

EXTERNAL LIGHTNING  
PROTECTION SYSTEMS

# nimbus<sup>®</sup> LIGHTNING RODS AND ACCESSORIES

cirprotec



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# Cirprotec, your protection partner

## SPECIALIST IN LIGHTNING AND SURGE PROTECTION

Pioneers in the **design and manufacture of lightning and surge protection devices**, Cirprotec has been manufacturing high quality solutions and products for over 25 years using the most innovative technologies. Cirprotec's leadership in this field is supported by its clear **commitment to innovation** and the latest trends. An example of this is the new nimbus® R lightning rod series, an online IOT **cloud-based monitoring system**, for convenient monitoring of events and maintenance.

### SAFETY AND RELIABILITY

- **Bringing together the experience** in the principal international **manufacturing and test standards** for surge protection devices (IEC and UL) and lightning rods (NF C and UNE).
- **Innovative product ranges combining surge protection and grounding system monitoring** to provide full safety and service continuity. SAFEGROUND®.
- **A world-class laboratory for lightning and surge protection testing**, with accreditations to IEC/EN 61643-11, EN 50550, UL 1449 4th edition, NF C 17-102 and UNE 21186, etc.

### WORLD-CLASS LIGHTNING AND SURGE TEST PLATFORM

Cirprotec is committed to innovation. More than 35,000 tests over 25 years attest to our commitment to continuous improvement.

In the field of lightning and surge protection, Cirprotec has a highly specialized team, with test laboratories, a high investment in R&Di, international patents and a presence on standards committees.

Cirprotec has two **state-of-the-art overvoltage testing laboratories** (current pulses of **up to 200 kA** in 10/350 lightning and early streamer type waveforms), for the **development and quality assurance** for testing lightning and surge protection systems. These complement the widest possible range of **tests offered according to IEC, UL and NF C standards**.

### COMPREHENSIVE PROTECTION

As the Spanish Building Technical Code, based on the UNE 21186 standard, states, **effective surge protection must combine the following protection systems:**

- **External protection** (ESE lightning rods and faradisation). System for protection against direct lightning strike. These capture the lightning within the protected area and lead it, in a controlled manner, safely to earth.
- **Internal protection** (power frequency overvoltage surge protection devices). Equipment designed to protect against the effect of surges due to direct and indirect strikes on equipment connected to the electricity and/or communications network.
- **Earthing system**  
Systems that allow atmospheric discharge currents to be dispersed into the ground. The need for monitoring the grounding system.

Cirprotec offers a **wide range of products** for each of these systems. It also provides custom products, advice, consulting and the best after-sales service.

### CIRPROTEC GUARANTEES THE SAFETY OF YOUR FACILITIES

Cirprotec designs and manufactures in accordance with the **strictest quality standards and certifies** its products to the most stringent standards (e.g. IEC, EN, UNE-EN, NF C) through independent certifying organisations such as ENAC, UL and Dekra.



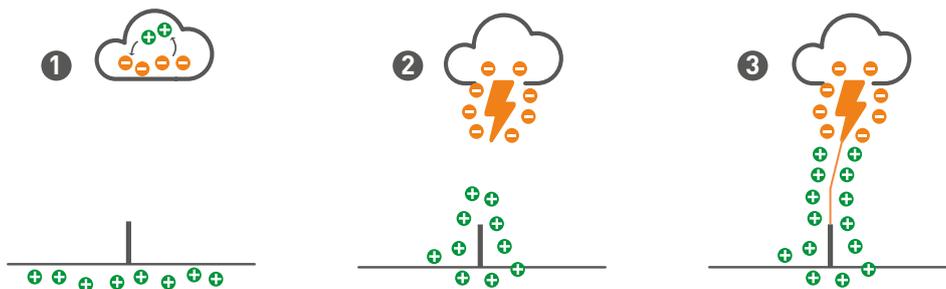
# Lightning | The need for protection

## THE PHENOMENON OF LIGHTNING

At any one time there are about **5,000 active thunderstorms around the world**. Lightning density depends on the terrain and climate, which means it varies from one place to another and from one time of year to another. In Spain, for example, some two million lightning bolts fall to earth, killing a dozen people and hundreds of animals each year.

The **average intensity of a lightning strike** is estimated to be around **20 kA - 30 kA**.

**Isokeraunic maps** present **historical strike density data** on the ground (Ng) and tabulate it from low to high risk of strike. In Spain, for example, the average isokeraunic level is relatively high, with 2 to 6 strikes/year per km<sup>2</sup>.



## HOW LIGHTNING FORMS

Lightning is a **powerful natural discharge** of static electricity, produced **during a thunderstorm** and generating an electromagnetic pulse. Under normal conditions, there is a balance between positive and negative charges in the atmosphere.

- 1 During the formation of a cumulonimbus, there is an increase of ionisation and a **potential difference is generated between the cloud and the ground**, which gives rise to small discharges.
- 2 As the electric field gains in strength, **the descending leader breaks up the dielectric field in the air**.
- 3 Eventually, it manages to break down the layers of the dielectric field in the air and **meets the ascending leader** from the surface.

## THE DESTRUCTIVE EFFECTS OF LIGHTNING

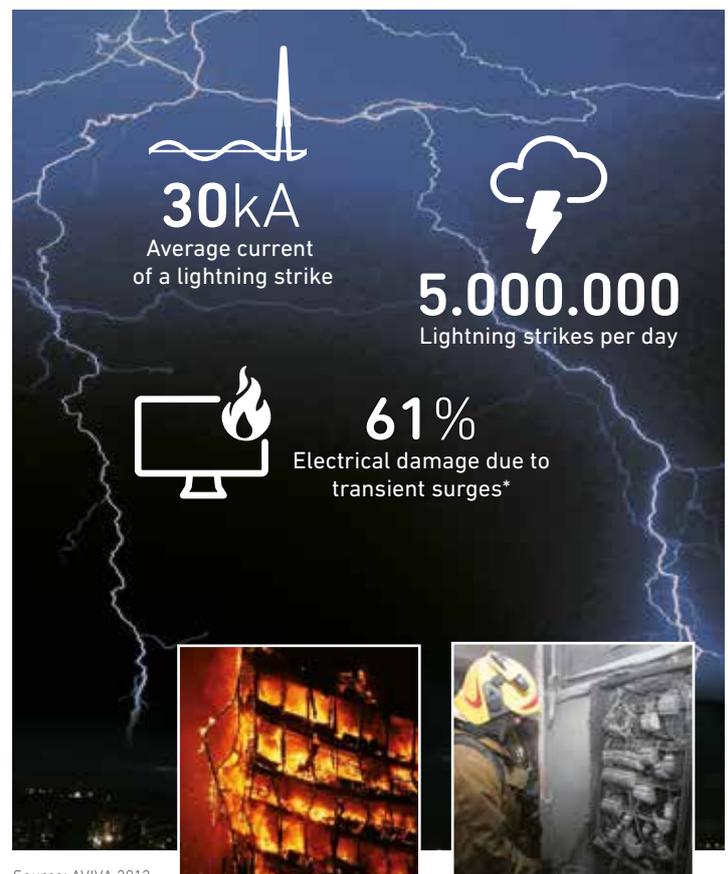
The effects of lightning pose a serious hazard to people, property, equipment and structures, and for this reason protection is essential.

### Catastrophic consequences for people and animals

The flow of a current of a certain intensity for a short period of time is sufficient to cause electrocution and severe burns to the subject in question, sometimes leading to death.

### Substantial financial losses:

- **Damage to buildings.** A direct lightning strike causes damage to structures (e.g. buildings, telecommunications antennas, manufacturing facilities and photovoltaic installations, etc.).
- **Fires.** The formation of sparks and heat dissipation due to the Joule effect can cause fires.
- **Destruction of equipment/service interruption.** An indirect lightning strike generates surges which damage equipment connected to the electrical network, telephone network, Ethernet, etc.



Source: AVIVA 2012

# Lightning | Effective protection

## REGULATORY FRAMEWORK

The destructive capacity of lightning makes it necessary to assess the need for protection, and possibly to install an effective protection system.

In the field of lightning protection, using either ESE lightning rods or faradisation systems, the following principle standards are used:

- **NF C 17-102:** "Protection of structures and open areas against lightning by a lightning rod with early streamer emission device" Internationally used French standard.
- **UNE 21186:** "Protection of structures, buildings and open areas by lightning rods with an early streamer emission device." Spanish standard.
- **UNE-EN 62305, IEC 62305:** "Lightning Protection". European and international standard.
- **Spanish Technical Building Code (CTE) Section SU8:** "Safety from the hazard caused by lightning" defines the need and measures to be taken for lightning protection, and is obligatory in Spain (Real Decreto 314/2006).
- **EN/IEC 62561:2011.** "Lightning protection system components (LPSC)". European and international standard. It consists of 7 parts specifying the requirements of the various components involved in lightning protection. These include cables, clamps, counters, earth rods, earth enhancer compounds and earth inspection pits, among others.

## RISK ANALYSIS

To determine the need for lightning protection and the level of protection required for a given facility, the various lightning rod standards specify a risk calculation. This calculation consists of knowing the levels of risk in the event of a lightning strike and its derivatives from parameters related to the facility (e.g. its dimensions, the annual level of lightning strikes, the materials of the structures, the type of wiring, and whether it is a cultural asset or open to the public).

This calculation will determine the need to establish various protection measures to effectively mitigate the risk (lightning rod, surge protection, or others).

## PRODUCT CERTIFICATION

Due to its construction and accessibility, an **ESE lightning rod** is designed for **high durability**, and accessing and replacing it is usually complicated and expensive. So it is especially **important** for it to be **certified** and have undergone **tests** (mechanical, climate chambers, current impulses) **in accordance with the above standards**, which **guarantee its reliability and robustness**.

