

TRANSFORMER GAS TESTING

Customer Type

Any Electrical Utility With Large Electrical Transformers

Application Description

Electrical utilities use large electrical transformers to drop the voltage coming from power lines. These transformers can be huge; the size of a car or greater. The transformers are sealed with an oil bath surrounding all of the electrical coils inside. This oil bath acts as both a coolant and an insulator. At the top of the transformer, there is a head space that has no oil and instead is filled with Nitrogen under a slight pressure. For a new transformer, this nitrogen blanket will remain "clean" for a long time. As the transformer ages, and the insulation between the wire coils starts to break down, the high voltage can arc between two adjacent coils of the transformer. When this occurs, the high voltage passes through the oil blanket, and causes the oil to break down. This causes small amounts of flammable vapors to form from the oil, and which rise to the top of the transformer to mix with the nitrogen blanket. These flammable vapors consist of a variety of gases, but generally Hydrogen is predominant. Periodic testing of the Nitrogen blanket for flammable vapors is a good indication of the health of the transformer. If the testing reveals a buildup of flammable vapors, the transformer can be removed from service in a planned manner instead of a catastrophic manner (they can blow up if undetected).

RKI's Solution

RKI offers a "Transformer Gas Testing" version of our EAGLE portable sample drawing gas monitor for this application. This instrument has a range of 0-5% Hydrogen and uses a catalytic sensor. The instrument is provided with a sample bag, a probe, and a dilution fitting. The dilution fitting is needed since the catalytic sensor requires oxygen in order to operate. The dilution fitting is attached to the inlet of the EAGLE gas monitor, and this fitting blends 50% sample with 50% ambient air, which provides sufficient oxygen for the sensor. For testing, the sample bag is filled from the transformer. (Remember that the transformer is normally under slight positive pressure,

and a valve is present on most transformers that can be easily used for this). The sample probe is attached to the dilution fitting on the instrument inlet, and then connected to the filled sample bag to test the sample. Readings are provided over the range of 0-5% Hydrogen, and recorded for future reference. Testing frequencies vary for each Utility, but generally are between 3 to 6 months. A sudden rise of flammables over this time period is an indication of transformer trouble.



Equipment needed

We offer an EAGLE version as described above for Hydrogen only, and also another version that includes oxygen, in case the operator wishes to confirm oxygen levels too.

72-5101RK-TR1

EAGLE for transformer gas testing, 0-5% Hydrogen, includes alkaline batteries, dilution fitting, probe, and sample bag.

81-5101RK-H2

Test Kit for EAGLE P/N 72-5101RK-TR1.

72-5201RK-TR1

EAGLE for transformer gas testing, 0-5% Hydrogen and 0-25% Oxygen, includes alkaline batteries, dilution fitting, probe, and sample bag.