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Introduction to Partial Discharge Testing of Oil Filled Transformers

Pacific Crest Transformers has recently purchased the Doble test equipment necessary to perform factory partial discharge tests. The decision to do so was based in part due to customer requests for the test option, but more importantly to provide PCT with a tool to concretely validate the integrity of its designs.



Doble partial discharge (PD) test equipment

Last July's paper detailed routine and type tests as required by IEEE C57.12.90

The routine tests are:

1. Winding Resistance
2. Ratio, Polarity and Phase Relation
3. Core Loss and Exciting Current
4. Load Loss and Impedance
5. Induced Potential
6. Applied Potential (Hi-Pot)
7. Production Line Impulse Test
8. Insulation Resistance
9. Insulation Power Factor
10. Leak (pressure) Test

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The type tests performed on each unique design are:

1. Full ANSI impulse Voltage Test
2. Temperature rise test
3. Short Circuit Test

Note that partial discharge testing is not listed. To date a PD test is not required by standards. It has however, been requested as an option by customers with increased frequency.

Why? A partial discharge test is non-destructive. A failure during a factory hi-pot or induced potential test requires a transformer repair whereas a factory PD test provides an accurate "snapshot" of the overall health of the transformer insulation system upon completion of manufacture. The results provide a base line for future evaluation through dissolved gas analysis (DGA), acoustical PD measurements, or more elaborate field testing similar, but normally not as accurate as, factory measurements due to electrical "noise" at the installation site.

With PCT's ability to offer partial discharge testing as an option, comes an opportunity for you to differentiate our product offerings from smaller regional manufacturers as well as transformer rebuild operations since most of these competitors typically do not have the equipment nor expertise to offer the test.

The accompanying paper was developed as a sales tool for distribution to your customers. Please advise if you have any questions.

Thank you,
Merry Christmas!

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Best regards,

A handwritten signature in black ink that reads "Tom Steeber".

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