ionCleanse

Electronic Detoxification System

Electrical Safety Test Report Per EN60335-1:

Safety of household and similar electrical appliances

By

4735 Walnut St., #E
Boulder, Colorado 80301
303.444.7480
www.percept.com

Revision History:

Version	Date	Comments	Contributors
1.0	09/09/2003	Initial Release	C. Poore

Table of Contents

List of Tables

List of Figures

1.0 Introduction

1.1 Overview

This test plan covers the electrical safety compliance requirements and test methods needed for product certification of the ionCleanse, hereafter known as the Equipment Under Test (EUT), to internal and external regulatory requirements as stated in the references.

1.2 Qualifications

The EUT(s) supplied by ionCleanse are representative of product produced in their volume manufacturing process.

The EUT have not been further modified except as noted in this report.

All modifications required to meet the requirements of the tests have been reported to ionCleanse via this report.

1.3 Client

ionCleanse

11000 E. Yale Ave., #35

Aurora, CO 80015

303-755-0112

1.4 Company Restricted Information

This document contains confidential and restrictive information and shall not be reproduced outside of ionCleanse or Percept Technology Incorporated without written consent.

This document must be reproduced in whole unless written consent has been attained from Percept Technology Inc.

1.5 Reference Documents

1) EN60335-1, Household and similar electrical appliances – Safety - Part1: General Requirements: 2002

2.0 Test Summary

The test results presented in this report apply only to the product tested under the test conditions specified.

The safety test and evaluation of the EUT were performed on the equipment from 04 Sept 2003 to 09 Sept 2003.

All evaluations concerning safety were complete.

No modifications were made to the unit in order to successfully complete the safety evaluation, and no issues were discovered during test.

3.0 Product Description

3.1 EUT Identification

Sample Number	Model #	Serial Number or ID Number	Comments
1	ionCleanse	01302	Modifications for EMC compliance installed
2	ionCleanse	01301	No modifications

3.2 General

Part / Model No.: ionCleanse
Rated Input Voltage: 100 – 240 VAC Rated Frequency: 50 – 60 Hz
Rated Current: 1.6A Rated Power: 60 W max
Supply Connection: Detachable line cord – single phase
Construction: Nonconductive plastic enclosure with separate AC Power Adapter

3.3 Classification

Installation and Use: Portable
Protection Class: Class I
Protection Ingress per IEC60529: None

3.4 Power Supplies

Manufacturer	Model	Output and Type	Evaluated for electrical safety per UL1950 / EN60950	
			Agency	File No.
Mean Well	SPU50-6	24 VDC / 2.5A 60 W max	UL	E183744
			TUV Rhineland	S9754645

3.5 Interface Ports

Label or Name	Type	Function
Array	DC voltage / current	Connects ionCleanse controller to the array
N/A	DC power	Connection for Mean Well power supply to controller

3.6 Approved Accessories

Manufacturer	Part Number	Description	Function
None Evaluated			

3.7 Support Equipment

Support equipment is supplied to enable or monitor the performance of the equipment, and where practical, shall not be subject to the test conditions or requirements.

Manufacturer	Part Number	Description	Function
None			

3.8 Laboratory Test Equipment

Code	Instrument	Manufacturer	Model #	Serial Number	Last Cal Date	Cal Due Date
1	20 Channel Multiplexer	Agilent	34901A	US37249758	11/01/02	11/01/03
2	20 Channel Multiplexer	Agilent	34901A	US41010932	05/20/03	05/20/04
3	20 Channel Multiplexer	Agilent	34901A	US41010881	05/20/03	05/20/04
4	AC/DC Hipot Tester	QuadTech	Sentry 20	2262725	Verify before use	
5	Ball Pressure Apparatus	Ergonomics	BPA10	83	11/26/02	05/26/04
6	Caliper	Mitutoyo	CD-6"CS	62101	11/01/02	11/01/03
7	Circular Chart Recorder	Honeywell	DR4300	0051Y049121600001	01/20/03	01/20/04
8	Circular Chart Recorder	Honeywell	DR4300	0218Y254829300002	01/20/03	01/20/04
9	Circular Chart Recorder	Honeywell	DR4300	0218Y254829300001	01/20/03	01/20/04
10	Current Probe	LeCroy	AP015	3762	02/01/03	02/01/04
11	Current Probe	LeCroy	AP015	1270	02/24/03	02/24/04
12	Data Acquisition	Agilent	34970A	US37036182	11/01/02	11/01/03
13	Data Acquisition	Agilent	34970A	MY41008353	04/15/02	04/15/04
14	Desiccant Cabinet	Bel-Art Products	42071.0007	01	No Cal or Verification req'd	
15	Desiccant Cabinet	Bel-Art Products	42071.0007	02	No Cal or Verification req'd	
16	DMM	Extech	382860	BJ115290	11/01/02	11/01/03
17	DMM	Fluke	77 III	77870864	11/01/02	11/01/03
18	DMM	Fluke	77 III	77870865	11/01/02	11/01/03
19	DMM	PDI	870	25012258	11/07/02	11/07/03
20	DMM	Extech	382860	BJ115293	12/02/02	12/02/03
21	DMM	Fluke	77	46320497	No Cal or Verification req'd	
22	Electronic Digital Caliper	General	143	241	11/01/02	11/01/03
23	Force Gauge	Chatillon	DPP5	25109	11/06/02	11/06/03
24	Ground Bond Tester	QuadTech	Sentry 50	2232622	Verify before use	
25	High Current Impedance Tester	Slaughter	PSC-30D60	171102	02/10/03	02/10/04
26	Impact Ball	E.D. & D.	ITB-01	No S/N	Verify 5/11/04	
27	Leakage Current Meter	Simpson	229-2	229-2001	11/26/02	05/26/04
28	Measuring Circuit A.1	Percept Tech	EN61010-1	No S/N	Verify before use	
29	Oscilloscope	LeCroy	9350AM	935001734	11/01/02	11/01/03
30	Oscilloscope	LeCroy	9354AL	935401854	02/01/03	02/01/04
31	Oscilloscope Voltage Probe	Tektronix	P5100	NONE	02/03/03	02/03/04
32	Power Source	California Instr	801RP	8392	Verify before use	
33	Power Supply	Tektronix	PS2521G	TW52339	Verify before use	
34	Power Supply	Tektronix	PS2521G	TW53311	Verify before use	
35	Power Supply	Tektronix	PS280	TW10035	Verify before use	
36	Programmer/Controller	Watlow	Versatenn	59340	01/20/03	01/20/04

Code	Instrument	Manufacturer	Model #	Serial Number	Last Cal Date	Cal Due Date
37	Programmer/Controller	Watlow	Versatenn	60677	01/20/03	01/20/04
38	Programmer/Controller	Watlow	Versatenn	51576	01/20/03	01/20/04
39	Rheostat 1.0 ohm 7.07Amp	Ohmite	A	R010	No Cal or Verification req'd	
40	Rheostat 6 ohm 2.88Amp	Ohmite	RJS6R0	R020	No Cal or Verification req'd	
41	Temperature	Fluke	52 K/J	7413.0059	11/01/02	11/01/03
42	Temperature	Fluke	52 K/J	74130069	11/01/02	11/01/03
43	Test Finger Probe	E.D. & D.	TFP-01	No S/N	Verify 5/11/04	
44	Unjointed Finger Probe	Ergonomics	UFP20	85	11/26/02	05/26/04
45	True RMS Power Analyzer	Extech	380801	F097906	05/15/03	05/15/04

4.0 General Test Conditions

4.1 Operating Modes and Configurations

4.1.1 Operating Modes

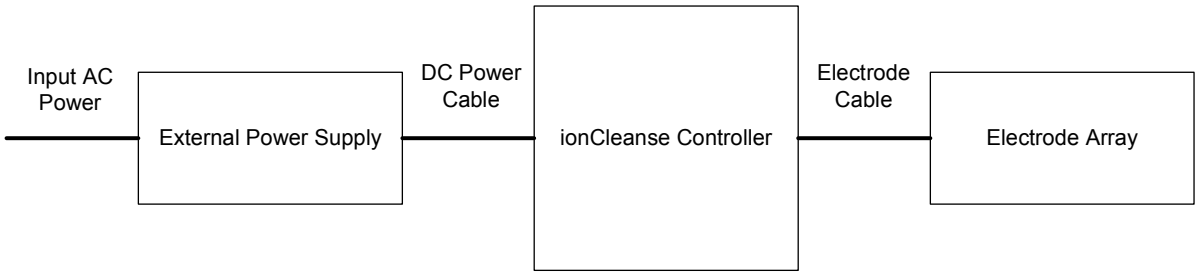
Normal operating mode is ionizing water with the array in either the positive or negative polarity. The EUT was tested in both polarities of operation with the indicated output current at maximum.

The output of the EUT may be operated continuously for up to 60 minutes with a 119 second cool-down period between cycles.

4.1.2 Configurations

The EUT was tested in its single configuration as shown in the block diagram.

Figure 1: EUT block diagram



5.0 Electrical Safety Tests

All tests are performed in the order given unless otherwise noted.

