ITC INDIA

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ELECTRICAL LABORATORY- TEST REPORT
Household and Similar Electrical Appliances – Safety - Part 2-76: Particular requirement for electric fence energizers

Test Report N°.....	ITC/TEST/NN/1607/02
Date of issue.....	06-08-2016
Sample date in.....	11-07-2016
Date of performance.....	11-07-2016 to 30-07-2016
Applicant.....	Mr. ARJUN N. CHAUDHARY
Customer.....	SAFRON SUBAPURA VILLAGE, RADHANPUR TALUKA, PATAN DISTRICT GUJRAT STATE, PIN CODE-385340
Sample description.....	SOLAR FENCE ENERGIZER
Sample Condition.....	OK
Customer reference.....	N/A
Trade mark / Manufacturer.....	**SAFRON**
Model / Type / Reference.....	SAFRON-HV/Sr.no-201606-002
Ratings.....	12 VDC/500mA
Test method(s).....	IEC 60335-2-76:2008 & IEC 60335-1:2013

Overall verdict **Pass** ☒
Fail ☐

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- Test case does not apply to the test object..... N/A
- Test object meets the requirement..... P (Pass)
- Test object does not meet the requirement..... F (Fail)

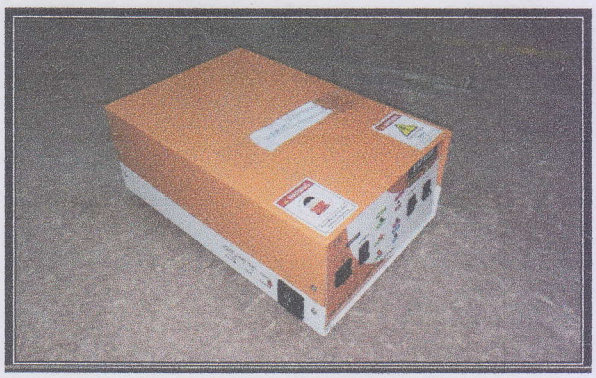
General remarks:

- " See enclosure ## " refers to additional information related to this report in the annexes section
- " See table ## " refers to a table appended to this report in the annexes section
- " See figure ## " refers to an image, picture or drawing appended to this report in the annexes section
- Throughout this report, a comma is used as decimal separator

General product information:

SOLAR FENCE ENERGIZER
Model- SAFRON-HV

Pictures of Specimen received:



Testing Engineer
Sahil Singh

Technical Manager
Naveen Chopra

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COPY OF MARKING PLATE

SAFRON™ SOLAR FENCE ENERGIZER	
SR. NO.	201606-002
MODEL	SAFRON-HV
INPUT	12 VDC/500 mA
OUTPUT	6KV TO 9KV/ 7 TO 8.5 A
WATTAGE	2 - 5 Jule Pulses
DURATION	250 - 300 Micro Sec (Pulse)
INTERVAL	1000 - 1200 milli Sec (Bet^N Pulses)

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IEC 60335-1 & IEC 60335-2-76				
60335-1	**60335-2-76**	**Requirement – Test**	**Results – Remarks**	**Verdict**
6		**Classification**		
	6.1	Mains – operated energizers and battery operated energizers suitable for connection to the mains shall be class II with respected to protection against electric shock	Battery-operated energizers	P
6.2		Appliances shall have the appropriate degree of protection against harmful ingress of water		N/A
	6.2	Energizer shall be at least IPX4		N/A
7		**Marking and instruction**		
7.1		Appliances shall be marked with the		
		- rated voltage or rated voltage range in volts.	Rated Voltage: 12Vdc	P
		- symbol for nature of supply, unless the rated frequency is marked;		N/A
		- rated power input in watts or rated current in amperes,	500 mA	P
		- name, trade mark or identification mark of the manufacturer	Provided	P
		- Model or type reference	SAFRON-HV	P
		- symbol 5172 of IEC 60417, for class II appliances only;	Class II	P
		- IP number according to degree of protection against ingress of water other than IPX0	IP20	P
	7.1	Energizer shall be marked with the symbol 1641 of ISO 7000.	Provided	P
7.2		Stationary appliances for multiple supply shall be marked with the warning.		N/A
		Warning: Before obtaining access to terminals, all supply circuits must be disconnected.		N/A
7.3		Appliances having a range of rated values shall be marked with the lower and upper limits of the range separated by a hyphen.		N/A
		Appliances having different rated values and which have to be adjusted for use at a particular value by the user or installer shall be marked with the different values separated by an oblique stroke.		N/A
7.4		If the appliances can be adjusted for different rated voltages, the voltage to which the appliance is adjusted shall be clearly discernible.		N/A
7.5		For appliances marked with more than one rated voltage or with one or more rated voltage ranges, the rated power input or rated current for each of these voltage or ranges shall be marked.		N/A

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IEC 60335-1 & IEC 60335-2-76				
60335-1	**60335-2-76**	**Requirement – Test**	**Results – Remarks**	**Verdict**
7.6		Symbols	Provided	P
	7.6	 (symbol 5036 of IEC 60417) Dangerous voltage		P
		 (symbol 5017 of IEC 60417) Earth (ground)		P
7.7		Appliances to be connected to more than two supply conductors and appliances for multiple supply shall have a connection diagram fixed to them, unless the correct mode of connection is obvious		P
7.8		Except for type Z attachment, terminals used for connection to the supply mains indicated as follows:-		N/A
		- terminals intended exclusively for the neutral conductor shall be indicated by the letter N;		N/A
		- protective earthing terminals shall be indicated by symbol IEC 60417- 5019		N/A
		These indications shall not be placed on screws, removable washers or other parts which can be removed when conductors are being connected.		N/A
7.9		Switches which may give rise to a hazard when operated shall be marked so as to indicate clearly which part of the appliance they control.		N/A
7.10		Stationary appliances and the different positions of controls on all appliances shall be indicated by figures, letters or other visual means.		N/A
		The figure 0 shall not be used for any other indication unless it is positioned and associated with other number so that it does not give rise to confusion with the indication of the off position.		P
7.11		Controls intended to be adjusted shall be provided with an indication for the direction of adjustment.		P
7.12		Instructions for use shall be provided with the appliance so that the appliance can be used safely.		P
		The instructions shall state the substance of the following:		
		This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.		N/A

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IEC 60335-1 & IEC 60335-2-76				
60335-1	**60335-2-76**	**Requirement – Test**	**Results – Remarks**	**Verdict**
	7.12	Instructions for TYPES A, B and D energizers shall	Type A energizers	P
		Include a warning using non-rechargeable batteries:	rechargeable batteries:	N/A
		State that, during charging, lead-acid batteries must be placed in a well-ventilated area		P
7.12.1		If it is necessary to take precautions during installation of the appliance, appropriate details shall be given.	General operating precautions provided in the packaging box.	P
7.12.2		If a stationary appliance is not fitted with a supply cord and a plug, or with other means for disconnection from supply mains having a contact separation in all poles that provide full disconnection under overvoltage category III condition, the instruction shall state that means for disconnection must be incorporated in the fixed wiring in accordance with the wiring rules.		N/A
7.12.3		If the insulation of the fixed wiring supplying an appliance for permanent connection to the supply mains can come into contact with parts having temperature rise exceeding 50 K during test of clause 11, the instruction shall state that the fixed wiring insulation must be protected.		N/A
7.12.4		Instructions for built-in appliances:	Fixed appliances	N/A
		- dimensions of the space to be provided for the appliances;		N/A
		- dimensions and positions of the means for supporting and fixing the appliance within this space		N/A
		- minimum distances between the various parts of the appliance and the surrounding structure;		N/A
		- minimum dimensions of ventilating openings and their correct arrangement;		N/A
		- Connection of the appliance to the supply mains and the interconnection of any separate components.		N/A
		- necessity to allow disconnection of the appliance from the supply after installation, unless the appliance incorporates a switch complying with 24.3		N/A
7.12.5		For appliances with type X attachment having a specially prepared cord, the instructions shall contain the substance of the following:		P
		If the supply cord is damaged, it must be replaced by a special cord or assembly available from the manufacturer or its service agent.		P

