

## SF<sub>6</sub> gas solutions

### Analytic instrument for SF<sub>6</sub> gas and alternative insulating gases Model GA11

WIKA data sheet SP 62.12

#### Applications

- Analysis of the gas quality in gas-filled equipment
- For the analysis of SF<sub>6</sub> gas and alternative gas mixtures (C4-FN gas mixtures, natural origin gases)

#### Special features

- Provides measured values for humidity, gas composition (purity) and decomposition products
- Intelligent measurement based on the stability criteria of the sensing technology
- Temperature compensated sensing technology
- Not subject to any transport restrictions (IATA)



Analytic instrument, model GA11 (V2025)

#### 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<sub>6</sub>, C4-FN gas mixtures and also applications for natural origin gases (gas mixtures based on nitrogen, oxygen and carbon dioxide). The model GA11 can measure the concentration of up to six substances, depending on the selected equipment variant.

#### Design

A 10" colour touchscreen and a clearly arranged menu structure allow for intuitive operation. Sensors for the measurement of purity and humidity are included as standard. The model GA11 can be equipped with additional sensors for determining gas decomposition products.

The measuring gas is temporarily stored in an integrated depot and can be pumped back directly into the gas compartment. It is also possible to use an external gas recovery bag. The closed concept does not generate any emissions to the atmosphere.

In the automatic mode, the measurement is terminated, intelligently, based on stability criteria (variable measurement duration).

All functionalities are possible in both rechargeable battery and mains operation.

#### Field use

The analytic instrument is protected from the harsh ambient 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.

