

HYDROCAL 1001

Composite Gas-in-Oil Sensor



HYDROCAL 1001 is a permanently-installed composite gas-in-oil sensor for the analysis of following dissolved key fault gases (TDCG = \underline{T} otal \underline{D} issolved \underline{C} ombustible \underline{G} ases):

Fault gas	TDCG contribution
Hydrogen (H ₂)	approx. 25 %
Carbon Monoxide (CO)	approx. 15 %
Methane (CH ₄)	< 5 %
Acetylene (C ₂ H ₂)	approx. 45 %
Ethylene (C_2H_4)	approx. 20 %
Ethane (C_2H_6)	< 5 %

Integration of relevant key gases into a total weighted gas concentration enables the HYDROCAL 1001 to react to most transformer faults.

Hence, the device is an ideal, compact and cost effective tool used in particular for early transformer fault detection and preventative maintenance. HYDROCAL 1001 is equipped with one analog 4-20 mA output for the gas-in-oil analysis result and 3 digital relay outputs (Hi alert, Hi-Hi alert, malfunction)

Key advantages:

- Composite measurement of Hydrogen (H₂), Carbon Monoxide (CO), Methane (CH₄), Acetylene (C₂H₂), Ethylene (C₂H₄) and Ethane (C₂H₆)
- It provides communication interfaces ETHERNET 10/100Mbit/s (either copper-wired or fibre-optical) and RS 485 to support proprietary communication protocols and to be open / prepared for sub-station communication protocols IEC 61850, MODBUS, DNP3, etc.
- The construction has been significantly simplified and size has been reduced compared to other products in the market

General

Auxiliary supply:

Power consumption: Housing:: Dimensions: Weight: Ambient temperature: Oil temperature: Oil Pressure: Connection to valve:

Safety

Isolation protection: Degree of protection:

Measurements

88 VAC_{min} ... 276 VAC_{max} Optional: 88 VDC_{min} ... 390 VDC_{max} max. 250 VA Aluminium W 164 x H 164 x D 170 mm approx. 4 kg $-55 \degree C$... $+55 \degree C$ $-20 \degree C$... $+90 \degree C$ Up to 800 kpa DIN ISO 228: G 1½ Optional: NPT 1½

CE certified IEC 61010-1:2002 IP-66

Gas-in-Oil Measuremen	nt		
Measuring Quantity	Range	Accuracy	TDCG-Contribution
TDCG	0 5.000 ppm	± 15 % ± 20 ppm	
Hydrogen H ₂		± 10 % ± 15 ppm	approx. 20 % - 40 %
Carbon Monoxide CO		± 20 % ± 25 ppm	approx. 15 %
Methane CH ₄		± 20 % ± 25 ppm	approx. < 5 %
Acetylene C ₂ H ₂		± 20 % ± 25 ppm	approx. 45 %
Ethylene C ₂ H ₄		± 20 % ± 25 ppm	approx. 20 %
Ethane C ₂ H ₆		± 20 % ± 25 ppm	approx. < 5 %
Measurement cycle	20 min		

Analogue and digital outputs

Analogue DC output		
Туре	Range	Default function
Current DC	4 – 20 mADC	TDCG -Concentration

Digital outputs		
Туре	Control voltage	Max. switching capacity
Relais	3 x 12 VDC	220 VDC/VAC / 2 A / 60 W

Communication

- ETHERNET 10/100 Mbit/s (copper-wired or fibre-optical)
- RS 485 (proprietary communication or MODBUS Protocol)

Operation principle

■ Fuel cell-gas sensor for H₂, CO, CH₄, C₂H₂, C₂H₄ and C₂H₆



MTE Meter Test Equipment AG

Subject to alterations