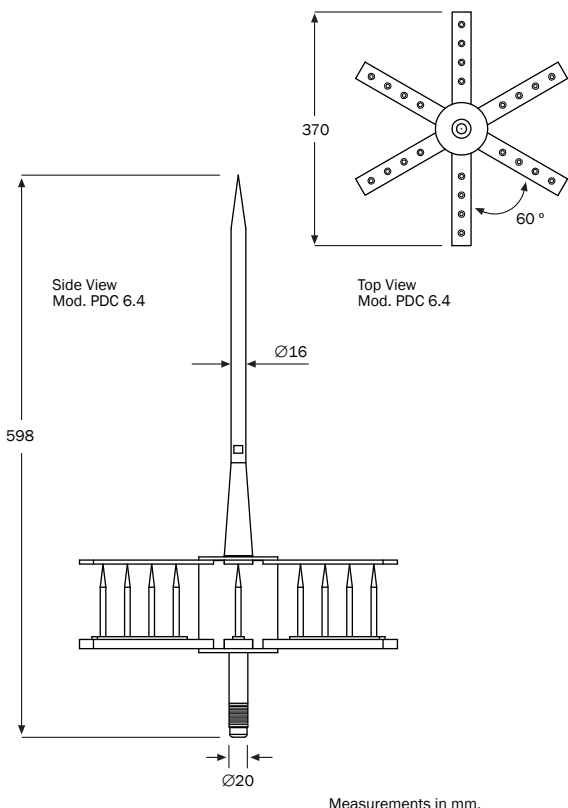


AIR TERMINALS




Photo Mod. PDC 6.4
(Ref. 101009)









INGESCO® PDC LIGHTNING RODS

DESCRIPTION :



- Lightning rod with non-electronic **ESE** (Early Streamer Emission) system, standardized according norms UNE 21.186 and NFC 17.102.
- Adaptable to all types of buildings.
- Application standards:
 - UNE 21.186
 - EN 50.164/1
 - NFC 17.102
 - EN 62.305
- Product certification num. ES020609 issued by the certification entity Bureau Veritas International.
 
- Manufactured in AISI 316L stainless steel and PA66 polyamide.
- 100 % EFFICIENCY, maximum durability.
- Does not need an external power supply.
- Guarantee of electrical continuity and operation after lightning strike, in any atmospheric conditions.

MODELS / PROTECTION LEVELS :

	PDC 3.1	PDC 3.3	PDC 4.3	PDC 5.3	PDC 6.3	PDC 6.4
INGESCO Lightning Rod						
Reference	101000	101001	101003	101005	101008	101009
Weight	2.350 gr.	3.200 gr.	3.400 gr.	3.600 gr.	3.800 gr.	4.150 gr.
Δt	15 μs	25 μs	34 μs	43 μs	54 μs	60 μs
LEVEL I	35 m	45 m	54 m	63 m	74 m	80 m
LEVEL II	43 m	54 m	63 m	72 m	83 m	89 m
LEVEL III	54 m	65 m	74 m	84 m	95 m	102 m
LEVEL IV	63 m	75 m	85 m	95 m	106 m	113 m

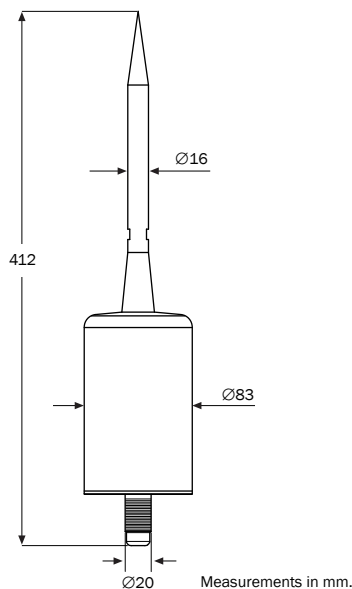
Protection radii calculated according to: Norm UNE 21.186 & NFC 17.102. (These radii of protection have been calculated according to an altitude difference of 20 m. between the end of the lightning rods and the considered horizontal plane).

AIR TERMINALS

INGESCO® PDC.E LIGHTNING RODS




Photo Mod. PDC.E 60
(Ref. 102007)



DESCRIPTION :



- Lightning rod with electronic **ESE** (Early Streamer Emission) system, standardized according norms UNE 21.186 and NFC 17.102.
- Adaptable to all types of buildings.
- Application standards:
 - UNE 21.186
 - NFC 17.102
 - EN 50.164/1
 - EN 62.305
- Product certification num. ES020609 issued by the certification entity Bureau Veritas International.
 
- Made of AISI 316 stainless steel.
- 100 % EFFICIENCY, maximum durability.
- Does not need an external power supply.
- Guarantee of electrical continuity and operation after lightning strike, in any atmospheric conditions.

