not withstanding the tests of 30.2.2 or 30.2.3, subjected to the needle-flame test of Annex M		N/A
30.3	Relevant insulating material have adequate resistance to tracking		N/A
	Tracking test at 175 V according to Annex N		N/A
	Tracking test at 250 V according to Annex N		N/A
	No hazard other than fire, tracking test at 175 V according to Annex N, and in addition needle-flame test of surrounding parts according to Annex M		N/A
	Possible needle-flame test of non-metallic material		N/A
31	RESISTANCE TO RUSTING		N/A
	Relevant ferrous parts adequately protected against rusting		N/A
32	RADIATION, TOXICITY AND SIMILAR HAZARDS		N/A
	Appliance does not emit harmful radiation		N/A
	Appliance does not present a toxic or similar hazard		N/A
	The ozone concentration produced by ionization shall not be excessive.		N/A
4	MEASURING METHODS(EN 62233:2008) (EMF)		P
4.2	The frequency range considered is from 4-1000Hz		P
	Measuring distance (according Table 1):.....(cm)	30cm	P



EN 60335-1			
Clause	Requirement - Test	Result - Remark	Verdict

	Measuring result		P
	Around (limit:40 Mt)	7.2Mt	P
	Operating conditions		P
	Couping factor	0.17	P
	Current density	2Ma/m ²	P

A	ANNEX A, NORMATIVE REFERENCES		N/A
	The annex contains a list of standards which are referred to, and thus become part of, this standard		N/A

C	ANNEX C, AGEING TEST ON MOTORS		N/A
	Test carried out when doubt with regard to the classification of the insulating system of a motor winding		N/A

D	ANNEX D, ALTERNATIVE REQUIREMENTS FOR PROTECTED MOTOR UNITS		N/A
	Void (EN60 335-1:04)		N/A

E	ANNEX E, MEASUREMENT OF CREEPAGE DISTANCES AND CLEARANCES		N/A
	Methods of measuring creepage distances and clearances, specified in 29.1, indicated in 10 different cases		N/A

F	ANNEX F, MOTORS NOT ISOLATED FROM THE SUPPLY MAINS AND HAVING BASIC INSULATION NOT DESIGNED FOR THE RATED VOLTAGE OF THE APPLIANCE		N/A
	Motors having a working voltage not exceeding 42 V, not being isolated from the supply mains, and having basic insulation not designed for the rated voltage of the appliance are tested according to this annex		N/A
	All clauses of this standard apply, unless otherwise specified in this annex		N/A
F.8	Protection against accessibility to live parts		N/A
F.11.8	Temperature rise of the body of the motor, where in contact with insulating material, not exceeding values in table 3 for the relevant insulating material		N/A
F.16	Leakage current and electric strength		N/A
F.19	Abnormal operation		N/A
F.19.101	Appliance operated at rated voltage with each of the following defects:		N



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Clause	Requirement - Test	Result - Remark	Verdict
	- short-circuit of the terminals of the motor, including any capacitor incorporated in the motor circuit		N/A
	- open circuit of the supply to the motor		N/A
	- open circuit of any shunt resistor during operation of the motor		N/A
F.22	Construction		N/A
F.22.101	Class I appliance incorporating a motor supplied by a rectifier circuit, the d.c. circuit being insulated from accessible parts of the appliance by double or reinforced insulation		N/A
G	ANNEX G, CIRCUIT FOR MEASURING LEAKAGE CURRENTS		P
	A suitable circuit for measuring leakage currents is shown		P
H	ANNEX H, SELECTION AND SEQUENCE OF THE TESTS OF CLAUSE 30		N/A
J	ANNEX J, BURNING TEST		---
	The burning test is made in accordance with EN707, and method FH is used		N/A
	Category FH3 applies, the maximum burning rate being 40 mm/min		N/A
K	ANNEX K, GLOW-WIRE TEST		P
	The glow-wire test is made in accordance with EN695-2-1 (clause numbers between parentheses refer to EN695-2-1)		P
(4)	Description of test apparatus: the last paragraph before the note is replaced		P
(5)	Severities: the duration of application of the tip of the glow-wire to the specimen being (30 ± 1) s		P
(10)	Observations and measurements: item c) does not apply		P
L	ANNEX L, BAD-CONNECTION TEST WITH HEATERS		P
	The bad-connection test with heaters is made in accordance with EN695-2-3 (clause numbers between parentheses refer to EN695-2-3)		P
(3)	General description of the test: additions concerning crimped connections		N/A
(4)	Description of test apparatus: replacements of some of the test specifications and the first paragraph of the note		N/A



