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PA-No. 2294

Applicant: SCHIRTEC Trading GmbH  
Ignaz-Köck Straße 10 / Top 1.6  
1210 Vienna, AUSTRIA

Commission received: 01.2007

**TEST REPORT Ref.No.: PA 2294-1**

Type of test item: Early Streamer Emission Lightning Protection Air Terminal  
MODEL SCHIRTEC-AS

Test specification (standard, test procedure):

Impulse test currents as specified in:  
EN 50164-1 / 1999 - clause 6.3 / Class H  
Lightning Protection Components (LPC) - Part 1: Requirements for connection components  
and in:  
IEC 61643-1 Ed.2.0 / 2005-03 respectively  
EN 61643-11 / 2002 + A11 / 2006 - clause 7.1.1

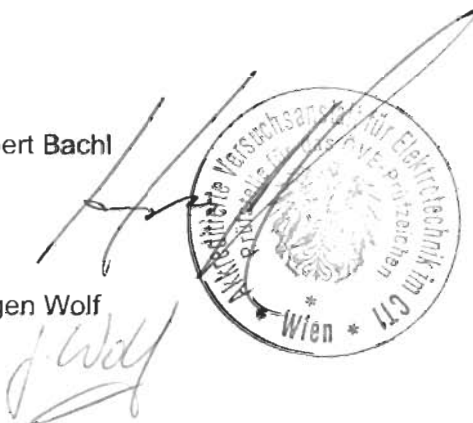
Initial and final verification:  
by resistance measurement between tip and sphere

Compiled by: Hubert Bachl

Date: 31.01.2007

Approved by: Jürgen Wolf

Date: 31.01.2007



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**Test details and test arrangement:**

Three samples of the lightning protection terminal were tested with lightning impulse currents according to the following table 1. Each terminal was subjected to three (3) current impulses according to EN 50164-1.

Table 1: Impulse test current parameters

Nominal values			Tolerances according					
			IEC/EN 61643				EN 50164-1	
$I_{imp}/I_{max}$	Q	W/R	Q -20%	Q +20%	W/R -35%	W/R +35%	W/R -20%	W/R +20%
kA ±10%	As	kJ/Ohm	As	As	kJ/Ohm	kJ/Ohm	kJ/Ohm	kJ/Ohm
<b>100</b>	<b>50</b>	<b>2500</b>	<b>40</b>	<b>60</b>	1625	3375	<b>2000</b>	<b>3000</b>

In addition the impulse duration shall not exceed 2ms according EN 50164-1.

Before the first impulse current application and after the last impulse current application the resistance between the terminal tip and the sphere was measured to check for any damage or alteration of the internal circuitry.

The air terminal bottom tube was connected via a short down-conductor of appropriate cross section to the impulse generator. The connection between air terminal and down-conductor was done by use of a special clamping unit provided by the applicant.

The air terminal tip was connected via a minimum air gap of some mm to the other output terminal of the generator.

Details and pictures see Annex 1.

**Test Results:**

Initial measurement of resistance between the terminal tip and the sphere on all three samples

→ approx. 20 MΩ

Application of three current impulses – for details see table 2. Oscillograms are shown in Annex 2.

Final measurement of resistance between the terminal tip and the sphere on all three samples

→ approx. 20 MΩ

Table 2: Test current parameters

Test parameters	$I_{imp}$ [kA]	Q [As]	W/R [kJ/ $\Omega$ ]
<i>Sample 1</i>			
First impulse	98,8	39,6	1950
Second impulse	105,6	52,4	2790
Third impulse	101,9	52,4	2800
<i>Sample 2</i>			
First impulse	107,5	42,9	2360
Second impulse	102,5	52,1	2830
Third impulse	103,8	55,4	2970
<i>Sample 3</i>			
First impulse	103,8	51,1	2740
Second impulse	102,5	52,8	2800
Third impulse	103,1	49,5	2640