**Product test certifications** must be carried out by **recognized (accredited) laboratories or entities**, in order to ensure that the product complies with the applicable standards and meets the specified safety requirements. Lastly, it is important to have a **certification by an external entity** which **audits the production process**, thus guaranteeing its **industrial quality**.

As a matter of fact, when calculating the protection radius of an ESE lightning rod, the early emission is the only factor that depends on the lightning rod itself rather than on the characteristics of the facility. Which means that the reliable calculation of this value, certified by an accredited lab, is crucial for the correct protection of the facility.



ISOKERAUNIC MAP



Lightning strike density on the ground in Ng (strokes/year · km<sup>2</sup>)

# Lightning protection system

The destructive capacity of the lightning makes it essential to evaluate the need for protection and, perhaps, to install a system to ensure effective protection. The current regulatory framework in each country defines the need for protection and sets out the steps to follow for designing a system which guarantees protection against lightning.

## ASSESS THE NEED FOR PROTECTION

The need for protection of a facility is established starting from the evaluation of the **degree of safety** required and **associated risk** factors. Whenever the expected strike frequency ( $N_e$ ) is greater than the permissible risk ( $N_a$ ), protection must be installed. The **calculation of the need for protection** is quite complex and depends on the applicable regulatory framework.

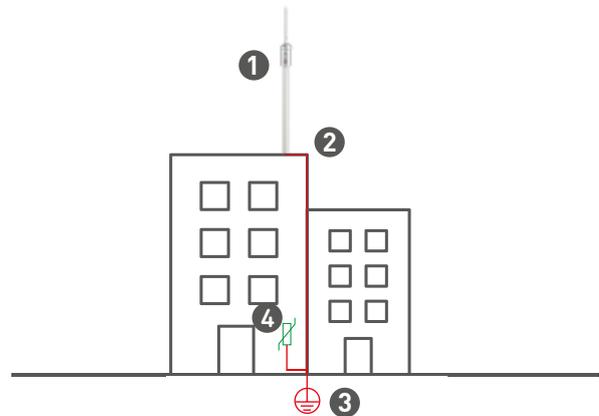
Required efficiency (E)	Level of protection	
$E \geq 0.98$	Level 1	Maximum safety
$0.95 \leq E \leq 0.98$	Level 2	High safety
$0.80 \leq E \leq 0.95$	Level 3	Medium safety
$0 \leq E \leq 0.80$	Level 4	Standard safety

Source: CT-DB-SUA8:2010

## DESIGNING A PROTECTION SYSTEM (REQUIRED COMPONENTS)

The standards define an effective lightning protection system as a set of equipment and devices to capture (never to attract) lightning and conduct it safely to earth:

- 1 Capture system:** lightning air terminals.
- 2 Down conductor system:** components required to conduct lightning energy in a controlled and safe manner.
- 3 Earthing systems:** components required for dissipating lightning currents. A grounding system is essential for the proper operation of the protection system.
- 4 Surge protection:** devices for protecting electrical and electronic equipment connected to the facility's electrical network or low current networks (communication and information systems) against voltage surges.



## CHOOSE THE CAPTURE TECHNOLOGY

Various types of lightning protection systems are available, which may be more or less appropriate depending on the construction features of the facility to be protected, the overall installation costs, etc.

### Protection by Faradisation terminals (passive systems)

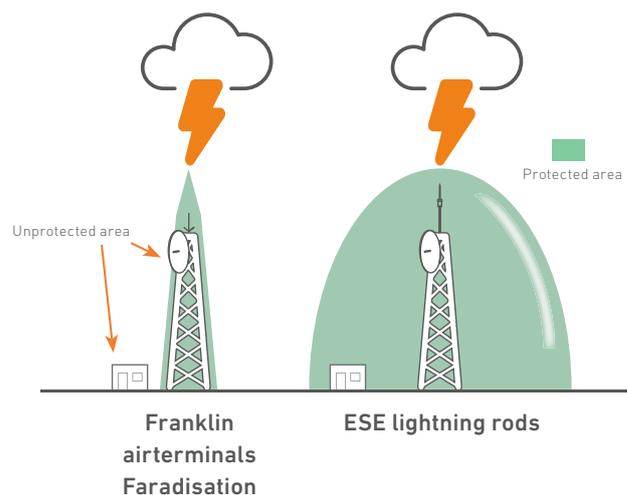
Standards: UNE EN 62305, IEC 62305 and CTE SU8.

Systems which capture by means of rods and meshes work by distributing and dissipating the lightning discharge current through a network of conductors.

### Lightning rod protection with early streamer emission (ESE)

Standards: NF C 17-102, UNE 21186, CTE SU8, NP 4426, etc.

Suitable for any installation type and open areas, where it optimises the material and installation cost while ensuring proper safety.



## Design quickly and easily with nimbus® project designer

Free online tool which allows to design external lightning protection systems (need for protection, optimised location of ESE lightning rods) and generates a complete report to attach to the project quote.



[nimbus.cirprotec.com](http://nimbus.cirprotec.com)

# Lightning rods | ESE Technology

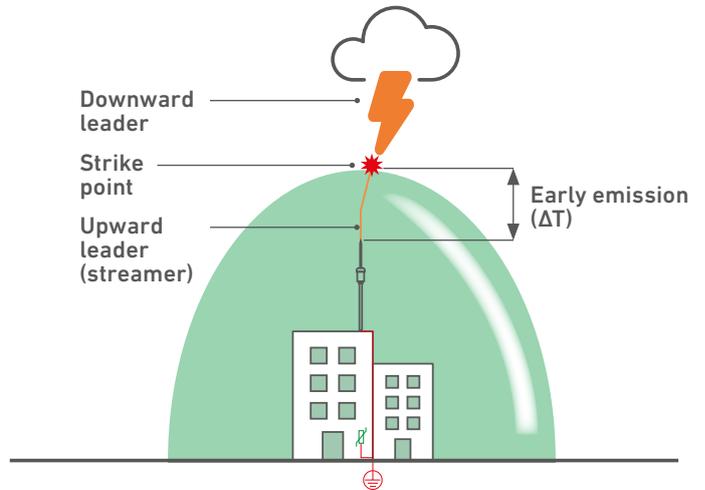
## THE MOST EFFICIENT SYSTEM

ESE (Early Streamer Emission) technology uses the atmospheric gradient to generate ionization which creates an **upward propagating leader** faster than any Franklin passive rod. The time difference  $\Delta T$  is the "benefit" of ESE technology and is known as "early emission" (microseconds  $\mu s$ ).

By reducing the start time, the streamer can be connected to the descending leader at a **virtually located strike point well above the tip of the ESE lightning rod**. This **substantially increases the protected volume** (or radius) and facilitates the protection of large areas, simplifying and reducing material and installation costs.

Determining the protection radius is key for selecting the model most suitable lightning rod for each facility based on the level of early emission ( $\Delta T$ ).

The main standards governing these devices are NF C 17-102:2011 and UNE 21186:2011. They establish the relationship between the early streamer emission time parameter of the lightning rod ( $\Delta T$ ) and its radius of protection/coverage.



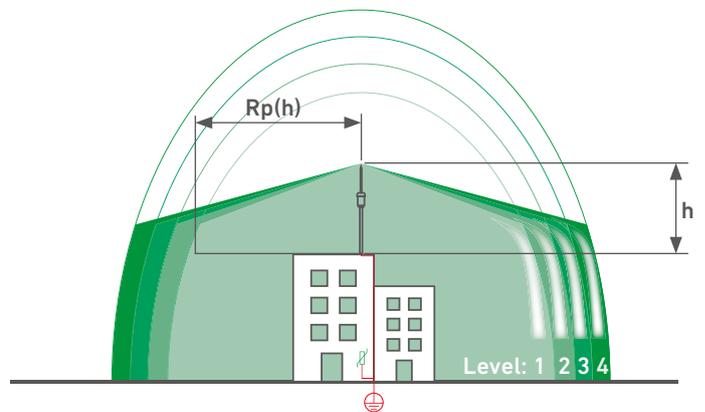
## GREATER PROTECTION VOLUME

- Radius of protection up to 120 m
- Savings of over 30% compared to a passive system
- Easy to install and maintain

## WHAT ESE MODEL ( $\Delta T$ ) SHOULD BE INSTALLED?

The selection and installation of an ESE type lightning rod is carried out **using risk assessment guidelines**. An effective and safe design requires defining the **level of protection or degree of safety** required, calculating the volume of the facility to be protected and, depending on this, selecting the **appropriate lightning rod** based on its early emission time  $\Delta T$ .

The table below determines the **radius of protection ( $R_p$ )** as a function of the height of the lightning rod above the surface to be protected ( $h$ ), the value of early emission ( $\Delta T$ ) of each model and the level of protection. This level is determined from the **risk assessment**.



Protection radius [m] according to NF C 17-102:2011

Level of protection		LEVEL 1				LEVEL 2				LEVEL 3				LEVEL 4			
h[m]	Model	nimbus®/nimbus® R				nimbus®/nimbus® R				nimbus®/nimbus® R				nimbus®/nimbus® Rv			
	$\Delta T[\mu s]$	15	30	45	60	15	30	45	60	15	30	45	60	15	30	45	60
2		13	19	25	31	15	22	28	35	18	25	32	39	20	28	36	43
5		32	48	63	79	37	55	71	86	45	63	81	97	51	71	89	107
10		34	49	64	79	40	57	72	88	49	66	83	99	56	75	92	109
20		35	50	65	80	44	59	74	89	55	71	86	102	63	81	97	113
30		34	49	64	79	45	60	75	90	58	73	89	104	69	85	101	116
40		29	46	62	77	44	59	74	89	60	75	90	105	72	88	103	118
50		18	40	58	74	40	57	72	88	60	75	90	105	74	89	105	120
60		-	30	51	69	34	52	69	85	58	73	89	104	75	90	105	120

# nimbus®

## PROJECT DESIGNER

Tool for the complete design of an external lightning protection system.



