




















TEST REPORT	
IEC 60 215	
Safety requirements for radio transmitting equipment	
Report Reference No.	L06001-527-1-1
Tested by (+ signature)	Serkan Kefali 
Approved by (+ signature)	Gunay Arda 
Date of issue	2006-05
Contents	28 pages
Testing laboratory Name	Esim Test Hizmetleri A.S.
Address	IMES Sanayi Sitesi C Blok 308. Sok. No:46 81260 Y.Dudullu - Istanbul / Turkey
Testing location	As above
Client Name	Hurma Elektronik San. ve Tic. Koll. Sti.
Address	Eskoop San. Sit. C5 Blok No:243 Organize San. Bolgesi Ikitelli – Istanbul / Turkey
Standard	IEC 60215:1987 + A1:1990 + A2:1993
Test procedure	N/A
Non-standard test method	N/A
Test Report Form/blank test report	
Test Report Form No.	IECEN60215G
TRF originator	ESIM
Master TRF	Dated 2006-05
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Test item Description	Analogue TV Transmitter
Trademark	Hurma
Model and/or type reference	TVV 1000
Manufacturer	Hurma Elektronik San. ve Tic. Koll. Sti.
Rating(s)	220VAC or 3 x 220 VAC, 50 Hz, 3,7 kW
Test case verdicts	
Test case does not apply to the test object	N(A.)
Test item does meet the requirement	P(ass)
Test item does not meet the requirement	F(ail)


ESİM
 Test Hizmetleri Sanayi ve Ticaret A.Ş.
 İmes Sanayi Sitesi C Blok 308 Sok. No:46
 81260 Y.Dudullu - İSTANBUL
Esim Test Hizmetleri San. Ve Tic. A.Ş.
 Sermayesi : 1.000.000.000,000 TL

Testing																			
Date of receipt of test item	2006-05																		
Date(s) of performance of test.....	2006-05																		
General remarks																			
<p>This report shall not be reproduced except in full without the written approval of the testing laboratory.</p> <p>The test results presented in this report relate only to the item(s) tested.</p> <p>"(see appended table)" refers to a table appended to the report.</p> <p>"(see remark #)" refers to a remark appended to the report.</p> <p>"(see Annex #)" refers to an annex appended to the report.</p> <p>Throughout this report a comma (point) is used as the decimal separator.</p>																			
Summary of Testing and Conclusions																			
All tests have been performed at 25 ⁰ C ambient.																			
Copy of marking plate																			
<table border="1"> <tr> <td>Üretici Firma Manufacturer</td> <td>Hurma Elektronik San. Ve Tic. Koll. Şti. Eskiöop San. Sıt. C5 Blok No:243 Organize San. Bölgesi İhtelil / İstanbul</td> </tr> <tr> <td>Cihaz (Equipment)</td> <td>Analog TV Verici (Analogue TV Transmitter)</td> </tr> <tr> <td>Model (Model)</td> <td>TVV 1000</td> </tr> <tr> <td>RF Çıkış Gücü</td> <td>1KW Tepe Sync (1KW Peak Sync)</td> </tr> <tr> <td>Besleme Voltajı</td> <td>220 VAC veya (ör) 3x220 VAC +/-%10 50 Hz</td> </tr> <tr> <td>Tüketim (AB. Pow.)</td> <td>3,7KW Yaklaşık (3,7KW Approx.) +/-%10</td> </tr> <tr> <td>Dikkat Attention</td> <td>Bu cihazın içinde hayatı tehlikeye sokacak yükseklikte voltajlar vardır. Telekomünikasyon Kurumu İmal ve Bakım Onarım Yetki Belgesine Sahip Firmalar Dışında Cihazın Kapaklarının Açılması Yasaktır</td> </tr> <tr> <td></td> <td> </td> </tr> <tr> <td></td> <td></td> </tr> </table>	Üretici Firma Manufacturer	Hurma Elektronik San. Ve Tic. Koll. Şti. Eskiöop San. Sıt. C5 Blok No:243 Organize San. Bölgesi İhtelil / İstanbul	Cihaz (Equipment)	Analog TV Verici (Analogue TV Transmitter)	Model (Model)	TVV 1000	RF Çıkış Gücü	1KW Tepe Sync (1KW Peak Sync)	Besleme Voltajı	220 VAC veya (ör) 3x220 VAC +/-%10 50 Hz	Tüketim (AB. Pow.)	3,7KW Yaklaşık (3,7KW Approx.) +/-%10	Dikkat Attention	Bu cihazın içinde hayatı tehlikeye sokacak yükseklikte voltajlar vardır. Telekomünikasyon Kurumu İmal ve Bakım Onarım Yetki Belgesine Sahip Firmalar Dışında Cihazın Kapaklarının Açılması Yasaktır		 			<div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>DİKKAT TV VERİCİSİ, AÇILDIKTAN 1 DAKİKA SONRA YAYINA BAŞLAR. BU BİR HATA VEYA ARIZA DEĞİLDİR. OSİLATÖRLERİN KARARLI HALE GELMESİ İÇİN GEREKLİDİR.</p> <p> hurma elektronik SANAYİ ve TİCARET KOLLEKTİF ŞİRKETİ</p> </div>
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<div style="border: 1px solid black; padding: 5px;"> <p> hurma elektronik MODEL NO: TVV 1000 SERİ NO: 010005</p> <p> </p> </div>	<div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>DİKKAT VERİCİ ANTENİ BAĞLAMADAN CİHAZI ÇALIŞTIRMAYIN WARNING DO NOT OPEN TRANSMITTER BEFORE CONNECT ANTENNAS</p> </div> <div style="border: 1px solid black; padding: 5px; text-align: center; margin-top: 10px;">  </div>																		