EN 60335-1			
Clause	Requirement - Test	Result - Remark	Verdict
(6)	Severities: the duration of application of the test power being (30 ± 1) min		N/A
(8)	Test procedure: 8.6 replaced		N/A
(11)	Information to be given in the relevant specification: item h), the first dashed paragraph, does not apply		N/A
M	ANNEX M, NEEDLE-FLAME TEST		N/A
	The needle-flame test is made in accordance with EN60695-2-2 (clause numbers between parentheses refer to EN695-2-2)		N/A
(4)	Description of the apparatus: the sixth paragraph is replaced		N/A
(5)	Severities: the duration of application of the test flame is (30 ± 1) s		N/A
(8)	Test procedure: some changes in the test specifications		N/A
(10)	Evaluation of the test results: addition in the test specification		N/A
N	ANNEX N, PROOF TRACKING TEST		N/A
	The proof tracking test is made in accordance with EN112 (clause numbers between parentheses refer to EN112)		N/A
(3)	Test specimen: the last sentence of the first paragraph does not apply		N/A
(5)	Test apparatus: some changes in the subclauses		N/A
(6)	Procedure: adjustments of the test specifications		N/A
P	ANNEX P, SEVERITY OF DUTY CONDITIONS OF INSULATING MATERIAL WITH RESPECT TO THE RISK OF TRACKING		N/A
	Recognition of different duty conditions with respect to the risk of tracking		N/A
ZA	ANNEX ZA (NORMATIVE) SPECIAL NATIONAL CONDITIONS		N/A
7.12	DENMARK: Requirements regarding marking tag of power supply cord and connection of earthing wire for class I appliances delivered without a plug		N/A
19.5	NORWAY: The test is also applicable to appliances intended to be permanently connected to fixed wiring		N/A

EN 60335-1			
Clause	Requirement - Test	Result - Remark	Verdict
22.2	FRANCE, NORWAY: The second paragraph of this subclause, dealing with single-phase, permanently connected class I appliances having heating elements, is not applicable due to the supply system		N/A
25.6	BELGIUM, FRANCE, SPAIN, UNITED KINGDOM: Plugs according to standard sheet C2b not allowed		N/A
	AUSTRIA, FINLAND, GERMANY, ICELAND, IRELAND, ITALY, LUXEMBOURG, NETHERLANDS, NORWAY, PORTUGAL, SPAIN, SWEDEN, SWITZERLAND, UNITED KINGDOM: Plugs according to standard sheet C3b not allowed		N/A
	DENMARK: Supply cords of single-phase portable appliances having a rated current not exceeding 13 A provided with a plug according to the following:		N/A
	Class I appliances: Section 107-2-D1, ed.3 1998, Standard Sheet DK 2-1a		N/A
	For appliances covered by a Part 2 of EN 60335, also plugs in accordance with Section 107-2-D1, ed. 3, 1998, Standard Sheet C2b, C3b or C4 are allowed		N/A
	Class II appliances: Section 107-2-D1, ed.3 1998, Standard Sheet C1b, C5, C6, DKA 2-1a and DKA 2-1b		N/A
	Stationary single-phase appliances, having a rated current not exceeding 13 A, and provided with a supply cord and a plug, the plug is in accordance with the requirements above		N/A
	Multi-phase appliances and single-phase appliances having a rated current exceeding 13 A, and provided with a supply cord and a plug, the plug is in accordance with the requirements below:		N/A
	Class I appliances: Section 107-2-D1, Standard Sheet DK 6-1a / EN 60309-2, Standard Sheet 2-II, 2-IV		N/A
	Class II appliances: Section 107-2-D1, Standard Sheet DK 6-1a / EN 60309-2, Standard Sheet 2-II, 2-IV, the earthing contact not being connected		N/A
	The current for the plug not exceeding the values specified; standard sheet (no.); current (A)		N/A
	IRELAND: Only plugs according to Standard Sheets B2 and C5 allowed (see also Annex ZB)		N/A
	ITALY: Only plugs listed in CENELEC Report ROBT-005:2001 allowed		N/A
	SPAIN: For appliances for household use, only the following plugs are allowed:		N/A



