



TEST REPORT	
56730-1 rev 1 TRF EMC	
ETSI EN 301 489-14	
Report Reference No.....	56730-1 rev 1 TRF EMC
Tested by (name+signature) .....	A. Lumina 
Approved by (name+signature) .....	G. Curioni 
Date of issue .....	2006-02-23
<b>Testing Laboratory</b> .....	<b>Nemko Spa</b>
Address.....	Via Trento e Trieste, 116 I-20046 Biassono MI (Italy)
Testing location/ procedure.....	Full application of Harmonised standards <input checked="" type="checkbox"/> Partial application of Harmonised standards <input type="checkbox"/> Other standard testing methods <input type="checkbox"/> Non-standard testing methods <input type="checkbox"/> SINAL accredited test report <input type="checkbox"/>
Testing location/ address.....	Nemko Spa - Via Trento e Trieste, 116 - I-20046 Biassono MI (Italy)
<b>Applicant's name</b> .....	<b>Hurma Elektronik Sanayi ve Ticaret Koll. Sti.</b>
Address.....	Eskoop Sanayi Sitesi C5 Blok No: 243 Organize sanayi Bölgesi Ikitelli/Istanbul/Türkiye
<b>Test specification:</b>	
Standard .....	ETSI EN 301 489-14 v1.2.1 (2003-05)
Test procedure .....	Nemko PT 177
Non-standard test method.....	N/A
<b>Test Report Form No.</b> .....	<b>TRF EMC SpA</b>
TRF Originator .....	Nemko Spa
Master TRF.....	2005-04
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<b>Test item description</b> .....	<b>Analogue TV Broadcasting service transmitter</b>
Trade Mark.....	HURMA
Manufacturer .....	Hurma Elektronik Sanayi ve Ticaret Koll. Sti
Model/Type reference .....	TVV 1000
Ratings .....	198 – 242 Vac, 50 Hz, 1000 W Peak Sync.

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## EMC -- TEST REPORT

<b>Test Report No. :</b> <b>56730-1rev1 TRF EMC</b>	2006-02-23
	Date of issue

Type / Model : TVV 1000 s/n 010605

Equipment : The E.U.T. was composed of a single unit (cabinet).[including: power supply, TV TX exciter (TVV 200), power amplifier (1000 W), RF output filter].

**Applicant** : Hurma Elektronik Sanayi ve Ticaret Koll. Sti.

Address : Eskoop Sanayi Sitesi C5 Blok No: 243  
Organize sanayi Bölgesi Ikitelli/Istanbul/Türkiye

**Manufacturer** : Hurma Elektronik Sanayi ve Ticaret Koll. Sti.

Address : Eskoop Sanayi Sitesi C5 Blok No: 243  
Organize sanayi Bölgesi Ikitelli/Istanbul/Türkiye

<b>Test Result</b> according to the standards on page 6:	<b>Positive</b>
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The test report merely corresponds to the test sample.  
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

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## 1 - EQUIPMENT UNDER TEST (E.U.T.)

### 1.1 - Product description:

- Model / (s/n) : TVV 1000 / s.n. 010605

### 1.2 - E.U.T. specifications:

- E.U.T. use : base station for fixed use
- Antenna connector : 7/16, 50  $\Omega$
- Antenna type : external antenna (not provided)

#### 1.2.1 – Electric characteristics:

- Rated voltage : 220 V, 3 phase
- Voltage supply source : AC mains
- Rated power : 3500 W

#### 1.2.2 – RF characteristics:

- RF rated power @ 50  $\Omega$  : 1000 W peak sync.
- Transmission frequency : Ch 32 (559.250 MHz)
- Assigned band : IV – V (UHF)
- Operating frequency range : 470 ÷ 860 MHz
- Channel step : 8 MHz
- Necessary bandwidth : 7.607 MHz
- Colour/system : PAL/ B,G
- ITU designation : VISION C3F / SOUND 1 F3E
- Video IF : 38.9 MHz
- Local osc. : higher

### **1.3 - E.U.T. I/O terminals:**

- Power supply cable;
- Audio & Video input > 3 m. long;
- Local oscillator control port; < 3 m. long;
- RF out.

### **1.4 - E.U.T. configuration:**

The E.U.T. was composed of single unit.