IEC 60215			
Clause	Requirement – Test	Result - Remark	Verdict

5	CONDITIONS OF NORMAL USE		—
a)	The ambient atmospheric conditions for the equipment are within the range		N
	Or within more stringent conditions agreed between manufacturer and purchaser	-5 ⁰ C and +40 ⁰ C temp. %45 and %75 Humidity	P
b)	The supply voltage and frequency	220V or 3 x 220V, 50Hz.	P
c)	For a.c. equipment, the waveform of the supply voltage is substantially sinusoidal		P
d)	For equipment which may be operated from a.c. or d.c., either supply is applied separately	Only a.c.	N
e)	The safety earth terminals or contacts, if any, are connected to earth		P
f)	The access doors and cover plates or other protective covers, if any, are closed or fixed in position		P
	Unless they are designed to be opened or removed by hand; in which case they are left open or removed		N
g)	The equipment is operating in any position for which it has been designed to be used		P
h)	The equipment has its accessible control at any setting		P
i)	The equipment it operating with any input signal condition given in the equipment specification		P

6	FAULT CONDITIONS		—
	The initial faults shall be applied separately, in turn, in any convenient order		P
a)	Short circuit across creepage distances,		P

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Clause	Requirement – Test	Result - Remark	Verdict

	if they are less than the value given in Appendix B,		P
	Unless the insulation complies with the provision of Clause 16		N
b)	Short circuit across clearances in air, if they are less than the values given in Appendix B		P
c)	A potentially dangerous failure of any components as determined from inspecting the equipment and studying the circuit diagram,		P
	unless the component is known to comply with an IEC test recommendation appropriate to the conditions of use in the equipment		N
d)	Connection of any unfavourable impedance to the radio-frequency output connection, including open circuits and short circuits		N
e)	Failure of any cooling system	Block ventilation openings	P
f)	Continuous operation of motors, intended for intermittent operation,		N
	Unless protection against this is including in the equipment		N
g)	Locking of moving parts in rotating or linear operating devices,		P
	If these parts can be jammed by mechanical failure		P
h)	The loss of a phase of a three-phase supply		P

8	COMPONENTS		—
8.1	Component shall not be loaded in excess of their ratings under normal conditions nor, as far as practicable, under fault conditions		P

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Clause	Requirement – Test	Result - Remark	Verdict

	Components which are known to comply with an IEC test recommendation appropriate to the conditions of use in the equipment need not be tested		P
	The number of components to be tested shall be agree between manufacturer and purchaser		N
8.2	Connectors		—
a)	Connectors shall be designed so that they cannot be mated in a manner which might cause a hazard		P
b)	Connectors shall be constructed so as to prevent a bare wire inserted into the connector from penetrating the connector and making contact with any other parts		P
c)	Connectors and internal connections for ancillary purposes shall have clearance and creepage distance in ait to other circuits at least twice those specified in Appendix B		P
d)	Connectors with a non-detachable cord or cable comply with the requirements of IEC 60065		N
8.3	Circuit-breakers and manually-operated switched for the mails supply and other supply circuits shall have adequate making and breaking capacity under conditions of normal use	Approved switch	P
	Circuit-breakers shall also have adequate making and breaking capacity under fault conditions		N
	Switches, including circuit-breakers and safety isolation, shall disconnect the equipment simultaneously from all poles of the supply source necessary to make the equipment safe		N
	An indication of the “on” and “off” position of such switches shall be provided and be clearly visible		P
8.4	Fuse-links shall have an enclosed fuse-element.		P
	The rating of the fuse-link shall be marked on the fixed part of the assembly or adjacent to it		P