### Comprehensive tool

All the tools you need for facility drawing, risk assessment, optimisation of lightning rod placement and generation of technical documentation integrated into a single piece of software.

**SOFTWARE**  
**allinone**

# nimbus<sup>®</sup> project designer software

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LIGHTNING SYSTEM PROTECTION DESIGN FOR ANY TYPE OF FACILITY

# Lightning system protection design software

The **nimbus® project designer** is a **free online tool** which allows users to create the **complete design of a lightning protection system**, from analyzing the risks in accordance with the current regulations, to automatically calculating the optimal number and location of **nimbus®** lightning rods.

The software provides a valuable document detailing the data and calculations for the specification of the project, **facilitating the preparation of quotes.**

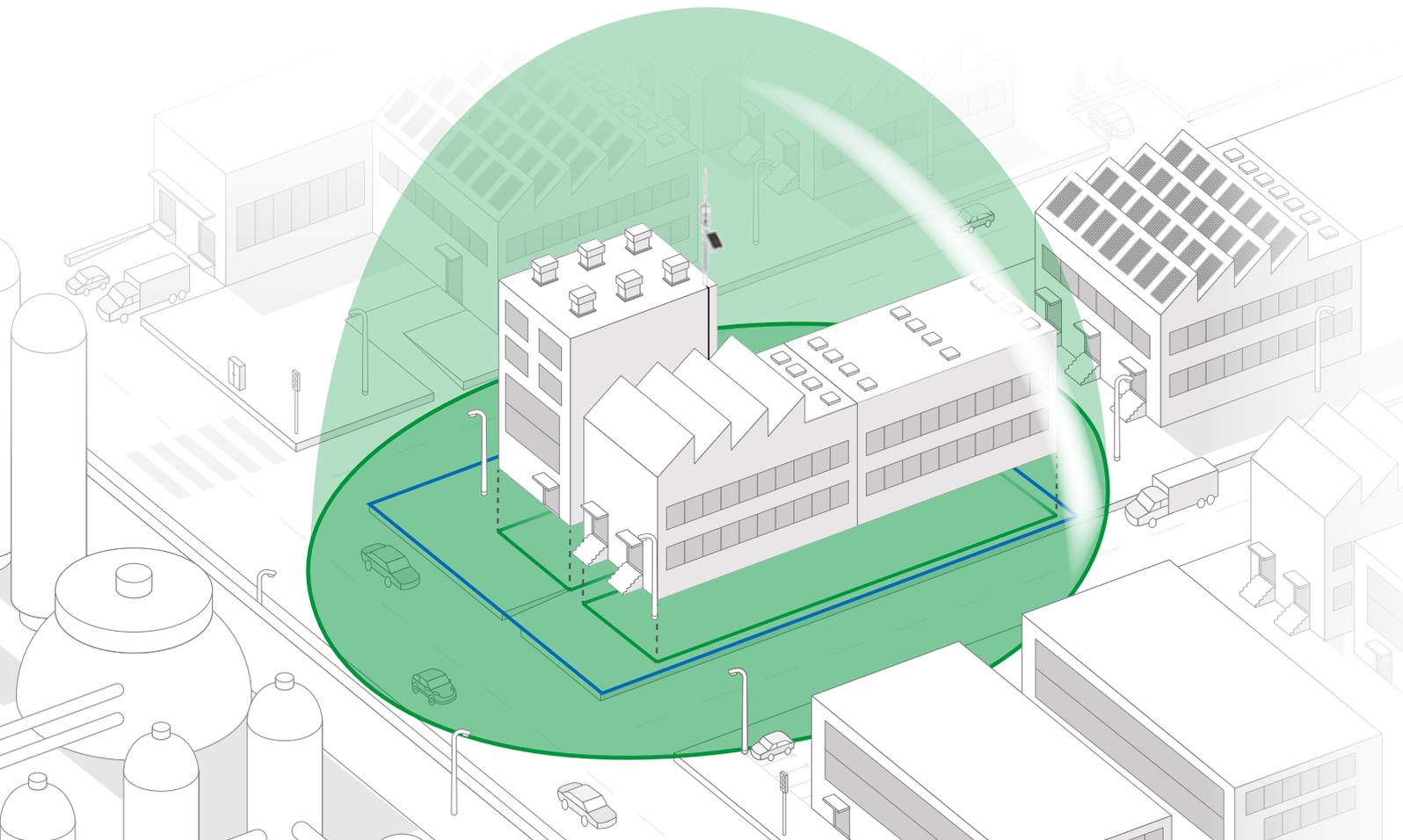
The results of the project are compiled in a report that includes general aspects related to the project in question, normative information, definition of the areas and structures to be protected, the exact location of the lightning rods and earthings and an exhaustive list of accessories that make up the lightning protection system (LPS).

This tool aims to **facilitate the process of analysis and calculation of lightning protection** for any type of facility through the installation of lightning rods on the actual structures and/or on self-supporting poles:

- **Small systems** for industry, tertiary sector, residential and municipal buildings, schools, observatories, radars installations, etc.
- **Large retail and industrial complexes**, hotels, logistics hubs, institutional headquarters, rooftop solar systems, sports, leisure and military complexes, etc.
- **Extensive facilities** such as WWTP/ DWTP (water treatment), solar farms, mining and cement facilities, airports, ports, university campuses, etc.

**nimbus®**   
**PROJECT DESIGNER**

[nimbus.cirprotec.com](http://nimbus.cirprotec.com)



# Easy, fast and optimised project design

## AUTOMATIC LIGHTNING ROD CALCULATION

The **algorithm** developed by Cirprotec allows the **optimal location** of nimbus® lightning rods and earthings **using cost criteria**.

## GUIDED PROCESS



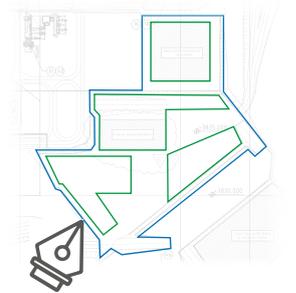
Thanks to a linear process, and **guided by an assistant with contextual help**, defining projects becomes a simple task. No previous knowledge is required.

## EASY DEFINITION OF THE PROTECTION AREA

**Complete and simple** drawing tool with drawing import.

## RISK ASSESSMENT

Calculations of the level of protection **in accordance with current standards** NF C 17-102:2011, UNE 21186:2018 and CTE SU08.



## TECHNICAL SPECIFICATION TOOL

A simple and intuitive interface makes it possible to design the external lightning protection system, while providing a **complete document for the specification of the project**.

## BILL OF MATERIALS

Includes **all necessary accessories** for the lightning protection system.



FINAL PROJECT REPORT

# nimbus® project designer | Step by step

## RESOLVE YOUR PROJECTS RAPIDLY AND INTUITIVELY

nimbus® project designer is an **online software tool** which provides the designer with the necessary tools for the design of lightning protection projects.

A **linear process allows the user to be guided** by the assistant through a set of "stations" which configure the **data and decisions** which determine the scope of the external lightning protection project, in all cases allowing it to be **edited or modified**.

These steps are detailed as follows:

- Project data
- Drawing and parameters
- Risk assesment
- nimbus® optimiser
- Bill of materials
- Project report

More information on [cirprotec.com/externa](https://cirprotec.com/externa)



## Project data

**PROJECT DATA**

NAME: \_\_\_\_\_

LOCATION: Terrassa, Barcelona

**NORMATIVE DATA**

REFERENCE STANDARD: UNE 21186:2011

DOWN CONDUCTOR TYPE: Cable 50mm<sup>2</sup>

ACCESSORY SAFETY MARGIN: 10%

ICFE PROJECT APPLICABLE TO NF C STANDARD:

**PROJECT CLIENT DATA**

COMPANY: \_\_\_\_\_

CONTACT PERSON: \_\_\_\_\_

Name: \_\_\_\_\_

CONTACT E-MAIL: \_\_\_\_\_

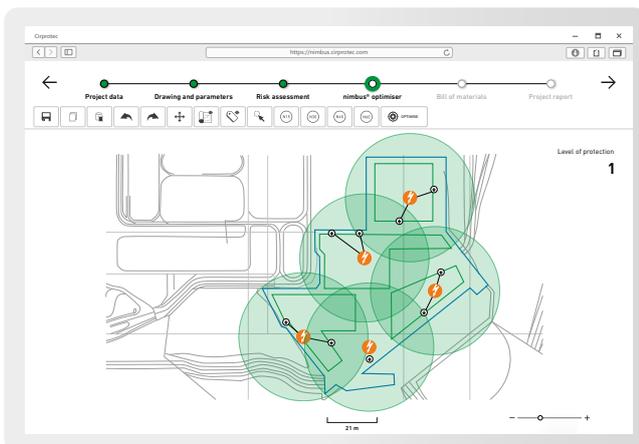
E-mail: \_\_\_\_\_

CONTACT PHONE NUMBER: \_\_\_\_\_

Telephone: \_\_\_\_\_

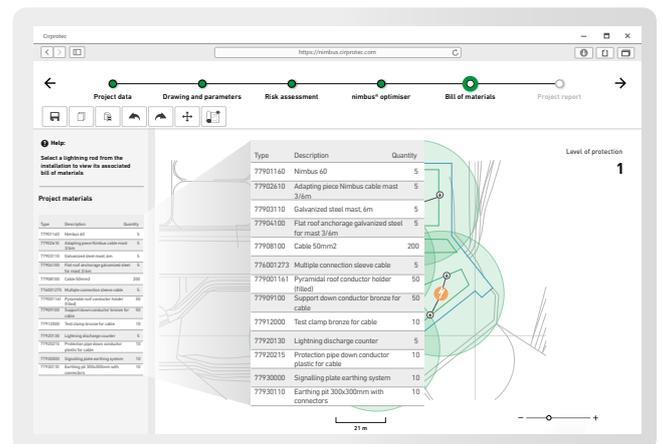
- 1 Name the project and define its geographic location.
- 2 Indicate the regulatory framework and the technical characteristics of the facility.
- 3 Fill in the property details of your customer's facility in order to issue a customized report.