Possible Test Results:

Test does not apply to the product: N/A
Product meets the requirement: PASS
Product does not meet the requirement: FAIL

5.1 GENERAL CONDITIONS FOR THE TESTS

Clause	Requirement - Test	Remark	Result
5			
	Tests performed according to cl. 5, e.g. nature of supply, sequence of testing, etc.		PASS

5.2 CLASSIFICATION

Clause	Requirement - Test	Remark	Result
6			
6.1	Protection against electric shock: Class I, II, III:	Class I Portable	PASS
6.2	Protection against harmful ingress of water		NA

5.3 MARKING AND INSTRUCTIONS

Clause	Requirement - Test	Remark	Result
7			
7.1	Rated voltage or voltage range (V):		
	Single-phase appliances to be connected to the supply mains: 230 V covered		PASS
	Multi-phase appliances to be connected to the supply mains: 400 V covered		NA
	Nature of supply:		PASS
	Rated frequency (Hz):		PASS
	Rated power input (W):		PASS
	Rated current (A):		PASS
	Manufacturer's or responsible vendor's name, trademark or identification mark:		PASS
	Model or type reference:		PASS
	Symbol 5172 of IEC 60417, for Class II appliances		NA
	IP number, other than IPX0:	Not Rated	NA
7.2	Warning for stationary appliances for multiple supply		NA
	Warning placed in vicinity of terminal cover		NA
7.3	Range of rated values marked with the lower and upper limits separated by a hyphen		NA
	Different rated values marked with the values separated by an oblique stroke		NA
7.4	Appliances adjustable for different rated voltages, the voltage setting is clearly discernible		NA
7.5	Appliances with more than one rated voltage or one or more rated voltage ranges, marked with rated input or rated current for each rated voltage or range, unless		NA
	the power input is related to the mean value of the rated voltage range		NA
	Relation between marking for upper and lower limits of rated power input or rated current and voltage is clear		NA
7.6	Correct symbols used		PASS

Clause	Requirement - Test	Remark	Result
7.7	Connection diagram fixed to appliances to be connected to more than two supply conductors and appliances for multiple supply		NA
7.8	Except for type Z attachment, terminals for connection to the supply mains indicated as follows:		
	- marking of terminals exclusively for the neutral conductor (N)		NA
	- marking of protective earthing terminals (symbol 5019 of IEC 60417)		NA
	- marking not placed on removable parts		NA
7.9	Marking or placing of switches which may cause a hazard		NA
7.10	Indications of switches on stationary appliances and controls on all appliances by use of figures, letters or other visual means:		PASS
	The figure 0 indicates only OFF position, unless no confusion with the OFF position		PASS
7.11	Indication for direction of adjustment of controls		NA
7.12	Instructions for safe use provided		PASS
7.12.1	Sufficient details for installation supplied		PASS
7.12.2	Stationary appliances not fitted with means for disconnection from the supply mains having a contact separation in all poles that provide full disconnection under overvoltage category III, the instructions state that means for disconnection must be incorporated in the fixed wiring in accordance with the wiring rules	Detachable Line Cord Used	PASS
7.12.3	Insulation of the fixed wiring in contact with parts exceeding 50 K during clause 11; instructions stating that the fixed wiring must be protected		PASS
7.12.4	Instructions for built-in appliances:		
	- dimensions of space		NA
	- dimensions and position of supporting means		NA
	- distances between parts and surrounding structure		NA
	- dimensions of ventilation openings and arrangement		NA

Clause	Requirement - Test	Remark	Result
	- connection to supply mains and interconnection of separate components		NA
	- plug accessible after installation, unless		NA
	a switch complying with 24.3		NA
7.12.5	Replacement cord instructions, type X attachment with a specially prepared cord	Detachable Line Cord Used	NA
	Replacement cord instructions, type Y attachment		NA
	Replacement cord instructions, type Z attachment		NA
7.13	Instructions and other texts in an official language	Manufacturer was advised of this requirements and declares that instructions will be copied into appropriate languages as necessary	PASS
7.14	Marking clearly legible and durable	The “2.5 AMP” marking is difficult to read – need rub test	PASS
7.15	Marking on a main part		PASS
	Marking clearly discernible from the outside, if necessary after removal of a cover		PASS
	For portable appliances, cover can be removed or opened without a tool		NA
	For stationary appliances, name, trademark or identification mark and model or type reference visible after installation		PASS
	For fixed appliances, name, trademark or identification mark and model or type reference visible after installation according to the instructions		NA
	Indications for switches and controls placed on or near the components. Marking not on parts which can be positioned or repositioned in such a way that the marking is misleading		PASS
7.16	Marking of a possible replaceable thermal link or fuse link clearly visible with regard to replacing the link		PASS

5.4 PROTECTION AGAINST ACCESS TO LIVE PARTS

Clause	Requirement - Test	Remark	Result
8	**NOTE**: Perform the test of 22.11 prior to the tests of Clause 8		
8.1	Adequate protection against accidental contact with live parts	Power supply is sealed and approved. Controller does not contain any LIVE parts	PASS
8.1.1	Requirement applies for all positions, detachable parts removed		PASS
	Insertion or removal of lamps, protection against contact with live parts of the lamp cap		NA
	Use of test probe B of IEC 61032: no contact with live parts		PASS
8.1.2	Use of test probe 13 of IEC 61032 through openings in class 0 appliances and class II appliances/ constructions: no contact with live parts		NA
	Test probe 13 also applied through openings in earthed metal enclosures having a non-conductive coating: no contact with live parts		NA
8.1.3	For appliances other than class II, use of test probe 41 of IEC 61032: no contact with live parts of visible glowing heating elements		NA
8.1.4	Accessible part not considered live if:		
	- safety extra-low a.c. voltage: peak value not exceeding 42.4 V	Approved power supply in sealed enclosure	PASS
	- safety extra-low d.c. voltage: not exceeding 42.4 V	Controller does not contain LIVE parts	PASS
	- or separated from live parts by protective impedance		NA
	If protective impedance: d.c. current not exceeding 2 mA, and		NA
	a.c. peak value not exceeding 0.7 mA		NA
	- for peak values over 42.4 V up to and including 450 V, capacitance not exceeding 0,1 μF		NA
	- for peak values over 450 V up to and including 15 kV, discharge not exceeding 45 μC		NA
8.1.5	Live parts protected at least by basic insulation before installation or assembly:		
	- built-in appliances		NA

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

5.5 STARTING OF MOTOR-OPERATED APPLIANCES

Clause	Requirement - Test	Remark	Result
9			
	Requirements and tests are specified in part 2 when necessary		NA

5.6 POWER INPUT AND CURRENT

Clause	Requirement - Test	Remark	Result
10			
10.1	Power input at normal operating temperature, rated voltage and normal operation not deviating from rated power input by more than shown in table 1		NA
10.2	Current at normal operating temperature, rated voltage and normal operation not deviating from rated current by more than shown in table 2	See Table 1: Current deviation	PASS

Table 1: Current deviation

10.2	Test Equipment Code: 32, 45					
	EUT Code: 1					
Test Condition	**AC Current measurements**			**DC Current measurements**		
	Rated (A)	**Measured A)**	**+20% Allowed (A)**	**Rated (A)**	**Measured (A)**	**+20% Allowed (A)**
240 VAC / 50 Hz	1.6	0.624	1.92	2.5	2.51	3.0
240 VAC / 60 Hz	1.6	0.619	1.92	2.5	2.51	3.0
100 VAC / 60 Hz	1.6	1.225	1.92	2.5	2.51	3.0
100 VAC / 50 Hz	1.6	1.227	1.92	2.5	2.51	3.0

5.7 HEATING

Clause	Requirement - Test	Remark	Result
11			
11.1	No excessive temperatures in normal use	See Table 2: Heating test, thermocouples	PASS
11.2	Placing and mounting of appliance as described		NA
11.3	Temperature rises, other than of windings, determined by thermocouples		NA
	Temperature rises of windings determined by resistance method, unless		NA
	the windings makes it difficult to make the necessary connections		NA
11.4	Heating appliances operated under normal operation at 1.15 times rated power input :		NA
11.5	Motor-operated appliances operated under normal operation at most unfavourable voltage between 0.94 and 1.06 times rated voltage:		NA
11.6	Combined appliances operated under normal operation at most unfavourable voltage between 0.94 and 1.06 times rated voltage:		NA
11.7	Operation duration corresponding to the most unfavourable conditions of normal use		PASS
11.8	Temperature rises not exceeding values in table 3		PASS
	Protective devices do not operate		PASS
	Sealing compound does not flow out		PASS

Table 2: Heating test, thermocouples

11.8	Test Equipment Code: 32, 45, 12, 1, 41		
	EUT Code: 1		
	Test voltage (V):	240 VAC / 50 Hz	—
	Ambient (°C):	24.4	—
Operating Mode: Output current maxed at 2.48A from the DC supply. EUT set for consecutive 60 minute cycles with 119 second cool down between until temperatures stabilized. Test duration was			

Thermocouple # / location	Measured (C)	dT (C)	Max. dT (C) allowed
02 / R8	110.3	85.9	135
03 / C1	38.3	13.9	20
04 / U1	73.7	49.3	105
05 / Q1	46.7	22.3	105
06 / Q2	38.8	14.4	105
07 / Q3	35.0	10.6	105
08 / U3	60.6	36.2	105
09 / R3	53.0	28.6	135
10 / R1	35.6	11.2	135
11 / U2	38.0	13.6	105
12 / Power Supply	55.8	31.4	60
13 / Power Supply	50.2	25.8	60
14 / PCB under R8	63.2	38.8	120
15 / EUT enclosure above U3	30.5	6.1	60

