

Analytic instrument for SF₆ gas, g³ gas or N₂ gas Model GA11

Applications

- Analysis of the gas quality in gas-filled equipment
- For the analysis of SF₆ gas, g³ gas or N₂ gas

Special features

- Provides measured values for humidity, gas composition (purity) and decomposition products (optional)
- Three methods for emission-free treatment of the measurement gas:
 - Direct back pumping into the tested gas compartment
 - Pumping into an external gas cylinder
 - Collecting in the external gas bag
- Battery power for min. 5 measurements or mains supply
- Not compromised by transport restrictions (IATA)



Analytic instrument model GA11

Description

The model GA11 analytic instruments are innovative and reliable instruments for determining the quality of different insulating gases. Among these insulating gases are included SF₆, Novec™ 4710 gas mixture (g³ gas) as well as applications for technical air (clean air/ dry air, based on oxygen and nitrogen). The model GA11 can measure the concentration of up to six parameters, depending on the selected equipment variant.

Set up

A clearly arranged menu structure and a 7" colour touchscreen allow for intuitive operation. Sensors for the measurement of purity and humidity are included as standard. Optionally, the model GA11 can be extended with electrochemical sensors for determining the SF₆ gas decomposition products.

The measured gases can either be pumped back into the gas compartment of the switchgear or an external gas cylinder or, alternatively, it can be collected directly in a gas bag. In each case, emission into the atmosphere is avoided. The described treatment of the measuring gas can also be carried out in the battery mode if mains voltage is not available.

Field use

The analytic instrument is protected from the harsh environmental conditions through an impact-resistant and waterproof plastic case. The hard-top case, which is designed for field use, is fitted with wheels and a telescopic carrying handle for ease of transport.

Operator interface

Operation

The user interface is intuitive and can be operated via the touchscreen.

English, German, Spanish, Japanese, Chinese and Korean are the available languages for selection.

After connecting the gas compartment or the gas cylinder under test, the measurement can be started.



Language selection

Displaying the measurement results

The measurement results on the concentration of purity, decomposition products and humidity of SF₆ gas are displayed after the end of the measurement.

These results are automatically compared to the set guidelines for contaminated or reusable SF₆ gas (CIGRE B3.02.01, IEC or in accordance with user-defined specifications). Accordingly, an OK or Not-OK symbol is shown.

The GA11 makes it quick and easy to import a measuring point list, edited on a PC. Due to the complexity of the measurement task, specific knowledge is a pre-requisite, see IEC 62271-4:2013, ASTM D2029-97:2017 and CIGRÉ - SF₆ Measurement guide (723).



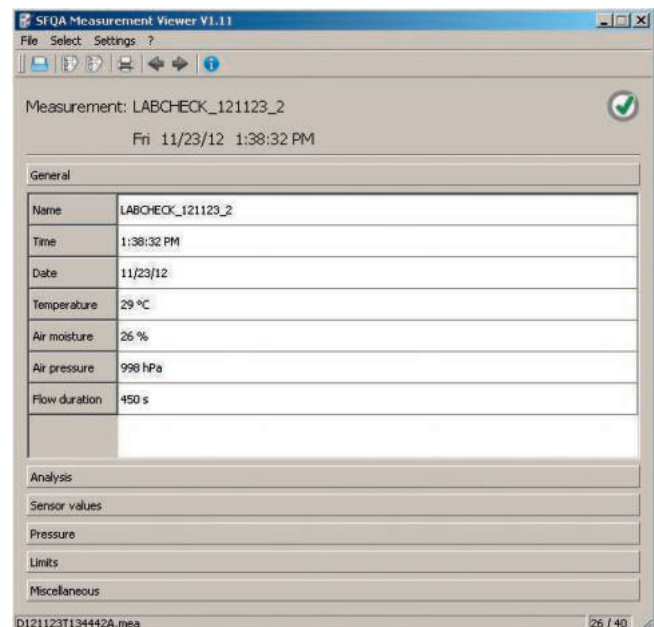
Measured value display

Saving and export of the values

Up to five hundred measurement results can be stored within the instrument and can be transferred via the USB interface.

The enclosed software "SF₆-Q-Analyser measurement viewer" is free of charge and can output the measurement results as a PDF report or in CSV format.

The CSV format is suitable for importing the data using Microsoft® Excel® or other table calculation programs or database programs.



