Gating Techniques for Active Noise Suppression

For example, the OMICRON MPD PD measurement and analysis system enables the following gating methods to filter out surrounding interferences.

Channel gating

To reduce the effect of disturbances, such as inverter noise on the measurement results, you can use the second MPD 800 input channel as a gating channel. The underlying method uses the (gating) signal of a sensor or other coupling close to the source of the disturbance, which is dominated by the interfering signals. The signal of the measurement channel is not used for the measurement result if an impulse of a certain size is measured on the gating channel.
Window gating of phase and amplitude

Phase/amplitude gates allow you to eliminate frequency-stable signals with a certain amplitude and fixed phase position, for example converter or rectifier pulses and irrelevant PD. You can easily define the gating areas by marking them with the mouse. These areas will be excluded during the subsequent PD measurement.

Useful filtering tools for separating PD sources from interference

In addition to various gating methods, OMICRON PD measurement and analysis systems also provide you with powerful tools you can use to distinguish various PD sources from interferences for easy visualization and reliable analysis.

3PARD – three-phase filtering tool

Partial discharge (PD) events closer to one phase can also be detected on the other phases. The 3PARD (3-phase amplitude relation diagram) tool simplifies the differentiation of various PD sources and PD interferences. It relies on a synchronous three-phase measurement of a test object.

The combined results of three measurement channels are displayed in a single 3PARD star diagram, which facilitates result comparison and separation of impulse sources. To further increase the testing reliability, clusters are selected in the 3PARD and the resulting PRPD diagrams show the filtered-out pulses in real time while graying out the residual pulses in the background (Figure 5).
3FREQ – single-phase filtering tool

The 3FREQ diagram, also known as 3CFRD (3-center frequencies relation diagram), is a one-channel filtering tool that uses three digital filter frequencies to characterize PD sources by their frequency signature.

Using a 3FREQ diagram, you can separate PD events such as surface discharge, corona and internal voids from disturbances. Just as with the 3PARD, the resulting PRPD diagram shows filtered out pulses while graying out the residual pulses in the background to improve the testing reliability.