Protection of an industrial plant

using a

PREVECTRON®

early streamer emission

lightning conductor

Indelec

lightning protection

PROTECTION OF AN INDUSTRIAL PLANT

USING A PREVECTRON® EARLY STREAMER EMISSION (E.S.E.) LIGHTNING CONDUCTOR

GENERAL

1→The lightning protection system should be in full compliance with French lightning protection standard NF C 17-102 (Protection of structures and of open areas against lightning using Early Streamer Emission air terminals).

2→To ensure an effective system and satisfactory long term performance, all fittings need to be mechanically robust and provide good corrosion resistance in conditions of 50° C and 95% relative humidity.

3→All materials used should be suitable for lightning protection installations.

AIR TERMINAL

1→The air terminal should be of the PREVECTRON® Early Streamer Emission (E.S.E.) type which is equipped with a lower series of energy collecting electrodes and an upper series of spark-generating electrodes. The triggering device of the E.S.E. air terminal is sealed in a stainless-steel housing fixed at the center of its central rod.

2→The air terminal should be fixed at the top of a steel elevation pole so as be at least 2 metres above the structure to be protected. Its height above roof level would be dependent on the level of protection and the protection radii required.

3→The elevation pole should be firmly attached to the wall, roof, or on any protruding part of the building.
Guy wires may be used in order to ensure the stability of the installation. In this case, the bottom-end of each guy wire should be connected to the down conductor.

4→If the protection of the plant building requires the installation of two or more E.S.E. air terminals, the base of the elevation poles should be interconnected at roof level by a solid copper conductor of the same cross-sectional area as the down conductors of the installation.

DOWN CONDUCTOR

1→Each E.S.E. air terminal should be connected to at least one down conductor. Two conductors should be installed on opposite sides of the building if the protected structure is higher than 28 metres or if the horizontal length of the down conductor is greater than its vertical length.

2→The down conductor(s) should be high conductivity round or flat solid bare or tinned copper conductor with a minimum size of 50 mm^2. They should be fixed to the structure by means of 3 fasteners per metre.

3→The down conductor(s) should be connected to the air terminal by means of a metallic adapter located on the E.S.E. air terminal. It should then run down the elevation pole and take the shortest direct route down the outside of the building to the earth termination network, avoiding any sharp corners, thereby providing a low impedance path from the air terminal to its earth termination system(s).

4→Any metallic object located less than 1 metre from the down conductor should be connected to the latter (for further information regarding bonding specification, refer to NF C 17-102 part 3).

5→A 6 digit Lightning Flash Counter may be installed in order to count the actual lightning strikes on the E.S.E. air terminal.

6→ A test clamp should be installed 2 metres above ground level so that the down conductor may be disconnected from the earth termination system for regular checks of the earth termination resistance value. This test clamp should be grounded to an inspection pit if the building happens to be covered with metal cladding.

7→The base of the down conductor should be protected from accidental knocks and other damage by means of a 2 metre stainless-steel protection sheath fixed to the structure.

EARTH TERMINATION SYSTEM

1→Each down conductor should be connected to its own earth termination system using a crow-foot or a triangular earth termination. The crow-foot earthing is made of conductors of the same material and cross-sectional area as the down conductor(s) of the installation and arranged in crow-foot fashion (three 7 to 8 metre long conductors buried horizontally). A copper-covered steel earth rod should be added at the end of each copper length. The triangular earthing system is made of a set of three vertical copper-covered steel earth rods totalling a minimum length of 6 metres arranged as a triangle and separated from each other by a distance at least equal to the driven depth and interconnected by a conductor which is identical to the down conductor(s) of the installation.

2→The resistance value of each earth termination system should be 10 Ohms or less.

3→Each earth conductor and rod connection should be housed in a proprietary concrete or P.V.C pit in order to facilitate inspection. The pit should be complete with a lid and the assembly should be installed flush with ground level.

4→The lightning conductor(s) earth termination system(s) should then be connected to the general earth of the site in order to acheive an equipotential earth network.
This connection should be equipped with a disconnecting clamp housed in a concrete or P.V.C inspection pit.

Conforming the international standard CEI 61643-11and the French standard NF EN 61643-11, the installation of a type 1 overvoltage arrester (DGV) is now mandatory for all structure equipped with a lightning air terminal.

