

Sensor firmware main menu

User menu

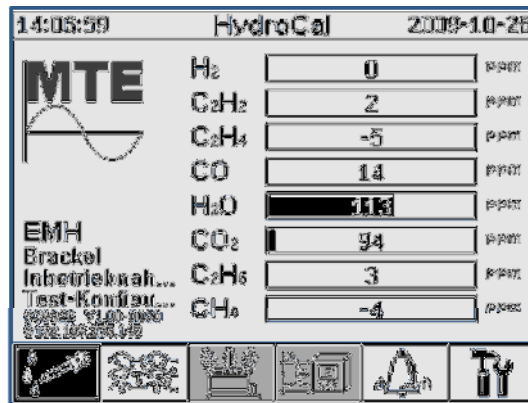
- Transformer administrator data
- Customer / Site administrator data

Gas-in-Oil menu

- Chart diagram
- Result table

Transformer menu

- Aging rate
- Hot spot temperature
- Loss-of-Live



External menu

- Voltage and current measurement
- Bottom and top oil measurement
- Oil humidity measurement

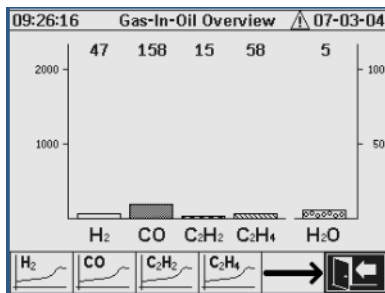
Alarm menu

- Alarm overview
- Alarm acknowledgement

Configuration menu

- Alarm level setting
- Communication setting
- Transformer setting
- Installation

Gas-in-Oil overview menu



Individual chart diagram for hydrogen (H₂), carbon monoxide (CO), carbon dioxide (CO₂), methane (CH₄), acetylene (C₂H₂), ethylene (C₂H₄) and ethane (C₂H₆) and moisture.

Alarm setup / edit menu

#	Name	Date/Time	Status
1	H2-Alert(#1)	04-07 13:02	🔔
2	CO-Alert(#2)	04-06 12:15	🔔
3	C2H2-Alert(#3)	04-06 12:15	🔔
4	C2H4-Alert(#4)	04-06 12:15	🔔
5	H2O-Alert(#5)	04-06 12:15	🔔

Display of alarm list. Details of each alarm and individual settings.

Bushing monitoring setup menu

Bushing Monitoring Setup

Frequency [Hz]:

HV Bushing Voltage [kV]:

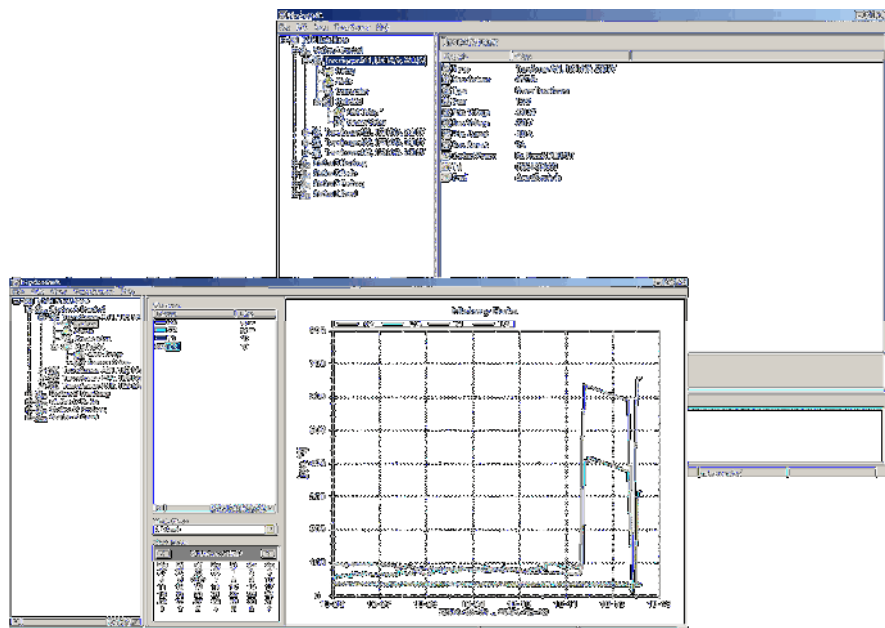
LV Bushing Voltage [kV]:

The bushing monitoring setup menu allows the input of all basic parameters required for the bushing monitoring.