MODELS / PROTECTION LEVELS:

MODEL	PDC.E 15	PDC.E 30	PDC.E 45	PDC.E 60
Reference	102004	102005	102006	102007
Weight	3,775	3,770	3,765	3,760
Δt	15 μs	30 μs	45 μs	60 μs
LEVEL I	35 m	50 m	65 m	80 m
LEVEL II	43 m	59 m	74 m	89 m
LEVEL III	54 m	70 m	86 m	102 m
LEVEL IV	63 m	81 m	97 m	113 m

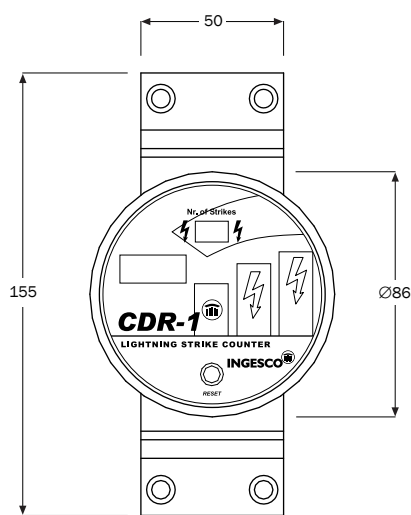
Protection radii calculated according to: Norm UNE 21.186 & NFC 17.102
(These radii of protection have been calculated according to an altitude difference of 20 m. between the end of the lightning rods and the considered horizontal plane).

LIGHTNING STRIKE COUNTERS

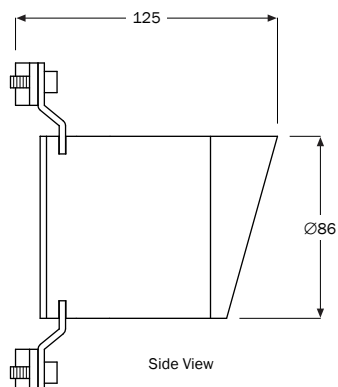
CDR-1 LIGHTNING STRIKE COUNTER



Ref. 430016



Front View



Side View

DESCRIPTION :

- Logs the lightning strikes which occur within the external lightning protection system.
- Complies with the requirements set forth in the standards:
 - UNE 21.186
 - NFC 17.102
 - EN 62.305
 - EN 50.164-1
 - EN 50164-6
- Range of Intensity:
1 kA (8/20 μ s) - 100 kA (10/350 μ s), according to EN 50.164/6
- Valid for: Cable 50-95 mm², Rod \varnothing 8-12 mm, Tape 30x2 mm.
- An external power supply is not required for its operation.
- Designed for installation in parallel.
- Resettable model.

MODELS :

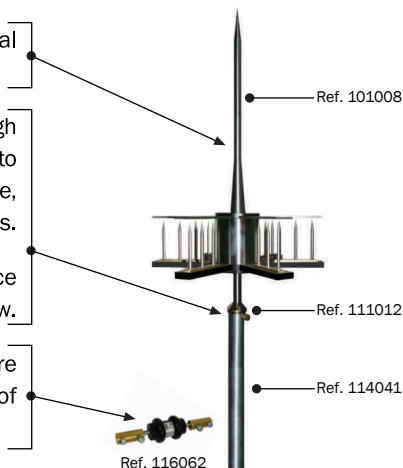
CDR-1	Ref. 430016	830
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INSTALLATION GUIDE

EXTERNAL LIGHTNING PROTECTION INSTALLATION

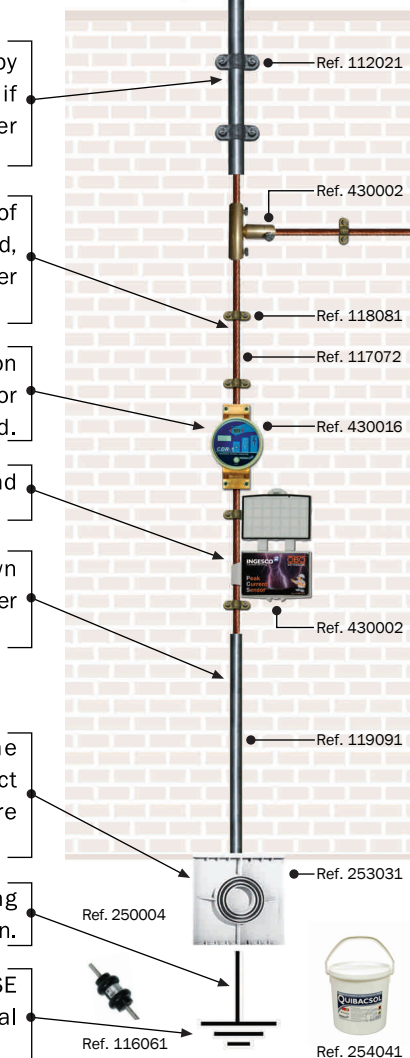
CAPTURE SYSTEM

- Fix the central axis of the air terminal to the head-mast adaptor piece.
- Pass the down conductor cable through the interior of the mast and connect it to the base of the head-mast adaptor piece, fixing it by means of two allen screws.
- Connect the head-mast adaptor piece within the mast, fix it with its screw.
- Connect all metallic structures that are within the safe distance by means of spark gaps.



