Analytic instrument for SF_6 gas, g^3 gas or N_2 gas Model GA11

Applications

- Analysis of the gas quality in gas-filled equipment
- For the analysis of SF_6 gas, g^3 gas or N_2 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 SF_6, Novec™ 4710 gas mixture (g^3 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 SF_6 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.

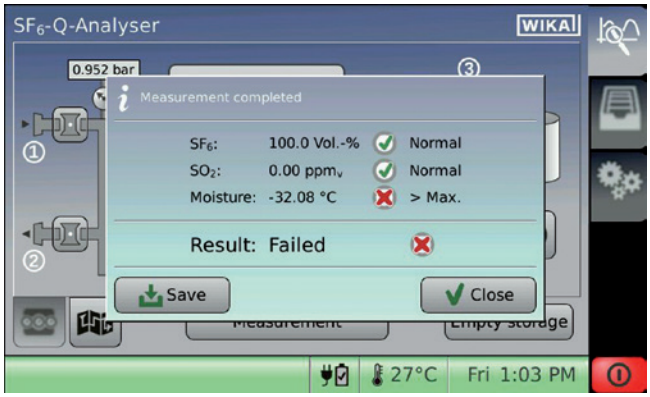
Language selection

Displaying the measurement results

The measurement results on the concentration of purity, decomposition products and humidity of SF_6 gas are displayed after the end of the measurement.

These results are automatically compared to the set guidelines for contaminated or reusable SF_6 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 CIGRÈ - SF_6 Measurement guide (723).

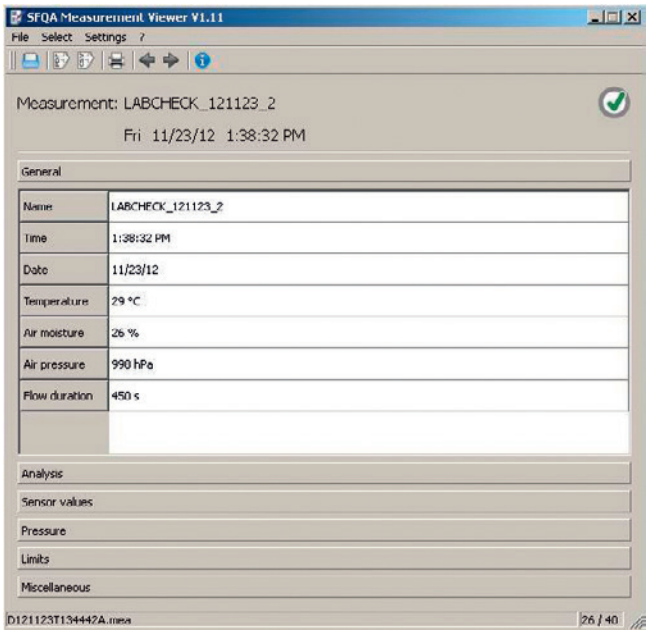


Measured value display

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 “SF_6-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 SF_6 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. ■ 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_2S sensor	
Measurement principle	Electrochemical H_2S 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	■ -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

g³ percentage sensor (3M™ Novec™ 4710 in g³-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 N_2 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	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	■ -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. ±0.3 % vol. ■ 0 ... 7 % vol. ±0.1 % vol.

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** ■ Low weight and easily transportable ■ Cost-effective version to prevent SF_6 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

Ordering information

Model / Version / Optional sensor technology / Accessories

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