



ERKOÇ® İMALAT

LIGHTNING CONDUCTOR AND ACCESSORIES MANUFACTURE



Detakom®-A5

LIGHTNING CONDUCTOR

EARLY STREAMER EMISSION

APPROPRIATE FOR NFC17102



Detakom®-A5 ESE LIGHTNING CONDUCTOR

ESE - EARLY STREAMER EMISSION

Which has been produced in Turkey under the label **Detakom®** since 2003, has been the lightning conductor preferred both in Turkey and around the World.

It has been combined with the **25-year** experience of **Erkoç Engineering** company in Lightning Conductors and Grounding since December 2005 and produced **Detakom® - A5** model, which is preferred both in Turkey and around the World.

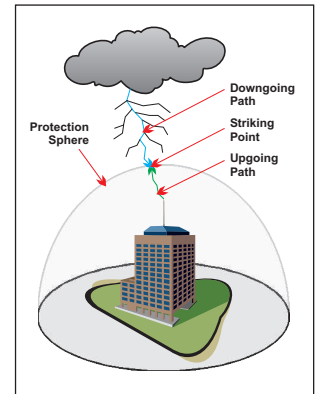
Paramount Features of Detakom®-A5 Active Lightning Conductors:

- 1- Its most paramount feature is that its impact tension generator inside is covered with epoxy insulating material with a durability of 450 kV/cm²
- 2- Another feature is that since its outer parts are covered with XL 304 stainless steel, it is resistant against dynamic power surging in from the air during lightning discharge and also it is not affected by acid rain caused by lightning discharge.
- 3- **Detakom® - A5** lightning conductor was tested by **BET BLITZSCHUTZ-EMV TECHNOLOGIEZENTRUM** Laboratory, Germany and successfully passed the 100kA current standing test.
- 4- It was tested in line with active lightning conductor test standards of **French NF C 17-102** (Appendix C) at Romania ICMET CRAIOVA High Voltage Laboratory and and given Active Lightning Conductor title after displaying a high performance. (ICMET CRAIOVA has got accreditation certificate)
- 5- It was tested in line with active lightning conductor test standards of **French NF C 17-102** (Appendix C) at METU Electric and Electronic Laboratory and given Active Lightning Conductor title after displaying a high performance.
- 6- It is produced under **ISO 9001-2000** Quality Certificate and **25 years** of experience of **Erkoç Engineering**.
- 7- **Detakom® - A5** Active Lightning Conductor is produced by constant testing during the production process.

Detakom®-A5 Active Lightning Conductor Operation Procedure:

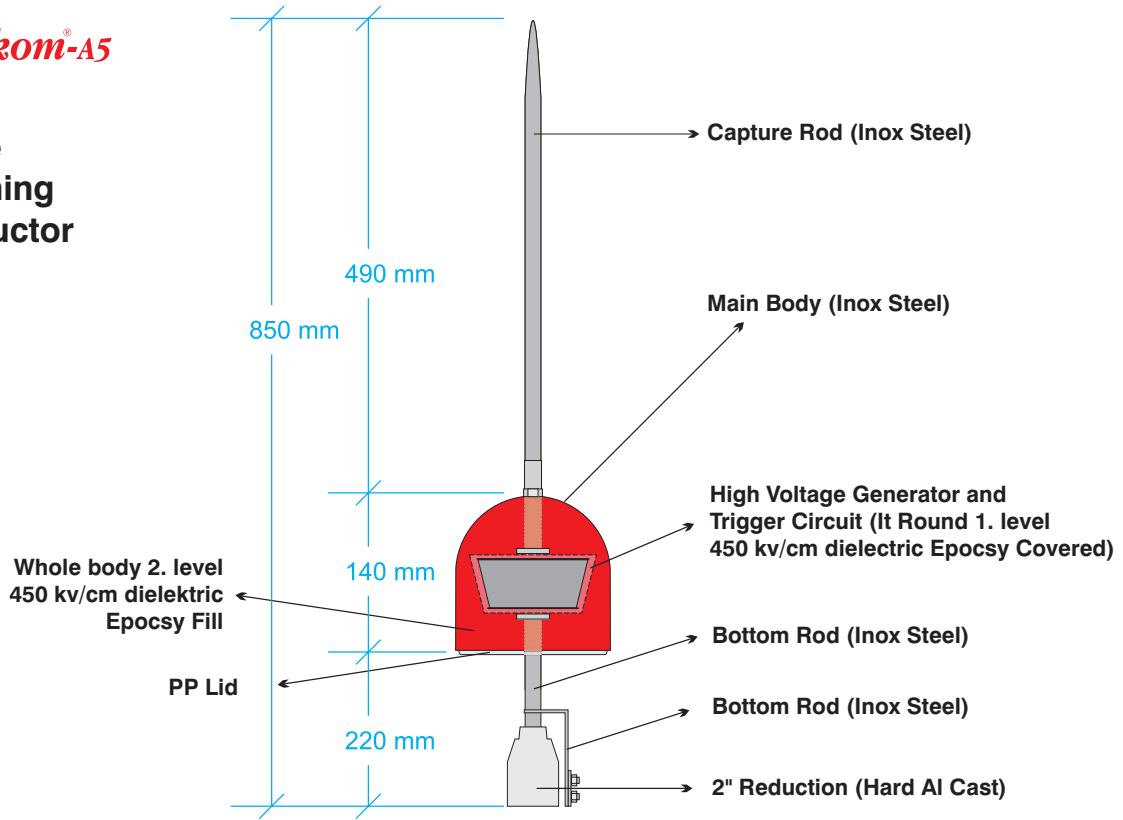
When the electrical field created by storm rises to 10-20 kV/m value, **Detakom® - A5** Active Lightning Conductor generates a warning stream by the impact tension generator inside in a certain frequency and amplitude by gathering the required energy from the electrical field which creates the lightning. This stream creates a path that moves upward. This path which enables the lightning to flow down controllably, arrests the lightning on a vertex it forms above a large-diameter protection field above the building and conducts the lightning to the ground.

Together with its accelerator rod, impact tension generator, and inner structure, it is designed to safely conduct even the largest lightning streams by the help of its assemblies.



