

# Transport X<sup>2</sup>



## Portable Onsite DGA

Dissolved Gas Analysis (DGA) and moisture measurement of insulating fluids are recognized as the most important tests for condition assessment of fluid-insulated transformers. Every year asset owners deploy field crews to take thousands of fluid samples from transformers as part of periodic health checks and for immediate operational decisions. These samples are sent to offsite laboratories for analysis. Transport X<sup>2</sup> is a portable 'lab in a box' delivering detailed analysis with dramatically reduced turnaround times. In critical situations, the ability to perform DGA in less than 30 minutes on the spot, empowers asset owners to determine a transformer's condition onsite and thereby allow operational decisions to be made at the earliest opportunity.

GE was the first to deliver consumable-free DGA products to the market and the Transport X<sup>2</sup> represents the next generation of its portable system. GE's class leading Photo-acoustic spectroscopy (PAS) gas measurement technology, now in its fourth generation, provides laboratory-challenging levels of precision in a calibration free, easy-to-use and hand-carriable product.

Benefiting from over 40 years of global DGA experience, the Kelman™ Transport X<sup>2</sup> encapsulates intuitive advancements to bring improved performance, innovative new features, enhanced user experience and greater robustness.

## Key Benefits

- Measurement of seven diagnostic gases and moisture content in the oil
- Fast diagnostics in less than 30 minutes
- Intuitive touchscreen interface with step-by-step instructions and Plug and Play connectivity
- Compatible with mineral insulating oils and newer ester-based fluids (natural and synthetic)
- Enables operators to effectively respond to alarms, trip events and supports on-site field decision making
- Ideal companion to GE's range of single gas online DGA monitors for adding transformer diagnostics

## Applications

As the average age of generation, transmission and distribution transformers increases, the risk of rapid deterioration and even catastrophic failures also increases. Transformer changes can occur in between rounds of periodic laboratory DGA analysis and this risk exposure can go unnoticed. The Transport X<sup>2</sup> offers electric utility and industrial customers accurate, economical and portable DGA and diagnostics in an easy-to-use handy instrument that is applicable for:

- Mission critical industrial transformers
- Distribution transformers
- Buchholz relay gas
- Tap changer tanks
- Instrument transformers
- Oil filled circuit breakers

## Fully Portable

- Standalone DGA field instrument capable of measuring seven diagnostic gases and moisture
- Calibration and consumable gas free design for autonomous field operation
- Robust design with IP67 rating when closed
- Unit weighs less than 9 kg (20 lb)

## Field Proven Technology

- Advanced PAS technology (4th generation) underpinned by decades of DGA experience
- Designed and built to GE's high quality standards
- Supports mineral oil and ester fluids
- 5 year warranty as standard

## Intuitive Operation

- Graphical touchscreen user interface
- Intuitive onscreen step-by-step instructions
- Seamless integration with Perception software
- Plug and Play download of measurements and log files using standard USB 2.0 memory stick

## Built-in Diagnostics

- Built-in internationally recognized DGA diagnostic software tools
- Color graphical display to facilitate visualization
- Storage capacity for >20,000 measurements
- Further diagnostic capabilities through data upload to the Perception software suite



## Application Example

The Kelman Transport X<sup>2</sup> remains your ideal partner for use in conjunction with GE's range of single gas online DGA monitors. These units (such as Hydran™ 201Ti and Hydran M2-X) monitor the transformer and raise an alarm when an abnormal level of fault gas is reached or when the rate of change of this gas level increases rapidly so that you can take action and protect your transformer early in the process.

Such events often require further investigation before a valid conclusion can be reached. Traditional methods require an oil sample to be sent to a laboratory for analysis. This can be a lengthy process before a diagnosis and related decision can be made. However, with the Transport X<sup>2</sup>, the sample can be taken and analyzed onsite, giving comprehensive diagnostic information in less than 30 minutes. The Transport X<sup>2</sup> data can then be uploaded and visualized in GE's powerful Perception software alongside the readings from the online monitor.



