sertec S.R.L.
Soluciones inteligentes pensando en usted

QUALITY SYSTEM CERTIFICATION
DNV·GL
ISO 9001

PDCE-CMCE SERTEC

ELECTROMAGNETIC FIELD PROTECTOR

The most effective protection system **Against Lightning**

DUN & BRADSTREET
D-U-N-S® REGISTERED™

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THE PDCE-CMCE SERTEC
Is great for:

FACTORIES

HOSPITALS
SANATORIES

TELECOMMUNICATIONS

SPORTS
COMPLEXES

CONSTRUCTION

SHIPS

MONUMENTS AND
HISTORICAL SITES

BUILDINGS
SHOPPING CENTERS

MINES AND
PETROCHEMICALS
EXPLOSIVE ATMOSPHERES

AIRPORTS
RADARS
CONTROL TOWERS

WIND GENERATORS
PHOTOVOLTAIC PANELS

ELECTRICAL SUBSTATIONS
HIGH AND LOW VOLTAGE
LINES

PDCE SERTEC

Multiple Field Electric Compensator

SERTEC Electromagnetic Field Protector

The PDCE-CMCE SERTEC Protector aims to protect people, animals and structures in installations on land, air and water from any electrical phenomenon whose means of transport is air.

The PDCE-CMCE SERTEC is designed to protect using countermeasures that control and compensate the electroatmospheric effects produced by climate change, industrial, meteorological or solar electromagnetic pollution, manifested in the form of electrical storms, electromagnetic pulses, etc. The PDCE SERTEC is permanently protecting its coverage area to correct the effects of electromagnetic disturbances according to their origin, frequency, voltage and intensity. Compensating, stabilizing the current of the electric charges in its environment, draining them to earth in harmless milliamperes, minimizing the formation of the lightning in its protection area

The PDCE-CMCE SERTEC is the result of the discovery of the behavior of electroatmospheric phenomena that interact in the atmosphere of our planet. The novelty of this technological development is supported by the well-known laws of OHM and Maxwell's equations, on which this new technology is based. Essentially to have at all times the stabilized electric field of the atmosphere referring to earth in the protection area. The system behaves passively at the level of prevention, based on atmospheric electrical activity with the aim of maintaining a clean and controlled environment of electrical and magnetic contamination.