Detakom-A5

**ESE
Active
Lightning
Conductor**



DETAKOM[®]-A5 (ELECTROSTATIC) ACTIVE LIGHTNING CONDUCTOR TECHNICAL SPECIFICATIONS

A) DETAKOM[®]-A5 ACTIVE LIGHTNING CONDUCTOR PRODUCED IN TURKEY. IT COMPRISES OF 3 PARTS.

- 1) AIR TERMINAL : Comprised of stainless XL 304 steel, it is 18 mm in diameter, and 475 mm in length.
- 2) AIR TERMINAL CAP : 160 mm in diameter, 135 mm in height, and hemi-sphere shaped, it is of **XL 304** stainless steel material which is physically not getting dirt, with a polished surface and not affected from corrosion. The inner part is covered by epoxy insulating material (**1 cm is resistant to 450 kV**) and impact tension generator is placed within.
- 3) ROOF. POLE CONN. ADAP. : Enables the connection between the Active Lightning Conductor and 2" pole. It is of hard aluminum cast and on a 2x50 mm² copper connector.
- 4) WEIGHT AND FULL LENGTH: Full weight being 7.100 kg, its full length is 85 cm including accelerator point.
- 5) ORIGINAL PACKAGING : is of size 17x18x48 cm.

B) FEATURES

- 1) OPERATION :
 - a) It features **ESE-EARLY STREAMER EMISSION**. It operates by sufficient electrostatic field change created around it.
 - b) It operates by impact tension generation principle. Impact tension generator creates the corona discharge by generating tension at the reverse signal of the lightning. It is turned on only when there is a lightning risk.
 - c) It does not emit sparkles or arcs while operating and is not in need of external kinetic or solar energy. There are no materials that can be corroded by decreasing-ending arc.
 - d) All of it is produced from non-corrosive XL 304 stainless steel material and certified by test reports.
 - e) It is resistant even to the high 100 kA stream. It successfully passed from these high-voltage tests in **BET BUTZSCHUTZ EMV TECHNOLOGIEZENTRUM** Labs, Germany, and was certified

C) TRIGGERING TIME GAIN

In the diameter calculation Detakom[®]-A5 ΔT :60 mt., ΔT must be taken as 60 μS

D) GUARANTEE

- 1) OPERATION : It has **10 years** of operational guarantee from **Erkoç Electricity Ltd.**
- 2) STAINLESSNESS : Since all of it is produced from XL 304 stainless steel, it is stainless (it is also not affected from the acid rain created by lightning discharge).
- 3) DYNAMIC : It is resistant of dynamic power that emanates from the air by lightning discharge.


E) STANDARDS

- a) Active Lightning Conductor Test Report of French **NF C 17-102 (Appendix C) Standard** from **ICMET CRAIOVA** in 2008
- b) Active Lightning Conductor Test Report of French **NF C 17-102 (Appendix C) Standard** from **METU** in 2005.
- c) Test report that say it resist 100 kA, from **BET BUTZSCHUTZ EMV TECHNOLOGIEZENTRUM** Laboratory, Germany in 2003 and in 2007.

F) CERTIFICATES / DOCUMENTS

- a) In the original packaging of each unit there is an original **10 years** operational guarantee documents that is signed by producer firm, **Erkoç Electricity Ltd.**
- b) The product is produced under the **ISO9001:2000 Quality Management System Certificate**

Ex. 5




LIT

RESEARCH, DEVELOPMENT AND TESTING NATIONAL INSTITUTE FOR ELECTRICAL ENGINEERING

ICMET CRAIOVA ROMANIA
HIGH VOLTAGE LABORATORY - LIT

200515 Craiova, Calea Bucuresti 144
Phone: 0351 - 404888, 0351 - 404889, 0351 - 402425,
Fax: 0251 - 415482; 0351 - 404890




INCERCARE ROMANIA RENAR
SR EN ISO/CEI 17025:2005
CERTIFICAT DE ADEPTARE Nr. 450-L


TEST REPORT
No. 41576 / 19.05.2008

1. Product: Early Streamer Emission Active Lightning Conductor-ESELCT type DETAKOM-AS
2. Test: Evaluation of the imitation advance according to NFC 17 - 102 / 1995 norm.
3. Test order: CONTRACT No. 1272/14.04.2008
4. Customer: ERKOC MUHENDISLIK - EROL KOC
5. Customer's address: Sarayi Cad. Ortak Han 31 / 16 Ulus - Ankara Turkey
6. Test results: There are presented the measurements results
7. Test responsible: Eng. I. Balca



Test Supervisor
Eng. A. Linguraru



QA. Responsible:
Eng. G. Macovei



APPROVED LABORATORY HEAD
Eng. Dorin Popa

8. The test report contains 12 pages.
9. The test report was edited in 4 ex.; 1 ex. to LIT and 3 ex. to customer.


CAUTION:

- a. The test result makes reference only to tested product.
- b. Integral reproduction of the test report is forbidden.
- c. Any part of this test report may be reproduced only with the accord. of LIT and RENAR.
- d. Reports without original signatures are not valid.
- e. Laboratory accreditation or any of its test reports elaborated in accreditation conditions not constitute or imply, themselves, an approval of product by RENAR, which has accredited the test laboratory, or by any other organization.

© ICMET Craiova 2008

Cover Page

page 5



LIT

TEST REPORT No. 41576

9. TEST ON ESELCT TYPE Detakom - AS

- 9.1. Reception date: 17.04.2008
- 9.2. Test date: 08.05.2008
- 9.3. Atmospheric conditions

BEFORE TEST	Beginning of the test: 16h50 p = 1000 mb t = 16.3 °C hr = 55.9 %
AFTER TEST	End of the test: 18h35 p = 1000 mb t = 16.4 °C hr = 55.2 %

- 9.4. Results See tables on page 7

Number of significant impulses: 100

Average of significant T_B :


- calculated from the experimental wave $T_{PDA} = 270.5 \mu s$ Stdev: 11.9 %
- transferred on the reference waveform: $T_{PDA} = 345.5 \mu s$

See curves on page 8

Measuring uncertainty for ΔT is 5.9 %
The uncertainty stated is expanded uncertainty obtained by multiplying the standard uncertainty by the coverage factor $k=2$. The value of measured lies within the assigned range of values with probability of 95 %.

