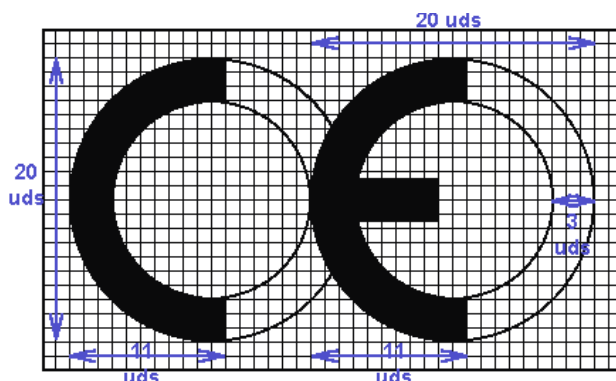


# REPORT

## GENERAL SAFETY

### Test Laboratory CE mark



### TESTS AND MEASURES REQUESTED:

#### DIRECTIVE:

2001/95/CE General Safety Products

Isolation resistance

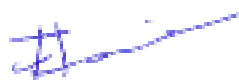
Dielectric strength

Earth continuity

Leakage current

Transitory over voltage

Extreme Climatic tests



F. J. García. T. Telecom. Eng.

# SUMMARY

## Part 1: GENERAL INFORMATION SECTION

- Test laboratory general conditions
- Particular conditions
- Description test sample
- Test notes
- Additional documentation
- Classification
- Summary and test results
- Modifications to obtain standard type approval

## Part 2: TEST AND MEASURES REQUESTED

- Isolation resistance
- Dielectric strength
- Earth continuity
- Leakage current
- Transitory over voltage

## ANNEX:

- RELATION LABORATORY INSTRUMENTS
- CALIBRATION ACCURACY AND TOLERANCE OF MEASURES
- PHOTOGRAPHS

## Part 1: GENERAL INFORMATION SECTION

### Test laboratory general conditions

In order to ensure the measurement traceability in reference to the national and international standards, the laboratory has established a program for all the instruments, probes and measurement accessories of calibration being verified and maintained with periodical verifications of all their technical characteristics.

Professional privacy is guaranteed.

All tests are performed according to these standards and type test.

The test results presented in this report relate only to the item(s) tested.

#### TEST LABORATORY CLIMATIC CONDITIONS

Ambient temperature: 21 °C to 23 °C

Relative humidity: 45 % to 65 %

Atmospheric pressure: 90 kPa (900 mbar) to 104 kPa (1040 mbar)

### Particular conditions

The equipment under test have been chosen:	a) Under supplier by free delivery
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a) Under supplier by free delivery

b) Under supplier by sampling procedure

### Description test sample

Deionizer lightning rod (PDE) 3 Models: BABY , JUNIOR , SENIOR
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### Test notes

---NO COMMENTS---
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### Supplied additional documentation

Requirement - Test	Remark
Utilization	User manual
Safety instructions	User manual
Installation	Installation manual
Maintenance	Maintenance manual
Service	Service manual
Construction manual. Description Schematics and diagrams Printer circuits. Layout Spare parts, and critical components list	Constructive technical File

### Classification

Classification (General Safety)	Class I
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#### CLASSES:

##### Class I

GND protection.

##### Class II

Double or reinforced isolation protection.

##### Class III

Very low voltage safety protection.

### Summary and conclusions of the tests requested

---	Description	Result
---	Isolation resistance	P
---	Dielectric strength	P
---	Earth continuity	P
---	Leakage current	P
---	Transitory over voltage	P
---	Extreme Climatic tests	P

### Modifications to obtain standard type approval

---- NO COMMENTS----

#### NOTES:

Abbreviations used in this report:

