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dinfil

Ground filter
model DNNFT

High reactance filter for protection against high frequency ground induced surges

The dinfil ground filter model DNNFT is a high reactance filter for protection against high frequency ground induced surges derived from atmospheric discharges, electromagnetic pulses and other sources.

Technical principle of operation

The operating principle of the dinfil filter model DNNFT is based on the fact that when high frequency alternating currents try to pass through the most active part of the winding, the self-inductance produced by the magnetic flux of the current that tries to pass through it generates a counter-electromotive force that opposes the passage of its alternating component. However, it does not prevent direct current or direct current or low frequency alternating current from passing through it and continuing to flow freely through the entire winding and the rest of the electronic circuit. During the process of filtering the high frequency alternating current, the energy contained in the alternating component that cannot pass through the filter is absorbed by the ferrite core in the form of heat. However, the temperature reached by the ferrite for this reason is very low and hardly noticeable.

Technical characteristics

Concept	High frequency ground filter
Product	dinfil
Model	DNNFT
Type of filter certified according to UNE EN IEC 62305 and UNE EN IEC 62561.	H
Direct Current Electrical Resistance using 10 A source	0,37 mΩ
Resistance after 3 current injections of 100 KA 10/350 according to standard UNE EN IEC 62305-1:2011 Annex C and UNE EN IEC 62561-1:2012	0,38 mΩ
Electrical resistance value requirement of the filter using 10 A sources before and after the 3 current injections of 100 KA 10/350.	< 1 mΩ
Intensity	100 KA 10/350
Specific energy	2500 KJ/Ω
Cable insertion in brass part	Cable up to 10 mm ø (use accessory piece brass. See figure 2). Cable between 10 mm ø and 16 mm ø (Do not use accessory part brass. See figure 3).
Allen type clamping screws	M8x10
Required tightening torque of Allen screws M8x10	8 Nm
Certified Normative	UNE EN IEC 62305-1:2011 (Report No. LCOE 2019033F0172) UNE EN IEC 62561-1:2012

Table 1. Technical characteristics of the dinfil ground filter.

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Testing results

Sample	Serial number	Register	Ip (kA)	W/R (KJ/Ω)	Q (C)	T1 (µs)	T2 (µs)	Result of the visual inspection	Resistance before the tests (mΩ)
DNNFT	S/N	RC12-09	113,7	2.962	52,8	19,6	355	SATISFACTORY	0,370
		RC12-10	112,4	2.794	49,4	19,6	356	SATISFACTORY	
		RC12-11	110,9	2.763	49,2	19,6	366	SATISFACTORY	
DNNFT-P	S/N	RC12-12	109,5	2.836	50,0	20,0	388	SATISFACTORY	0,670
		RC12-13	107,1	2.624	49,2	20,0	356	SATISFACTORY	
		RC12-14	105,9	2.580	47,6	20,0	382	SATISFACTORY	

Table 2. Results of the dinfil filter tests at the LCOE.

Conclusions

No sample presented evidence of visual damage. The measured resistance of its contacts was less than 1 mΩ.

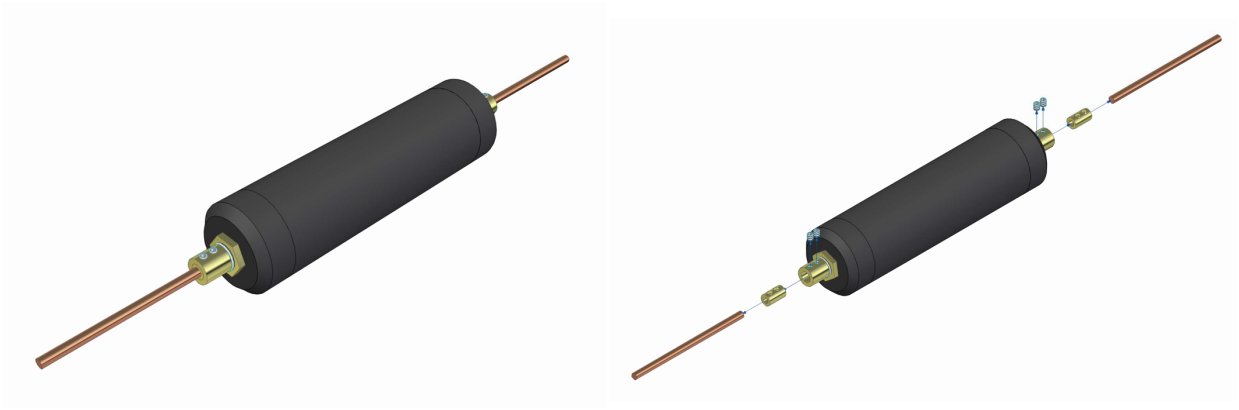

Figure 1. Cable insertion up to 10 mm diameter.