PC-Software

Transformer administration data

- All administration data of a transformer can be entered
- Network of different power plants and transformer banks can be configured
- Selective contact to each transformer in the network
- Obtaining information of total transformer situation



Technical data HYDROCAL 1008

General

Auxiliary supply:	88 VACmin ... 276 VACmax Optional: 88 VDCmin ... 390 VDCmax
Power consumption:	max. 350 VA
Housing:	Aluminium
Dimensions:	W 263 x H 263 x D 257 mm
Weight:	approx. 15 kg
Operation temperature: (Ambient)	-55°C ... +55°C
Oil temperature: (in the transformer)	-20°C ... +90°C
Oil Pressure:	0 - 800 kpa (negative pressure allowed)
Connection to valve:	DIN ISO 228: G 1½ Optional: NPT 1½

Safety

Isolation protection:	CE certified IEC 61010-1:2002
Degree of protection:	IP-55

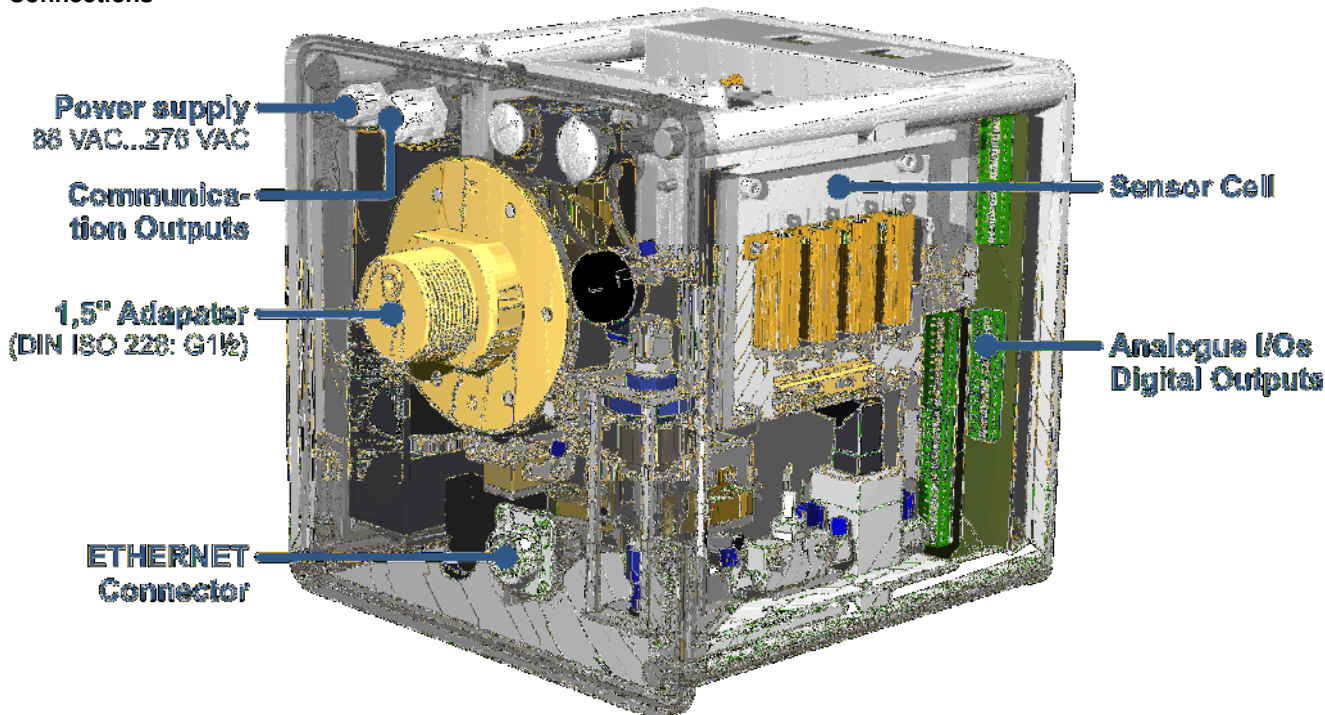
Measurements

Gas/Humidity-in-Oil Measurement		
Measuring Quantity	Range	Accuracy
Hydrogen H ₂	0 ... 2.000 ppm	± 15 % ± 25 ppm
Carb. Monoxide CO	0 ... 5.000 ppm	± 20 % ± 25 ppm
Carb. Dioxide CO ₂	0 ... 20.000 ppm	± 20 % ± 25 ppm
Methane CH ₄	0 ... 2.000 ppm	± 20 % ± 25 ppm
Acetylene C ₂ H ₂	0 ... 2.000 ppm	± 20 % ± 5 ppm
Ethylene C ₂ H ₄	0 ... 2.000 ppm	± 20 % ± 10 ppm
Ethane C ₂ H ₆	0 ... 2.000 ppm	± 20 % ± 15 ppm
Moisture	0 ... 100 ppm	± 3 % ± 3 ppm

Operation principle

- Miniaturized gas sample production based on headspace principle (no membrane, negative pressure-proof)
- Patent-pending oil sampling system (EP 1 950 560 A1)