P: Pass

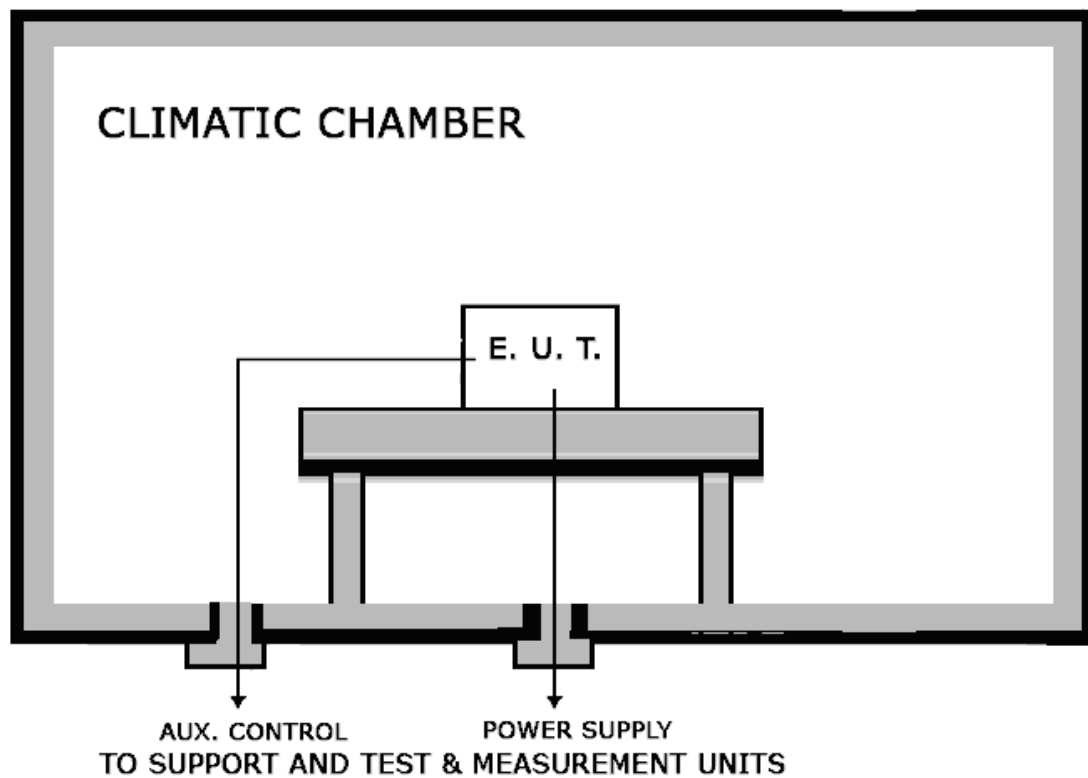
F: Fail

N: Not applied, or not requested.

## Part 2: TEST AND MEASURES REQUESTED

Trials and actions under normal conditions and extreme temperatures and humidity.

Test set-up:



## INSULATION RESISTANCE

MEASUREMENTS IN NORMAL CONDITION, TEMPERATURE AND HUMIDITY:

DESCRIPTION	M Ohm
Test Voltage 1000 V DC. Power lines and gnd	> 28100

INCIDENCES	-----
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MEASUREMENTS IN EXTREME CONDITION, TEMPERATURE AND HUMIDITY

See extreme climatic tests.

## DIELECTRIC STRENGTH

REFERENCE VOLTAGE U (V):	----
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ISOLATION TYPE , TESTED EQUIPMENT:	SPECIAL
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### MEASUREMENTS IN NORMAL CONDITION, TEMPERATURE AND HUMIDITY

DESCRIPTION	Test Voltage V AC	Leakage current mA
Between alimentation lines and input output lines and gnd	5000	< 0.2

RUPTURE VOLTAGE V (AC)	> 5000
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INCIDENCES	-----
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### MEASUREMENTS IN EXTREME CONDITION, TEMPERATURE AND HUMIDITY

Test after 48 hours equipment in dimatic chamber.

