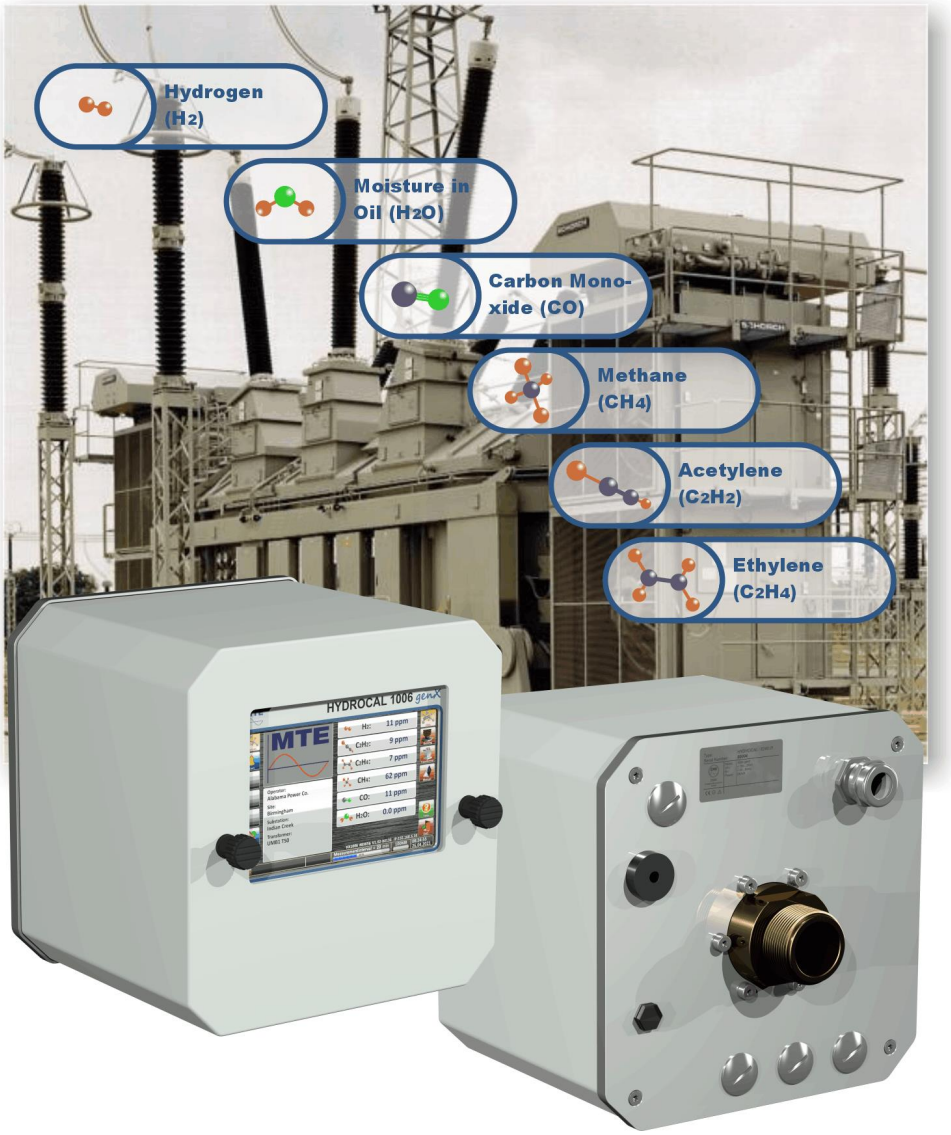
MTE Meter Test Equipment

HYDROCAL 1006 genX

Online Dissolved Gas Analysis (DGA) and Moisture Analysis System for Power Transformers and oil-filled electrical Equipment



The new HYDROCAL 1006 genX is the first truly maintenance-free multi-gas online DGA solution combining proven near infrared (NIR) measuring technology with vacuum protected membrane extraction.

As Hydrogen (H_2) is involved in nearly every fault of the insulation system of power transformers and Carbon Monoxide (CO) is a sign of an involvement of the cellulosic / paper isolation the presence and increase of Acetylene (C_2H_2) further classifies the nature of a fault as overheating, partial discharge or high energy arcing.

The additional measurement of Ethylene (C_2H_4) and Methane (CH_4) serves for further analysis, e.g. Duval triangle according IEC 60599.