IEC 60215			
Clause	Requirement – Test	Result - Remark	Verdict

8.5	The equipment shall be constructed so that there is no danger to personnel resulting from the failure of any part due to corrosion		P
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9	CONSTRUCTION		—
9.1	General requirements		—
a)	The equipment shall constructed of non-flammable materials and shall have adequate strength to enclosure safety	Metal Enclosure	P
b)	Where the slackness of electrical connection could constitute a hazard, their tightness shall not be dependent upon the degree of compression applied to an insulation material		P
	Screws which serve both as electrical and mechanical connections shall be adequately locked		N
c)	Moving parts liable to cause personal injury be adequately guarded		P
d)	Where parts can be set in motion by remote control suitable precautions shall be incorporated to prevent possible injury		N
e)	Equipment shall be mechanically designed to minimize the possibility of injury to personnel		P
f)	Attention shall be paid in the design of equipment to minimize the generation of acoustic noise		P
	Where the noise exceed the safe value recommended in ISO Standard 1999, noise shall be displayed giving the safe time allowed and recommending that ear protectors should be worn		N
9.2	Test to check resistance to humidity shall be agreed between manufacturer and purchaser and shall be made after the equipment has been subjected to the appropriate damp heat test given in IEC 60068-2		P

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Clause	Requirement – Test	Result - Remark	Verdict

9.3	If the transmitter is specified as protected against the ingress of water, it shall remain safe when tested under the conditions agreed between manufacturer and purchaser.	Not specified	N
9.4	The arrangement for housing batteries shall provide adequate ventilation to remove noxious gas and vapours and ensure that leakage of electrolyte will neither cause damage to other parts not endanger person	No batteries	N

10	MARKING RELEVANT TO SAFE		—
a)	Marking shall be indelible to remain easily legible and discernible throughout the life of the equipment		P
b)	Marking shall, as far as practicable, be in the language appropriate to the area in which the equipment is to be used		P
c)	Switches and isolators specifically provided to render equipment safe shall be clearly marked as such to prevent ambiguity between these switched and other switches		P
d)	Parts which serve as protection against harmful radiation, and which are intended to be removed during servicing, shall be marked with an appropriate warning		N

	PROTECTION AGAINST HARMFUL ELECTRICAL SHOCK AND RADIO-FREQUENCY SKIN BURNS		—
11	Where no test method is given, compliance shall be checked by visual inspection and, where appropriate, by a functional test		N

12	EARTHING		—
12.1	Safety earth terminal		—

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Clause	Requirement – Test	Result - Remark	Verdict

a)	Equipment to be connected to fixed wiring		—
	A separate safety earth terminal shall be used		P
b)	Equipment provided with a non-detachable flexible cord or cable		—
	In additional of item a), the cord or cable used for connecting the equipment to the mains supply shall include an insulated earth conductor of adequate cross-section, colour-coded in accordance with IEC 60173		N
c)	Equipment provided with a mains supply connector		—
	The mains supply connector shall incorporate a safety earth contact which shall be an integral part of the connector		P
12.2	Safety earth connections		—
a)	Reliance shall not be placed on the conductivity of the cabinet or framework for safety earth connection		P
b)	Safety earth conductors shall not be used for any other purpose		P

13	ENCLOSURE		—
	The requirements for safety devices preventing access to enclosure whilst dangerous voltages are present are given in Sub-clause 13.1 below		—
	Permissible voltages remaining on the equipment after the enclosure have been opened are given in Sub-clause 13.2		—
	Some additional safety provisions are described in Sub-clause 13.3		—
13.1	Safety devices relating to enclosure		—
a)	It shall not be possible to open doors, or to remove cover plates or other protective covers which are designed to be removed by hand, before all dangerous voltages have been removed and accessible parts have been made electrically safe	No such parts	N

IEC 60215			
Clause	Requirement – Test	Result - Remark	Verdict
	In addition, it is recommended that all parts subject to peak voltages in excess of 1 000 V		N
b)	The protection shall be accomplished by safety device forming part of the equipment		N
c)	The coupling between the safety mechanism and the locking of the means of access shall be effected in such a way that it will not be possible to gain access to an enclosure without the safety devices having operated correctly		N
d)	The reapplication of dangerous voltages shall not be possible until the earth connection established by safety earthing switch,		N
	If any, has been disconnected, and any cover plates have been replaced and access doors closed		N
e)	The safety system for equipment with access doors for enclosure shall include an arrangement to enable any person entering the enclosure to prevent the doors being closed and dangerous voltages being reapplied while he is inside		N
13.2	Voltages remaining on the equipment		—
a)	Parts becoming accessible after access doors have been opened,		N
	or cover plated, or other protective covers designed to be removed by hand have been removed, shall be electrically safe in accordance with Sub-clause 3.2		N
b)	In addition to the voltage which are allowed under Item a) of Sub-clause 3.2, it is permitted to have voltage on the equipment which do not comply with the requirements of Item b) of the same sub-clause		N
	provided that these voltages are not accessible and are less than 354 V peak with respect to earth,		N
	As measured with an instrument having internal resistance of not less than 10 k Ω per volt		N