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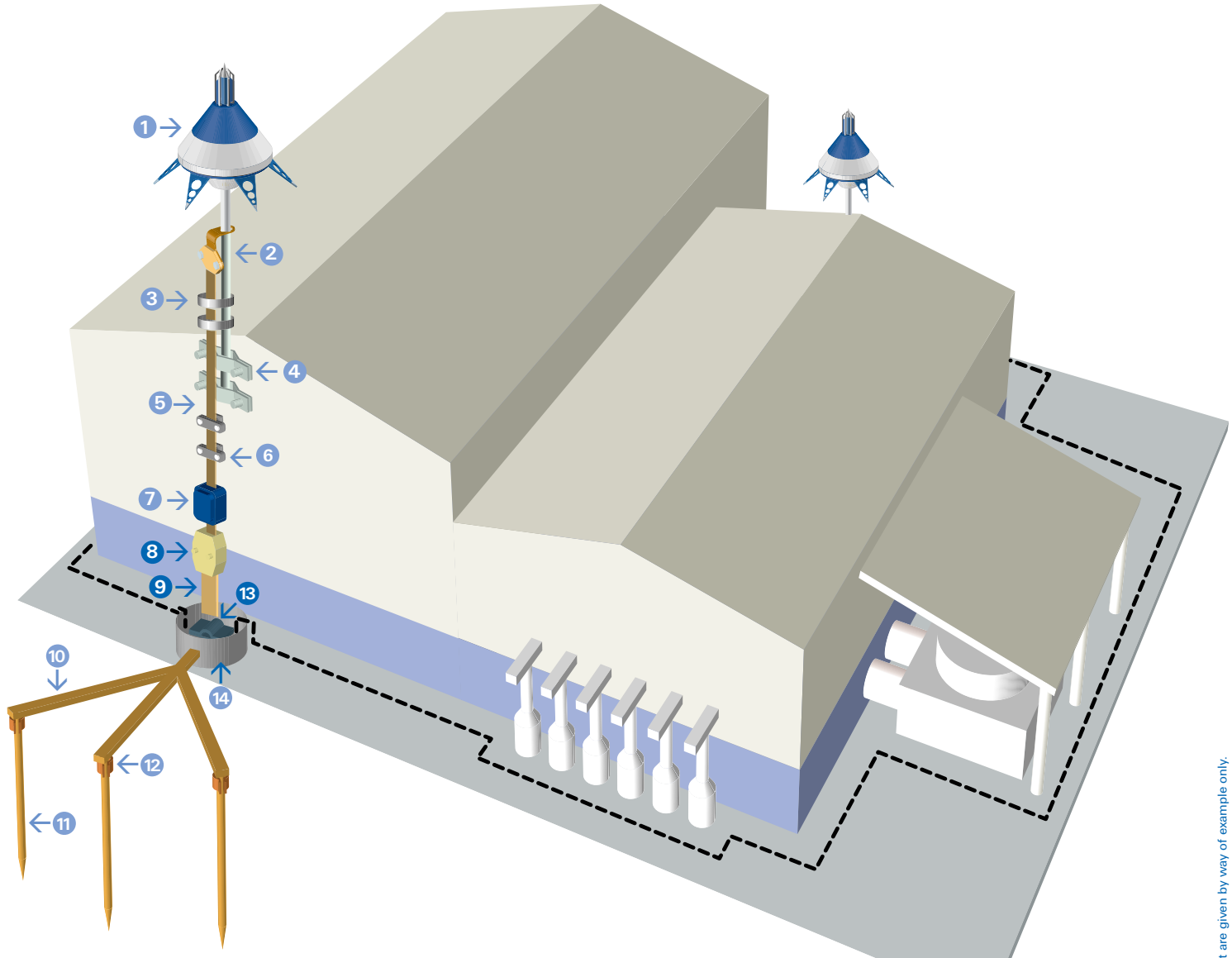
1	Prevectron®2 S 6.60	ref: 1243	8	Test clamp	ref: 7001B
2	Elevation pole	ref: 2023	9	Protection sheath	ref: 7014
3	Clamping collar	ref: 6058	10	Copper earthing	ref: 7021
4	Side mounting brackets	ref: 3013	11	Earth rod	ref: 7030
5	Copper conductor	ref: 5001	12	Rod-to-conductor clamp	ref: 7039
6	PVC clips	ref: 6071	13	Earth clamp	ref: 8004
7	Digital Lightning Flash Counter	ref: 8011	14	Inspection housing	ref: 7052



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