EN 60335-1			
Clause	Requirement - Test	Result - Remark	Verdict
	according to UNE 20315: ESC 10-1b, C2b, C4, C6 or ESB 25-5b		N/A
	according to UNE-EN 50075		N/A
	SWITZERLAND: supply cords of portable household and similar electrical appliances having a rated current not exceeding 10 A, provided with a plug complying with SEV 1011 or IEC 60884-1 and one of the following dimension sheets:		N/A
	SEV 6532-2.1991, plug type 15, 3P+N+PE, 250/400 V, 10 A		N/A
	SEV 6533-2.1991, plug type 11, L+N, 250 V, 10 A		N/A
	SEV 6534-2.1991 plug type 12, L+N+PE, 250 V, 10 A		N/A
	UNITED KINGDOM: Only plugs according to Standard Sheets B2 and C5 allowed (see also Annex ZB)		N/A
25.8	IRELAND, UNITED KINGDOM: replacement of figures (rated current/cross-sectional area) in the table		N/A
ZB	ANNEX ZB (INFORMATIVE) A-DEVIATIONS		N/A
4	SWITZERLAND: Information about batteries with carbon-zinc and alkali-manganese		N/A
7.1	ITALY: The voltage is 220 V/380 V		N/A
25.6	IRELAND: These regulations apply to all plugs for domestic use at a voltage of not less than 200 V and allow only plugs complying with I.S. 401:1997, or equivalent, to be fitted to domestic appliances.		N/A
	UNITED KINGDOM: These regulations apply to all plugs for domestic use at a voltage of not less than 200 V and allow only plugs to BS 1363 to be fitted to domestic appliances. It also allows plugs to BS 4573 and standard sheet C5 to be fitted to shavers and toothbrushes.		N/A
29.3	GERMANY: Third dashed item not applicable for appliances where the insulation is accessible. Additional measures, such as a multi-layered insulation or adequate thickness, taken.		N/A
ZC	ANNEX ZC (NORMATIVE) NORMATIVE REFERENCES TO INTERNATIONAL PUBLICATIONS WITH THEIR CORRESPONDING EUROPEAN PUBLICATIONS		N/A
	This Standard incorporates provisions from the publications listed		N/A



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EN 60335-1			
Clause	Requirement - Test	Result - Remark	Verdict

ZC	ANNEX ZD (INFORMATIVE) IEC and CENELEC CODE DESIGNATIONS FOR FLEXIBLE CORDS		N/A
	A list of code designations for different types of flexible cords		N/A



10	TABLE: input deviation measurements					P
input deviation Dp of/at:		Prated (W)	P (W)	Dp	requireddP	Remark
230V		5W	5.1W	2%	+10% or 60W	

11.8	TABLE: temperature rise measurements			P
	t1 (°C)	24.5°C		---
	t2 (°C)	24.8°C		---
	test voltage (V)			---
temperature rise dT of part/at:		dT (K)		required dT (K)
		243.8V	\	
Metal enclosure		32.5	\	50
PCB		38.9	\	105
Plastic enclosure		12.6	\	60
Connector body		10.8	\	Ref.
Motor Body		32.4	\	85
Ambient		23.5	\	Ref.