DESCRIPTION	Test Voltage V AC	Leakage current mA
Between alimentation lines and input output lines and gnd	5000	< 0.2

RUPTURE VOLTAGE V (AC)	> 5000
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INCIDENCES	-----
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## EARTH CONTINUITY

MEASUREMENTS IN NORMAL CONDITION, TEMPERATURE AND HUMIDITY

TEST VOLTAGE APPLIED = 12V CA

TEST CURRENT APPLIED = 25 A

DESCRIPTION	Ohms
Between metallic parts and gnd protection	< 0.01

INCIDENCES	-----
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## LEAKAGE CURRENT

MEASUREMENTS IN NORMAL CONDITION, TEMPERATURE AND HUMIDITY

Test Voltage: 230 + 10%= 253 VAC

DESCRIPTION	Normal condition mA
Leakage current to gnd	----

INCIDENCES	-----
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## TRANSITORY OVER VOLTAGE

**Pulse de 1,2 / 50  $\mu$ s in open circuit and 8 / 20  $\mu$ s current in cut circuit**

Applied 10 positive pulses and 10 negative pulses with 1 s. interval.

TESTS IN NORMAL CONDITION, TEMPERATURE AND HUMIDITY:

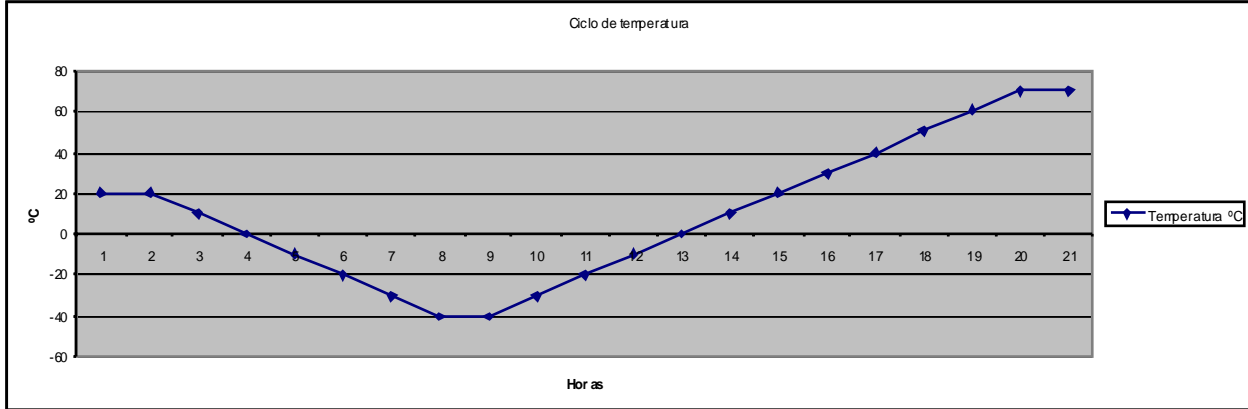
DESCRIPTION	Test Voltage
Impulses applied between power lines and gnd	V
10 positive pulses with 1 s. interval	4000
10 negative pulses with 1 s. interval	4000

INCIDENCES	-----
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Clause	Requirement - Test	Note - Remark	Result
----	Transitory Over Voltage	After testing not be found: Sing of overload Component quality deterioration	P