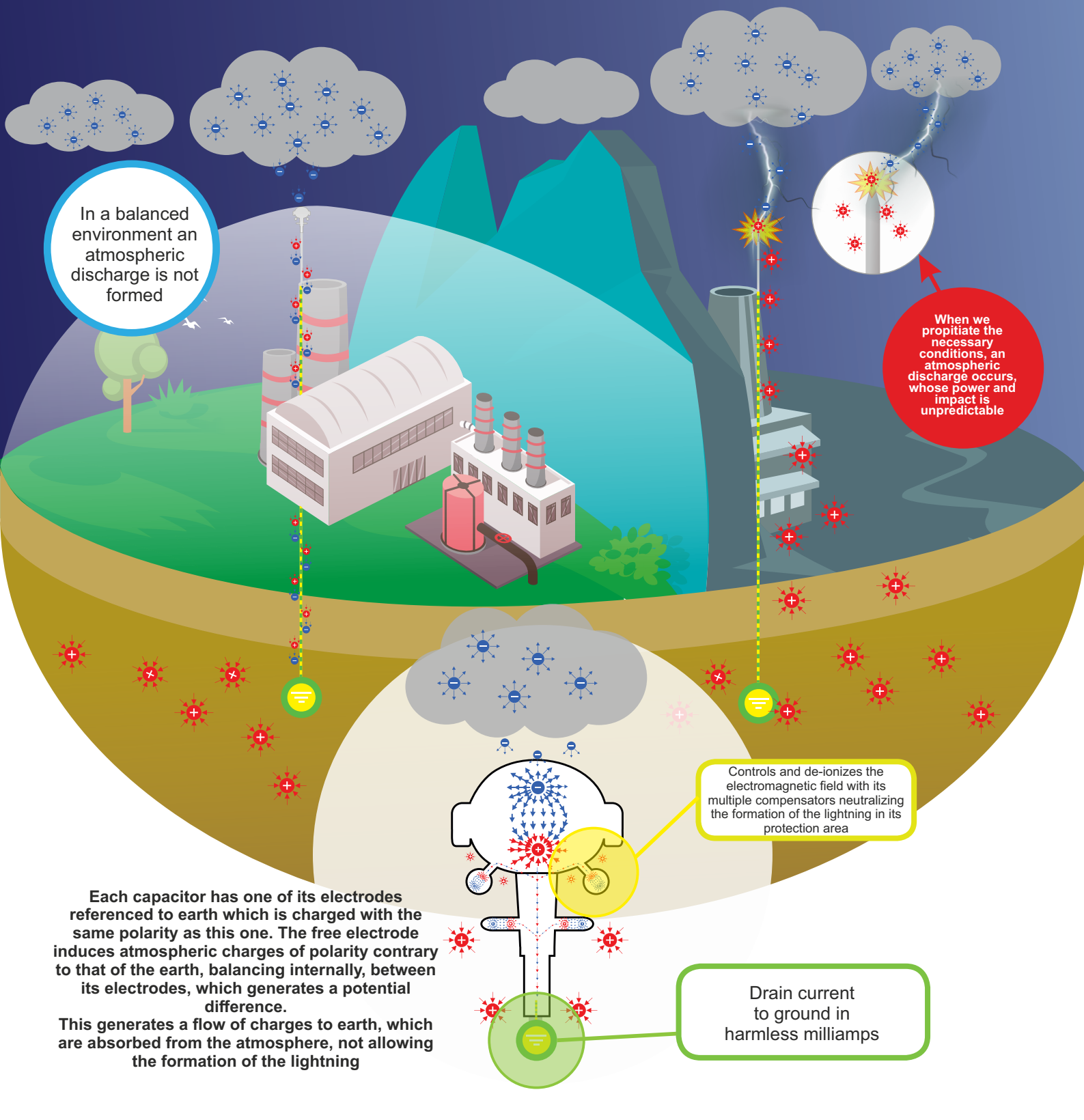
In 1916 Nikola Tesla in his patent No. 1,266,175 mentioned the operating principles of a primitive device based on the principles that underpin our developments, explaining the inconveniences caused by the lightning rods, which instead of protecting property and people, attracted the rays increasing the feasibility of electric discharges and consequently the risks that they entailed.

New materials and designs, added to years of experience, have allowed us to improve the experiences of the undisputed scientist Nikola Tesla, evolving in the protection of atmospheric phenomena.

OPERATING Principle

The multiple electric field compensator, CMCE SERTEC

is a passive sensor system designed to balance and deionize at all times the effects of atmospheric phenomena through multiple compensators, generating a protective shield in its coverage area, its operating principle is based on compensating, stabilizing the existing electric field in its environment, in this way it cancels the formation of the ascending tracer neutralizing the lightning draining the electric charges to earth, in harmless milliamperes.



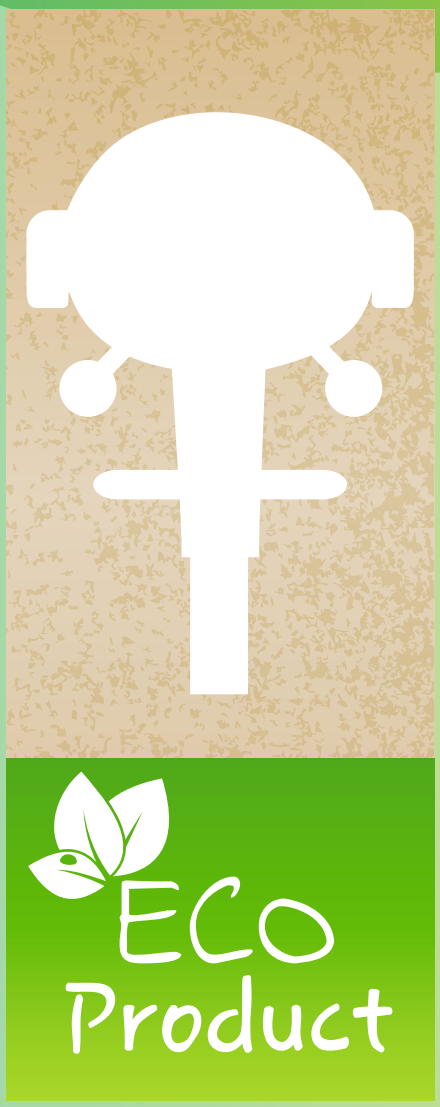
Each capacitor has one of its electrodes referenced to earth which is charged with the same polarity as this one. The free electrode induces atmospheric charges of polarity contrary to that of the earth, balancing internally, between its electrodes, which generates a potential difference.
This generates a flow of charges to earth, which are absorbed from the atmosphere, not allowing the formation of the lightning