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Clause	Requirement – Test	Result - Remark	Verdict

13.3	Additional provisions		—
a)	As far as feasible, earthing wands shall be provided as an additional safety measure		N
b)	The design of the equipment shall be such that it is impossible to receive an electric shock by touching insulating material surfaces on the exterior		P

14	MECHANICAL CONSIDERATION CONCERNING SAFETY DEVICES		—
a)	Safety devices shall be designed in accordance with the “fail-safe” principle		P
b)	There shall be no possibility of a false indication of safety		P
c)	The operation of safety devices shall be such that transition from the “safe” position to the “unsafe” position cannot be carried out without deliberate action, nor shall there be ambiguity between the “safe” position and the “unsafe” position		P
d)	It shall not be possible to disable a safety device by hand		P
e)	Safety device shall be designed to withstand such mishandling as may be expected in practice and continue to remain effective throughout the life of the equipment		P
f)	Safety earthing switches shall be so constructed and mounted that the closing of the contacts is directly visible from a safe location		N
g)	Handles, knobs, etc., forming part of the safety system shall be reliably fixed to their shafts		P
h)	All parts of the safety system, including mechanical couplings, bearings, taper pins, etc., shall be reasonably accessible for inspection and maintenance		P

IEC 60215			
Clause	Requirement – Test	Result - Remark	Verdict

15	WIRING		—
a)	All conductors and cables shall be adequately protected against any risk of mechanical damage to which they may be liable in normal conditions of service		P
b)	Conductors within the equipment which are intended for monitoring, keying, control or modulating purposes, and which are connected to external circuits shall be protected		P
c)	The terminating arrangement for flexible cables shall ensure that the electrical connections are free from mechanical strain and that the cables are protected from abrasion		P

16	INSULATION		—
a)	Where creepage distances are smaller than those specified in Appendix B, the insulating material shall be non-tracking and non-flammable		P
	The insulating material will be considered to be non-tracking if the comparative tracking index is equal to or greater than 175	> 175V	P
b)	Smaller creepage distances are allowed inside thermionic tubes, on tube bases and sockets, relays, plugs and sockets, printed circuit boards, transistors, micro-modules and similar devices, provided that they comply with their own specification		P

17	VOLTAGE AT THE RADIO-FREQUENCY OUTPUT CONNECTION		—
a)	Transmitter radio-frequency output connections which are not electrically safe, especially those for open wire feeders, are permitted if personnel cannot unintentionally approach a position where danger might exist		P

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Clause	Requirement – Test	Result - Remark	Verdict

b)	As far as feasible the radio-frequency output connection shall be arranged to drain off to earth any charges due to, for example, the accumulation of static charges which may give rise to dangerous voltages	Earthed	P
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	HIGH TEMPERARURES, FIRE AND MISCELLANEOUS HAZARDS		—
18	When no test method is given, compliance shall be checked by visual inspection and, where appropriate, by a functional test		P

19	HIGH TEMPERARURES		—
19.1	Permissible temperature rise under conditions of normal use		—
	No accessible part of the equipment shall attain temperatures which might cause injury to personnel and no part shall attain. temperatures which might cause deterioration of electrical insulation or impairment of mechanical strength		P
	Other factors such as operator comfort and the need to provide reasonable working conditions may, however, often dictate a lower allowable temperature rise		P
19.2	Temperature rise under fault conditions		—
	Under the specified fault conditions (see Clause 6), no part of the equipment shall reach a temperature giving rise to danger or fire or the release of flammable or toxic gases		P
	If the temperature rise is limited by the operation of a thermal trip, overload trip or fuse, the temperatures shall be measured 2 min after the operation of the device		P
	If no such device is fitted, the temperatures shall be measured until the maximum temperature is attained, but for not longer than 6 h of operation of the equipment		N

IEC 60215			
Clause	Requirement – Test	Result - Remark	Verdict

	The temperatures shall be compared with the maximum safe working temperatures for the components and materials used		P
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20	FIRE		—
	Equipment shall be so constructed that the possibility of fire and its spread is minimized		P
	The use of flammable components and materials, for example, non fire-retardent plastics, should be avoided wherever reasonably practicable		P