Sample incoming date : 2005-12-23

## 2 - REFERENCE DOCUMENTS

- Nemko PT 177: Use of measurements equipment to perform standard tests.
- Nemko PT 179: Uncertainty measurement evaluation in EMI testing.
- ETSI EN 301 489-01 v1.5.1 (2004-11)  
ElectroMagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common Technical Requirements.
- ETSI EN 301 489-14 v 1.2.1 (2003-05)  
Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 14: Specific conditions for analogue and digital terrestrial TV broadcasting service transmitters.
- - EN 55011 (1998) + A1 (1999) + A2 (2002)  
Limits and methods of measurement of radio disturbance characteristics of industrial, scientific and medical (ISM) radio-frequency equipment.
- EN 55022 (1998) + A1 (2000) + A2 (2003)  
Information technology equipment – Radio disturbance characteristics - Limits and methods of measurement. .
- EN 61000-3-2 (2000) + A2 (2005)  
Electromagnetic compatibility (EMC) - Part 3: Limits - Section 2: Limits for harmonic current emission (equipment input current  $\leq 16$  A per phase).
- EN 61000-3-3 (1995) + A1 (2001)  
Electromagnetic compatibility (EMC) - Part 3: Limits. - Section 3: Limitation of voltage fluctuations and flicker in low-voltage supply systems for equipment with rated current  $\leq 16$  A.
- EN 61000-4-2 (1995) + A1 (1998) + A2 (2001)  
Electromagnetic Compatibility (EMC) - Part 4: Testing and measurements techniques - Section 2: Electrostatic discharge immunity test.
- EN 61000-4-3 (1996) + A1 (1998) + A2 (2001)  
Electromagnetic Compatibility (EMC) - Part 4: Testing and measurements techniques - Section 3: Radiated, radio-frequency, electromagnetic field immunity test.
- EN 61000-4-4 (1995) + A1 (2001) + A2 (2001)  
Electromagnetic Compatibility (EMC) - Part 4: Testing and measurements techniques - Section 4: Electrical fast transient/burst immunity test.
- EN 61000-4-5 (1995) + A1 (2001)  
Electromagnetic compatibility (EMC) - Part 4: Testing and measurement techniques - Section 5: Surge immunity test.
- EN 61000-4-6 (1996) + A1 (2001)  
Electromagnetic Compatibility (EMC) - Part 4: : Testing and measurements techniques - Section 6: Immunity to conducted disturbances induced by radio-frequency fields.
- EN 61000-4-11 (1994) + A1 (2001)  
Electromagnetic compatibility (EMC) - Part 4: Testing and measurement techniques  
Section 11: Voltage dips, short interruptions and voltage variations immunity tests.

### 3 - TEST FACILITIES

#### 3.1 - TEST EQUIPMENT LIST

<i>Equipment</i>	<i>Model</i>	<i>Manufacturer</i>	<i>Serial N°</i>
RF receiver 9 kHz ÷ 30 MHz	ESHS 30	R&S	828765/012
LISN 9 kHz ÷ 30 MHz	ESH2-Z5	R&S	872 460/041
Shielded room	--	Siemens	009
AC power source	4VS300GL	Zenone Elettronica	444
AC power source	4VS300GL	Zenone Elettronica	445
AC power source	4VS300GL	Zenone Elettronica	446
AC power source	6834A	HP	3432A-00125
Mains analyzer	Harmonics 1000	EMC Partner	Harmonics 1000-16
Mains analyzer	PM 3000A	Voltech	6872-002-10
Log periodic antenna 200 ÷ 1000 MHz	HUF-Z3	R&S	893 232/005
Biconical antenna 20 ÷ 200 MHz	HUF-Z2	R&S	893 934/008
Anechoic chamber	Alflab	Pagmatron	002
Signal generator 100 kHz ÷ 1 GHz	SMX	R&S	883 180/027
RF amplifier 80 ÷ 1000 MHz	SMC100	IFI	1754-0696
Power supply control module	PS5000	IFI	-
Microwave Horn Antenna 0.8 ÷ 5 GHz	AT4002A	A&S	300773
RF amplifier 0.8 ÷ 5 GHz	50S1G4A	A&S	301049
ESD generator	NSG 435	Schaffner	000310
Mainframe	NSG 200E	Schaffner	00861
Burst generator	NSG 225A	Schaffner	1484 9222
Coupling clamp	CDN 300	Schaffner	--
Coupling clamp	CDN 125	Schaffner	--
Signal generator 100 kHz ÷ 2 GHz	SMH	R&S	845.4002.52
RF amplifier 150 kHz÷300 MHz	411/LA	EIN	629
Coupling/decoupling network	CDN 801-T4	Rohrbacher	60116
RF Injection Probe 1÷500 MHz	F-130-1	FCC	104
Pulse generator	Transient 1000	EMC partner	TRA 1000-82
Pulse generator	NSG 651	Schaffner	172
Coupling network	CDN 110	Schaffner	255
Spectrum analyzer	FSEK	R & S	88255/905
TV Demodulator	AMFS	R&S	839094/001
Video measurement system	VSA	R&S	839340/007
Colour TV pattern generator	PM 551B	Philips	LO3029
Dummy load * Client's property	BN 531692	SPINNER	D-63472
Thermohygrometer data loggers	175-H2	TESTO	20012380