CLIMATE CHANGE

CURRENT SITUATION

The current climate change is generated by air pollution, deforestation, greenhouse gases. To all this we should add the solar flares that when they reach our atmosphere, generate weather phenomena causing the electrification of the severe atmosphere for hours, creating large thunderstorm cores with a lot of lightning activity, where the positive polarity predominates (rising lightning) , although there is also a negative polarity (descending lightning).

In normal weather, a voltage higher than 120V / m created by the potential difference between the ionosphere and the earth appears at sea level. This value varies constantly depending on the natural electrification of the atmosphere, either by solar flares or by the formation of electrical storms. Our atmosphere is a perfect laboratory where the molecules of the gases recombine to find their stability, varying pressures and temperatures according to their electrical excitation, which turn into different meteorological phenomena. When the atmosphere is excited, it seeks equilibrium, thus generating large displacements of masses to compensate, in its wake creating winds and changes in the state of the water molecule, transforming into a broad catalog of clouds. Thunderstorms are responsible for accidents and human losses.



ENVIRONMENTAL RESPONSIBILITY

SERTEC S.R.L. demonstrates its commitment to the environment by developing a production system that is also effective, friendly and sustainable.

A high percentage of the materials used for the production of the CMCE SERTEC Protector are recycled, in this way we seek to collaborate with a more sustainable and above all more secure environment.

TECHNOLOGICAL CHANGE

THE PDCE-CMCE SERTEC

A legacy of one of the most privileged minds: Nikola Tesla

The PDCE-CMCE ensures a 99% reduction of lightning impacts in almost all types of buildings and structures through the deionization of electrostatic charge.

Our device guarantees the reliability of computer systems and data during storms, optimizes production by increasing competitiveness and improves staff safety, among other positive aspects.

TECHNOLOGICAL DIFFERENCES BETWEEN THE PDCE-CMCE SERTEC AND THE CONVENTIONAL LIGHTNING ROD

	PDCE CMCE	Conventional Lightning Rod
	It does not excite or capture the lightning, since it does not generate ascending tracers.	Excites and captures the lightning, generating upward tracers.
	Protects all types of structures and environments with risk of fire or explosion.(ATEX)	Increases the risk of fire or explosion.
	It does not generate overvoltages.	Generates overvoltages.
	Avoids electrical risks.	Creates high voltage electrical hazards.
	Complies with the basic principles of occupational risk prevention.	Does not comply with the basic principles of occupational risk prevention
	Does not generate Electromagnetic Compatibility effects.	Generates effects of Electromagnetic Compatibility, since it attracts the ray.
	Ground connection is compatible with low voltage electrical ground connections according to the REBT.	Ground connection is NOT compatible with the low voltage electrical earth electrodes according to the REBT.
	It is not radioactive and is manufactured according to the RoHS regulations.	Some are radioactive.
	Environmentally friendly.	Indirectly generates electromagnetic pollution.
	Price is very competitive in relation to safety.	Price is NOT competitive in relation to safety.
	Offers guaranteed protection.	Does not offer guaranteed protection.

