



# Gas Detection For Life

## Application Brief

### *Transformer Condition Tested with an H<sub>2</sub> Gas Monitor*



amounts of flammable vapors to form from the oil, and 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 "Transformer Gas Testing" versions of our EAGLE portable sample drawing gas monitor for this application. These instruments have a range of 0-5% hydrogen and use a catalytic sensor. This unit also monitors Oxygen. This Eagle for transformer gas testing has two pumps. In this version the probe is connected directly to the transformer tap, and the internal pump is used to extract a sample from the transformer. A second pump is used to pull the required air through the dilution fitting. This version can also be used on transformers with positive or negative pressure. 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.

#### **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 headspace that has no oil and instead is filled with nitrogen, generally under a slight positive 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

- Available in single H<sub>2</sub> or dual gas with H<sub>2</sub> and O<sub>2</sub> channels
- Dual pump design eliminates the need for sample gas bags or dilution fittings
- Increasing O<sub>2</sub> alarms
- LEL, PPM, or % vol H<sub>2</sub> readings
- Takes samples from positive or negative pressure transformers





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### WHO TO CALL ON - USERS

Electrical Power Companies:

The potential users for the Eagle Transformer Gas Monitor will be all facilities that have and use electrical transformers. (Usually, step-down transformers.)

These are typically, large, ground based transformers:

**Power Companies** – Identify their Power Substations

- Corporate Industrial Hygienist
- Safety Dept.

**Power Substations:**

- Substation Specialist
- Transmission Specialist
- Transmission Support
- Substation Maintenance Support Group, Engineers
- Calibration Lab for instruments – Gas Monitors

**Electrical Membership CO-Ops (EMC's)**

- Small rural electrical power companies

**Contractors**

- Independent contractors that work for the power companies doing transformer work or maintenance.

### ORDERING INFORMATION

#### Single Gas H<sub>2</sub> EAGLE

72-5101RK-TRB  
EAGLE for Hydrogen (H<sub>2</sub>), 0 - 5% volume with 2 pumps for transformer testing

81-5101RK-H2  
Calibration kit, EAGLE, 103L cylinder of 50% LEL Hydrogen/Air, demand flow regulator, case & tubing

#### Dual Gas H<sub>2</sub>/O<sub>2</sub> EAGLE

72-5201RK-TRB  
EAGLE for H<sub>2</sub> (0 - 5%) / O<sub>2</sub>, with 2 pumps for transformer gas testing

81-5201RKTR1  
Calibration kit, EAGLE, 103L cylinder of 50% LEL H<sub>2</sub>/Air, 103L cylinder of 100% N<sub>2</sub>, demand flow regulator, case & tubing

81-5201RKTR1-LV  
Cal kit, EAGLE, 34L cylinder 50% LEL H<sub>2</sub>/Air, 34L cyl 100% N<sub>2</sub>, dispensing valve, gas bag, case & tubing