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IEC 60335-1 & IEC 60335-2-76				
60335-1	**60335-2-76**	**Requirement – Test**	**Results – Remarks**	**Verdict**
		For appliances with type Y attachment, the instructions shall contain the substance of the following.		N/A
		If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard		N/A
		For appliances with type Z attachment, the instructions shall contain the substance of the following.		N/A
		The supply cord cannot be replaced. If the cord is damaged the appliance should be scrapped.		N/A
7.12.6		The instruction for appliances incorporating a non-self-resetting thermal cut-out that is reset by disconnection of the supply mains shall contain the substance of the following.		N/A
		Caution: In order to avoid a hazard due to inadvertent resetting of the thermal cut-out, this appliance must not be supplied through an external switching device, such as a timer, or connected to a circuit that is regularly switched on and off by the utility.		N/A
7.12.7		The instruction for fixed appliances shall state how the appliance is to be fixed to its support.		P
7.12.8		The instructions for appliances connected to the water mains shall state		N/A
7.13		Instruction and other text required by this standard shall be written in an official language of the country in which the appliance is to be sold.	In Compliance	P
7.14		The marking required by the standard shall be clearly legible and durable.	In Compliance	P
7.15		The marking specified in 7.1 to 7.5 shall be on a main part of this appliance.	In Compliance	P
7.16		If compliance with this standard depends upon the operation of a replaceable thermal link or fuse link, the reference number or other means for identifying the link shall be marked at such a place that it is clearly visible when appliance has been dismantled	Fuse used	P
	7.101	The output terminals shall be clearly and indelibly identified by marking with the words EARTH	Provided	P
	7.102	For types A, B, C and D energizers and Battery-operated energizers	Type A energizers	P
	7.103	Energizers shall be supplied with instruction that contain information regarding		P
	-	The installation of electric fences		P
	-	The means of connecting the energizes to the electric fence		P

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IEC 60335-1 & IEC 60335-2-76				
60335-1	**60335-2-76**	**Requirement – Test**	**Results – Remarks**	**Verdict**

8		**Protection against access to live parts**		
8.1		Appliances shall be constructed and enclosed so that there is adequate protection against accidental contact with the live parts	In Compliance	P
8.1.1		The requirement of 8.1 applies for all positions of the appliance when it is operated as in normal use, and after the removal of detachable parts.		P
8.1.2		Test probe 13 of IEC 60132 is applied without appreciable force through openings in class 0 appliances, class II appliances and class II constructions, except for those giving access to lamp caps and live parts in socket-outlets.	Class II appliance	P
8.1.3		For appliances other than those of class II, test probe 41 of IEC 61032 is applied without appreciable force to live parts of visibly glowing heating elements,		N/A
8.1.4		An accessible part is not considered to be live if		P
	-	The means for the connection of the fence is not considered to be live part		P
a)		the part supplied at safety extra-low voltage, provided that		N/A
1)		For a.c. the peak value of the voltage does not exceed 42.2 V,		N/A
2)		For d.c. the voltage does not exceed 42.4V Or If protective impedance is used, the current between the part and the supply source shall not exceed 2 mA for d.c.	D.C operated	P
a)		a.c. peak value shall not exceed 0.7 mA for a.c.		N/A
		- for voltages having a peak value over 42.4 V up to and including 450 V, the capacitance		N/A
		- for peak values over 450 V up to and including 15 kV, discharge not exceeding 45 µC		N/A
		- for voltages having a peak value over 15 KV, the energy is the discharge shall not exceed 350 mJ.		N/A
8.1.5		Live parts of built-in appliances, fixed appliance and appliances delivered in separate units, shall be protected at least by basic insulation before installation or assembly.		P
8.2		Class II appliances and class II construction shall be constructed and enclosed so that there is adequate protection against accidental contact with basic insulation and metal parts separated from live parts by basic insulation only.		P
		It shall only be possible to touch parts which are separated from live parts by double insulation or reinforced insulation		N/A

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IEC 60335-1 & IEC 60335-2-76				
60335-1	**60335-2-76**	**Requirement – Test**	**Results – Remarks**	**Verdict**
9		**Starting of motor-operated appliances**		N/A
10		**Power input and current**		N/A
10.1		If an appliance is marked with rated power input, the power input at normal operating temperature shall not deviate from the rated power input by more than the deviation shown in table 1.		-
10.2		If an appliance is marked with rated current, the current at normal operating temperature shall not deviate from the rated current by more than the deviation shown in Table 2.		-
	10.101	The energizer is supplied at rated voltage or rated voltage for battery supply		-
11		**Heating**		N/A
11.1		Appliances and their surroundings shall not attain excessive temperatures in normal use.		-
11.2		Hand-held appliances are held in their normal position of use.		-
		Appliances with pins for insertion into socket outlets are plugged into an appropriate wall mounted socket-outlet.		-
		Built in appliances are installed in accordance with the instruction		-
		Other heating and other combined appliances are placed in a test corner as follows.		-
	11.2	The battery is discharged to such an extent that the voltage delivered by the battery does not exceed 0,75times to the nominal value		-
11.3		Temperature rises, other than those of windings, are determined by means of fine-wire thermocouples positioned so that they have minimum effect on the temperature of the part under test.		-
11.4		Heating appliances are operated under normal operation and at 1.15 times rated power input.		-
	11.5	The energizer is operated under normal operation, supplied as follows		-
	-	A mains operated energizers is supplied with the most unfavorable supply voltage between 0.85and 1.1times rated voltage		-
	-	Types A and C energizers, when they are connected for mains supply are supplied with the most unfavorable supply voltage between 0.85 and 1.1 times rated voltage		-
	-	A type B energizer, when it is connected for mains supply with battery charge operation supply voltage between 0.85 and 1.1 times rated voltage		-

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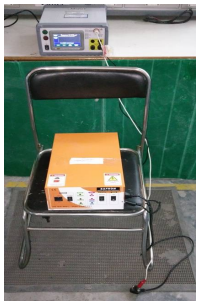
IEC 60335-1 & IEC 60335-2-76				
60335-1	**60335-2-76**	**Requirement – Test**	**Results – Remarks**	**Verdict**
	-	Types A, B, C and energizers when they are connected for battery supply, and battery-operated energizers are supplied		-
11.6		Combined appliances are operated under normal operation and supplied with the most unfavorable voltage between 0.94 times and 1.06 times the rated voltage.		-
	11.7	The energizer is operated until steady condition are established		-
11.8		During the test, the temperature rises are monitored continuously and shall not exceed the values shown in table 3.		-
	11.8	The temperature rise limits for appliance for tropical climates are reduced by 15K.		-
		The temperature rise limits for fans marked with an ambient operating temperature are reduced by the difference between the marked value & 25°C		-
13		**Leakage current and electric strength at operating temperature**		
13.1		At operating temperature, the leakage current of the appliance shall not be excessive and its electric strength shall be adequate.		N/A
		Heating appliances are operated at 1.15 times the rated power input.		N/A
		Protective impedance and radio interference filters are disconnected before carrying out the tests.		N/A
	-	Compliance is check by the test of 13.2 and 13.3 for main operated energizers suitable for connection to the main supply only		N/A
13.2		The leakage current is measured between any pole of the supply and accessible metal parts connected to metal foil having an area not exceeding 20 cm × 10 cm which is in contact with accessible surfaces of insulating materials		N/A
		After the appliance has been operated for a duration as specified in 11.7 the leakage current shall not exceed		N/A