### 3.2 – BEST MEASUREMENT CAPABILITY

Hereafter the best measurement capability for EMC tests are reported

<i>Test</i>	<i>Field</i>	<i>uncertainty of measurement</i>	<i>remarks</i>
Radiated Emission	Antenna distance 3m Frequency range (30÷200)MHz	±5.2dB	(1)
Radiated Emission	Antenna distance 3m Frequency range (200÷1000)MHz	±4.9dB	(1)
Radiated Emission	Antenna distance 10m Frequency range (30÷200)MHz	±5.0dB	(1)
Radiated Emission	Antenna distance 10m Frequency range (200÷1000)MHz	±4.8dB	(1)
Conducted Emission	Frequency range (0.009÷30)MHz	±2.8dB	(1)
Radiated Power Emission	Frequency range 30÷300MHz	±4.0dB	(1)
Harmonic current emission	Frequency range 50Hz÷2kHz	2%	(1)
Voltage fluctuation emission	--	2%	(1)
Radiated Immunity	Frequency range 20MHz÷2.5GHz	(0÷6.0)dB	(1)
Conducted RF Immunity	Frequency range( 0.09÷230)MHz	2.0dB	(1)
ESD Immunity	--	6%	(1)
Burst Immunity	5kHz	2%	(1)
Surge Immunity	--	2%	(1)
Dips immunity	--	2%	(1)
Magnetic field immunity	50Hz	2.0dB	(1)
Low frequency immunity	Frequency range 15Hz÷150kHz	2.0dB	(1)

(1) The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor  $k=2$  which has been derived from the assumed normal probability distribution for a coverage probability of 95%



#### 4 - TESTS PERFORMED

- Conducted voltage emission from AC mains power port [0.15÷30 MHz]
- Voltage fluctuations (flicker)
- Radiated RF Electro-magnetic field immunity (Amplitude modulation) [80 ÷ 2000 MHz]
- Electrostatic discharge
- Fast transients (burst) common mode
- RF common mode [0.15÷80 MHz]
- Voltage dips and short interruptions
- Surges, common and differential mode

#### 5 - GENERAL TEST CONDITIONS

##### 5.1 - ENVIRONMENTAL CONDITIONS

t = 18÷25 °C

p = 985÷1010 hPa

RH = 30÷55 %

##### 5.2 - OPERATING CONDITIONS OF THE EUT DURING THE TESTS

The E.U.T. was tested at its maximum RF output power, according to figure 1 of ETSI EN 301 489-14 & sub clause 4.2.1.

For particular test conditions see remarks in detailed page of the relevant test.

##### 5.3 - PARAMETERS EVALUATED DURING IMMUNITY TESTS

According to table 1 ETSI EN 301 489-14

Manufacturer's declared minimum video S/N > 57 dB weighted

##### 5.4 - EXCLUSION BANDS

Transmitter exclusion band for immunity test:

allocated channel No. 32, according to clause 4.3.1 of EN 301 489-14.

## 6 - SUMMARY OF TEST RESULTS

Port	Test category	Type of test	Frequency range	Level	Performance criteria	Normative references	Test result
Enclosure	Emission	Radiated emission	30÷1000 MHz	-	-	EN 55022	NA (1)
AC mains	Emission	Conducted voltage emission	0.15 ÷ 30 MHz	-	-	EN 55022	C
AC mains	Emission	Harmonic currents	0.1÷2 kHz	-	-	EN 61000-3-2	NA (2)
AC mains	Emission	Voltage fluctuations	-	-	-	EN 61000-3-3	C
Enclosure	Immunity	Radiated EM fields (AM)	80÷2000 MHz	3	CT	EN 61000-4-3 EN 301489-14	C
Enclosure	Immunity	Electrostatic discharge	-	2,3	TT	EN 61000-4-2 EN 301489-14	C
AC mains	Immunity	Fast transients	-	3	TT	EN 61000-4-4 EN 301489-14	C
Control / signal lines	Immunity	Fast transients	-	3	TT	EN 61000-4-4 EN 301489-14	C
AC mains	Immunity	RF common mode	0.15 ÷ 80 MHz	3	CT	EN 61000-4-6 EN 301489-14	C
Control / signal lines	Immunity	RF common mode	0.15 ÷ 80 MHz	3	CT	EN 61000-4-6 EN 301489-14	C
AC mains	Immunity	Voltage dips and short interruptions	-	70% U <sub>T</sub> 40% U <sub>T</sub> 0% U <sub>T</sub>	TT TT TT	EN 61000-4-11 EN 301489-14	C
AC mains	Immunity	Surges Line to line Line to earth	-	2,3	TT	EN 61000-4-5 EN 301489-14	C

C = the equipment under test complied with the test specification limit.

NC = the equipment under test did not comply with the test specification limit.

NA = the test is not applicable to the port.

### Notes:

- (1) This parameters are normally covered in standards relating to the use of radio spectrum. This test is applicable for ancillary equipment not incorporated into transmitters, receivers or transceivers.
- (2) For professional equipment with a total power greater than 1000 W the limits are not specified in this standard EN 61000-3-2. (rated AC mains power 3500 W, see page 16)

### Plots symbols

Symbols used in the attached plots have the following meaning:

- "Conducted voltage emission on AC mains power port" test
- (+) = repetition of Average measurements for values near the test specification limit;
- (X) = repetition of Quasi Peak measurements for values near the test specification limit;
- Upper curve = measured Peak values;
- Lower curve = measured Average values.

