ENGLISH

INGESCO® PDC LIGHTNING ROD

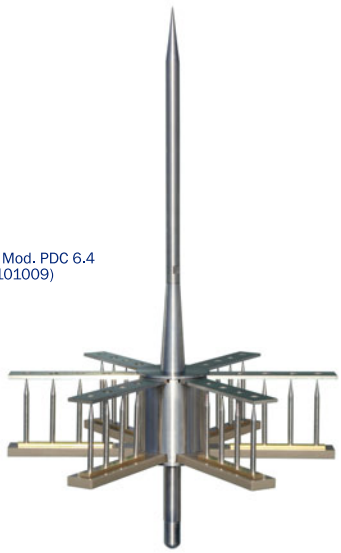

Photo Mod. PDC 6.4
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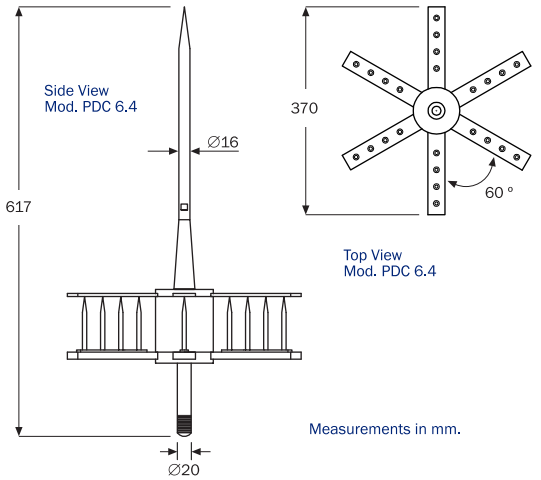

PRODUCT

Lightning rod with ***ESE*** (Early Streamer Emission) system, standardized according norms UNE 21.186 and NFC 17.102.

OPERATION

The specific function of **INGESCO® PDC** lightning rod is producing an upward stream of ionized particles pointed to clouds that will channel the eventual electrical discharge from its origin.

There is a different potential between the discharger (that has the same potential than the air around it) and both the air terminal tip and the deflection ensemble (they have the same potential than earth). This difference increases as atmospheric potential becomes higher because of the imminent lightning stroke.

Knowing the value of this difference $\triangle t$ allows us to relate time and velocity of electrical discharge spread and, consequently, to calculate the lightning impact distance and the protection radium that offers each lightning rod model (see table below).

The knowledge of this value allows finally to select the most appropriate lightning rod model taking into account the characteristics of the structure we want to protect and the level of protection needed according the norms UNE 21.186 and NFC 17.102.

PROTECTION LEVELS

MODEL	PDC 3.1	PDC 3.3	PDC 4.3	PDC 5.3	PDC 6.3	PDC 6.4
Reference	101000	101001	101003	101005	101008	101009
Weight	1.950 gr.	2.900 gr.	3.100 gr.	3.200 gr.	3.500 gr.	3.900 gr.
$\triangle t$	**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 21.186:1996/1M:2009 & NFC 17.102 rectificatif Janvier 2009. (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).

CHARACTERISTICS & BENEFITS

- 100% of efficacy in discharge capture.
- High level of protection.
- Electric continuity guaranteed. The device doesn't offer any resistance to discharge conduction.
- Lightning rod without electrical components. Maxim durability guaranteed.
- **INGESCO® PDC** preserves its initial properties after each discharge.
- Because it contains no electronic elements, there are no replaceable parts.
- It doesn't need external power supply.
- Operation guaranteed in any atmospheric condition.

TECHNICAL SPECIFICATIONS

The capture terminal of **INGESCO® PDC** fits the following technical specifications:

— It has a double ***ESE*** (Early Streamer Emission) system:

- A early streamer device that produces the upward emission.
- An electro atmospheric condenser.
- An atmospheric accelerator.

— An insulation system certified by the General Testing & Research Laboratory of the Generalitat of Catalunya (LGAI).

— An external structure made from stainless steel AISI 316.

— Early Streamer Emission system made from stainless steel AISI 316 and Epoxy resin.

Its effective operation in any atmospheric condition and environment is thus guaranteed.

INSTALLATION

The capture terminal of **INGESCO® PDC** should follow the prescriptions of the norms NFC 17.102 (or Norm UNE 21.186) and EN 62.305, and should take into account the following:

- The point of the lightning rod should be situated, at least two meters above the highest building to be protected.
- For its installation on a mast, the corresponding head-mast adapter is needed for the lightning rod.
- The cabling of the covers should be protected against surges and connect to ground the metallic structures present within the safety zone.
- The lightning rod should be connected to a grounding point by way of one or various conducting cables which will go down, whenever possible, the exterior of the construction with the shortest and straight possible trajectory.
- The earth termination systems, whose resistance are not to surpass 10 ohms, should guarantee the most rapid possible dispersion of the lightning current discharge.

NORMS, TESTS & CERTIFICATES

INGESCO® PDC, fulfils the requirements contained in norms:

- UNE 21.186
- EN 62.305
- NFC 17.102
- EN 50.164/1

Manufactured by **INGESCO®** from 1984, it is the first lightning rod provided with a non electronical ESE system that fulfils the requirements contained in the norms UNE 21.186 and NFC 17.102.

Guaranteed by:

— Operation principle registered in patent num. 526.264 from April 16, 1984.

— Spanish Ministry of Industry register num. 150.032.

INGESCO® PDC Lightning rods have successfully passed the following certification tests and trials:

- Supported current test in the BET, Blitzschutz & EMV Technologiezentrum (Menden, RFA, 1998) Laboratory and in the ISKRA ZASCITE Laboratory - Surge Voltage Protection Systems, Engineering and Cooperation (2001).
- Evaluation test of the upward leader initiation time emitted by the lightning rods with ESE system (annex C NFC 17.102), at the LABELEC High Voltage Laboratory (2005).
- Test of insulation resistance, at the General Testing & Research Laboratory (LGAI) of the Generalitat of Catalunya (1997).
- Certificate of fulfillment of the particular regulation of brand AENOR, issued by LABELEC High Voltage Laboratory (2002).
- Certificate of supported current, issued by LABELEC High Voltage Laboratory (2002).
- Certificate of insulation in rainy conditions, issued by LABELEC High Voltage Laboratory (2001).
- Product certificate nº ESPMDD004531-B, issued by the Bureau Veritas International certification entity (2006).