13.3	TABLE: electric strength measurements at operating temperature			P
test voltage applied between:			test voltage (V)	breakdown
Input and enclosure			3000	No

16.3	TABLE: electric strength measurements			P
test voltage applied between:			test voltage (V)	breakdown
Input and enclosure			3000	No

24.1	TABLE: Components			P
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Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity
Enclosure	Sabic Innovative Plastics Us L L C	940(f1)	V-0, 1.8mm thick minimum, 120°C	UL 94 UL746	UL E121562
PCB	DONGGUAN CITY HUAXIA PCB MFG CO LTD	CEM-1	HX-2, 1.6mm, 130 °C	UL94	UL E328942

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 of fixing enclosure		3.0	II	1.2

29.1	TABLE: Clearance					N/A
	Overvoltage category:		I	--		
		Type of insulation				
Rated impulse voltage (V)	Min. cl (mm)	Basic	Functional	Supplementary	Reinforced	Verdict/ Remark
300	0.5	--	--	--	--	--
500	0.5	--	--	--	--	--
800	0.5	--	--	--	--	--
1500	1.0	--	--	--	--	--
2500	2.0	--	--	--	--	--
4000	3.5	--	--	--	--	--
6000	6.0	--	--	--	--	--
8000	8.5	--	--	--	--	--
10000	11.5	--	--	--	--	--

29.2	TABLE: Creepage distances, basic, supplementary and reinforced insulation										P
Working voltage (V)	Creepage distance (mm) Pollution degree							type of insulation			
	1	2			3						
		Material group			Material group						
		I	II	III a/ III b	I	II	III a/ III b	B	S	R	Verdict
≤50	0,18	0,6	0,85	1,2	1,5	1,7	1,9	2	--	--	P
>125and≤250	0.6	1.3	1.8	2.5	3.2	3.6	4.0	--	--	--	N/A
>125and≤250	0.6	1.3	1.8	2.5	3.2	3.6	4.0	--	--	--	
>125and≤250	1.2	2.6	3.6	5.0	6.4	7.2	8.0	--	--	--	N/A
B=Basic, S=Supplementary and R=Reinforced											

30.1	TABLE: ball-pressure tests for thermoplastics	P
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	Limited impression diameter (mm)	≤ 2 mm	---
Part	Test temperature (°C)	Impression diameter (mm)	
Plastic enclosure	75°C	1.02	
PCB	125°C	0.64	

30.2	TABLE: glow wire test		P
Part	Test temperature (°C)	Result	
PCB	750°C	Not burning	

**Appendix 2 Equipment list**

Code	Name	Model/Type	S/N	Calibrated date	Next Calibration Date	Manufacture
EZT-001	Digital Multimeter	34401A	MY47043456	2018.10.18	2019.10.17	agilent
EZT-004	Push/pull gauge	NK-500	2Q10060932	2018.10.18	2019.10.17	
EZT-005	Electronic weight	DSI-861	198692	2018.10.18	2019.10.17	shangdeli
EZT-006	Insulation resistance tester	CS2676CX	1107032-009	2018.10.18	2019.10.17	changshen
EZT-007	Earthing resistance tester	YD2668-4B	4B-2307	2018.10.18	2019.10.17	Yangzi
EZT-008	HI-pot/Insulation tester	CS2672C	1108006-002	2018.10.18	2019.10.17	changshen
EZT-010	AC Voltage Regulator	TDGC2J	--	2018.10.18	2019.10.17	SAKO
EZT-013	AC power source	HPA-3110	3513	2018.10.18	2019.10.17	Henqiang
EZT-014	Temperature/Humidity chamber	SDJ-80L	SDJ-80J	2018.10.18	2019.10.17	Shenzhen hongjian
EZT-015	Electric oven	HK45AS	F11011008	2018.10.18	2019.10.17	Guangzhou KENTON
EZT-017	AC digital power meter	PF9901	YG100731N11070075	2018.10.18	2019.10.17	Yuanfang
EZT-022	Leakage current tester	228	10-866030	2018.10.18	2019.10.17	simpson
EZT-023	Oscilloscope	TDS1012C-SC	C013300	2018.10.18	2019.10.17	tektronix
EZT-024	Tape measure	DK-2041	--	2018.10.18	2019.10.17	Proskit
EZT-025	Stop watch	TA-228	--	2018.10.18	2019.10.17	KTJ
EZT-026	Data acquisition/switch unit	34970A	MY44057668	2018.10.18	2019.10.17	Agilent
EZT-027	Temperature/humidity meter	VC230	--	2018.10.18	2019.10.17	ViCTOR
EZT-028	Torque drive	3RTD	435850B	2018.10.18	2019.10.17	TOHNICHI
EZT-033	Test finger	ZLT-I02	I021203	2018.10.18	2019.10.17	Guangzhou zhilitong
EZT-034	Test pin	ZLT-I09	I091201	2018.10.18	2019.10.17	Guangzhou zhilitong
EZT-038	Test apparatus of the mains plug	ZLT-LJ2	LJ011202	2018.10.18	2019.10.17	Guangzhou zhilitong



