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**ELECTRICAL EQUIPMENT LABORATORY**  
**ENERGY UNIT**

# Test report

No B126-05-CX-EE-01E

Page 1 of 7

## Radio interference voltage test

**TEST OBJECT:** Current transformer  
**DESIGNATION:** CA-123  
**REQUESTED BY:** ELECTROTÉCNICA ARTECHE HNOS., S.A.  
Derio Bidea, 28 - 48100 MUNGIA (BIZKAIA)  
**MANUFACTURER:** ELECTROTÉCNICA ARTECHE HNOS., S.A.  
**STANDARD:** IEC 60044-1:1996 + A1:2000 + A2:2002  
**RECEIVING DATE:** November 29th 2005  
**TEST DATE:** December 2nd 2005

The test object was submitted to the tests required by the client, and the procedures specified in the above mentioned Standard were applied.

### THE PRESENT DOCUMENT CONSISTS OF:

**No of pages:** 7 (and Annex of 2 pages)  
**Photographs:** Annex  
**Drawing:** Annex

**Заличено по чл.2 от ЗЗД**

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tecnalia

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Head of Electrical Equipment Laboratory

**E C**  
E N S A Y O S  
Nº 4 LE148

Barakaldo, December 15th 2005

- \* The present report refers only and exclusively to the sample tested and at the moment and conditions in which the measures were made.
- \* The partial reproduction of the present document is categorically forbidden without the permission in writing of de LABEIN.

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ANNEX	Photographs
	Drawing

## 1. TEST OBJECT DESIGNATION

### CURRENT TRANSFORMER

Characteristics, indicated by the manufacturer, are the following:

Manufacturer:	ARTECHE		
Type:	CA-123		
Serial No.:	0504820/3	2005	
Ratio:	300-600 / 1-1-1		
Primary terminal markings:	P1-P2		
Rated primary current, I <sub>pn</sub> :	300-600 A		
Secondary terminal markings:	1S1-1S2	2S1-2S2	3S1-3S2
Rated secondary current, I <sub>sn</sub> :	15 A	30 A	30 A
Rated output:	50 VA	75 VA	75 VA
Accuracy class:	0.5	5P20	5P20
Extended rated current:	120 %	120 %	120 %
Rated insulation level:	123/230/550 kV		
Rated frequency:	50 Hz		
Rated short-time thermal current, I <sub>th</sub> :	40 kA - 1 s		
Rated dynamic current, I <sub>dyn</sub> :	100 kA		

See the photograph and the rating plate of test object in the annex.

## 2. TESTS PERFORMED. STANDARD

Test performed:

- Radio interference voltage test.

The test has been carried out according to the standard:

- **IEC 60044-1:1996 + A1:2000 + A2:2002, "Instrument transformers. Part 1: Current Transformers".**

Quoted standard:

- CISPR 18-2:1986, "Radio interference characteristics of overhead power lines and high-voltage equipment. Methods of measurement and procedure for determining limits."

The calculation of the uncertainties of the measurements is available.

### 3. DESCRIPTION OF THE TEST

To simulate the operation condition tubes with spherical terminations are used in order to prevent spurious discharges.

The test voltage is applied between one of the terminals of the primary winding and earth. The frame and all the secondary terminals are connected to earth.

A pre-stress voltage of  $1.5 U_m/\sqrt{3}$  is applied and maintained for 30 s. The voltage is then decreased to  $1.1 U_m/\sqrt{3}$  in about 10 s and maintained at this value for 30 s before measuring the radio interference voltage.

The current transformer is considered to have passed the test if the radio interference level at  $1.1 U_m/\sqrt{3}$  is lower than  $2500 \mu\text{V}$ .