Triggering advance: $\Delta T = T_{PDS} - T_{PDA} = 409.6 - 345.5 = 64.1 \mu s \pm 3.5 \mu s$

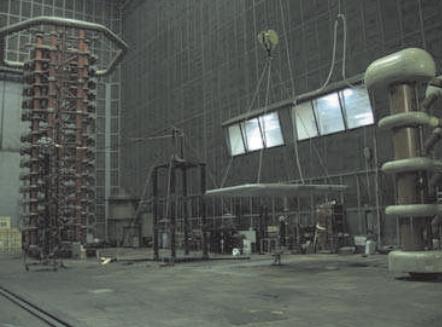

Test Result



LIT

TEST REPORT No. 41576

page 9

Raul

Test Moment




ROMANIAN ACCREDITATION ASSOCIATION
NATIONAL ACCREDITATION BODY

ACCREDITATION CERTIFICATE

No. 450-L

By the present certificate RENAR attest the competence of:
High Voltage Testing Laboratory (LIT)
belonging to **ICMET CRAIOVA**
144 Bucharest Street 200515 Craiova Dolj County

for the activity of performing tests as third party laboratory for the scope:

- a) High Voltage tests and measurements; impulse (lightning and switching), alternating, continuous and combined voltages, partial discharges, radio interference, harmonics, capacitors and tangent delta;
- b) Tests and measurements in Electromagnetic Compatibility (EMC) field;
- c) Radio disturbance tests and measurements at low voltage equipment;
- d) Determination of protection degree for protection housings and of effectiveness for early streamer emission lightning conductors.

The list of tests or types of tests for which accreditation was granted is contained in the annex attached to the present certificate, containing 10 pages.

The assessment was carried out according to:
SR EN ISO/CEI 17025: 2005

Date of issue: 13.11.2006

Date of expiry: 13.11.2010

GENERAL DIRECTOR RENAR
Drd. eng. Cristian Dorin NICHITA




PRESIDENT OF THE ACCREDITATION COUNCIL
Prof. univ. dr. eng. Ion POPESCU



RENAR is signatory of EA - MLA and ILAC-MRA for testing.
Partially reproduction of the present certificate is forbidden.

ICMET CRAIOVA Accreditation Certificate

METU ELECTRIC AND ELECTRONIC ENGINEERING FACULTY NFC 17 102 (APPENDIX C) TEST




ORTA DOĞU TEKNİK ÜNİVERSİTESİ
ELEKTRİK VE ELEKTRONİK MÜHENDİSLİĞİ BÖLÜMÜ
MIDDLE EAST TECHNICAL UNIVERSITY
ELECTRICAL AND ELECTRONICS ENGINEERING DEPT.
1956

No: 05-02-559
ERKOC Elek. İml. Taah.lth. İhr. San. Tic.LTD.ŞTİ
ESELCE (Early Streamer Emission Lightning Conductor) Evaluation of the Streamer Initiation Advance

TEST REPORT

28.12.2005



METU NFC 17 102 Test

1. General

Firm / Institution Applied : ERKOÇ Elek. İml. Taah.lth. İhr. San. Tic.LTD.ŞTİ
Sanayi Cad. Ortak Han No. 31/16 ULUS Ankara
erkoc@erkocimalat.com
Tel : 0 312 312 56 17 Fax : 0 312 310 90 81
Tests Required : ESELCE (Early Streamer Emission Lightning Conductor) Evaluation of the Streamer Initiation Advance

Date of the Test : 28.12.2005

Tests Conducted In : Middle East Technical University , High Voltage Laboratory,Ankara


Ambient Conditions : 19 °C , 687 mmHg , % 60 Relative Humidity (No significant variation has been observed in these values during the tests .)
Altitude : 900 m
Impulse Generator : HAEFFELY 2.4 MV,120 KJ

Equipment Tested :
Detakom- A5 ESELCE.
Model : Detakom - A5 , Series No: 00200

2. TEST STANDARD
NFC17-102 (Appendix C)

3. DESCRIPTION OF THE TESTS
A 4500 x 4500 mm plane high voltage electrode with rounded edges (R= 200 mm) was positioned 1000 mm above the test sample . 100 negative polarity impulses of 200 / 2000 μS (Rise time = 170 μS) with 300 kV +/- 5 kV magnitude are applied and the time lags to flashover are recorded .A time interval of 1 minute was allowed between consecutive impulses . The measurements are repeated using a SRLC (simple rod lightning conductor) of the same tip geometry and high .The results are given in Table.1.Test system is shown in Figure.1.

Lightning Cond.	Time to Flashover (μS)		
	Min.	Max.	Average
SRLC	40	1850	346
ESELCE	25	65	38



NFC 17 102 Test Procedure

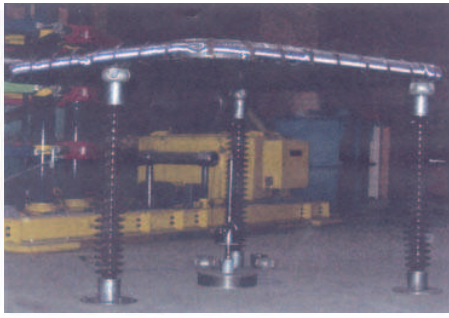


Figure.1. Test System

Oscillograms recorded during the tests is given in Figures.2a , b and c.

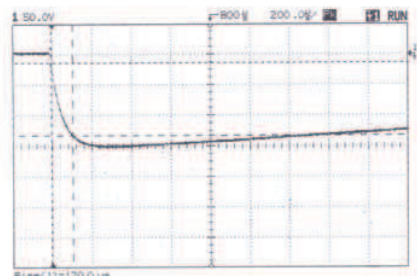



Figure.2a. Test Voltage Waveform



METU NFC 17 102 Test Moment

4. EVALUATION of THE MEASUREMENTS

As proposed in NFC17-102 (Appendix C) , the time lags measured using SRLC and ESELCE are applied as shown in Figure 3 .on the Reference electric field ve test electric field curves , and the from the electric field values corresponding to these time lags , a time lag gain of approximately $\Delta T = 477 \mu S$ was determined .