5.8 LEAKAGE CURRENT AND ELECTRIC STRENGTH AT OPERATING TEMPERATURE

Clause	Requirement - Test	Remark	Result
13			
13.1	Leakage current not excessive and electric strength adequate		
	Heating appliances operated at 1.15 times rated power input:		NA
	Motor-operated appliances and combined appliances supplied at 1.06 times rated voltage:		NA
	Protective impedance and radio interference filters disconnected before carrying out the tests		NA
13.2	Leakage current measured by means of the circuit described in figure 4 of IEC 60990	See Table 3: Leakage current	PASS
	Leakage current measurements		PASS
13.3	Electric strength tests according to table 4	See Table 4: Electric strength	PASS
	No breakdown during the tests		PASS

Table 3: Leakage current

13.2	Test Equipment Code: 27		
	EUT Code: 1		
	Heating appliances: 1.15 x rated input:	NA	—
	Motor-operated and combined appliances: 1.06 x rated voltage:	NA	—
Leakage current between		**I (mA)**	**Max. allowed I (mA)**
Electrode Array and Primary – normal condition		0.01	0.75
Electrode Array and Primary – no PE condition		0.22	0.75

Table 4: Electric strength

13.3	Test Equipment Code: 4		
	EUT Code: 1		
Test voltage applied between:		**Voltage (V)**	**Breakdown (Yes/No)**
Primary and Array		3000	No
Primary and PE		1000	No

5.9 TRANSIENT OVERVOLTAGES

Clause	Requirement - Test	Remark	Result
14	**Note**: Perform the tests of clause 14 AFTER the tests of clause 29		
	Appliances withstand the transient overvoltages to which they may be subjected	EUT utilizes a power supply approved to EN60950	NA
	Clearances having a value less than specified in table 16 subjected to an impulse voltage test, the test voltage specified in table 6		NA
	No flashover during the test, unless of functional insulation		NA
	In case of flashover of functional insulation, the appliance complies with clause 19 with the clearance short circuited		NA

5.10 MOISTURE RESISTANCE

Clause	Requirement - Test	Remark	Result
15			
15.1	Enclosure provides the degree of moisture protection according to classification of the appliance	EUT is classified IPX0	NA
	Compliance checked as specified in 15.1.1, taking into account 15.1.2, followed by the electric strength test of 16.3		NA
	No trace of water on insulation which can result in a reduction of clearances and creepage distances below values specified in clause 29		NA
15.1.1	Appliances, other than IPX0, subjected to tests as specified in IEC 60529:		NA
15.1.2	Hand-held appliance turned continuously through the most unfavourable positions during the test		NA
	Built-in appliances installed according to the instructions		NA
	Appliances placed or used on the floor or table placed on a horizontal unperforated support		NA
	Appliances normally fixed to a wall and appliances with pins for insertion into socket-outlets are mounted on a wooden board		NA
	For IPX3 appliances, the base of wall mounted appliances is placed at the same level as the pivot axis of the oscillating tube		NA
	For IPX4 appliances, the horizontal centre line of the appliance is aligned with the pivot axis of the oscillating tube		NA
	However, for appliances normally used on the floor or table, the movement is limited to two times 90° for a period of 5 min, the support being placed at the level of the pivot axis of the oscillating tube		NA
	Wall-mounted appliances, take into account the distance to the floor stated in the instructions		NA
	Appliances with type X attachment fitted with a flexible cord as described		NA
	Detachable parts tested as specified		NA

Clause	Requirement - Test	Remark	Result
15.2	Spillage of liquid does not affect the electrical insulation	Does not utilize a liquid container. Instructions for use should caution against spillage of liquid.	NA
	Appliances with type X attachment fitted with a flexible cord as described		NA
	Appliances incorporating an appliance inlet tested with or without an connector, whichever is most unfavourable		NA
	Detachable parts removed		NA
	Overfilling test with additional amount of water, over a period of 1 min (l):		NA
	The appliance withstands the electric strength test of 16.3		NA
	No trace of water on insulation that can result in a reduction of clearances and creepage distances below values specified in clause 29		NA
15.3	Appliances proof against humid conditions	EUT utilizes a power supply approved to EN60950	PASS
	Humidity test for 48 h in a humidity cabinet		NA
	The appliance withstands the tests of clause 16		NA

5.11 LEAKAGE CURRENT AND ELECTRIC STRENGTH

Clause	Requirement - Test	Remark	Result
16			
16.1	Leakage current not excessive and electric strength adequate		PASS
	Protective impedance disconnected from live parts before carrying out the tests		NA
16.2	Single-phase appliances: test voltage 1.06 times rated voltage:	See Table 5: Leakage current	PASS
	Three-phase appliances: test voltage 1.06 times rated voltage divided by √3:		NA
	Leakage current measurements		PASS
16.3	Electric strength tests according to table 7	See Table 6: Electric strength	PASS
	No breakdown during the tests		PASS

Table 5: Leakage current

16.2	Test Equipment Code: 27		
	EUT Code: 1		
	Heating appliances: 1.15 x rated input:	NA	—
	Motor-operated and combined appliances: 1.06 x rated voltage:	NA	—
Leakage current between		**I (mA)**	**Max. allowed I (mA)**
Electrode Array and Primary – normal condition		0	0.75

Table 6: Electric strength

16.3	Test Equipment Code: 4		
	EUT Code: 1		
Test voltage applied between:		**Voltage (V)**	**Breakdown (Yes/No)**
Primary and Array		3000	No
Primary and PE		1000	No

5.12 OVERLOAD PROTECTION OF TRANSFORMERS AND ASSOCIATED CIRCUITS

Clause	Requirement - Test	Remark	Result
17			
	No excessive temperatures in transformer or associated circuits in event of short-circuits likely to occur in normal use	EUT utilizes a power supply approved to EN60950 – short-circuit protected	PASS
	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:		NA
	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		NA
	Temperature of the winding not exceeding the value specified in table 8,		NA
	however limits do not apply to fail-safe transformers complying with sub-clause 15.5 of IEC 61558-1		NA

5.13 ENDURANCE

Clause	Requirement - Test	Remark	Result
18			
	Requirements and tests are specified in part 2 when necessary	No part 2 standard	NA

5.14 ABNORMAL OPERATION

Clause	Requirement - Test	Remark	Result
19			
19.1	The risk of fire or mechanical damage under abnormal or careless operation obviated	Tests of 19.11 and 19.12	PASS
	Electronic circuits so designed and applied that a fault will not render the appliance unsafe	Tests of 19.11 and 19.12	PASS
19.2	Test of appliance with heating elements with restricted heat dissipation; test voltage (V): power input of 0.85 times rated power input:		NA
19.3	Test of 19.2 repeated; test voltage (V): power input of 1.24 times rated power input:		NA
19.4	Test conditions as in cl. 11, any control limiting the temperature during tests of cl. 11 short-circuited	See clause 11	PASS
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		NA
	The test repeated with reversed polarity and the other end of the heating element connected to the sheath		NA
	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		NA
19.6	Appliances with PTC heating elements tested at rated voltage, establishing steady conditions		NA
	The working voltage of the PTC heating element is increased by 5% and the appliance is operated until steady conditions are re-established. The voltage is then increased in similar steps until 1.5 times working voltage or until the PTC heating element ruptures		NA
19.7	Stalling test by locking the rotor if the locked rotor torque is smaller than the full load torque or locking moving parts of other appliances	Approved Fan is used	PASS
	Locked rotor, motor capacitors open-circuited or short-circuited, if required		NA
	Locked rotor, capacitors open-circuited one at a time		NA

Clause	Requirement - Test	Remark	Result
	Test repeated with capacitors short-circuited one at a time, if required		NA
	Appliances with timer or programmer supplied with rated voltage for each of the tests, for a period equal to the maximum period allowed		NA
	Other appliances supplied with rated voltage for a period as specified		NA
	Winding temperatures not exceeding values specified in table 8	(see appended table)	NA
19.8	Three-phase motors operated at rated voltage with one phase disconnected		NA
19.9	Running overload test on appliances incorporating motors intended to be remotely or automatically controlled or liable to be operated continuously		NA
	Winding temperatures not exceeding values as specified	(see appended table)	NA
19.10	Series motor operated at 1.3 times rated voltage for 1 min:		NA
	During the test, parts not being ejected from the appliance		NA
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	Disconnect fan utilizing non-locking connector. See Table 7: Abnormal operation, temperature rises	PASS
19.11.1	Before applying the fault conditions a) to f) in 19.11.2, it is checked if circuits or parts of circuit meet both of the following conditions:		
	- the electronic circuit is a low-power circuit, that is, the maximum power at low-power points does not exceed 15 W according to the tests specified		PASS
	- 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		PASS
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:		

Clause	Requirement - Test	Remark	Result
	a) short circuit of functional insulation if clearances or creepage distances are less than the values specified in 29		NA
	b) open circuit at the terminals of any component		PASS
	c) short circuit of capacitors, unless they comply with IEC 60384-14		NA
	d) short circuit of any two terminals of an electronic component, other than integrated circuits. This fault condition is not applied between the two circuits of an optocoupler		NA
	e) failure of triacs in the diode mode		NA
	f) failure of an integrated circuit. The possible hazardous situations of the appliance are assessed to ensure that safety does not rely on the correct functioning of such a component		PASS
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		PASS
	During and after each test the following is checked:		
	- the temperature rise of the windings do not exceed the values specified in table 8		NA
	- the appliance complies with the conditions specified in 19.13		PASS
	- any current flowing through protective impedance not exceeding the limits specified in 8.1.4		NA
	If a conductor of a printed board becomes open-circuited, the appliance is considered to have withstood the particular test, provided all three of the following conditions are met:		
	- the material of the printed circuit board withstands the burning test of annex E		NA
	- any loosened conductor does not reduce the clearances or creepage distances between live parts and accessible metal parts below the values specified in cl. 29		NA
	- the appliance withstands the tests of 19.11.2 with open-circuited conductor bridged		NA