IEC 60335-1 & IEC 60335-2-76				
60335-1	**60335-2-76**	**Requirement – Test**	**Results – Remarks**	**Verdict**
13.3		Electric strength test as per table 4	 (Refer Table A)	P
		No breakdown shall occur during the test.	In compliance	P
		The appliance is disconnected from the supply and the insulation is immediately subjected to a voltage having a frequency of 50 Hz or 60 Hz for 1 min,	In compliance	P
14.		**Transient Overvoltage**		
		Appliance shall withstand the transient over voltage to which they may be subjected.		N/A
	14.101	Energizers shall be resistant to atmospheric surges entering from the fences		N/A
15		**Moisture resistance**		
15.1		The enclosure of the appliance shall provide the degree of protection against moisture in accordance with the classification of the appliance.		P
15.1.1		Appliances other than those classified IPX0 are subjected to the test of IEC 60529.		-
		Water valves containing live parts and that are incorporated in external hoses for connection of an appliance to the water mains are subjected to the test specified for IPX7 appliances.		N/A
15.1.2		Hand held appliances are turned continuously through the most unfavorable positions during the test.		N/A
		Built-in-appliances are installed in accordance with the instructions.		N/A
		Appliances normally used on the floor or table are placed on a horizontal unperforated support having a diameter of twice the oscillating tube radius minus 15 cm		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

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IEC 60335-1 & IEC 60335-2-76				
60335-1	**60335-2-76**	**Requirement – Test**	**Results – Remarks**	**Verdict**
		For IPX4 appliances, the horizontal centre line of the appliance is aligned with the pivot axis of the oscillating tube.		N/A
		For wall mounted appliances state that the appliance is to be placed close to the floor level and specifies a distances.		N/A
		Appliances with type X attachment, except those having a specially prepared cord, are fitted with the lightest permissible type of flexible cord of the smallest cross-sectional area specified in table 13.		N/A
15.2		Appliances subject to spillage of liquid in normal use shall be so constructed so that such spillage does not affect their electrical insulation.		N/A
15.3		Appliances shall be proof against humid conditions that may occur in normal use.	Temp: 25˚C Humidity: 93% RH Duration: 48 H In Compliance	P
16		**Leakage current and electric strength.**		
16.1		The leakage current of the appliance shall not be excessive and its electric strength shall be adequate.		P
		Protective impedance is disconnected from live parts before carrying out the tests.		N/A
	-	Compliance is check by follows test : - 16.2, 16.3and 16.102 for main opertaed energizer and battery-operated energizer suitable for connection fo the mains - 16.101 and 16.102 for battery operated energizers		N/A
16.2		An a.c. test voltage is applied between live parts and accessible metal parts		N/A
		The test voltage is.		
		- 1.06 times rated voltage, for single-phase appliances.		N/A
		- 1.06 times rated voltage, divided by $\sqrt{3}$, for three-phase appliances.		N/A
		The leakage current shall not exceed (3,5 mA)		N/A
16.3		Electric strength test as per table 7		
		No breakdown shall observe during the test.		P
		The insulating is subjected to a voltage having a frequency of 50 Hz or 60 Hz for 1 minute.		P

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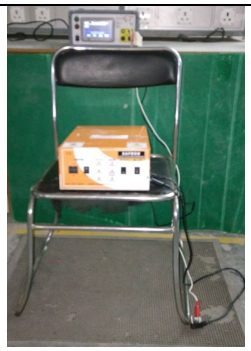
IEC 60335-1 & IEC 60335-2-76				
60335-1	**60335-2-76**	**Requirement – Test**	**Results – Remarks**	**Verdict**
		A test voltage is applied between accessible metal parts and the supply cord which is wrapped with metal foil where it is located in an inlet bushing, a cord guard or a cord anchorage.		P
		No breakdown shall observe during the test		P
	16.101	For battery operated energizer the terminal are connected 10 min to a voltage between 1,1 and 1.5 times rated voltage for supply		
	-	Insulation test is subjected 1 min to d.c voltage approximately 500V .	 (Refer Table A)	P
17		**Overload protection of transformer and associated circuits**		N/A
		Appliances incorporating circuits supplied from a transformer shall be constructed so that in the event of short circuits which are likely to occur in normal use, excessive temperatures do not occur in the transformer or in the circuits associated with the transformer.		-
		The temperature rise of the insulation of the conductor of safety extra-low voltage circuits shall not exceed the relevant value specified in table 3 by more than 15 K.		-
		The temperature of windings shall not exceed the values specified in table 8.		-
18		**Endurance**		
	-	energizer shall be so constructed that are able to endure extreme temperature that may be encountered in normal use		N/A

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IEC 60335-1 & IEC 60335-2-76				
60335-1	**60335-2-76**	**Requirement – Test**	**Results – Remarks**	**Verdict**

19		**Abnormal operation**		N/A
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 practicable.		-
		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 dangerous malfunction.		-
		Appliances incorporating heating elements are subjected to the tests of 19.2 and 19.3.		-
		Appliances incorporating motor are subject to the tests of 19.7 to 19.10.		-
	19.1	**The** energizer is mounted in 11.2except that the battery, where applicable, is fully charged		-
19.2		Appliances with heating elements are tested under the conditions of specified in clause 11 but with restricted heat dissipation with power input of 0.85 times rated power input normal operation.		-
19.3		The test of 19.2 is repeated with power input 1.24-time rated power input under normal operation.		-
19.4		The appliance is tested under the conditions specified in clause 11.		-
19.5		The test of 19.4 is repeated on class 01 appliances and class I appliances incorporating tubular sheathed or embedded heating elements.		-
19.6		Appliances with PTC heating elements are supplied at rated voltage until steady conditions with regard to power input and temperature are established.		-
19.7		The appliance is operated under stalled conditions by		-
		- locking the rotor if the locked rotor torque is smaller than the full load torque;		-
		- locking moving parts of other appliances.		-
		During the test the temperature of the windings shall not exceed the relevant value specified in Table 8		-
		- 50 K, for appliance with T marking;		-
		- 65 K, for other appliance.		-

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IEC 60335-1 & IEC 60335-2-76				
60335-1	**60335-2-76**	**Requirement – Test**	**Results – Remarks**	**Verdict**
19.8		One phase of appliances incorporating multi-phase motors is disconnected. The appliance is then operated under normal operation and supplied at rated voltage for the period in 19.7		-
19.9		A running overload test is carried out an appliances incorporating motor that are intended to be remotely or automatically controlled or liable to be operated continuously.		-
19.10		Appliances incorporating series motors are operated with the lowest possible load and supplied at 1.3 times rated voltage for 1 min.		-
19.11		Electronic circuits are 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.		-
19.11.1		Fault conditions a) to f) specified in 19.11.2 are not applied to circuits or parts of circuits when both of the following conditions are met;		-
		- the electronic circuit is a low-power circuit as described below;		-
		- Protection against electric shock, fire hazard, mechanical hazard or dangerous malfunction of other parts of the appliances does not rely on the correct functioning of the electronic circuit.		-
19.11.2		The fault conditions are considered and, if necessary, applied one at a time, consequential faults being taken into consideration;		-
a)		Short circuit of functional insulation if clearances or creepage distances are less than the values specified in clause 29;		-
b)		open circuit at the terminals of any component;		-
c)		Short circuit of capacitors, unless they comply with IEC 60384-14;		-
d)		Short circuit of any two terminals of an electronic component, other than an integrated circuit. This fault condition is not applied between the two circuits of an opt coupler		-