## 7 - TEST RESULTS

### 7.1 - CONDUCTED EMISSION ON AC MAINS POWER PORT.

• *Test equipment list*

<i>Equipment</i>	<i>Model</i>	<i>Manufacturer</i>	<i>Serial N°</i>
RF receiver 9 kHz ÷ 30 MHz	ESHS 30	R&S	828765/012
LISN 9 kHz ÷ 30 MHz	ESH2-Z5	R&S	872 460/041
Shielded room	--	Siemens	009
Colour TV pattern generator	PM 551B	Philips	LO3029

• *Test method*

According to sub clause 9 of EN 55022.

• *Acceptance limits (according to table 2 of ETSI EN 301 489-14 for E.U.T. power greater than 200 VA or ; according to ETSI EN 301 489-1 E.U.T. power less than 200 VA intended to be used in telecommunication centres only ).*

<i>Frequency (MHz)</i>	<i>Quasi-Peak dB(µV)</i>	<i>Average dB(µV)</i>
0.15 to 0.50	89	76
0.50 to 30	83	70

*for 2 < AC mains power [kVA] £ 10*

<i>Frequency (MHz)</i>	<i>Quasi-Peak dB(µV)</i>	<i>Average dB(µV)</i>
0.15 to 0.50	79	66
0.50 to 30	73	60

*for AC mains power [kVA] £ 2 (concerning each phase power)*

• *Test result*

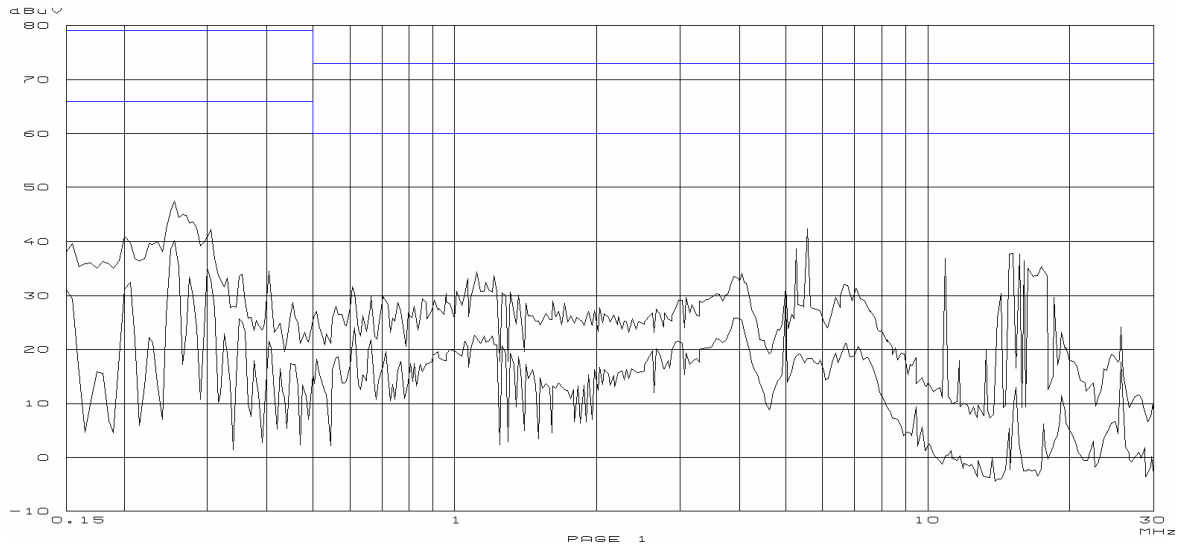
The equipment under test **comply** with the test specification limit.  
For test result see the following attachments .

• *Remarks*

*In order to comply with test specification limits an external EMI filter, provided by the Client as an integral part of the device, was used.*

NEMKO S.p.A. PT Dpt  
 CONDUCTED EMISSION ON AC MAINS

EUT: TVV 1000  
 Manufacturer: Sferma  
 Model: Sferma  
 Test Spec: EN 55011  
 Comment: at 1 kW output



