



# **LIGHTNING PROTECTION SYSTEMS**





# EUROPEAN TECHNOLOGY

RESEARCH + DEVELOPING + INNOVATION

- Our product are safe and effective.
- We offer solutions tailored to the needs and demands of our costumers.
- We are innovating by incorporating new technologies in lightning protection systems.
- We have high knowledge on lightning protection systems.
- We provide high quality care, professional, close and personalized.
- Our products and services have an excellent price/quality ratio.
- We are rigorous in meeting our commitments.
- We have highly qualified technical personnel.
- We are highly respectful of the environment.
- We believe in human values.
- You will fell safe with our products.

## Aiditec Systems, S.L.

Innovative technology-based company, with a high knowledge of the technique and the market of lightning protection, which researches, develops, manufactures and distributes innovative and technologically advanced products. Our main objective is to meet the needs and expectations of our customers by offering innovative high-tech solutions tailored to their needs and requirements. We are professional experts in lightning protection systems, with accumulated experience of more than 50 years and with proven knowledge and experience in different areas such as:

- Industrial design
- Engineering
- Marketing
- Quality
- Management and logistics
- Production

# Design and manufacturing

Our products meet all the requirements established in current regulations and have been designed, manufactured and verified according to the most demanding quality standards. In addition, all the materials used are of spanish origin.

We have certifications of accredited bodies, official and independent to give maximum guarantees. All our lightning rods have a lifetime warranty.

## Services

### PROJECTS

Our engineering team is qualified to carry out lightning protection projects, situation analysis and projection of the most suitable solution to provide the most effective protection.

### ADVICE

Technical advice to all types of professional in the sector for the correct installation of atmospheric discharge protection systems.

### TRAINING COURSES

We offer training courses for all kinds of professionals who want to acquire knowledge of lightning protection so that they can perform installations, checks, maintenance, etc.

### REVISIONS

We carry out reviews of complete lightning protection systems throughout the national territory. In this way, the correct functioning of the installations over time is ensured and, in addition, we comply with what the UNE standards establish.

### CALCULATION OF THE RISK INDEX

We make risk calculations. This calculation is what determines if a building or structure needs or not a lightning protection system according to regulations. It can also be done without cost and at any time by entering in our web.



# Revisions and maintenance

## WHY SHOULD LIGHTNING PROTECTION SYSTEMS BE VERIFIED?

- Because a deficient system pose greater risk than its non-existence.
- Because there are standards that regulate the installation and maintenance of these systems.
- Because correct maintenance ensures the effectiveness of the system.

## WHAT DO THE UNE STANDARDS INDICATE REGARDING THE REVISIONS?

According to these standards, it is necessary to carry out revisions of these systems in following cases:

- Initially, when you have finished installing the system.
- Every time the building or structure to be protected is modified or repaired.
- When a lightning strike has occurred (counter required).
- When other facilities that may be affected are added.
- Periodically, according to table 7 contained in the UNE standards.
- At least once a year, except for buildings or structures with risk of explosion, where checks will be carried out twice a year.

## CHECK POINTS

- ESE lightning rod. That is appropriate and sufficient for what you need to protect.
- Height. Ensure that the tip of the ESE is at least 2 meters above any element within its protection zone, including antennas.
- N° of down conductors. Minimum 2 for each system.
- Trajectory, location and continuity.
- Fixings. That the mechanical fixings of the different elements are in correct condition.
- Safety distances. Check that they are complied with throughout the route of the system and with respect to all installations.
- Equipotential bonding. Verify that the corresponding equipotential bonds are in correct condition.
- Resistance. Check that the ground is below 10 ohms.

## TECHNICAL REPORT

Each review should be registered in a detailed technical report that includes all the results of this revision, as well as the corrective measures to be taken if necessary.

# Lightning protection system

Lightning can affect us fundamentally in two, either by direct impact or through an overvoltage, so a complete lightning protection system is made up of two systems; one of external protection against direct impacts, and the other of internal protection to counteract the effects produced by overvoltages.

The installation of a lightning protection system designed and installed in accordance with the standards minimizes the consequences of lightning as much as possible. On the other hand, to keep the system in perfect condition over time, it will be necessary to carry out periodic reviews and maintenance.

## WHY SHOULD WE INSTALL A LIGHTNING PROTECTION SYSTEM?

There are different reasons for installing a lightning protection system, but they could be reduced to two fundamentally:

1. Having a lightning protection system is the best option to protect people, animals, structures, machinery and facilities against this natural phenomenon.
2. To comply with the norms that regulate the installation of these systems. According to these standards, in some cases the installation will be mandatory, necessary or recommended. To determine this question, the calculation of the risk index must be performed. Different factors are taken into account in this calculation, but basically two are taken into account; the probability of impact and the consequences derived from it. Among the structures in which installation of a lightning protection system will be necessary are:
  - Buildings or open areas with public attendance.
  - High-rise buildings.
  - Constructions or tanks in which toxic, radioactive, flammable or explosive substances are handled or contain and of course ATEX areas.
  - Buildings containing especially vulnerable or valuable equipment or documents.
  - In general, structures used for commercial, industrial, agricultural, administrative or residential purposes.

In addition, it should be borne in mind that insurers recommend the installation and maintenance of these protection systems to be able to adjust the amounts of the insurance, since in this way they understand that the user is using the appropriate means to protect himself from lightning and its effects.



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ADVANCE+.....	pg. 9
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<b>FUNCTIONING OF ESE LIGHTNING RODS</b>	
<p>When a storm forms, there is an increase in atmospheric electrical potential that can exceed 10kV/meter quickly. The ESE internal device stores this energy in the electro-atmospherical capacitor, which is formed by the outer metal casing and the earthed shaft.</p> <p>With this increase of potential, two things happen at the same time; the first is that a downwards stream is created from the clouds to the ground, and the second is that an upward artificial stream is created by lightning rod. This ascending stream intercepts the descending one, guiding the electric discharge through the lightning rod and conducts it to the ground safely.</p> <p>The time that the upward stream of an ESE lightning rod forward to a stream created by any passive element, such as a Franklin rod, is what determines the radius of protection. This is what is known as advance time in priming (<math>\Delta t</math>). Therefore, there are different ESE models with different advance times depending on the meters of protection needed in each case.</p>	
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# ISO 9001 certificate







# ESE ADVANCE<sup>+</sup>

## PROTECTION GUARANTEE

The ESE ADVANCE+ made of stainless steel AISI 316L has successfully passed the tests based on the UNE 21186, NFC 17102 and NP 4426, for early streamer emission lightning rod (ESE).

### DIMENSIONAL

Ensures that the dimensions are standardized.

### OF CURRENT (200 kA - 10/350 µs)

Ensures its functioning after several lightning strokes.

### SALINE MIST AND HUMID SULPHUROUS ATMOSPHERE

Certifies resistance in corrosive environments.

### ADVANCE TIME

Guarantees the protection radii.

## SECURITY FACTOR

Protection radii calculated based on the CTE, UNE 21186, NFC 17102 and NP 4426 standards, applying a minimum security factor of 10 microseconds.

## INCORPORATION OF NEW TECHNOLOGIES

As a result of investigations made and the R + D projects, the ESE ADVANCE+ incorporates the following new technologies:

### SAT - STABILIZATION OF ADVANCE TIME

It achieves a maximum deviation of 5% in the advance time performed according to product certification regulations, which guarantees the stability of the lightning rod.

### FBD - FORCED BLOW DEIONIZATION

Allow quick deionization arc chamber, which ensures that the lightning rod is in perfect condition to capture a new discharge.

### IAW - INSULATION ASSURANCE WATER

Maintains permanently isolated the electrodes of the lightning rod which have to be at a different potential; ensuring lightning rod operation in extreme wet conditions.

### EOA - EXTENSION OF ARC

Maintains proper tension between the electrodes of the lightning rod that are different potential, ensuring its perfect running.

## WARRANTY

All ESE ADVANCE+ have limited international lifetime warranty against manufacturing defects.\*

\*[www.aiditecsystems.com/warranty](http://www.aiditecsystems.com/warranty)

**INFORME DE ENSAYO IE-ITE-110471-2/M1/EN**  
ALTA TENSION

**INFORME DE ENSAYO IE-ITE-110471-4**  
ALTA TENSION



## ISOLATING SYSTEM "ISOLATED RAIN"

### TOTAL ISOLATION GUARANTEE

In ESE lightning rods it is essential to guarantee the insulation between the armor or electrodes that make it up and which are at different potential.

If in adverse weather conditions (heavy rain) this insulation is lost, the priming device would stop working and therefore the lightning conductor can not offer the specified protection.

The ESE ADVANCE<sup>+</sup> lightning rod ensures operation of triggering device and its effectiveness in protecting thanks to the "Isolated Rain" system.

This system guarantees total insulation in extreme rain conditions, provided by the insulating sleeves that surround the electrodes that must permanently maintain the insulation. This prevents the rain from bringing the metallic body of the lightning rod (at atmospheric potential) into contact with the metallic axis (at ground potential).



### THE ISOLATING SYSTEM "ISOLATED RAIN" GUARANTEED THE PERFECT OPERATION UNDER EXTREME RAIN:

- When the electric field varies during storm
- During the approach of the downward leader

### INSTALATION

The ESE ADVANCE<sup>+</sup> installation must be performed as described in the technical building code (CTE) and the UNE 21186, NFC 17102 and NP 4426.



Reference		Model	PROTECTION LEVEL			
			I	II	III	IV
			(Pr for 6 m height in relation to the plane to be protected)			
900 101		ADVANCE+ A1	55	60	70	80
900 102		ADVANCE+ A2	80	87	97	107
Pr = Protection radii in meters according CTE SU8, UNE 21186, NFC 17102 and NP 4426.						

# ESE ADVANCE+ CERTIFICATES

CERTIFICADO DE ENSAYO / TEST CERTIFICATE



## PDC ADVANCE+ A1 · ESE ADVANCE+ A1

ENSAYOS\* REALIZADOS EN BASE A LAS NORMAS / RELATED TESTS\* BASED ON THE STANDARDS

NFC 17102 - UNE 21186 - NP 4426

ENSAYOS MECÁNICOS / MECHANICAL TESTS

ENSAYOS AMBIENTALES / ENVIRONMENTAL TESTS

ENSAYOS ELÉCTRICOS / ELECTRICAL TESTS

Resistencia a la energía de la descarga con forma de onda 10/350 µs  
Energy resistance of the discharge with waveform factor of 5 µs

200 kA

ENSAYOS DE AVANCE EN EL CEBADO / ADVANCE TIME TESTS

Tiempo de avance en el cebado con factor de seguridad mínimo de 5 µs  
Advance time with minimum safety factor of 5 µs

37 µs

GARANTÍA DE AISLAMIENTO ENTRE ELECTRODOS  
ISOLATION GUARANTEE BETWEEN ELECTRODES

RADIOS DE PROTECCIÓN / RADII PROTECTION



H	RADIOS DE PROTECCIÓN / RADII PROTECTION	
	NIVEL / LEVEL I	NIVEL / LEVEL II
2	22	24
3	33	36
4	45	49
5	55	60
6	55	60
8	56	61
10	57	62
15	58	63
20	59	64

Radios de protección en metros según normas  
Radii protection in meters according standards

H = Altura de la punta con relación al plano a proteger en metros  
H = Height of the lightning rod in relation to the plane to be protected in meters

En las instalaciones en las que exista riesgo de peligro o contaminación del medio ambiente se aplicará un factor de seguridad del 40% sobre los radios de protección de esta tabla.  
On site where there is danger or risk of environmental pollution it will be applied a safety factor of 40% over the radii of protection of this table.