## nimbus® optimiser

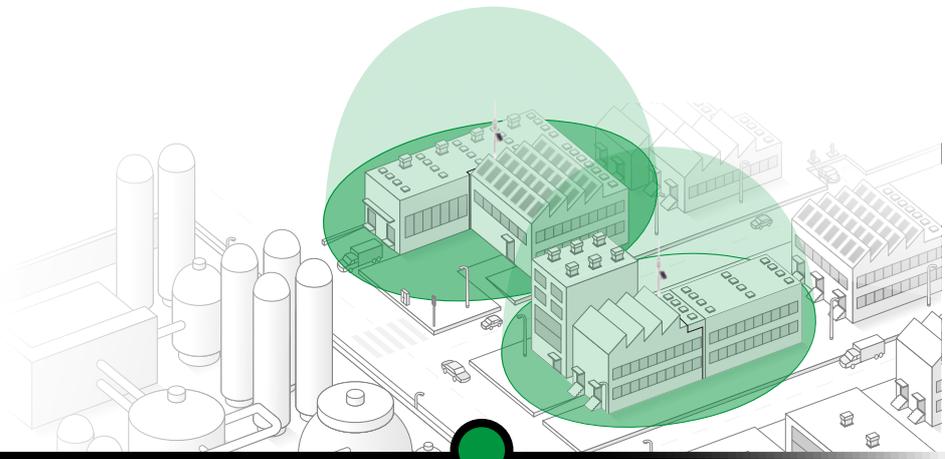


- 7 Automatically calculate the lightning rod placing to cover the entire area to be protected; also manual option.
- 8 Configure the accessories of each lightning rod and its earthing.

## Bill of materials

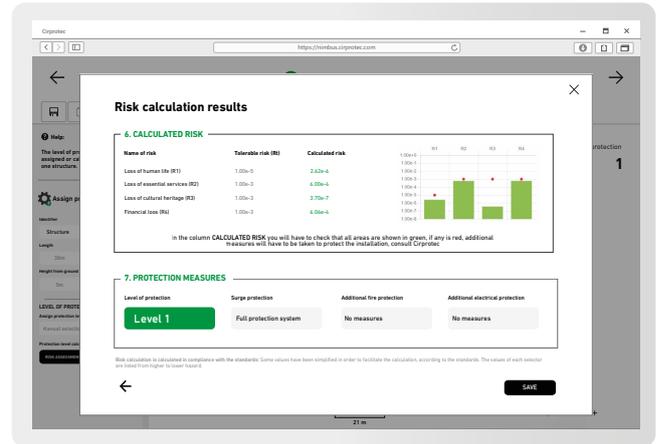
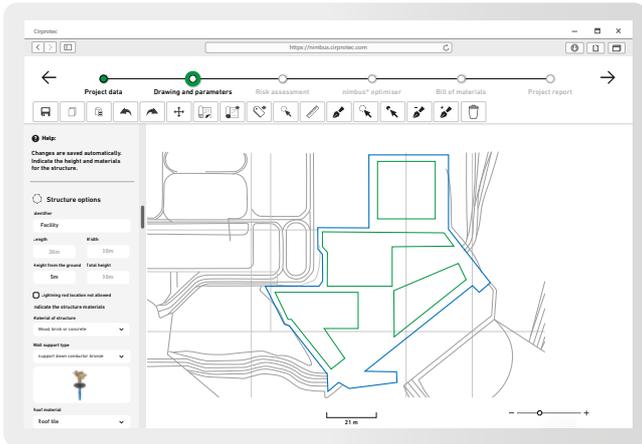


- 9 The software generates the overall bill of materials (lightning rods and accessories) required for the protection of the comprehensive facility, in addition to a bill of materials for each lightning rod.



## Drawing and parameters

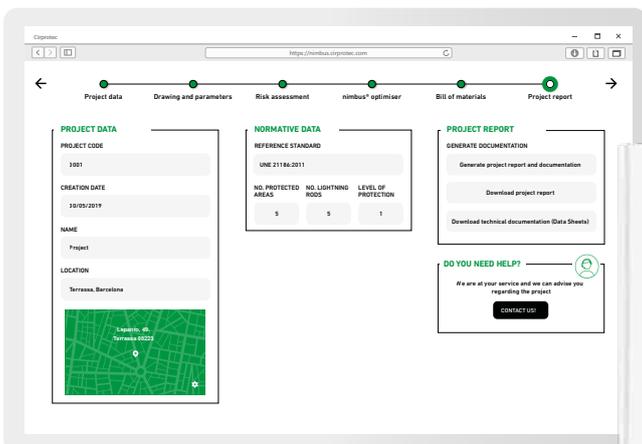
## Risk assessment



- 4 Import a plan and/or draw the perimeter of the installation and set the scale.
- 5 Draw the structures to be protected and indicate the height and materials for each one.

- 6 For each structure: Select the level of protection or calculate it using the risk calculation wizard.

## Final project report



- 10 Download the project report in PDF format together with the related technical data sheets.

- 11 Ready for submitting to the customer.

# Design using the most advanced software

## FEATURES

**nimbus® project designer** is the result of **Cirprotec's extensive experience in the design and dimensioning of lightning protection systems**. This software provides the designer with the set of tools needed for the **efficient solution** of projects.

- **Free access for any number of projects**

By just registering, you will have access to all the functions of the software and you can carry out any number of projects, with no limit to the number of lightning rods.

- **Web application**

Since it is a web application it does not require a download or installation, and works on any operating system and browser (optimised for Google Chrome).

- **Multilingual platform**

Both the user interface and the downloadable output files are available in Spanish, English and French. Compatible with scripts (writing systems) other than those of the Latin alphabet.

- **Effective project management and monitoring**

Track the status of the project, edit and recalculate where necessary (by adding restrictions, changing materials, etc.)

- **Step-by-step guided system with contextual help**

Creating projects is based on a linear process. The assistant will guide you through the entire process: import the background plan, draw structures and areas, define the level of protection for each of them, etc., to find a solution for your project quickly and easily. No previous knowledge required.

- **Calculations in accordance with current regulations**

The application performs calculations in accordance with current regulations on ESE lightning protection (NF C 17-102:2011, UNE 21186:2011 and CTE SUA 08), and also provides the possibility of introducing voluntary or prescriptive restrictions on radii of protection according to the laws of each country (ICPE, etc.).

- **Wide portfolio of accessories and materials**

The software includes the complete portfolio of external protection accessories from Cirprotec (See page 24).

The bill of materials provided by the program can be edited to suit the requirements of the project (type of down conductor (cable/flat tape), roof material, type of structure, etc.).

- **Online - always up to date**

Enjoy the most up-to-date version with new and improved features.



# The first comprehensive tool | All in one

## FUNCTIONS

- **Importing drawings and plans**

Use it as a background reference for drawing areas of the facility to be protected. The tool supports PDF, PNG, JPG formats, etc.

- **Draw your system easily**

The drawing environment has all the necessary tools for the detailed design of the areas and structures to be protected.

- **Risk analysis assistant**

It facilitates risk calculation, provides protection measures (level of protection, surge protection, additional fire and electrical protection) and applies the level of protection to each structure or area.

- **Complete lightning protection design**

From the automatic location of the total number of **lightning rods** and their respective **down conductors** to the selection of installation accessories, including the earthing system.

The location of the lightning rod can be set manually or automatically (thanks to the nimbus® optimiser). It also allows editing of the result provided by the optimiser.

- **nimbus® optimiser**

The calculation and geometric optimisation algorithm developed by Cirprotec provides a compromise between precision, speed and total cost (including all the required accessories for the installation of each lightning rod).

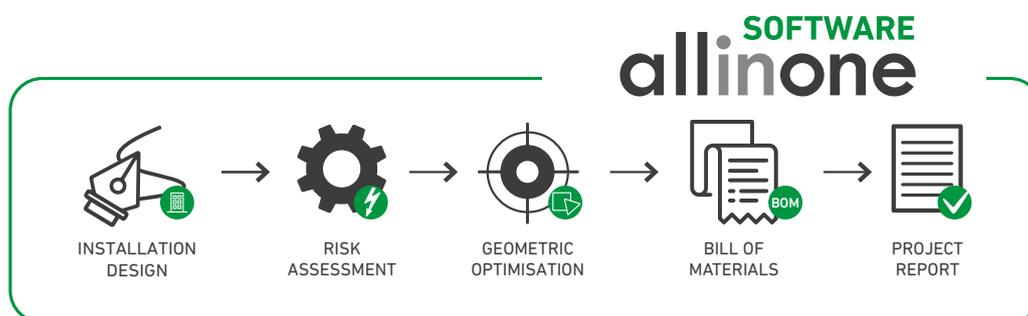
- **Bill of materials**

The accessories needed for the installation are defined automatically according to the location of the lightning rod (roof, wall or ground) and the characteristics of the structure on which it is located.

In the application one can interact with the user interface to show individual lists of materials by lightning rod or to display a summary list of the complete system.

- **Technical specification tool**

The final PDF document includes calculations of the risk analysis, specifications of the location of the lightning rod and earthing, bill of materials, technical product documentation, etc. and facilitates preparation of the project budget/quotation.



## nimbus® R

ESE lightning rod with remote test technology using the universal R-Tester (accessory).



## nimbus®

ESE lightning rod with early emission streamer according to NF C 17-102 and UNE 21186.

With over 45,000 lightning rods sold, nimbus® is a worldwide leading brand by Cirprotec.



