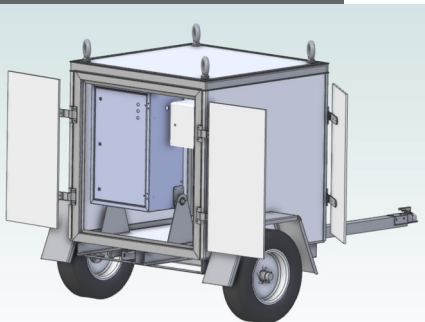
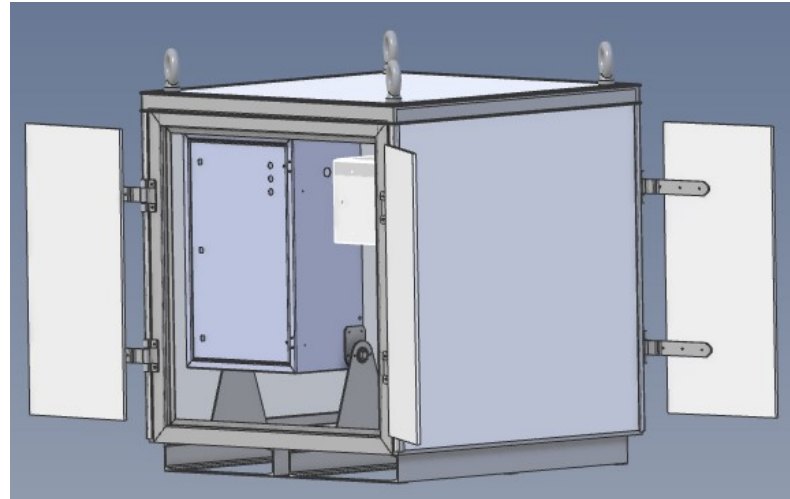


OPT100 Mobile DGA

**Mobile Dissolved Gas Analyzer Systems
for use with Transformer Oil
Designed for use on ENERGIZED Equipment**



Features

- Built around the Vaisala Optimus™ Advanced DGA platform.
- TRUE Multi-Gas analysis using vacuum gas extraction for better results
- Moisture in oil monitor.
- Works with Mineral oil AND Synthetic Esters.
- 120VAC or 240VAC single phase. DC power optional.
- Skid mounted standard. Casters or trailer mounted optional.
- A variety of communications options available.
- Remote monitoring available via a cellular modem and web based user interface.
- Easy to operate, Fully Automated.
- Designed for use on ENERGIZED equipment as long as needed.
- On-site training ALWAYS included with every OPT100 Mobile.

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Big Prairie, OH 44611

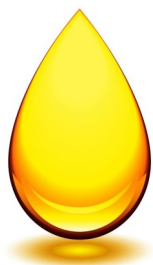
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OPT100 Mobile DGA

Mobile Dissolved Gas Analyzer Systems for use with Transformer Oil Designed for use on ENERGIZED Equipment

Technical Specifications

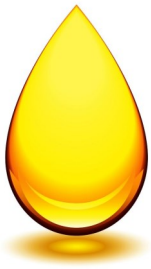
True Multi-Gas Analysis	Vaisala Optimus™ DGA monitor. <ul style="list-style-type: none">• Maintenance free multi-gas detection system with No calibration gases required, No internal column or measurement components to replace, and No fixed filters, filter wheels, membranes or capillary tubes to repair or replace .• System is able to operate in the harshest environments - from the Artic to the Tropics• Intelligent and Intuitive• Auto-calibration ensuring long-term stable online measurement• Runs on either mineral oil or synthetic esters
Enclosure	<p>Heavy duty, weather tight and robust. Aluminum frame construction Spill Containment integrated with the base - Includes spill detection switch Forklift slots in base Lifting eyes for moving the enclosure with an overhead crane Plenty of space for hoses, fittings, and accessories storage Extensive Grounding of Components to the frame Equipment Ground connection point (Please specify standard used by your company)</p> <p>G-Bond panels construct the enclosure envelope</p> <ul style="list-style-type: none">• Heavy duty structural panels• Galvanized steel on both the interior and exterior, coated with white gel-coat• HDPE core• Provide superior protection for the critical components inside• Sea-Lock sealed door openings with heavy duty cam-action latches• The entire enclosure is Tamper resistant to both humans and wildlife <p>Optional enclosure items include</p> <ul style="list-style-type: none">• Casters• Trailer with a variety of hitch and wiring options• Colors other than White
Hose Connections	1/2" INLET and OUTLET hoses Up to 30ft length Shut Off Solenoid Valve on End of Hoses Cam-Lock Fittings with Plugs/Caps (Other connection fittings available)
Electrical	120 or 240 VAC Single Phase Optional 110 to 220 DC Maximum power consumption 500 watts (4.2 amps at 120 VAC) Entire system can operate on basic extension cord from a 15 or 20 amp outlet
Data Transmission	Optional feature that allows remote monitoring of the system. Includes cellular modem and antenna for remote access of data and condition of system.