EZT-039	Ball pressure apparatus	ZLT-QY1	Q011202	2018.10.18	2019.10.17	Guangzhou zhilitong
EZT-040	Impact hammer	ZLT-CJ1	LJ011206	2018.10.18	2019.10.17	Guangzhou zhilitong
EZT-041	Impact hammer	ZLT-CJ1	LJ011205	2018.10.18	2019.10.17	Guangzhou zhilitong
EZT-042	Caliper rule	CD-6" CSX	500-196-20	2018.10.18	2019.10.17	MITUTOYO
EZT-044	Glow wire tester	ZRS-2	12121304	2018.10.18	2019.10.17	Guangzhou Xinna
EZT-045	Needle flame tester	ZY-2	12121311	2018.10.18	2019.10.17	Guangzhou Xinna
EZT-107	"Van der Hoofden" test head	EMF827	R21SW	2018.10.18	2019.10.17	Shenzhen HLKS
EZT-107-a	Measurement receiver	EMF827-a	R21SW	2018.10.18	2019.10.17	Shenzhen HLKS

Appendix 3 Photo documentation

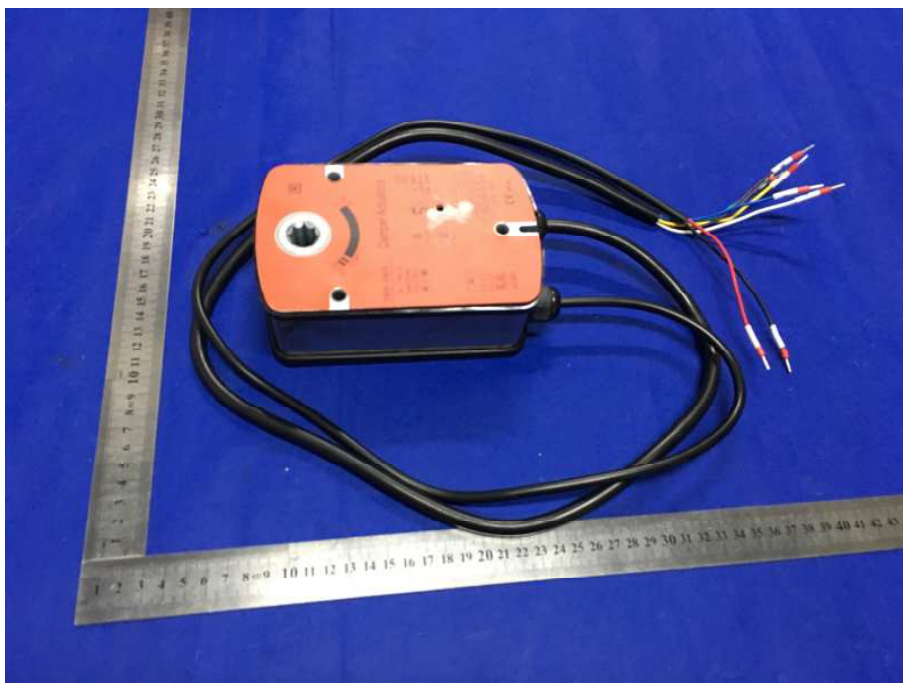
Photo 1

- ☒ front
- ☐ rear
- ☐ right side
- ☐ left side
- ☐ top
- ☐ bottom
- ☐ internal



Photo 2

- ☒ front
- ☐ rear
- ☐ right side
- ☐ left side
- ☐ top
- ☐ bottom
- ☐ internal



End of the report