Clause	Requirement - Test	Remark	Result
19.12	If the safety of the appliance for any of the fault conditions specified in 19.11.2 depends on the operation of a miniature fuse-link complying with IEC 60127, the test is repeated, measuring the current flowing through the fuse-link; measured current (A); rated current of the fuse-link (A):	Fuse did not operate	NA
19.13	During the tests the appliance does not emit flames, molten metal, poisonous or ignitable gas in hazardous amounts		PASS
	Temperature rises not exceeding the values shown in table 9		PASS
	Enclosures not deformed to such an extent that compliance with cl. 8 is impaired		PASS
	If the appliance can still be operated it complies with 20.2		PASS
	Insulation, other than of class III appliance, withstand the electric strength test of 16.3, the test voltage specified in table 4:		
	- basic insulation:		PASS
	- supplementary insulation:		PASS
	- reinforced insulation:		PASS

Table 7: Abnormal operation, temperature rises

19.7	Test Equipment Code: 32, 45, 12, 1, 41		
	EUT Code: 1		
	Test voltage (V):	240 VAC / 50 Hz	
	Ambient (°C):	21.2	

Operating Mode: Output current maxed at 2.48A from the DC supply. EUT set for 60 minute cycle. Fan was stalled 10 minutes into the cycle. The test duration was 60 minutes.

Thermocouple # / location	Measured (C)	dT (C)	Max. dT (C) allowed
02 / U3	120.8	99.6	105
03 / heatsink	118.2	97.0	--
04 / PCB near heatsink	105.8	84.6	120
05 / PCB near heatsink	99.4	78.2	120
06 / enclosure above U3	62.4	41.2	60

5.15 STABILITY AND MECHANICAL HAZARDS

Clause	Requirement - Test	Remark	Result
20			
20.1	Adequate stability		PASS
	Tilting test through an angle of 10° (appliance placed on an inclined plane/horizontal plane); appliance does not overturn		PASS
	Tilting test repeated on appliances with heating elements, angle of inclination increased to 15°		NA
	Possible heating test in overturned position; temperature rise does not exceed values shown in table 9		NA
20.2	Moving parts adequately arranged or enclosed as to provide protection against personal injury	Fan guard is installed	PASS
	Protective enclosures, guards and similar parts are non-detachable		PASS
	Adequate mechanical strength and fixing of protective enclosures		PASS
	Self-resetting thermal cut-outs and overcurrent protective devices not causing a hazard, by unexpected reclosure		NA
	Not possible to touch dangerous moving parts with test probe		PASS

5.16 MECHANICAL STRENGTH

Clause	Requirement - Test	Remark	Result
21			
	Appliance has adequate mechanical strength and is constructed as to withstand rough handling	Power Supply has EN60950 approval	NA
	No damage after three blows applied to various parts of the enclosure, impact energy 0,5 ± 0,04 J		NA
	If necessary, supplementary or reinforced insulation subjected to the electric strength test of 16.3	Power supply approved to EN60950 is used	NA
	If necessary, repetition of groups of three blows on a new sample		NA

5.17 CONSTRUCTION

Clause	Requirement - Test	Remark	Result
22			
22.1	Appliance marked with the first numeral of the IP system, relevant requirements of IEC 60529 are fulfilled	EUT is IPX0	NA
22.2	Stationary appliance: means to provide all-pole disconnection from the supply provided, the following means being available:		
	- a supply cord fitted with a plug		PASS
	- a switch complying with 24.3		NA
	- a statement in the instruction sheet that a disconnection incorporated in the fixed wiring is to be provided		NA
	- an appliance inlet		PASS
	Singe-pole switches and single-pole protective devices for the disconnection of heating elements in single-phase permanently connected class I appliances, connected in the phase conductor		NA
22.3	Appliance provided with pins: no undue strain on socket-outlets	Utilizes approved detachable supply cord	NA
	Applied torque not exceeding 0.25 Nm		NA
	Pull force of 50N to each pin after the appliance has being placed in the heating cabinet; when cooled to room temperature the pins are not displaced by more than 1mm		NA
	Each pin subjected to a torque of 0.4Nm; the pins are not rotating unless rotating does not impair compliance with the standard		NA
22.4	Appliance for heating liquids and appliance causing undue vibration not provided with pins for insertion into socket-outlets		NA
22.5	No risk of electric shock when touching the pins of the plug	Power Supply approved to EN60950	PASS
22.6	Electrical insulation not affected by condensing water or leaking liquid	Power Supply approved to EN60950	PASS
	Electrical insulation of Class II appliances not affected in case of a hose rupture or seal leak		NA
22.7	Adequate safeguards against the risk of excessive pressure in appliances provided with steam-producing devices		NA

Clause	Requirement - Test	Remark	Result
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		NA
22.9	Insulation, internal wiring, windings, commutators and slip rings not exposed to oil, grease or similar substances		NA
	Adequate insulating properties of oil or grease to which insulation is exposed		NA
22.10	Location or protection of reset buttons of non-self-resetting controls is so that accidental resetting is unlikely		NA
NOTE: Perform the tests of 22.11 prior to the tests of Clause 8			
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 access to the fan when tested with the test probe using the push test	PASS
	Obvious locked position of snap-in devices used for fixing such parts		NA
	No deterioration of the fixing properties of snap-in devices used in parts that are likely to be removed during installation or servicing		NA
	Tests as described		NA
22.12	Handles, knobs etc. fixed in a reliable manner		NA
	Fixing in wrong position of handles, knobs etc. indicating position of switches or similar components not possible		NA
	Axial force 15 N applied to parts, the shape being so that an axial pull is unlikely to be applied		NA
	Axial force 30 N applied to parts, the shape being so that an axial pull is likely to be applied		NA
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		NA
22.14	No ragged or sharp edges creating a hazard for the user in normal use, or during user maintenance		PASS

Clause	Requirement - Test	Remark	Result
	No exposed pointed ends of self tapping screws etc., liable to be touched by the user in normal use or during user maintenance		PASS
22.15	Storage hooks and the like for flexible cords smooth and well rounded		NA
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		NA
	Cord reel tested with 6000 operations, as specified		NA
	Electric strength test of 16.3, voltage of 1000 V applied		NA
22.17	Spacers not removable from the outside by hand or by means of a screwdriver or a spanner		NA
22.18	Current-carrying parts and other metal parts resistant to corrosion under normal conditions of use	Corrosion of the element does not result in a safety hazard.	PASS
22.19	Driving belts not used as electrical insulation		NA
22.20	Direct contact between live parts and thermal insulation effectively prevented, unless material used is non-corrosive, non-hygroscopic and non-combustible		NA
	Compliance is checked by inspection and, if necessary, by appropriate test		NA
22.21	Wood, cotton, silk, ordinary paper and fibrous or hygroscopic material not used as insulation, unless impregnated		NA
22.22	Appliances not containing asbestos		PASS
22.23	Oils containing polychlorinated biphenyl (PCB) not used		PASS
22.24	Bare heating elements adequately supported	**Note**: Perform the test of clause 22.24 AFTER the tests of clause 29	NA
	In case of rupture, the heating conductor is unlikely to come in contact with accessible metal parts		NA
22.25	Sagging heating conductors cannot come into contact with accessible metal parts		NA

Clause	Requirement - Test	Remark	Result
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		NA
22.27	Parts connected by protective impedance separated by double or reinforced insulation		NA
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		NA
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		NA
22.30	Parts serving as supplementary or reinforced insulation fixed so that they cannot be removed without being seriously damaged, or		NA
	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		NA
22.31	Clearances and creepage distances over supplementary and reinforced insulation not reduced below values specified in clause 29 as a result of wear		NA
	Clearances and creepage distances between live parts and accessible parts not reduced below values for supplementary insulation, if wires, screws etc. become loose		NA
22.32	Supplementary and reinforced insulation designed or protected against deposition of dirt or dust		NA
	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		NA
	Ceramic material not tightly sintered, similar material or beads alone not used as supplementary or reinforced insulation		NA
	Oxygen bomb test at 70 °C for 96 h and 16 h at room temperature		NA

Clause	Requirement - Test	Remark	Result
22.33	Conductive liquids that are or may become accessible in normal use are not in direct contact with live parts	Instructions in the manual to ensure that spillage of the liquid on the power supply and controller is avoided	NA
	Electrodes not used for heating liquids		NA
	For class II constructions, conductive liquids that are or may become accessible in normal use, not in direct contact with basic or reinforced insulation		NA
	For class II constructions, conductive liquids which are in contact with live parts, not in direct contact with reinforced insulation		NA
22.34	Shafts of operating knobs, handles, levers etc. not live, unless the shaft is not accessible when the part is removed		NA
22.35	Handles, levers and knobs, held or actuated in normal use, not becoming live in the event of an insulation fault		NA
	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		NA
	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		NA
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		NA
22.37	Capacitors in Class II appliances not connected to accessible metal parts, unless complying with 22.42		NA
	Metal casings of capacitors in Class II appliances separated from accessible metal parts by supplementary insulation, unless complying with 22.42		NA

