

Hydrocal 1011 *genX* P

Portable Dissolved Gas Analysis for Power Transformers and Oil-Filled Electrical Equipment



The **HYDROCAL 1011 genX P** is a portable device for the analysis of dissolved and free gases from the isolation fluid of oil-filled power transformers and other electrical equipment. It individually measures moisture in oil (H_2O) and the key gases hydrogen (H_2), carbon monoxide (CO), carbon dioxide (CO_2), methane (CH_4), acetylene (C_2H_2), ethylene (C_2H_4), ethane (C_2H_6), oxygen (O_2), nitrogen (N_2) and propane (C_3H_8) dissolved in transformer oil.

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 involvement of the cellulosic / paper insulation the presence and increase of the other lightweight hydrocarbon gases further classifies the nature of a fault as overheating, partial discharge or high energy arcing. Oxygen (O_2) can be a sign of excessive aging or leakages of the sealing of hermetic transformers.

Key Advantages

- Individual measurement of hydrogen (H_2), carbon monoxide (CO), carbon dioxide (CO_2), methane (CH_4), acetylene (C_2H_2), ethylene (C_2H_4), ethane (C_2H_6), oxygen (O_2), nitrogen (N_2) and propane (C_3H_8)
- Moisture in oil (H_2O) measurement
- Maintenance-free near infrared measurement system with head-space gas extraction acc. IEC 60567
- Operation by integrated 7" color TFT (800x480 pixel) touchscreen or via genX webserver from any smartphone, notepad or PC
- Communication interfaces WiFi, USB or ETHERNET 10/100 Mbit/s
- SD memory of test results, history and diagnostic data of power transformers and oil-filled electrical equipment
- Integrated thermal report printer

Application

HYDROCAL 1011 genX P has been designed for various applications in addition to classical laboratory and online DGA:

- Monitoring of a fleet of smaller (e.g. distribution) transformers where online DGA would not be commercially viable
- Monitoring of other oil-filled high-voltage equipment, e.g. measuring/protection transformers, CTs/PTs, circuit breakers, etc.
- Assistance during installation and/or repair of power transformers
- Analysis of gas samples from Buchholz relays
- Confirmation of alerts from online DGA equipment or Buchholz relays

Oil sampling



Operation

The operation of HYDROCAL 1011 genX P is especially user-friendly due to various advantages designed into the device:

- Operation via a large 7" color TFT (800x480 pixel) touchscreen display
- Motion videos integrated into the firmware menu to explain the entire analysis step-by-step to make the operation as easy and user-friendly as possible and to avoid any unforeseen mistakes
- Integrated WiFi interface and HYDROCAL genX webserver to operate the device by any smartphone, tablet or notebook PC