NEMKO S.p.A. PT Dpt  
CONDUCTED EMISSION ON AC MAINS

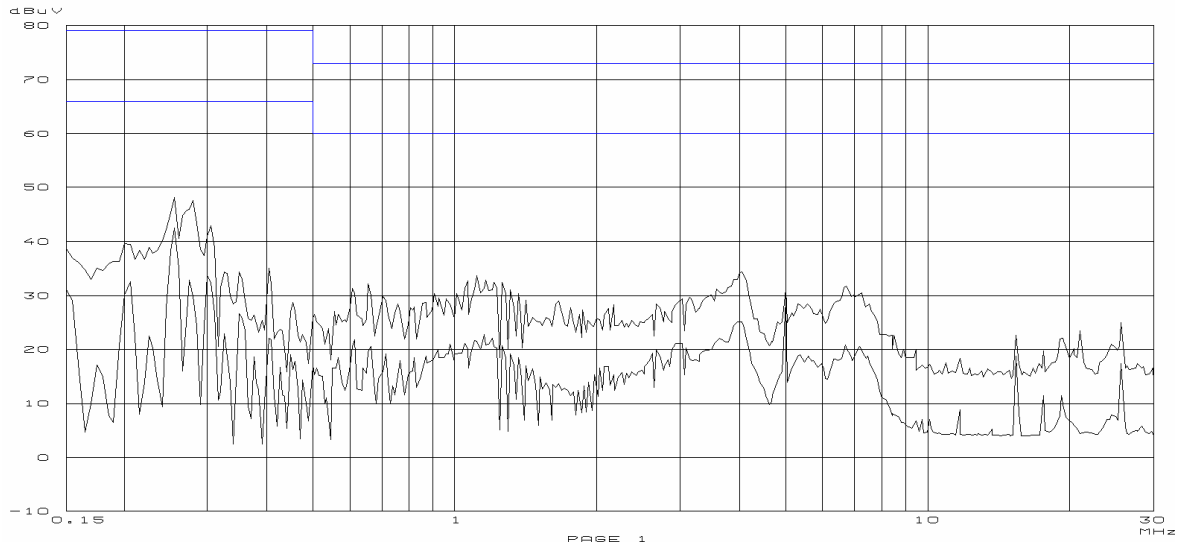
EUT: TVV 1000  
Manuf: Hcr 3a  
Op Cond: See relevant paragraph of test report  
Operator: A. Lyrina  
Test Spec: EN 55011  
Comment: neutral line  
CV at 1 KW output

Final Measurement Results:

no Results

NEMKO S.p.A. PT Dpt  
 CONDUCTED EMISSION ON AC MAINS

EUT: TVV 1000  
 Manufacturer: Sierma  
 Operator: Sierma  
 Test Site: EN 55011  
 Test Spec: EN 55011  
 Comment: 1 KW output



NEMKO S.p.A. PT Dpt  
CONDUCTED EMISSION ON AC MAINS

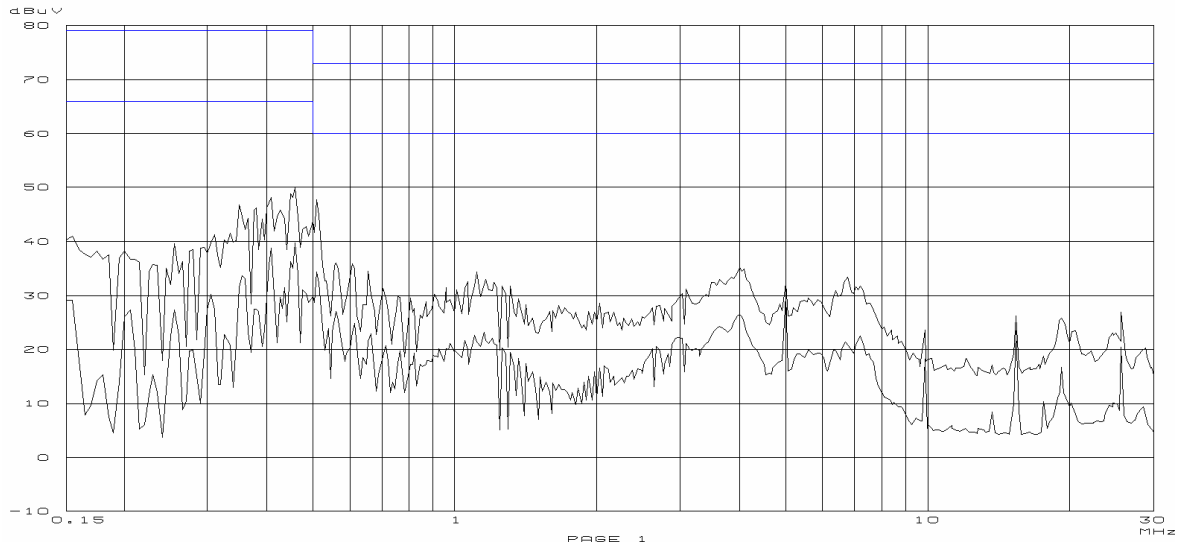
EUT: TVV 1000  
Manuf: Hcr 30a  
Op Cond: See relevant paragraph of test report  
Operator: A. Lyrinda  
Test Spec: EN 55011  
Comments: at R  
at 1 KW output

Final Measurement Results:

no Results

NEMKO S.p.A. PT Dpt  
 CONDUCTED EMISSION ON AC MAINS

EUT: TVV 1000  
 Manufacturer: Serrera  
 Operator: Serrera  
 Test Lab: EN 55011  
 Test Spec: EN 55011  
 Comment: 1 KW output



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NEMKO S.p.A. PT Dpt  
CONDUCTED EMISSION ON AC MAINS

