

DGA - 3900

Dissolved Gas Analyser



EPCC / PRODUCTS / APPLICATION / SOFTWARE / ACCESSORIES / CONSUMABLES / SERVICES

Analytical Technologies Limited

An ISO 9001 Certified Company

www.analyticalgroup.net

►► Product Introduction

Next generation on-line multi-gas DGA

Dissolved Gas Analysis (DGA) and moisture measurement of insulating fluids are recognized as the most important tests for condition assessment of transformers. In previous years, multi-gas DGA was traditionally confined to a laboratory environment, with infrequent off-line manual sampling forming part of time-based maintenance strategies. However, as the global average age of transformers continued to rise, the possibility of rapid ageing, unplanned outages and even catastrophic failure between off-line tests also increased, leading many asset owners to adopt on-line DGA monitoring strategies to increase network reliability.

Multi-gas on-line DGA and moisture analyser. At its heart lies an evolved implementation of proven PhotoAcoustic Spectroscopy (PAS) measurement technology, providing laboratory challenging levels of precision and repeatability with no consumables and no need for frequent re-calibration.

►► Key Benefits

- Provides remote alert and multi-gas diagnostic of deteriorating transformer condition
- Expedites operational decisions without needing to go to site for manual oil sampling
- Issues can be detected in their infancy, avoiding unexpected failures and facilitating planned outages
- Anchors condition based maintenance and asset replacement strategies on hard data
- No need for consumables or frequent recalibration to operate at optimum performance
- New “Rapid Mode” provides near real time insight on fast developing faults
- Enhanced computing power and scalable I/Os for a flexible transformer monitoring solution
- Compatible with mineral insulating oils and newer ester based fluids (natural and synthetic)

►► Applications

DGA 3900 is an invaluable foundational tool for implementing Asset Performance Management (APM) across electrical generation, transmission and industry, enabling a condition based asset replacement strategy and delivering improvements in system reliability and availability.

A DS-Agile and PREDIX Grid APM ready device, the DGA 3900's wide range of communication methods and protocols enables connection to those platforms and integration with Perception transformer fleet management software as well as other software, historian and SCADA systems.

►► Proven Technology

- Improved accuracy with lower detection limits
- Installed base of >13,000 units
- No carrier or calibration gas consumables
- Laboratory challenging field measurement of nine gases plus moisture
- Complete DGA analysis up to once per hour and new "Rapid Mode" for critical gases in ~30 min

►► Reliable and Available

- Enhanced reliability and easier field servicing
- Factory calibration benchmarked against industry standard laboratory assessment

►► Intuitive and Flexible

- Integrated 7" colour LCD screen for simplified local user interaction and visualisation of data
- Lightweight innovative two-enclosure design enables adjacent or separated installation
- Can connect to AC or sub-station DC power

►► Scalable and Connected

- Expandable analogue/digital I/Os
- Future proof computing platform ready for feature enhancements
- Designed for cyber security, with a range of comms options and protocols

►► Technical Specifications

MEASUREMENTS

Technology

Automated headspace gas extraction

Photo-acoustic spectroscopy (PAS) gas measurement

Thin film capacitive moisture sensor

Immersed Fiber Optic Oxygen sensor

Frequency

Configurable from once per hour to once every 4 weeks

Faster sampling automatically triggered upon alert level reached

"Rapid Mode" provides a rapid indication of the evolution of the gasses indicated below in ~30 minutes