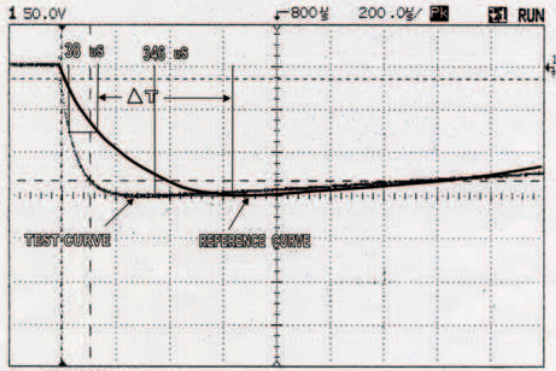



Figure 3. Triggering time advance determination for ESELCE


4. RESULT

The measurements and the analysis of the results indicated that ESELCE sample provided an important advance in the triggering time with respect to SRLC .

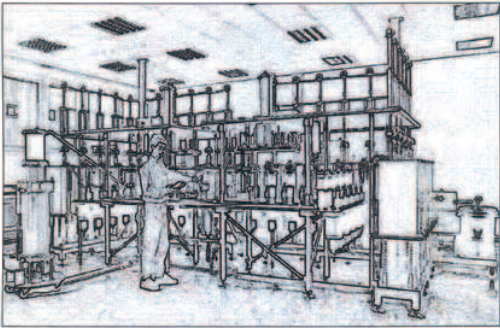
Prof. Dr. Mirzahan HIZAL
Dept. of Electrical and Electronics Eng.
Middle East tech. University
ANKARA



NFC 17 102 Test Result Certificate



Test report



Report number: BET/Detakom-A5 07-08-14-1 e

Date of test: 2007-07-24

Test engineer: Dipl.-Ing. M. Benzin


Customer: Erkoc Muhendislik – Erol Koc

Device under test: Detakom-A5 ESE Active Lightning Conductor

Test requirements: Impulse current test with 3 x 100kA

Page 1 / 20

Cover Page



Report number: BET/Detakom-A5 07-08-14-1 e

Date of test: 2007-07-24

Test engineer: Dipl.-Ing. M. Benzin Page 5 / 20

Used oscilloscope

Manufacturer: Agilent

Type: 54624A

Series-No.: MY 10002936

Ident.-No.: P603007

Channels: 4

Bandwidth: 100 MHz

Sampling rate: 200 Msa/s

Last calibration: 30.08.2005

Next calibration: 30.08.2007

Page 5 / 20

9 Measured results

Test name : Erkoc-A5-070724		Date : 24.07.2007 11:12:05				
Counter	Test sample	Channel: Current				
		Peak Value	Front Time	Charge	Specific Energy	Duration
4	1252	98.4 kA	23.1 µs	53.2 As	2.78 MA²s	1.50 ms
5		98.4 kA	22.8 µs	55 As	2.87 MA²s	1.50 ms
6		98.4 kA	22.7 µs	54.7 As	2.85 MA²s	1.45 ms
7	1253	99.2 kA	23.5 µs	51.7 As	2.69 MA²s	1.45 ms
8		98.4 kA	23.1 µs	51 As	2.64 MA²s	1.50 ms
9		99.2 kA	23.1 µs	52.8 As	2.75 MA²s	1.45 ms
10	1254	100 kA	23.6 µs	51.3 As	2.62 MA²s	1.50 ms
11		99.2 kA	22.6 µs	54.1 As	2.83 MA²s	1.50 ms
12		100 kA	23.1 µs	53.8 As	2.85 MA²s	1.45 ms

Table 1: recorded parameters of the current impulses


The current impulses comply with the test parameters of the first short stroke of table C.1 of IEC 62305-1 "Protection against lightning – Part 1: General principles" (2006-01) / EN 62305-3 "Protection against lightning – Part 1: General principles" (2006-02) for lightning protection level (LPL) III - IV.

The oscillograms of the current impulses are given in annex B.

The test is performed at a temperature of 20 - 21 °C, a relative humidity of 68 - 70 % and an air pressure of 979 - 980 mbar.

This report only explains the samples submitted for test and does not produce evidence for the quality of standard fabrication. Publishing or copying is subject to prior permissions of BET GmbH.

Test Value



Report number: BET/Detakom-A5 07-08-14-1 e

Date of test: 2007-07-24

Test engineer: Dipl.-Ing. M. Benzin Page 8 / 20

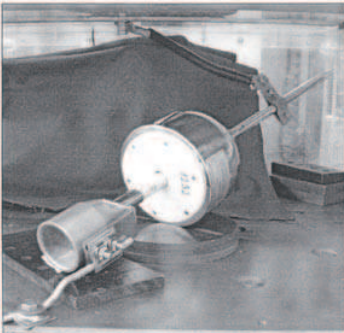


Figure 1: Test arrangement, connection of the DUT to the lightning current generator

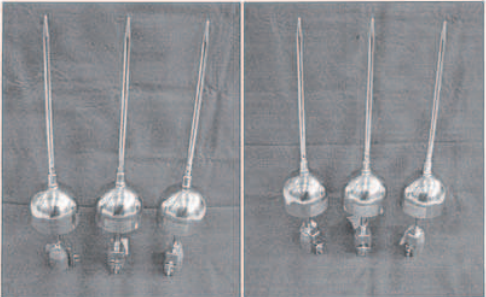



Figure 2 and 3: Test samples before and after the impulse current test

This report only explains the samples submitted for test and does not produce evidence for the quality of standard fabrication. Publishing or copying is subject to prior permissions of BET GmbH.

Test Moment



Report number: BET/Detakom-A5 07-08-14-1 e

Date of test: 2007-07-24

Test engineer: Dipl.-Ing. M. Benzin Page 9 / 20




Figure 4 and 5: Test sample 1252 before and after the impulse current test




Figure 6 and 7: Test sample 1254 before and after the impulse current test




Figure 8 and 9: Test sample 1253 before and after the impulse current test

This report only explains the samples submitted for test and does not produce evidence for the quality of standard fabrication. Publishing or copying is subject to prior permissions of BET GmbH.

Test Pictures

ERA

Certificate of Assessment

European Quality Assurance Limited
hereby grants to

ERKOÇ Mühendislik Elektrik İmalat.
Sanayi Cad. Ortak Han No:31/26 ULUS -ANKARA
whose Quality Management System is in conformance with

TS EN ISO 9001:2000

the right to be listed in the Quality Register of Quality Assessed Companies
for the following scope(s)

Installation and Service of Active and Faraday Lightning Conductors and Electrical
Systems; Production of Earthing Components.
Aktif ve Faraday Tipi Paratonerler ve Elektrik Sistemleri Tesisi ve Servisi;
Topraklama Malzemeleri İmalatı.