**nimbus<sup>®</sup>**

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**ESE LIGHTNING ROD (WITH ELECTRONIC EARLY STREAMER EMISSION)**

# nimbus® | Highlights

## ESE TECHNOLOGY

The state-of-the-art electronic device (ESE technology) allows the nimbus® lightning rod range to offer the best performance in terms of early emission levels.

## IN ACCORDANCE WITH STANDARDS

The lightning rods of the nimbus® series have undergone the tests and quality controls specified in the requirements of standards NF C 17-102:2011 and UNE 21186:2011.

## QUALITY ASSURANCE

nimbus® lightning rods are Bureau Veritas certified. This guarantees the type tests, as well as the production process (audited) and ensures quality.



## AISI 316 STAINLESS STEEL

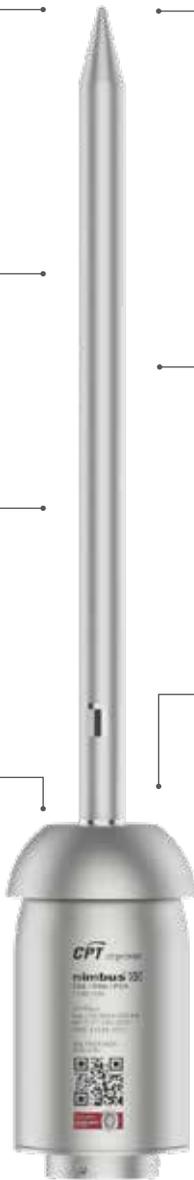
Highest quality anti-corrosion stainless steel AISI 316 is used in the manufacture of nimbus® lightning rods.

## MAINTENANCE TEST

Inspection and maintenance of LPSs is called for by the regulations. Cirprotec partners offer this service to its customers. The LR-tester (accessory) allows to perform the maintenance test of any nimbus® lightning rod on site.



LR-TESTER



## + 45,000 LIGHTNING RODS

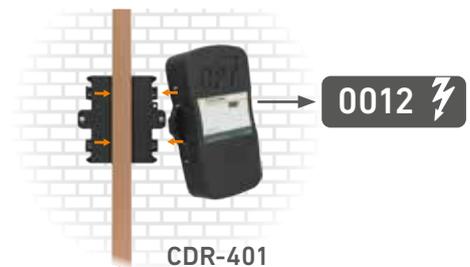
The quality and reliability of the nimbus® series is backed by +25 years of experience of CPT. Over 45.000 lightning rods have been installed worldwide in cooperation with a consolidated global network of highly experienced sales and installation partners, as well as recurring customers.

## BEYOND THE STANDARD

The nimbus® series offers a level of robustness well above those required in the standard, thus exceeding the characteristics of similar solutions. Tests carried out at independent laboratories have demonstrated its ability to withstand discharges of up to 200 kA.

## LIGHTNING DISCHARGE COUNTER

CDR-401 is the standard open-core lightning strike counter, which can easily be placed around a down tape or down cable.



CDR-401

## PART NUMBERS

ORDERING CODE	PART NUMBER	EARLY STREAMER EMISSION TIME [µs]	HEIGHT [CM]	NF C 17-102:2011 UNE 21186:2011
77901115	nimbus® 15	15	37.85	✓
77901130	nimbus® 30	30	42.85	✓
77901145	nimbus® 45	45	47.85	✓
77901160	nimbus® 60	60	52.85	✓
77920130	CDR-401	-	-	-
77900015	LR-Tester	-	-	-

# QR | Verify your nimbus® online

## WHY MAY IT BE USEFUL TO VERIFY NIMBUS® WITH A QR CODE?

nimbus® is one of the **most recognized ESE lightning rod brands** in the world thanks to Cirprotec's more than 25 years of experience as a protection specialist, as well as the more than **45,000 lightning rods installed**, which have endured the severest conditions for years and decades.

nimbus® **quality is assured**, with the product enjoying great trust in the market. Consumers who choose nimbus® can rest assured that they are buying a durable and reliable product at all levels:

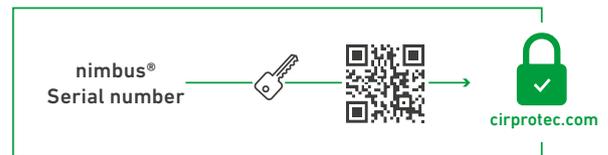
- **Certificates in accordance with NF C 17-102:2011 and UNE 21186:2011 standards**
- **Production audited by Bureau Veritas**
- **Current testing exceeding the standard**
- **Materials of the utmost quality and extended warranty**

Cirprotec is the first manufacturer to make available to customers who wish for it a **method for confirming the quality of lightning rods, verifiable prior to installation.**

The customer can have **total peace of mind** regarding the origin/authenticity of the device purchased, which will confirm the quality associated with the **original brand** and avoid the risk of copies.

The inclusion of the **laser-marked QR code** on the body of the product allows to verify the nimbus® quality, simply and quickly, from any smartphone device with an app for reading QR codes.

The QR code includes the **serial number** and encodes it along with a secure https:// link pointing to the official Cirprotec website at <https://qr.cirprotec.com>. This is the only way to be **certain that the product complies with the specified certifications and regulations, and that it was manufactured according to processes audited by Bureau Veritas.**



## VERIFIABLE QUALITY PEACE OF MIND

nimbus® is the **first lightning rod** to provide a secure quality confirmation method based on the **verification of its authenticity.**

Verification must be done on the official Cirprotec website **using a laser-marked QR** on the product body.

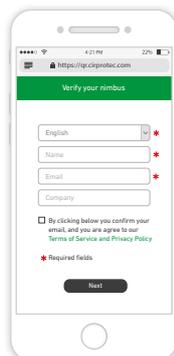
<https://qr.cirprotec.com>



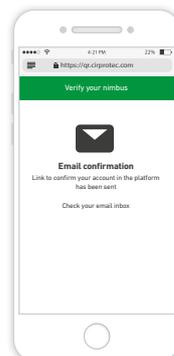
### SCAN QR CODE



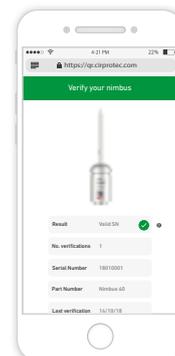
### FILL OUT DATA



### EMAIL CONFIRMATION



### VERIFICATION RESULT



# nimbus® R | Remotely testable series

## REMOTELY TESTABLE LIGHTNING ROD

The nimbus® range consists of various series, 45,000 units of which have been installed in the field worldwide. These lightning rods have withstood for years and decades the most severe weather conditions, proving their sturdiness, durability and quality.

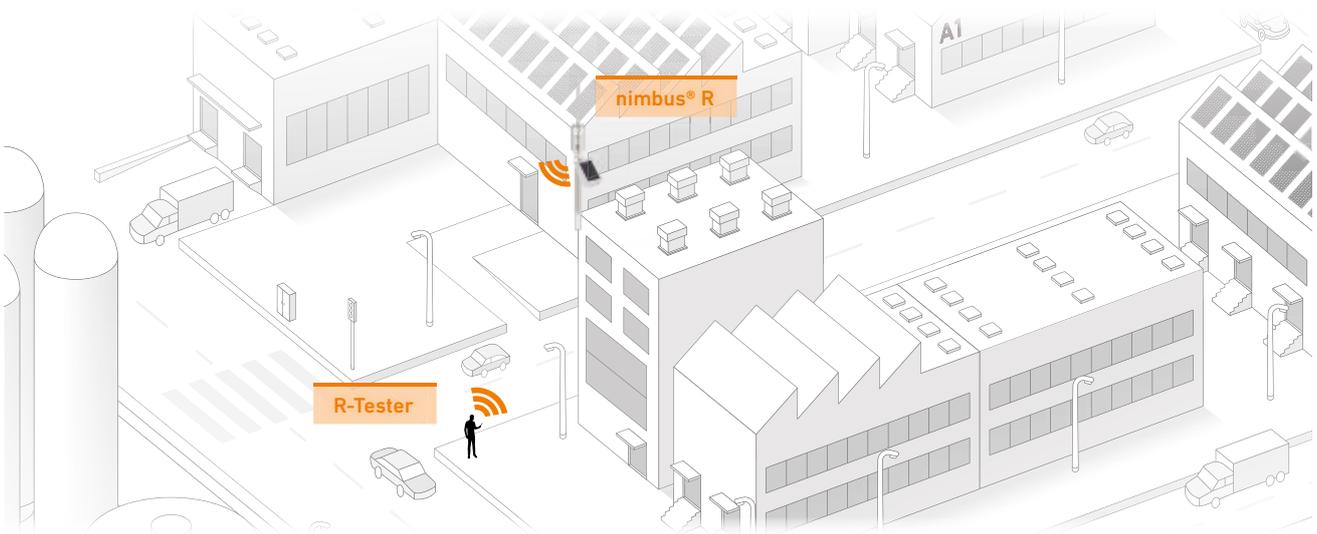
Be that as it may, lightning protection systems – including lightning rods – **are subject to periodic maintenance, the frequency of which depends on regulatory issues, the criticality of the facilities, and their location/exposure.**

Each lightning rod manufacturer makes methods available to the market for testing its correct operation. In fact, some codes and standards even contemplate the possibility of this being done remotely.

In the standard nimbus® series, maintenance is performed using the LR-Tester product, which requires physical access to the lightning rod, at the height at which it is installed.

The nimbus® R range **simplifies this process by incorporating remote verification technology.** This way one can **check its operation**, with the help of a **remote control called R-Tester**, without physically accessing the lightning rod.

This feature, in addition to facilitating and speeding up the maintenance process, results in cost savings. This makes the nimbus® R lightning rod especially suitable for installations where circumstances require frequent maintenance at an optimal cost.



## FEATURES & BENEFITS

The **R-Tester** is especially indicated for installation professionals and external lightning protection maintenance professionals.

### Remote result on the remote control

By means of the connection between R-Tester and the nimbus® R lightning rod, the result is shown on the remote control.