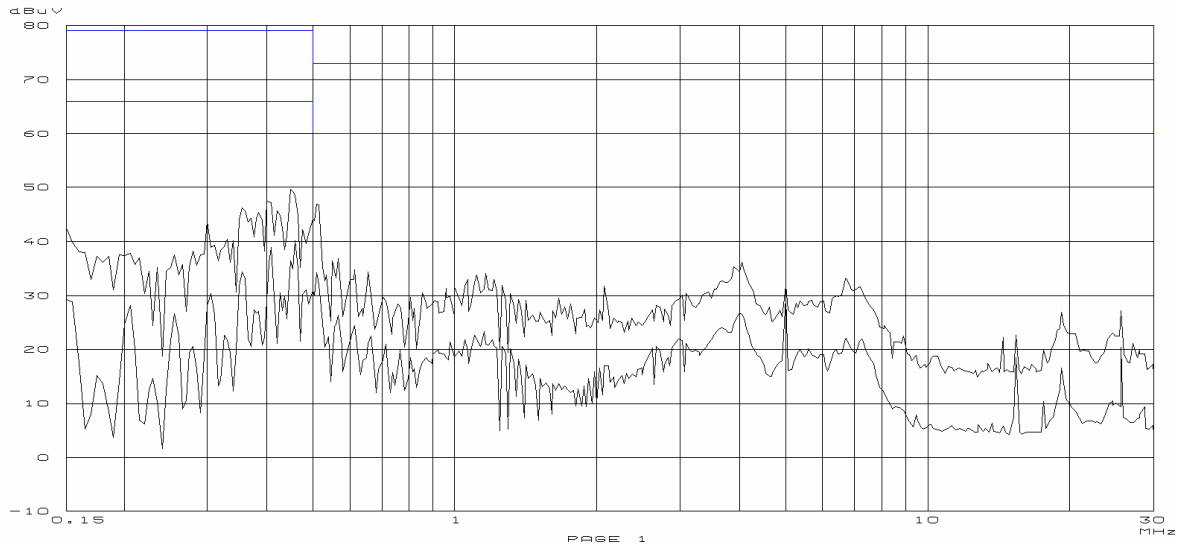
EUT: TVV 1000  
Manuf: Hcr 30a  
Op Cond: See relevant paragraph of test report  
Operator: A. Lyrinda  
Test Spec: EN 55011  
Comment: p14 00 S  
CV at 1 KW output

Final Measurement Results:

no Results

NEMKO S.p.A. PT Dpt  
 CONDUCTED EMISSION ON AC MAINS

EUT: TVV 1000  
 Manufacturer: Sierma  
 Operator: Sierma  
 Test Lab: EN 55011  
 Test Spec: EN 55011  
 Comment: at 1 KW output



PAGE 1

NEMKO S.p.A. PT Dpt  
CONDUCTED EMISSION ON AC MAINS

EUT: TVV 1000  
Manuf: Hcr 30a  
Op Cond: See relevant paragraph of test report  
Operator: A. LUCIADA  
Test Spec: EN 55011  
Comment: pt T  
CV at 1 KW output

Final Measurement Results:

no Results

## 7.2 - VOLTAGE FLUCTUATIONS

### *• Test equipment list*

<i>Equipment</i>	<i>Model</i>	<i>Manufacturer</i>	<i>Serial N°</i>
AC power source	4VS300GL	Zenone Elettronica	444
AC power source	4VS300GL	Zenone Elettronica	445
AC power source	4VS300GL	Zenone Elettronica	446
AC power source	6834A	HP	3432A-00125
Mains analyzer	Harmonics 1000	EMC Partner	Harmonics 1000-16
Colour TV pattern generator	PM 551B	Philips	LO3029

### *• Test method*

According to clause 6 of EN 61000-3-3.

### *• Acceptance limits*

Short-term flicker value  $P_{st} \leq 1.0$ .

Relative steady-state voltage change  $d_c \leq 3.3\%$ .

Maximum relative voltage change  $d_{max} \leq 4\%$ .

The relative voltage change value  $d(t)$  during a voltage change shall not exceed 3.30 % for more than 500 ms.

### *• Test result*

The equipment under test **complied** with the test specification limit.

For test result see the following attachments.

### *• Remarks*

//



R Phase

Urms = 228.5V Freq = 50.013 Range: 25 A  
Irms = 8.289A Ipk = 19.59A cf = 2.364  
P = 1406W S = 1894VA pf = 0.742

Test - Time : 1 x 10min = 10min( 100 %)

LIN (Line Impedance Network) : L: 0.24ohm +j0.15ohm N: 0.16ohm +j0.10ohm

Limits : Plt : 0.65 Pst : 1.00  
dmax : 4.00 % dc : 3.30 %  
dtLim: 3.30 % dt>Lim: 500ms

Test completed, Result: PASSED

Pst dmax dc dt>Lim  
[%] [%] [ms]  
1 0.072 0.000 0.010 0.000

S Phase

Urms = 228.7V Freq = 50.000 Range: 25 A  
Irms = 8.521A Ipk = 20.04A cf = 2.352  
P = 1455W S = 1949VA pf = 0.746

Test - Time : 1 x 10min = 10min( 100 %)