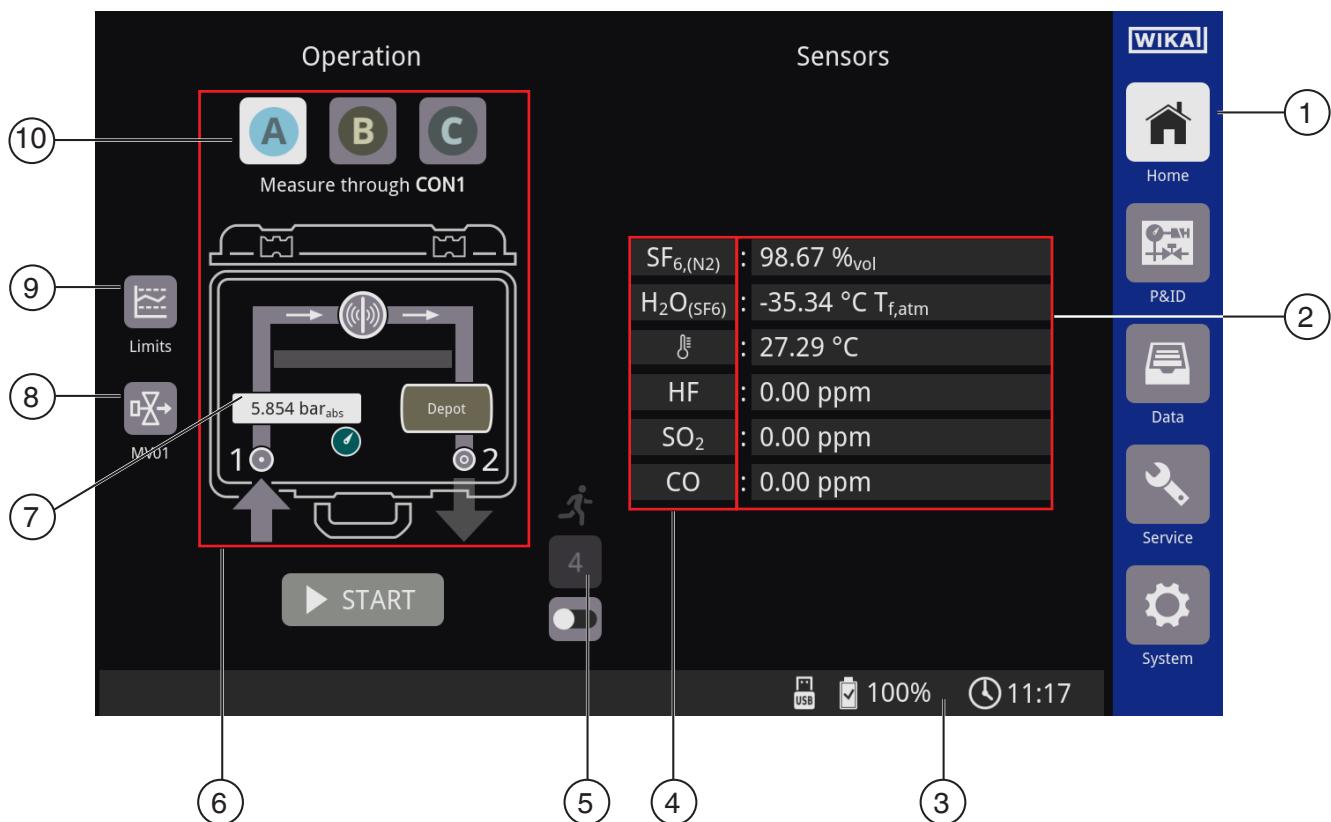
## User interface

The analytic instrument is operated via the user interface on the touchscreen display.

The fields and symbols with a grey background are action fields that open settings or information masks.

The menu navigation on the right-hand side of the screen can be used to open the specified operating and settings masks.

On completing measurement or service procedures as well as for warning messages, an audible signal is output.



- ① Menu navigation
- ② Sensor values
- ③ Information bar
- ④ Sensing technology
- ⑤ Number of operations
- ⑥ Action area for displaying and changing the measurement operation
- ⑦ Input pressure
- ⑧ Open/close inlet valve
- ⑨ Set limit values
- ⑩ A - Measure through CON1  
B - Pump back to CON1  
C - Measure and pump back to CON1

## Instrument construction



- ① Storage for measuring hose and power cord
- ② Operating area
- ③ Adapter (available as an accessory)



- 1 Touchscreen
- 2 Service port
- 3 USB interface
- 4 CON2 outlet for gas recovery bag
- 5 On/Off key
- 6 CON1 inlet, pump back
- 7 Grounding connection
- 8 USB data carrier
- 9 Mains connection

# Specifications, version for SF<sub>6</sub> gas

Basic information	
<b>Connections</b>	
Inlet / Pump back	Quick coupling with self-sealing valve
Outlet for gas recovery bag	Quick coupling with self-sealing valve
<b>Permissible pressure ranges</b>	
Inlet / Pump back	1.03 ... 40 bar abs. <sup>1)</sup> [14.94... 580.15 psi abs.] / max. 10 bar abs. [145 psi abs.]
Outlet for gas recovery bag	< 1.015 bar abs. [14.72 psi abs.]
<b>Display</b>	
<b>Flow rate of measuring gas</b>	
Dimensions	58 x 47 x 30 cm [22.8 x 18.5 x 11.8 in]
Weight <sup>2)</sup>	Approx. 22 kg [49 lb]
<b>Ingress protection (IP code) per IEC 60529</b>	
Case closed	IP67
Case open	IP20

1) In use with pressure reducer (article number: 14722090). Without pressure reducer max. 16 bar abs. [232.06 psi abs.].

2) Without adapter

Voltage supply and power consumption	
<b>Voltage supply</b>	
Battery operation	NiMH (nickel-metal hydride), rechargeable battery is charged during mains operation
Mains operation	AC 110 ... 240 V (50/60 Hz)
Battery capacity	3 Ah (typ.)
Nominal voltage	21.6 V DC
Charging current (typ.)	1 A
<b>Power consumption</b>	Max. 161 W

Operating conditions	
<b>Operating temperature</b>	-10 ... +50 °C [14 ... 122 °F]
<b>Storage temperature range</b>	-15 ... +55 °C [5 ... 131 °F]
<b>Charging temperature of the rechargeable battery</b>	0 ... 45 °C [32 ... 113 °F]
<b>Humidity</b>	10 ... 90 % relative humidity
<b>Condensation</b>	Non-condensing

