

# INGESCO® PDC.E LIGHTNING ROD

Photo Mod. PDC.E



## PRODUCT

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

## OPERATION

Lightning rods provided with electronic **ESE** system offer the most effective and safe protection before lightning. They have been designed to reduce the time of the electro atmospheric discharge, in order to increase their capacity for lightning capture.

When a storm cloud is near to produce a downward electrical discharge (lightning), an increase in the electric field takes place. The electronic **ESE** system accumulates this electric potential and afterwards releases it as high voltage impulses that ionise the air particles around the device. This process produces an upward streamer emission that attracts and captures lightning.

The **INGESCO® PDC.E** put together two quality factors:

- 1.- It uses the latest generation electronic technology able to generate upward emissions in shorter times, so the protection for your equipments and facilities increases.
- 2.- It is the result of R&D programmes in our Electro-technical Laboratory LABELEC and has been submitted to several tests (performance before artificial electric field).

Because of that, **INGESCO® PDC.E** is the most reliable lightning rod of its class you can find currently in the market, able to offer an **intelligent performance**: its **ESE** system only works when there is a real risk of lightning impact, lowering the risk of unnecessary discharges.

## PROTECTION LEVELS

MODEL	PDC.E 15	PDC.E 30	PDC.E 45	PDC.E 60
Reference	102004	102005	102006	102007
Weight	3.775 gr.	3.770 gr.	3.765 gr.	3.760 gr.
$\Delta t$	15 $\mu s$	30 $\mu s$	45 $\mu s$	60 $\mu s$
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).

## 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 with electronic device.
- **INGESCO® PDC.E** preserves its initial properties after each discharge.
- It doesn't need external power supply.
- Operation guaranteed in any atmospheric condition.

## TECHNICAL SPECIFICATIONS

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

- It has an electronic **ESE** (Early Streamer Emission) system:
  - A capacitive generator of an upward emission.
  - A capacitive circuit to store electric charges.
  - An electro atmospheric condenser.
- An insulation system made with resin (certified for high voltage devices protection).
- An external structure made from stainless steel AISI 316 L.

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

## INSTALLATION

The capture terminal of **INGESCO® PDC.E** 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.E** fits the requirements contained in norms:

- UNE 21.186
- EN 50.164/1
- EN 62.305
- EN 50.164/3
- NFC 17.102

In addition to all the specifications described for these types of components in the Regulation of High Voltage by the Ministry of Industry and Energy.

Lightning rod fabricated since 2006 use the most advanced electronic components available on the current electronic lightning rod market.

**INGESCO® PDC.E** lightning rod have successfully surpassed the following tests and trials of certification:

- Evaluation test of the upward leader initiation time emitted by the lightning rods with **ESE** system (annex C UNE 21.186 and NF C 17-102), at the LABELEC High Voltage Laboratory.
- Mechanical test (traction and flexion until breakage).
- Product certificate issued by the Bureau Veritas Certification entity.
- Lightning protection test components according 50.164/1, in the high voltage laboratory LABELEC.
- Certificate of insulation in rainy conditions issued by the high voltage laboratory LABELEC.