### R-Tester is universal

Any nimbus® R lightning rods can be tested from a single remote control serial number. It is not necessary to buy an R-Tester for each lightning rod, which makes it cost effective for both installers and owners.

### Long range

The technology incorporated in R-tester and nimbus® R, allows testing, serial number by serial number from great distances, an important aspect for most installations.



### Check to validate the installation

Make sure the nimbus® R works correctly right after completing the initial installation.



### Reduced maintenance costs

Cost effectiveness. Simplified process.



### Peace of mind

It allows periodic maintenance tests without the need to physically access the lightning rod, thus favouring an optimal periodicity.

# nimbus® R | Highlights

## COMPLIANCE WITH STANDARDS CODES

Lightning rod regulations NFC 17-102:2011 and UNE 21186:2011; as well as series UNE 61000-6 for radiated emissions.

## VERIFIABLE QUALITY PEACE OF MIND

nimbus® is the first lightning rod to provide a high-quality confirmation method based on the verification of its authenticity. Verification must be done on the official Cirprotec website using a laser-marked QR on the body of the lightning rod.

## LED COMMUNICATION ALERT

When performing a test, a high intensity LED on the lightning rod provides visual verification that the communication between the lightning rod and the remote control is taking place correctly.

## RELIABILITY UNDER EXTREME CONDITIONS

The components of the nimbus® R series ensure quality protection, as in the entire nimbus® range. The components related to communication and testing are also of the highest quality. nimbus® runs on a battery which can operate at temperatures down to -30 °C.

Ergonomically designed to withstand hurricane force winds.

This all guarantees the long-term operability and profitability of the projects.

## OFF-THE-GRID

It requires no external power as it includes a PV module and a high capacity battery which allows the communication to be powered as well as to make exhaustive tests of the internal operating electronics of the lightning rod (emission and charge).

## REMOTE TESTING

Remote test using the universal R-Tester control (accessory), with wide range of RF communication in open areas (> 200 m).

## PART NUMBERS

ORDERING CODE	PART NUMBER	EARLY STREAMER EMISSION TIME [µs]	HEIGHT [CM]	REMOTELY TESTABLE	NF C 17-102:2011 UNE 21186:2011
77901401	nimbus® 15 R	15	45.85	√	√
77901403	nimbus® 30 R	30	50.85	√	√
77901404	nimbus® 45 R	45	55.85	√	√
77901406	nimbus® 60 R	60	60.85	√	√
77901410	R-Tester (accessory)	-	-	-	-



### Capture System (air terminal)

nimbus® lightning rod **with early emission system (ESE)**. **More than 45,000** protected facilities around the world.

### Adapting piece

For fixing nimbus® in the mast.

### Lightning strike counter

It allows **lightning strikes on the facility to be detected**, for the purpose of maintenance, thus ensuring its integrity.

### Down conductor system

Set of **clamps and accessories** for the design of the lightning system. Solutions for cable and flat tape.

### Earthing system

Elements that ensure a good **dissipation of the energy** from the lightning strike.

# Lightning rods & accessories

---

EXTERNAL PROTECTION PRODUCTS

# Early streamer emission (ESE) lightning rods

## nimbus®

nimbus® is the series of lightning rods with electronic early streaming emission (ESE). Radius of protection up to 120 m (based on emission times). Complies with standards NF C 17-102:2011, UNE 21186:2011, CTE SU 8.

ESE electronic technology, unlike passive Faradization systems with air terminals, makes active use of atmospheric gradient to generate ionization in order to increase the height of the lightning impact point above the tip of the rod, thus increasing the volume protected. This facilitates the protection of large areas, simplifying and reducing material and installation costs.

The nimbus® lightning rods exceed the requirements of the new version of standard NF C 17-102 v2011, with the goal of making them more robust, without sacrificing their compact size and with a significant weight reduction.

## FEATURES AND BENEFITS

- Tested with lightning currents up to 200 kA (10/350 μs).
- Highest Quality: AISI 316 stainless steel and non-expendable components.
- Tested and certified by independent laboratories.
- Bureau Veritas Certification of the production process.
- Easy installation (and transport) thanks to its new design.
- Testable in-situ with the Cirprotec LR tester.

TECH INFO  
cirprotec.com/nimbus

+45.000 lightning rods installed

Standards

- NF C 17-102:2011
- UNE 21186:2011

CE

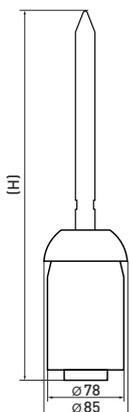
Watch the video on  
[www.youtube.com/cptcirprotec](http://www.youtube.com/cptcirprotec)



## PART NUMBERS

ORDERING CODE	PART NUMBER	EARLY STREAMER EMISSION TIME [μs]	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
			PROTECTION RADIUS (IN METERS) FOR H=5M			
77901115	nimbus® 15	15	32	37	47	51
77901130	nimbus® 30	30	48	55	63	71
77901145	nimbus® 45	45	63	71	81	89
77901160	nimbus® 60	60	79	86	97	107

## DIMENSIONS



PART NUMBER	HEIGHT (H) [mm]
nimbus® 15	378.5
nimbus® 30	428.5
nimbus® 45	478.5
nimbus® 60	528.5

# Lightning discharge counters

## CDR-401

CDR-401 is Cirprotec's lightning discharge counter. It complies with the latest applicable Lightning Protection related Standards (UNE-EN 50164-6, UNE-EN 62561-6 and UTE C 17106).

### FEATURES AND BENEFITS

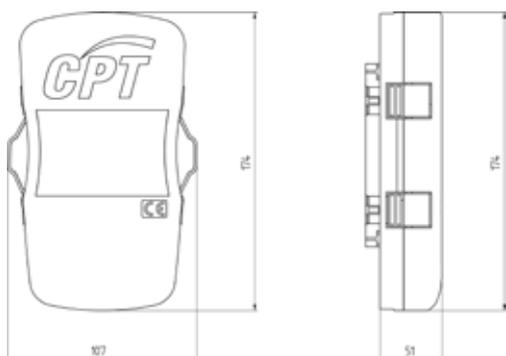
- Open core technology: CDR-401 is a "Clip-on" counter that can be installed around the conductor. Ideal also for retrofitting.
- Universal: Installation around flat tapes and cable conductors.
- CDR-401 is totally protected against the effect of dust and against the effect of immersion (IP67).



### PART NUMBERS

ORDERING CODE	PART NUMBER	THRESHOLD CURRENT (8/20) [KA]	MAXIMUM COUNTING AND WITHSTAND DISCHARGE CURRENT (10/350) [KA]	MAX. FLAT TAPE WIDTH [MM]	MAX. DIAMETER OF CABLE [MM]
77920130	CDR-401	1	150	30	10

### DIMENSIONS



# Capture system | Adaptors

## ADAPTING PIECE NIMBUS TO MAST

Adapting piece for fixation of nimbus® to the mast, with fixation for cable or tape down conductor.



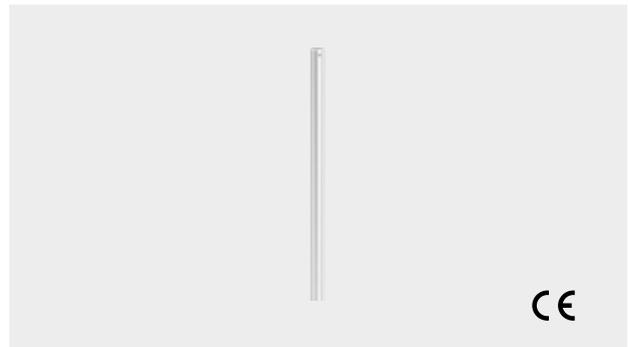
### PART NUMBERS

ORDERING CODE	PART NUMBER	MATERIAL	MAX. DIAMETER OF CABLE [MM]	MIN. DIAMETER OF CABLE [MM]	MAX. MAST DIAMETER [MM]	MAX. FLAT TAPE WIDTH [MM]	MIN. FLAT TAPE WIDTH [MM]
Cable							
77902610	P-ADAP D36,5	Brass	10	8	36,5	-	-
77902600	P-ADAP D39,5	Brass	10	8	39,5	-	-
Tape							
77902611	P-ADAPTACION (PLETINA)	Brass	-	-	36,5	30	25
77902613	P-ADAP D39,5 PLETINA	Brass	-	-	39,5	30	25

# Down conductor system | Masts for lightning rod

## MASTS FOR LIGHTNING RODS

Steel mast for lightning rod elevation over the protected structure level, consisting of several segments of 3m each.



### PART NUMBERS

ORDERING CODE	PART NUMBER	MATERIAL	NO. PARTS	PRODUCT HEIGHT [MM]	DIAMETER [MM]
77903010	MAST 3M FEG	Galvanized steel	1 segment	3000	42
77903110	MAST 6M FEG	Galvanized steel	2 segments	6000	48
77903210	MAST 9M FEG	Galvanized steel	3 segments	9000	60
77903020	MAST 3M INOX	Stainless steel	1 segment	3000	42
77903120	MAST 6M INOX	Stainless steel	2 segments	6000	48
77903220	MAST 9M INOX	Stainless steel	3 segments	9000	60

# Down conductor system | Free standing pylons

## SUPPORT POLE

Support pole for lightning rod elevation over terrain level (up to 25m), with fixation bolts for foundation.