Humidity sensor	
<b>Measurement principle</b>	Polymer-based capacitive humidity sensor
<b>Measuring range / Accuracy<sup>1)</sup></b>	-40 ... +40 °C ±2 K -60 ... <-40 °C ±3 K
<b>Resolution</b>	0,01 °C
<b>Units</b>	°C T <sub>d,atm</sub> / °C T <sub>f,d,atm</sub> / °C T <sub>d,press</sub> / °C T <sub>f/d,press</sub> / ppm <sub>w</sub> / ppm <sub>v</sub> / % rH

1) For dew point accuracy at 20 °C and input pressure, see „Dew point accuracy“ on page 6

SF <sub>6</sub> percentage sensor	
<b>Measurement principle</b>	Speed of sound
<b>Measuring range / Accuracy<sup>1)</sup></b>	80 ... 100 % vol ±0.2 % based on SF <sub>6</sub> /N <sub>2</sub> mixtures 50 ... 80 % vol ±0.3 %, based on SF <sub>6</sub> /N <sub>2</sub> mixtures 15 ... 25 % vol ±0.5 %, based on SF <sub>6</sub> /N <sub>2</sub> mixtures 0 ... 100 % vol ±0.5 % based on SF <sub>6</sub> /CF <sub>4</sub> mixtures
<b>Resolution</b>	0.01 %

1) Outside the specified measuring ranges, the accuracy is ±1 %. Optimisation of individual measuring ranges on request.

## Selectable sensing technology

<b>SO<sub>2</sub> sensor</b>	
<b>Measurement principle</b>	Electrochemical sulphur dioxide sensor
<b>Measuring range / Accuracy</b>	In combination with HF sensor, only 20 ppm makes sense. <ul style="list-style-type: none"> <li>■ 0 ... 20 ppm ±0.4 ppm</li> <li>■ 0 ... 100 ppm ±2 ppm</li> <li>■ 0 ... 500 ppm ±10 ppm</li> </ul>
<b>Resolution</b>	0.01 ppm
<b>Max. zero point offset</b>	0.5 %, of end value of measuring range
<b>Long-term stability</b>	< 2 % signal degradation / month (linear)
<b>Service life</b>	2 years starting from installation

<b>HF sensor<sup>1)</sup></b>	
<b>Measurement principle</b>	Electrochemical hydrogen fluoride sensor
<b>Measuring range / Accuracy</b>	0 ... 10 ppm ±0.4 ppm
<b>Resolution</b>	0.01 ppm
<b>Max. zero point offset</b>	0.5 %, of end value of measuring range
<b>Long-term stability</b>	< 2 % signal degradation / month (linear)
<b>Service life</b>	2 years starting from installation

1) SO<sub>2</sub> concentrations above 20 ppm can damage the HF sensor. Damage caused by excessive SO<sub>2</sub> concentrations will void the guarantee.