21	IMPLOSION AND EXPLOSION		—
21.1	General requirements		—
	Components which are liable to implosion or explosion shall be so protected that personnel will not be exposed to danger	No such component	N
21.2	Implosion		—
	Cathode-ray tubes or picture tubes of measuring or monitoring equipment with a maximum face dimension exceeding 16 cm shall either be intrinsically safe or the enclosure shall provide adequate protection against the effects of an implosion		N
	Compliance shall be checked by visual inspection and, if necessary, by the tests described in IEC 60065 for intrinsically-safe tubes or for equipment having non-intrinsically safe tubes		N
21.3	Explosion		—
	Components which may cause danger by exploding shall be equipped with a safety valve or have a clearly marked "weak spot" in their structure to prevent the development of excessive pressures		N

IEC 60215			
Clause	Requirement – Test	Result - Remark	Verdict
	The safety valve or "weak spot" shall be so situated that there will be no danger to personnel in the event of its operating		N

22	HARMFUL RADIATION		—
22.1	Non-ionizing radiation, including electromagnetic fields		—
	The transmitter shall be so constructed that there is no danger to personnel from any stray or cabinet non-ionizing radiation at radio frequencies	Not tested	N
	The electric or magnetic components of any stray electric and magnetic fields produced by the transmitting equipment shall not exceed 200 V/m or 0,5 A/m, respectively, over the frequency range 30 MHz to 30 GHz		N
22.2	Ionizing radiation		—
	The equipment shall be so constructed that there is no danger to personnel due to harmful ionizing radiation		N
	Compliance shall be checked by measuring the amount of ionizing radiation near the outer surface of the enclosure		N
	The method of measurement to be used shall be such that the appropriate spectrum of ionizing radiation is included		N
22.3	General requirements concerning radioactive materials		—
	A warning notice shall be affixed to equipment using tubes or any other items in which radioactive materials have been deliberately incorporated		N
	Full instructions for the handling, storage and disposal of such devices shall be given in the equipment handbook, together with a note explaining the hazards associated with the materials		N

IEC 60215			
Clause	Requirement – Test	Result - Remark	Verdict

23	DANGEROUS METERIAL		—
	Any dangerous materials incorporated in the equipment shall be listed in the equipment hand-book which shall contain full instructions for the safe handling, storage and disposal of the materials, together with a note explaining the hazards associated with the materials contained in the components		N

24	DANGEROUS SHORT-CIRCUIT OF LOW VOLTAGE SUPPLIES		—
	Conductors and terminations in equipment containing high current/low voltage parts such as tube filament supplies and high-capacity batteries,		P
	although electrically safe as defined in Sub-clause 3.2, are liable to give rise to severe arcing or overheating if accidentally short-circuited, with the possibility of injury to personnel and the risk of fire		P
	Equipment containing such high current/low voltage parts shall be designed and constructed so as to minimize the possibility of dangerous short-circuiting		P

A	APPENDIX A, REFERENCES TO OTHER PUBLICATIONS		—
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B	APPENDIX B, CLEARANCE AND CREEPAGE DISTANCES		—
	The clearances and creepage distances between parts shall be adequate to avoid failure under such conditions as a deposit of dust or moisture		P

IEC 60215			
Clause	Requirement – Test	Result - Remark	Verdict

	The clearances and creepage distances in air given in the table, are the minimum actual separation, taking into account tolerances in assemblies and piece-parts		P
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C	APPENDIX C, SYMBOLS		—
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D	APPENDIX D, GUIDANCE ON ASSESSING THE COMPETENCE OF PERSONNEL FOR DESIGNATION AS SKILLED		—
	The definition of "skilled" in Sub-clause 3.1 is intended to ensure that personnel are considered to be skilled only if they are competent to take responsibility both for their own safety and for that of unskilled personnel under their immediate supervision, when working on the transmitter		N
	Competence in this context necessitates adequate technical knowledge, adequate practical experience, and adequate detailed knowledge of the particular transmitter installation to avoid danger to personnel		N
	Training requirements for a skilled person should not be confined solely to technical matters and, preferably, should include first-aid treatment, especially methods of artificial resuscitation: respiration and external cardiac compression (heart massage)		N
	In practice it is not possible to give precise details of the technical knowledge, training and experience necessary for a skilled person		N

E	APPENDIX E, GUIDANCE ON SAFETY PRECAUTIONS TO BE OBSERVED BY PERSONNEL WORKING ON RADIO TRANSMITTING EQUIPMENT		—
E1	Introduction		—