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IEC 60335-1 & IEC 60335-2-76				
60335-1	**60335-2-76**	**Requirement – Test**	**Results – Remarks**	**Verdict**
e)		Failure of trials in the diode mode;		-
f)		Failure of an integrated circuit. All possible output signals are considered for faults occurring within the integrated circuit. If it can be shown that a particular output signal is unlikely to occur, then the relevant fault is not considered.		-
g)		Failure of an electronic power switching device is a partial turn-on mode with loss of gate control. During the test, winding temperatures shall not exceed the values given in 19.7.		-
19.11.3		If the appliance incorporates a protective electronic circuit which operates to ensure compliance with clause 19. The relevant test is repeated with a single fault simulated. as indicated in a) to f) of 19.11.2		-
19.11.4		Appliances having a device with a off position obtain by electronic disconnection or a device that can be placed in the stand-by mode, are subjected to the tests of 19.11.4.1 to 19.11.4.7. the tests are carried out with the appliance supplied at rated voltage, the device being set in the off position or in the stand-by mode.		-
		Appliances incorporating a protective electronic circuit are subjected to the tests of 19.11.4.1 to 19.11.4.7. The tests are carried		-
19.11.4.1		The appliance is subjected to electrostatic discharges in accordance with IEC 61000-4-2 test level 4 being applicable. Ten discharges having a positive polarity ten discharges having a negative polarity are applied at each preselected point.		-
19.11.4.2		The appliance is subjected to radiated fields in accordance with IEC 61000-4-3, test level 3 being applicable.		-
19.11.4.3		The appliance is subjected to fast transient burst in accordance with IEC 61000-4-4. The test level 3 is applicable for signal and control lines. Test level 4 is applicable for the power supply lines. The bursts are applied for 2 min with a positive polarity and 2 min with a negative polarity.		-

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IEC 60335-1 & IEC 60335-2-76				
60335-1	**60335-2-76**	**Requirement – Test**	**Results – Remarks**	**Verdict**
19.11.4.4		The power supply terminals of the appliance are subjected to voltage surges in accordance with IEC 61000-4-5, five positive impulses and five negative impulses being applied at the selected points. Test level 3 is applicable for the line-to-line coupling mode, a generator having a source impedance of 2 Ω being used. Test level 4 is applicable for the line-to-earth coupling mode, a generator having a source impedance of 12 Ω being used.		-
19.11.4.5		The appliance is subjected to injected currents in accordance with IEC 61000-4-6, test level 3 being applicable. During the test, all frequencies between 0.15 MHz to 80 MHz are covered.		-
19.11.4.6		The appliance is subjected to the Class 3 voltage dips and interruptions in accordance with IEC 61000-4-11. The values specified in Table 1 and Table 2 of IEC 61000-4-11 are applied at zero crossing of the supply voltage.		-
19.11.4.7		The appliance is subjected to mains signals in accordance with IEC 61000-4-13, test level class 2 being applicable.		-
19.12		If safety of the appliances depends upon the operation of a miniature fuse-link complying with IEC 60127 during any of the fault conditions specified in 19.11.2, the test is repeated but with the miniature fuse-link replaced by an ammeter, if current is measured.		-
		- does not exceed 2.1 times the rated current of the fuse-link, the circuit is considered to be adequately protected; and the test is carried out with the fuse-link short circuited.		-
		- is at least 2.75 times the rated current of the fuse-link, the circuit is considered to be adequately protected.		-
		- is between 2.1 times and 2.75 times the rated current of the fuse link, the fuse link is short circuited and the test is carried out.		-

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IEC 60335-1 & IEC 60335-2-76				
60335-1	**60335-2-76**	**Requirement – Test**	**Results – Remarks**	**Verdict**
19.13		During the tests the appliance shall not emit flames, molten metal, or poisonous or ignitable gas in hazardous amounts and temperature rises shall not exceed the values in table 9		-
		For appliances which are immersed in or filled with conducting liquid in normal, the appliance is immersed in or filled with water for 24 h before the electronic strength test is carried out.		-
		The appliance shall not undergo a dangerous malfunction, and there shall be no failure of protective electronic circuits if the appliance is still operable.		-
19.14		Appliances are operated under the conditions of clause 11. Any contractor or relay contact that operates under the conditions of Clause 11 is short-circuited.		-
	19.101	Energizer are subjected to each of the following conditions is turn, while being supplied with the voltage specified in 11.5		-
	-	The energizer is placed in the most unfavourable position even is likely not installed		-
	-	Adjustable from the outside of the energizers without the aid of a tool		-
	-	The earthing conductor is removed fron the earthing terminals of the fence circuit and connected to any other output terminals		-
	-	The output terminal are short circuited		-
	19.102	Types A,C and D energizers are subjected to each of the following conditions specified in 11.5		-
	-	With the energizer connected for battery supply		-
	-	With the energizer connected for main operation		-
	19.103	Types B energizers are subjected to each of the specified in 11.5		-
	19.104	Battery operated energizers and type B Energizers connected for battery		-
	19.105	Battery operated energizes having a rated voltage of less than 12 V and type A, B,C, and D energizer having a rated voltage for battery supply of less than 12 V are operated under normal operation when supplied with an input voltage of 13.2 Vdc		

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IEC 60335-1 & IEC 60335-2-76				
60335-1	**60335-2-76**	**Requirement – Test**	**Results – Remarks**	**Verdict**
20		**Stability and mechanical hazards**		N/A
21		**Mechanical strength**		
21.1		Appliance shall have adequate mechanical strength and be constructed to withstand such rough handling that may be expected in normal use.		P
21.2		Accessible parts of solid insulation shall have sufficient strength to prevent penetration by sharp implements.		P
	21.101	The Energizer shall with stand the effect of being dropped on 25mm thick board height of 225mm ± 5mm		P
22		**Construction**		
22.1		If the appliance is marked with the first numeral of the IP system, the relevant requirements of IEC 60529 shall be fulfilled.	IP20	P
22.2		For stationary appliances, means shall be provided to ensure all-pole disconnection from the supply mains. Such means shall be one of the following.		-
		- a supply cord fitted with a plug;		N/A
		- a switch complying with 24.3		N/A
		- a statement in the instructions that a disconnection incorporated in the fixed wiring is to be provided;		N/A
		- an appliance inlet.		N/A
22.3		Appliance provided with pins: no undue strain on socket-outlets		N/A
		Applied torque not exceeding 0.25 Nm		N/A
		Pull force of 50N to each pin after the appliance has being placed in the heating cabinet		N/A
		Each pin subjected to a torque of 0.4Nm; the pins are not rotating unless rotating does not impair compliance with the standard		N/A
22.4		Appliance for heating liquids and appliance causing undue vibration not provided with pins for insertion into socket-outlets		N/A
22.5		No risk of electric shock when touching the pins of the plug		N/A
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

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IEC 60335-1 & IEC 60335-2-76				
60335-1	**60335-2-76**	**Requirement – Test**	**Results – Remarks**	**Verdict**
22.7		Adequate safeguards against the risk of excessive pressure in appliances provided with 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
22.9		Insulation, internal wiring, windings, commutators and slip rings not exposed to oil, grease or similar substances		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 that provide the necessary degree of protection against electric shock, moisture or contact with moving parts	No moving parts present	N/A
22.12		Handles, knobs etc. Shall be fixed in a reliable manner so that no loosening could result in a hazard		P
		Axial force 15 N applied to parts, the shape being so that an axial pull is unlikely to be applied		P
		Axial force 30 N applied to parts, the shape being so that an axial pull is likely to be applied		P
22.13		Unlikely that handles, when gripped as in normal use, make the operators hand touch parts having a temperature rise exceeding the value specified for handles which are held for short periods only		N/A
22.14		No ragged or sharp edges creating a hazard for the user in normal use, or during user maintenance	No ragged or sharp edges	P
		No exposed pointed ends of self-tapping screws etc., liable to be touched by the user in normal use or during user maintenance	In compliance	P
22.15		Storage hooks and the like for flexible cords smooth and well rounded		N/A
22.16		Automatic cord reels cause no undue abrasion or damage to the sheath of the flexible cord, no breakage of conductors strands, 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

