HAEFELY

Solution 210

DDX 9121b partial discharge test on power transformers

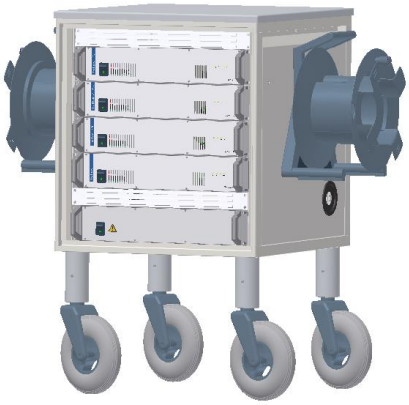
Problem

According IEC 60076-3, Partial Discharge Test is a mandatory Routine Test for $U_m \geq 72.5$ kV and a Special Test for $U_m \leq 72.5$ kV (optional/purchaser required/improved quality check).

On three phases transformers, although there are no IEC requirements to continuously measure each phase, today it is a common practice to measure and record the partial discharge on all High Voltage bushings simultaneously, and also have an indication of the partial discharge level on the Low Voltage side.

Solution

With the DDX 9121b-4, all HV and LV bushings can be tested, and partial discharge levels can be recorded at the same time. Three of the four detectors included in the system are used to simultaneously monitor the HV bushings ($U_m \geq 72.5$ kV: PD test mandatory). By using the four inputs (DDX 9121b/SKMX option) any pulse coming from the Low Voltage side are also recorded ($U_m \leq 72.5$ kV: PD test optional/purchaser required/improved quality check).



The test system contains 4 partial discharge detectors and is built in a trolley with large wheels. The device can be easily located beside the transformer and connected to the measuring impedances using the included twin BNC cables.

Communications between the computer and the test system is done using fiber optic (or a normal LAN cable).

The test system is plugged into the mains, and the coupling impedances are passive, therefore no batteries or battery chargers are required.

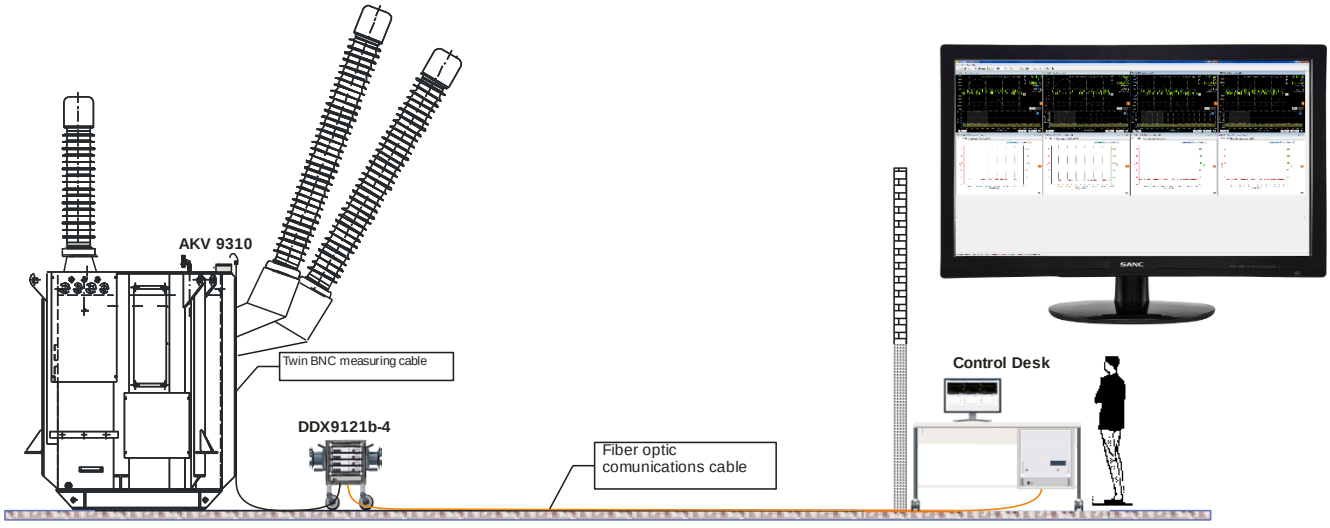


Fig. 1: Connection between the transformer, the DDX 9121b-4 and the control room

The included analysis function (NQP, PD pattern) allows further investigation of the origin of the discharges.