RISKS - COSTS - EFFECTIVENESS ANALYSIS

	Electrical Risk	Accident Risk	Security-Cost Ratio	Efficiency of the System	Return on Investment
PDCE CMCE	LOW	LOW	LOW	HIGH · 99% No Lightning	HIGH · 99% No Lightning
Conventional	HIGH	HIGH	HIGH	LOW · 99% Lightning	LOW

EVOLUTION
Of The Lightning Rod

Benjamin Franklin, published in London in his famous almanac (Poor Richard's Almanack), an article where he proposed the idea of using pointed steel rods, on roofs, to protect themselves from falling lightning. His theory was tested in England and France before he even executed his famous comet experiment in 1752. One would say that he invented the lightning rod and presented the so-called single fluid theory to explain the two types of atmospheric electricity, the positive and negative.

In 1753, the Russian Georg Wilhelm Richmann followed Franklin's investigations to verify the protective effect, but in his investigation a lightning strike struck him when he was excited and attracted by the lightning rod, and he received a deadly electric shock when manipulating part of the installation of the lightning rod.

The foundation of an ESE (Early Streamer Emission) terminal as it is known generates impulses of controlled magnitude and frequency at the tip of the terminal during high static fields before a lightning strike. This allows the creation of an uplink leader from the terminal that propagates into the downlink leader from the cloud.

A lightning conductor creates an electric field distribution with field lines concentrated at its tip, thus facilitating the current of ionized particles, which is a lightning bolt. This applies to any lightning rod, when trying to facilitate the path of charges and therefore say that it is "attracts lightning".

Already in 1916 Nikola Tesla in his patent Nº 1.266.175 mentioned the principles of operation of a primitive device based on the principles that sustain our product, the protector of electroatmospheric field PDCE-CMCE SERTEC, explaining the disadvantages that already at that time produced the point lightning conductors that instead of protecting the goods and people, attracted the rays increasing the feasibility of fall of lightning and consequently the risks for the goods and people.

....It is popularly believed that by allowing a leak into the air, the needle-shaped lightning rod fulfills two functions: one, to drain the ground of its negative electricity, the other to neutralize the positive of the clouds. To a certain extent it performs both functions. But a systematic study of electrical disturbances on earth has made it palpably evident that the action of the Franklin conductor, as commonly interpreted, is largely illusory. The actual measurement proves that the amount of electricity escaping from numerous points is entirely insignificant when compared with that induced within a considerable terrestrial area, and unimportant in the dissipation process. But it is true that the negatively charged air in the vicinity of lightning rods, which has been converted into a conductor through the influence of lightning, facilitates the passage of lightning. This increases the probability of lightning strikes in the immediate vicinity. The fundamental facts behind this type of lightning conductor are: First, it attracts lightning, so that it will be struck by one more often than if it were not; second, it makes most, but not all, discharges it receives become harmless; third, by turning the air into a conductor, and for other reasons, it is sometimes the cause of damage to objects in the vicinity; and fourth, in general, its power to prevent damage predominates, more or less, over the risks it summons..... (condensed translation patent 1,266,175)

Technical Specifications

Coverage Area

- PDCE-CMCE Technology Method: Cover radius depending on the model varies between 25m. to 120m. (Check model's manual).
- All models must be installed at a height of 3m. above the highest point to be protected (For more detailed information check the manual).
- Rolling Spheres Method: For protection levels I, II, III and IV defined according to IEC 62305, the rolling sphere method must be used, with the protection radius marked by the standard.

Connection system to the mast:

It incorporates in its axis the connection system to the mast. The PDCE needs an internal measuring mast 42 mm Ø and outside 49 mm Ø with through hole of 8 mm Ø to 32 mm from the edge of the mast (may vary depending on the model, more detailed information consult the manual).

Component Materials:

Recycled Aluminum, Insulator: Polyacetal, also called polyoxymethylene (POM); Ceramic, or According to model, consult the manual.

100 meters Protection

CMCE EVO 100

Description: For use in Residences, offices, telecommunications, etc.
Weight: 7,130 kilograms (Gross)
Measurements: Ø 24.17 cm x 36.72 cm.
Packaging: Galvanized Metallic Material
Height: 41cm.
Diameter: 28 cm.