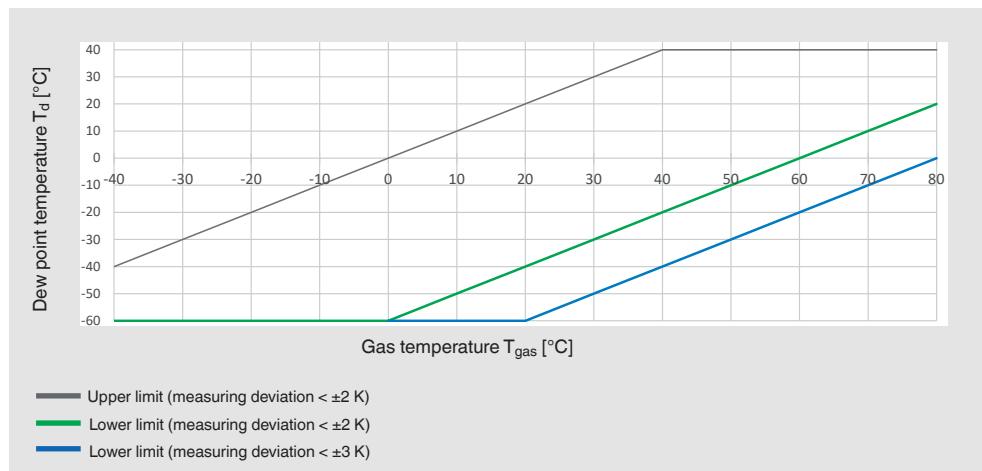
<b>H<sub>2</sub>S sensor</b>	
<b>Measurement principle</b>	Electrochemical hydrogen sulphide sensor
<b>Measuring range / Accuracy</b>	0 ... 100 ppm ±2 ppm
<b>Resolution</b>	0.01 ppm
<b>Max. zero point offset</b>	0.5 %, of end value of measuring range
<b>Long-term stability</b>	< 2 % signal degradation / month (linear)
<b>Service life</b>	2 years starting from installation

<b>CO sensor</b>	
<b>Measurement principle</b>	Electrochemical carbon monoxide sensor
<b>Measuring range / Accuracy</b>	0 ... 500 ppm ±10 ppm
<b>Resolution</b>	0.01 ppm
<b>Max. zero point offset</b>	0.5 %, of end value of measuring range
<b>Long-term stability</b>	< 2 % signal degradation / month (linear)
<b>Service life</b>	2 years starting from installation

## Dew point accuracy

Measuring deviation  $< \pm 2 \text{ K}$  at  $T_{\text{gas}} - T_d < 60 \text{ K}$

Measuring deviation  $< \pm 3 \text{ K}$  at  $60 \text{ K} < T_{\text{gas}} - T_d < 80 \text{ K}$ ,  $T_{\text{gas}} - T_d > 80 \text{ K}$  n. d.



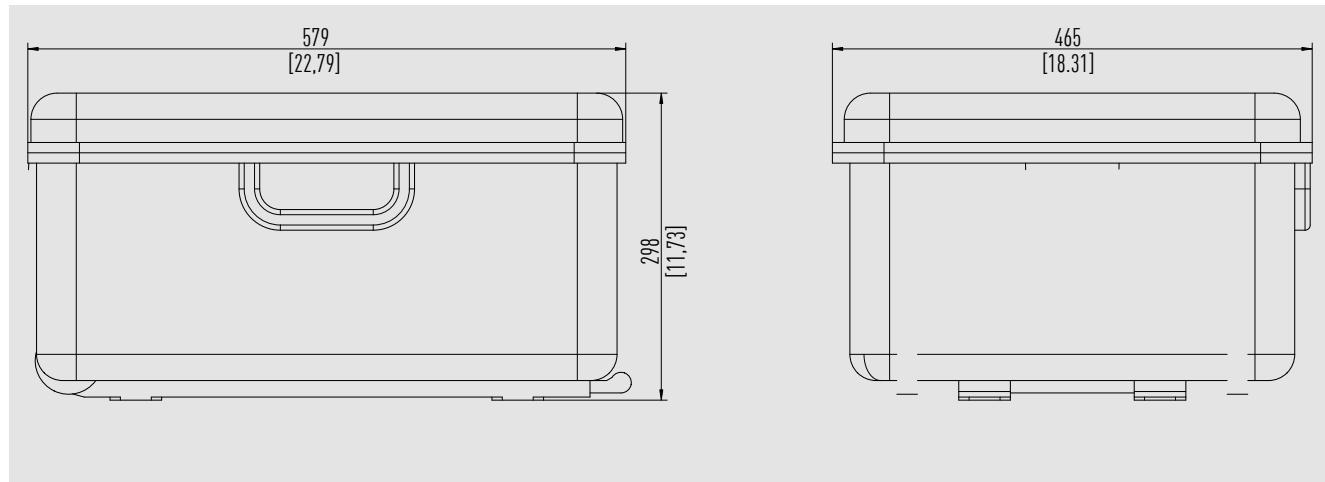
Examples:

- If the gas temperature is  $+30 \text{ °C}$  [ $86 \text{ °F}$ ] and the dew point is  $-20 \text{ °C}$  [ $-4 \text{ °F}$ ], an accuracy of  $< \pm 2 \text{ K}$  is achieved ( $T_{\text{gas}} - T_d < 60 \text{ K}$ ).
- If the gas temperature is  $+40 \text{ °C}$  [ $104 \text{ °F}$ ] and the dew point is  $-30 \text{ °C}$  [ $-22 \text{ °F}$ ], an accuracy of  $< \pm 3 \text{ K}$  is achieved ( $60 \text{ K} < T_{\text{gas}} - T_d < 80 \text{ K}$ ).

## Approvals

Logo	Description	Region
	<b>EU declaration of conformity</b> EMC Directive EN 61326 emission (group 1, class B) and immunity (industrial environments) Pressure Equipment Directive Low Voltage Directive Machinery Directive RoHS directive	European Union

## Dimensions in mm [in]



## Accessories and spare parts

Model 1)	Description	Order number
	<b>Gas recovery bag, model GA45</b> <ul style="list-style-type: none"> <li>■ Low weight and easily transportable</li> <li>■ Cost-effective version to prevent SF<sub>6</sub> emissions</li> <li>■ Compatible with all WIKA analytic instruments</li> <li>■ With overpressure valve as burst protection</li> <li>■ Resistant to decomposition products</li> <li>■ Storage capacity 110 litres [29.06 gal]</li> </ul> <p>For further specifications, see data sheet SP 62.08</p>	14531953
	<b>Pressure reducer</b> <ul style="list-style-type: none"> <li>■ Single-stage 2-port line pressure regulator for corrosive gases and gas mixtures</li> <li>■ Material: stainless steel</li> <li>■ Inlet pressure: 40 bar</li> <li>■ Outlet pressure: 10 bar, adjustable</li> <li>■ Inlet: quick coupling D9 female</li> <li>■ Outlet: quick coupling D9 male</li> </ul>	14722090
-	<b>Power cord</b> <ul style="list-style-type: none"> <li>With angled EU connector type F</li> <li>With angled US connector type B</li> <li>With angled CN connector type I</li> <li>With angled UK connector type G</li> </ul>	14647381 14713614 14713617 14713618
-	<b>Self-sealing coupling</b> <ul style="list-style-type: none"> <li>DN 20 to D9 quick coupling (SF<sub>6</sub>) Connection 1: M45 x 2 female, brass Connection 2: D9 quick coupling male, stainless steel</li> <li>DN 8 to D9 quick coupling (SF<sub>6</sub>) Connection 1: M26 x 1.5 female, brass Connection 2: D9 quick coupling male, stainless steel</li> <li>DN 20 to D9 quick coupling (alternative insulating gases) Connection 1: M48 x 2 female, stainless steel Connection 2: D9 quick coupling male, stainless steel</li> </ul>	14017515 14013758 14073214
-	<b>Measuring hose</b> <ul style="list-style-type: none"> <li>For analytic instruments with D9 quick coupling Ø 2.5 mm [0.1 in], length 2 m [6.56 ft]</li> <li>For analytic instruments with D9 quick coupling Ø 2.5 mm [0.1 in], length 4 m [13.12 ft]</li> <li>For analytic instruments with D9 quick coupling Ø 2.5 mm [0.1 in], length 6 m [19.68 ft]</li> <li>For analytic instruments with D9 quick coupling Ø 2.5 mm [0.1 in], length &gt; 6 m [19.68 ft]</li> </ul>	14276756 14200598 14158232 On request

1) The figures are an example and may change depending on the state of the art in design, material composition and representation.

### Ordering information

Model / Version / Sensing technology / Accessories

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