## EXTREME CLIMATIC TESTS

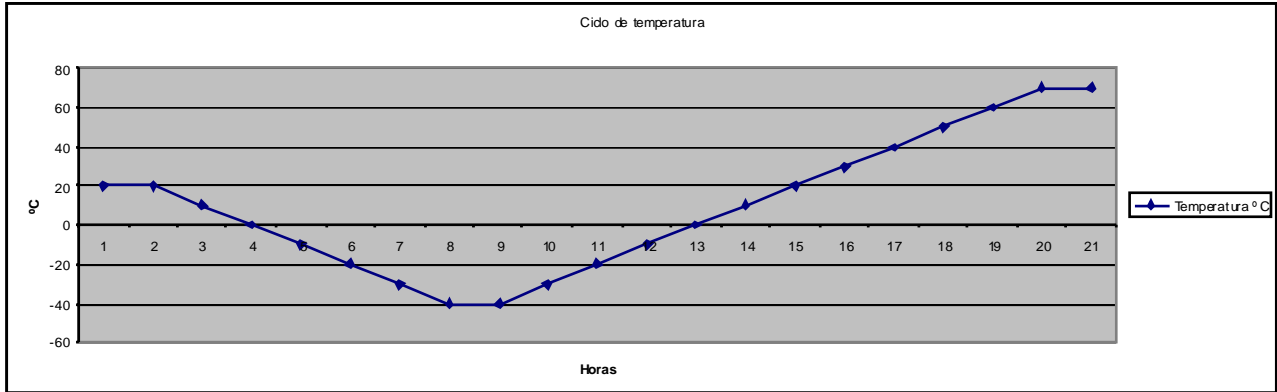
Cycle -40 ° C to +70 ° C (wet heat 95%) (Ramp 6 hours up and 6 hours down)



DESCRIPTION	M Ohm
Test Voltage 1000 V DC. Power lines and gnd	> 1617

INCIDENCES	The insulation resistance decreases with increasing moisture.
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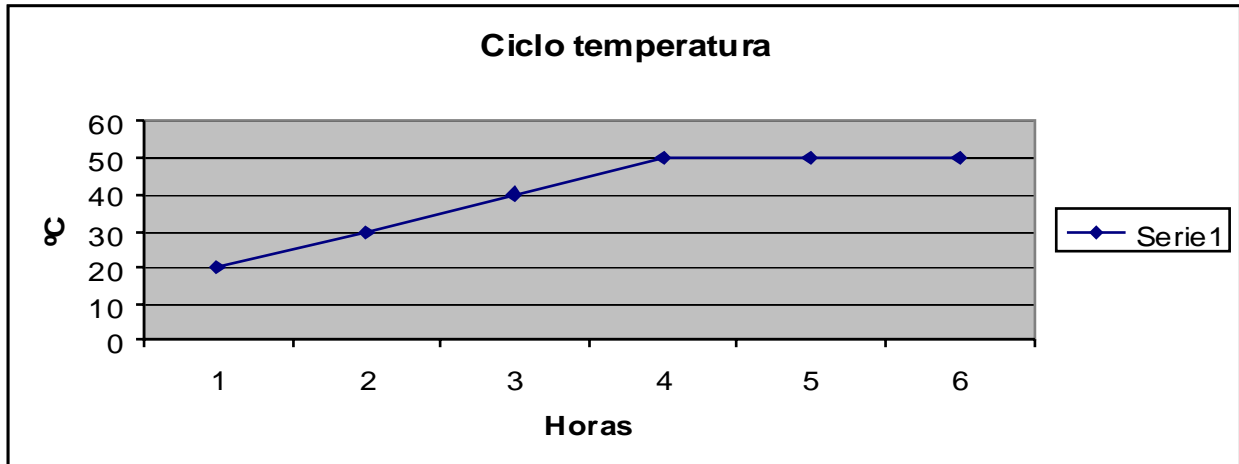
Cycle -40 ° C to +70 ° C (dry heat 10%) (Ramp 6 hours up and 6 hours down)