Disposal of oil sample



Cleaning and preparation of next analysis



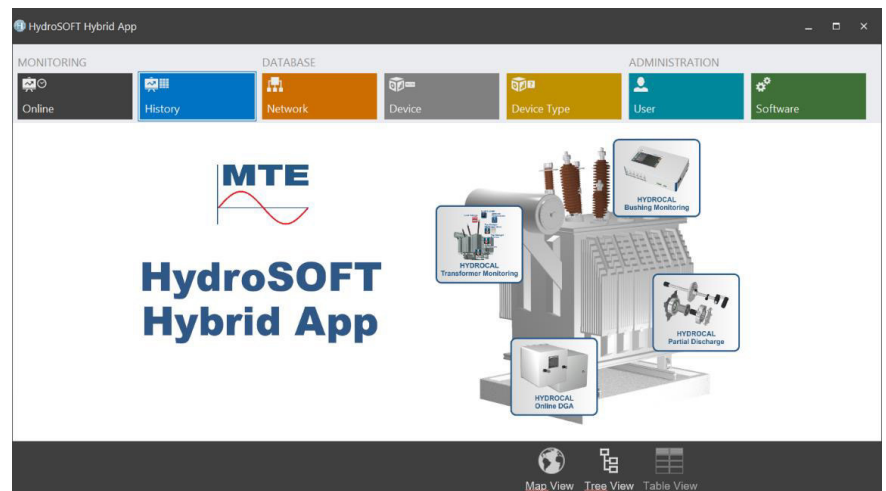
Software Tool HydroSOFT Hybrid App

Concept

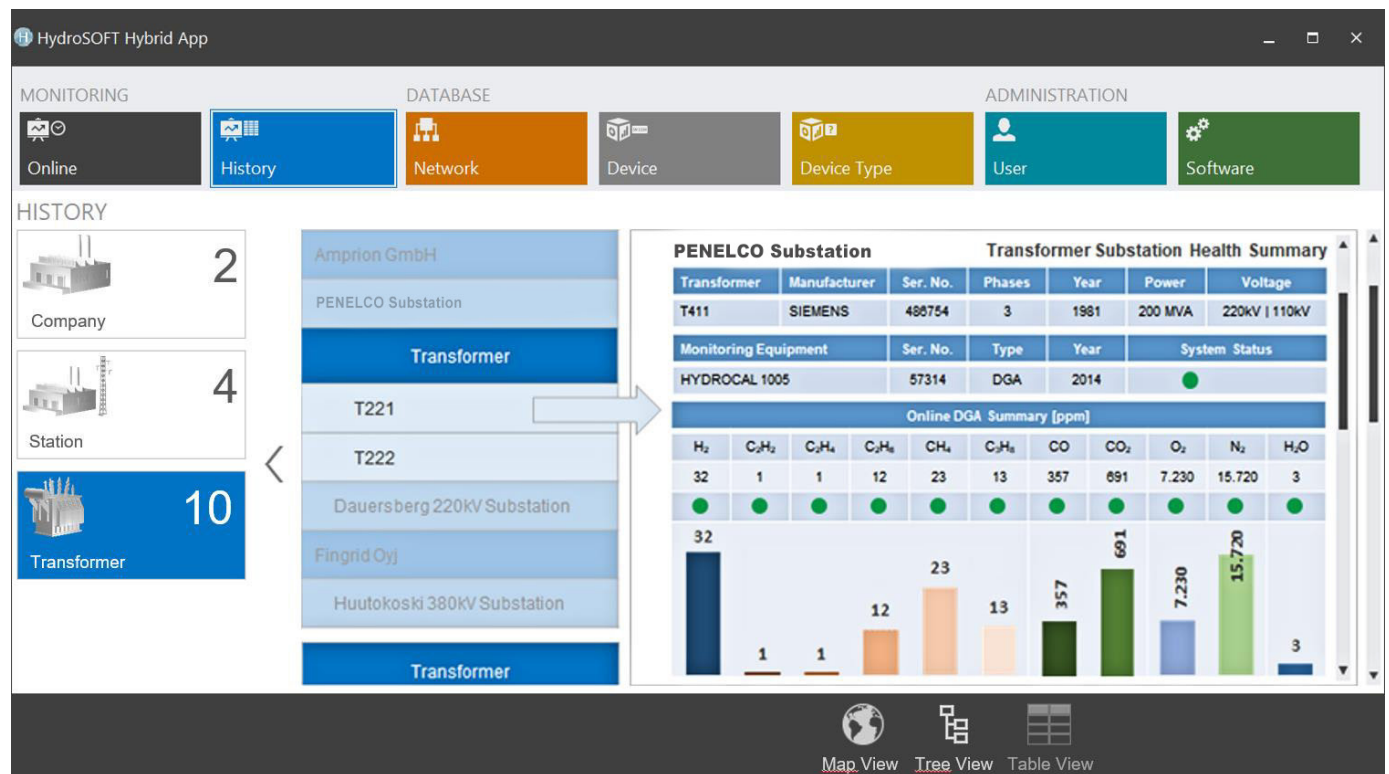
HydroSOFT Hybrid App is the new central software tool to collect, display, and report DGA results from HYDROCAL 1011 genX P as well as all other HYDROCAL online DGA devices.

The software is designed for touchscreen operation as well as for classical operation by keyboard/mouse.

It is supported by a powerful SQL Server Express database allowing for multi-user access as well as the configuration of HYDROCAL devices.