IEC 60335-1 & IEC 60335-2-76				
60335-1	**60335-2-76**	**Requirement – Test**	**Results – Remarks**	**Verdict**
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 under normal conditions of use		P
22.19		Driving belts not used as electrical insulation		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
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 fibers used for the electrical insulation of heating elements.		N/A
22.22		Appliances shall not contain asbestos	In compliance	P
22.23		Oils containing polychlorinated biphenyl (PCB) shall not be used in appliance	In compliance	P
22.24		Bare heating elements 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 cannot come into contact with accessible metal parts		N/A
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	Class II appliance	P
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	Class II appliance	P
22.30		Parts serving as supplementary or reinforced insulation fixed so that they cannot be removed without being seriously damaged, or	Class II appliance	P
		so constructed that they cannot be replaced in an incorrect position, and so that if they are omitted, the appliance is rendered inoperable or manifestly incomplete		N/A

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IEC 60335-1 & IEC 60335-2-76				
60335-1	**60335-2-76**	**Requirement – Test**	**Results – Remarks**	**Verdict**
22.31		Clearances and creepage distances over supplementary and reinforced insulation not be reduced below values specified in clause 29 as a result of wear.		N/A
	22.31	This requirement applies only to mains-operated energizers and battery operated energizers suitable for connection to the mains.		P
22.32		Supplementary and reinforced insulation designed or protected against deposition of dirt or dust		N/A
		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 material or beads alone not used as supplementary or reinforced insulation		N/A
		Oxygen bomb test at 70 °C for 96 h and 16 h at room temperature		N/A
	22.31	This requirement applies only to mains-operated energizers and battery operated energizers suitable for connection to the mains.		P
22.33		Conductive liquids that are or may become accessible in normal use are not in direct contact with live parts		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, not in direct contact with basic or reinforced insulation		N/A
		For class II constructions, conductive liquids which are in contact with live parts, not in direct contact with reinforced insulation		N/A
22.34		Shafts of operating knobs, handles, levers and similar part shall not be live, unless the shaft is inaccessible 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 failure of basic insulation		P
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 shall not connected to accessible metal parts	Class II appliance	P
22.38		Capacitors shall not connect between the contacts of a thermal cut-out		P

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IEC 60335-1 & IEC 60335-2-76				
60335-1	**60335-2-76**	**Requirement – Test**	**Results – Remarks**	**Verdict**
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.		N/A
22.41		No components, other than lamps, containing mercury		N/A
22.42		Protective impedance shall consist of at least two separate components. Values specified in 8.1.4 not exceeded if any one of the components are 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
22.44		Appliances are not allowed to have an enclosure that is shaped and decorated so that the appliance is likely to be treated as a toy by children		P
22.45		When air is used as reinforced insulation, clearances not reduced below the values specified in 29.1.4 due to deformation as a result of an external force applied to the enclosure		N/A
22.46		Software used in protective electronic circuit shall be software class B or software class C		N/A
22.47		Appliances intended to be connected to the water mains shall withstand the water pressure expected in normal use.		N/A
22.48		Appliance intended to be connected to the water mains shall be constructed to prevent back siphon age of non-potable water into the water mains		N/A
22.49		For remote operation, the duration of operation shall be set before the appliance can be started unless the appliance switches off automatically at the end of a cycle or it can operate continuously without giving rise to a hazard		N/A
22.50		Controls incorporated in the appliance, if any, shall take priority over controls actuated by remote operation.		N/A
22.51		A control on the appliance shall be manually adjusted, to the setting for remote operation before the appliance can be operated in this mode.		N/A
22.52		Socket-outlets on appliances accessible to the user shall be accordance with the socket-outlet system used in the country in which the appliance is sold.		N/A

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IEC 60335-1 & IEC 60335-2-76				
60335-1	**60335-2-76**	**Requirement – Test**	**Results – Remarks**	**Verdict**
	22.101	For mains-operated energizers and battery operated energizers suitable for connection to the mains, internal connection shall be so fixed or protected.		P
		Energizers shall be so designed that, even in the losing or breaking of wires, a conductive connection cannot be formed between the mains supply and the fence circuit, and no other hazards condition shall arise		P
	22.102	For mains-operated energizers and battery operated energizers suitable for connection to the mains, transformers in the fence circuit shall be placed in a separate compartment.		N/A
	22.103	For metal-encased class II energizers, the output terminal shall be placed so that exrternal conductors connected to these terminals are not likely to come into contact with the enclosure.		P
	22.104	Energizers shall be so designed that		
	-	The conductor for the connection of the fence and the earth electrode can be easily connected.		P
	-	It is possible to actuate switches and other control.		P
	22.105	For mains-operated energizers and battery operated energizers suitable for connection to the mains, any assembly gap in the supplementary insulation shall not be co- incidental with any such gap in the basic insulation.		N/A
	22.106	Metal parts in the battery compartment that become accessible when replacing battery even with the aid of tool shall be insulated from live part by double insulation or reinforce insulation		P
	22.107	battery operated energizers and battery operated energizers suitable for connection to the mains shall be provided with mean to prevent the user from being subjected to an electric shock due to the energizer output voltage,		P
	22.108	Energizer output characteristics shall be such that		
	-	The impulse repetition rate shall not exceed 1 Hz		N/A
	-	The impulse duration of the impulse in the 500 Ω component of the standard load shall not exceed 10 ms		N/A
	-	The energy / impulse in the non-inductive resistor R1 of the standard load shall not exceed 5 J		N/A
	22.109	If the energizer is provided with the more than one fence circuit, the output characteristics shall be within the limit specified in 22.108		N/A

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IEC 60335-1 & IEC 60335-2-76				
60335-1	**60335-2-76**	**Requirement – Test**	**Results – Remarks**	**Verdict**
	22.110	For type A and B energizer that have terminal for the connection of the battery no load DC output voltage shall not exceed 42.4V.		P
	22.111	The peak value of the output voltage, U_0, shall be measured and recoded to enable the test and measurement of 14.102,14.103, 14.103, 14.104 and 16.3 to be carried out.		N/A
23		**Internal Wiring**		
23.1		Wire ways 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	In compliance	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 conductor's 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 flexing for conductors flexed during normal use and at rated voltage.		N/A
		Electric strength test, 1000 V between live parts and accessible metal parts		N/A
23.4		Bare internal wiring sufficiently rigid and fixed in normal use, clearances or creepage distances cannot be reduced below the values specified in Clause 29		P
23.5		The insulation of internal wiring withstanding the electrical stress likely to occur in normal use		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	The main operated energizers and battery operated energizers suitable for connection to the mains colur green/yellow not used		N/A

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IEC 60335-1 & IEC 60335-2-76				
60335-1	**60335-2-76**	**Requirement – Test**	**Results – Remarks**	**Verdict**