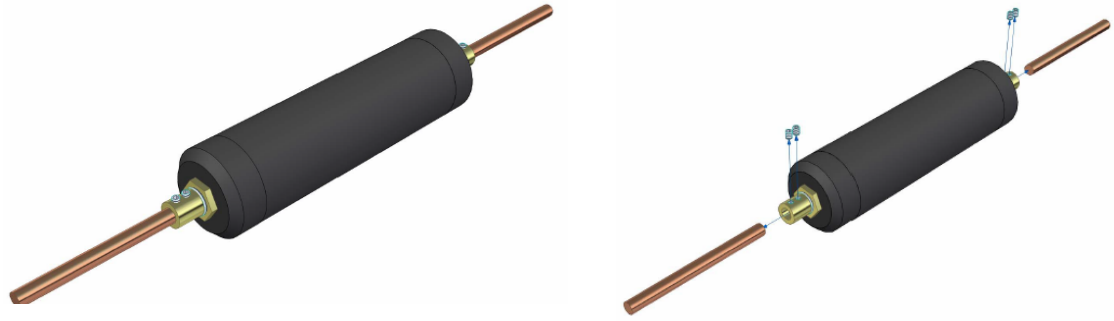

Figure 2. Cable insertion from 10 mm to 16 mm diameter.

Materials, measurements and weight

Figure 3. Measurements of the dinfil ground filter DNNFT model.

Concept	dinfil ground filter DNNFT model
Length (mm)	450
Diameter (mm)	98
Weight (Kg)	5
Box weight (Kg)	0,2
Materials	Copper, Ferrite, POM and dielectric insulator

Table 3. Materials, measurements and weight of the DNNFT.

Installation

It is installed between the earth connection and the element to be protected, as close as possible to the earth connection (Figure 4).
In order to protect the electrical and electronic equipment of a structure, as well as the DDCE, an equipotential bonding bar can be installed and all the earth connections of the same can be connected to this bar and the filter inserted between the earth connection and the bar. In any case, the number of filters to be installed will depend on the potential earth overvoltage inputs and the design of the installation (Figures 5, 6, 7, 8 and 9).
It can be installed vertically or horizontally.
The filter will be placed on the wall or other type of structures, by means of flanges and the necessary accessories to have a secure fixation (Figures 10 and 11).

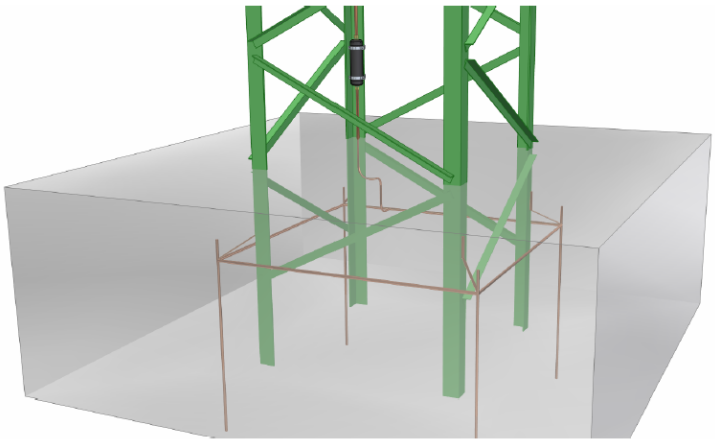

Figure 4. Installation of a dinfil filter on the DDCE downstream cable for its protection.