Clause	Requirement - Test	Remark	Result
22.38	Capacitors not connected between the contacts of a thermal cut-out		PASS
22.39	Lamp holders used only for the connection of lamps		NA
22.40	Motor-operated appliances and combined appliances intended to be moved while in operation, or having accessible moving parts, fitted with a switch to control the motor. The actuating member of the switch being easily visible and accessible		NA
22.41	No components, other than lamps, containing mercury		NA
22.42	Protective impedance consisting of at least two separate components		NA
	Values specified in 8.1.4 not exceeded if any one of the components are short-circuited or open-circuited		NA
22.43	Appliances adjustable for different voltages, accidental changing of the setting of the voltage unlikely to occur		NA
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		PASS
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		NA

5.18 INTERNAL WIRING

Clause	Requirement - Test	Remark	Result
23			
23.1	Wireways smooth and free from sharp edges		PASS
	Wires protected against contact with burrs, cooling fins etc.		PASS
	Wire holes in metal well rounded or provided with bushings		NA
	Wiring effectively prevented from coming into contact with moving parts		PASS
23.2	Beads etc. on live wires cannot change their position, and are not resting on sharp edges or corners		PASS
	Beads inside flexible metal conduits contained within an insulating sleeve		NA
23.3	Electrical connections and internal conductors movable relatively to each other not exposed to undue stress		NA
	Flexible metallic tubes not causing damage to insulation of conductors		NA
	Open-coil springs not used		NA
	Adequate insulating lining provided inside a coiled spring, the turns of which touch one another		NA
	No damage after 10 000 flexings for conductors flexed during normal use or 100 flexings for conductors flexed during user maintenance		NA
	Electric strength test, 1000 V between live parts and accessible metal parts		NA
23.4	Bare internal wiring sufficiently rigid and fixed		NA
23.5	The insulation of internal wiring withstanding the electrical stress likely to occur in normal use		PASS
	No breakdown when a voltage of 2000 V is applied for 15 min between the conductor and metal foil wrapped around the insulation		NA
23.6	Sleeving used as supplementary insulation on internal wiring retained in position by positive means		NA
23.7	The colour combination green/yellow used only for earthing conductors	Power Supply Approved to EN60950	PASS

Clause	Requirement - Test	Remark	Result
23.8	Aluminium wires not used for internal wiring		PASS
23.9	No lead-tin soldering of stranded conductors where they are subject to contact pressure, unless		PASS
	clamping means so constructed that there is no risk of bad contact due to cold flow of the solder		PASS

5.19 COMPONENTS

Clause	Requirement - Test	Remark	Result
24			
24.1	Components comply with safety requirements in relevant IEC standards	Components in power supply are assumed to be approved	PASS
	List of components	Reference manufacturer's Bill of Materials	PASS
	Components not tested and found to comply with relevant IEC standard for the number of cycles specified are tested in accordance with 24.1.1 to 24.1.6		NA
	Components not tested and found to comply with relevant IEC standard, components not marked or not used in accordance with its marking, tested under the conditions occurring in the appliance		NA
24.1.1	Capacitors likely to be permanently subjected to the supply voltage and used for radio interference suppression or for voltage dividing, complying with IEC 60384-14, or	Power Supply approved to EN60950	PASS
	tested according to annex F		NA
24.1.2	Safety isolating transformers complying with IEC 61558-2-6, or		NA
	tested according to annex G		NA
24.1.3	Switches complying with IEC 61058-1, the number of cycles of operation being at least 10 000, or		NA
	tested according to annex H		NA
24.1.4	Automatic controls complying with IEC 60730-1 with relevant part 2. The number of cycles of operation being:		
	- thermostats: 10 000		NA
	- temperature limiters: 1 000		NA
	- self-resetting thermal cut-outs: 300		NA
	- non-self-resetting thermal cut-outs: 30		NA
	- timers: 3 000		NA
	- energy regulators: 10 000		NA

Clause	Requirement - Test	Remark	Result
24.1.5	Appliance couplers complying with IEC 60320-1	Power Supply approved to EN60950	PASS
	However, appliances classified higher than IPX0, the appliance couplers complying with IEC 60320-2-3		NA
24.1.6	Small lamp holders similar to E10 lampholders complying with IEC 60238, the requirements for E10 lampholders being applicable		NA
24.2	No switches or automatic controls in flexible cords		PASS
	No devices causing the protective device in the fixed wiring to operate in the event of a fault in the appliance		PASS
	No thermal cut-outs that can be reset by soldering		PASS
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		NA
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	Phono-jack on element	PASS
24.5	Capacitors in auxiliary windings of motors marked with their rated voltage and capacitance and used accordingly		NA
	Capacitors in appliances for which 30.2.3 is applicable and that are permanently connected in series with a motor winding, are of class P1 or P2 of IEC 60252		NA
	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		NA
24.6	Working voltage of motors connected to the supply mains and having basic insulation that is inadequate for the rated voltage of the appliance, not exceeding 42V.		NA

Clause	Requirement - Test	Remark	Result
	In addition, the motors are complying with the requirements of Annex I		NA

5.20 SUPPLY CONNECTION AND EXTERNAL FLEXIBLE CORDS

Clause	Requirement - Test	Remark	Result
25			
25.1	Appliance not intended for permanent connection to fixed wiring, means for connection to the supply:		
	- supply cord fitted with a plug		PASS
	- an appliance inlet having at least the same degree of protection against moisture as required for the appliance		NA
	- pins for insertion into socket-outlets		NA
25.2	Appliance not provided with more than one means of connection to the supply mains		PASS
	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		NA
25.3	Connection of supply conductors for appliance intended to be permanently connected to fixed wiring possible after the appliance has been fixed to its support		NA
	Appliance provided with a set of terminals for the connection of cables or fixed wiring, cross-sectional areas specified in 26.6		NA
	Appliance provided with a set of terminals allowing the connection of a flexible cord		NA
	Appliance provided with a set of supply leads accommodated in a suitable compartment		NA
	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		NA
25.4	Cable and conduit entries, rated current of appliance not exceeding 16 A, dimensions according to table 10		NA
	Introduction of conduit or cable does not reduce clearances or creepage distances below values specified in 29		NA
25.5	Method for assemble supply cord with the appliance:		
	- type X attachment		PASS
	- type Y attachment		NA

Clause	Requirement - Test	Remark	Result
	- type Z attachment, if allowed in part 2		NA
	Type X attachment, other than those with a specially prepared cord, not used for flat twin tinsel cords		PASS
25.6	Plugs fitted with only one flexible cord		PASS
	Supply cords of single-phase portable appliances having a rated current not exceeding 16 A, fitted with a plug complying with the following standard sheets of IEC 60083:1975:		PASS
	- for Class I appliances: standard sheet C2b, C3b or C4 :		PASS
	- for Class II appliances: standard sheet C5 or C6:		NA
25.7	Supply cord not lighter than:		
	- braided cord (60245 IEC 51)	Approved Power Cord Provided	NA
	- ordinary tough rubber sheathed cord (60245 IEC 53)		NA
	- ordinary polychloroprene sheathed flexible cord (60245 IEC 57)		NA
	- flat twin tinsel cord (60227 IEC 41)		NA
	- light polyvinyl chloride sheathed cord (60227 IEC 52), appliance not exceeding 3 kg		NA
	- ordinary polyvinyl chloride sheathed cord (60227 IEC 53), appliance exceeding 3 kg		NA
	Supply cords having high flexibility, not lighter than:		
	- rubber insulated and sheathed cord (60245 IEC 86)		NA
	- rubber insulated, crosslinked PVC sheathed cord (60245 IEC 87)		NA
	- crosslinked PVC insulated and sheathed cord (60245 IEC 88)		NA
	Temperature rise of external metal parts exceeding 75 K, PVC cord not used, unless		NA
	appliance so constructed that the supply cord is not likely to touch external metal parts in normal use, or		NA
	the supply cord is appropriate for higher temperatures, type Y or type Z attachment used		NA

Clause	Requirement - Test	Remark	Result
25.8	Nominal cross-sectional area of supply cords according to table 11; rated current (A); cross-sectional area (mm²):	Approved Power Cord Provided	NA
25.9	Supply cord not in contact with sharp points or edges		PASS
25.10	Green/yellow core for earthing purposes in Class I appliance	Approved Power Cord Provided	PASS
25.11	Conductors of supply cords not consolidated by lead-tin soldering where they are subject to contact pressure, unless		NA
	clamping means so constructed that there is no risk of bad contacts due to cold flow of the solder		NA
25.12	Moulding the cord to part of the enclosure does not damage the insulation of the supply cord		NA
25.13	Inlet opening so shaped as to prevent damage to the supply cord		PASS
	Unless the enclosure at the inlet opening is of insulation material, a non-detachable lining or bushing complying with 29.3 for supplementary insulation provided		NA
	If unsheathed supply cord, a similar additional bushing or lining is required, unless		NA
	the appliance is class 0		NA
25.14	Supply cords adequately protected against excessive flexing	Approved Power Cord Provided	PASS
	Flexing test:		
	- applied force (N):		NA
	- number of flexings:		NA
	The test does not result in:		
	- short circuit between the conductors		NA
	- breakage of more than 10% of the strands of any conductor		NA
	- separation of the conductor from its terminal		NA
	- loosening of any cord guard		NA
	- damage, within the meaning of the standard, to the cord or the cord guard		NA
	- broken strands piercing the insulation and becoming accessible		NA

