

SITRAM DRY

Online transformer drying system



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Introduction

Insulation materials on all power transformers will degrade with time. Insulation aging depends on several different factors including insulation material, oil temperature, moisture content, oxygen content, particle contamination and acids due to degradation effects. Moisture content has a significant impact on transformer life expectancy, especially on the aging of the solid insulation.

Conventional methods of removing moisture, e.g., oil treatment plants, have focused on rapidly drying out transformer oil. Yet, since 98 % of the moisture is stored in the cellulose insulation, this has only a short-time effect. The rate of drying depends on the rate of water diffusion from the insulation into the insulating oil, which is a very slow process.

SITRAM DRY online oil dehydration system removes moisture from the insulation through disturbing the moisture equilibrium between the insulating oil and the paper insulation so that moisture diffuses from the wet insulating paper to the dried insulating oil, slowly removing the moisture from the solid insulation.

Features

The system is well-suited for transformers of varying ages, manufacturers, and ratings (from distribution to power transformers). The main features are:

- Continuous online removal of moisture based on a molecular sieve technology

- Easy to install on any energized transformer
- Temperature and moisture monitoring
- Cartridge replacement and regeneration service
- Cabinet version certified for a protection class of IP 55
- Leakage detection
- Cabinet heating for usage down to -20 °C
- High build quality certified with CE-conformity

Benefits

SITRAM DRY is an efficient and low maintenance way to remove moisture from a transformer. Following benefits are supported:

- A low breakdown voltage caused by high moisture values in oil can be restored in the first days of operation.
- On the long-term moisture is also removed from the insulation paper, slowing down the cellulose degradation process.

High moisture is accelerating the paper degradation process, the strategic decision to dry a transformer at an early stage in its lifecycle might extend the total life expectation of a transformer dramatically.

Scope of work / Deliverable

- Installation and configuration of SITRAM DRY
- Cartridges Exchange

Extending the life of your transformer with SITRAM DRY!

Technical Details

SITRAM DRY utilizes molecular sieve absorbent material. As the oil is circulated through SITRAM DRY by a small pump, the sieve material contained in the cylinders absorbs the moisture. Moisture diffusion will slow down as the moisture content of the insulating paper converges to its equilibrium with the dried insulating oil.

The drying process not only reduces the aging rate of the cellulose, but it also improves the breakdown voltage of the insulation oil and increase transformer reliability and life expectancy. Transformers can be operated with a significantly reduced risk of failure and on higher load cycles.

Proven product concept

SITRAM DRY is installed in a cabinet certified for IP 55 allowing a flexible installation in most environments. Additionally, the cabinet equipped with a leakage sensor avoids any potential contamination.

Benefits for new transformers

SITRAM DRY installed on a new or refurbished transformer can maintain the moisture content at the original 0.5% factory level. The system can significantly extend the expected life of a transformer at a fraction of its replacement costs. When installed at a new transformer one set of cartridges will last over one year or longer.

Benefits for older or wet transformers (>2% moisture in the insulation)

Legacy transformers generally have higher moisture content, so the target is to reduce the moisture content of insulating paper to an acceptable level and maintaining this level. The timespan required to dry out the unit will vary with the size, moisture content and operational temperature variation.

Comprehensive Service

SITRAM Dry is a robust system, and it only needs little maintenance effort. Thanks to the humidity sensors at the inlet and the outlet, the degree of saturation of the cartridges can be determined. The exchange of the cartridges is easy due to the quick couplings and can be done by transformer service personal. Should you however require any assistance when operating SITRAM DRY, our global service network is always happy to help.



Open SITRAM DRY cabinet showing three cartridges filled with molecular sieve

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