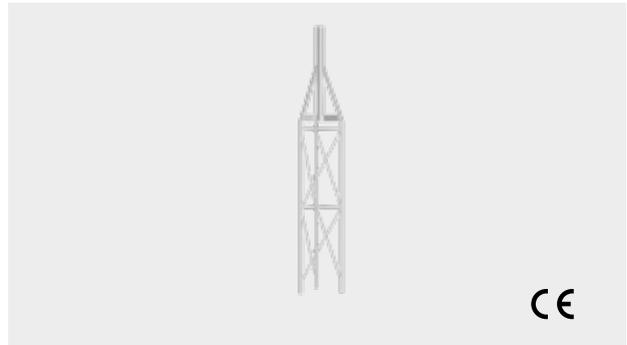
## PART NUMBERS

ORDERING CODE	PART NUMBER	MATERIAL	NO. PARTS	PRODUCT HEIGHT [MM]
77906000	POSTE FIJ-ESPAR 6M	Galvanized steel	1 segment	6000
77906040	POSTE FIJ-ESPAR 8M	Galvanized steel	1 segment	8000
77906100	POSTE FIJ-ESPAR 10M	Galvanized steel	1/2 segments	10000
77906110	POSTE FIJ-ESPAR 12M	Galvanized steel	1/2 segment	12000
77906200	POSTE FIJ-ESPAR 15M	Galvanized steel	2 segments	15000
77906220	POSTE FIJ FeCG 20M	Galvanized steel	2 segments	20000
77906225	POSTE FIJ FeCG 25M	Galvanized steel	2 segments	25000

# Down conductor system | Trestle towers

## TRESTLE TOWER

Trestle tower for lightning rod elevation over the protected structure level (up to 21m), consisting of several segments of 3m each.



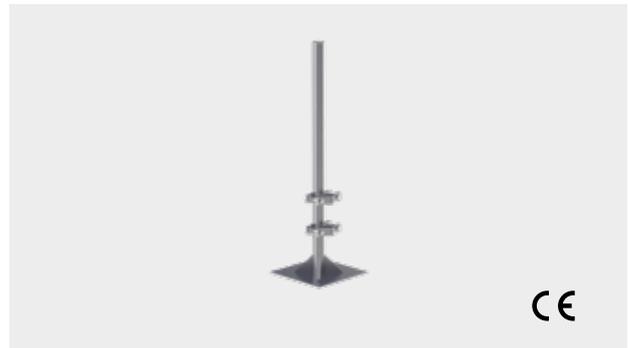
## PART NUMBERS

ORDERING CODE	PART NUMBER	MATERIAL	NO. PARTS	PRODUCT HEIGHT [MM]
77906206	TORRE RIGIDA 6M	Galvanized steel	2 segments	6000
77906209	TORRE RIGIDA 9M	Galvanized steel	3 segments	9000
77906210	TORRE RIGIDA 12M	Galvanized steel	4 segments	12000
77906215	TORRE RIGIDA 15M	Galvanized steel	5 segments	15000
77906218	TORRE RIGIDA 18M	Galvanized steel	6 segments	18000
77906221	TORRE RIGIDA 21M	Galvanized steel	7 segments	21000

# Down conductor system | Mast anchorages

## MAST ANCHORAGE FOR FLAT ROOF

Anchorage for mounting of the lightning rod mast on a flat roof.

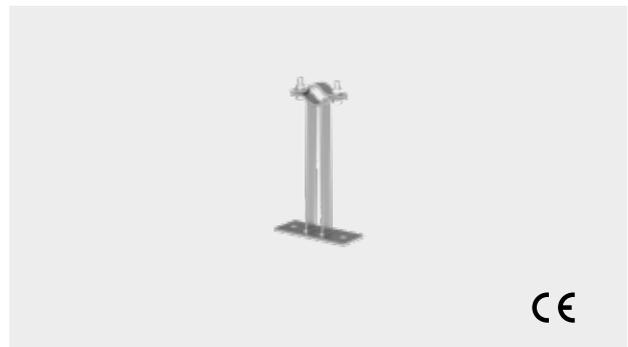


### PART NUMBERS

ORDERING CODE	PART NUMBER	MATERIAL	PRODUCT HEIGHT [MM]	INTERNAL DIAMETER [MM]
77904100	PIE SOP MAST TEJ	Galvanized steel	1016	50
77904105	PIE SOP MAST 9M	Galvanized steel	1016	50

## SCREW-PLATE MAST ANCHORAGE

Anchorage for mounting of the lightning rod mast on the wall, with screw plate.



### PART NUMBERS

ORDERING CODE	PART NUMBER	MATERIAL	NO. PARTS	MAX. MAST DIAMETER [MM]	PRODUCT LENGTH [MM]	MOUNTING TYPE
77904400	ANCLAJES PL 30 D 1 1/2" (MAST 3 Y 6M)	Galvanized steel	2 pieces	60	80	Mast 3 and 6m
77904402	ANCLAJES PL 30 D 2" (MAST 9M)	Galvanized steel	3 pieces	60	80	Mast 9m
77904700	ANCLAJES PL 60 (MAST 3 Y 6M)	Galvanized steel	2 pieces	60	80	Mast 3 and 6m
77904705	ANCLAJES PL 60 (MAST 9M)	Galvanized steel	3 pieces	60	80	Mast 9m

## EMBEDDABLE MOUNTING MAST ANCHORAGE

Anchorage for mounting of the lightning rod mast on the wall, for embeddable mounting.



### PART NUMBERS

ORDERING CODE	PART NUMBER	MATERIAL	NO. PARTS	MAX. MAST DIAMETER [MM]	PRODUCT LENGTH [MM]	MOUNTING TYPE
77904200	ANCLAJES EMPO 30 D 1 1/2" (MAST 3 Y 6M)	Galvanized steel	2 pieces	60	35	Mast 3 and 6m
77904202	ANCLAJES EMPO 30 D 2" (MAST 9M)	Galvanized steel	3 pieces	60	35	Mast 9m
77904210	ANCLAJES EMPO 60 D 1 1/2" (MAST 3 Y 6M)	Galvanized steel	2 pieces	60	35	Mast 3 and 6m
77904212	ANCLAJES EMPO 60 D 2" (MAST 9M)	Galvanized steel	3 pieces	60	35	Mast 9m

# Down conductor system | Mast anchorages

## MAST ANCHORAGE FOR HORIZONTAL RAIL

Anchorage for mounting of the lightning rod mast on a horizontal rail.



### PART NUMBERS

ORDERING CODE	PART NUMBER	MATERIAL	PRODUCT HEIGHT [MM]	NO. PARTS	MAX. MAST DIAMETER [MM]
77904500	ANCLAJES BARAN H	Galvanized steel	105.3	2 pieces	60
77904505	ANCLAJES BARAN H 3P	Galvanized steel	105.3	3 pieces	60

## MAST ANCHORAGE FOR VERTICAL RAIL

Anchorage for mounting of the lightning rod mast on a vertical rail.



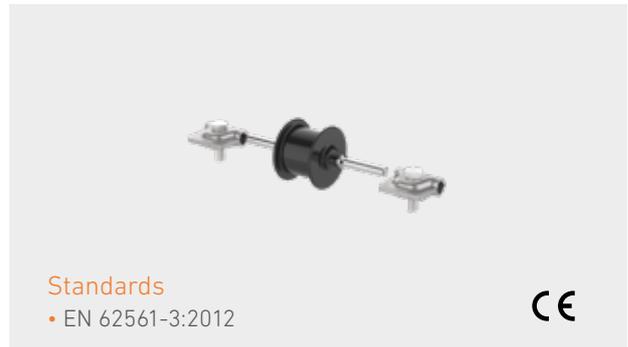
### PART NUMBERS

ORDERING CODE	PART NUMBER	MATERIAL	PRODUCT HEIGHT [MM]	NO. PARTS	MAX. MAST DIAMETER [MM]
77904600	ANCLAJES BARAN V	Galvanized steel	106.3	2 pieces	60
77904605	ANCLAJES BARAN V 3P	Galvanized steel	106.3	3 pieces	60

# Down conductor system | Spark gaps

## SPARK GAP

Spark gap for equipotential protection for the lightning rod down conductor system.



## PART NUMBERS

ORDERING CODE	PART NUMBER	LIGHTNING IMPULSE CURRENT (10/350) [KA]	VOLTAGE PROTECTION LEVEL [KV]	CONNECTOR MATERIAL	HOUSING MATERIAL	APPLICATION
77920510	KIT VIA CHISPAS+MAST-ANTENA	100	<= 5	Stainless steel	Plastic	Mast-antenna protection
77920310	EQUIPOT TIERRA	100	<= 5	Stainless steel	Plastic	Equipotential protection

# Down conductor system | Down conductors

## COPPER CABLE DOWN CONDUCTOR

Round braided copper cable for lightning rod down conductor.



## PART NUMBERS

ORDERING CODE	PART NUMBER	MATERIAL	SECTION [MM^2]	DIAMETER [MM]	PACKAGING UNIT [M]
77908100	CABLE-TRZ Cu 50	Copper	50	8	50
77908200	CABLE-TRZ Cu 70	Copper	70	10	50

## FLAT TAPE DOWN CONDUCTOR

Tinned copper tape for lightning rod down conductor.



## PART NUMBERS

ORDERING CODE	PART NUMBER	MATERIAL	MIN. FLAT TAPE WIDTH [MM]	MIN. FLAT TAPE THICKNESS [MM]	PACKAGING UNIT [M]
77908103	PLETINA 25x3	Copper	25	3	25
77908101	PLETINA 30x2	Copper	30	2	50

# Down conductor system | Supports

## PYRAMIDAL CONDUCTOR HOLDER

Pyramidal lightning rod down conductor holder for roof.



### PART NUMBERS

ORDERING CODE	PART NUMBER	HOUSING MATERIAL	MAX. DIAMETER OF CABLE [MM]	MAX. FLAT TAPE WIDTH [MM]	PACKAGING UNIT
Universal					
779001161	SOP-CEM CABLE PLETINA	PVC + Concrete	8	30	20
779001162	SOP VAC TEJADO PLANO CABLE PLETINA	PVC	8	30	20

## ROOF TYLE CONDUCTOR HOLDER

Roof tyle lightning rod down conductor holder.