IEC 60215			
Clause	Requirement – Test	Result - Remark	Verdict
	To ensure the safety of personnel working on radio transmitters and associated equipment, a full appreciation of the various hazards involved is required		N
E2	Dangerous voltages and currents		—
	Fundamentally, current rather than voltage, is the criterion of shock intensity. The passage of even a very small current through a vital part of the human body can cause DEATH		N
E3	Electric shock: first-aid treatment		—
	Electric shock may result in interruption of natural breathing. Immediate action is necessary to restore the breathing and it is therefore essential that personnel are familiar with the various methods of artificial respiration and heart massage		N
	In the case of high-voltage accidents urgent medical aid is needed to treat the effects of poisonous products in the body caused by severe burns		N
	It is necessary to check all personnel engaged in the operation and maintenance of transmitting equipment in which dangerous voltages may be present, for their ability to apply artificial resuscitation and to make arrangements for additional first-aid training of such personnel whenever needed		N
E4	Operation of transmitting equipment		—
E4.1	The equipment shall be kept constantly in such condition as to comply with the relevant safety requirements		N
E4.2	At regular intervals, the condition of the equipment and the correct functioning of protective and safety devices shall be checked by a skilled person approved by the appropriate authority for this duty		N

IEC 60215			
Clause	Requirement – Test	Result - Remark	Verdict
	Functional checks shall be carried out on interlocking systems of doors, mechanical interlocks, isolating switches, earthing switches, parallel resistances and protective devices against overvoltages and over-currents		N
	The safety devices shall not be altered or disconnected except for replacement, nor shall the safety circuit be modified without specific approval of the appropriate authority in each case		N
E4.3	All covers giving protection against accidental contact with dangerous voltages, shall be kept closed under conditions of normal operation		N
E4.4	All metal enclosures and covers of electrical and electronic equipment shall be effectively earthed, and care shall be taken to maintain these protective earth connections		N
E4.5	The room occupied by equipment of open construction is to be considered as an enclosure, within the meaning of Sub-clause 3.7 of this standard		N
E5	Procedure for establishing the absence of voltage		—
E5.1	Before starting work on the equipment, it shall be isolated from the mains supply		N
	Disconnection shall always be checked by visual inspection		N
	After the mains supply has been disconnected, all other lines such as control, interlocking and modulation lines shall be disconnected if they carry dangerous voltages		N
	When disconnection of the antenna or antenna transmission line is not possible, other suitable precautions shall be taken, for example, earthing, when necessary at several places, to establish absence of voltage		N

IEC 60215			
Clause	Requirement – Test	Result - Remark	Verdict
E5.2	Capacitors which are connected to a circuit isolated from its supply shall be discharged and have their terminals permanently short-circuited and the casing earthed during the whole period of the work		N
E5.3	The electrical charge retained by electrical machinery when stopped may, in certain cases, be sufficient to cause a severe shock		N
E5.4	Before any maintenance work is carried out on automatic or remote controlled equipment, the remote switching circuits shall be made inoperative		N
E6	Procedure for determination of the absence of voltage		—
	After the equipment has been isolated according to Clause E5, the absence of voltage shall be determined at the work place		N
E7	Working on live circuits		—
	Whenever possible, work on live circuits with voltages over 350 V peak shall be avoided		N
	The visual inspection of live equipment, or parts of it should be permitted when the doors are opened, door interlockings bridged, protective covers removed or other protective measures made ineffective, only by specific agreement of the appropriate authority and provided the inspection is carried out by a skilled person approved for this duty		N
	In specific cases, especially in the presence of strong radio-frequency fields, suitable measures shall be taken to indicate the areas of danger		N
E8	Other hazards		—
E8.1	Radio frequency radiation hazards		—

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a)	The maximum levels of power density in the microwave range and/or the electric and magnetic components of field strength at lower radio-frequencies to which personnel may be exposed shall not exceed the national limits of the country concerned		N
b)	Personnel shall never make a direct visual examination of any microwave radiator, reflector, waveguide, horn or any concentrated beam radiating system during periods of transmission		N

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	TABLE: temperature rise measurements					
	Position of the functional switch	ON Position		—		
Operating conditions						
Transmitting						
	U (V)	I (A)	P (W)			
	220	20,7	3725			
	3 x 220V	5,1(Per phase)	3730			
	Loudspeaker impedance (Ω)	-		—		
	Several loudspeaker systems	-				
	Marking of loudspeaker terminals	-				
Monitored point:		dT (K)	Limit dT (K)			
Ambient power supply fan motor		20	info			
Ambient power supply socket		10	Info			
Ambient amplifier fan motor		22	Info			
Power supply transformer winding		29	Info			
Transformer winding		47	Info			
Ambient over current relay		10	Info			
Ambient 28V cooler		23	Info			
Ambient temp. sensor		29	Info			
Ambient power supply relay		9	Info			
Diament transformer body		16	Info			
Ambient power socket plastic		15	Info			
	Winding temperature rise measurements					
	Ambient temperature t1 (oC)			—		
	Ambient temperature t2 (oC)			—		
Temperature rise dT of winding:		R1 (Ω)	R2 (Ω)	dT (K)	Limit dT (K)	Insulation class

