Protection of a transmission tower

using a

PREVECTRON®

early streamer emission

lightning conductor

Indelec

lightning protection

PROTECTION OF A TRANSMISSION TOWER

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

GENERAL

1→The lightning protection system should be in full compliance with the 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 installation.

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 to be at least 2 metres above any antenna and/or the structure to be protected.

3→The elevation pole should be firmly attached to the top of the tower.

DOWN CONDUCTOR

1→At least two down conductors should be fixed on opposite sides of the tower with one being located on the prevailing wind side. Three down conductors should be installed if the height of the tower exceeds 40 metres. These conductors should be interconnected every 30 metres by an horizontal conductor. This configuration is intended to provide the lowest impedance path from the air terminal to the earth termination network.

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

3→Each down conductor should be connected to the air terminal by a metallic adapter located on the E.S.E. air terminal. It should then run down the elevation pole and tower taking the shortest direct route to its earth termination network.

4→In order to protect the waveguides or coaxial cables running down the tower, specific grounding kits should be installed.

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

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

7→A test clamp should be provided for each down conductor in a concrete or P.V.C pit so that each down conductor may be disconnected from its earth termination and regular checks of the earth termination resistance value be carried out.

EARTH TERMINATION SYSTEM

1→Each down conductor and the metallic structure of the tower should be provided with their own earth termination system using a triangular earth termination. The triangular termination is made of a set of three copper-covered steel earth rods totaling a minimum length of 6 metres arranged in a triangular fashion and separated from each other by a distance at least equal to their driven depth and interconnected by a conductor identical to the down conductor.

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 triangular earth terminations should then be connected together so as to form an earth loop around the tower and achieve the equipotential earth network of the installation.

5→This loop will then be connected to the general earthing system of the transmission building located near the tower. 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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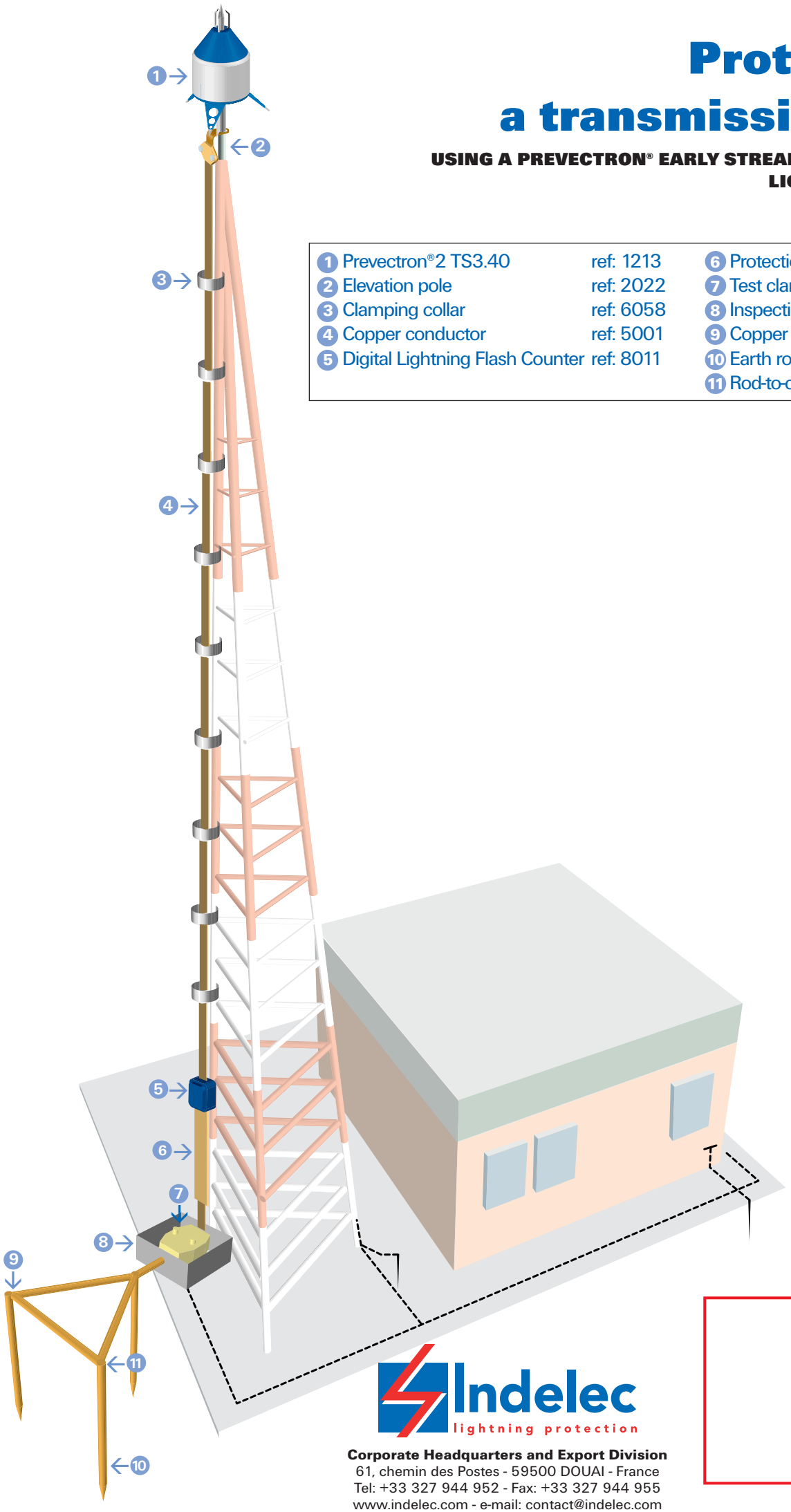
1 Prevectron®2 TS3.40	ref: 1213	6 Protection sheath	ref: 7014
2 Elevation pole	ref: 2022	7 Test clamp	ref: 7001B
3 Clamping collar	ref: 6058	8 Inspection housing	ref: 7052
4 Copper conductor	ref: 5001	9 Copper earthing	ref: 5001
5 Digital Lightning Flash Counter	ref: 8011	10 Earth rod	ref: 7030
		11 Rod-to-conductor clamp	ref: 7039



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