23.8		Aluminum wires shall not used for internal wiring		In compliance	P
23.9		No lead-tin soldering of stranded conductors where they are subject to contact pressure, unless			N/A
		clamping means so constructed that there is no risk of bad contact due to cold flow of the solder			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, shall be at least equivalent to that of light pvc sheathed flexible cord.			N/A
24		**Components**			
24.1		Components comply with safety requirements in relevant IEC standards			P
24.1.1		Capacitors likely to be permanently subjected to the supply voltage and used for radio interference suppression or for voltage dividing, IEC 60384-14,			N/A
24.1.2		Safety isolating transformers complying with IEC 61558-2-6.		In compliance	P
24.1.3		Switches complying with IEC 61058, the number of cycles of operation being at least 10 000		In compliance	P
24.1.4		Automatic controls complying with IEC 60730-1 with relevant part 2. The number of cycles of operation being:			N/A
		- thermostats:	10 000		N/A
		- temperature limiters:	1 000		N/A
		- self-resetting thermal cut-outs:	300		N/A
		- non-self-resetting thermal cut-outs	30		N/A
		- timers:	3 000		N/A
		- energy regulators:	10 000		N/A
24.1.5		Appliance couplers complying with IEC 60320-1		In compliance	P
		However, appliances classified higher than IPX0, the appliance couplers complying with IEC 60320-2-3			-
24.1.6		Small lamp holders similar to E10 lamp holders complying with IEC 60238, the requirements for E10 lamp holders being applicable			N/A
24.1.7		If the remote operation of the appliance is via a telecommunication network, the relevant standard for telecommunication interface circuitry in the appliance is IEC 62151			N/A
24.1.8		The relevant standard for thermal links is IEC 60691. Thermal links that do not comply with IEC 60691 are considered to be an intentionally weak part for the purposes of clause 19.			N/A

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IEC 60335-1 & IEC 60335-2-76				
60335-1	**60335-2-76**	**Requirement – Test**	**Results – Remarks**	**Verdict**
24.1.9		Relays other than motor starting relays, are tested as part of the appliances		N/A
24.2		Appliances shall not be fitted with		
		switches or automatic controls in flexible cords;		N/A
		devices that cause the protective device in the fixed wiring to operate in the event of a fault in the appliance		N/A
		thermal cut-outs that can be reset by a soldering operation, unless the solder has a melting point of at least 230 °C		N/A
24.3		Switches intended for all-pole disconnection of stationary appliances are directly connected to the supply terminals and having a contact separation in all poles, providing full disconnection under overvoltage category III conditions	Overvoltage category II	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 60083 or IEC 60906-1 or with connectors and appliance inlets complying with the standard sheets of IEC 60320-1		P
24.5		Capacitors in auxiliary windings of motors shall be marked with their rated voltage and their rated capacitance and shall be used in accordingly with their marking		P
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, shall not exceeding 42V.		N/A
24.7		Detachable Hose-sets for the connection of appliances to the water mains, shall comply with IEC 61770.		N/A
24.8		Motor running capacitors in appliances for which 30.2.3 is applicable and that are permanently connected in series with a motor winding shall not cause a hazard in the event of a capacitor failure.		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:		P
		-supply cord fitted with a plug		P
		- an appliance inlet having at least the same degree of protection against moisture as required for the appliance		P
		- pins for insertion into socket-outlets		N/A
	25.1	Type D energizers shall be provided with a non-detachable flexible cord with connecting means that are not suitable for connection to the mains		N/A

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IEC 60335-1 & IEC 60335-2-76				
60335-1	**60335-2-76**	**Requirement – Test**	**Results – Remarks**	**Verdict**
25.2		Stationary Appliance for multiple supply shall not be 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		Appliances intended to be permanently connected to fixed wiring shall be provided with one of the following means for connection to the supply mains:		-
		a set of terminals allowing the connection of a flexible cord		P
		a fitted **supply cord**		P
		a set of **supply leads** accommodated in a suitable compartment		P
		a set of terminals allowing the connection of cables of fixed wiring having the nominal cross-sectional areas specified in 26.6		P
25.4		a set of terminals and cable entries, conduit entries, knock-outs or glands, which allow the connection of the appropriate types of cable or conduit.		N/A
		Cable and conduit entries, rated current of appliance not exceeding 16 A, dimensions according to table 10		N/A
		Introduction of conduit or cable does not reduce clearances or Creepage distances below values specified in clause 29		N/A
25.5		**Supply cords** shall be assembled to the appliance by one of the following methods:		N/A
		- type X attachment		P
		- type Y attachment		N/A
		- type Z attachment is allowed for portable fans		N/A
		Type X attachment, other than those with a specially prepared cord, shall not be used for flat twin tinsel cords		P
	25.5	Battery operted energizers shall be assembled with the energizers by a type x –attachment		P
25.6		Plugs shall not be fitted with more than one flexible cord.		P
	25.7	Supply cords other than flexible lead or flexible cord connecting and external battery	Class II appliance	P

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IEC 60335-1 & IEC 60335-2-76				
60335-1	**60335-2-76**	**Requirement – Test**	**Results – Remarks**	**Verdict**
25.8		Conductors of **supply cords** shall have a nominal cross-sectional area not less than that shown in Table 11.		P
	25.8	The conductors in flexible leads or flexible cords used to connect the battery in battery operated energzier shall have nomianl cross sectional area of not less than 0.75 mm2		P
25.9		**Supply cords** shall not be in contact with sharp points or edges of the appliance		P
25.10		The **supply cord** of **class I appliances** shall have a green/yellow core		N/A
25.11		Conductors of **supply cords** shall not be consolidated by soldering where they are subjected to contact pressure, unless the contact pressure is provided by spring terminals		N/A
25.12		The insulation of the supply cord shall not be damaged when Moulding the cord to part of the enclosure.		P
25.13		Inlet openings for **supply cords** shall be constructed so that the sheath of the **supply Cord** can be introduced without risk of damage.		N/A
		If the **supply cord** is unsheathed, a similar additional bushing or lining is required, unless the appliance is a **class 0 appliance** or a **class III appliance** that does not contain **live parts**.		N/A
25.14		Appliances provided with a supply cord and that are moved while in operation shall be constructed so that the supply cord is adequately protected against excessive flexing where it enters the appliance.		N/A
		Flexing test:		
		- applied force (N).....:		N/A
		- number of flexing.....		N/A
		The test shall not result in:		
		- a short circuit between the conductors, such that the current exceeds a value equal to twice the rated current of the appliance		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

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IEC 60335-1 & IEC 60335-2-76				
60335-1	**60335-2-76**	**Requirement – Test**	**Results – Remarks**	**Verdict**
25.15		Appliances provided with a supply cord, and appliances intended to be permanently connected to fixed wiring by a flexible cord, shall have a cord anchorage.		N/A
		The cord anchorage shall relieve conductors from strain, including twisting, at the terminals and protect the insulation of the conductors from abrasion.		N/A
		It shall not be possible to push the cord into the appliance to such an extent that the cord or internal parts of the appliance could be damaged.		N/A
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 that may be connected, unless the cord is specially prepared		N/A
		- the cord cannot touch the clamping screws of cord anchorage if these screws are accessible, unless 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 part of a specially prepared cord		N/A
		- screws which have to be operated when replacing the cord do not fix any other component. However, this does not apply if		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		P
25.17		For **type Y attachment** and **type Z attachment**, cord anchorages shall be adequate.		N/A
25.18		Cord anchorages only accessible with the aid of a tool, or so constructed that the cord can only be fitted with the aid of a tool		N/A