LIN (Line Impedance Network) : L: 0.24ohm +j0.15ohm N: 0.16ohm +j0.10ohm

Limits : Plt : 0.65 Pst : 1.00  
dmax : 4.00 % dc : 3.30 %  
dtLim: 3.30 % dt>Lim: 500ms

Test completed, Result: PASSED

Pst dmax dc dt>Lim  
[%] [%] [ms]  
1 0.072 0.000 0.010 0.000

T Phase

Urms = 228.5V Freq = 50.039 Range: 25 A  
Irms = 6.653A Ipk = 15.15A cf = 2.277  
P = 1268W S = 1520VA pf = 0.834

Test - Time : 1 x 10min = 10min( 100 %)

LIN (Line Impedance Network) : L: 0.24ohm +j0.15ohm N: 0.16ohm +j0.10ohm

Limits : Plt : 0.65 Pst : 1.00  
dmax : 4.00 % dc : 3.30 %  
dtLim: 3.30 % dt>Lim: 500ms

Test completed, Result: PASSED

	Pst	dmax	dc	dt>Lim
	[%]	[%]	[%]	[ms]
1	0.072	0.000	0.020	0.000

### 7.3 - RADIATED RF ELECTROMAGNETIC FIELD IMMUNITY

• *Test equipment list*

<i>Equipment</i>	<i>Model</i>	<i>Manufacturer</i>	<i>Serial N°</i>
Log periodic antenna 200 ÷ 1000 MHz	HUF-Z3	R&S	893 232/005
Biconical antenna 20 ÷ 200 MHz	HUF-Z2	R&S	893 934/008
RF amplifier 80 ÷ 1000 MHz	SMC100	IFI	1754-0696
Power supply control module	PS5000	IFI	-
RF generator 0.1 ÷ 1000 MHz	SMX	R&S	826 4517.5
Anechoic chamber	Alflab	Pagmatron	002
RF generator 0.4 ÷ 1040 MHz	SMS	R&S	871366/010
RF amplifier 10 kHz÷ 220 MHz	250 L	AR	8645
Anechoic chamber	ALFLAB	Pagmatron	002
Microwave horn antenna 0.8 ÷ 5 GHz	AT 4002A	A&R	300773
RF amplifier 0.8 ÷ 4.2 GHz	50S1G4A	A&R	301049
Signal generator 10 MHz-20 GHz	SMP 22	R&S	830857/001
Spectrum analyzer	FSEK	R & S	88255/905
TV Demodulator	AMFS	R&S	839094/001
Video measurement system	VSA	R&S	839340/007
Colour TV pattern generator	PM 551B	Philips	LO3029

• *Test method*

According to clauses 7 and 8 of EN 61000-4-3 and according to table 3 of ETSI EN 301 489-14.

Radiated immunity was tested on EUT with horizontal and vertical polarization of the antenna.

Antenna: biconical/log periodic

Field strength: 10 V/m

Frequency range: 80 ÷ 2000 MHz

Modulation: 80% AM

Frequency step increment: 1%

AF signal: 1000 Hz (sine wave)

Frequency scan ranges: 80 ÷ 200 MHz; 200 ÷ 1000 MHz; 1400 ÷ 2000 MHz

• *Acceptance limits*

Performance criteria CT according to clause 6.1 of EN 301 489-14.

• *Test result*

The equipment under test **complied** with the test specification limit.

• *Remarks //*



## 7.4 - ELECTROSTATIC DISCHARGE

### • Test equipment list

<i>Equipment</i>	<i>Model</i>	<i>Manufacturer</i>	<i>Serial N°</i>
ESD generator	NSG 435	Schaffner	000310
Spectrum analyzer	FSEK	R & S	88255/905
TV Demodulator	AMFS	R&S	839094/001
Video measurement system	VSA	R&S	839340/007
Colour TV pattern generator	PM 551B	Philips	LO3029

### • Test method

According to clauses 7 and 8 of EN 61000-4-2.

### • Acceptance limits

Performance criteria TT according to clause 6.2 of EN 301 489-14.

### • Test result

<i>Test point</i>	<i>Test voltage (kV)</i>	<i>Discharge application mode</i>	<i>Test result</i>	<i>Remarks</i>
Connectors	± 4	Contact	C	-
Enclosure	± 4	Contact	C	-
VCP	± 4	Contact	C	-
HCP	± 4	Contact	C	-
Screws	± 4	Contact	C	-
LEDs	± 8	Air	C	-
push buttons	± 8	Air	C	-
display	± 8	Air	C	-
Power meter	± 8	Air	C	-
Main switch	± 4	Contact	C	-

C = the equipment under test complied with the test specification limit.

NC = the equipment under test did not comply with the test specification limit.

VCP = Vertical coupling plane

HCP = Horizontal coupling plane

### • Remarks

//

## 7.5 - FAST TRANSIENTS (BURST) COMMON MODE

### • Test equipment list

<i>Equipment</i>	<i>Model</i>	<i>Manufacturer</i>	<i>Serial N°</i>
Mainframe	NSG 200E	Schaffner	00861
Burst generator	NSG 225A	Schaffner	1484 9222
Coupling clamp	CDN 125	Schaffner	--
Coupling clamp	CDN 300	Schaffner	--
Spectrum analyzer	FSEK	R & S	88255/905
TV Demodulator	AMFS	R&S	839094/001
Video measurement system	VSA	R&S	839340/007
Colour TV pattern generator	PM 551B	Philips	LO3029

### • Test method

According to clauses 7 and 8 of EN 61000-4-4 and according to table 3 of ETSI EN 301 489-14.