### PART NUMBERS

ORDERING CODE	PART NUMBER	MATERIAL	MAX. DIAMETER OF CABLE [MM]	MAX. FLAT TAPE WIDTH [MM]	PRODUCT LENGTH [MM]
Cable					
776111019	SOP-COND NIRO CLIP V2A D8 AI	Stainless steel	8	-	263
Tape					
77611100	SOP-COND TEJ PLETINA	Stainless steel	-	30	210

## DOWN CONDUCTOR SUPPORT METALLIC ROOF

Clamp for lightning rod down conductor on metallic roof.



### PART NUMBERS

ORDERING CODE	PART NUMBER	MATERIAL	HOUSING MATERIAL	MAX. DIAMETER OF CABLE [MM]	MAX. FLAT TAPE WIDTH [MM]
Cable					
776111397	SOP-COND TF ISO CABLE D10	Stainless steel	PVC Isolator	10	-
Tape					
776111398	SOP-COND TF ISO PLETINA	Stainless steel	PVC Isolator	-	30

# Down conductor system | Clamps

## BRONZE CABLE CLAMP

Bronze clamp for lightning rod round cable down conductor.



### PART NUMBERS

ORDERING CODE	PART NUMBER	MATERIAL	PRODUCT HEIGHT [MM]	MAX. DIAMETER OF CABLE [MM]	MIN. DIAMETER OF CABLE [MM]
Cable					
77909100	SOP-CABLE Br M8 TIRAF 50/70	Brass	73.4	10	8

## NYLON CABLE CLAMP

Nylon clamp for lightning rod round cable down conductor.



### PART NUMBERS

ORDERING CODE	PART NUMBER	MATERIAL	PRODUCT HEIGHT [MM]	MAX. DIAMETER OF CABLE [MM]	MIN. DIAMETER OF CABLE [MM]
Cable					
776001155	SOP-COND TF NYLON D8MM	Nylon	60	8	8

## COPPER TAPE CLAMP

Copper clamp for lightning rod flat for down conductor.



### PART NUMBERS

ORDERING CODE	PART NUMBER	CONNECTOR MATERIAL	PRODUCT HEIGHT [MM]	MAX. FLAT TAPE WIDTH [MM]	MIN. FLAT TAPE WIDTH [MM]
Tape					
7760001182	SOP-COND PLETINA Cu 30MM TACO	Copper	73.4	30	25

# Down conductor system | Clamps

## TAPE STAPLE FOR CONCRETE WALL

Galvanized steel staples for fastening flat tape conductors.



### PART NUMBERS

ORDERING CODE	PART NUMBER	MATERIAL	PRODUCT HEIGHT [MM]	MAX. FLAT TAPE WIDTH [MM]	MIN. FLAT TAPE WIDTH [MM]
Tape					
77934202	GRAPA LIGERA PLETINA	Galvanized steel	5	30	25

## DOWN CONDUCTOR CLAMP FOR METALLIC WALL

Galvanized steel down conductor clamp with dowel for metallic structure.



### PART NUMBERS

ORDERING CODE	PART NUMBER	MATERIAL	MAX. DIAMETER OF CABLE [MM]	MIN. DIAMETER OF CABLE [MM]	MAX. FLAT TAPE WIDTH [MM]	MIN. FLAT TAPE WIDTH [MM]
Cable						
77600030	SOP-COND D-8/10 TF MET FeCG	Stainless steel	10	8	-	-
Tape						
77600035	SOP-COND PL30 TF MET FeCG	Stainless steel	-	-	30	25

# Down conductor system | Connecting sleeves

## STEEL CONNECTION SLEEVE

Stainless steel connection sleeve for disconnection of the down conductor to allow for maintenance of the earthing system.



### PART NUMBERS

ORDERING CODE	PART NUMBER	MATERIAL	MAX. DIAMETER OF CABLE [MM]	MIN. DIAMETER OF CABLE [MM]	MAX. FLAT TAPE WIDTH [MM]	MIN. FLAT TAPE WIDTH [MM]
Cable						
776001273	BORNA MULTI-CLAMP INOX D8-10	Stainless steel	10	8	-	-
Tape						
776001343	BORN VARIO-CLAMP PL/PL FeCG 30/30	Galvanized steel	-	-	30	25
77912001	MANGUITO-U (PLETINA)	Stainless steel	-	-	30	25

## BRASS CONNECTION SLEEVE

Brass connection sleeve for disconnection of the down conductor to allow for maintenance of the earthing system.



### PART NUMBERS

ORDERING CODE	PART NUMBER	MATERIAL	MAX. DIAMETER OF CABLE [MM]	MIN. DIAMETER OF CABLE [MM]	MAX. FLAT TAPE WIDTH [MM]	MIN. FLAT TAPE WIDTH [MM]
Cable						
77912000	MANGUITO-U C-70	Brass	10	8	-	-

## FLAT TAPE CONNECTION SLEEVE

Tinned connection sleeve for maintenance on tape down conductor earthing system.



### PART NUMBERS

ORDERING CODE	PART NUMBER	CONNECTOR MATERIAL	HOUSING MATERIAL	MAX. FLAT TAPE WIDTH [MM]	MIN. FLAT TAPE WIDTH [MM]
Tape					
77931002	JUNTA DE CONTROL PLETINA	Stainless steel	Brass	30	25

# Down conductor system | Protection pipes

## PROTECTION PIPE

Protection pipe for down conductor system.



## PART NUMBERS

ORDERING CODE	PART NUMBER	MATERIAL	PRODUCT HEIGHT [MM]	DIAMETER [MM]	MAX. DIAMETER OF CABLE [MM]	MAX. FLAT TAPE WIDTH [MM]
Cable						
77920215	TUB-PROT POLIETILENO 50-70MM2 3M + ABRAZ	Polyethylene	3000	50	10	-
77920200	TUB-PROT BAJ 3M D32	Galvanized steel	3000	32	10	-
Tape						
77920201	TUB-PROT BAJ 2M (PLETINA)	Galvanized steel	2000	30	-	30

# Earthing system | Ground connection and equipotentiality

## EARTHING INSPECTION PIT

Inspection pit for earthing system, with connectors for down conductor and earth rods.



## PART NUMBERS

ORDERING CODE	PART NUMBER	HOUSING MATERIAL	PRODUCT WIDTH [MM]	PRODUCT LENGTH [MM]
77930110	ARQUETA COMPLETA 300X300	Polypropylene	300	300

## EARTHING SYSTEM WARNING SIGN

Warning sign to indicate the presence of a nearby lightning rod grounding system.



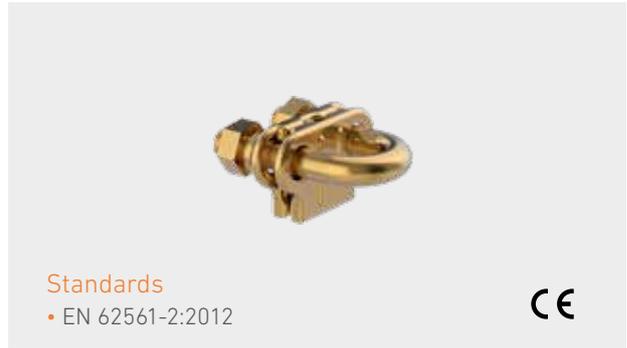
## PART NUMBERS

ORDERING CODE	PART NUMBER	MATERIAL	PRODUCT HEIGHT [MM]	PRODUCT WIDTH [MM]
77930000	PLACA SEÑAL DE PUESTA A TIERRA	Aluminium	150	60

# Earthing system | Clamps

## EARTH ROD CLAMP

Clamp for lightning rod cable/tape down conductor to earth rod of the earthing system.



### PART NUMBERS

ORDERING CODE	PART NUMBER	MATERIAL	MAX. DIAMETER OF CABLE [MM]	MIN. DIAMETER OF CABLE [MM]	MAX. FLAT TAPE WIDTH [MM]	MIN. FLAT TAPE WIDTH [MM]	MAX. EARTH ROD DIAMETER [MM]
Cable							
77934200	GRAPA-AB La /JAB	Brass	10	8	-	-	18
Tape							
77934204	GRAPA Br JAB (PLETINA 30MM)	Brass	-	-	30	25	20

## "GOOSE FOOT" TYPE EARTHING CONNECTOR

"Goose foot" type earthing connector for tape down conductor.



### PART NUMBERS

ORDERING CODE	PART NUMBER	MATERIAL	MAX. FLAT TAPE WIDTH [MM]	MIN. FLAT TAPE WIDTH [MM]
77938000	CONEXION PARA PATA DE GANSO	Stainless steel	30	25

# Earthing system | Earth electrodes

## EARTH ROD

Earth rod for earthing system, stainless steel with a minimum coating of 0,25mm of copper.



### PART NUMBERS

ORDERING CODE	PART NUMBER	MATERIAL	HOUSING MATERIAL	DIAMETER [MM]	PRODUCT LENGHT [MM]
77932100	JAB Cu 2 D14	Stainless steel	Copper	14	2000
77933501	JAB Cu 254MICRAS 1,43x3M SIN ROSCA	Stainless steel	Copper	14	3000

## EARTH PLATE

Earth plate for earthing system, with connector for attaching the down conductor.



### PART NUMBERS

ORDERING CODE	PART NUMBER	MATERIAL	PRODUCT WIDTH [MM]	PRODUCT LENGTH [MM]	MAX. DIAMETER OF CABLE [MM]
77936100	PLACA TT Cu 500X500X2	Copper	500	500	10

## EARTH ENHANCING COMPOUNDS

Earthing system enhancing compounds for improvement of resistivity.



### PART NUMBERS

ORDERING CODE	PART NUMBER	PRODUCT WEIGHT [GR]	MATERIAL
77938501	LOWPAT 25 KG	25000	Liquid
77938310	SACO 11,36KG ADITIVO MEJORA TIERRA	11360	Bentonite

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