**Conclusion:**

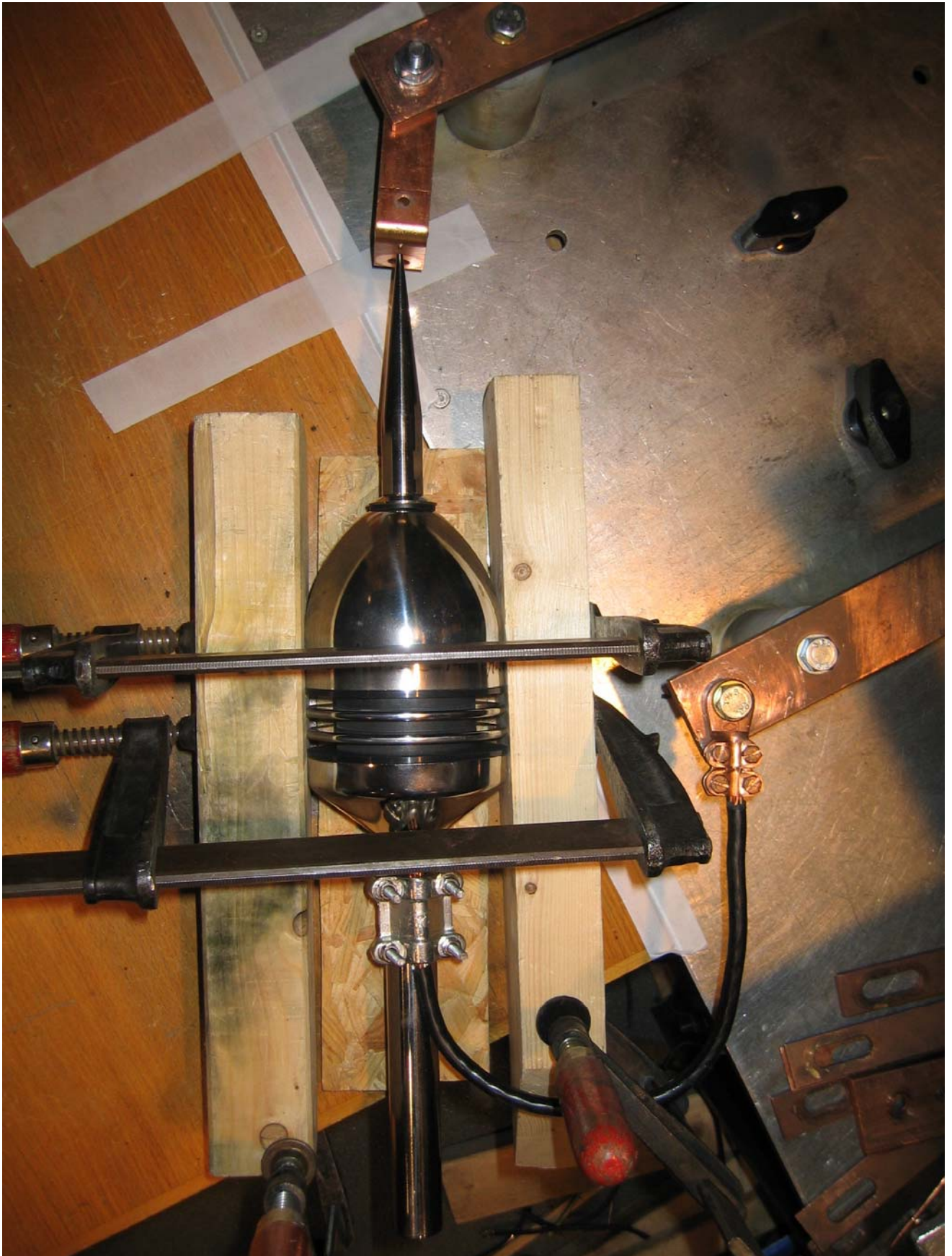
Visual inspection showed no physical damage, no loose parts and no deformation. Comparison of initial and final resistance measurements between the terminal tip and the sphere showed no differences exceeding the measurement accuracy and therefore no indication for any alteration or damage of the internal circuitry.