- Infrared NIR gas sensor unit for CO, CO₂, CH₄, C₂H₂, C₂H₄ and C₂H₆
- Micro-electronic gas sensor for H₂
- Thin-film capacitive moisture sensor

Connections



Analogue and digital outputs (standard)

Analogue DC Outputs		Default functions	Alternative functions
Type	Range		
Current DC	0/4 ... 20 mADC	H ₂ Con.	Free config.
Current DC	0/4 ... 20 mADC	CO Con.	Free config.
Current DC	0/4 ... 20 mADC	CO ₂ Con.	Free config.
Current DC	0/4 ... 20 mADC	CH ₄ Con.	Free config.
Current DC	0/4 ... 20 mADC	C ₂ H ₂ Con.	Free config.
Current DC	0/4 ... 20 mADC	C ₂ H ₄ Con.	Free config.
Current DC	0/4 ... 20 mADC	C ₂ H ₆ Con.	Free config.
Current DC	0/4 ... 20 mADC	Moisture Con.	Free config.

Digital Outputs		
Type	Control Voltage	Max. Switching Capacity
Relay	8 x 12 VDC	220 VDC/VAC / 2 A / 60 W

Analogue inputs and digital outputs (optional)

Analogue DC Inputs (External sensors)		Accuracy	Remarks
Type	Range	of the measuring value	
Current DC	4 x 0/4 ... 20 mADC	≤ 0.5 %	

Analogue AC Inputs (Cap. HV Bushing)		Accuracy	Remarks
Type	Range	of the measuring value	
Voltage or Current	6 x 0 ... 80 V +20% 6 x 0/4 ... 20 mA +20%	≤ 1.0 %	Configurable via jumper

Digital Outputs		
Type	Control Voltage	Max. Switching Capacity
Opto-coupler	5 x 5 VDC	U _{CE} : 4 V (rated) / 35 V (max.) U _{EC} : 7 V (max.) U _{CE} : 40 mA (max.)

Communication

- ETHERNET 10/100 Mbit/s (copper-wired or fibre-optical)
- RS 485 (proprietary or MODBUS protocol)
- On-board GSM or analog modem (optional)