Clause	Requirement - Test	Remark	Result
25.15	Conductors of the supply cord relieved from strain, twisting and abrasion by use of cord anchorage	Approved Power Cord Provided	PASS
	The cord cannot be pushed into the appliance to such an extent that the cord or internal parts of the appliance can be damaged		NA
	Pull and torque test of supply cord, values shown in table 10: pull (N); torque (not on automatic cord reel) (Nm):		NA
	Max. 2 mm displacement of the cord, and conductors not moved more than 1 mm in the terminals		NA
	Creepage distances and clearances not reduced below values specified in 29.1		NA
25.16	Cord anchorages for type X attachments constructed and located so that:		
	- replacement of the cord is easily possible		NA
	- it is clear how the relief from strain and the prevention of twisting are obtained		NA
	- they are suitable for different types of cord		NA
	- cord cannot touch the clamping screws of cord anchorage if these screws are accessible, unless separated from accessible metal parts by supplementary insulation		NA
	- the cord is not clamped by a metal screw which bears directly on the cord		NA
	- at least one part of the cord anchorage securely fixed to the appliance, unless part of a specially prepared cord		NA
	- screws which have to be operated when replacing the cord do not fix any other component, if applicable		NA
	- if labyrinths can be bypassed the test of 25.15 is nevertheless withstood		NA
	- 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		NA
	- for Class II appliances: they are of insulating material, or if of metal, they are insulated from accessible metal parts by supplementary insulation		NA

Clause	Requirement - Test	Remark	Result
25.17	Adequate cord anchorages for type Y and Z attachment		NA
25.18	Cord anchorages only accessible with the aid of a tool, or		NA
	so constructed that the cord can only be fitted with the aid of a tool		NA
25.19	Type X attachment, glands not used as cord anchorage in portable appliances		NA
	Tying the cord into a knot or tying the cord with string not used		NA
25.20	Conductors of the supply cord for type Y and Z attachment adequately additionally insulated		NA
25.21	Space for supply cord for type X attachment or for connection of fixed wiring constructed to permit checking of conductors with respect to correct positioning and connection before fitting any cover, no risk of damage to the conductors when fitting the cover, no contact with accessible metal parts if a conductor becomes loose, etc.		NA
	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		NA
25.22	Appliance inlet:		
	- live parts not accessible during insertion or removal	Power Supply Approved to EN60950	PASS
	- connector can be inserted without difficulty		PASS
	- the appliance is not supported by the connector		PASS
	- is not for cold conditions if temp. rise of external metal parts exceeds 75 K, unless the supply cord is not likely to touch such metal parts		PASS
25.23	Interconnection cords comply with the requirements for the supply cord, except as specified		NA
	If necessary, electric strength test of 16.3		NA
25.24	Interconnection cords not detachable without the aid of a tool if compliance with the standard is impaired when they are disconnected		NA

Clause	Requirement - Test	Remark	Result
25.25	Dimensions of pins compatible with the dimensions of the relevant socket-outlet. Dimensions of pins and engagement face in accordance with the relevant plug in IEC 60083		NA

5.21 TERMINALS FOR EXTERNAL CONDUCTORS

Clause	Requirement - Test	Remark	Result
26			
26.1	Appliances provided with terminals or equally effective devices for connection of external conductors	No external terminals containing LIVE parts	NA
	Terminals only accessible after removal of a non-detachable cover		NA
26.2	Appliances with type X attachment and appliances for connection to fixed wiring provided with terminals in which connections are made by means of screws, nuts or similar devices, unless the connections are soldered		NA
	Screws and nuts serve only to clamp supply conductors, except		NA
	internal conductors, if so arranged that they are unlikely to be displaced when fitting the supply conductors		NA
	If soldered connections used, the conductor so positioned or fixed that reliance is not placed on soldering alone		NA
	Soldering alone used, barriers provided, clearances and creepage distances satisfactory if the conductor becomes free at the soldered joint		NA
26.3	Terminals for type X attachment and for connection to fixed wiring so constructed that the conductor is clamped between metal surfaces with sufficient contact pressure and without damaging the conductor		NA
	Terminals for type X attachment and those for connection to fixed wiring so fixed that when tightening or loosening the clamping means:		
	- the terminal does not loosen		NA
	- internal wiring is not subjected to stress		NA
	- clearances and creepage distances are not reduced below the values in 29		NA
	Compliance checked by inspection and by the test of subclause 8.6 of IEC 60999-1, the torque applied being equal to two-thirds of the torque specified. Nominal diameter of thread (mm); screw category; torque (Nm):		NA

Clause	Requirement - Test	Remark	Result
26.4	Terminals for type X attachment, except those with a specially prepared cord, and those for connection to fixed wiring, no special preparation of conductors required, and so constructed or placed that conductors prevented from slipping out		NA
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		NA
	Stranded conductor test, 8 mm insulation removed		NA
	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		NA
26.6	Terminals for type X attachment and for connection to fixed wiring suitable for connection of conductors with required cross-sectional area according to table 13; rated current (A); nominal cross-sectional area (mm^2):		NA
	Terminals only suitable for a specially prepared cord		NA
26.7	Terminals for type X attachment accessible after removal of a cover or part of the enclosure		NA
26.8	Terminals for the connection to fixed wiring, including the earthing terminal, located close to each other		NA
26.9	Terminals of the pillar type constructed and located as specified		NA
26.10	Terminals with screw clamping and screwless terminals not used for flat twin tinsel cords, unless conductors ends fitted with a device suitable for screw terminals		NA
	Pull test of 5 N to the connection		NA
26.11	For type Y and Z attachment: soldered, welded, crimped and similar connections may be used		NA
	For Class II appliances: the conductor so positioned or fixed that reliance is not placed on soldering, welding or crimping alone		NA

Clause	Requirement - Test	Remark	Result
	For Class II appliances: soldering, welding or crimping alone used, barriers provided, clearances and creepage distances satisfactory if the conductor becomes free		NA

5.22 PROVISION FOR EARTHING

Clause	Requirement - Test	Remark	Result
27			
27.1	Accessible metal parts of Class 0I and I appliances, permanently and reliably connected to an earthing terminal or contact of the appliance inlet	No accessible metal parts can become LIVE – Approved power supply used.	NA
	Earthing terminals not connected to neutral terminal		NA
	Class 0, II and III appliance have no provision for earthing		NA
	Safety extra-low voltage circuits not earthed, unless protective extra-low voltage circuits		NA
27.2	Clamping means adequately secured against accidental loosening		NA
	Terminals used for the connection of external equipotential bonding conductors allow connection of conductors of 2.5 to 6 mm², and		NA
	do not provide earthing continuity between different parts of the appliance		NA
	Conductors cannot be loosened without the aid of a tool		NA
27.3	For appliances with supply cord, current-carrying conductors become taut before earthing conductor, if the cord slips out of the cord anchorage		NA
27.4	No risk of corrosion resulting from contact between metal of earthing terminal and other metal		NA
	Adequate resistance to corrosion of coated or uncoated parts providing earthing continuity, other than parts of a metal frame or enclosure		NA
	Parts of steel providing earthing continuity provided at the essential areas with an electroplated coating, thickness at least 5 µm		NA
	Adequate protection against rusting of parts of coated or uncoated steel, only intended to provide or transmit contact pressure		NA
	In case of aluminium alloys precautions taken to avoid risk of corrosion		NA

Clause	Requirement - Test	Remark	Result
27.5	Low resistance of connection between earthing terminal and earthed metal parts		NA
	This requirement does not apply to connections providing earthing continuity in the protective extra-low voltage circuit, provided that clearances of basic insulation are based on the rated voltage of the appliance		NA
	Resistance not exceeding 0,1 Ω at the specified low-resistance test		NA
27.6	The printed conductors of printed circuit boards not used to provide earthing continuity in hand held appliances		NA
	They may be used in other appliances if:		
	- at least two tracks are used with independent soldering points and the appliance complies with requirements of 27.5 for each circuit		NA
	- the material of the printed circuit board complies with IEC 60249-2-4 or IEC 60249-2-5		NA

5.23 SCREWS AND CONNECTIONS

Clause	Requirement - Test	Remark	Result
28			
28.1	Fixings, electrical connections and connections providing earthing continuity withstand mechanical stresses	No EARTHING connections internal or external. Approved powersupply provided.	NA
	Screws not of soft metal liable to creep, such as zinc or aluminium		NA
	Diameter of screws of insulating material min. 3 mm		NA
	Screws of insulating material not used for any electrical connection or connections providing earthing continuity		NA
	Screws used for electrical connections or connections providing earthing continuity screw into metal		NA
	Screws not of insulating material if their replacement by a metal screw can impair supplementary or reinforced insulation		NA
	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		NA
	For screws and nuts; test as specified	(see appended table)	NA
28.2	Electrical connections and connections providing earthing continuity constructed so that contact pressure not transmitted through insulating material liable to shrink or distort, unless shrinkage or distortion compensated		NA
	This requirement does not apply to electrical connections in circuits carrying a current not exceeding 0.5A		NA
28.3	Space-threaded (sheet metal) screws only used for electrical connections if they clamp the parts together		NA
	Thread-cutting (self-tapping) screws only used for electrical connections if they generate a full form standard machine screw thread		NA

