

# Predictive diagnostics for Low Voltage rotating electrical machines

Pure sinusoidal waveforms or in the presence of electronic converters

## Solbox



**Solbox** is a range of **diagnostic tools for monitoring the state of the insulation system of wire windings based electrical machines** in presence of pure sinusoidal waveforms or due to electronic converters. These instruments have been designed and built to detect the **presence or absence of partial discharges with ON-LINE measurements** (and therefore during normal and routine operations) within the insulation system, in an **absolutely non-invasive way**.

**Solbox** consists of two main parts:

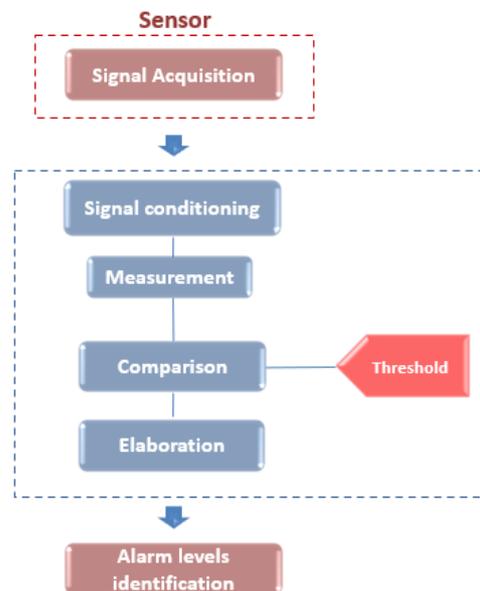
1. A **sensor** capable of receiving the electromagnetic signals generated by the activity of partial discharges. It is available in a compact version, to be installed directly inside the terminal box, or boxed for installation outside of the machine.
2. An **electronic device** having the function of conditioning and processing the signal received by the sensor. By doing so, it can identify the presence of a potentially harmful partial discharge activity. It consists of different sections for *signal conditioning and processing*, for the *management of the alarm logic* and for the *power supply*.

These sections are characterized by the following features:

- a. **Signal conditioning:** signal filtering by passive analog filters and signal processing by different amplification stages
- b. **Signal measurement:** after the signal filtering phase, the maximum amplitude is measured
- c. **Threshold setting:** the measured signal is compared with a threshold above the noise band
- d. **Alarm level setting:** defined according to the number of discharges and their amplitude
- e. **Alarm signalling:** identified by the lighting of LEDs of different colours depending on the alarm levels.

Low voltage electrical machines can work in the presence of electronic converters or pure sine waveforms; for this reason two different solutions have been developed:

- **PWM:** in presence of electronic converters
- **SIN:** with pure sine waveforms



## AVAILABLE VERSIONS

### SOLBOX ST (Standalone)

**Compact and integrated version** in which the sensor, the conditioning circuit, the logic and the power supply section are contained in a single box. This solution, if battery powered, **does not require any wiring**.

### SOLBOX HS (High Sensitivity)

In this version the sensor is externalized with respect to the box in which the conditioning circuit, the logic and the power supply section are contained. The connection between the two parts is wired and optimized to **reduce overall dimensions**, ensure **greater flexibility in installation** and obtain a **better S/N ratio**.

### SOLBOX RSC (Remote Signalling and Controlling)

It has the same structure as the Solbox HS but is equipped with a **remote-control unit for the user interface and partial discharge presence alarms**. By introducing this interface, which can be controlled through dedicated programmable systems, you have the advantage of being able to monitor machines that are not easily accessible (located up to 100m away from the remote unit); it also offers the **possibility to connect to the network with other commercial devices**.