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TABLE: insulation resistance measurements		
Insulation resistance R between:	R (MΩ)	Required R (MΩ)
Between parts separated by basic or supplementary insulation	>>1	Min. 1
Between parts separated by double or reinforced insulation	>>1	Min. 1

TABLE: electric strength measurements		
Test voltage applied between:	Test voltage (V)	Breakdown
Between parts separated by basic or supplementary insulation	1500	No
Between parts separated by double or reinforced insulation	3000	No

TABLE: summary of fault condition tests						
Voltage (V) 0,9 or 1,1 times rated voltage					242 V	—
Ambient temperature (°C)					25°C	—
Monitored point:				dT (K)	Limit dT (K)	
Under fault conditions specified below						
Winding temperature rise measurements						
Ambient temperature t1 (°C)					25/23	—
Ambient temperature t2 (°C)					25/23	—
Temperature rise dT of winding:	R1 (Ω)	R2 (Ω)	dT (K)	Limit dT (K)	Insulation class	
Transformer output short circuit Secunder (Diemen E3016057)	47,8	62,9	82	125(lowest)	-	
Ebm W2S130-AA03-01 fan motor	137,1	197,8	115	125(lowest)	-	
Ebm R2E160-AY47-01 fan motor	72,1	105,8	121	150	B	

TABLE: fault condition tests	
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Clause	Requirement – Test	Result - Remark	Verdict

	ambient temperature (°C)	25	—			
	model/type of power supply	-	—			
	manufacturer of power supply	-	—			
	rated markings of power supply		—			
Component No.	fault	test voltage (V)	test time	fuse No.	fuse current (A)	result
Control Circuit D2 diode	Short circuit	220	5 min.	-	-	No damage
Control Circuit C3 capacitor	Short circuit	220	5 min.	-	-	No damage
Control Circuit C4 capacitor	Short circuit	220	5 min.	-	-	No damage
Control Circuit Q2 transistor	Short circuit	220	5 min.	-	-	No damage
Supply D4 diode	Short circuit	220	5 min.	-	-	No damage
Supply D6 diode	Short circuit	220	5 min.	-	-	No damage
Supply D3 diode	Short circuit	220	5 min.	-	25A	Fuse operated
Amplifier C24 capacitor	Short circuit	220	5 min.	-	25A	Supply fuse operated
Amplifier Q2 transistor	Short circuit	220	5 min.	-	-	Q3 and Q5 were damage.
TV Transmitter Amp. C19 capacitor	Short circuit	220	5 min.	-	-	R22, R23, R24 and R25 were damage.
TV Transmitter Amp. C13 capacitor	Short circuit	220	5 min.	-	25A	Supply fuse operated Q3/4 was damage
TV Transmitter Amp. C16 capacitor	Short circuit	220	5 min.	-	3A	Control circuit fuse operated
Block chimney openings	Block	220	5 min.	-	-	Safety device operated
Block all ventilation openings	Block	220	5 min.	-	-	Safety device operated
supplementary information						

TABLE: list of critical components and materials
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Component	Manufacturer/ trademark	Type/model	Value / rating	Standard	Approval/ Reference
Fan motor	ebm	W2S130-AA03-01	230V, 50/60Hz., 45/39W	-	VDE
Fan motor	ebm	R2E160-AY47-01	230V, 50/60Hz., 240/280W	-	VDE
Transformer	Diemen	E3016057	230V, 50/60Hz., 2x12V, 2VA	IEC 60215	Tested in appliance
Signal lamp	Rafi	1.60502	250V, 2W, T70	IEC 61210	VDE
ON/OFF switch	Apem	641SHK	400V, 10A, T85	IEC 61058	VDE
Internal Outlet	Schurter	P685	250V, 10A	IEC 60320	SEV
Internal inlet snap in	Schurter	6600-41	250V, 10A	IEC 60320	KEMA KEUR
Supply cord	Various	H05VV-F	4 x 6mm ²	HD22	HAR
Motor protector relay	Time / inter	MKR-03	220-240VAC Mono phase	-	-
Miniature circuit breaker	Siemens	5SQ21	C10 230V / 400V	-	-
Miniature circuit breaker	Siemens	5SQ21	C32 230V / 400V	-	-
Contactator	Siemens	3TF4322	30A, 600V AC	-	-
Recidual current device	Siemens	5SM1 342-1	230V/400V 25A	-	-