►► Range

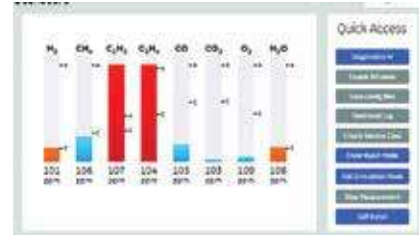
	LDL	UDL	Accuracy*	Repeatability	Available in Rapid Mode
Hydrogen (H ₂)	5 -	5,000 ppm	± LDL or ±5%	< 3%	•
Carb. Monox. (CO)	1 -	10,000 ppm	± LDL or ±3%	< 2%	•
Methane (CH ₄)	2 -	5000 ppm	± LDL or ±3%	< 2%	
Acetylene (C ₂ H ₂)	0.5 -	3000 ppm	± LDL or ±3%	< 2%	•
Ethylene (C ₂ H ₄)	1 -	5000 ppm	± LDL or ±3%	< 2%	
Carb. Diox. (CO ₂)	20 -	30,000 ppm	± LDL or ±3%	< 3%	•
Ethane (C ₂ H ₆)	1 -	5000 ppm	± LDL or ±3%	< 2%	
Oxygen (O ₂)	100 -	25,000 ppm	± LDL or ±5%	< 2%	•
Nitrogen (N ₂) **	10,000 -	100,000 ppm	± LDL or ±15%		
Moisture (H ₂ O)	0 -	100% RS (in ppm)	± 3% RH	< 3%	•

*whichever is greater. Accuracy quoted is the accuracy of the detectors during calibration. Gas-in-oil measurement may be affected by oil type and condition. Repeatability as measured from final production test data.

** N₂ value is calculated and available on free-breathing transformers only.



DGA 3900 being tested in the factory



DGA 3900 gas levels displayed on the local LCD screen

►► FEATURES

Display

4x sunlight visible LED arrays

Backlit 7" inch color resistive touch LCD screen (800 x 480)

Integrated embedded secure webserver (https)

Analogue Inputs

Up to 15x optional analogue inputs for load CTs, PT100 inputs or 4–20mA sensors

Digital Output

USB port (type B connector) for local connection to laptop computer for configuring the system

Wi-Fi (802.11b/g/n)

Serial output (RS-485)

1Gb Ethernet (RJ45) standard with fiber-optic options

GSM/GPRS or CDMA/LTE modem options

Digital Protocols

Modbus as standard

DNP3 or IEC 61850 (Ed 1 or 2) options

Alarms

Alarm setting screens/scenarios, based on gas level, gas rate of change and moisture level, assignable to relays

6x standard and up to 18x dry contact relays (type C, SPDT), NO/NC, 10A at 250Vac resistive load, 10A at 30Vdc resistive load

Separate Service Alarm with own relay

►► ENVIRONMENT

Conditions

Operating ambient temperature	-40°C to +55°C (-40°F to +131°F)
Operating ambient humidity	0-95% RH, non-condensing
Oil temperature at valve***	-20°C to +120°C (-4°F to +248°F)
Oil pressure at valve	0-700KPa (0-100psi)

***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 -20°C recommends the use of heat trace cabling on piping

Enclosure

IP56 certified

Powder coated aluminium (RAL9002)

Unpainted 316 Stainless Steel option

Power Requirements

AC	Nominal 100-240 Vac, Range 85-264 Vac, 4A
DC	Nominal 100-250 Vdc, Range 90-300 Vdc

Mechanical

	Analysis Unit	Hub Unit
Dimensions	600 x 484 x 330 mm 23.6 x 19.1 x 13.0 in	600 x 484 x 330 mm 23.6 x 19.1 x 13.0 in
Weight	33.4Kg 73.6 lb	33.4Kg 73.6 lb