\*Ensayos realizados en el Instituto Tecnológico de la Energía (ITE)

AIDITEC SYSTEMS, S.L. C/ Torres 7, Bajo derecha 46018 Valencia (SPAIN)

CERTIFICADO DE ENSAYO / TEST CERTIFICATE



## PDC ADVANCE+ A2 · ESE ADVANCE+ A2

ENSAYOS\* REALIZADOS EN BASE A LAS NORMAS / RELATED TESTS\* BASED ON THE STANDARDS

NFC 17102 - UNE 21186 - NP 4426

ENSAYOS MECÁNICOS / MECHANICAL TESTS

ENSAYOS AMBIENTALES / ENVIRONMENTAL TESTS

ENSAYOS ELÉCTRICOS / ELECTRICAL TESTS

Resistencia a la energía de la descarga con forma de onda 10/350 µs  
Energy resistance of the discharge with waveform factor of 5 µs

200 kA

ENSAYOS DE AVANCE EN EL CEBADO / ADVANCE TIME TESTS

Tiempo de avance en el cebado con factor de seguridad mínimo de 5 µs  
Advance time with minimum safety factor of 5 µs

60 µs

GARANTÍA DE AISLAMIENTO ENTRE ELECTRODOS  
ISOLATION GUARANTEE BETWEEN ELECTRODES

RADIOS DE PROTECCIÓN / RADII PROTECTION



H	RADIOS DE PROTECCIÓN / RADII PROTECTION			
	NIVEL / LEVEL I	NIVEL / LEVEL II	NIVEL / LEVEL III	NIVEL / LEVEL IV
2	32	34	39	44
3	47	52	58	64
4	63	68	78	85
5	79	86	97	107
6	80	80	97	107
8	80	87	98	108
10	80	88	99	109
15	80	89	101	111
20	80	89	102	113

Radios de protección en metros según normas  
Radii protection in meters according standards

H = Altura de la punta con relación al plano a proteger en metros.  
H = Height of the lightning rod in relation to the plane to be protected in meters.

En las instalaciones en las que exista riesgo de peligro o contaminación del medio ambiente se aplicará un factor de seguridad del 40% sobre los radios de protección de esta tabla.  
On site where there is danger or risk of environmental pollution it will be applied a safety factor of 40% over the radii of protection of this table.

NFC 17102 / UNE 21186 / NP 4426

\*Ensayos realizados en el Instituto Tecnológico de la Energía (ITE) / \*Test performed by Energy Technological Institute (ITE)

AIDITEC SYSTEMS, S.L. C/ Torres 7, Bajo derecha 46018 Valencia (SPAIN) TEL: +34 963 842 957 www.aiditecsystems.com



**S  
I  
G  
M  
A<sup>+</sup>**

**AIDITEC**  
SYSTEMS

ESE Model S3

$\Delta t = 60 \mu s$

Serial Nr.

200 KA - 10/350  $\mu s$

UNE 21186 - NFC 17102 - NP 4426 - CTE BUI



WARRANTY

**ESE SIGMA<sup>+</sup>**





## TECHNICAL SPECIFICATIONS

Double triggering device:

- Generator anticipation of the upward leader
- Circuit for storing electrical charges

Operation in any weather condition

Guarantee isolation between electrodes

Fully autonomous and maintenance-free

## TEST AND CERTIFICATES

Test performed at the Technological Institute of Energy (ITE) and based on the UNE 21186, NFC 17102 and NP 4426.

- Mechanical
- Electrical
- environmental
- Advance time

## BENEFITS

- Security factor of 5  $\mu$ s as a minimum in the protection radii
- Efficiency at 100% discharge
- High level of protection
- Electrical continuity
- No resistance to the passage of each download
- Maintains its properties to the passage of each download

## STANDARDS AND INSTALLATION




For installation it is recommended to follow the guidelines established in the following standards: UNE EN 62305 - UNE 21186 - NFC 17102 - NP 4426 - CTE - REB

## WARRANTY

All ESE SIGMA+ have limited international lifetime warranty against manufacturing defects.\*

[\\*www.aiditecsystems.com/warranty](http://www.aiditecsystems.com/warranty)



Reference		Model	PROTECTION LEVEL			
			I	II	III	IV
			(Pr for 6 m height in relation to the plane to be protected)			
800 101		SIGMA+ S1	40	50	55	65
800 102		SIGMA+ S2	65	70	80	90
800 103		SIGMA+ S3	80	87	97	107
Pr = Protection radii in meters according CTE SU8, UNE 21186, NFC 17102 and NP 4426.						

# ESE SIGMA+ CERTIFICATES

CERTIFICADO DE ENSAYO / TEST CERTIFICATE

**PDC SIGMA+ S1 · ESE SIGMA+ S1**

ENSAYOS\* REALIZADOS EN BASE A LAS NORMAS / RELATED TESTS\* BASED ON THE STANDARDS

NFC 17102 - UNE 21186 - NP 4426

ENSAYOS MECÁNICOS / MECHANICAL TESTS

ENSAYOS AMBIENTALES / ENVIRONMENTAL TESTS

ENSAYOS ELÉCTRICOS / ELECTRICAL TESTS

Resistencia a la energía de la descarga con forma de onda 10/350 µs  
Energy resistance of the discharge with waveform factor of 5 µs

200 kA

ENSAYOS DE AVANCE EN EL CEBADO / ADVANCE TIME TESTS

Tiempo de avance en el cebado con factor de seguridad mínimo de 5 µs  
Advance time with minimum safety factor of 5 µs

25 µs

GARANTÍA DE AISLAMIENTO ENTRE ELECTRODOS  
ISOLATION GUARANTEE BETWEEN ELECTRODES



H	RADIOS DE PROTECCIÓN / RADIUS PROTECTION	
	NIVEL / LEVEL I	NIVEL / LEVEL II
2	16	20
3	24	30
4	32	40
5	39	49
6	46	56
8	60	72
10	71	83
15	92	107
20	113	133

Radio de protección en metros según normas  
Radius protection in meters according standards

H = Altura de la punta con relación al plano a proteger en metros.  
H = Height of the lightning rod in relation to the plane to be protected in meters.

En las instalaciones en las que existe riesgo de peligro o contaminación superior del 40% sobre los radios de protección de esta tabla, se aplicará un factor de seguridad de 1,25.

\*Ensayos realizados en el Instituto Tecnológico de la energía (ITE) / Test performed by Energy Technological Institute (ITE)

AIDITEC SYSTEMS, S.L. C/ Torres 7, Bajo derecha 46018 Valencia (SPAIN) TEL: +34 963 842 957

CERTIFICADO DE ENSAYO / TEST CERTIFICATE

**PDC SIGMA+ S2 · ESE SIGMA+ S2**

ENSAYOS\* REALIZADOS EN BASE A LAS NORMAS / RELATED TESTS\* BASED ON THE STANDARDS

NFC 17102 - UNE 21186 - NP 4426

ENSAYOS MECÁNICOS / MECHANICAL TESTS

ENSAYOS AMBIENTALES / ENVIRONMENTAL TESTS

ENSAYOS ELÉCTRICOS / ELECTRICAL TESTS

Resistencia a la energía de la descarga con forma de onda 10/350 µs  
Energy resistance of the discharge with waveform factor of 5 µs

200 kA

ENSAYOS DE AVANCE EN EL CEBADO / ADVANCE TIME TESTS

Tiempo de avance en el cebado con factor de seguridad mínimo de 5 µs  
Advance time with minimum safety factor of 5 µs

45 µs

GARANTÍA DE AISLAMIENTO ENTRE ELECTRODOS  
ISOLATION GUARANTEE BETWEEN ELECTRODES

RADIOS DE PROTECCIÓN / RADII PROTECTION



H	RADIOS DE PROTECCIÓN / RADIUS PROTECTION	
	NIVEL / LEVEL I	NIVEL / LEVEL II
2	32	31
3	43	44
4	55	58
5	65	70
6	75	79
8	95	101
10	115	122
15	157	165
20	199	209

Radio de protección en metros según normas  
Radius protection in meters according standards

H = Altura de la punta con relación al plano a proteger en metros.  
H = Height of the lightning rod in relation to the plane to be protected in meters.

En las instalaciones en las que existe riesgo de peligro o contaminación superior del 40% sobre los radios de protección de esta tabla, se aplicará un factor de seguridad de 1,25.

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CERTIFICADO DE ENSAYO / TEST CERTIFICATE

**PDC SIGMA+ S3 · ESE SIGMA+ S3**

ENSAYOS\* REALIZADOS EN BASE A LAS NORMAS / RELATED TESTS\* BASED ON THE STANDARDS

NFC 17102 - UNE 21186 - NP 4426

ENSAYOS MECÁNICOS / MECHANICAL TESTS

ENSAYOS AMBIENTALES / ENVIRONMENTAL TESTS

ENSAYOS ELÉCTRICOS / ELECTRICAL TESTS

Resistencia a la energía de la descarga con forma de onda 10/350 µs  
Energy resistance of the discharge with waveform factor of 5 µs

200 kA

ENSAYOS DE AVANCE EN EL CEBADO / ADVANCE TIME TESTS

Tiempo de avance en el cebado con factor de seguridad mínimo de 5 µs  
Advance time with minimum safety factor of 5 µs

60 µs

GARANTÍA DE AISLAMIENTO ENTRE ELECTRODOS  
ISOLATION GUARANTEE BETWEEN ELECTRODES

RADIOS DE PROTECCIÓN / RADII PROTECTION



H	RADIOS DE PROTECCIÓN / RADIUS PROTECTION			
	NIVEL / LEVEL I	NIVEL / LEVEL II	NIVEL / LEVEL III	NIVEL / LEVEL IV
2	32	31	35	39
3	43	44	50	55
4	55	58	66	74
5	65	70	80	90
6	75	79	90	100
8	95	101	115	127
10	115	122	140	155
15	157	165	190	212
20	199	209	240	267

Radio de protección en metros según normas  
Radius protection in meters according standards

NFC 17102 / UNE 21186 / NP 4426

H = Altura de la punta con relación al plano a proteger en metros.  
H = Height of the lightning rod in relation to the plane to be protected in meters.

En las instalaciones en las que existe riesgo de peligro o contaminación del medio ambiente se aplicará un factor de seguridad del 40% sobre los radios de protección de esta tabla.  
On sites where there is danger or risk of environmental pollution it will be apply a safety factor of 40% over the radii of protection of this table.

\*Ensayos realizados en el Instituto Tecnológico de la energía (ITE) / Test performed by Energy Technological Institute (ITE)

AIDITEC SYSTEMS, S.L. C/ Torres 7, Bajo derecha 46018 Valencia (SPAIN) TEL: +34 963 842 957 www.aiditecsystems.com





**ESE ELECTRON E15**





## TEST

Test performed at the Technological Institute of Energy (ITE) based on UNE 21186, NFC 17102 and NP 4426 standards.

- Mechanical
- Electrical
- Environmental
- Advance time

## TECHNICAL SPECIFICATIONS

- Made of stainless steel AISI 316L
- Guarantee isolation between electrodes
- Maintains its properties to the passage of each download
- Operation in any weather condition
- Fully autonomous and maintenance-free
- Dimensions: 300mm x Ø 60mm
- Metric thread: M-16
- Weight: 1.8kg

## STANDARDS AND INSTALLATION

For installation it is recommended to follow the guidelines established in the following standards: UNE EN 62305 - UNE 21186 - NFC 17102 - NP 4426 - CTE - REB

## BENEFITS

- Designed for single-family homes or small locations
- High level of protection

## WARRANTY

All ESE ELECTRON E15 have limited international lifetime warranty against manufacturing defects.\*

[\\*www.aiditecsystems.com/warranty](http://www.aiditecsystems.com/warranty)



Reference	Model	PROTECTION LEVEL			
		I	II	III	IV
		(Pr for 6 m height in relation to the plane to be protected)			
800 010	ELECTRON E15	40	50	55	65
Pr = Protection radii in meters according CTE SU8, UNE 21186, NFC 17102 and NP 4426.					