DOWN CONDUCTOR

- Anchor the mast to the structure by means of suitable support and if necessary, fix the mast to the cover using anchor braces.
- Fix the down conductor by means of fastener clips, tightening them well and, as a reference, use three fasteners per meter.
- Install the **CDR-1** lightning counter on the lower part of the conductor, two or three meters above the ground.
- Install the **PCS** card to the ground conducting cable.
- Protect the lower part of the down conductor by way of a minimum 2 meter protection tube.



GROUNDING SYSTEM

- Install the test joint inside the registry case in order to disconnect the grounding system and measure its resistance.
- Select the appropriate grounding system according to the type of terrain.
- Use an spark gap to connect the ESE grounding system with the general grounding system of the building.

INSTALLATION REQUIREMENTS:

- The tip of the lightning rods must be located, at a minimum, two meters above the zone it protects (including antennas, cooling towers, ceilings and deposits).
- Install two or more down conductors for each installation of lightning rods.
- The receiving antennas (TV, radio, telephone) must be connected by means of spark gaps to the down conductors of the lightning rod installations.
- The coaxial cables of the antennas must be protected with a device against surges.
- The metallic elements that rise above the roof should be connected to the closest down conductor.
- The trajectory of the down conductor must be as straight as possible and follow the shortest possible path, avoiding any abrupt layers or overhangings.
- In the layerings, the curvature of the radius are not to be inferior to 20 cm.
- The conducting cable must be placed outside of the building (whenever possible), avoiding the proximity of electrical or gas conductors.
- It is recommended the grounding have a registry case available in order to perform periodic inspections.
- The registry case (or, in its absence the conducting cable) must be provided with a system disconnecting switch that permits the disconnection of the grounding in order to measure its resistance.
- The resistance of the grounding taken must be the lowest possible (less than 10 ohms). The value is measured on the ground insulated from all other elements of conductive nature.
- It is advisable to connect the grounding of the lightning rods with the general grounding system of the building it is designed to protect.
- It is recommended to add Quibacsol mineral composite to enhance ground conductivity.

INSTALLATION GUIDE

EXTERNAL LIGHTNING PROTECTION INSTALLATION

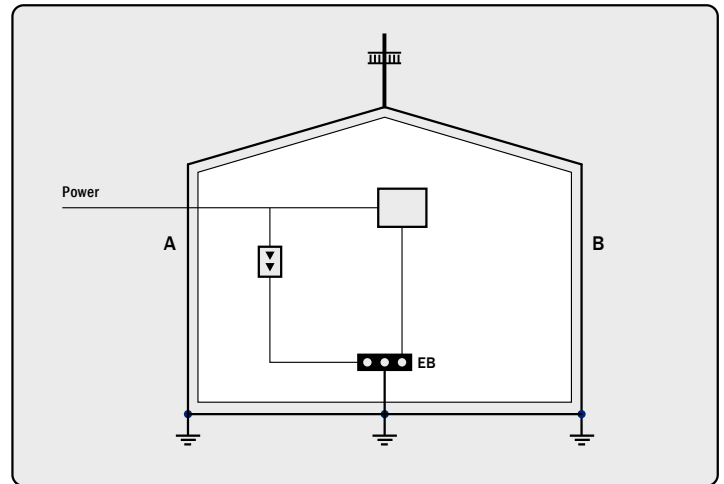
DOWN CONDUCTORS

The down conductors are designed to lead the lightning current from the capture devices to the ground.

Each lightning rod must be connected to at least two down conductors (A and B).

On buildings higher than 60m, four downconductors will be needed. These downconductors will be placed, wherever is possible, in the four corners of the building.

The two down conductors are to be located on two different facades, whenever this is possible.



GROUNDING INSTALLATION

GROUNDING SPIKES:

- Introduce the spikes vertically in the terrain, arranged in line or in a triangle, spaced by a distance equal to the buried length as a minimum. The spikes are to be connected by way of sufficient sectioned cables which have identical or compatible characteristics as that which is used in the lightning down conductor.
- Bury the cable in a ditch at a minimum depth of 50 cm. Another possible configuration consists of burying the conducting cable of the same nature and section as that of the down conductor (excepting aluminium), having a crow's foot shape which must be buried at least 50 cm in depth.
- Install an inspection system in order to allow future maintenance.

GROUNDING PLATE:

- Especially recommended for rocky terrain which does not permit excavation of great depth.
- Create a 1 m³ minimum hole in the earth.
- Connect the plate to the down conductor.
- Install the copper plate vertically in relation to the ground and fold the stamped sides, alternating to the left and to the right in order to enhance conductivity.
- Fill in the hole, adding layers of Quibacsol composite to improve contact between the ground and the plate.
- Compact the land.
- Install an inspection system in order to allow future maintenance.

