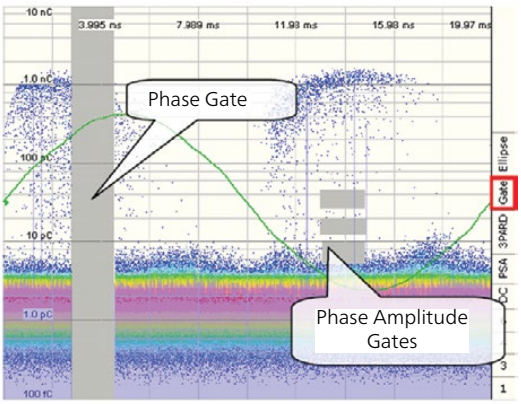
Gating Techniques for Active Noise Suppression

While measuring partial discharges (PD) in a noisy environment, you have to deal with external pulse-like disturbances, which interfere with the PD signals from the test object. Often, these external disturbances dominate the PD signal from the test object, so that the apparent charge value (Q_{iec}) indicated by the PD measurement system does not match the apparent charge value from the test object.

In this case, a suppression of these disturbances is needed to perform a mostly undisturbed and sensitive PD measurement. The OMICRON MPD 600 PD measurement and analysis system enables the following gating methods:

Figure 1



Use of gating windows

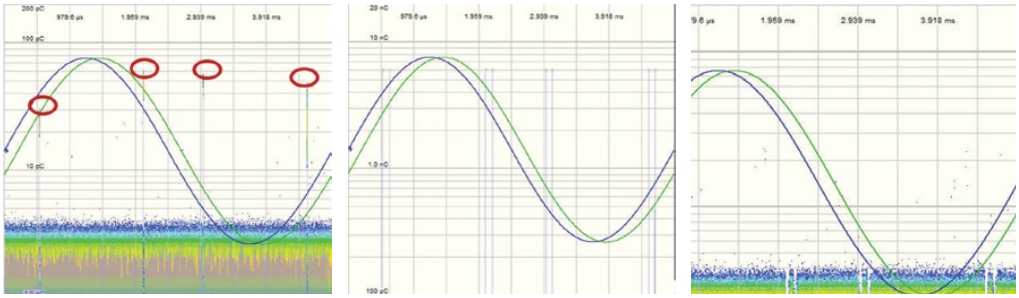
Manual Gating

Disturbances, which are phase-locked to the test voltage (e.g. as a result of switching activity), can be easily eliminated by using window gating. This method uses gating windows to mask disturbances all over the test voltage phase.

Antenna Gating

However, if the phase position of a disturbance is changing related to the test voltage (e.g. disturbances from power-electronic speed-regulated drive units), the windows have to be readjusted. An alternative method is the so-called "Antenna Gating" where those disturbances can be captured by antennas, inductive sensors or other couplers which are connected to a second MPD 600 acquisition unit.

Figure 2

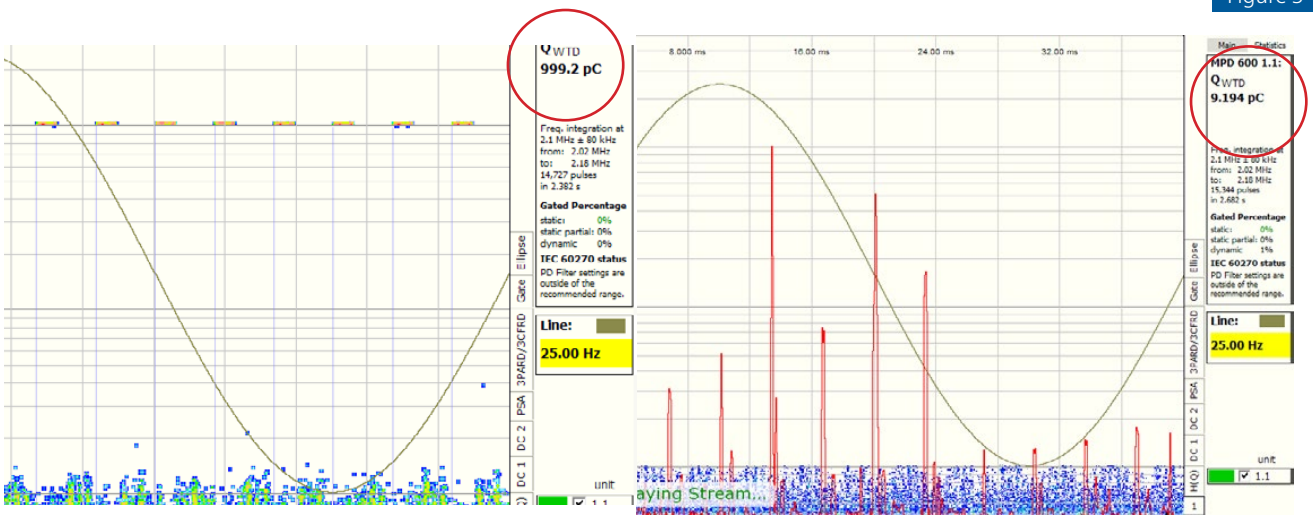


PRPD before gating | Disturbances on gating unit | PRPD after gating

Dynamic Noise Gating (DyNG)

Non-stationary pulses that are not fixed in phase ("moving" vs. phase) – e.g. interference from drives, motor-generator test sets and temporary interference – can be suppressed by the unique "Dynamic Noise Gating" (DyNG).

Figure 3

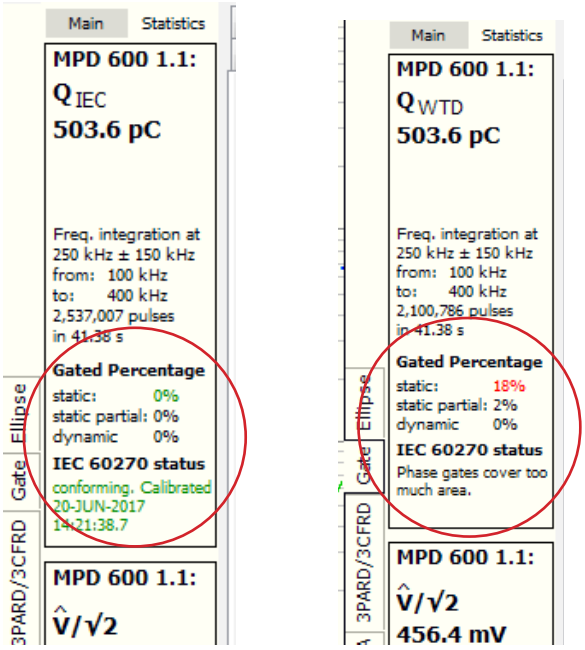


Before suppression by DyNG

After suppression by DyNG

Moreover, the MPD 600 software will indicate to the user whether the measurement conforms to IEC 60270 as illustrated in Figure 4.

Figure 4



Please click HERE or scan the QR code to watch our PD video on Youtube.

More information about the MPD 600 PD measurement and analysis system is available at:
www.omicronenergy.com/mpd600

Hands-on training is also available from OMICRON Academy, where you can learn how to perform PD measurement and analysis on a variety of electrical assets. Please click HERE for more information.