## Technical Specification

| MEASUREMENT RANGE   |                                    | TECHNOLOGY  |  | FEATURES  |  |
|---|------------------------------------|---|--|---|--|
| Hydrogen (H <sub>2</sub> )  | 5 – 5,000 ppm                      | Automated headspace gas extraction                            |  | LCD Size  | 6.5 inch color touchscreen                               |
| Carbon Monoxide (CO)  | 2 – 50,000 ppm                     | Photo-acoustic spectroscopy (PAS) gas measurements (4th gen.) |  | LCD Type  | Resistive touchscreen                                    |
| Carbon Dioxide (CO <sub>2</sub> )   | 40 – 50,000 ppm                    | Thin film capacitive moisture sensor                          |  | Screen Resolution   | 640 x 480  |
| Methane (CH <sub>4</sub> )  | 2 - 50,000 ppm                     | Oil and Buchholz gas injection utilizing syringes             |  | Computer interface  | USB  |
| Acetylene (C <sub>2</sub> H <sub>2</sub> )  | 0.5 - 50,000 ppm                   | Mineral oil and ester fluid (natural & synthetic)             |  | Measurement Download  | USB 2.0 Memory Stick                                     |
| Ethane (C <sub>2</sub> H <sub>6</sub> )   | 2 - 50,000 ppm                     | Robust design and portable                                    |  |   | Direct Perception Sync                                   |
| Ethylene (C <sub>2</sub> H <sub>4</sub> )   | 2 - 50,000 ppm                     |   |  | Logfile Retrieval   | USB 2.0 Memory Stick and Perception                      |
| Measurement Accuracy*   | ±5% or ±LDL (whichever is greater) | <b>ENVIRONMENT</b>  |  | Output  | CSV file format and Screen                               |
| Moisture (H <sub>2</sub> O)   | 0-100% relative humidity           | Operating Ambient Temperature                                 | 5 – 50 °C (+41 to +122 °F)                               | Hardcopy  | 2 inch thermal printer                                   |
| Moisture in Oil Accuracy  | ±3%                                | Operating Altitude  | Maximum 2,000m   | Onboard Diagnostics   | Duval's triangle, Rogers' ratio, Key Gas & Japanese ETRA |
| *Accuracy quoted is the accuracy of the detectors during calibration; gas-in-oil measurement accuracy may be affected by sampling, oil type, environmental conditions and/or product usage cycle. |                                    | Operating Pressure  | 760 - 1040 millibar                                      | <b>ADDITIONAL OPTIONS</b>   |  |
| Note: For Buchholz gas samples, LDL is 50 ppm, accuracy is ±30%, for all gases.   |                                    | Power Supply  | 115 – 230 V AC 50/60 Hz; 40 W                            | Gas check kit for verification of ongoing accuracy  |  |
|   |                                    | Enclosure   | IP67 (when closed)<br>IP20 (when operating)              | Kit for collection and analysis of Buchholz gas samples   |  |
|   |                                    | Oil Sample Volume   | 50 ml (Oil)  | Transit case provides extra protection during air travel and harsh environment transportation (IP67 rating when closed)       |  |
|   |                                    | Gas Sample Volume   | 5 ml (Buchholz Gas)                                      | Sample cooler box to rapidly cool hot oil samples for immediate analysis, doubles as a secure sample transportation container |  |
|   |                                    | Dimensions  | 363 mm x 282 mm x 120 mm (14.3 in. x 11.1 in. x 4.7 in.) |   |  |
|   |                                    | Weight  | 9 kg (20 lb)   |   |  |

| Kelman TRANSPORT X <sup>2</sup> | TX2 | x   | x   | x   | x   | x  | x | Base Unit                | Description  |
|---------------------------------|-----|-----|-----|-----|-----|----|---|--------------------------|--|
| Language                        | ENG |     |     |     |     |    |   |                          | English  |
| Power Cable                     |     | CA1 |     |     |     |    |   |                          | IEC Mains cable - 2 Pin EURO                         |
|                                 |     | CA2 |     |     |     |    |   |                          | IEC Mains cable - 3 Pin USA                          |
|                                 |     | CA3 |     |     |     |    |   |                          | IEC Mains cable - Australian                         |
|                                 |     | CA4 |     |     |     |    |   |                          | IEC Mains cable - South Africa + India               |
|                                 |     | CA5 |     |     |     |    |   |                          | IEC Mains cable - UK                                 |
|                                 |     | CA6 |     |     |     |    |   |                          | IEC Mains cable - Swiss                              |
|                                 |     | CA7 |     |     |     |    |   |                          | IEC Mains cable - Japanese                           |
| Color option                    |     |     | CL0 |     |     |    |   | Transport X2 CONF Silver | Standard - Silver                                    |
|                                 |     |     | CL1 |     |     |    |   | Transport X2 CONF Yellow | Unit and accessories pack in yellow                  |
| Transit Case                    |     |     |     | TC0 |     |    |   |                          | None   |
|                                 |     |     |     | TC1 |     |    |   | CASE01017                | Unit and accessories packed in graphite transit case |
| System Check Kit                |     |     |     |     | SC0 |    |   |                          | Not Required   |
|                                 |     |     |     |     | SC1 |    |   | KITT00002                | System Check Kit (including 1x gas canister)         |
| Buchholz Kit                    |     |     |     |     |     | B0 |   |                          | Not Required   |
|                                 |     |     |     |     |     | B1 |   | KITT00005                | Buchholz Kit for Buchholz Gas Measurements           |

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