# ESE ELECTRON E15 CERTIFICATE

CERTIFICADO DE ENSAYO / TEST CERTIFICATE



## PDC ELECTRON E15 · ESE ELECTRON E15

ENSAYOS\* REALIZADOS EN BASE A LAS NORMAS / RELATED TESTS\* BASED ON THE STANDARDS

NFC 17102 - UNE 21186 - NP 4426

ENSAYOS MECÁNICOS / MECHANICAL TESTS

ENSAYOS AMBIENTALES / ENVIRONMENTAL TESTS

ENSAYOS ELÉCTRICOS / ELECTRICAL TESTS

Resistencia a la energía de la descarga con forma de onda 10/350  $\mu$ s  
Energy resistance of the discharge with waveform factor of 5  $\mu$ s

200 kA

ENSAYOS DE AVANCE EN EL CEBADO / ADVANCE TIME TESTS

Tiempo de avance en el cebado con factor de seguridad mínimo de 5  $\mu$ s  
Advance time with minimum safety factor of 5  $\mu$ s

15  $\mu$ s

GARANTÍA DE AISLAMIENTO ENTRE ELECTRODOS  
ISOLATION GUARANTEE BETWEEN ELECTRODES

RADIOS DE PROTECCIÓN / RADII PROTECTION



H	RADIOS DE PROTECCIÓN / RADII PROTECTION			
	NIVEL / LEVEL I	NIVEL / LEVEL II	NIVEL / LEVEL III	NIVEL / LEVEL IV
2	12	15	17	20
3	19	22	26	30
4	25	29	35	40
5	29	34	44	49
6	30	35	45	50
8	32	39	47	54
10	33	40	48	55
15	34	42	52	60
20	35	43	54	63

Radios de protección en metros según normas  
 Radii protection in meters according standards

NFC 17102 / UNE 21186 / NP 4426

H = Altura de la punta con relación al plano a proteger en metros.  
 H = Height of the lightning rod in relation to the plane to be protected in meters.

En las instalaciones en las que exista riesgo de peligro o contaminación del medioambiente se aplicará un factor de seguridad del 40% sobre los radios de protección de esta tabla.  
 On site where there is danger or risk of environmental pollution it will be apply a safety factor of 40% over the radii of protection of this table.

\*Ensayos realizados en el Instituto Tecnológico de la energía (ITE) / \*Test performed by Energy Technological Institute (ITE)

AIDITEC SYSTEMS, S.L. C/ Torres 7, Bajo derecha 46018 Valencia (SPAIN) TEL: +34 963 842 957 www.aiditecsystems.com





# **CONVENTIONAL FRANKLIN RODS**







## CONVENTIONAL FRANKLIN RODS

### FRANKLIN ROD

Lightning rod or Franklin rod for lightning protection. It can be used as a capturing element or as part of passive protection systems. Includes brass adapter piece for Ø 45 mm mast and internal connection with Ø 8/10 mm (50/70 mm<sup>2</sup>) round conductor.

Reference	Material	Model	Dimensions (mm)
AS700010	AISI 304	Multiple Franklin rod	1 x (Ø 16 x 170) + 3 x (Ø8 x 65)
AS700020	AISI 304	Simple Franklin rod	Ø 16 x 170
Standards: <b>UNE 21186, NFC 17102 and NP 4426</b>			

### AIR TERMINATION ROD

They are integrated directly on the adapter piece. It can be used as the only capturing element or it can be part of passive protection systems, complementing the protection in conductive meshes (Faraday cage).

Reference	Material	Dimensions (mm)	Thread
AS500602	Copper	Ø 16 x 500	Exterior M-16
AS500603	Copper	Ø 16 x 1000	Exterior M-16
AS500680	AISI 304	Ø 16 x 500	Exterior M-16
AS500681	AISI 304	Ø 16 x 1000	Exterior M-16
AS500684	AISI 304	Ø 16 x 500	Interior M-10
AS500685	AISI 304	Ø 16 x 1000	Interior M-10
Standards: <b>IEC 62305 and EN 50164</b>			

### AIR TERMINATION ROD WITH SELF-SUPPORT

self-supporting lightning rod with hinged tripod made of galvanized steel with the possibility of adjusting up to 10° of inclination. Sized to withstand winds of up to 145 km/h. They include concrete counterweights, protective roof plates and connection clamp for conductor ø 6/10 mm.

Reference	Material	Height	Space needed	Counterweight
AS500760	Galvanized steel and aluminum	4,5 m	118 x 132 cm	3
Standards: <b>EN 50614, UNE 21186, NFC 17102 and NP 4426</b>				

# ANCHORS AND ACCESSORIES

## ANCHORS

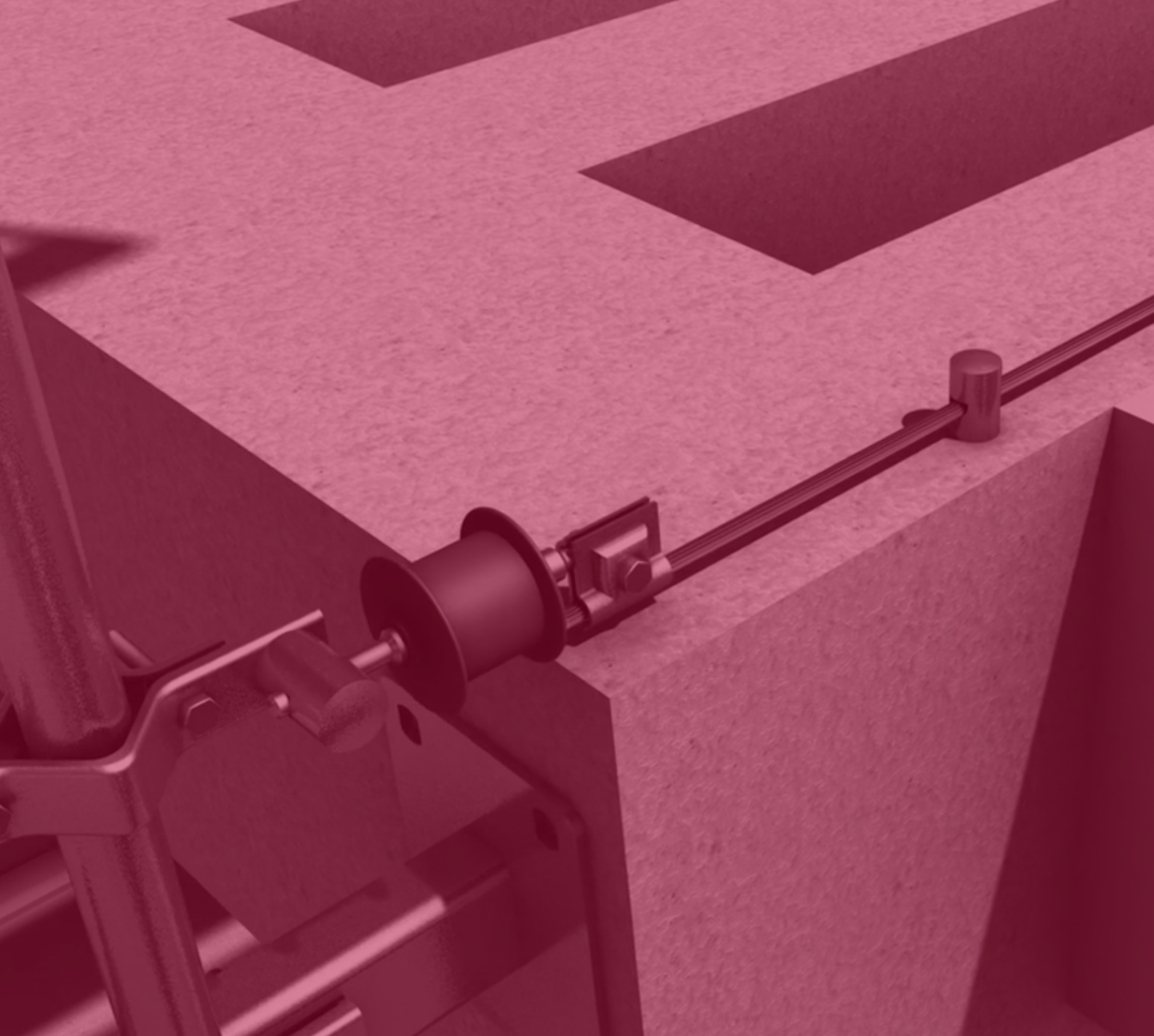
Anchors for fixing lightning rods.

Reference	Material	Dimensions (mm)	Fixing type
AS500700	Galvanized steel	70 x 70 x 70	External thread M-10
AS500720	Concrete	Ø 337 X 90	Internal thread M-16
AS500721	Concrete	Ø 240 X 90	Internal thread M-16
AS500740	Bracket - Stainless Steel Tip - Aluminum	Ø 10 X 1000	Regulable ridge tile 120/240 mm
Standards: EN 50164, UNE 21186, NFC 17102 and NP 4426			

## ACCESSORIES

Roof protection plate when using concrete support (AS500720 and AS500721).

Reference	Material	Dimensions (mm)
AS500730	Ethylene vinyl acetate copolymer (EVA)	Ø 370 x 10
AS500731	Ethylene vinyl acetate copolymer (EVA)	Ø 280 x 10



# ACCESSORIES



# MASTS

## MAST TO WALL

Mast made of galvanized steel or stainless steel (optimal for highly corrosive environments) with a diameter of 45 x 2 mm thick to be attached to buildings or structures with 2 supports (except 8 m mast that are fixed with 3 supports + tensioners).



Reference	Material	Sections / Length	total lenght (m)
AS700229	Galvanized steel	1 section / 2 m	2
AS700231	Galvanized steel	2 sections / 2 m	4
AS700233	Galvanized steel	3 sections / 2 m	6
AS700235	Galvanized steel	4 sections / 2 m	8
AS700270	Stainless steel	1 section / 2 m	2
AS700271	Stainless steel	2 sections / 2 m	4
AS700273	Stainless steel	3 sections / 2 m	6
AS700275	Stainless steel	4 sections / 2 m	8

Standards: **UNE 21186, NFC 17102 and NP 4426**

## SELF-SUPPORTED MAST

Mast to be installed on a concrete block embedded in the ground, made of galvanized steel and studied to withstand winds of up to 140 km/h.

Reference	Lenght (m)	Sections	Hinge	Assembly	Base plate dimensions (mm)	Foundation dimensions (cm)
AS700306	6	2	Yes	Screwed	400 x 400 x 10	80 x 80 x 80
AS700308	8	3	Yes	Screwed	400 x 400 x 10	80 x 80 x 80
AS700310	10	4	Yes	Screwed	500 x 500 x 10	100 x 100 x 100
AS700312	12	5	Yes	Screwed	500 x 500 x 10	100 x 100 x 100
AS700315	15	6	Yes	Screwed	500 x 500 x 10	150 x 150 x 150
AS700320	20	8	-	Soldier	600 x 600 x 10	200 x 200 x 200
AS700325	25	10	-	Soldier	750 x 750 x 12	200 x 200 x 200

Standards: **UNE 21186, NFC 17102 and NP 4426**

# ANCHORS

## SURFACE ANCHORS

Anchors for fixing mast up to Ø 45 mm to roofs and flat surfaces.

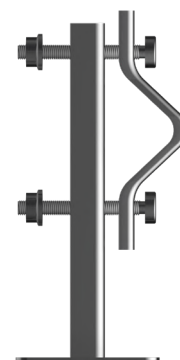
Reference	Material	Base plate dimensions (mm)	For mast up to
AS700400	Galvanized steel	300 x 300 x 300	3 m
AS700401	Galvanized steel	500 x 500 x 500	6 m
Standards: UNE 21186, NFC 17102 and NP 4426			



## SCREW ANCHORS

Standard anchor to screw. Manufactured in a "U" profile of 20 x 40 x 20 x 3 mm.

Reference	Material	Lenght (mm)
AS700624	Galvanized steel	200
AS700625	Galvanized steel	350
AS700626	Galvanized steel	500
AS700627	Stainless steel	200
AS700628	Stainless steel	350
AS700629	Stainless steel	500
Standards: UNE 21186, NFC 17102 and NP 4426		



## BUILT-IN ANCHORS

Light anchor to screw. Manufactured in "L" profile of 30 x 30 x 3 mm.

Reference	Material	Lenght(mm)
AS700440	Galvanized steel	350
AS700441	Galvanized steel	500
AS700640	Stainless steel	350
AS700641	Stainless steel	500
Standards: UNE 21186, NFC 17102 and NP 4426		

## ANCHORS FOR PARALLEL AND CROSS FIXING

Anchors for fixing masts in parallel and cross made of 3 mm “L” profile.

Reference	Material	Lenght (mm)
AS700460	Galvanized steel	200
AS700660	Stainless steel	200
Standards: <b>UNE 21186, NFC 17102 and NP 4426</b>		

## WELDING ANCHORS

Anchors for welding to structures. Manufactured in a “U” profile of 20 x 40 x 20 x 3 mm.

Reference	Material	Lenght (mm)
AS700500	Galvanized steel	350
AS700501	Galvanized steel	500
AS700700	Stainless steel	350
AS700701	Stainless steel	500
Standards: <b>UNE 21186, NFC 17102 and NP 4426</b>		

## TRESTLE TOWER ANCHOR

Anchors for fixing masts to trestle tower. Manufactured in a “U” profile of 20 x 40 x 20 x 3 mm.