DESCRIPTION	M Ohm
Test Voltage 1000 V DC. Power lines and gnd	> 28100

INCIDENCES	Insulation resistance stable.
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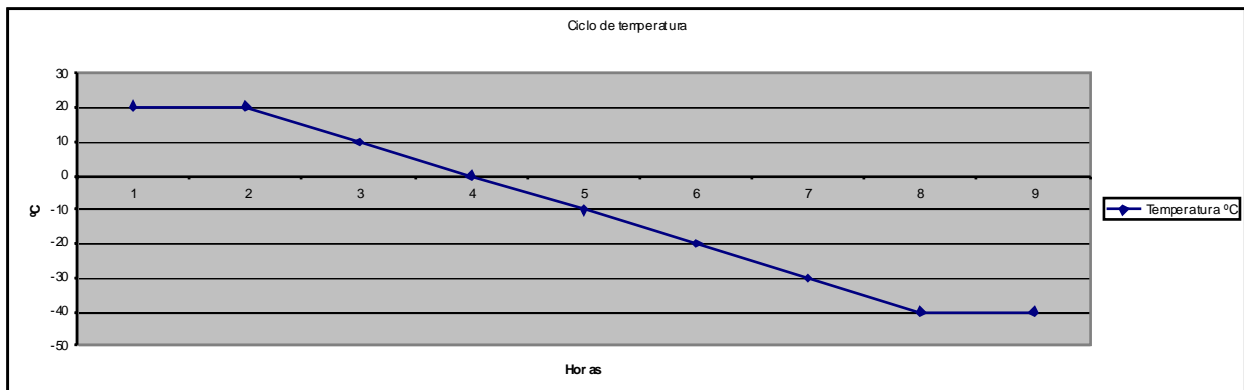
Extreme condition spray (tropical) 50 ° C at 100% humidity



DESCRIPTION	M Ohm
Test Voltage 1000 V DC. Power lines and gnd	> 465

INCIDENCES	The insulation resistance decreases with increasing moisture.
------------	---

Extreme condition of Frost (polar) -40 ° C.



DESCRIPTION	M Ohm
Test Voltage 1000 V DC. Power lines and gnd	> 724

INCIDENCES	-----
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## ANNEX

### LABORATORY INSTRUMENTS

#### LOGIC ANALYSIS SYSTEM HP-16500 A

Modular system.

State analyser dos 80 channels, enlarged to 400. Timer analyser 80 channels, enlarged to 400

Pattern generator 16 channels,

Oscilloscope digital 2 channels 400 MS/s, enlarged to 8. Sweep time. IEE488

#### POWER SUPPLY HP-6654A

Power 600W. Regulated 0-60V., 0-9A., IEE488

#### POWER SUPPLY HP-6032B

Power 1200W Regulated 0-60V., 0-50A., IEE488

#### RF. GENERATOR HP-8656B

Range: 100KHz to 990MHz Resolution 10Hz., IEE488

#### RF. GENERATOR HP-8662A

Range: 10KHz to 1280 MHz Resolution 0.1 Hz. Pattern frequency, stability  $5 \times 10^{-10}$ , IEE488.

#### FREQUENCY DOUBLER HP11721A

Range: 100 to 2600 MHz

#### AUDIO ANALYZER SCOTT 830Z

Ranges: 32Hz. to 16KHz. 30 to 130 dB SPL (-), (A), (C). De -60 to +40dBm.

#### AUDIO ANALYZER HP-8903A

Range: 20Hz. to 100KHz. IEE488

#### MODULATION ANALYZER HP-8901B

Range: 150 kHz. to 1300 MHz. With external mixer to 22 GHz. Resolution Hz.

Precision Wattmeter 18 GHz. IEE488

#### MODULATION ANALYZER HP 8901A

Range: 150 kHz to 1300 MHz. Resolution: 10 Hz for  $F < 1\text{GHz}$ , 100 Hz for  $F > 1\text{GHz}$ , IEE488

#### SYSTEM INTERFACE HP-8956A

Range: 0 to 18 GHz. IEE488

#### SYSTEM INTERFACE HP-8954A

Range: 0 to 18 GHz IEE488

#### ATTENUATOR HP-8498A

Range: 0 to 18 GHz. ,30 dB. ,30W. ,50 Ohm..

#### SET MARCONI COMMUNICATIONS TEST 2955

Range: 0.4 MHz to 1000 MHz. (Alta stability, IEE488,)

#### ATTENUATOR BIRD A 8322

Range: 0 to 1200 MHz., 30 dB. ,200W. ,50 Ohm..