ANNEX 1

SCHIRTEC Model SCHIRTEC-AS

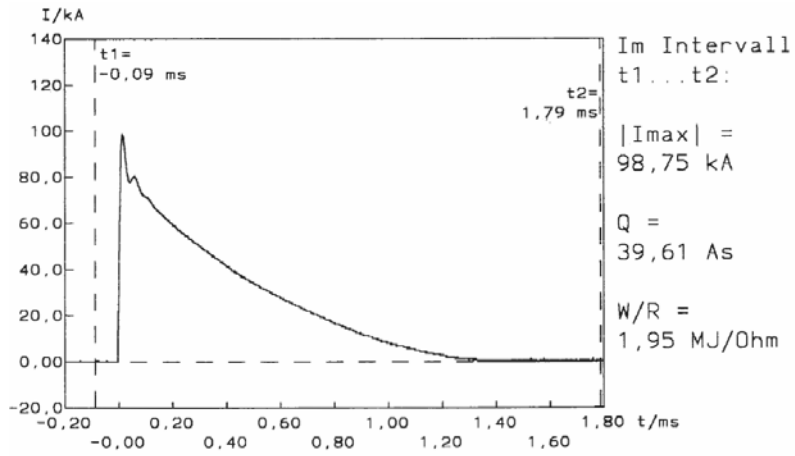


Test arrangement and generator connection

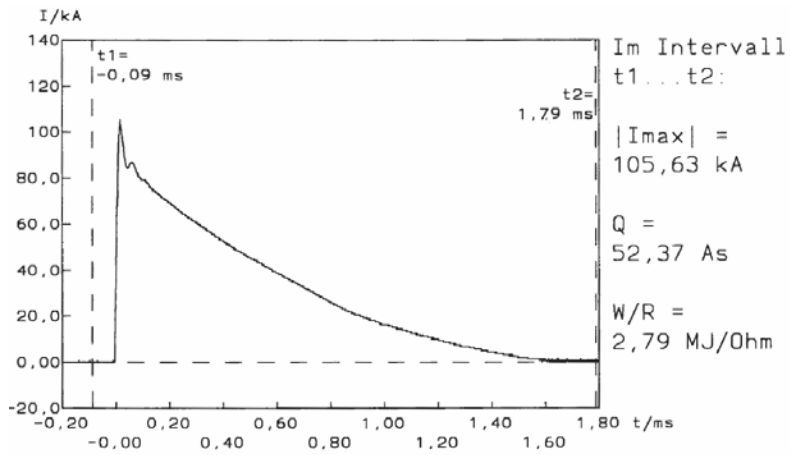


ANNEX 2

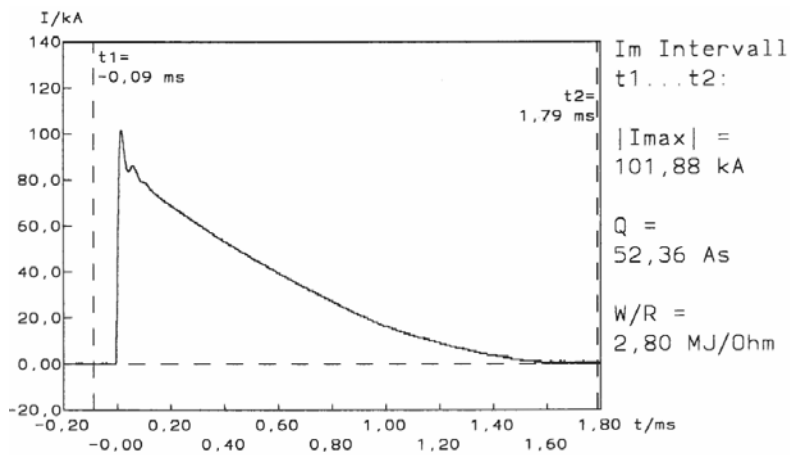
SCHIRTEC Model SCHIRTEC-AS



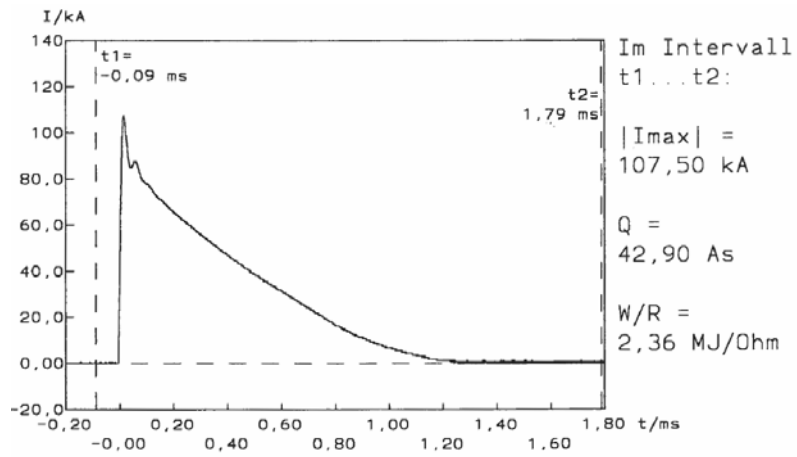