Database

Instrument construction



- 1 TFT touchscreen
- 2 On and Off button
- 3 USB interface
- 4 Mains supply indicator
- 5 Charging indicator
- 6 Network connection (LAN)
- 7 Power connection
- 8 Outlet for gas recovery bag
- 9 Outlet for gas cylinder
- 10 Inlet, return pumps

Specifications, version for SF₆ gas

Base instrument	
Connections	
Inlet/return pumps	Quick coupling with self-sealing valve
Outlet for gas cylinder	Self-sealing valve DN 8
Outlet for gas recovery bag	Quick coupling, self-sealing valve
Permissible pressure ranges	
Inlet/return pumps	1.3 ... 35 bar abs./1.3 ... 10 bar abs.
Outlet for gas cylinder	1.3 ... 10 bar abs.
Outlet for gas recovery bag	< 1.015 bar abs.
TFT touchscreen	7" (resolution 800 x 480)
Voltage supply	
Battery power	Lithium-ion battery, battery is charged during mains supply mode
Mains operated	AC 90 ... 264 V (50 ... 60 Hz)
Permissible temperature ranges	
Operation	0 ... 40 °C
Storage	-20 ... +60 °C
Flow measuring gas	
	20 litres/hour
Dimensions	
	W x H x D: 538 x 406 x 297 mm
Weight	
	approx. 25 kg

Humidity sensor	
Measurement principle	Polymer-based capacitive humidity sensor
Measuring range/accuracy	-40 ... +20 °C dew point ±2 °C dew point -60 ... < -40 °C dew point ±4 °C dew point
Resolution	1 °C
Units	°Ctd/°Ftd/ppm _w /ppm _v /°Ctdpr/°Ftdpr (Dew point at gas compartment pressure, relative to ambient pressure and temperature-compensated at 20 °C)
Calibration interval	2 years

SF ₆ percentage sensor	
Measurement principle	Sound velocity
Measuring range/accuracy	0 ... 100 % ±0.5 % based on SF ₆ /N ₂ mixtures (calibration for SF ₆ /CF ₄ mixtures on request)
Resolution	0.1 %

Optional sensor technology

SO ₂ sensor	
Measurement principle	Electrochemical SO ₂ sensor
Measuring range/accuracy	In combination with HF sensor, only 0 ... 10 or 0 ... 20 ppm _v make sense. <ul style="list-style-type: none"> ■ 0 ... 10 ppm_v ±0.5 ppm_v ■ 0 ... 20 ppm_v ±1 ppm_v ■ 0 ... 100 ppm_v ±3 ppm_v ■ 0 ... 500 ppm_v ±5 ppm_v
Resolution	0.1 ppm _v
Permissible air humidity	15 ... 90 % r. h. (non-condensing)
Max. zero offset	0.1 ppm _v
Long-term stability	< 1 % signal degradation/month (linear) < 0.5 % at 0 ... 500 ppm _v
Service life	2 years starting from installation

HF sensor	
Measurement principle	Electrochemical hydrogen fluoride sensor
Measuring range/accuracy	0 ... 10 ppm _v ±1 ppm _v
Resolution	0.1 ppm _v
Permissible air humidity	15 ... 90 % r. h. (non-condensing)
Max. zero offset	0.1 ppm _v
Long-term stability	< 1 % signal degradation/month (linear)
Service life	2 years starting from installation

H ₂ S sensor	
Measurement principle	Electrochemical H ₂ S sensor
Measuring range/accuracy	0 ... 100 ppm _v ±5 ppm _v
Resolution	0.1 ppm _v
Permissible air humidity	15 ... 90 % r. h. (non-condensing)
Max. zero offset	0.1 ppm _v
Long-term stability	< 1 % signal degradation/month (linear)
Service life	2 years starting from installation

CO sensor	
Measurement principle	Electrochemical CO sensor
Measuring range/accuracy	0 ... 500 ppm _v ±9 ppm _v
Resolution	0.1 ppm _v
Permissible air humidity	15 ... 90 % r. h. (non-condensing)
Max. zero offset	0.1 ppm _v
Long-term stability	< 1 % signal degradation/month (linear)
Service life	2 years starting from installation

Precision pressure sensor	
Measuring range	0 ... 10 bar abs.
Accuracy	≤ ±0.05 % of span Including non-linearity, hysteresis, non-repeatability, zero offset and end value deviation (corresponds to measured error per IEC 61298-2). Calibrated in vertical mounting position with process connection facing downwards.
Non-linearity (per IEC 61298-2)	≤ ±0.04 % of span BFSL
Temperature error	0 ... 10 °C: ≤ ±0.2 % of span/10 K 10... 40 °C: no additional temperature error
Long-term stability	≤ ±0.1 % of span/year
Measuring rate	2 ms
Calibration interval	2 years

Specifications, version for g³ gas (3M™ Novec™ 4710)

Base instrument	
Connections	
Inlet/return pumps	Quick coupling with self-sealing valve
Outlet for gas cylinder	Self-sealing valve DN 8
Outlet for gas recovery bag	Quick coupling, self-sealing valve
Permissible pressure ranges	
Inlet/return pumps	1.3 ... 12 bar abs.
Outlet for gas cylinder	1.3 ... 12 bar abs.
Outlet for gas recovery bag	< 1.015 bar abs.
TFT touchscreen	7" (resolution 800 x 480)
Voltage supply	
Battery power	Lithium-ion battery, battery is charged during mains supply mode
Mains operated	AC 90 ... 264 V (50 ... 60 Hz)
Permissible temperature ranges	
Operation	0 ... 40 °C
Storage	-20 ... +60 °C
Flow measuring gas	20 litres/hour
Dimensions	W x H x D: 538 x 406 x 297 mm
Weight	approx. 25 kg