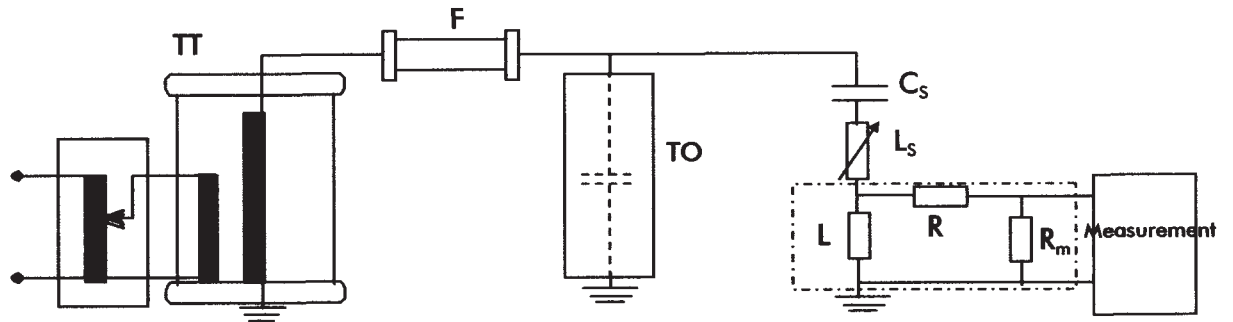
$$U_m = 123 \text{ kV}$$

$$\text{Test voltage: } 1.5 U_m/\sqrt{3} = 106.5 \text{ kV}$$

$$\text{Test voltage: } 1.1 U_m/\sqrt{3} = 78.1 \text{ kV}$$

#### 4. MEASURING CIRCUIT

The measuring circuit is in accordance with standard CISPR 18-2:1986.



TT: Test transformer

TO: Test object

F: High voltage filter

$C_s$ : Coupling capacitance (1090 pC)

$L_s$ : Adjustable inductance

L: Low impedance inductance at 50 Hz

R: Resistor of 275  $\Omega$

$R_m$ : Resistor in parallel with the measuring equipment (50  $\Omega$ )

Impedance between high voltage and earth ( $Z_s + R_l$  according to CISPR 18-2):

Modulus: 337  $\Omega$

Phase Angle: 15°

Measuring frequency: 0.6 MHz

Attenuation (measured with 1 V at 0.6 MHz), A: 1 dB

Resistors net factor, R: 21.5 dB/1  $\mu$ V/300  $\Omega$

## 5. AMBIENT AIR CONDITIONS

Ambient temperature:	15 °C
Atmospheric pressure:	100.9 kPa
Relative humidity:	54 %

## 6. RESULTS

The radio interference level is the sum of measured value ( $V_m$ ), attenuation ( $A$ ) and resistors net factor ( $R$ ).

$$V(\text{dB}/1 \mu\text{V}/300 \Omega) = V_m + A + R$$

At the measuring voltage,  $1.1 U_m/\sqrt{3} = 78.1 \text{ kV}$ , the result is the following:

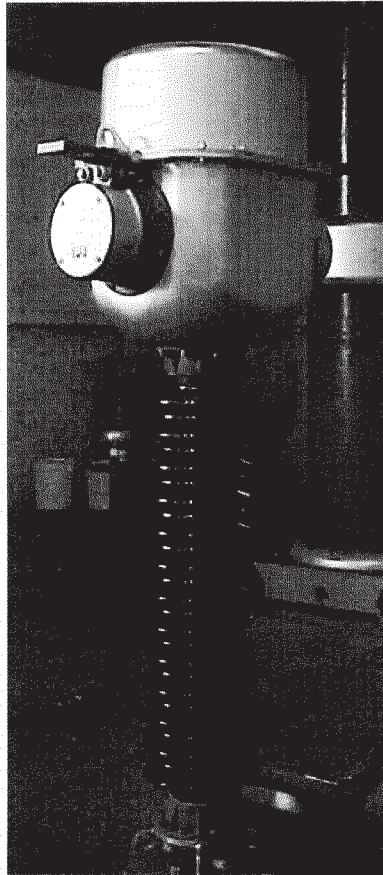
Measured level ( $V_m$ ): 0.83 dB

Attenuation ( $A$ ): 1 dB


Resistors net factor ( $R$ ): 21.5 dB

$$V(\text{dB}/1 \mu\text{V}/300 \Omega) = 23.3 \text{ dB (14.67 } \mu\text{V)}$$

Result: **CORRECT**, the radio interference level measured is lower than the limit of 2500  $\mu\text{V}$ .