Signed *John Tinsley* DIRECTOR / SCHEME MANAGER
on behalf of European Quality Assurance Limited

This Certificate of Assessment Number 4515 first issued on 29th August 2003
is valid until 10th September 2009
and is issued subject to the regulations, and within the accredited scope, of

European Quality Assurance Limited
Navigation House, 48 Millgate
Newark, Nottinghamshire
NG24 4TY

Further information regarding the scope of this certificate and the applicability of ISO 9001:2000 requirements may be obtained by contacting ERA.
The use of the assessment mark indicates a certificate in respect of the activities covered by the assessment certificate number 4515.

Doc. No. Certificate Issue 3 February 98

Erkoç ISO Certificate

ERKOÇ® ELEKTRİK
İmalat Taah. İth. İhr. San. ve Tic. Ltd. Şti.

Sanayi Cad. Ortak Han No: 31/26
Ulus-ANKARA - TURKEY
Tel: +90 (312) 312 56 17
Fax: +90 (312) 310 90 81
www.erkocimalat.com
erkoc@erkocimalat.com

WARRANTY CERTIFICATE

DETAKOM

Erkoc Elec. Co. clarifies that lightning protection material, which series number has given below, has/have 10 years average life-time when regular installation, maintenance and checking are performed to NFC 17102.

Material	Serial No	Date of Purchase
Detakom-AS	0318	10/02/2006

Erkoc Elec. Co. warrants that these units have undergone satisfactorily all the quality control tests and revisions, and that units are guaranteed against manufacturing defects or malfunction for twelve (12) months from purchase date. During the warranty period, this material will be replaced by Erkoc Elec. Co. free of charges in the case of defect.

Manufacturer: **Erkoc Elec. Co. General Manager Erol KOÇ**
 General Distributor: **Erkoc Engineering**
 Distributor: **ERKOÇ MÜHENDİSLİK EİK. Müh. EROL KOÇ ELEKTRİK - PARATONER - TAHHÜT**
 Sanayi Cad. Ortak Han No: 31/26 Ulus
 Tel: 312 56 17 Fax: 310 90 81 ANKARA
 Akademi Oto San. Sit. Cad. 770 Sk. No: 346
 Tel-Fax: 346 51 21 Yenimahalle - ANKARA
 ULUS V. D. 363 003 2335

Erkoç Warranty Certificate

T.C. SANAYİ VE TİCARET BAKANLIĞI
TÜKETİCİNİN VE REKABETİN KORUNMASI
GENEL MÜDÜRLÜĞÜ

GARANTİ BELGESİ

Belgenin Onay Tarihi ve Sayısı: **29.05.11.12.05**

Bu Belgenin kullanılmasında; 4077 sayılı Tüketicinin Korunması Hakkında Kanun ve bu Kanun'a dayanılarak yürürlüğe konulan Garanti Belgesi Uygulama Esaslarına Dair Yönetmelik uyarınca, T.C. Sanayi ve Ticaret Bakanlığı Tüketicinin ve Rekabetin Korunması Genel Müdürlüğü tarafından izin verilmiştir.

Serdar KENTURAN
Başkan
Genel Müdürlük Yürütme Kurulu

İMALATÇI/İTHALATÇI/FİRMANIN

UNVANI : ERKOÇ MÜHENDİSLİK - EROL KOÇ
MERKEZ ADRESİ : SANAYİ CADDESİ ORTAK HAN NO:31/16 ULUS/ANKARA
TELEFONU : 0 312 334 28 90
TELEFAKSI : 0 312 310 90 61
FİRMA YETKİLİSİNİN İMZASI-KAŞESİ : *Erol KOÇ*

MALIN

CİNSİ : PARATONER TESİSATI
MARKASI : ERKOÇ
MODELİ : KULLI LİSTESİ
BANDROL VE SERİ NO :
TESLİM TARİHİ VE YERİ :
GARANTİ SÜRESİ : 2 YIL
AZAMI TAMİR SÜRESİ : 30 GÜN

SATICI FİRMANIN

UNVANI :
ADRESİ :
TELEFONU :
TELEFAKSI :
FATURA TARİHİ VE NO :
TARİH-İMZA-KAŞE :

Republic Of Turkey Ministry Of Industry And Com-Merce Protection Of Consumers And Competition Directorate General Warranty Certificate

T.C. TÜRK PATENT ENSTİTÜSÜ

TASARIM TESCİL BELGESİ

TESCİL NUMARASI : 2003 00662

Bu belge ekinde yer alan tasarım, 21/03/2003 tarihinde tescil edilmiş olup 554 Sayılı Endüstriyel Tasarımların Korunması Hakkında Kanun Hükmünde Kararname'nin 12 nci maddesi gereğince 5 yıl süre ile korunmaktadır. İşbu belge 29/12/2005 tarihinde düzenlenmiştir

Naim UĞUR
Endüstriyel Tasarımlar Dairesi Başkanı

TÜRK PATENT [] ENSTİTÜSÜ

Turkish Patent Institute Design Registration Certificate

DETAKOM[®]-A5 Active Lightning Conductor

It was tested in 2005 in METU and in 2008 in ICMET CRAIOVA in line with French NF C 17-102 (Appendix C) Standard.