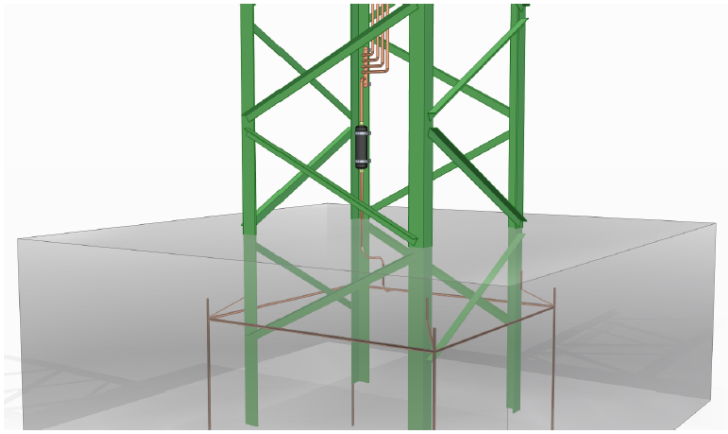

Figure 5. Dinfil filter type installation to protect the DDCE and all the electrical and electronic equipment of the tower (by means of an equipotential bar).

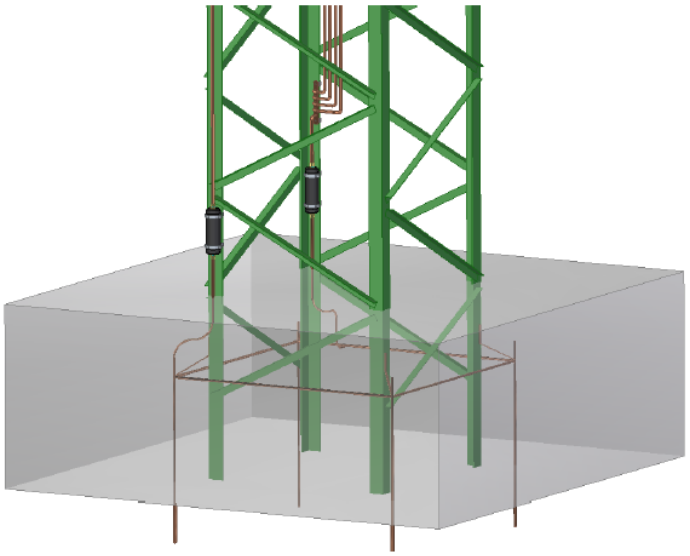

Figure 6. Protection of DDCE and tower equipment by means of 2 separate dinfil filters (standard installation).

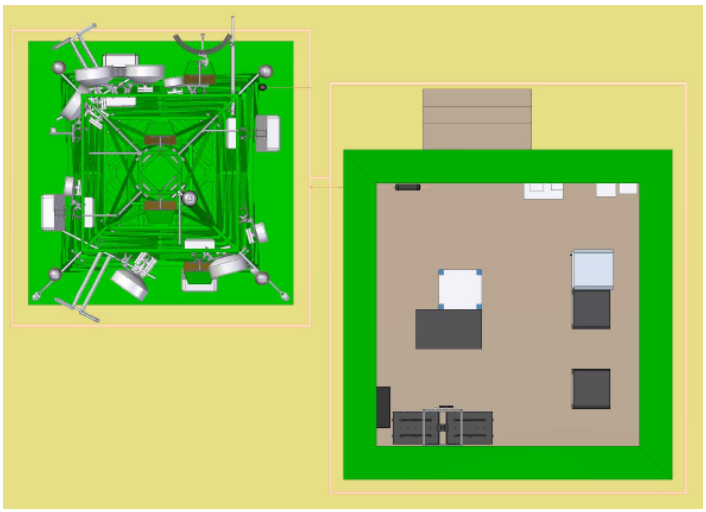

Figure 7. Point of view of the total protection of a telecommunications center more than 60 m high with 1 DDCE, 4 lateral DDCE and 2 dinfil filters (Figure 4 (tower) and house), as well as the equipotential disposition of land.

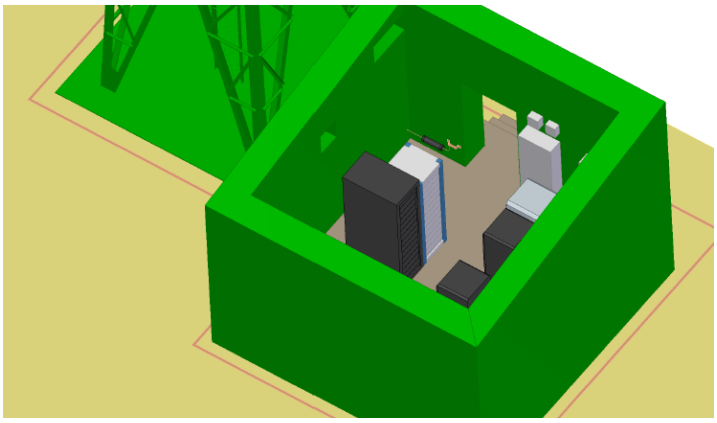

Figure 8. Installation of a dinfil filter in a telecommunications center for the protection of internal equipment.