Reference	Material	Lenght (mm)
AS700560	Galvanized steel	400
AS700561	Galvanized steel	600
AS700760	Stainless steel	400
AS700761	Stainless steel	600
Standards: <b>UNE 21186, NFC 17102 and NP 4426</b>		

## ADJUSTABLE ANCHORS

Adjustable anchor made of a 20 x 40 x 20 x 3 mm "U" profile with screw fixing.

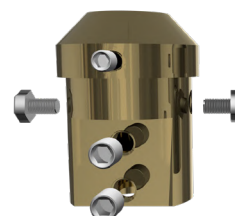
Reference	Material	Lenght (mm)
AS700540	Galvanized steel	from 500 to 800
Standards: <b>UNE 21186, NFC 17102 and NP 4426</b>		

## ADAPTATION PARTS

### ADAPTATION PIECE WITH INTERNAL CONNECTION

Adaptation pieces for the union of the lightning rod with the mast and internal connection with the down conductor.

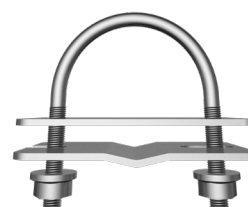
Reference	Material	Mast	Conductor
AS700100	Brass	Ø 45 mm	Round Ø 8 / 10 mm Flat 30 x 2 mm
Standards: <b>EN 50164, UNE 21186, NFC 17102 and NP 4426</b>			



### U BOLT

For the union of the lightning rod with the mast and with a stainless-steel flange for the external connection with the down conductor.

Reference	Material	Mast	Conductor
AS700150	Acero inoxidable	hasta Ø 55 mm	Round up to Ø 15 mm Flat up to 50 x 5 mm
Standards: <b>EN 50164, UNE 21186, NFC 17102 and NP 4426</b>			





# CONDUCTORS

## TAPE CONDUCTORS

Bare flat conductors recommended by lightning protection regulations as down conductors and ground conductors.



Reference	Material	Dimensions (mm)	meters x roll
AS600121	Tined copper	30 x 2	50
AS600181	Stainless steel	30 x 2	50
Standards: IEC 62305, EN 50164, EN 13601, BS 7430, UNE 21186, NFC 17102, NP 4426, AS 1567, BS 6746, BS 2898, BS 6360 and AS 1866.			

## ROUND CONDUCTOR

Round bare conductors recommended by lightning protection regulations for use in highly corrosive environments.



Reference	Material	Dimensions (mm)
AS600200	Copper	Ø 8
AS600260	Galvanized steel	Ø 8
AS600261	Galvanized steel	Ø 8
Standards: IEC 62305, EN 50164, EN 13601, BS 7430, UNE 21186, NFC 17102, NP 4426, AS 1567, BS 6746, BS 2898, BS 6360 and AS 1866.		

## STRANDED CONDUCTOR

Bare stranded conductors recommended by lightning protection regulations for their easy installation.



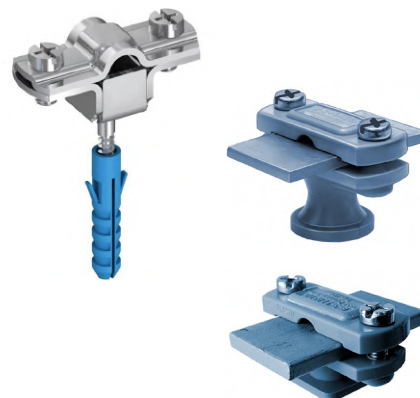
Reference	Material	Dimensions	Composition
AS600301	copper	50 mm <sup>2</sup>	19 threads of Ø 1,8 mm
AS600302	copper	75 mm <sup>2</sup>	19 threads of Ø 2,2 mm
AS600303	copper	95 mm <sup>2</sup>	19 threads of Ø 2,5 mm
Standards: IEC 62305, EN 50164, EN 13601, BS 7430, UNE 21186, NFC 17102, NP 4426, AS 1567, BS 6746, BS 2898, BS 6360 and AS 1866.			

## CONDUCTOR FIXINGS

### CLAMPS

Clamps for fixing conductors to buildings and structures.

Reference	Material	For conductor	Elevation
AS600560	Stainless steel	Round up to Ø 11 mm Flat up to 30 mm	10 mm
AS600660	Nylon	Round up to Ø 11 mm Flat up to 30 mm	40 mm
AS600661	Nylon	Round up to Ø 11 mm Flat up to 30 mm	25 mm
Standards: UNE 21186, NFC 17102 and NP 4426.			



### SPACERS

Spacers/extensions for fixing conductors to buildings and structures.

Reference	Material	Diameter (mm)	Length (mm)
AS600680	Stainless steel	Ø 25	50
AS600681	Stainless steel	Ø 25	100
AS600690	Brass	Ø 25	500
AS600691	Brass	Ø 25	100
Standards: EN 50164, UNE 21186, NFC 17102 and NP 4426.			

## SUPPORTS FOR FIXING CONDUCTORS

### FOR ROOF TILES

Supports for fixing conductors to tiles.

Reference	Material	For conductors
AS600641	Stainless steel	From Ø 6 mm to Ø 11 mm
Standards: EN 50164, UNE 21186, NFC 17102 and NP 4426.		

## FOR FLAT SURFACES

Supports for fixing conductors to flat surfaces.

Reference	Material	Support	For conductor	State
AS600600	Polypropylene	Conical	Ø 8 mm	Empty
AS600601	Polypropylene	Conical	Ø 8 mm	Full
AS600620	Concrete	Block	Ø 8 mm	-
Standards: UNE 21186, NFC 17102 and NP 4426.				

## UNIONS AND CONNECTIONS FOR CONDUCTORS

### MULTICLAMP

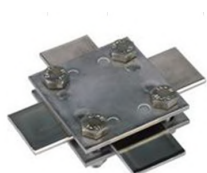
Universal connector for round stainless steel conductors with multiple connection ways.



Reference	Material	Dimensions (mm)	For conductor	Screw
AS600841	Stainless steel	40 x 40 x 40	From Ø 8 to Ø 10 mm	M-10 x 40 mm
Standards: UNE 21186, NFC 17102 and NP 4426.				

### CROSS CONNECTOR

Cross connector for tape and round conductors.



Reference	Material	For round conductor	For flat conductor	For electrode
AS600823	Stainless steel	Up to Ø 10 mm	Up to 40 x 4 mm	Up to Ø 17 mm
Standards: UNE 21186, NFC 17102 and NP 4426.				

## OTHER ACCESSORIES

### GUARD TUBE

Tube for the mechanical protection of the down conductors of the protection system.

Reference	Material	Lenght (m)	For conductor
AS600950	Galvanized steel	2	Round and flat of 30 mm
AS600951	Stainless steel	2	Round and flat of 30 mm
AS600952	polyurethane	2	Round and flat of 30 mm
Standards: <b>UNE 21186, NFC 17102 and NP 4426.</b>			



### RAIN PROTECTOR

Rain cover to prevent the passage of water on roofs or flat surfaces in which spikes or masts are embedded.

Reference	Material	Dimensions (mm)	For rods or masts
AS600965	Neoprene	115 x 115 x 60	Up to Ø 50 mm
Standards: <b>UNE 21186, NFC 17102 and NP 4426.</b>			

### TENSIONERS KIT

Fastening and tensioning of masts by means of steel winds to avoid falls due to the effect of the wind.

Reference	Material	section of conductor	Length
AS700352	Stainless steel	Ø 3 mm	50 m
Standards: <b>UNE 21186, NFC 17102 and NP 4426.</b>			





## INSULATING CABLE

Non-flammable insulating cable designed to ensure that systems continue to operate in extreme conditions.

Reference	Material	Section	Coating type
AS600306	Cobre	50 mm <sup>2</sup>	Flame retardant
Standards: <b>UNE 21186, NFC 17102 and NP 4426.</b>			

## GUARD TUBE

Flexible metal tube for cable protection.



Reference	Material	Internal diameter	Coating type
AS600752	Steel	Ø 16 mm	PVC
Standards: <b>UNE 21186, NFC 17102 and NP 4426.</b>			

## SECTIONING BOX

Sectioning box for earthing resistance checking.

Reference	Material	Dimensions	Connections
AS600400	Opaque polycarbonate	160 x 118 x 71	Tinned copper of 20 x 3 mm
AS600401	Transparent polycarbonate	160 x 118 x 71	Tinned copper of 20 x 3 mm
Standards: <b>UNE 21186, NFC 17102 and NP 4426.</b>			

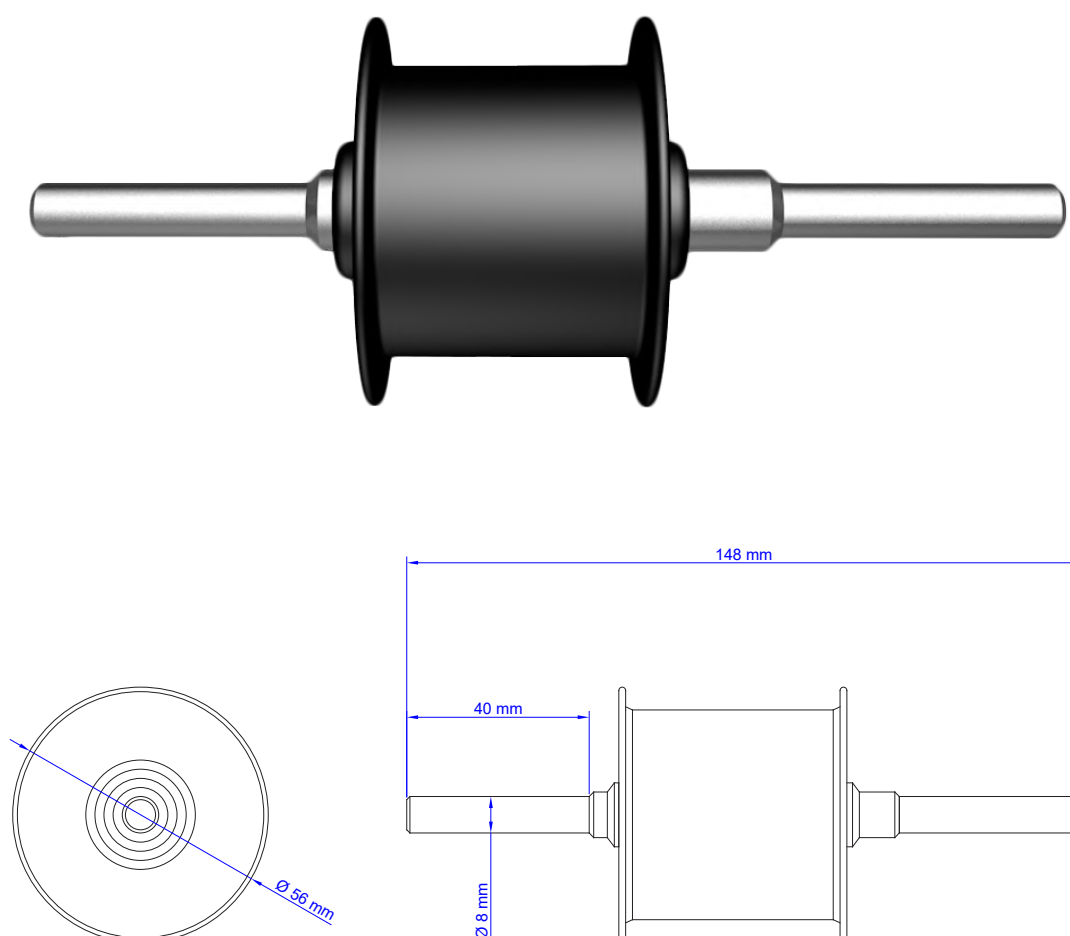
## SPARK GAP FOR EQUIPOTENTIAL BOUNCING

Lightning protection standards indicate that each downconductor must have its own ground and independently must have a value below 10 ohms. On the other hand, they also recommend connecting the grounds of lightning rod with other ground to avoid potential differences.