PA 2294 MUSTER 1  
First impulse



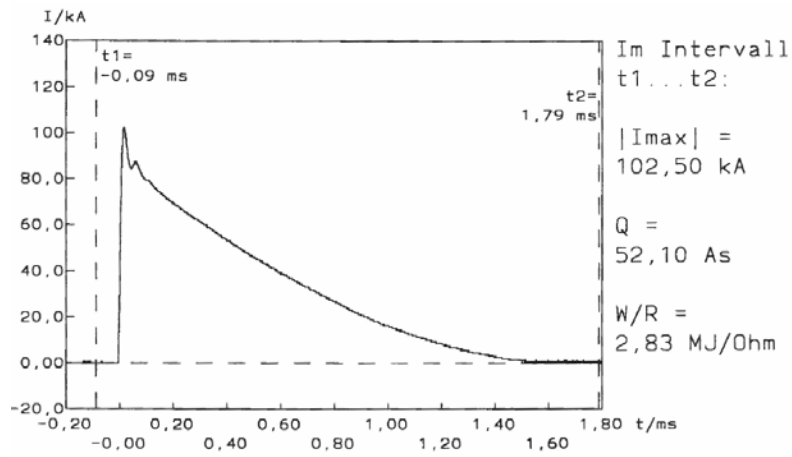
PA 2294 MUSTER 1  
Second impulse



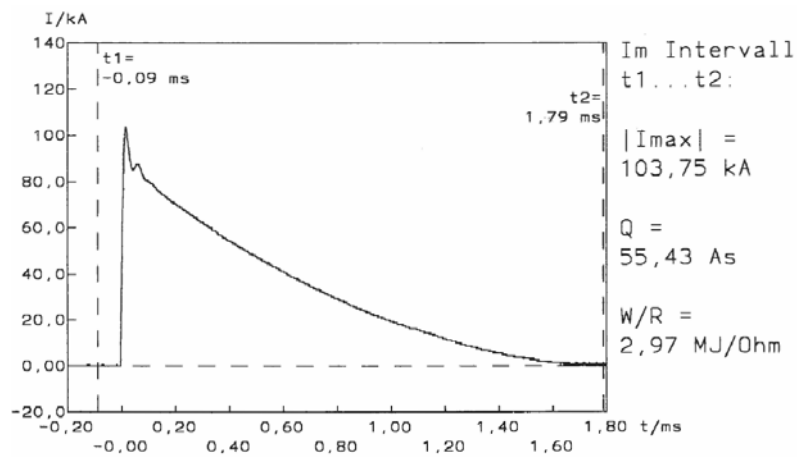
PA 2294 MUSTER 1  
Third impulse



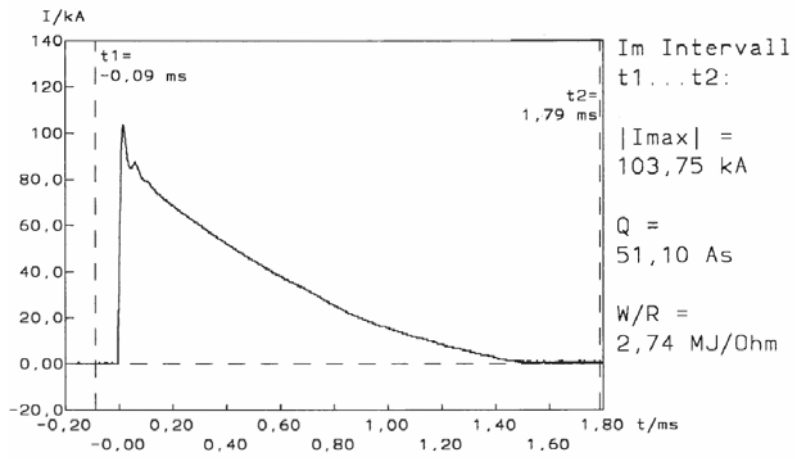
PA 2294 MUSTER 2  