Humidity sensor	
Measurement principle	Polymer-based capacitive humidity sensor
Measuring range/accuracy	<ul style="list-style-type: none"> ■ -25 ... 0 °C dew point ±2 °C dew point ■ -35 ... -25 °C dew point ±3 °C dew point ■ -55 ... -35 °C dew point ±4 °C dew point
Resolution	1 °C
Units	°Ctd/°Ftd/ppm _w /ppm _v /°Ctdpr/°Ftdpr (Dew point at gas compartment pressure, relative to ambient pressure and temperature-compensated at 20 °C)
Calibration interval	2 years

g ³ percentage sensor (3M™ Novec™ 4710 in g ³ -Gas)	
Measurement principle	Sound velocity
Measuring range/accuracy	0 ... 10 % (percentage Novec™ 4710) ±0.3 % based on Novec™ 4710/CO ₂ mixture ¹⁾ Any measuring range on request, based on Novec™ 4710/CO ₂ or Novec™ 4710/N ₂ mixtures ²⁾

1) ±0.5 % if the ambient pressure (standard at 1,000 mbar abs.) deviates by more than 100 mbar.

2) For special calibrations, the measuring tolerances may deviate from the standard specification.

Optional sensor technology

Oxygen sensor	
Measurement principle	Optical
Measuring range/accuracy	0 ... 10 % vol. ±0.3 % vol. (option: 0 ... 25 % vol.) ³⁾
Permissible air humidity	15 ... 90 % r. h. (non-condensing)
Max. zero offset	0.2 % vol.
Long-term stability	< 2 % signal degradation/month (linear)
Service life	2 years starting from installation

3) ±0.5 % at 0 ... 25 %, for special calibrations the measuring tolerances may deviate from the standard specification.

Specifications, version for N₂ gas

Base instrument	
Connections	
Inlet/return pumps	Quick coupling with self-sealing valve
Outlet for gas cylinder	Self-sealing valve DN 8
Outlet for gas recovery bag	Quick coupling, self-sealing valve
Permissible pressure ranges	
Inlet/return pumps	1.3 ... 12 bar abs. / 1.3 ... 10 bar abs.
Outlet for gas cylinder	1.3 ... 10 bar abs.
Outlet for gas recovery bag	< 1.015 bar abs.
TFT touchscreen	7" (resolution 800 x 480)
Voltage supply	
Battery power	Lithium-ion battery, battery is charged during mains supply mode
Mains operated	AC 90 ... 264 V (50 ... 60 Hz)
Permissible temperature ranges	
Operation	0 ... 40 °C
Storage	-20 ... +60 °C
Flow measuring gas	40 litres/hour
Dimensions	W x H x D: 538 x 406 x 297 mm
Weight	approx. 25 kg

Humidity sensor	
Measurement principle	Polymer-based capacitive humidity sensor
Measuring range/accuracy	<ul style="list-style-type: none"> ■ -25 ... 0 °C dew point ±2 °C dew point ■ -35 ... -25 °C dew point ±3 °C dew point ■ -55 ... -35 °C dew point ±4 °C dew point
Resolution	1 °C
Units	°Ctd/°Ftd/ppm _w /ppm _v /°Ctdpr/°Ftdpr (Dew point at gas compartment pressure, relative to ambient pressure and temperature-compensated at 20 °C)
Calibration interval	2 years

N ₂ percentage sensor (helium in N ₂)	
Measurement principle	Sound velocity
Measuring range/accuracy	0 ... 5 % vol. ±0.5 % vol. Any measuring range on request, based on helium in N ₂ mixtures ¹⁾

1) For special calibrations, the measuring tolerances may deviate from the standard specification.


N ₂ percentage sensor (SF ₆ in N ₂)	
Measurement principle	Sound velocity
Measuring range/accuracy	0 ... 100 % vol. ±0.5 % vol.

Optional sensor technology

Oxygen sensor	
Measurement principle	Optical
Measuring range/accuracy	0 ... 10 % vol. ±0.3 % vol. (option: 0 ... 25 % vol. ±0.3 % vol.) ¹⁾
Permissible air humidity	15 ... 90 % r. h. (non-condensing)
Max. zero offset	0.2 % vol.
Long-term stability	< 2 % signal degradation/month (linear)
Service life	2 years starting from installation

1) ±0.5 % at 0 ... 25 %, for special calibrations the measuring tolerances may deviate from the standard specification.

Accessories

	Description	Order number
	Gas recovery bag, model GA45 <ul style="list-style-type: none">■ Low weight and easily transportable■ Cost-effective version to prevent SF₆ gas emissions■ Compatible with all WIKA gas analytic instruments■ With overpressure valve as burst protection■ Resistant to decomposition products■ Storage capacity 110 litres For further specifications see data sheet SP 62.08	14013015
	Hose connection 4 m, Ø 2.5 mm	14200598