Direct connections can be made but it is always better to do it with spark gaps for many different reasons:

- Spark gap facilitate the main path of the lightning current to be through the grounding of the lightning rod.
- Maintains the different earth connections to the same potential, avoiding dangerous spark jumps in unwanted areas but only at the moment of discharge because in a normal state it keeps them separate.
- It prevent some highly sensitive systems or equipment from being influenced by these direct connections.
- It protect against the corrosion that can occur in some cases when directly connecting different earth connections.

Spark gap are also used to protect antennas, metal structures, tanks, etc.



## SPARK GAP FOR ANTENNA

It is connected to the antenna mast to ensure equipotential bonding between the metal elements, thus avoiding dangerous sparks between the lightning protection system and antenna mast, which could even cause fire and damage to the structure.



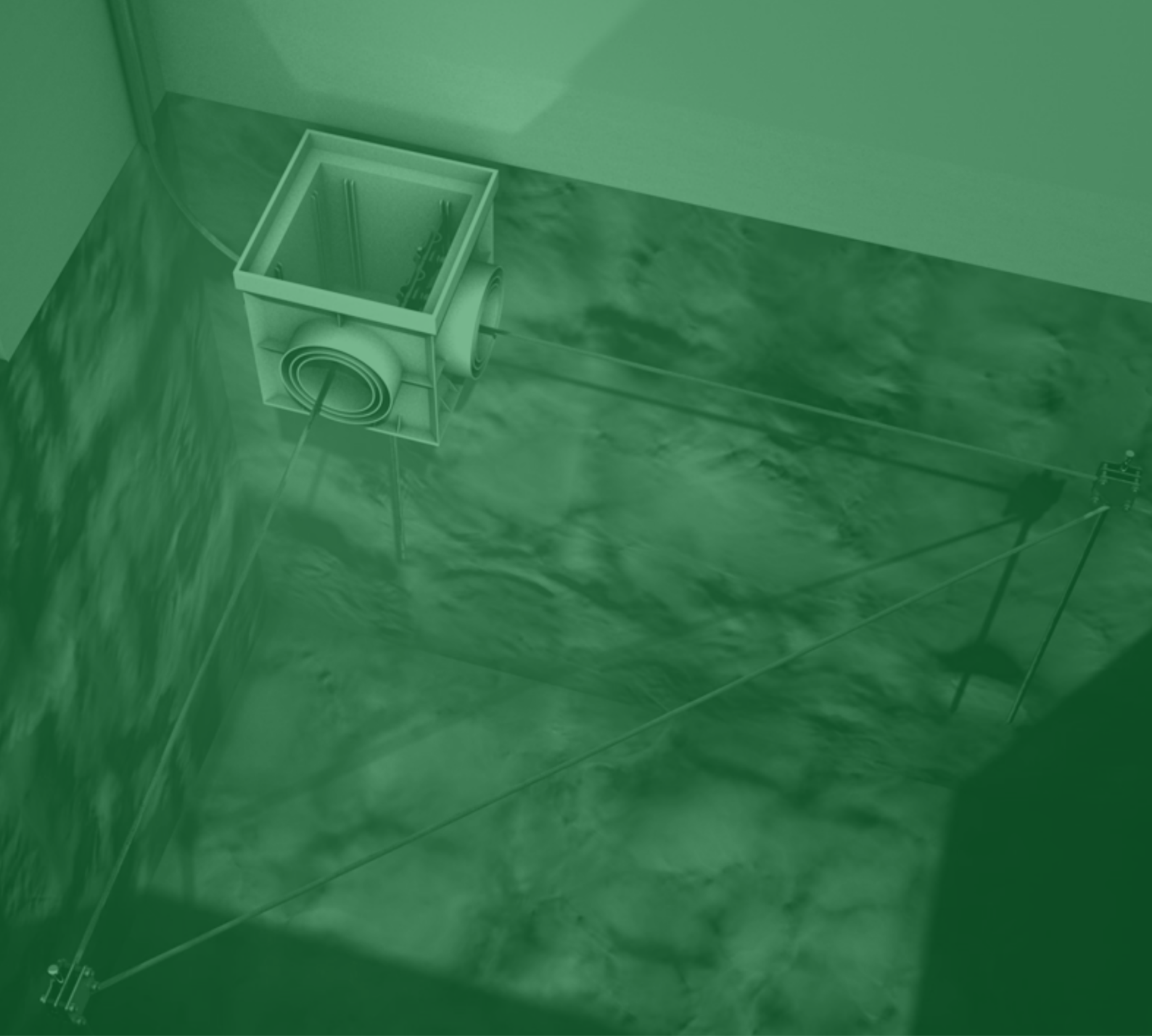
Reference	Material	For antennas	For round conductors	For flat conductors
AS600910	Stainless steel	From Ø 30 to Ø 50 mm	From Ø 8 to Ø 10 mm	Up to 30 mm
Standards: UNE 21186, NFC 17102 and NP 4426.				

## SPARKWAY FOR EARTHING AND OTHER STRUCTURES

Equipotential protection sparks path for connection to lightning rod/grounding downcomer.



Reference	Material	for antennas	For round conductors	For flat conductors
AS500550	Stainless steel	-	From Ø 8 to Ø 10 mm	Up to 30 mm
Standards: UNE 21186, NFC 17102 and NP 4426.				



# GROUNDING



# SPECIAL ELECTRODES FOR GROUND HIGH RESISTIVITY

## ACTIVE ROD

Active electrode with moisture exchanger and ionic compound drainage, specially suitable for conducting ground connections in very high resistivity soils. Includes stainless steel connector for conductor from Ø 8 to Ø 10 mm and flat up to 30 mm.



Reference	Material	Dimensions	Form
AS500070	Copper + compound	Ø 28 x 1500 mm	Vertical
AS500071	Copper + compound	Ø 28 x 2000 mm	Vertical
AS600080	Copper + compound	Ø 50 x 1500 mm	Vertical
AS600081	Copper + compound	Ø 50 x 2000 mm	Vertical
Standards: IEC 62305, UL 467, EN 50164, UNE 21186, NFC 17102 and NP 4426.			

## GRAPHITE ELECTRODE

Rigid graphite electrode indicated for conducting ground connections in particularly aggressive soils. Includes stainless steel connector for conductor from Ø 8 to Ø 10 mm and flat up to 30 mm.



Reference	Material	Dimensions	Drilling
AS500040	Rigid graphite	Ø 50 x 400 mm	2 m
AS500041	Rigid graphite	Ø 50 x 800 mm	2 m
Standards: UNE 21186, NFC 17102 and NP 4426.			

## COPPER BONDED ELECTRODE

Copper bonded steel grounding electrode with a high degree of corrosion resistance.



Reference	Material	Dimensions	Covering	Finish
AS500101	Copper plated steel	Ø 14,2 x 2000 mm	254 micras	Smooth
AS500131	Copper plated steel	Ø 14,2 x 2000 mm	100 micras	Smooth
AS500161	Copper plated steel	Ø 14,2 x 2000 mm	254 micras	Threading
Standards: BS 7430, BS 6651, UL 467, NFPA 780, IEC 62305, EN 50164, UNE 21186, NFC 17102 and NP 4426.				

## STAINLESS STEEL SOLID ELECTRODE

Stainless steel electrode for grounding with extreme quality and very high degree of corrosion resistance.

Reference	Material	Diameter	Length
AS500133	Stainless steel	Ø 14,2 mm	2 m
Standards: IEC 62305, UL 467, EN 50164, UNE 21186, NFC 17102 and NP 4426.			



## ELECTRODE ACCESSORIES

### CLAMP

Accessory for extension and driving of the electrodes.

Reference	Material	For electrode	
AS500280	Bronze / Copper	Smooth	Ø 14,2 mm
AS500281	Bronze / Copper	Threading	Ø 14,2 mm
Standards: UNE 21186, NFC 17102 and NP 4426.			



### STAPLES

Staples for joining electrodes with earthing conductors.

Reference	Material	For electrode	For conductor
AS500330	Copper	Ø 20 mm	Round up to 70 mm <sup>2</sup>
Standards: UNE 21186, NFC 17102 and NP 4426.			



# IMPROVERS OF EARTHING VALUES

## WELLCONDUCTOR

Totally ecological, non-corrosive, highly hygroscopic and fast-acting ionic compound that substantially improves ground conductivity due to its electrolytic base and provides the grounding electrode with a reserve of conductive material with high resistance to permeability and a long duration in order to maintain the resistance obtained for as long as possible depending on the conditions specific to the remain.



Reference	Material	Dimensions
AS500460	3 compounds	Container of 3 kg
Standards: EN 50164, UNE 21186, NFC 17102 and NP 4426.		

## GROUND PLATES

Plates with connector for conductors recommended as grounding electrodes to obtain a very low resistance in very stony ground due to the large contact surface with the ground.



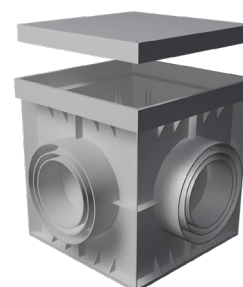
Reference	Material	Dimensions	For conductor
AS500401	Copper	500 x 500 x 1,5 mm	Rond of Ø 8/10 mm Flat up to 30 mm
AS500411	Copper	500 x 500 x 1,5 mm	254 microns
Standards: IEC 62305, EN 50164, EN 13601, BS 2874, UNE 21186, NFC 17102, NFPA 780 and NP 4426.			

## EARTH PITS

### EARTH PIT

Polypropylene earth pit to have the earth connections located and organized. Resistant to chemicals and UV rays. Lid included

Reference	Material	Dimensions	Hole
AS500512	Polypropylene	200 x 200 x 200 mm	Ø 200 mm
AS500513	Polypropylene	300 x 300 x 300 mm	Ø 200 mm
Standards: IEC 62305, EN 50164, EN 13601, BS 2874, UNE 21186, NFC 17102, NFPA 780 and NP 4426.			



### BONDING BAR

Stainless steel bonding bar for equipotential bonding of earth electrodes and round conductors Ø 8/10 mm and flat conductors up to 30 mm wide.

Reference	Material	Dimensions	Connections	For earth pit
AS500540	Stainless steel	60 x 5 x 196 mm	4	AS500512
AS500541	Stainless steel	60 x 5 x 242 mm	6	AS500513
Standards: IEC 62305, EN 50164, EN 13601, BS 2874, UNE 21186, NFC 17102, NFPA 780 and NP 4426.				