First impulse



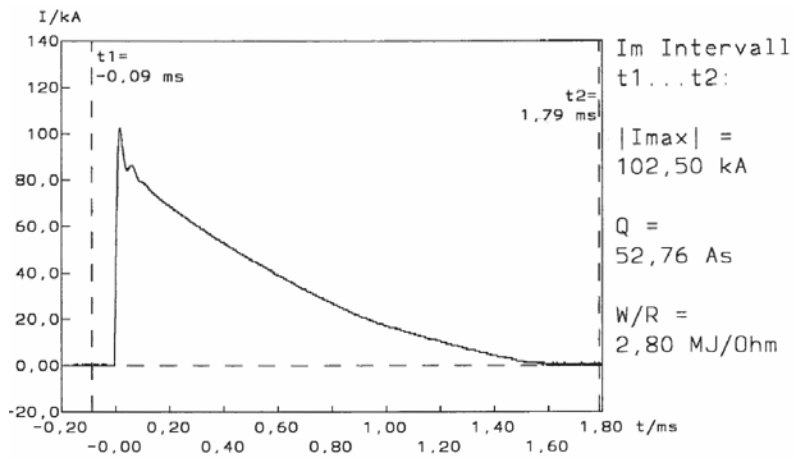
PA 2294 MUSTER 2  
Second impulse



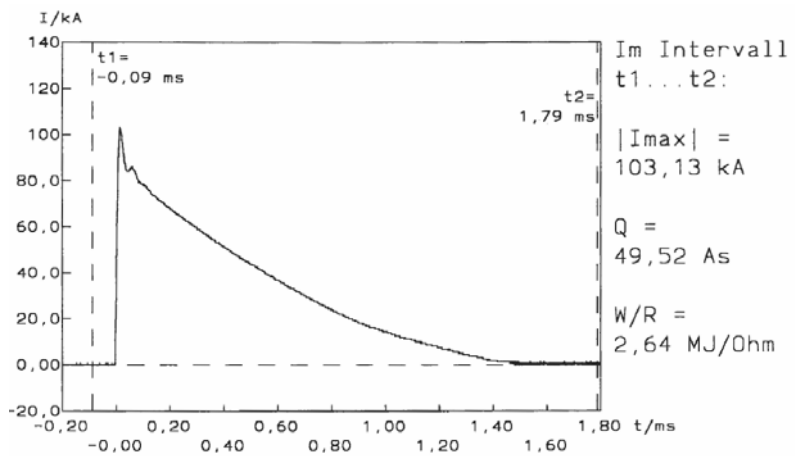
PA 2294 MUSTER 2  
Third impulse



PA 2294 MUSTER 3  
First impulse



PA 2294 MUSTER 3  
Second impulse



PA 2294 MUSTER 3  
Third impulse