Key Advantages

- Individual measurement of Hydrogen (H_2), Carbon Monoxide (CO), Acetylene (C_2H_2), Methane (CH_4) and Ethylene (C_2H_4)
- Moisture in Oil (H_2O) measurement
- Easy to mount on a transformer valve (G 1½" DIN ISO 228-1 or 1½" NPT ANSI B 1.20.1)
- Easy to mount on the operating transformer without any operational interruption
- Maintenance free system due to less movable parts
- Advanced software (on the unit and via PC) with intuitive operation by 7" color TFT capacitive touchscreen, WLAN and Webserver operation from any smart phone, tablet or notebook PC
- Communication interfaces ETHERNET 10/100 Mbit/s (copper-wired / RJ 45 or fibre-optical / SC Duplex) and RS 485 to support MODBUS® RTU/ASCII, MODBUS®TCP, DNP3, proprietary communication protocols and substation communication protocol IEC 61850
- Optional external I/O module

Technical data HYDROCAL 1006 genX

General

Optional nominal voltages of auxiliary supply:	120 V -20% +15% AC 50/60 Hz [1] or 230 V -20% +15% AC/DC 50/60 Hz [1] or 130 V +15% DC [1]
Power consumption:	240 VA
Housing:	Aluminium
Dimensions:	W 250 x H 250 x D 286 mm
Weight:	Approx. 8.0 kg
Operation temperature: (ambient)	-55°C ... +55°C (below -10°C display function locked)
Oil temperature: (inside transformer)	-20°C ... +105°C
Storage temperature: (ambient)	-20°C … +65°C
Oil Pressure:	0 … 800 kPa
Connection to valve:	G 1½" DIN ISO 228-1 or 1½" NPT ANSI B 1.20.1

Safety

	IEC 61010-1
Insulation protection:	Class 1
Degree of protection:	IP-55

Digital outputs (Standard)

3 x Digital outputs		Max. Switching capacity (Free assignment)
Type	Control voltage	
3 x Relay	12V	220V DC / 250V AC / 2A / 60W / 62.5VA

Communication

- 1 x RS 485 (proprietary or MODBUS® RTU/ASCII protocol)
- ETHERNET 10/100 Mbit/s copper-wired / RJ 45 or fibre-optical / SC Duplex (proprietary or MODBUS® TCP protocol)
- IEC 61850 (Option)
- DNP3 serial modem or GPRS/UMTS modem (Option)
- HTML protocol. WLAN and Webserver operation from any phone, tablet or notebook PC

Notes

[1] **120 V** ⇨ 120 V -20% = **96 V_{min}** 120 V +15% = **138 V_{max}**
230 V ⇨ 230 V -20% = **184 V_{min}** 230 V +15% = **264 V_{max}**
130 V ⇨ 130 V = **130 V_{min}** 130 V +15% = **149 V_{max}**

Operation principle

- Diffusion principle with gas-permeable membrane with copolymer
- Micro-electronic gas sensors for H_2 measurement
- Near-infrared gas sensor unit for CO, CH_4, C_2H_2 and C_2H_4
- Thin-film capacitive moisture sensor for H_2O measurement
- Temperature sensors (oil temperature, gas temperature, back plate temperature)

Measurement

Dissolved Gas Analyis	Accuracy [2][3]		
Measuring Quantity	Range	Gas Extraction	Gas Measurement
Hydrogen H_2	0 ... 10000 ppm	≤ ± 8% ± 4 ppm	≤ ±10 % ± 20 ppm
Carbon Monoxide CO	0 ... 10000 ppm	≤ ± 8% ± 30 ppm	≤ ±10 % ± 5 ppm
Acetylene C_2H_2	0 ... 10000 ppm	≤ ± 8% ± 4 ppm	≤ ±10 % ± 5 ppm
Methane CH_4	0 ... 10000 ppm	≤ ± 8% ± 4 ppm	≤ ±10 % ± 10 ppm
Ethylene C_2H_4	0 ... 10000 ppm	≤ ± 8% ± 4 ppm	≤ ±10 % ± 5 ppm
Dissolved Moisture Analysis			
Measuring Quantity	Range	Accuracy	
Dissolved Moisture in Oil (H_2O) – relative [%]	0 … 100 %	≤ ± 3 %	
in Mineral Oil – absolute [ppm]	0 … 100 ppm	≤ ± 3% ± 3 ppm	
in Ester Oil – absolute [ppm] [4]	0 … 2000 ppm	≤ ± 3 % of MSC [5]	

[2]Related to temperatures ambient +20°C and oil +55°C | [3]Accuracy for moisture in oil for mineral oil types | [4]Option | [5]Moisture Saturation Content

Connections

