

CORONA

the invisible light

The corona phenomenon is associated with energized high voltage installations and can hardly be avoided, especially under wet and contaminated conditions. The corona phenomenon is involved with multiple effects such as: discharge of ultraviolet radiation, audio noise, radio interferences, the liberation of Ozone and formation of acids none of which are visible to bare eyes. Corona can be present due to inadequate hardware design, damaged hardware, deficient interfaces due to improper design and/or manufacturing etc.



Corona discharge can be a significant threat to the integrity of electrical grid components, in particular to those made of organic polymers. Corona can lead to direct and indirect energy losses and unexpected outages, and therefore **there is a necessity to periodically inspect and search for corona discharges.**

CORONA INSPECTION METHODS

The main purpose of inspection is to be able to verify the integrity of the systems, and detect faults in their early stages when repair is possible and costs are relatively low. Corona indicates faults in their early stages and therefore spotting corona is advantageous.

- » Acoustic – measuring audio noise levels
- » Radio Interference (RIV) – voltage measurements
- » Thermography – measuring hot spots
- » E-Field measurement
- » UV radiation detection

Acoustic and RIV measurement methods are sensitive to background noise and cannot be used to determine the precise location of the discharge.

IR thermography seeks significant modifications in the surface temperature and can hardly, if

at all, detect the very small changes in temperature caused by corona.

E-field measurement is totally inconvenient and time consuming.

UV radiation detection provides information on the exact location of corona, and the only provision is that there is a need for a line of sight, just as any other camera including IR.

In most cases it is recommended to use a combination of inspection methods taking into account that the only way to validate emission and pinpoint the sources is by using a UV camera.

CORONA CAMERAS CORE FUNCTION

is to reveal corona and pinpoint the exact location

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THE ADVANTAGES OF USING DayCor® CORONA CAMERAS

Using DayCor® sensitive coronas camera is clearly an advantageous practice, because it is

- » Nondestructive
- » Allow inspecting while systems are powered
- » Allow inspecting remote objects
- » Provide data in real time
- » Portray corona in its natural occurrences
- » Enable visualizing both the discharges and the faults
- » Provide assessments to the severity of discharges
- » Convenient mode of operation, easy & intuitive

DayCor® CAMERAS BASICS

- » Visualize UVc
- » Merge UV & visible imaging
- » Amplify UV signals
- » Assess severity of corona PD
- » Record findings

The solar radiation is being blocked by the Ozone layer in the UVc range “solar blind” region of 240-280nm. A fraction of the UV radiation emitted by corona is in this range. Daytime corona cameras take advantage of this fact and use special filters to filter in signals generated by corona in the UVc while filtering out all other. The camera

uses 2 spectral channels: one for corona UV signals and one for the visible light from the same scene. The UV channel undergoes amplification processes to enable seeing the corona. Finally, the camera collects the light from both channels and presenting a perfectly merged view of the source of discharge and the discharge itself.