120 meters Protection

CMCE SERTEC 120

Descripction: Greater deionizing power, for use in buildings, large complexes, mining, boats, electric stations, etc.
Weight: 8.370 kilograms (Gross)
Measurements: Ø 24.17 cm x 36.72 cm.
Packaging: Galvanized Metallic Material
Height: 41cm.
Diameter: 28 cm.

120 meters Protection

CMCE BLACK 120

Description: Same characteristics as the CMCE 120, but with a dark matt color design, to avoid disturbance to the environmental visual.
Weight: 8.370 kilograms (Gross)
Measurements: Ø 24.17 cm x 36.72 cm.
Packaging: Galvanized Metallic Material
Height: 41cm.
Diameter: 28 cm.

120 meters Protection

CMCE-AT 120

Description: Developed for installations in high temperature environments, for example: chimneys, industries, etc. Supports up to 400ºC.
Weight: 8.370 kilograms (Gross)
Measurements: Ø 24.17 cm x 36.72 cm.
Packaging: Galvanized Metallic Material
Height: 41cm.
Diameter: 28 cm.

MODELS Specifications

CMCE maximum working voltage WITHOUT lightning discharge

640,000 volts to one meter, according to high voltage laboratory tests.

Maximum allowable current of short circuit

The tests carried out according to IEC-10/350 Q curves of 100,000 Amperes, specified in the IEC-62305 norms, show that the equipment supports 7 continuous degasses of 89,906KA; 89.62KA; 88.53KA; 89.3KA; 90.44KA; 96,656KA; 89,688KA; without breaking materials or marks of deterioration or perforation.

Protection effectiveness

99% reduction of impact of direct rays in the protected structure. In case of direct impact of lightning (1%) or indirect effects due to external induced overvoltages in the protected structure, the CMCE behaves like a thermal fuse, absorbing part of the lightning energy in heat by melting its components, minimizing (between 60% - 90%) electromagnetic effects.

Does not contain radioactive, electronic or heavy metals components.

CMCE HOME

Description: Developed to protect all types of structures on land, residences, small buildings, warehouses, etc.
Weight: 2,460 kilograms (Gross)
Measures: 24 cm. Height x 15.5 cm. diameter.
Packaging: Galvanized Metallic Material

CMCE NANO

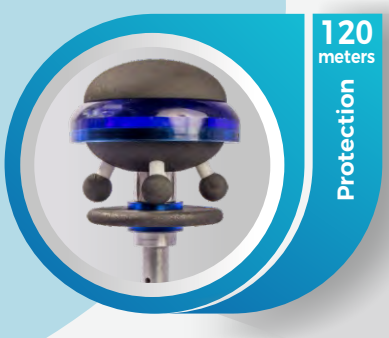
Description: Developed for Small deposits, Telecommunications Towers, Medium and High Voltage Power Lines, Traffic Lights, Small Radars, Road Cameras, Garitas, and other structures that can be covered by their protection radius.
Weight: 980 grams (Gross)
Measures: 17cm. Height x 10 cm. diameter.
Packaging: Galvanized Metallic Material

CMCE- HIGH VIBRATION

Description: Developed with the same characteristics as the CMCE 120, but with a special design to avoid the fall of the equipment, especially for derricks, etc.
Weight: 11,170 kilograms (Gross)
Measurements: Ø 24.17 cm x 36.72 cm.
Packaging: Galvanized Metallic Material
Heigh 41cm. | Diameter 28 cm.

HIGH RESISTANCE

Description: Designed for highly corrosive environments, since it is a steel with high resistance to corrosion, given that the chromium or other alloying metals it contains, have great affinity for oxygen and react with it forming a passivating layer, thus avoiding corrosion of iron (purely stainless metals, which do not react with oxygen are gold and platinum, and of lower purity are called corrosion resistant.
Weight: 20 kilograms (Gross)
Measurements: Ø 24.17 cm x 36.72 cm.