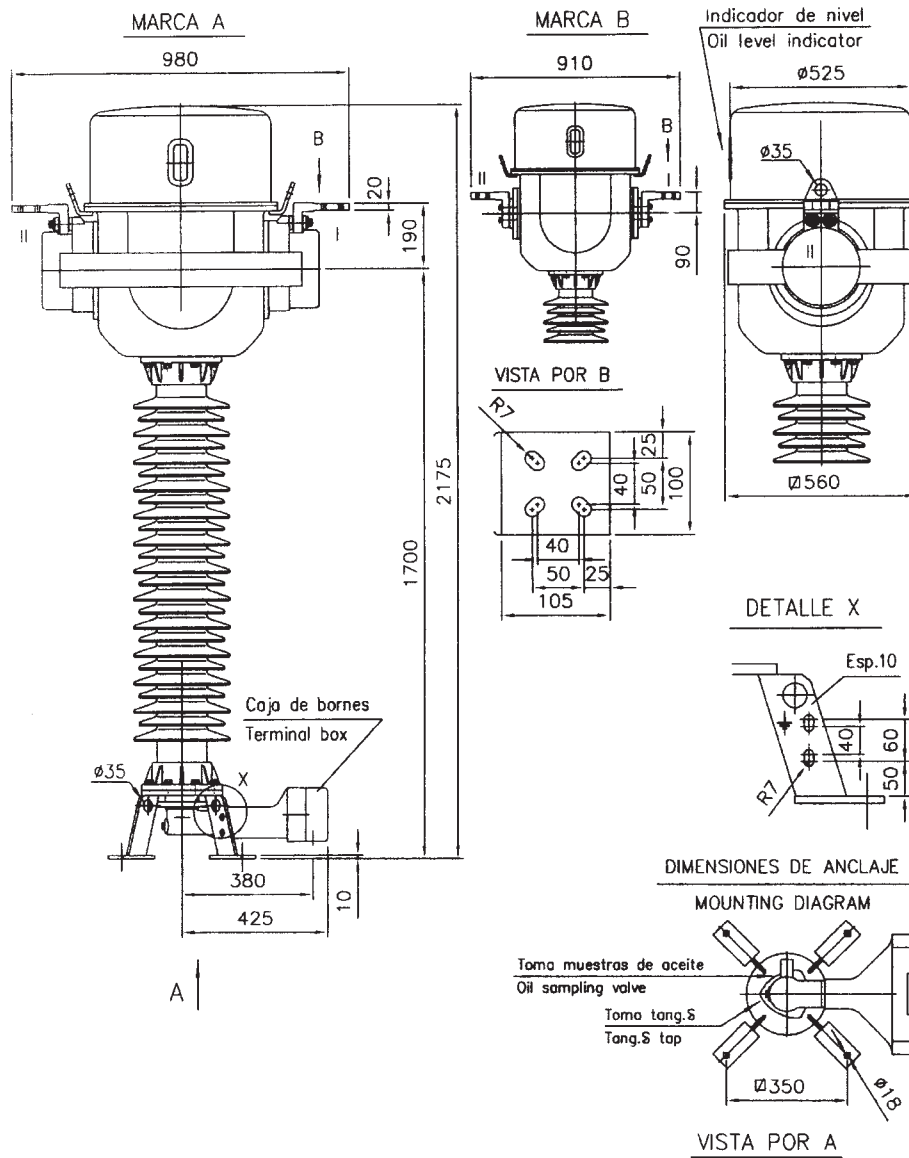


Test object

TRANSFORMADOR DE CORRIENTE / CURRENT TRANSFORMER										
MADE IN SPAIN	TIPO / TYPE	CA-123								IP/In [0504820/3 2005]
	PRIM / Pri.T.	P1 - P2								
	K <sub>n</sub>	I <sub>pn</sub>	300-600							A
		I <sub>sn</sub>	1	1	1				A	
	BORN / Sec.T.	1S1-1S2	2S1-2S2	3S1-3S2						
	VA	15	30	30						
	CL	0.5	5P20	5P20						
	Ext. %	120	120	120						
	F <sub>s</sub> / SF	10								
	Cat. temp/Temp. cat	-25°/+40°C.								
										
		KV	123/230/550							
		Hz	50							
		I. ter./I.th.	40	KA	1	S				
		I. din./I.dyn.	100	KA						
		Als/Ins.								
Peso Total / Total W. 275 Kg.      Peso Aceite / Oil W. 50 Kg.										
IMPORTANTE : Hermeticidad total. Prohibido desmontar. IMPORTANT : Hermetically sealed unit. Opening forbidden.										

Rating plate of the test object





PESO	ACEITE-OIL	50 Kgs.
WEIGHT	TOTAL	275 Kgs.

I	II
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(F) TRANSFO DE INTENSIDAD  
CURRENT TRANSFORMER CA 123

Dimensiones en m.m. aproximadas  
Dimensions in m.m. only aproximatives

Fecha 1-4-05	Comprobado	Dibujo número 4284430
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