Detakom[®]-A5 Active Lightning Conductor Diameter Calculation:

Rp = Protection Radius

h = Rooftop Pole Free Height

D = Triggering Distance according to NFC 17-102 Standard

1) Calculating Very Sensitive Protection Field = 20 m

2) Calculating Sensitive Protection Field = 45 m

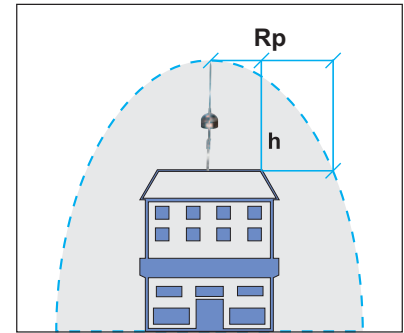
3) Calculating Standard Protection Field = 60 m

ΔL = Warning Path (m)

ΔL (m) = $V(m/\mu s) \times \Delta T(\mu s)$

ΔT = Early Streamer Gain (Triggering Step) (μs)

Rp = $\sqrt{[h \times (2 \times D - h) + \Delta L \times (2 \times D + \Delta L)]}$ h ≥ 5 mt (Not: for h < 5 mt please look at following table)

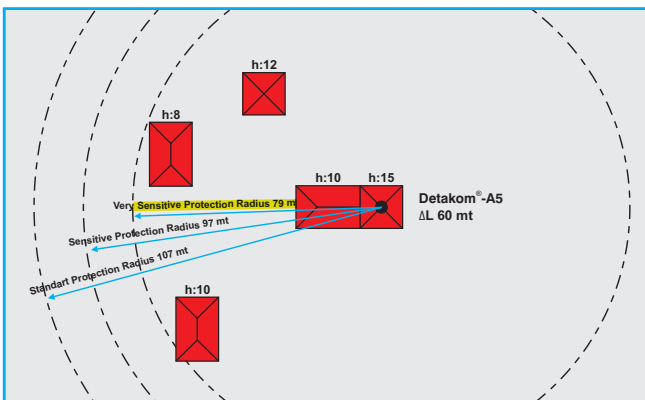


ESE Lightning Conductor Schematic Protection Field

1- HOW TO REACH ΔT (μs) (EARLY STREAMER GAIN): In tests conducted in accordance with **NFC 17 102**, 100 lightning discharges with the same amplitude and power are applied to a simple rod (SR) and to the Active Lightning Conductor (ESE) each. The time of arresting the lightning and conducting it to the ground for both SR and the ESE are measured and their averages are taken. The ΔT value that indicates the superiority of the lightning conductor over the simple rod is established by comparing **T_{ESE}** and **T_{SR}** values by the help of a reference curve on the graphic.

2- HOW TO CALCULATE DIAMETER ACCORDING TO NFC 17 102 STANDARD: by The diameter is calculated by applying the ΔT value found to the formula (**Rp**) indicated in **NFC 17 102** Standard and mentioned above. In the applications, the biggest ΔT value for active lightning conductors is accepted as 60 μs. In these cases, when the ΔT value exceed **60 μs**, the maximum value is taken as **60 μs**.