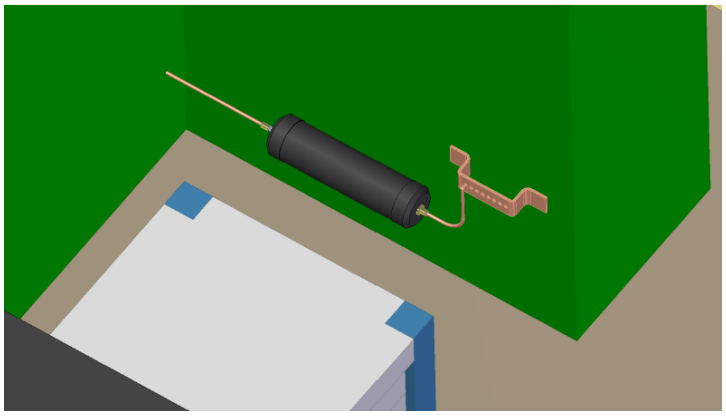

Figure 9. Enlarged view of figure 8.

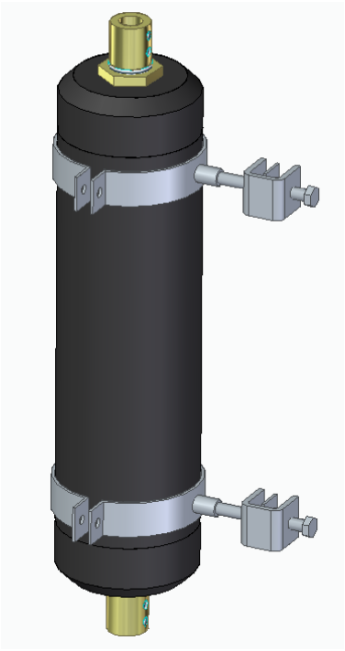

Figure 10. Clamps and attachment to dinfil filter legs.

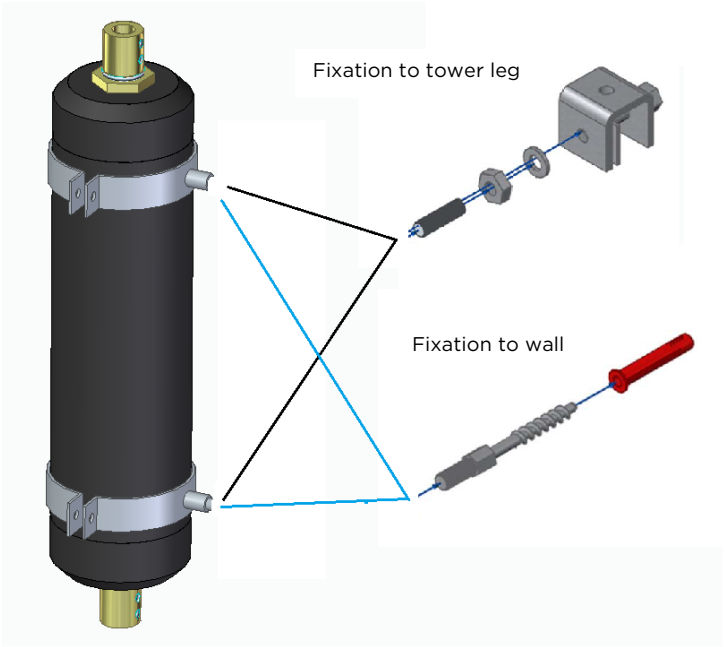

Figure 11. Detail of fixation to leg and wall of the dinfil filter.

Applications

Unique and effective system for the protection of earth induced high frequency surges in all types of structures.

Its installation is recommended in all those structures whose exposure to this type of surge is significant, such as: telecommunication towers, radars, train installations, electrical substations, isolated structures, wind towers, etc.

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