Result Display

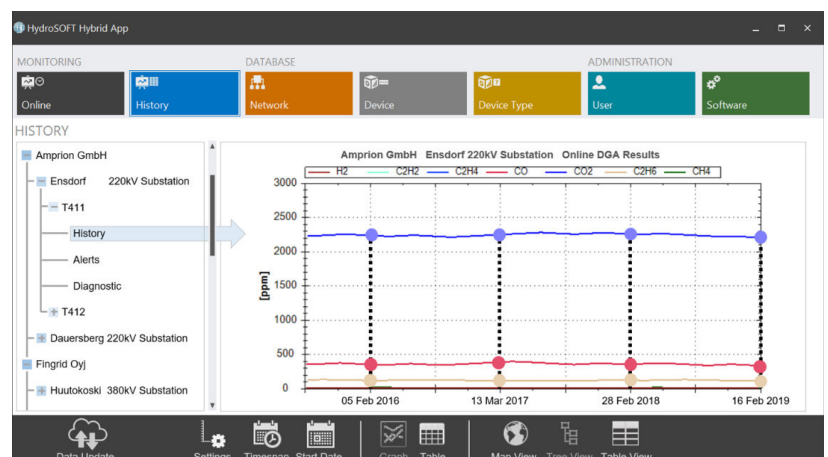


Historical Results

Whenever a new offline DGA analysis has been carried out by HYDROCAL 1011 genX P it can be added to the database inside the device as well as in the HydroSOFT Hybrid App central software tool.

By this trend and tendencies of DGA results can be reviewed which are often more significant than absolute results.

HYDROSOFT Hybrid App also allows us to compare online and offline DGA results as well as it includes a powerful reporting tool.



Technical data HYDROCAL 1011 *genX P*

General

Power supply:	88 VAC _{min} ... 264 VAC _{max} 47 ... 63 Hz
24 VDC supply:	20 VDC _{min} ... 28 VDC _{max}
Power consumption:	max. 130 W
Housing:	Hard plastic housing
Dimensions:	W 447 x D 297 x H 187 mm
Weight:	approx. 13.4 kg
Operation temperature: (ambient)	-10°C ... +50°C
Oil temperature: (in the transformer)	-20°C ... +90°C
Storage temperature: (ambient)	-20°C ... +60°C

Safety

Insulation protection:	CE certified IEC 61010-1
Degree of protection:	IP68 (housing closed) IP40 (housing open)

Measurement

Measurement Quantity	Measuring Range	Accuracy of gas extraction		Accuracy of the 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
Carbon Dioxide CO ₂	0 ... 20000 ppm	≤ ± 8 %	± 30 ppm	≤ ± 10 %	± 5 ppm
Methane CH ₄	0 ... 10000 ppm	≤ ± 8 %	± 4 ppm	≤ ± 10 %	± 5 ppm
Acetylene C ₂ H ₂	0 ... 10000 ppm	≤ ± 8 %	± 4 ppm	≤ ± 10 %	± 5 ppm
Ethylene C ₂ H ₄	0 ... 10000 ppm	≤ ± 8 %	± 4 ppm	≤ ± 10 %	± 5 ppm
Ethane C ₂ H ₆	0 ... 10000 ppm	≤ ± 8 %	± 4 ppm	≤ ± 10 %	± 5 ppm
Propane C ₃ H ₈	0 ... 5000 ppm	≤ ± 8 %	± 4 ppm	≤ ± 15 %	± 20 ppm
Oxygen O ₂	0 ... 50000 ppm	≤ ± 8 %	± 500 ppm	≤ ± 10 %	± 500 ppm
Nitrogen N ₂	0 ... 150000 ppm	≤ ± 8 %	± 1500 ppm	≤ ± 10 %	± 1500 ppm

Oil moisture measurement

Measurement Quantity	Measuring Range	Accuracy of oil moisture measurement
Moisture in Oil H ₂ O	0 ... 100 % 0 ... 150 ppm 0 ... 2000 ppm	≤ ± 3 % (absolut) ≤ ± 3 % ± 3 ppm ≤ ± 3 % of MSC ¹⁾

¹⁾ Moisture Saturation Content

Connections



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