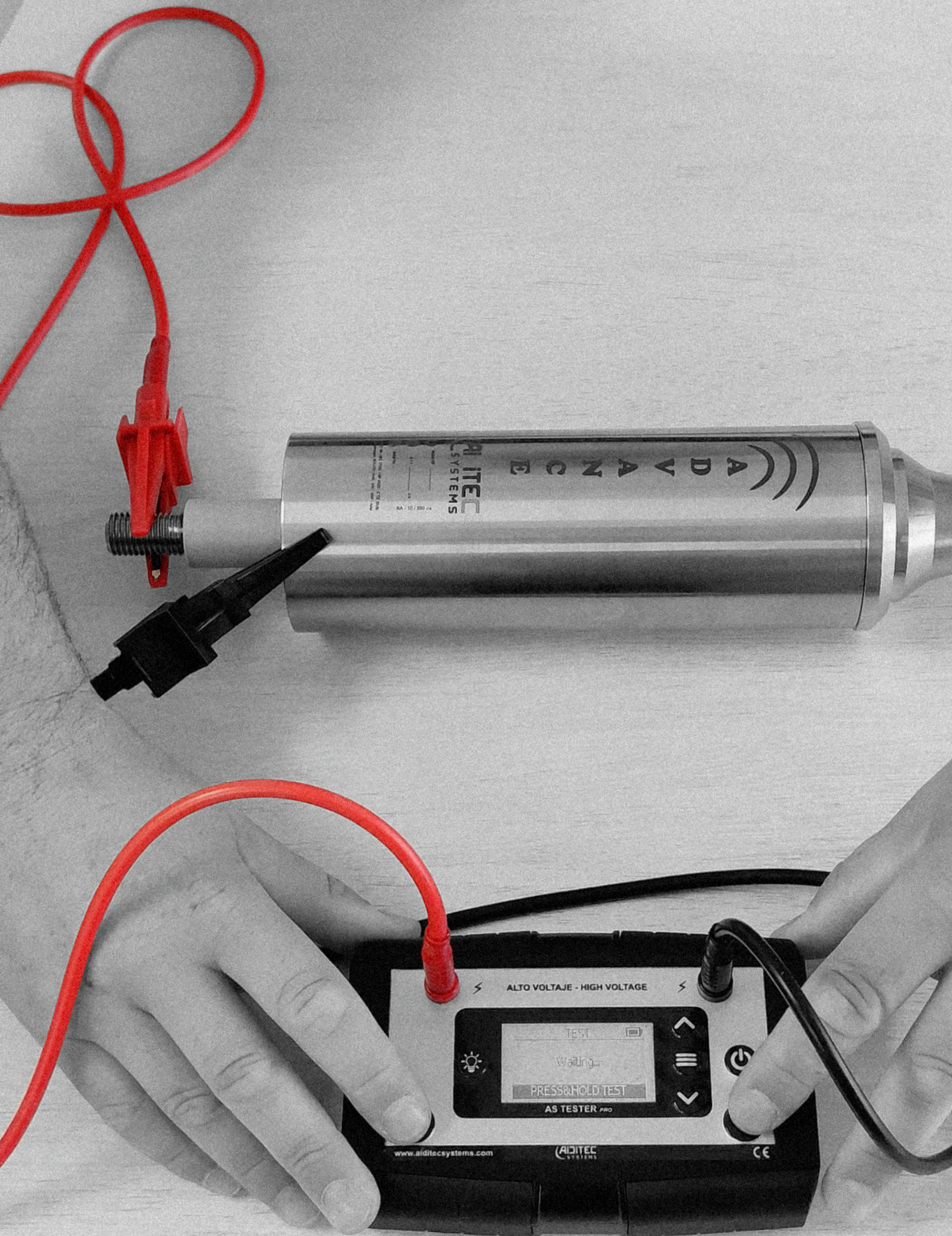






# **MEASURING DEVICES**



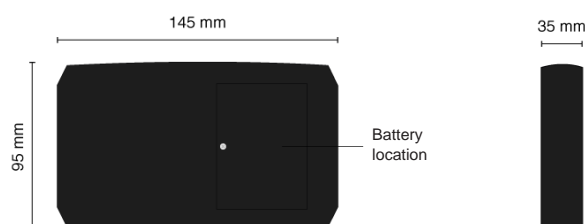




# AS TESTER PRO

## TESTER FOR ESE LIGHTNING RODS

The AS TESTER PRO device is a test portable high-tech equipment, which makes an automatic and complete testing of the operation of the ESE lightning rod. It is valid for all models of lightning rods with priming device manufactured by Aiditec Systems, S.L.



## TECHNICAL FEATURES

- Manufactured with high quality materials
- Maximum output voltage: 3000V
- Lightning rod priming test:  $0.3\text{mA} \pm 2\%$
- Battery: 3,7V / 1800 mAh
- Autonomy: 1000 test
- Operating temperature:  $-20^{\circ}\text{C} \dots +50^{\circ}\text{C}$
- Dimensions of the case: 290 x 240 x 100 mm
- Weight: 288 gr. \*With case: 881 gr.



# PERFORMING A MEASUREMENT

## INSTRUCTIONS

- Plug de cables into the connection terminals of the tester.
- Connect clamps on the lightning rod in the test position, as indicated in the connection diagram regardless of polarity.
- Press the power button.
- Select "New Test".
- Press simultaneously the two TEST buttons to start the cycle.
- Wait a few seconds while the tester makes testing.

## CONNECTION

The measurement should always be made between the 2 existing potential in all lightning rods with triggering device (ESE):

- ATMOSPHERIC POTENTIAL (Tip and metal housing)
- GROUND POTENTIAL (Axis)

\*If the measurement is affected with the lightning rod installed, connection to ground potential can be done on the mast or the itself downconductor, since both elements must be joined to the axis of the lightning rod.

## SECURITY

- Do not touch the lightning rod at the time of testing.
- This device produces high voltage: handle connection cables correctly.
- To measure it is necessary to press the two TEST buttons with both hands.
- Avoid the realization of testing in storm conditions.

## MESSAGES ON DISPLAY

TEST OK	Satisfactory test
TEST FAILED	Faulty test

## OTHER MESSAGES ON DISPLAY

- OPEN CIRCUIT: Open circuit >> The PDC is faulty.
- SHORT CIRCUIT: Short circuit >> The PDC has a short circuit or a low resistive value.
- LEAKAGE CURRENT: Current Leakage >> PDC has current leakage.
- OUT OF RANGE: Out of range >> The PDC works at voltages outside of those specified.

## WARNING

The AS TESTER PRO device only ensures the proper operation of the triggering device, but not the physical integrity of the lightning rod, so a positive result in a lightning rod who has suffered physical damage does not mean that it maintains its coverage level since this depends not only on triggering device but also to physical parameters, so to ensure the level of coverage is also required visual inspection of the physical integrity of the lightning rod.



# ADT COUNTER

## LIGHTNING EVENT COUNTER

### THE MOST VERSATILE, COMPLETE AND EASY TO INSTALL

It counts and records the direct impacts, as well as the surges protection of a lightning protection system.

It is a device that does not intervene in the operation of the protection system but that is undoubtedly a very important element, because it is the only way to know that the system has suffered a lightning strike and then a review of the system must be carried out to verify that everything is still in correct condition and remain protected.

### TECHNICAL CHARACTERISTICS

- Undercurrent threshold ( $I_{tc}$  8/20  $\mu s$ ) - 1 kA
- Current supported and counted ( $I_{mcw}$  10/350  $\mu s$ ) - 100 kA
- Valid for plate up to 60 x 10 mm
- Valid for round up to  $\varnothing$  15 mm
- Operating temperature: - 20°C ... + 65°C
- Weight: 285 gr.
- Dimensions: 82 x 69 x 45 mm
- Conforms to: EN 62561-6 / EN 50164-6 / UTE C 17-106

### BENEFITS

- Quick and easy installation.
- No need to disconnect or sectioning the downconductor.
- Can be installed in any type of downconductor.
- It can be used to count and record impact direct and surges.

### LOCATION

The device must be located anywhere on the down conductor between the protection tube and the mast.



Reference	Material	Dimensions	Rank	Temperature
600 920	Plastic	82 x 69 x 45 mm	0 - 9999	-20°C ... +65°C

According to: **EN 62561-1, 50164-6 y UTE C 17-106.**  
 Recommended by the standards of lightning protection. It is inserted into the downconductor with less ohmic resistance or in the straightest and most direct to ground.

# ADT COUNTER CERTIFICATE

CERTIFICADO DE ENSAYO / TEST CERTIFICATE



## Contador de Rayos ADT COUNTER Lightning Event Counter ADT COUNTER

### DESCRIPCIÓN DEL PRODUCTO / PRODUCT DESCRIPTION

El contador de impactos de rayos ADT Counter ha superado con éxito los ensayos eléctricos conforme a la norma UNE EN 62561-6, de acuerdo con los tests consecutivos de mínima corriente umbral, corriente de no detección y corriente soportada y contada.

The lightning event counter ADT Counter has successfully passed the electrical test according to UNE EN 62561-6, according to the consecutive tests of minimum current threshold, no current detection and withstand current and counted.

### ORGANISMO QUE REALIZA LOS ENSAYOS / INSTITUTION PERFORMING THE TESTS

Instituto Tecnológico de la Energía ITE - Red de Institutos Tecnológicos de la Generalitat Valenciana.  
Informe IE-ITE 140055-EN, de acuerdo con la norma UNE EN 62561-6: "Requisitos para los contadores de impactos de rayos"

Energy Technological Institute ITE - Network of Technological Institutes of the Valencian.  
Report IE-ITE 140055-EN, according to standard EN 62561-6: "Requirements for lightning event counters"

### CLASIFICACIÓN / CLASIFICATION

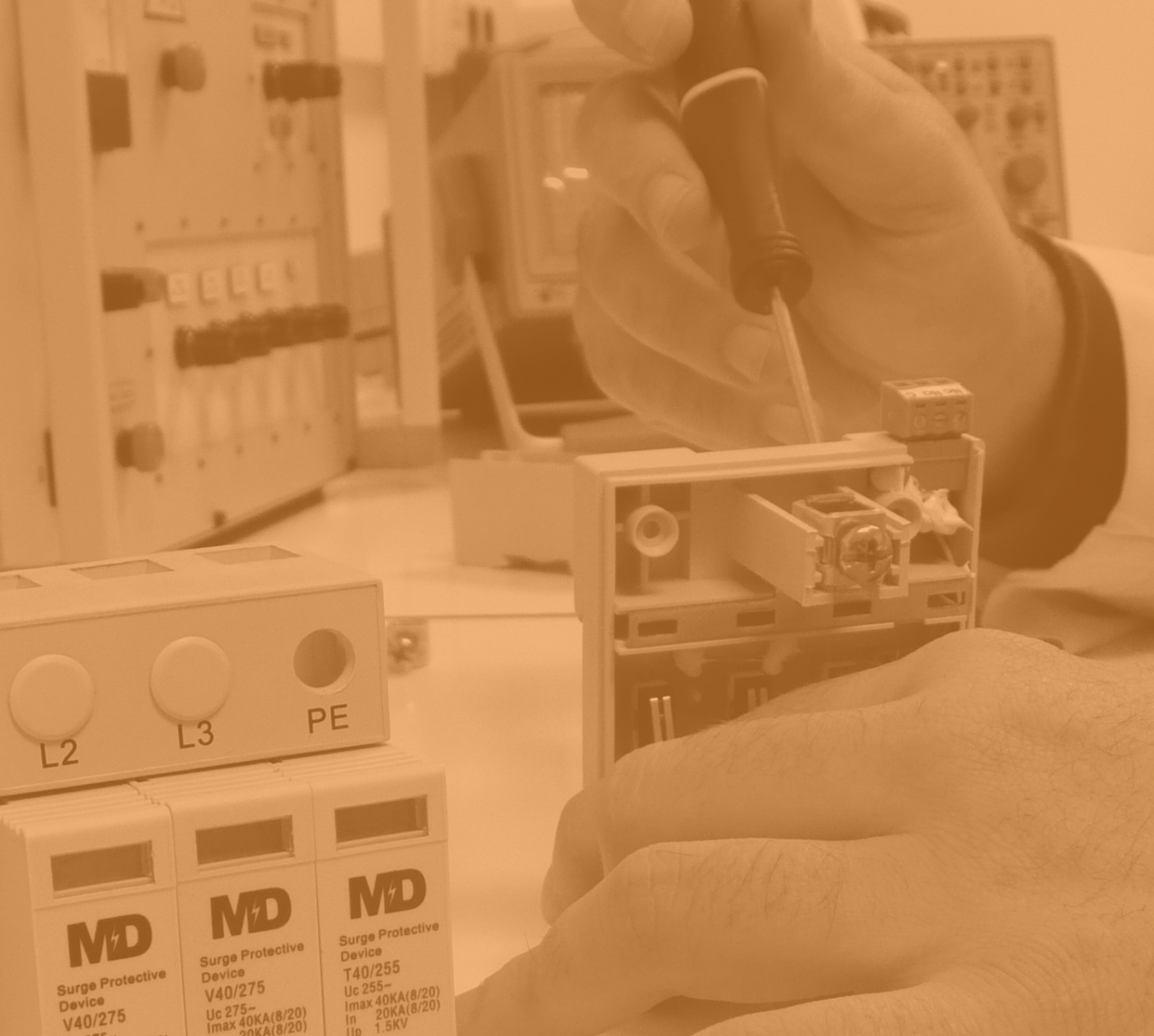
Para conexión con conductores de un SPCR / To connect with conductors of a LPS  
Para conexión con conductores de SPD / To connect with SPD conductors

### DATOS TÉCNICOS / TECHNICAL DATA



REF.	AS600920
Dimensiones Dimensions	82 x 69 x 45 mm
Peso Weight	320 gr.
Código IP IP code	IP-43
Temperatura de funcionamiento Operating temperature	- 20°C ... + 65°C
Para conductor redondo For round conductor	Hasta / Up to Ø 15 mm
Para conductor plano For flat conductor	Hasta / Up to 60 x 10 mm
Mínima corriente umbral ( $I_{lc}$ ) con onda 8/20 Minimum current threshold ( $I_{lc}$ ) with wave 8/20	1 kA
No detección con $I_{lc}/2$ No detection ( $I_{lc}/2$ ) with wave 8/20	0,5 kA
Corriente soportada contada ( $I_{mcw}$ ) con onda 10/350 Withstand current and counted ( $I_{mcw}$ ) with wave 10/350	100 kA
Ubicación Location	Cualquier punto de la bajante entre el tubo de protección y el mástil. Any point on the downspout between the protection tube and the mast.
Garantía limitada internacional Limited international warranty	1 año 1 year

AIDITEC SYSTEMS, S.L. C/ Torres 7, Bajo derecha 46018 Valencia (SPAIN) TEL: +34 963 842 957 www.aiditecsystems.com



# SURGE PROTECTIVE DEVICES



# WHY IS IT IMPORTANT TO INSTALL SURGE PROTECTIVE DEVICES?

## 1. FACILITIES WITH LIGHTNING RODS

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It is necessary to install surge protective devices at least in the main electric switchboards of facilities equipped with lightning rods, especially in those installations closest to the lightning rod.