CMCE GRAPHENE

Description: Developed for special applications and Military use.
The innovation is based on the properties of Graphene, on which this new technology is based, since one of the fundamental characteristics of this material is its great conductivity even superior to copper, its low resistance, capable of converting every photon that absorbs in multiple electrons (excited electrons) and induce a greater number of electrons than low energy photons that can conduct electrical current. To this strength is added that it is the highest strength material known so far, it is estimated that it can be 200 times stronger than steel and at the same time it is light as carbon fiber. The prevention and protection device behaves as a passive system and is designed to generate counter measures to prevent the formation of electrical phenomena (lightning). Therefore, the device will attenuate the formation of electric fields that are generated in its environment, maintaining a clean environment of electrical, electromagnetic and magnetic contamination.

CERTIFICATIONS
Regulations

ISO 9001-2015 Certificate by DNV-GL

INTN Product Certificate (National Institute of Technology and Standardization and Metrology).

High Voltage Comparative Tests in the INTI according to NFC-17100, where the comparative difference is that there are no lightning discharges.

ENAC; ILAC-MRA
A.1. General tests (Section.c.3.1UNE21186: 2011 // NF C17-102: 2011)
Test: Documentation, information and identification (C.3.1.1)
Test: Marking (C.3.1.2)
A.2. Mechanical tests (Section.c.3.2 UNE21186: 2011 // NF C17-102: 2011)
Test: Mechanical tests (C.3.2)
A.3 Environmental tests (Section.c.3.3UNE21186: 2011 // NF C17-102: 2011)
Test: Salt spray test (C.3.3.1)
Test: Test in sulphurous humid atmosphere (C.3.3.2)
A.4 Current test (Section.c.3.4UNE21186: 2011 // NF C17-102: 2011)
Test: Current test (C.3.4)
TO 5. Priming advance tests (Section.c.3.5UNE21186: 2011 // NF C17-102: 2011)
Test: Determination of the progress in the PDC priming (C.3.5.3 UNE 21186: / C.3.5.2.4 NF C17-102: 2011)

SERTEC S.R.L. is approved within the NATO Cataloging System (NOC) with the NCAGE code SFKU3 for our CMCE-SERTEC lightning conductors

DUNS REGISTER Number 955067967

Electromagnetic field protection
It complies with Decree 10071/07 of the Secretary of the Environment SEAM Paraguay on the protection of electromagnetic fields, sets the maximum parameters of exposure to electric and magnetic fields in the frequency range from 0 to 300 Gz. The regulations approve as maximum permissible maximum permissible exposure limits, the values established as reference levels by the International Commission on Non-ionizing Radiation Protection ICNIRP (International Commission on Non-Ionizing Radiation Protection).

Electric field: 10 kV / m (occupational exposure)
5 kV / m (public exposure)
Magnetic field: 500 µT (occupational exposure)
100 µT (public exposure)

In situations in which simultaneous exposures of different frequencies are given, the criteria and recommendations of the ICNIRP are adopted.
The enforcement authority is the Secretariat of the Environment.

GREEN RECYCLING SEAL
The Green Seal delivered by SERTEC S.R.L. in its products it allows the user to be informed that we are a company responsible for the life cycle.
By choosing this product you are collaborating with the environment since we use recycled materials.
Environment solid waste management Complies with the requirements of law No. 3956/09 on solid waste management in the Republic of Paraguay, the SEAM Environment Secretariat, is the enforcement authority, whose regulatory content and practical use should generate the reduction of the same, to the minimum. Topic addressed: the SUMMIT OF THE EARTH at the 1972 Stockholm Convention held by the United Nations for the preservation of natural resources. Environmental Action Program to address global warming, generating agreements such as the Kyoto Protocol

WARRANTY

MANUFACTURED BY SERTEC S.R.L. IN ASUNCIÓN, PARAGUAY

MAINTENANCE: Annual mandatory, carried out and certified by the official installer.
PRODUCT WARRANTY 5 YEARS warranty for manufacturing defect, proving annual maintenance.

* PRODUCT INSURED IN GARANTIA S.A. - Reinsured by Standard & Poors - A.M. Best, against "Manufacturing defects", value of damages covered up to a maximum of 500,000 USD.-

Para ver numero de Póliza Vigente, escanear el código QR

Check insurance coverage according to the country where it will be installed and the equipment model.

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ELECTROMAGNETIC FIELD PROTECTOR

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