DDCE-50 Plus

Variable electric field balancer lightning rod

Living Technology Synertech
www.rfid.co.za

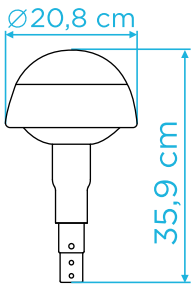
Protection System against Atmospheric Discharges and Electromagnetic Pulses avoiding direct lightning strike on the protected structure

Made of Aluminum & POM

Weight 4,5 kg

Packaging: Recicled cardboard & PELD

Measurements



Packaging: 26 x 26 x 47 cm

Passive Collector System of electrostatic currents on time, that takes them to the ground, whose operating principle is based on balancing or compensating the variable electric field on it's surroundings, avoiding the creation of an upward leader on the DDCE Plus and on to the protected structure.

Electromagnetic Protector

System specially designed for the external electromagnetic pulses protection, absorbing the variable radiofrequency waves and eliminating the noise that can generate interference in telecommunications.

The protection design is based on the installations of the DDCE-50 Plus in the areas where the waves can be coupled or in the areas where interferences can be generated. Depending on the case, the DDCE 50 Plus can be installed vertically or with a maximum angle of 5º to the vertical.

Protection effectiveness

100% reduction of direct lighting impacts on the protected structure.

Maximum working voltage without lightning strikes

Progressive tension increase

705 kV are applied to 1 m progressively without lightning discharge (maximum applied by the laboratory). According to the high voltage tests carried out at the Electrical Engineering Laboratory of the University of Pau (University Center for Scientific Research),

Application of instantaneous voltage (comparison with Franklin Rod)

With peak voltage (kV) U100 from 427,5 KV to 1.15 m, the leader always appears at the Franklin Rod.

With peak voltage (kV) U50 from 526 KV to 1.15 m, the leader appears on the ground or at the base of the mast, but always outside the DDCE 50 Plus.

According to the high voltage tests of! the Official Central Electrotechnical Laboratory (LCOE) of Getafe (Madrid)

DDCE-50 Plus performance

Tests carried out in the Official Laboratory INTA (National Institute of Aerospace Technology) belonging to the Ministry of Defense of Spain, certifies the optimal performance of the DDCE 50 Plus in the spectrum between 0.4 to 2 GHz as compensator of variable electric fields, behaving as a sink of variable radio frequency electric fields without sending radiant electric fields in this frequency spectrum.

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Current impulses of 100 kA. Waveform 10 / 350! s

Tests of Electrical current Impulses to 100 kA with waveform 10 / 350! s according to the UNE 21186: 2011 regulation, section C3.4. The waveforms applied correspond to the UNE-EN 62561 standard

Ip (kA) = 100 kA ± 10 %
W/R = 2500 kJ/ ± 35%
Q = 50 C ± 20 %
Duration < 5 ms

Realized in the Official Central Laboratory of Electrotechnics (LCOE) of Getafe (Madrid) with satisfactory result.

Coverage radius

The coverage radius of the DDCE 50 Plus model has been calculated using the Rolling Sphere Method and the Protective Angle Method accoding to the requirements of the UNE EN IEC 62305 standard. The DDCE 50 Plus has been certified for slightly higher currents than 100KA and curve 10/350. Based on these tests and the calculation formulas described in the UNE EN IEC 62305 standard, the following results are obtained:

ROLLING SPHERE METHOD

Installation height (m)	Coverage radius * (m)
2	19,89
5	31,22
7	37,22
10	43,58
13,4	50
20	50
30**	50
40**	50
50**	50

PROTECTIVE ANGLE METHOD

Installation height (m)	α (degrees)	Coverage radius * (m)
5	76,36	20,61
10	70,63	28,45
15	66,19	33,99
20	62,40	38,25
25	59,01	41,63
30	55,91	44,33
35	53,02	46,49
40	50,30	48,18
45	47,70	49,46
50	45,21	50,37

* The coverage radius of the DDCE 50 PLUS will be given provided all the metallic structures existing within this radius are at the same potential as the lower semi-sphere of the DDCE and there are not structures of equal or greater height.

In case of requiring levels of protection defined in the standard UNE EN IEC 62305 (Level I, II, III or IV), for the calculation of the radius of protection of the DDCE 50 Plus and of all existing protection systems against lightning, the following radius of the rolling sphere will be applied: Level I (R = 20 m), Level II (R = 30 m), Level III (R = 45 m) and Level IV (R = 60 m). In this case, the protection radius of the DDCE 50 Plus can also be 50 m, as long as the regulatory requirements are met (Consult the manufacturer or official distributor).