1) an asterisk indicates a mark which assures the agreed level of surveillance

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TABLE: RESISTANCE TO HEAT, FIRE AND TRACKING (appended table)

Component	Manufacturer	Type	Ball pressure test		Tracking test [CTI/ PTI]	Glow wire test					Needle-flame test	Verdict
			75°C	125°C		GWT 550°C	GWT 650°C	GWT 750°C	GWFI 850°C	GWIT		
PCB	Hurma	-	-	X	175V	X	X	X	X	-	-	P
Int. plug / Socket	Schurter	P685	-	X	-	X	X	X	X	-	-	P
Fuse holder	-	-	-	-	-	X	X	X	X	-	-	P
Signal lamp	Rafi	1.60502	-	-	-	X	X	-	-	-	-	P

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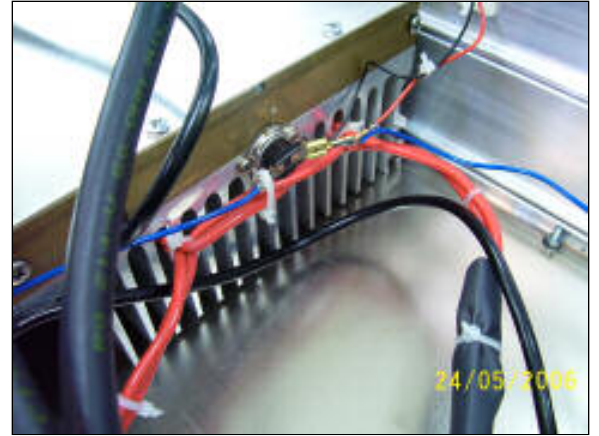
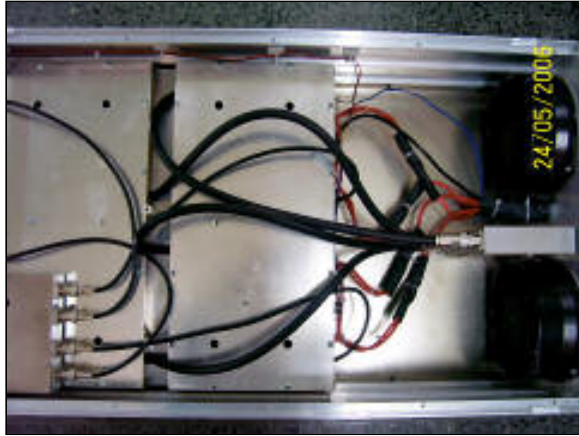
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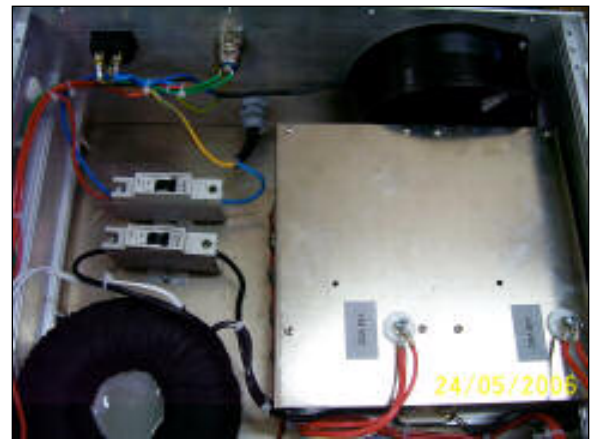
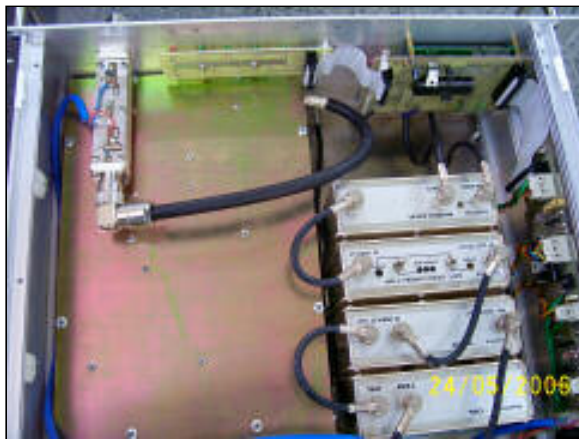
Power supply



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Amplifier



Drive exciter



Insulation