In the case of high resistivity of the terrain, the need for installing overvoltage protection is even more crucial. The greater the earth potential differences, the higher the energetic impact of overvoltages will be.

### REASONS WHY TO INSTALL PROTECTIVE DEVICES

- Lack of insulation: a poor isolated insulation will be reached by atmospheric discharges when lightning strikes the lightning rod. This device redirects energy to the ground.
- Electromagnetic fields: as a result of lightning strikes, strong currents are generated. As a result magnetic fields are induced in every conductor nearby, such as electric, data and coaxial cables.

## 2. LARGE-SCALE FACILITIES

---

When lightning strikes the earth, currents may be induced in long-distance cables used for electric lines especially in large-scale facilities. In order to avoid the loads of the installation to be damaged, surge protective devices must be installed at both ends of cables used for the loads connection.

The higher the resistivity of the terrain, the greater the voltage gradients are and the need to protect both ends of the cable.

### REASONS TO INSTALL PROTECTIVE DEVICES

- Inductions: When a lightning strikes the earth, an electrical potential funnel is generated and therefore electrical potential differences appear in the terrain. Consequently, if an electric, coaxial or data cable runs between two different potential curves, a current will be induced thereon and affect the loads fed by this cable.

### 3. ELECTRICAL FACILITIES WITH ELECTRONIC DEVICES

---

The transient overvoltages transmitted by the distribution networks have their origin the electrical distributors, line faults and mainly in the atmospheric discharges that reach High-Voltage lines.

Since the discharge lamps, variable speed drives, connection and disconnection of generators cause surges and short-term currents with high-peak values, transient surges caused by network users and their surroundings can not be obviated.

In order to reduce incidences and avoid users, devices and facilities themselves to be damaged, it is necessary to install the properly surge protective devices for this kind of installations, at least in the main electrical switchboard and those with a high risk of suffering the consequences of overvoltages.

#### REASONS WHY TO INSTALL SURGE PROTECTIVE DEVICES

- Induced atmospheric discharges on High-Voltage lines: an atmospheric discharge is the most damaging problem that you can find in an installation. As a High-Voltage power line is the most likely place for a lightning to strike, most of the time it will reach the installation through the electrical supply.
- Overvoltages originated in the electrical network: manoeuvres such as the switching of electric substations in electrical network may cause micro-interruptions which are associated to transient voltage peaks that will be transmitted throughout the whole electrical network. As a result, the power supply of users facilities will be affected. Sometimes the value of voltage supplied by electricity companies is higher than the maximum supported by electronic devices and consequently these are affected.
- The influence of power loads over electronics: the start or stop of engines and generators, the variable speed drives, etc., may produce overvoltages in the electronic devices. According to the magnitude of the overvoltage, electronic devices of the installation may be damaged gradually or quickly.

# MODULAR PROTECTION SYSTEMS (SPD)

## SURGE PROTECTIVE DEVICES TYPE 1

Surge protective devices Type 1 are recommended for installations where there is a high probability of atmospheric discharges.



### COMPACT SURGE PROTECTIVE DEVICES

Reference	Description	Uc. Máx	I <sub>imp</sub>	U <sub>p</sub>
AD4-400/240	Tetrapolar	255 V	100 kA	1,2 kV
AD2-400/240	Bipolar	255 V	100 kA	1,2 kV
AD1-200/240	Unipolar for F-N	255 V	50 kA	1,2 kV
AD1-400/240	Unipolar for N-T	255 V	100 kA	1,2 kV

Available for all types of ground systems. TT, IT, TN-S y TN-C.  
Standards: IEC 61643-1, EN 61643-11 y UL 1449



### PLUGGABLE SURGE PROTECTIVE DEVICES

Reference	Description	Uc. Máx	I <sub>imp</sub> (F-N / N-T)	U <sub>p</sub>
AA1-25/240	Unipolar for F-N	255 V	25 kA	1,5 kV
AA1-100/240	Unipolar for N-T (*)	255 V	100 kA	1,5 kV
AA2-H100/240	Bipolar (*)	255 V	25/100 kA	1,5 kV
AD1-400/240	Tetrapolar (*)	255 V	25/100 kA	1,5 kV

(\*) N-T protectors NOT pluggable.

For remote signaling please consult price and reference.

Available for all types of ground system. TT, IT, TN-S y TN-C.

Standards: IEC 61643-1, EN 61643-11 y UL 1449



### CARTRIDGES FOR PLUGGABLE SURGE PROTECTIVE DEVICES

Reference	Description	Uc. Máx	I <sub>imp</sub>	U <sub>p</sub>
A25/240	F-N cartridge	255 V	25 kA	1,5 kV

## SURGE PROTECTIVE DEVICES TYPE 1 + 2

Surge protective devices Type 1 + 2 are installed at the head of installations to protect and it is combined the characteristics of Type 1 and Type 2.

### COMPACT SURGE PROTECTIVE DEVICES

Reference	Description	Uc. Máx (F-N / N-T)	$I_{imp}$ (L-N) (F-N / N-T)	$U_p$
BD4-100/240	Tetrapolar	255 V / 255 V	12,5 / 25 kA	1,2 kV
BD2-100/240	Bipolar	250 V / 255 V	12,5 / 25 kA	1,2 kV
BD1-100/240	Unipolar	255 V	25 kA	1,2 kV

For remote signaling please consult price and reference.  
Available for all types of ground system. TT, IT, TN-S y TN-C.  
Standards: IEC 61643-1, EN 61643-11 y UL 1449



REPORT OF TEST RESULTS

RED IT

ITE INSTITUTO TECNOLÓGICO DE LA ENERGÍA

ALTA TENSIÓN

Test: 4.5.1.1. Discharge energy withstand test.  
4.5.2. Residual time.

Test methodology: RP 58.01 (rev. 3). "Reglamento particular de la marca AEN para ensayos con dispositivos de catodo".

Equipment tested: Early streamer emission air terminal (ESE).

Quantity: 1.

Code: ME-ITE 1104712.

Client: Aides Systems S.L.

Test location site: ITE High Voltage Laboratory, Edificio BA, U.P.V. Camino de Vera, s/n 46102 Valencia (España).

The results contained in the present report, according to the test requested in and exclusively for the objects indicated in testing that are identified in section 5. Tested in the test date detailed in sections 4 and 6 respectively.

This report is a translation of the 110471-AM report generated on March 15, 2012. This report may not be partially copied without the written approval of ITE.

By: Manuel Martínez  
Position: Laboratory technician  
Date: 24/10/13

Reviewed: Anabel Sorja  
Position: Laboratory coordinator  
Date: 24/10/13

This report is comprised of 17 pages that contain 3 Appendices.

REPORT OF TEST RESULTS

RED IT

ITE INSTITUTO TECNOLÓGICO DE LA ENERGÍA

ALTA TENSIÓN

Test: 4.5.1.1. Discharge energy withstand test.  
4.5.2. Residual time.

Test methodology: RP 58.01 (rev. 3). "Reglamento particular de la marca AEN para ensayos con dispositivos de catodo".

Equipment tested: Early streamer emission air terminal (ESE).

Quantity: 1.

Code: ME-ITE 1104714.

Client: Aides Systems S.L.

Test location site: ITE High Voltage Laboratory, Edificio BA, U.P.V. Camino de Vera, s/n 46102 Valencia (España).

The results contained in the present report, according to the test requested in and exclusively for the objects indicated in testing that are identified in section 5. Tested in the test date detailed in sections 4 and 6 respectively.

This report is a translation of the 110471-AM report generated on March 15, 2012. This report may not be partially copied without the written approval of ITE.

By: Manuel Martínez  
Position: Laboratory technician  
Date: 24/10/13

Reviewed: Anabel Sorja  
Position: Laboratory coordinator  
Date: 24/10/13

This report is comprised of 17 pages that contain 3 Appendices.

REPORT OF TEST RESULTS

RED IT

ITE INSTITUTO TECNOLÓGICO DE LA ENERGÍA

ALTA TENSIÓN

Ensayo: Ensayo de resistencia de FSC.

Método de ensayo: Ensayo según el anexo C de la UNE 21186:2011  
Ensayo según el anexo C de la UNE 21186:2011  
Ensayo según el anexo C de la UNE 21186:2011

Equipo ensayado: Pararrayos con dispositivo de catodo.

Cantidad: 1.

Código: ME-ITE 1104712.

Cliente: AIDES SISTEMAS S.L.

Lugar de realización del ensayo: Laboratorio de Alta Tensión de ITE, Edificio BA, U.P.V. C7 de 46102 Valencia (España).  
Laboratorio de Seguridad Eléctrica de ITE, Av. Juan de la C. 46102 Valencia (España).

Las resultados contenidos en el presente informe, conforme a los ensayos solicitados, se refieren exclusivamente a los objetos identificados en el apartado 5. Ensayados en el modo y fecha indicados en los apartados 4 y 6 respectivamente. Este informe no deberá reproducirse parcialmente sin la aprobación por escrito de ITE.

Este informe es una traducción del informe nº ITE-110471-AM.

Elaborado: Manuel Martínez  
Cargo: Técnico del laboratorio  
Fecha: 24/10/13

Revisado: Anabel Sorja  
Cargo: Coordinador de ensayos  
Fecha: 24/10/13

Este informe se compone de 17 páginas.

REPORT OF TEST RESULTS

RED IT

ITE INSTITUTO TECNOLÓGICO DE LA ENERGÍA

ALTA TENSIÓN

Ensayo: Ensayo de resistencia a la energía de la descarga.

Método de ensayo: 4.5.1. Ensayo de resistencia a la energía de la descarga.  
4.5.2. Tiempo de respuesta en el catodo.

Equipo ensayado: Pararrayos con dispositivo de catodo.

Cantidad: 1.

Código: ME-ITE 1104714.

Cliente: Aides Systems S.L.

Lugar de realización del ensayo: Laboratorio de Alta Tensión de ITE, Edificio BA, U.P.V. Camino de Vera, s/n 46102 Valencia (España).

Los resultados contenidos en el presente informe, conforme a los ensayos solicitados en el apartado 5, se refieren exclusivamente a los objetos identificados en el apartado 5. Ensayados en el modo y fecha indicados en los apartados 4 y 6 respectivamente. Este informe no deberá reproducirse parcialmente sin la aprobación por escrito de ITE.

Este informe es una traducción del informe nº ITE-110471-AM.

Elaborado: Anabel Sorja  
Cargo: Coordinador de ensayos  
Fecha: 24/10/13

Revisado: Francisco Magaña  
Cargo: Técnico de laboratorio  
Fecha: 24/10/13

Este informe se compone de 17 páginas que contienen 3 Anexos.



## SURGE PROTECTIVE DEVICES TYPE 2

Surge protective devices Type 2 are installed at the head of electrical installations and at secondary power panels. Protect electronic and electrical equipment against transient overvoltages of origin industrial, atmospheric and maneuvering.