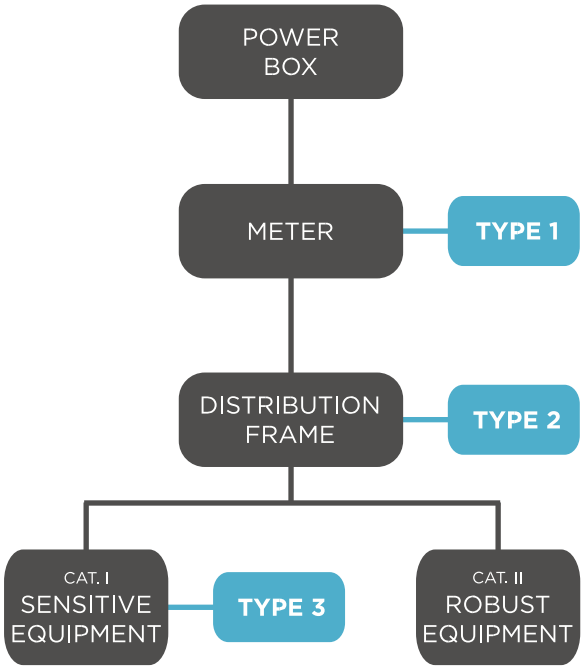
Protection against indirect effects from lightning

If indirect effects due to external induced overvoltage reach the DDCE 50 PLUS, whether by ground or radiated by air (electromagnetic pulses), the DDCE 50 Plus behaves like a thermal fuse, absorbing part of the energy, and may suffer damage.

For protection against these indirect effects to the DDCE, the protection element model DNNF will be available as a sheath in the down wire just after the end of the axis of the DDCE 50 Plus, if the mast is made of fiber, or it will be arranged in the cable down just after the end of the mast, if this is metallic (consult installation manual).

For installations that are very exposed to these indirect effects, a ground filter model DNNFT50 will be installed. This passive device will also be used for protection against high-frequency earth-induced surges of all electrical and electronic equipment of the protected structure (see installation manual).

Finally, it will also be necessary to have overvoltage protectors to the electrical installation, according to the following scheme:



Type 1 Protectors:

For nominal voltage of 230 V, 50 KA, ≤ 4KV F+N Type 1 + 2

Type 1 + 2 Protectors:

For nominal voltage of 230/400 V, 50 KA, ≤ 4KV 3F+N

Protection for telephone line or ADSL Type 1:

20 KA

Type 2 Protectors:

Nominal discharge current C2 (8/20 us) 2,5 KA Type 1 + 3

Protector for TV/SAT Antenna:!

Nominal discharge current C2 (8/20 us) 10 KA

Applications

Model for protection of houses and low-rise structures.

Efficient model for lateral protections in all types of structures and for electromagnetic protection.

Installation

Once the proper height and the mast with 42 mm inner section selected, to place the DDCE Plus must be made a thru-holes of 8 mm diameter and at 36 and 61 mm from the edge of the mast , ensuring support and mechanical connection between DDCE Plus and the mast.

The down pipe that joins the DDCE Plus to the grounding must be as straighter as possible, assuring the trajectory of the cable through flanges and, avoiding to make angles with less than a 20 cm radius.

Guarantee that the layout of the cable is always descendant.

IMPORTANT NOTE: In installations with significant risk of receiving external induced surges (telecommunication towers, radars, substations, etc.), the FIBER mast will always be placed.

Bureau Veritas Certification (Es036861)

Lightning protection | UNE-EN (IEC 62305:2012)

Lightning strike risk security | TBC (Technical Building Code): SU8

NBR 5419:2005 | IRAM 2184:2011

NTC 4552:2008 | SANS 10313:2012

AS/NZS1768/2007

NFPA 780:2011 | CAN/CSA-B72-M87(R2013)

NATO Certification

The DDCE is officially certified by NATO in the concept of “Lightning Protection System and Electromagnetic Protector” with the NATO code DDCE:NCAGE:SYN37.

The DDCE has been selected to be part of the NATO Cataloguing System (NCS), by which it is guaranteed that a same article is known within the logistics field of the countries members of the system by one and sole denomination and a sole NATO Catalog Number (NOC).

CE Labeling

The DDCE device is compliant with General Law of Security Products 2001/95/CE and working limits of Electromagnetic Compatibility , under EC Labeling requirements:

Product Safety | Directives 2011/95/CE

Electromagnetic Compatibilty | Directives

92/31/CEE

Low Voltage Equipment | Directives 72/23/CEE

Quality Management System

Dinnteco International S.L, works with the Quality Management System according to international standards ISO 9001:2015, applied to: design, marketing, management, fabrication, installation and assembly of variable electric field lightning rod.

Labor Risk Prevention

The DDCE is compliant with the requirements of preventive action (Article 5) of the Law 31/1995 of November 8th of Labor Risk Prevention, as well as RD 614/2001 of June 8th about health and safety protection of workers from electric risk.

Environmental Protection

Rohs standards compliant.

Maintenance

Annual mandatory, executed and certified by the official installer.

DDCE Warranty

5 years product warranty (DDCE), subject to annual maintenance.

Guarantee coverage

The guarantee applies to the DDCE models manufactured by **Dinnteco International S.L.**

Damage covered: All damage caused to the installation protected by the impact of a direct lighting on the DDCE derived from a manufacturing defect of the product, up to a maximum value of 3,000,000 euros per equipment per year. Are excluded from this coverage, the effects that may appear on the installation and / or product and / or protected area, derived from indirect effects by external induced surges. It also covers damages to third parties for a value of up to 300,000 Euros per victim.

Geographical scope of coverage: Worldwide, including USA and CANADA

Note: once the product warranty has been completed and up to the tenth year of installation, subject to annual maintenance, in case of product breakage or operational damage, Dinnteco International will provide a new product to the customer.

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