Clause	Requirement - Test	Remark	Result
	Such screws not used if they are likely to be operated by the user or installer unless the thread is formed by a swaging action		NA
	Thread-cutting and space-threaded screws may be used in connections providing earthing continuity, provided unnecessary to disturb the connection and at least two screws are used for each connection		NA
28.4	Screws and nuts that make mechanical connection secured against loosening if they also make electrical connections or connections providing earthing continuity		NA
	Rivets for electrical connections or connections providing earthing continuity secured against loosening if subjected to torsion		NA

5.24 CLEARANCES, CREEPAGE DISTANCES AND SOLID INSULATION

Clause	Requirement - Test	Remark	Result
29	**NOTE**: Perform the tests of Clause 14 and 22.24 AFTER the tests of Clause 29		
	Clearances, creepage distances and solid insulation withstand electrical stress	Power supply approved to EN60950	NA
	For coatings used on printed circuits boards to protect the microenvironment or to provide basic insulation, annex J applies		NA
29.1	Clearances not less than the values specified in table 16, taking into account the rated impulse voltage for the overvoltage categories of table 15		NA
	The values specified may be smaller for basic insulation and functional insulation if the clearance meets the impulse voltage test of clause 14		NA
	Appliances are in overvoltage category II		NA
	Clearances less than specified in table 16 not allowed for basic insulation of class 0 and class 0I appliances,		NA
	or if pollution degree 3 is applicable		NA
	Compliance is checked by inspection and measurements as specified		NA
29.1.1	Clearances of basic insulation withstand the overvoltages, taking into account the rated impulse voltage		NA
	Clearance at the terminals of tubular sheathed heating elements may be reduced to 1mm if the microenvironment is pollution degree 1		NA
	Lacquered conductors of windings assumed to be bare conductors, but the clearances specified in table 16 are reduced by 0.5mm for rated impulse voltages of at least 1500V		NA
29.1.2	Clearances of supplementary insulation not less than those specified for basic insulation in table 16		NA
29.1.3	Clearances of reinforced insulation not less than those specified for basic insulation in table 16, but using the next higher step for rated impulse voltage		NA

Clause	Requirement - Test	Remark	Result
29.1.4	For functional insulation, the values of table 16 are applicable, unless		NA
	the appliance complies with clause 19 with the functional insulation short-circuited		NA
	Clearances at crossover points of lacquered conductors not measured		NA
	Clearance between surfaces of PTC heating elements may be reduced to 1mm		NA
	Lacquered conductors of windings assumed to be bare conductors, but the clearances specified in table 16 are reduced by 0.5mm for rated impulse voltages of at least 1500V		NA
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		NA
	If the secondary winding of a step-down transformer is earthed, or if there is an earthed screen between the primary and secondary windings, clearances of basic insulation on the secondary side not less than those specified in table 16, but using the next lower step for rated impulse voltage		NA
	Circuits supplied with a voltage lower than rated voltage, clearances of functional insulation based on the working voltage used as the rated voltage in table 15		NA
29.2	Creepage distances not less than those appropriate for the working voltage, taking into account the material group and the pollution degree		NA
	Pollution degree 2 applies, unless		NA
	precautions taken to protect the insulation; pollution degree 1		NA
	insulation subjected to conductive pollution; pollution degree 3		NA
	Compliance is checked by inspection and measurements as specified		NA
29.2.1	Creepage distances of basic insulation not less than specified in table 17		NA

Clause	Requirement - Test	Remark	Result
	For pollution degree 1, creepage distance not less than the minimum specified for the clearance in table 16, if the clearance has been checked according to the test of clause 14		NA
29.2.2	Creepage distances of supplementary insulation at least as specified for basic insulation in table 17		NA
29.2.3	Creepage distances of reinforced insulation at least double as specified for basic insulation in table 17		NA
29.2.4	Creepage distances of functional insulation not less than specified in table 18		NA
	Creepage distances may be reduced if the appliance complies with clause 19 with the functional insulation short-circuited		NA
29.3	Solid insulation having a minimum thickness of 1mm for supplementary insulation,		NA
	and 2mm for reinforced insulation		NA
	This requirement does not apply if the supplementary insulation, other than mica or similar scaly material, consists of at least two layers, each of the layers withstands the electric strength test of 16.3		NA
	This requirement does not apply if the reinforced insulation, other than mica or similar scaly material, consists of at least three layers, any two layers together withstand the electric strength test of 16.3		NA
	This requirement also does not apply to inaccessible insulation and does not exceed the maximum permissible temperature values, or		NA
	if the insulation, after conditioning as specified, withstands the electric strength test of 16.3		NA

5.25 RESISTANCE TO HEAT AND FIRE

Clause	Requirement - Test	Remark	Result
30			
30.1	External parts of non-metallic material,	Get rating of plastic enclosure	PASS
	parts supporting live parts, and	Approved power supply used, no LIVE parts in the controller enclosure	PASS
	thermoplastic material providing supplementary or reinforced insulation,		PASS
	sufficiently resistant to heat		PASS
	Ball-pressure test according to IEC 60695-10-2		NA
	External parts: at 40 °C plus the maximum temperature rise determined during the test of clause 11, or at 75 °C, whichever is the higher; temperature (°C):		PASS
	Parts supporting live parts: at 40°C plus the maximum temperature rise determined during the test of clause 11, or at 125°C, whichever is the higher; temperature (°C):		PASS
	Parts of thermoplastic material providing supplementary or reinforced insulation, 25°C plus the maximum temperature rise determined during clause 19, if higher; temperature (°C):		NA
30.2	Relevant parts of non-metallic material adequately resistant to ignition and spread of fire		PASS
30.2.1	Glow-wire test of IEC 60695-2-11 at 550 °C, unless		NA
	the material is classified at least HB40 according to IEC 60695-11-10		PASS
	Parts for which the glow-wire test cannot be carried out meet the requirements in ISO9772 for category FH3 material		NA
30.2.2	Appliances operated while attended, parts of insulating material supporting current-carrying connections and parts within a distance of 3mm subjected to the glow-wire test of IEC 60695-2-11 at a temperature of:		NA
	-750°C, for connections carrying a current exceeding 0,5A during normal operation		NA
	-650°C, for other connections		NA
	Test not applicable to conditions as specified		NA

Clause	Requirement - Test	Remark	Result
30.2.3	Appliances operated while unattended, tested as specified in 30.2.3.1 and 30.2.3.2		NA
	Test not applicable to conditions as specified		NA
30.2.3.1	Parts of insulating material supporting connections carrying a current exceeding 0.2A during normal operation, and		PASS
	parts of insulating material within a distance of 3mm,		PASS
	having a glow-wire flammability index of at least 850°C according to IEC 60695-2-12		NA
30.2.3.2	Parts of insulating material supporting current-carrying connections, and		PASS
	parts of insulating material within a distance of 3mm,		PASS
	subjected to glow-wire test of IEC 60695-2-11		NA
	Test not carried out on material having a glow-wire ignition temperature according to IEC 60695-2-13 as specified		NA
	Glow-wire test of IEC 60695-2-11, the temperature being:		
	-750°C, for connections carrying a current exceeding 0,2A during normal operation		NA
	-650°C, for other connections		NA
	Parts that during the test produce a flame persisting longer than 2 s, tested as specified		NA
	If a flame persists longer than 2 s during the test, parts above the connection, as specified, subjected to the needle-flame test of annex E, unless		NA
	the material is classified as V-0 or V-1 according to IEC 60695-11-10		NA
30.2.4	Base material of printed circuit boards subjected to needle-flame test of annex E		NA
	Test not applicable to conditions as specified		NA

5.26 RESISTANCE TO RUSTING

Clause	Requirement - Test	Remark	Result
31			
	Relevant ferrous parts adequately protected against rusting	Corrosion of the element does not present a hazard	PASS

5.27 RADIATION, TOXICITY AND SIMILAR HAZARDS

Clause	Requirement - Test	Remark	Result
32			
	Appliance does not emit harmful radiation		PASS
	Appliance does not present a toxic or similar hazard		PASS

5.28 ANNEX A (INFORMATIVE): ROUTINE TESTS

Clause	Requirement - Test	Remark	Result
A			
	Description of routine tests to be carried out by the manufacturer	Power supply manufacturer should provide proof that relevant safety tests have been completed No other tests are necessary	NA