### PLUGGABLE SURGE PROTECTIVE DEVICES

Reference	Description	Uc. Máx	In	I Máx	Up
BV1-20/240	Unipolar	250 V	10 kA	20 kA	1,2 kV
BV1-40/240	Unipolar	250 V	20 kA	40 kA	1,2 kV
BV1-60/240	Unipolar	250 V	30 kA	60 kA	1,2 kV
BD2-20/240	Bipolar	250 / 255 V	10 kA	20 kA	1,2 kV
BD2-40/240	Bipolar	250 / 255 V	20 kA	40 kA	1,2 kV
BD2-60/240	Bipolar	250 / 255 V	30 kA	60 kA	1,2 kV
BD4-20/240	Tetrapolar	250 / 255 V	10 kA	20 kA	1,2 kV
BD4-40/240	Tetrapolar	250 / 255 V	20 kA	40 kA	1,2 kV
BD4-60/240	Tetrapolar	250 / 255 V	30 kA	60 kA	1,2 kV

For remote signaling please consult price and reference.  
Available for all types of ground system. TT, IT, TN-S y TN-C.  
Standards: IEC 61643-1, EN 61643-11 y UL 1449

### CARTRIDGES FOR PLUGGABLE SURGE PROTECTIVE DEVICES

Reference	Description	Uc. Máx	In	I Máx	Up
V20/240	F - N cartridge	250 V	10 kA	20 kA	1,2 kV
V40/240	F - N cartridge	250 V	20 kA	40 kA	1,2 kV
V60/240	F - N cartridge	250 V	30 kA	60 kA	1,2 kV
D30/240	N - T cartridge	255 V	10 kA	30 kA	1,2 kV
D40/240	N - T cartridge	255 V	20 kA	40 kA	1,2 kV
D60/240	N-T cartridge	255 V	30 kA	60 kA	1,2 kV



## SURGE PROTECTIVE DEVICES TYPE 3

Surge protective devices Type 3 are installed in the power supply of the final receivers and coordinated with Type 2 protective devices.

### COMPACT SURGE PROTECTIVE DEVICES

Reference	Description	Uc. Máx	In (F-N / N-T)	I Máx (F-N / N-T)	Up (F-N / N-T)
CV2-10/240	Bipolar	250 V	5/10 kA	10/20 kA	1,2/1,5 kV

Includes LED signaling of the equipment status.  
Available for all types of ground system. TT, IT, TN-S y TN-C.  
Standards: IEC 61643-1, EN 61643-11 y UL 1449



### PLUGGABLE SURGE PROTECTIVE DEVICES

Reference	Description	Uc. Máx	In	I Máx	Up
CV1-15/240	Unipolar	250 V	7 kA	15 kA	1,2 kV
CV2-15/240	Bipolar	250 V	7 kA	15 kA	1,2 kV
CV4-15/240	Tetrapolar	250 V	7 kA	15 kA	1,2 kV

For remote signaling please consult price and reference.  
Available for all types of ground system. TT, IT, TN-S y TN-C.  
Standards: IEC 61643-1, EN 61643-11 y UL 1449



### CARTRIDGE FOR PLUGGABLE SURGE PROTECTIVE DEVICES

Reference	Description	Uc. Máx	In	I Máx	Up
V15/240	Cartridge	250 V	7 kA	15 kA	1,2 kV



## SURGE PROTECTIVE DEVICES FOR PHOTOVOLTAIC INSTALLATIONS

Surge protective devices Type 2 for protection devices working on continuous current. Protect photovoltaic equipment against transient overvoltages at atmospheric origin and maneuvering.



### PLUGGABLE SURGE PROTECTIVE DEVICES

Reference	Description	Uc. Máx	In	I Máx	Up
BF3-40/600	Tripolar	600 Vcc	20 kA	40 kA	1,8 kV
BF3-40/1000	Tripolar	1060 Vcc	20 kA	40 kA	3,2 kV

For remote signaling please consult price and reference.  
Standards: IEC 61643-1, EN 61643-11 y UL 1449



### CARTRIDGES FOR PLUGGABLE SURGE PROTECTIVE DEVICES

Reference	Description	Uc. Máx	In	I Máx	Up
V40/320	Cartridge	320 Vcc	20 kA	40 kA	1,0 kV
V40/530	Cartridge	530 Vcc	20 kA	40 kA	1,6 kV

## SURGE PROTECTIVE DEVICES FOR DATA LINES

Surge protective devices for data lines protect the electronic equipment in the network of communication against any overvoltage induced on the data lines. These arresters must be installed as close as possible to the equipment to protect.

### PLUGGABLE SURGE PROTECTIVE DEVICES FOR DATA LINES

Reference	Description	Uc. Máx	I <sub>n</sub>	I Máx	U <sub>p</sub> (L-L / L-T)	IL
TD/5-B0	1 par (Cartridge)	6 Vcc	5 kA	10 kA	80/350 V	500 mA
TD/12-B0	1 par (Cartridge)	15 Vcc	5 kA	10 kA	150/350 V	500 mA
TD/24-B0	1 par (Cartridge)	28 Vcc	5 kA	10 kA	200/500 V	500 mA
TD/48-B0	1 par (Cartridge)	60 Vcc	5 kA	10 kA	250/500 V	500 mA
TD/110-A0	1 par (Cartridge)	180 Vcc	5 kA	10 kA	1/0,75 kV	500 mA
TD/250-A0	1 par (Cartridge)	280 Vcc	5 kA	10 kA	0,5 kV	500 mA

Standard: IEC 61643-21



### SURGE PROTECTIVE DEVICES FOR TELEPHONE LINES, ADSL AND ETHERNET

Reference	Description	Uc. Máx	I <sub>n</sub> (L-L / L-T)	I Máx (L-L / L-T)	U <sub>p</sub> (L-L / L-T)	IL
TD/110-RJ11-4	For telephone lines with RJ11 connector	180 Vcc	2 kA	5 kA	200/500 V	0,5 A
Para 100Mb						
TD/5-RJ45-H-8-CAT 5	For Ethernet with RJ45 connector, Cat 5	6 Vcc	0,1/1 kA	0,3/2 kA	15/800 V	1 A
Para 100Mb						
TD/5-RJ45-H-8-CAT 6	For Ethernet with RJ45 connector, Cat 6	6 Vcc	0,1/2 kA	0,3/4 kA	30/800 V	1 A
Para 1000Mb						

Standard: IEC 61643-21





## SURGE PROTECTIVE DEVICES FOR COAXIAL CABLES

Surge protective devices for coaxial cables protect electronic equipment associated with the coaxial installation against any overvoltage induced on coaxial cables. These arresters must be installed as close as possible to the equipment to protect.



### SURGE PROTECTIVE DEVICES FOR COAXIAL CABLES

Reference	Description	Uc. Máx	I Máx	Impedancia	Up
CD-90-B-HH-75	BNC type Female - Female	70 Vcc	20 kA	75 ohm	700 V
CD-250-B-HH-75	BNC type Female - Female	200 Vcc	20 kA	75 ohm	750 V
CD-90-B-MH-75	BNC type Male - Female	70 Vcc	20 kA	75 ohm	700 V
CD-250-B-MH-75	BNC type Male - Female	200 Vcc	20 kA	75 ohm	750 V
CD-90-F-HH-75	F type Female - Female	70 Vcc	20 kA	75 ohm	700 V
CD-250-F-HH-75	F type Female - Female	200 Vcc	20 kA	75 ohm	750 V
CD-90-F-MH-75	F type Male - Female	70 Vcc	20 kA	75 ohm	700 V
CD-250-F-MH-75	F type Male - Female	200 Vcc	20 kA	75 ohm	750 V

Standard: **IEC 61643-21.**

Available in other types of connection and impedance.

### NOTE:

In this catalog are contemplated the most common protective devices. If you need a protector with different characteristics, contact us and our technical department will advise you in choosing the most appropriate protector.

**Tlf. +34 963 842 957**

**info@aiditecsystems.com**

## UNIFIED PROTECTION SYSTEM (SPU)

Unified Protection Systems aka SPU -Sistemas de Protección Unificado- are made up of multiple redundant protection coordinated sets with each other and designed according to the maximum discharge capacity criteria and a minimum residual voltage. Its design allows the implementation of accessory modules, as well as their adaptation to the needs of each installation, giving preference to safety and the proper functioning of itself.

SPUs have been conceived to ensure the protection of the installations against overvoltages, either atmospheric and industrial origin, MF/AM harmonics and peaks associated with micro-interruptions. Optionally, the electrical installation will be protected against surges, power interruptions and phase asymmetry effects by adding a PTR4 set. This set is time and voltage programmable.

### TECHNICAL CHARACTERISTICS

- Great discharge capacity for 8/20  $\mu$ s and 10/350  $\mu$ s waveforms.
- Residual values close to the voltage of the protected installation.
- Frequency filtering.
- They are 3 or 4 effective and auto-coordinated protective sets each one by itself.
- Remove surges between phases, phases-earth, phases-neutral, neutral-earth.
- Responses time of 0,025  $\mu$ s.
- Micro-interruptions in the order of milliseconds are removed in low power installations.
- Repairable.

### MAIN FEATURES FOR DEFINING THE DIFFERENT RANGE OF SPU SERIES

	4D SERIES	2D SERIES	4S SERIES	2S SERIES	3F SERIES
Installation mode	Parallel	Parallel	Series	Series	Parallel
Nominal voltage (v) (1)	230/240	230	230/240	230	400
Protection against industrial transient surges 8/20 $\mu$ s	*	*	*	*	*
Protection against transient lightning surge 10/350 $\mu$ s (2)	*	*	*	-	-
Permanent surge protection (3)	*	*	*	-	-
Undervoltage protection (3)	*	*	*	-	-
Protection of phase asymmetry (3)	*	*	*	-	-
MF/AF harmonic protection	*	*	*	*	*

(1) Available in other voltages upon request.

(2) According to models.

(3) Requires addition of the PTR4 set.

## SPU SERIES



**4D SERIES.** Parallel connected three-phase surge protective devices.

**2D SERIES.** Parallel connected single-phase surge protective devices.



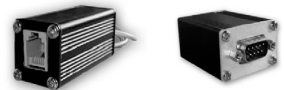
**4S SERIES.** Series connected three-phase surge protective devices.

**2S SERIES.** Series connected single-phase surge protective devices.



**DK SERIES.** Parallel connected High Voltage surge protective devices.

**TC SERIES.** Protective devices for data lines and communication.



## ADVANTAGES AND BENEFITS OF INSTALLING SPU DEVICES

Our protection systems have been designed to protect every kind of electrical and electronic installations of any power, especially those which have sensitive electronic devices. By installing a SPU system you are avoiding installations to be affected by: surges, permanent overvoltages, micro-interruptions, harmonics, undervoltages, phase asymmetry and electromagnetic compatibility.

## CUSTOM DEVICES

Since not all installations are alike and they need to be protected effectively, it is necessary to adapt to their features as well as to our customers demands. In MD we offer the possibility to modify the performances of our products to suit to their needs. Therefore, any device developed by MD can be:

- Set to special supply voltages, 500V, 690V, etc.
- Modify the IP rating in installations that require it.
- Increase the capacity of energy dissipation in installations bound to very energetic discharges.
- Increase the frequency filtering capacity.
- Adapt them to any network tipology: biphasic, three-phase lines without neutral, IT, TT, etc.
- Incorporate acoustic alarms.



# **RAILWAY PROTECTIVE DEVICES**





We are specialists in the design and manufacture of railway protective devices. Our devices are designed under robustness and highest reliability criteria. We cooperate with engineering in the search for solutions to specific problems by developing custom-built devices. The most relevant protective devices designed and developed by MD are:

- Protecting of substations rectifiers groups against surges.
- Protecting of electronic devices of auxiliary services against surges and MF/AF harmonics.
- Protecting of interlocking cabins against overvoltages, MF/AF harmonics and overcurrents.
- Protecting of signaling circuits against surges.
- Polarized protective devices (DPPo).
- Interval discharger.
- Protective devices against electrolytic corrosion.
- Outdoor autovalves.
- Indoor autovalves with remote signaling.









#### CENTRAL

#### AIDITEC SYSTEMS, S.L.

C/ Torres, 7 bajo dcha. 46018 Valencia, España (EUROPA)

info@aiditecsystems.com www.aiditecsystems.com

Tel. +34 963 842 957



#### INGENIERÍA I + D

#### MD TECNOLÓGICOS

C/ Torres, 15 bajo 46018 Valencia, España (EUROPA)

mdtecnologicos@mdtecnologicos.com

www.mdtecnologicos.com Tel. +34 963 838 122

#### GENERAL CONDITIONS

- Standard packaging is included.
- All products are guaranteed a minimum of 2 years against manufacturing defects.

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