### • Acceptance limits

Performance criteria TT according to clause 6.2 of EN 301 489-14.

### • Test result

<i>Port</i>	<i>Test voltage (kV)</i>	<i>Duration of test (min)</i>	<i>Test result</i>	<i>Remarks</i>
AC mains input port	± 2	2	C	-
Audio/Video inputs	± 1	2	C	-

C = the equipment under test complied with the test specification limit.

NC = the equipment under test did not comply with the test specification limit.

### • Remarks

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## 7.6 - RADIO-FREQUENCY COMMON MODE (conducted).

### • Test equipment list

<i>Equipment</i>	<i>Model</i>	<i>Manufacturer</i>	<i>Serial N°</i>
RF generator 0.1÷1000 MHz	SMX	R&S	883179/014
RF amplifier 150 kHz÷300 MHz	411/LA	EIN	629
Coupling/decoupling network	CDN 801-T4	Rohrbacher	60116
RF Injection Probe 1÷500 MHz	F-130-1	FCC	104
Spectrum analyzer	FSEK	R & S	88255/905
TV Demodulator	AMFS	R&S	839094/001
Video measurement system	VSA	R&S	839340/007
Colour TV pattern generator	PM 551B	Philips	LO3029

### • Test method

According to clauses 7 and 8 of EN 61000-4-6 and according to table 3 of ETSI EN 301 489-14.

### • Acceptance limits

Performance criterion CT according to table 1 of EN 301 489-14

### • Test result

<i>Port</i>	<i>Interfering voltage (V) Mod. AM 80 % 1000 Hz</i>	<i>Frequency range (MHz)</i>	<i>Frequency step</i>	<i>Test result</i>	<i>Remarks</i>
AC mains input port	10	0.15 ÷ 5 5 ÷ 80	50kHz 1%	C	-
Audio/Video inputs	10	0.15 ÷ 5 5 ÷ 80	50kHz 1%	C	-

C = the equipment under test complied with the test specification limit.

NC = the equipment under test did not comply with the test specification limit.

### • Remarks

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## 7.7 - VOLTAGE DIPS AND SHORT INTERRUPTIONS

### • Test equipment list

<i>Equipment</i>	<i>Model</i>	<i>Manufacturer</i>	<i>Serial N°</i>
AC power source	4VS300GL	Zenone Elettronica	444
AC power source	4VS300GL	Zenone Elettronica	445
AC power source	4VS300GL	Zenone Elettronica	446
Pulse generator	Transient 1000	EMC partner	TRA 1000-82
Spectrum analyzer	FSEK	R & S	88255/905
TV Demodulator	AMFS	R&S	839094/001
Video measurement system	VSA	R&S	839340/007
Colour TV pattern generator	PM 551B	Philips	LO3029

### • Test method

According to clauses 7 and 8 of EN 61000-4-11 and according to table 3 of ETSI EN 301 489-14.

### • Acceptance limits

According to clause 9.7.3 of EN 301 489-1.

### • Test result

<i>Reduction (%)</i>	<i>Reduction time (ms)</i>	<i>Disturbances (n°)</i>	<i>Performance criteria</i>	<i>Test result</i>	<i>Remarks</i>
30	10	3	TT	C	-
60	100	3	TT	C	-
>95	5000	3	TT	C	-

C = the equipment under test complied with the test specification limit.

NC = the equipment under test did not comply with the test specification limit.

### • Remarks

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## 7.8 - SURGES, DIFFERENTIAL AND COMMON MODE

### • Test equipment list

<i>Equipment</i>	<i>Model</i>	<i>Manufacturer</i>	<i>Serial N°</i>
Pulse generator	NSG 651	Schaffner	172
Coupling network	CDN 110	Schaffner	255
Spectrum analyzer	FSEK	R & S	88255/905
TV Demodulator	AMFS	R&S	839094/001
Video measurement system	VSA	R&S	839340/007
Colour TV pattern generator	PM 551B	Philips	LO3029

### • Test method

According to clauses 7 and 8 of EN 61000-4-5 and according to table 3 of ETSI EN 301 489-14.

### • Acceptance limits

Performance criterion TT according to table 1 of EN 301 489-14

### • Test result

<i>Port</i>	<i>Coupling mode</i>	<i>Test voltage</i>	<i>Test result</i>	<i>Remarks</i>
AC mains power input port	Common mode (line to ground)	2 kV	C	-
	Differential mode (line to line)	1 kV	C	-

C = the equipment under test complied with the test specification limit.

NC = the equipment under test did not comply with the test specification limit.

### • Remarks

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8 – PHOTOS

