



Kelman MINITRANS

Cost-effective on-line DGA & moisture for transformers

Knowledge of the condition of transformers is essential for all electrical networks and on-line monitoring of transformers is an increasingly vital component of successful asset management programs. The information provided by multi-gas on-line DGA allows valuable asset capabilities to be maximized and expensive failures to be avoided.

Dissolved Gas Analysis (DGA) and moisture measurement of the insulation oil are recognized as the most important tests for condition assessment of transformers. Traditionally performed in a laboratory environment, the Kelman™ MINITRANS provides for on-line discrete DGA monitoring of key gases associated with arcing, cellulose degradation and general fault conditions.

Key Benefits

- Cost effective on-line DGA
- Remote insight into transformer condition
- Discrete measurement of 3 key gases: Hydrogen, Carbon Monoxide and Acetylene; plus Moisture
- Faults can be detected in their infancy
- Generic fault type can be classified from results
- Transformer load and output can be optimized safely
- Aids condition based and predictive maintenance strategies
- Available with AC or AC/DC power supply

Applications

The MINITRANS facilitates entry into discrete on-line DGA and moisture monitoring for transformers and other oil insulated filled electrical equipment. The MINITRANS gives insight on developing faults, paper degradation and electrical arcing. It provides trending of gas-in-oil through its close integration with GE's powerful Perception™ Fleet software suite and/or users own software, historian and SCADA systems.

At a price that facilitates higher volumes of monitor deployment, The MINITRANS can be utilized to monitor any size of transformer, but is most widely employed to expand multi-gas on-line DGA coverage beyond the typical candidates of large, system critical or compromised transformers. It helps asset owners incorporate on-line DGA across a larger portion of their fleet, with a view to extending asset life, preventing unexpected failure and operating on a condition based/predictive maintenance schedule.

- Auxiliary GSU transformers
- On load tap changers
- Transmission transformers
- Distribution transformers

Cutting Edge Technology

- Three key fault gases plus moisture
- Automated headspace gas extraction
- State of the art photo-acoustic spectroscopy (PAS) measurement technology
- No carrier or calibration gases required
- Sampling frequency up to once per hour

Ease of Use

- Easy installation: no outages required reducing expense and inconvenience for user
- No consumables and minimal maintenance reduces running costs and site visits
- Extensive local and remote communications options available
- Sampling frequency user-configurable, versatile and flexible
- LCD display provides up to date information

Configurable Alerts

- Two sunlight visible front panel LED arrays
- User configurable relay contacts
- Alarms can be set or changed locally or remotely using Perception software
- Caution and alarm modes can be used to automatically increase sampling frequency

Integrated Solution

- Integrated load monitoring allows DGA analysis against transformer loading
- Can be connected to GE's Perception software for sophisticated graphical trending & diagnostic tools



Perception Fleet Software

Easy to install and configure, GE's Perception™ Fleet Asset Management Software is the ideal companion to your GE on-line monitors for both transformers and circuit breakers.

Perception Fleet moves customers from a manual, one-on-one asset assessment process to an automated and continuous fleet management solution.

Perception Fleet automatically downloads data from each GE online monitor and populates its database. It provides asset experts with comprehensive transformer diagnostic tools and data trending capabilities, as well as providing asset managers with asset fleet ranking based on health and risk indexes.



Technical Specifications

MEASUREMENTS

Range (LDL - UDL)

| | |
|--|-------------------------------------|
| Hydrogen (H ₂) | 5 - 5,000 ppm |
| Carbon Monoxide (CO) | 10 - 50,000 ppm |
| Acetylene (C ₂ H ₂) | 3 - 50,000 ppm |
| Moisture (H ₂ O) | 0-100% RS (given in ppm) |
| Accuracy* | ±10% or ±LDL (whichever is greater) |

*Accuracy quoted is the accuracy of the detectors during calibration.

Frequency

Variable - once per hour to once every 4 weeks

Technology

Uses photo-acoustic spectroscopy (PAS) to give highly reliable results. Field proven with over 10,000 Kelman PAS systems deployed in over ninety countries worldwide

Fully embedded processor and internal data storage for 10,000 records - over eight years of data at default sampling rate - protected by non-volatile memory

FEATURES

Alarms

Two sunlight visible front panel LED arrays (Red & Green)

Single Pole Alarm Relays, NO and NC provided: 1A@250Vac, 200mA@125Vdc, 150mA@300Vdc, 1A@30Vdc

Six alarm setting screens or scenarios are available, which can set alarms based on the level of the three gasses/moisture, and rates of change for each gas

Each alarm setting screen can activate the alarm relays or send an SMS message if equipped with the optional cellular modem

All alarms can be set or changed locally or remotely using Perception software

Caution and alarm modes can be used to increase sampling frequency

Communications

Two separate channels for remote communications, local USB connection and Ethernet connection

Communications protocols supported include MODBUS®, MODBUS/TCP, DNP3.0, IEC®61850

Modules available for communication via RS232, RS485, Ethernet, Fiber Optic, PSTN and cellular GSM/GPRS modems

ENVIRONMENT

Conditions

| | |
|-------------------------------|---|
| Operating ambient temperature | -35°C to +55°C (-40°F to +131°F): AC version -17°C to +55°C (1°F to +131°F): AC/DC version AC/DC version |
| Operating ambient humidity | 0-95% RH, non-condensing |

| | |
|----------------------------|----------------------------------|
| Oil temperature at valve** | -10°C to +100°C (14°F to +212°F) |
|----------------------------|----------------------------------|

**Based on testing carried out using VOLTESSO™ 35 mineral oil, over a ¼" pipe run of 10 metres or less from oil supply or return valve to monitor connection point and on transformer oil supply valve volumes of 200ml or less. For oil temperatures colder than -10°C GE recommend the use of heat trace cabling on piping

Enclosure Rating

IP55 certified

304 Stainless Steel (316 option)

Power Requirements

Available with either AC or AC/DC power supply

| | |
|----------------|--|
| AC Version *** | Nom: 115/230 Vac, Range: 103-126/207-253 Vac, 47-63 Hz, 6A max |
|----------------|--|

| | |
|---------------|--|
| AC/DC version | Nom: 100-230 Vac, Range: 90-253 Vac, 45-65Hz, 5A max Nom: 100-220 Vdc, Range: 90-242 Vdc, 45-65Hz, 5A max |
|---------------|--|

***AC input auto-switching

Mechanical

| | |
|------------|--|
| Dimensions | 600mm x 380mm x 350mm 24" x 15" x 14" |
| Weight | Installed weight 31Kg (68lb) Shipping weight 49Kg (108lb) |

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GEA-17281C(E)
English
200214



Imagination at work