#### LOAD BIRD A 8164

Range de 0 to 2400 MHz.. 100W. ,50 Ohm.

#### WATTMETER BIRD 43

#### REGULABLE COUPLING BIRD 4275

#### HP CALIBRATION SET AUTOMATIC MEASURES KIT

Adapters , probes, calibrated attenuator and loads. Range: 0 to 12.4 GHz.

## RECEIVER EMI FORMED FOR:

SPECTRUM ANALYZER HP-8566B, QUASI PEAK DETECTOR HP85650A, PRESELECTOR HP-85685A  
Range: 100 Hz. to 22 GHz. Resolution 0,1 Hz. Dynamic Range: -134 to +30.1 dBm. IEE488

## RECEIVER EMI FORMED FOR:

SPECTRUM ANALYZER HP-8566B, and QUASI PEAK DETECTOR HP85650A  
Range: 100 Hz. to 22 GHz. Resolution 0,1 Hz. Dynamic Range: -134 to +30.1 dBm. IEE488  
TRANSIENT LIMITER HP11947A  
Range: 9 kHz to 200 MHz

## ISOTROPIC FIELD METER EMCO 7110

Range: 10 kHz to 22 GHz, Level 1 to 400 V / m. 8 Inputs . IEE488  
OPTIC FIBRE INTERFACE FOR ISOTROPIC PROBE EMCO 7120. 2 units.  
ISOTROPIC PROBE EMCO 7122. Range 10 kHz to 1000 MHz, dynamic 1 to 250 V / m.  
ISOTROPIC PROBE EMCO 7121. Range 100 MHz to 18 GHz, dynamic 2 to 500 V / m.

LISN TELPRO 3 units.

## COUPLING NETWORK

Range: 100 kHz to 30 MHz

## LOG-PERIODIC ANTENNA CREATE

Range: 100 to 1300 MHz

## HORN ANTENNA

Range: 1 to 12 GHz

## NEAR FIELD PROBE HP 11940A

Range: 30 MHz to 1 GHz

## CURRENT PROBE SINGER 91550

## HIGH FREQUENCY PROBE HP85024A

Range: 300 kHz to 3 GHz

## DETECTOR PROBE HP11096A

Range: 100 kHz to 500 MHz

## POWER SENSOR HP8484A ( Automatic system calibration)

Range: 10 MHz to 18 GHz , y 100 pW to 10 $\mu$ W ( -70 dBm to - 20 dBm )

## POWER SENSOR HP8482A

Range: 10 MHz to 4200 MHz

## COAXIAL CABLES CALIBRATION AND MEASURE

HP11500A,  
HP11500A, 2 units.

## CLIMATIC CHAMBER HERAEUS VLK 04/150

Temperature range: -55 °C to + 200 °C , Resolution 0.1 °C  
Humidity range: 0 to 100% , Resolution 1%.  
Capacity : 53 x 53 x 53 cm. 150 litres.

## ELECTROSTATIC DISCHARGES GENERATOR KEYTEK MZ-15 / EC

Voltage range:  $\pm 0.5$  kV to  $\pm 15$  kV.  
Resolution: 10 V.  
Precision:  $\pm 3$  % .

## INSULATION METER TES 1600

Resistance range: 200 to 20000 M $\Omega$

## DIELECTRIC STRENGTH , EARTH CONTINUITY AND INSULATION RESISTANCE METER SEFELEC SMG 500

Range: 0 to

Delta detector, I , I max., I max. + delta; regulated: 0.1 to 100 mA  
Insulation resistance range: 50K $\Omega$  to 200 G $\Omega$ , With voltage test of 100 to 1000 V DC.

Earth continuity meter range: 1m $\Omega$  to 1.5  $\Omega$ , Current range: 5 to 30 A,, Application time: 0 to 999 s,, Test voltage: 6V or 12 V rms. IEE 488

LINEAR POWER AMPLIFIER KALMUS 747LC - CE  
Class A. Range: 10 kHz to 1 GHz. Power 50 W.