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OPT100 Mobile DGA

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Optimus™ System Technical Data

Measurement specification

Parameter ¹⁾	Range	Accuracy ^{2) 3)}	Repeatability ³⁾
Methane (CH ₄)	0 ... 10 000 ppm _v	±4 ppm or ±5 % of reading	10 ppm or 5 % of reading
Ethane (C ₂ H ₆)	0 ... 10 000 ppm _v	±10 ppm or ±5 % of reading	10 ppm or 5 % of reading ⁴⁾
Ethylene (C ₂ H ₄)	0 ... 10 000 ppm _v	±4 ppm or ±5 % of reading	10 ppm or 5 % of reading
Acetylene (C ₂ H ₂)	0 ... 5000 ppm _v	±0.5 ppm or ±5 % of reading	1 ppm or 5 % of reading
Carbon monoxide (CO)	0 ... 10 000 ppm _v	±4 ppm or ±5 % of reading	10 ppm or 5 % of reading
Carbon dioxide (CO ₂)	0 ... 10 000 ppm _v	±4 ppm or ±5 % of reading	10 ppm or 5 % of reading
Hydrogen (H ₂)	0 ... 5000 ppm _v	±15 ppm or ±10 % of reading	15 ppm or 10 % of reading
Moisture ⁵⁾ (H ₂ O)	0 ... 100 ppm _w ⁶⁾	±2 ppm ⁷⁾ or ±10 % of reading	Included in accuracy
Total gas pressure	0 ... 2000 hPa	±10 hPa or ±2 % of reading	10 hPa or 5 % of reading

- 1) ppm values are defined as µl/l according to IEC 60567 standard conditions
2) Accuracy specified is the accuracy of the sensors during calibration gas measurements.
3) Whichever is greater.
4) Repeatability of ethane measurement is specified with averaging of five measurements.
5) Measured as relative saturation (%RS).
6) Upper range limited to saturation.
7) Calculated ppm value is based on average solubility of mineral oils.

Measurement operation

Measurement cycle duration	1 ... 1.5 h (typical)
Response time (T63)	One measurement cycle ¹⁾
Warm-up time until first measurement data available	Two measurement cycles
Initialization time to full accuracy	Two days
Data storage	At least 10 years
Expected operating life	> 15 years

- 1) Three cycles for ethane and hydrogen.

Field performance

Parameter	Typical variance to laboratory DGA ^{1) 2)}
Acetylene (C ₂ H ₂)	±1 ppm or ±10 % of reading
Hydrogen (H ₂)	±15 ppm or ±15 % of reading
Other measured gases	±10 ppm or ±10 % of reading
Moisture (H ₂ O)	±2 ppm or ±10 % of reading

- 1) Compared with gas chromatography result from an oil sample considering also laboratory uncertainty. Performance of the gas-in-oil measurement may also be affected by oil properties and other chemical compounds dissolved in oil.
2) ppm values are defined as µl/l according to IEC 60567 standard conditions

Calculated parameters

Total dissolved combustible gases (TDCG)	Combined total of H ₂ , CO, CH ₄ , C ₂ H ₆ , C ₂ H ₄ , and C ₂ H ₂
24 h average	Available for single gases, moisture, TDCG, and total gas pressure
Rate of change (ROC)	Available for single gases and TDCG for 24 h, 7 d, and 30 d periods
Gas ratios ¹⁾	Available ratios: <ul style="list-style-type: none">• CH₄/H₂• C₂H₂/C₂H₄• C₂H₂/CH₄• C₂H₆/C₂H₂• C₂H₄/C₂H₆• CO₂/CO

- 1) Calculated from 24 h average values. See standard IEC 60599.

Outputs

RS-485 interface

Supported protocols	Modbus RTU, DNP3 (optional feature)
Galvanic isolation	2 kV RMS, 1 min

Ethernet interface

Supported protocols	Modbus TCP, HTTP, HTTPS, DNP3 (optional feature), IEC 61850 (optional feature)
Galvanic isolation	4 kV AC (50 Hz, 1 min)

Relay outputs

Number of relays	3 pcs, normally open (NO) or normally closed (NC), user selectable
Trigger type	Gas alert with user selectable limits
Max. switching current	6 A (at 250 V AC) 2 A (at 24 V DC) 0.2 A (at 250 V DC)

Auxiliary device interface

Maximum power	48 W
Voltage output	24 V DC

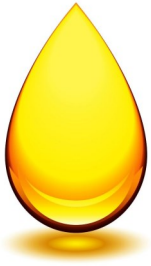
User interface

Interface type	Web based user interface, can be operated with standard web browsers
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KRIN  **usa**

built with

VAISALA **Inside**



About KRIN USA

The people of KRIN usa have been working in and manufacturing equipment for transformer oil since 1992. KRIN usa brings deep expertise to both vacuum processes and filtering systems. Our founder, Dennis Morgan, is well-known in the substation maintenance field as a systems designer, author ("Basic Principles of Vacuum Dehydration". 2010), and applications expert. The manufacturing facility is located in Ohio, and equipment from this facility has been shipped throughout the world. KRIN usa specializes in engineering, designing and constructing oil processing systems of the highest quality intended for use in the field for 20 years or more. Almost ALL the transformer oil systems manufactured at the Ohio facility are still in service in the field.

KRIN usa designs and constructs:

- OPT100 Mobile – Dissolved Gas and Moisture in oil analysis for energized equipment that can be moved between transformers as needed. KRIN partners with Vaisala on this product.
- DO Series - transformer oil de-gasification and de-watering systems for both energized and de-energized equipment.
- TE Series - enclosed oil "press" trailers with tanks and on-board filtration for use in substation maintenance.
- SK Series – filtration skids for spot cleaning of transformer oil
- DA Series – Dry air generating systems for transformer "Blanketing" operations providing -70F dewpoint or better.
- Custom systems – bring us your application, we can design and construct a system for your specific application. Past examples include transformer processing systems for manufacturing plants, turbine lube systems for hydro-electric generation plants, vacuum de-watering systems for steam powered electric generating plants, and MANY more.



What they are saying about KRIN USA systems

These systems look like they were built by people that have actually worked in the field -

Substation Maintenance Crew Lead, NC

This is the easiest system I have ever run

Substation Maintenance Tech, WA

This system gets the oil cleaner than any press we've ever had

Substation Maintenance Supervisor, SC

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