►► OPTIONS

Mounting stand

Sun canopy

Umbilical cable between units

Analogue output of gas values

DGA3900	E0	M0	U0	S0	C0	CO	X0	X0	X0	X0	X0	Base Unit	9 Gas DGA, Powder coated enclosure, 2m umbilical, Modbus TCP over Ethernet, Load CT, install kit, and Perception desktop.
Protocol Options	P 1 P 2 P 3 P 4											COMM90022	DNP3 over RS485
												COMM90012	DNP3 over Ethernet
												COMM90013	IEC 61850 Edition 1 over Ethernet
												COMM90014	IEC 61850 Edition 2 over Ethernet
Mounting Stand	M1											24-0822-01	Mounting Stand
Umbilical Cable			U1									CABL01054	5 Meter
			U2									CABL01055	10 Meter
Sun Canopy			S1									24-0973-01	Sun Canopy
Communication Options				C1								COMM90016	Ethernet Converter - RJ45 to 10/100Mbps Multimode Fibre ST Connector
				C2								COMM90017	Ethernet Converter - RJ45 to 10/100Mbps Multimode Fibre SC Connector
				C3								COMM90018	Ethernet Converter - RJ45 to 10/100Mbps Multimode Fibre LC Connector
				C4								COMM90019	Ethernet switch, 2 x 100BaseF - ST Multimode Fiber (2 Km max) + 4 x RJ45 10/100Mbps copper
				C5								COMM90020	Ethernet switch, 2 x 100BaseF - SC Multimode Fiber (2 Km max) + 4 x RJ45 10/100Mbps copper
				C6								COMM90021	Ethernet switch, 2 x 100BaseF - SC Singlemode Fiber (20 km max) + 4 x RJ45 10/100Mbps copper
				C7								COMM90005	GSM / GPRS Modem
				C10								COMM90015	Wireless Cell Modem for USA - Internal
Analogue I/O Card (5 slots available)							X1	X1	X1	X1	X1	13-0263-01	Analogue Input Card, 4-20mA
							X2	X2	X2	X2	X2	13-0256-02	Analogue Input Card, for PT100 Temp Sensor (4 wire)
							X3	X3	X3	X3	X3	13-0256-02-OPT1	Analogue Input Card, for PT100 Temp Sensor (3 wire)

HPLC Servicing, Validation, Trainings and Preventive Maintenance :

HPLC Servicing :HPLC Servicing : We have team of service engineers who can attend to any make of HPLC promptly @the most affordable cost.

Trainings :We also take up preventive Maintenance to reduce downtime of HPLC's Trainings.

AMC's/CMC :AMC's/CMC :We offer user training both in-House and at customer sites on HPLC principles, operations, trouble-shooting.

Validations :Validations :We have protocols for carrying out periodic Validations as per GLP/GMP/USFDA norms.

Instruments :Instruments :We offer instruments/Renting Services Modules like pumps,detector etc. on Rent.



About Analytical Technologies

Analytical Technologies is synonymous for offering technologies for doing analysis and is the Fastest Growing Global Brand having presence in at least 96 countries across the global. Analytical Technologies Limited is an ISO:9001 Certified Company engaged in Designing, Manufacturing, Marketing & providing Services for the Analytical, Chromatography, Spectroscopy, Bio Technology, Bio Medical, Clinical Diagnostics, Material Science & General Laboratory Instrumentation. Analytical Technologies, India has across the Country operations with at least 4 Regional Offices, 6 Branch Offices & Service Centers. Distributors & Channel partners worldwide.

Our Products & Technologies



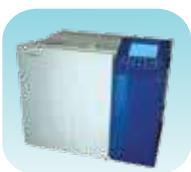
UV/VIS
Spectro 2080+
Double Beam



Infra FTIR



Optima Gas
Chromatograph
3007



Optima Gas
Chromatograph
2979 Plus



Flash
Chromatograph



Atomic Absorption
Spectrophotometer



Liquid Particle
Counter



Optical Emission
Spectrophotometer



DSC/TGA



Semi Auto Bio
Chemistry Analyzer



HEMA 2062
Hematology
Analyzer



Micro Plate
Reader/Washer



URINOVA 2800
Urine Analyzer



Total Organic
Carbon 3800



Fully Automated
CLIA



NOVA-2100
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RTPCR



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Laser Particle
Size Analyzer



Ion Chromatograph



Water purification
system

Regulatory compliances



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Analytical Foundation is a nonprofit organization (NGO) found for the purpose of:



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2. Improving quality of life by offering YOGA Training courses, Work shops/Seminars etc.

3. ANALYTICAL FOUNDATION aims to DETOXYFY human minds,souls and body by means of yoga, Meditation, Ayurveda, Health Care, Awards, Media, Events, Camps etc.



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