LINEAR POWER AMPLIFIER TELPRO  
Frequency range: 700 MHz to 2500 MHz Power 1 W.

BICONILOG ANTENNA EMCO 3141  
Range: 26 to 2000 MHz,, Power in continuous wave 1 kW.

TRIPOD EMCO 6-TR  
Telescopic, and polarity changer.

AMPLIFIER EMCO 7405  
Range: 100 kHz to 3 GHz.

IMMUNITY COMPACT GENERATOR EMTEST UCS 500/M4  
Fast transients (Burst). High energy pulses (surges). Voltage dips and interruptions AC/DC. Magnetic field immunity generator. IEE 488.

CAPTIVE COUPLING PROBE HFK

TEM CELL.  
Range: 10 kHz to 2 GHz.

FARADAY CHAMBER - SEMI ANECHOIC  
Dimensions 5.80 m. x 3.30m. x 2.70m. Access door: 1.20m. x 2.20m.

MULTIMETER AGILENT 34410A 6.5 Digit

LINEAR POWER AMPLIFIER. AMPLIFIER RESEARCH 5S1G4 + DC7144A + DC3010A  
Range: 0.8 – 4.2 GHz.

HORN ANTENNA SCHWARZBECK MESS – ELEKTRONIK BBHA 9120 E  
Range: 0.5 – 6 GHz

WOOD TRIPOD EMC 2202 HL

CLAMP CISPR-16-2 LUTHI MDS 21 B

CURRENT INJECTION CLAMP LUTHI EM101 RF

RF GENERATOR AGILENT E 8257 D - PSG  
Range: 250 KHz a 20 GHz

SPECTRUM ANALYZER HP-8566B,  
Range: 100 Hz. to 22 GHz. Resolution 0,1 Hz. Dynamic Range: -134 to +30.1 dBm. IEE488

OSCILSCOPE AGILENT – DSO7104B  
Range DC – 1 GHz.

CURRENT CLAMP FLUKE i30S

## CALIBRATION, PRECISION AND MEASUREMENT TOLERANCE

PARAMETERS (MEASURED IN CALIBRATION LABORATORY)			
FUNCTION	NOMINAL	MEASURED	TOLERANCE
FREQUENCY PRECISION	$5 \times 10^{-10}$	$3.2 \times 10^{-10}$	$5 \times 10^{-10}$
FREQUENCY RESOLUTION	0.1 Hz	---	---
RF POWER PRECISION (normal)	1.3 to 2.2 %		5 %
RF POWER PRECISION (maxim sens. calibr.)			1%
ATTENUATOR DEVIATION		0.1 to 0.33 dB	1 dB
POWER LEVEL (STEEP 0.1 dB)		0.01 to 0.03 dB	
POWER LEVEL (STEEP 2 dB)		0.01 to 0.04 dB	
POWER LEVEL (STEEP 10 dB)		0.00 to 0.33 dB	
BROADBAND		0.0 to 0.3 dB	
UNCERTAINLY LOGARITHMIC TEST		0.04 to 0.06 dB	
ERROR RESOLUTION BROADBAND		0.1 to 0.37 %	
ERROR FREQUENCY SPAN		0.00 to 0.75 %	
PRECISION MODULATION ANALYZER AM	100 %	99.950 to 100.020 %	1 %
PRECISION MODULATION ANALYZER FM		0.06 %	0.1 %
PRECISION MODULATION ANALYZER PHASE	0.2 to 250 rad.	0.205 to 249.7 rad.	0.007 to 7.6 rad
PRECISION MODULATION ANALYZER DISTORTION		0.01 to 0.03 %	0.1%
PRECISION MEASURES ISOTROPIC FIELD	$\pm 0.5$ dB max.	$\pm 0.44$ dB max.	
TEMPERATURE		$\pm 1$ °C	



## PHOTOGRAPHS