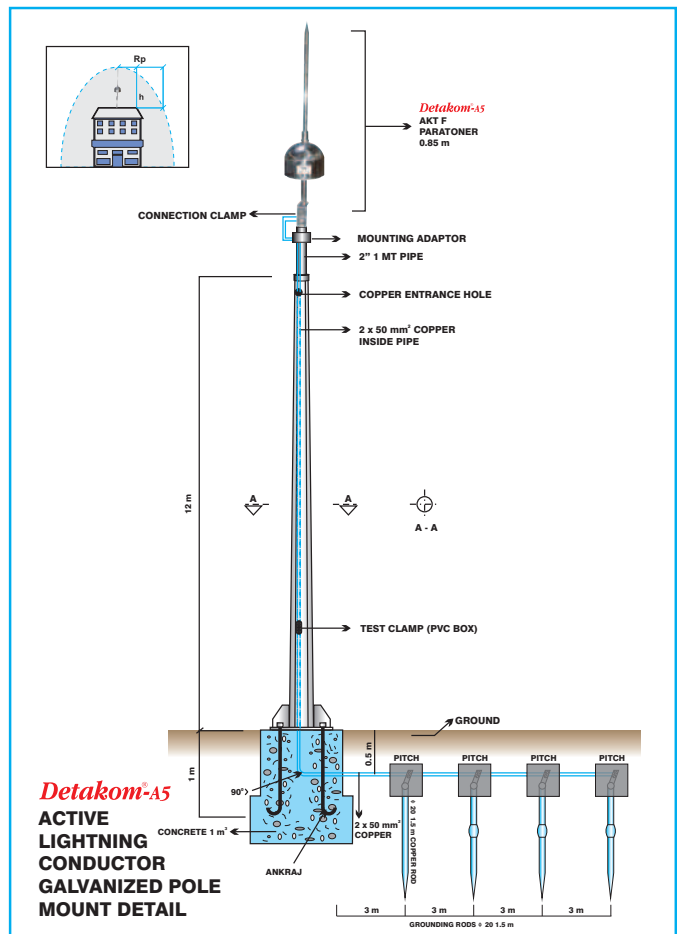
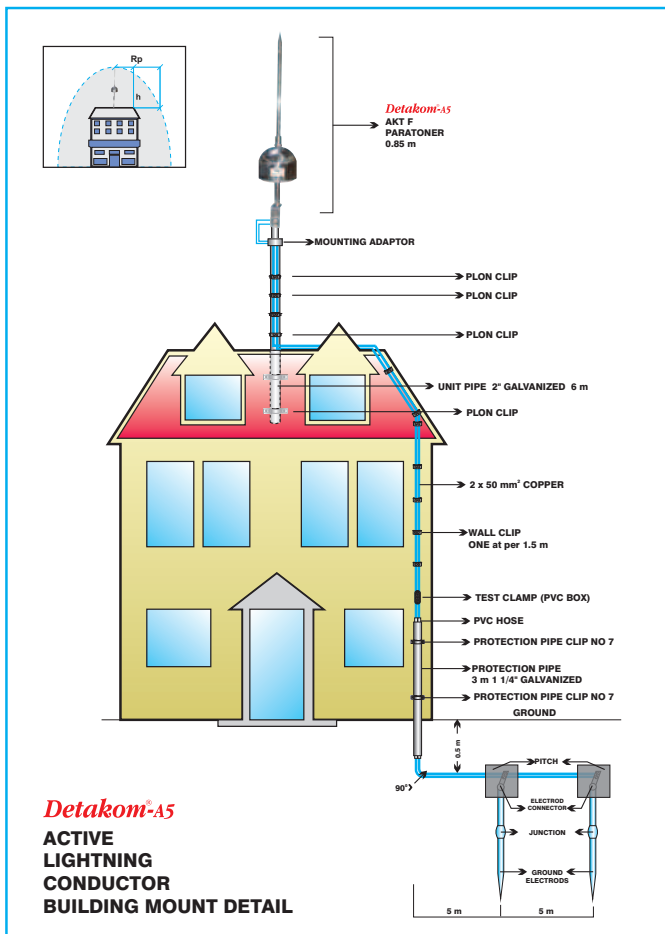
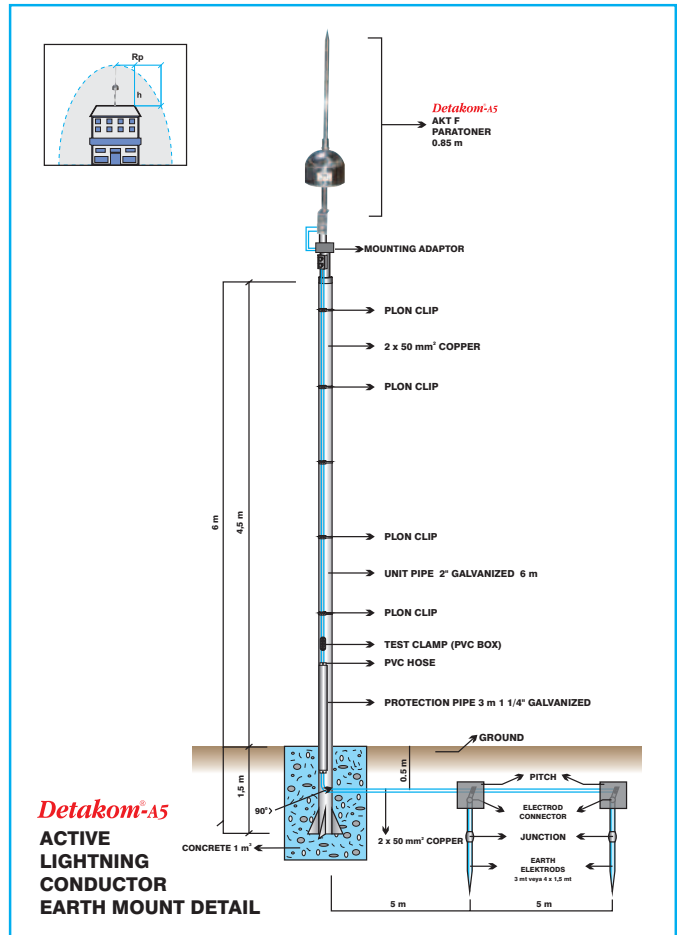
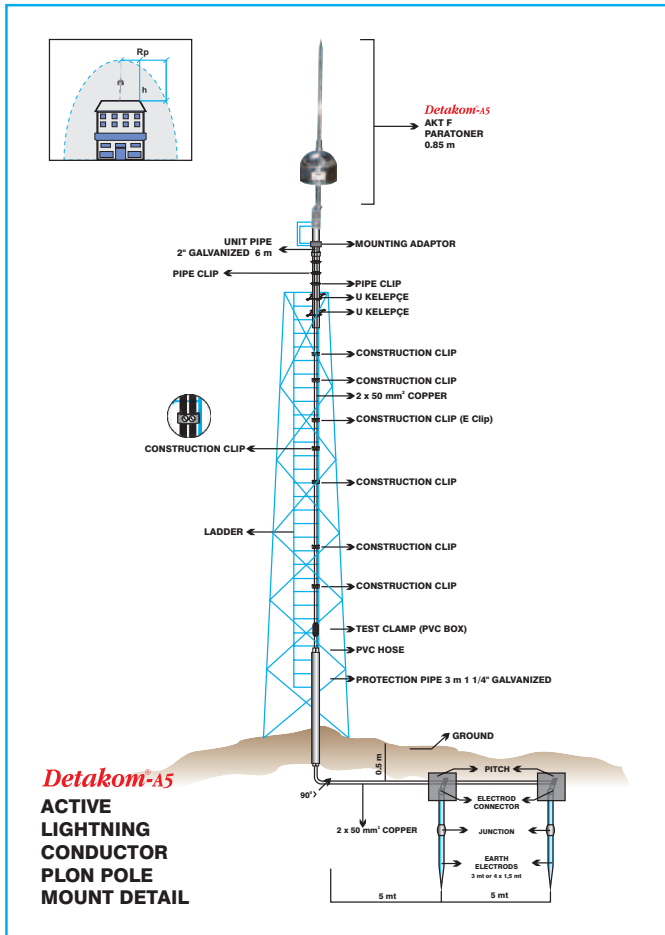
(Although the ΔT of **Detakom[®]-A5** Lightning Conductor is over **60 μs**, in the safety diameter calculation it is taken as **ΔT:60 μs**)



Typical Project

Protection Level	I (D = 20 mt)	II (D = 45 mt)	III (D = 60 mt)
	Very Sensitive		Sensitive
Detakom [®] -A5	Detakom [®] -A5 ΔL 60 mt	Detakom [®] -A5 ΔL 60 mt	Detakom [®] -A5 ΔL 60 mt
h (mt)	Protection Radius Rp (mt)		
2	32	40	44
4	64	78	87
5	79	97	107
6	79	97	107
10	79	99	109

Diameter Diagram





Philippines



Vietnam

Our Distributors

Vietnam
 Philippines
 Sri Lanka
 Bulgaria
 Russia
 Iran
 Cyprus
 India
 Ethiopia
 Uruguay
 Nigeria
 Indonesia
 Croatia

Other Abroad References

Azerbaijan
 Georgia
 Iraq
 Algeria
 Yemen

ERKOÇ OBSTRUCTION LIGHT

Obstruction Light PROPERTIES:

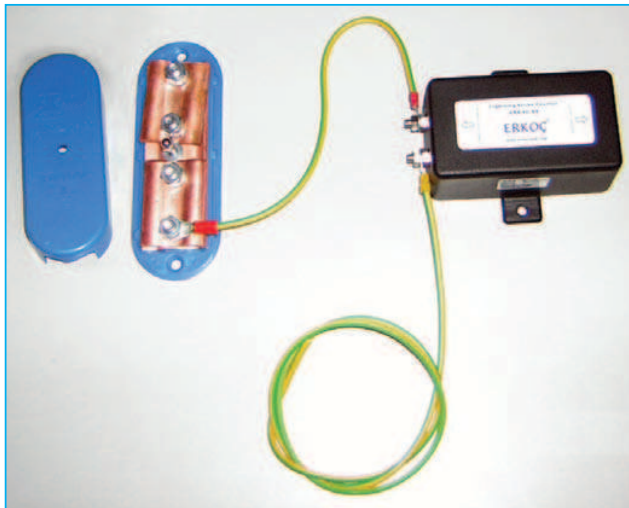
- 1- Triggering time of the primary lamp photocell is 1 second.
- 2- If the first lamp is off, then second turns on automatically.
- 3- At the morning lamp automatically turn off.
- 4- Resisted outside weather condition with compact cast iron body and seal.
- 5- Supply voltage is 220 V, by directly with clamp in square iron cast body.
- 6- Cast iron body is kiln-dry paint.
- 7- Red caps can be covered optionally with a metal wire cage.
- 8- According to Ip65 standard.
- 9- 1 (one) year of warranty.
- 10- Total weight except mounting pipe 6 Kg.
- 11- Red caps is polycarbon; does nor burn, melt or break down.
- 12- Packaging dimensions: 50 x 50 x 20 cm



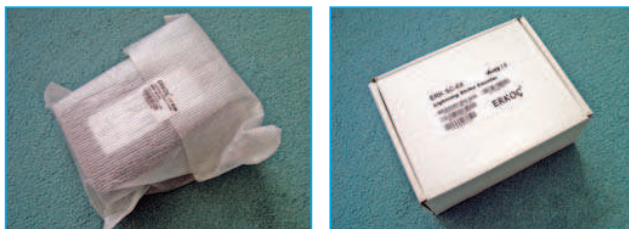
ERK SC-6X

ERK SC-6X is designed to count actual lightning strikes to a tower or to other conductive object (pipeline, coax line, etc) The counter is watertight and may be placed outdoors. However, the unit should be mounted to where it will readily drain and not be subject to standing water. The stud connections should be electrically attached to the tower using 14 AWG wire and be separated by approximately 8 feet. The inductive voltage drop due to a lightning strike will actuate the counter. Nearly strikes will not be counted unless the 8 feet separation between is increased. A log should be kept to record the date and counter reading. To test your counter, a 9V supply may be momentarily applied, in either polarity, to open circuited stud connections.

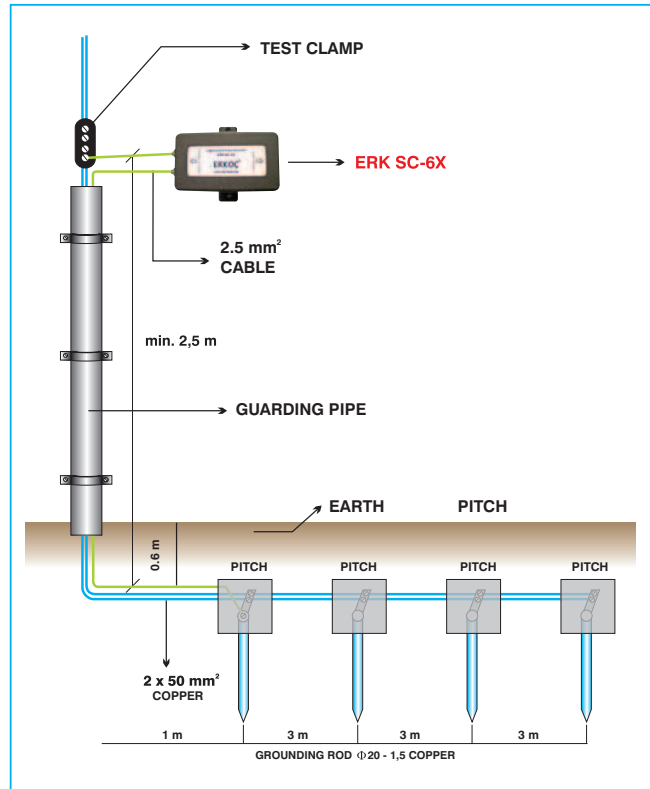
The ERK SC-6X requires a $0.5 \mu\text{H}$ inductance shunt to count nature's smallest lightning strike (3kA). This inductance can be in the form of a wire length, tower or pipe segment. To calculate use the following approximations: $0.3 \mu\text{H}$ per Foot per Wire $0.067 \mu\text{H}$ per Foot for Triangular Tower $0.150 \mu\text{H}$ per Foot for 6" and Up Pipe.



CONNECTION TO TEST CLAMP



PACKAGE



MOUNTING TO CIRCUIT

HARÇER ULTRAFILL™

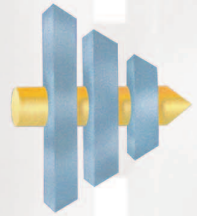
Earth Enhancement Material

ULTRAFILL is a low resistance carbon based backfill material, which dramatically lowers ground system resistance in difficult soil situations. Ultrafill contains no bentonite or concrete components, which, in very dry conditions, can cause shrinkage around the ground electrode, thus rendering it ineffective.

ULTRAFILL is ideal for use in rocky soil, sand, gravel or any other high resistance soil conditions. It is also the ideal backfill material for use around enhanced ground rods and ground grid systems.

ULTRAFILL is easy to use, safe and effective. Unlike other backfill products, Ultrafill is dust free and does not require mixing in water prior to installation. (However, Ultrafill does mix readily with water if required).

ULTRAFILL may be either used in a horizontal trench or grid, or in vertical applications.



HARÇER ULTRAWELD

Exothermic Welding



Ultraweld Process:

The Ultraweld process is an effective and safe method of welding copper to copper or copper to steel for the purpose of producing permanent electrical connections. Ultraweld exothermically welded connections are produced from the energy and molten copper metal liberated from an exothermic reaction between powdered copper oxide and aluminum. The reaction takes place at a theoretical temperature of 4600°F and as a result, molten copper alloy is created and used to melt the conductors and cast the finished connection. The exothermic reaction takes place in a semipermanent graphite mold that will last 50 or more welds if properly cared for. The process is simple and easy to implement providing an on-site means to make welded electrical connections without requiring external power, equipment or the special training usually required for brazing and welding. The process will provide a finished connection that will never corrode, loosen or increase in resistance. The finished connection also provides an ampacity that exceeds that of the conductors being joined.