Appendix A: Photos of Equipment

Figure 2: Photo of ionCleanse System

Figure 3: View of Controller PCB mounted in enclosure

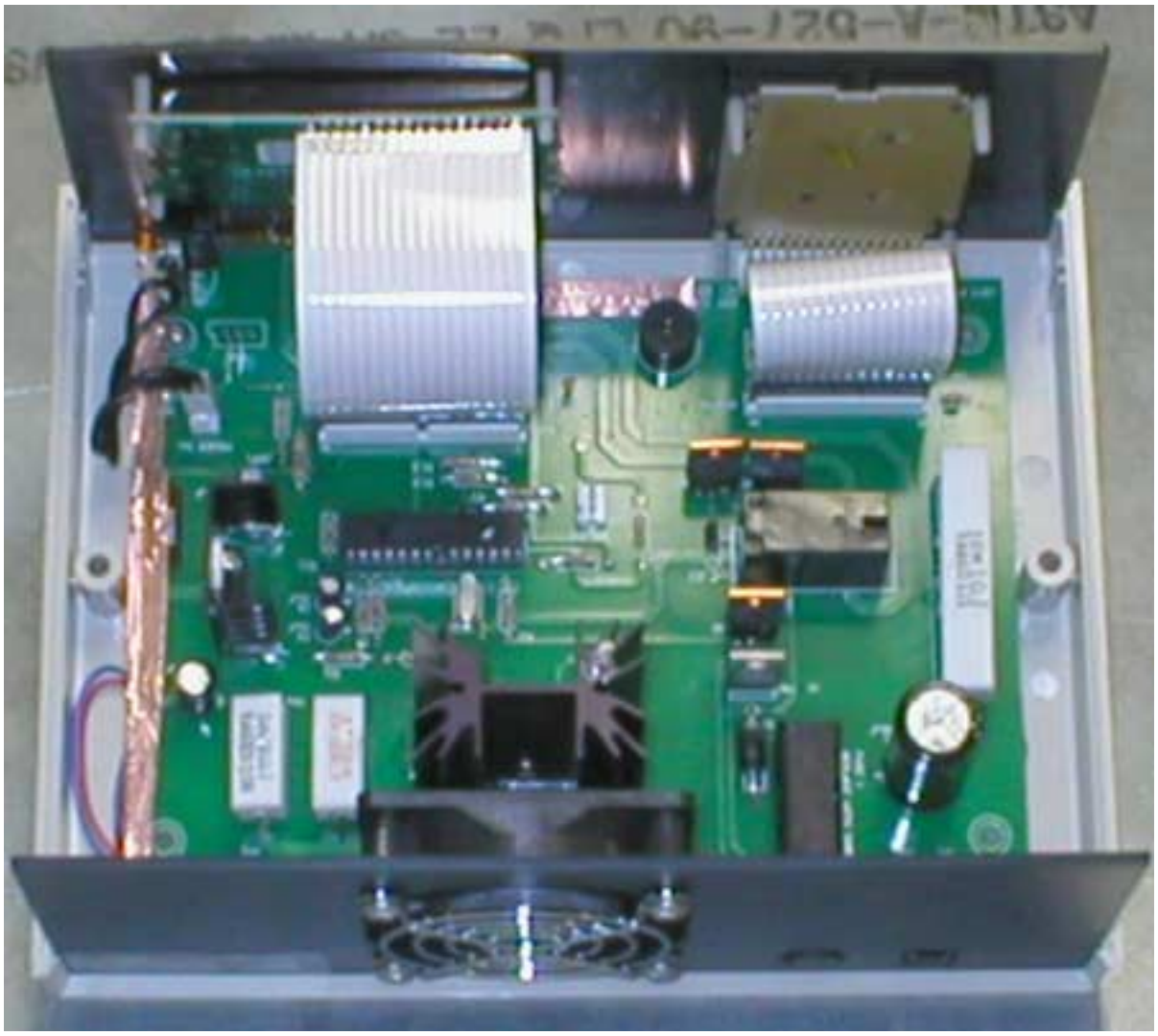


Figure 4: View of controller PCB with ground plane for EMC

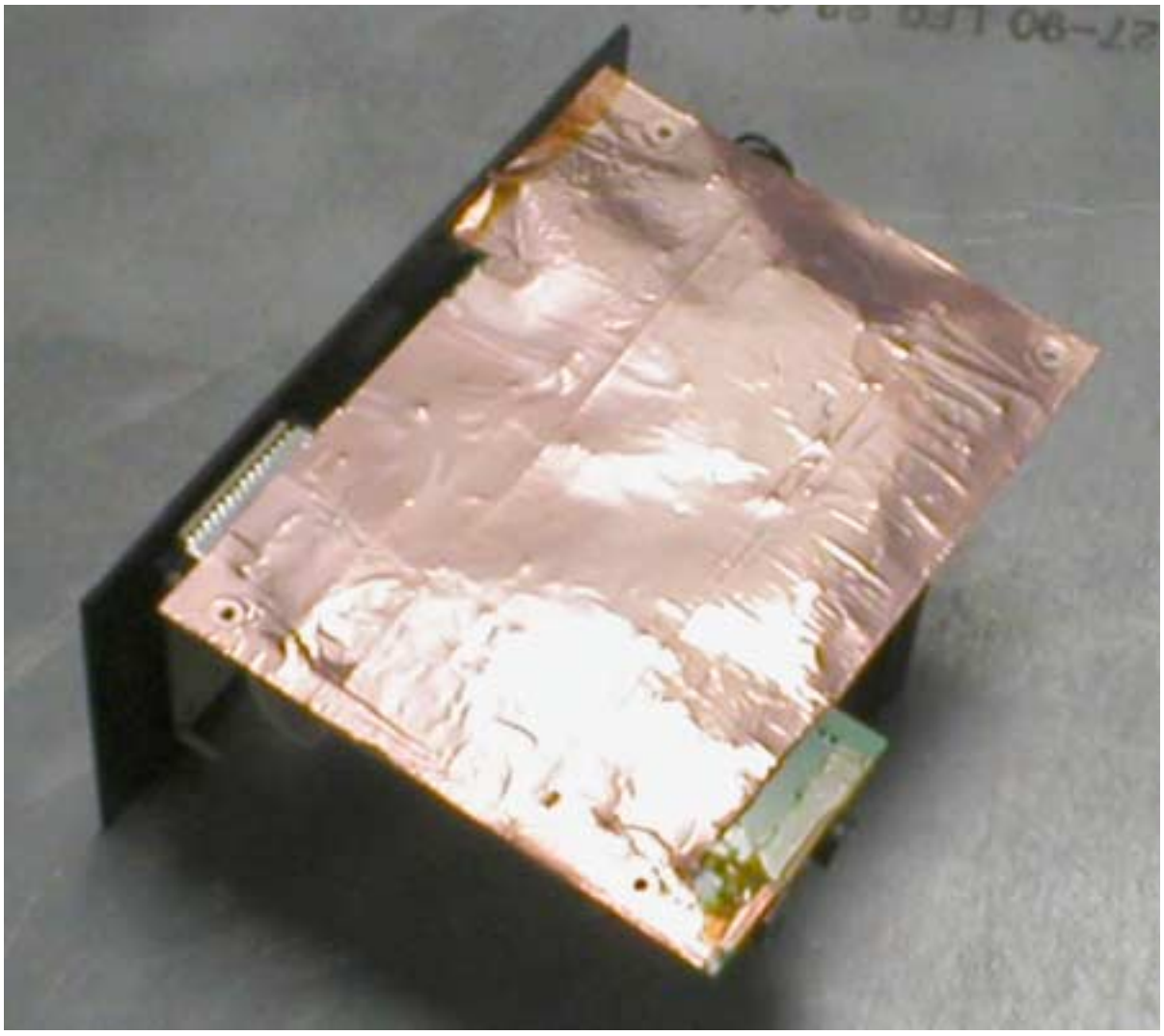


Figure 5: View of internal Controller components

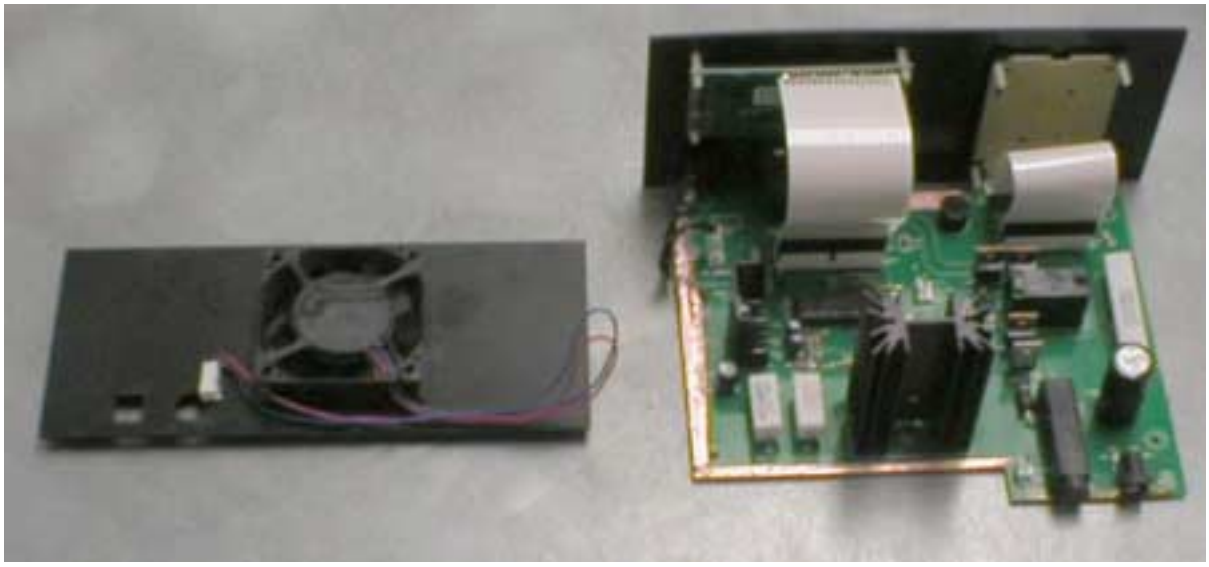


Figure 6: Controller Label

Figure 7: Power Supply Label