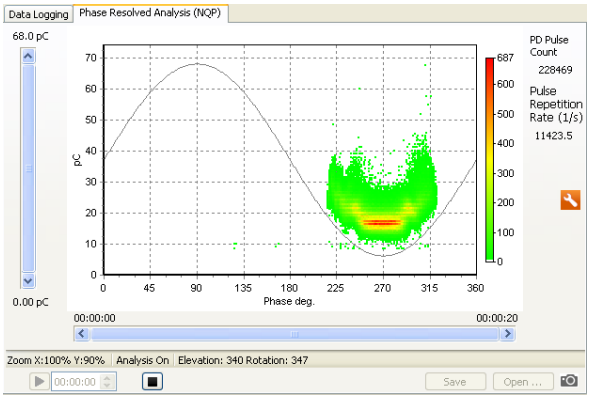


Fig 2: NQP pattern from DDX 9121b software- Corona

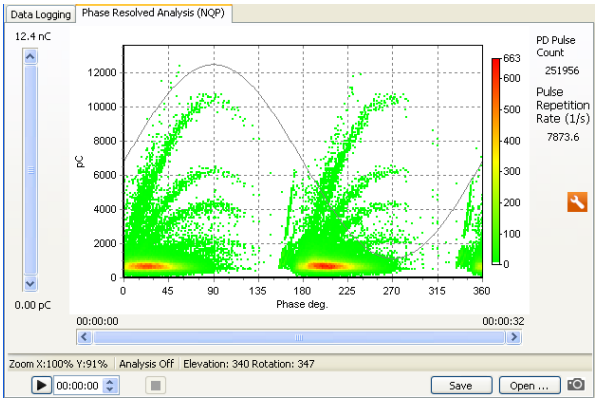


Fig 3: NQP pattern DDX 9121b software- Internal PD (void/cavity)

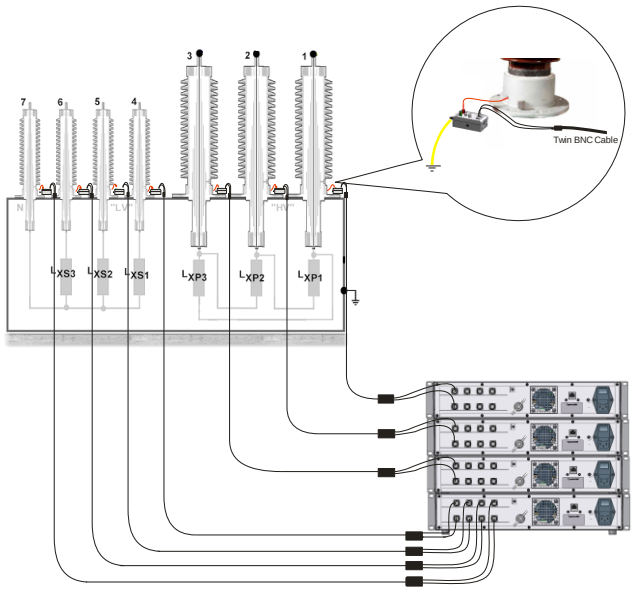


Fig. 4: Connection between the bushings, the coupling impedances AKV 9310 and the DDX 9121b-4 [1), 2)]

[1)] If LV bushings are not capacitive or bushing tap is not accessible, external coupling capacitors need to be used.
[2)] Um ≥ 72.5 kV: PD test mandatory for each phase. Um ≤ 72.5 kV: PD test optional/purchaser required/improved quality check).

Scope of supply

- DDX 9121b-4
- DDX 9121b/TROLL
- DDX 9121b/SKMX
- DDX 9121b/FO
- AKV 9310T (6 units)
- KAL 9511 / 9510 / 9520

Haefely Test AG
Birsstrasse 300
4052 Basel
Switzerland
☎ + 41 61 373 4111
🖷 + 41 61 373 4912
sales@tettex.com

Additional information at

www.haefely.com