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IEC 60335-1 & IEC 60335-2-76				
60335-1	**60335-2-76**	**Requirement – Test**	**Results – Remarks**	**Verdict**
25.19		Type X attachment, glands shall not be used as cord anchorage in portable appliances		N/A
		Tying the cord into a knot or tying the cord with string is not allowed.		N/A
25.20		The insulated conductors of the **supply cord** for **type Y attachment** and **type Z attachment** shall be additionally insulated from **accessible metal parts** by **basic insulation** for **class 0 appliances**, **class 0I appliances** and **class I appliances,** and by **supplementary insulation** for **class II appliances**.		N/A
		This insulation may be provided by the sheath of the **supply cord** or by other means.		N/A
25.21		The space for the connection of **supply cords** having **type X attachment**, or for the connection of fixed wiring, shall be constructed		N/A
		- so that it is possible to check that the supply conductors are correctly positioned and connected before fitting any cove		N/A
		- so that any cover can be fitted without risk of damage to the conductors or their insulation		N/A
		-for **portable appliances**, so that the uninsulated end of a conductor, should it become free from the terminal, cannot come into contact with **accessible metal parts**.		N/A
25.22		Appliance inlet:		N/A
		- live parts are not accessible during insertion or removal of the connector		N/A
		- connector can be inserted without difficulty		N/A
		- the appliance is not supported by the connector		N/A
		- appliance inlet is not for cold conditions if temp. rise of external metal parts exceeds 75 K, unless the supply cord is unlikely to touch such metal parts		N/A
25.23		Interconnection cords shall comply with the requirements for the supply cord, except that		
		- the cross-sectional area of the conductors of the **interconnection cord** is determined on the basis of the maximum current carried by the conductor during the test of Clause 11 and not by the **rated current** of the appliance		P

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IEC 60335-1 & IEC 60335-2-76				
60335-1	**60335-2-76**	**Requirement – Test**	**Results – Remarks**	**Verdict**
		- the thickness of the insulation of the conductor may be reduced if the voltage of the conductor is less than the **rated voltage**		N/A
25.24		Interconnection cords shall not detachable without the aid of a tool if compliance with the standard is impaired when they are disconnected.		N/A
25.25		The dimensions of pins of appliances that are inserted into socket-outlets shall be compatible with the dimensions of the relevant socket-outlet.		N/A
26		**Terminals for external conductors**		
26.1		Appliances shall be provided with terminals or equally effective devices for the connection of external conductors. The terminals, other than terminals in **class III appliances** that do not contain **live parts**, shall only be accessible after the removal of a **non-detachable cover.**	Class II Equipment	N/A
26.2		Appliances having **type X attachment**, except those having a specially prepared cord, and appliances for the connection of cables of fixed wiring shall be provided with terminals in which the connections are made by means of screws, nuts or similar devices, unless the connections are soldered.		P
26.3		Terminals for **type X attachment** and those for the connection of cables of fixed wiring shall be constructed so that they clamp the conductor between metal surfaces with sufficient contact pressure but without causing damage to the conductor		P
		The terminals shall be fixed so that when the clamping means is tightened or loosened		P
		- the terminal does not become loosen		P
		- internal wiring is not subjected to stress		P
		- neither **clearances** nor **creepage distances** are reduced below the values specified in Clause 29		P
26.4		Terminals for **type X attachment**, except **type X attachments** having a specially prepared cord, and terminals for the connection of cables of fixed wiring, shall not require special preparation of the conductor such as by soldering of the strands of the conductor		P

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IEC 60335-1 & IEC 60335-2-76				
60335-1	**60335-2-76**	**Requirement – Test**	**Results – Remarks**	**Verdict**
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		P
		No contact between live parts and accessible metal parts and, for class II constructions, between live parts and metal parts separated from accessible metal parts by supplementary insulation only		P
26.6		Terminals for type X attachment and for connection of cable of fixed wiring shall allow the connection of conductors having the nominal cross-sectional areas shown in Table 13		P
26.7		Terminals for **type X attachment**, other than those in **class III appliances** that do not contain **live parts**, shall be 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, shall be located close to each other.		N/A
26.9		Terminals of the pillar type shall be constructed and located so that the end of a conductor introduced into the hole is visible, or can pass beyond the threaded hole for a distance equal to half the nominal diameter of the screw but at least 2,5 mm.		N/A
26.10		Terminals with screw clamping and screw less terminals not used for flat twin tinsel cords, unless conductors ends fitted with a device suitable for screw terminals.	In Compliance	P
		Pull test of 5 N to the connection	In Compliance	P
26.11		For appliances having **type Y attachment** or type **Z attachment**, soldered, welded, crimped or similar connections may be used for the connection of external conductors	X type attachment	N/A
		For **class II appliances**, the conductor shall be positioned or fixed so that reliance is not placed upon the soldering, crimping or welding alone to maintain the conductor in position	Class II Appliance	P
	26.101	Output terminals shall be so designed or located that is not possible to connect the fence or the earth electrode.	In Compliance	P
	26.102	Output terminals shall be fixed that they will not work when loose when external are connected or disconnected	In Compliance	P
	26.103	Device for clamping the conductors connecting fence or earth electrode to energizers shall not serve to any other components		P

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IEC 60335-1 & IEC 60335-2-76				
60335-1	**60335-2-76**	**Requirement – Test**	**Results – Remarks**	**Verdict**
27		**Provision For Earthing**		
27.1		**Accessible metal parts** of **class 0I appliances** and **class I appliances** that may become live in the event of an insulation fault, shall be permanently and reliably connected to an earthing terminal within the appliance or to the earthing contact of the appliance inlet		N/A
		Earthing terminals and earthing contacts shall not be connected to the neutral terminal.		N/A
		Class 0 appliances, class II appliances and class III appliances shall have no provision for earthing.		P
		Safety extra-low voltage circuits shall not be earthed unless they are **protective extra-low voltage circuits**		N/A
27.2		The clamping means of earthing terminals shall be adequately secured against accidental loosening		N/A
		Terminals used for the connection of external equipotential bonding conductors allow connection of conductors of 2.5 to 6 mm^2, and do not provide earthing continuity between different parts of the appliance		N/A
		Conductors shall not be possible to loosened without the aid of a tool		N/A
27.3		For appliances with supply cord, current-carrying conductors become taut before earthing conductor, if the cord slips out of the cord anchorage		N/A
27.4		All parts of the earthing terminal intended for the connection of external conductors shall be such that there is no risk of corrosion resulting from contact between these parts and the copper of the earthing conductor or any other metal in contact with these parts.		N/A
		Parts providing earthing continuity, other than parts of metal frame or enclosure shall be of metal having adequate resistance to corrosion		N/A
27.5		The connection between earthing terminal and earthed metal parts shall have low resistance		N/A
27.6		The printed conductors of printed circuit boards not used to provide earthing continuity in hand held appliances		N/A
		They may be used in other appliances if:		N/A
		- at least two tracks are used with independent soldering points and the appliance complies with requirements of 27.5 for each circuit		N/A

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IEC 60335-1 & IEC 60335-2-76				
60335-1	**60335-2-76**	**Requirement – Test**	**Results – Remarks**	**Verdict**

28		**Screws and connections**		
28.1		Fixings, electrical connections and connections providing earthing continuity withstand mechanical stresses occurring in normal use		N/A
		Screws shall not of soft metal liable to creep, such as zinc or aluminum		P
		Diameter of screws of insulating material min. 3 mm		P
		Screws used for electrical connections or for connections providing earthing continuity shall screw into metal.		N/A
		Screws shall 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 user maintenance, not of insulating material if their replacement by a metal screw can impair basic insulation		P
28.2		Electrical connections and connections providing earthing continuity shall be constructed so that contact pressure not transmitted through non ceramic insulating material.		N/A
28.3		Space-threaded (sheet metal) screws only used for electrical connections if they clamp the parts together		P
		Thread-cutting (self-tapping) screws only used for electrical connections if they generate a full form standard machine screw thread		N/A
		Thread-cutting, thread rolling and space-threaded screws may be used in connections providing earthing continuity provided it is not necessary to disturb the connection		N/A
28.4		Screws and nuts that make a mechanical connection between different parts of the appliance shall be secured against loosening if they also make electrical connections or connections providing earthing continuity.		P
		Rivets used for electrical connections or for connections providing earthing continuity shall be secured against loosening if these connections are subject to torsion in normal use.		N/A

IEC 60335-1 & IEC 60335-2-76				
60335-1	**60335-2-76**	**Requirement – Test**	**Results – Remarks**	**Verdict**
29		**Clearances, Creepage distances and solid insulation**		
		Clearances, creepage distances and solid insulation withstand electrical stress	In compliance (Refer Table B)	P
29.1		Clearances shall not less than the values specified in table 16, taking into account the rated impulse voltage for the overvoltage categories of table 15	In Compliance	P
		for basic insulation and functional insulation, they comply with the impulse voltage test of Clause 14		P
		However, if the construction is such that the distances could be affected by wear, by distortion, by movement of the parts or during assembly, the clearances for rated impulse voltages of 1 500 V and above are increased by 0,5 mm and the Impulse voltage test is not applicable		N/A
29.1.1		The clearances of basic insulation shall be sufficient to withstand the overvoltage likely to occur during use, taking into account the rated impulse voltage.		P
		The 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
29.1.2		Clearances of supplementary insulation shall not be less than those specified for basic insulation in table 16		N/A
29.1.3		Clearances of reinforced insulation shall not less than those specified for basic insulation in table 16, but using the next higher step for rated impulse voltage		N/A
29.1.4		The clearances for functional insulation are the largest values determined from		
		the appliance complies with clause 19 with the functional insulation short-circuited		N/A
		Clearances at crossover points of lacquered conductors not measured		N/A
		Clearance between surfaces of PTC heating elements may be reduced to 1mm		N/A
29.1.5		Appliances having higher working voltage than rated voltage, the voltage used for determining clearances from table 16 is the sum of the rated impulse voltage and the difference between the peak value of the working voltage and the peak value of the rated voltage		N/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.		N/A
29.2		Appliances shall be constructed so that Creepage distances are not less than those appropriate for the working voltage, taking into account the	In Compliance	P

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IEC 60335-1 & IEC 60335-2-76				
60335-1	**60335-2-76**	**Requirement – Test**	**Results – Remarks**	**Verdict**
		material group and the pollution degree		
		Pollution degree 2 applies, unless		N/A
		precautions taken to protect the insulation; pollution degree 1		N/A
		insulation subjected to conductive pollution; pollution degree 3		P
29.2.1		Creepage distances of basic insulation shall not be less than specified in table 17	In Compliance	P
		Except for pollution degree 1, creepage distance shall not be less than the minimum dimension specified for the clearance in table 16.		N/A
29.2.2		Creepage distances of supplementary insulation shall be at least as specified for basic insulation in table 17		N/A
29.2.3		Creepage distances of reinforced insulation shall be at least double as specified for basic insulation in table 17		N/A
29.2.4		Creepage distances of functional insulation shall not be less than specified in table 18		N/A
29.3		Supplementary insulation and reinforced insulation shall have adequate thickness or have a sufficient number of layer, to withstand the electrical stress that can be expected during the use of the appliance		N/A
29.3.1		The thickness of the insulation shall be at least		N/A
		- 1 mm for supplementary insulation		N/A
		and 2mm for reinforced insulation		N/A
29.3.2		Each layer of material shall withstand electric strength of 16.3 for supplementary insulation.		N/A
29.3.3		The insulation is subjected to the dry heat test Bb of IEC 60068-2-2 for 48 h at a temperature of 50K in excess of the maximum temperature rise measured during the test of Clause 19.		N/A
29.3.4		The thickness of the **accessible parts** of **reinforced insulation** consisting of a single layer shall not be less than those specified in Table 19.		N/A
	29.101	The Clearance between the poles supply circuit in battery operated energizers shall be not less than 2mm when the energizers is fitted with the conductor as in normal use.		P

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IEC 60335-1 & IEC 60335-2-76				
60335-1	**60335-2-76**	**Requirement – Test**	**Results – Remarks**	**Verdict**
30		**Resistance to heat and fire**		
30.1		External parts of non-metallic material, parts of insulating material supporting live parts and parts of thermoplastic material providing supplementary or reinforced insulation shall be sufficiently resistant to heat.		N/A
30.2		Relevant parts of non-metallic material adequately resistant to ignition and spread of fire		N/A
	30.2.1	Glow-wire test of IEC 60695-2-11 at 650 ˚C, unless		P
		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 meet the requirements in ISO9772 for category HBF material		N/A
30.2.2		For appliances that are operated while attended, parts of non-metallic material supporting current-carrying connections and parts of non-metallic material within a distance of 3 mm of such connections are subjected to the glow-wire test of IEC 60695-2-11.		N/A
		750 °C, for connections that carry a current exceeding 0,5 A during normal operation,		N/A
		– 650 °C, for other connections.		N/A
30.2.3		Appliances operated while unattended, tested as specified in 30.2.3.1 and 30.2.3.2		N/A
30.2.3.1		Parts of insulating material supporting connections carrying a current exceeding 0.2A during normal operation, and	In Compliance	P
		parts of insulating material within a distance of 3mm,		N/A
		having a glow-wire flammability index of at least 850˚C according to IEC 60695-2-12		N/A
30.2.3.2		Parts of insulating material supporting current-carrying connections, and		
		parts of insulating material within a distance of 3mm,		N/A
		subjected to glow-wire test of IEC 60695-2-11		N/A
		Is not carried out on material having a glow-wire ignition temperature according to IEC 60695-2-13 as specified		N/A
		Glow-wire test of IEC 60695-2-11, the temperature being:		P
		-750˚C, for connections carrying a current exceeding 0,2A during normal operation		N/A
		-650˚C, for other connections		P
		Parts that during the test produce a flame persisting longer than 2 s, tested as specified		N/A
		If a flame persists longer than 2 s during the test,		N/A

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IEC 60335-1 & IEC 60335-2-76				
60335-1	**60335-2-76**	**Requirement – Test**	**Results – Remarks**	**Verdict**
		parts above the connection, as specified, subjected to the needle-flame test of annex E, unless		
		The material classified as V-0 or V-1 according to IEC 60695-11-10 are not subjected to needle flame test.		N/A
30.2.4		Base material of printed circuit boards subjected to 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		N/A
	-	The enclose of metal encased class II energizers shall be adequately protected against corrosion		N/A
32		Radiation, toxicity and similar hazards		
		Appliance shall not emit harmful radiation		N/A
		Appliance shall not present a toxic or similar hazard		N/A

IEC 60335-1 & IEC 60335-2-76				
60335-1	**60335-2-76**	**Requirement – Test**	**Results – Remarks**	**Verdict**

Table A:

Clause. No.	Test Conducted	Test Conditions	Test requirement	Results
Cl. 13.3	High Voltage Test	Test voltage: : 2500 V Test Duration: 1 min. Test Part: Between live part and metal part of the fan	Shall withstand without breakdown	Pass No flashover or break down occur
Cl. 16.3	Electric Strength	Between Insulation test is subjected 1 min to d.c voltage approximately 500V.	No Breakdown Shall be occur	Pass, No flash over occur.
Cl. 27.5	Earth Contact Resistance Test	Test Current: 25A Test Part: Between protective earth terminals and accessible metal Part	Calculated Earth Contact Resistance from current & drop in voltage shall not exceed 0.1 Ω)	N/A

Table B:

Cl. 29: Clearances, creepage distances and solid insulation			
	Minimum distance (mm)	**Measured distance (mm)**	**Verdict**
Clearances			
- Basic insulation (at Rated Impulse Voltage 2500)	1.5mm	>1.5mm	P
Creepage distances			
- Basic Insulation (at Working voltage 250V for pollution Degree 3, Material Group IIIa/IIIb)	4mm	>4mm	P

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