

Analytic instrument for SF₆ gas and alternative gas mixtures

Model GA11

WIKAI data sheet SP 62.12

Applications

- Analysis of the gas quality in gas-filled equipment
- For the analysis of SF₆ gas and alternative gas mixtures (C4-FN gas mixtures, natural origin gases (NOG))

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 SF₆, 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.

Construction

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 ensures that emissions are reduced to a minimum.

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

All functionalities are possible in both 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.

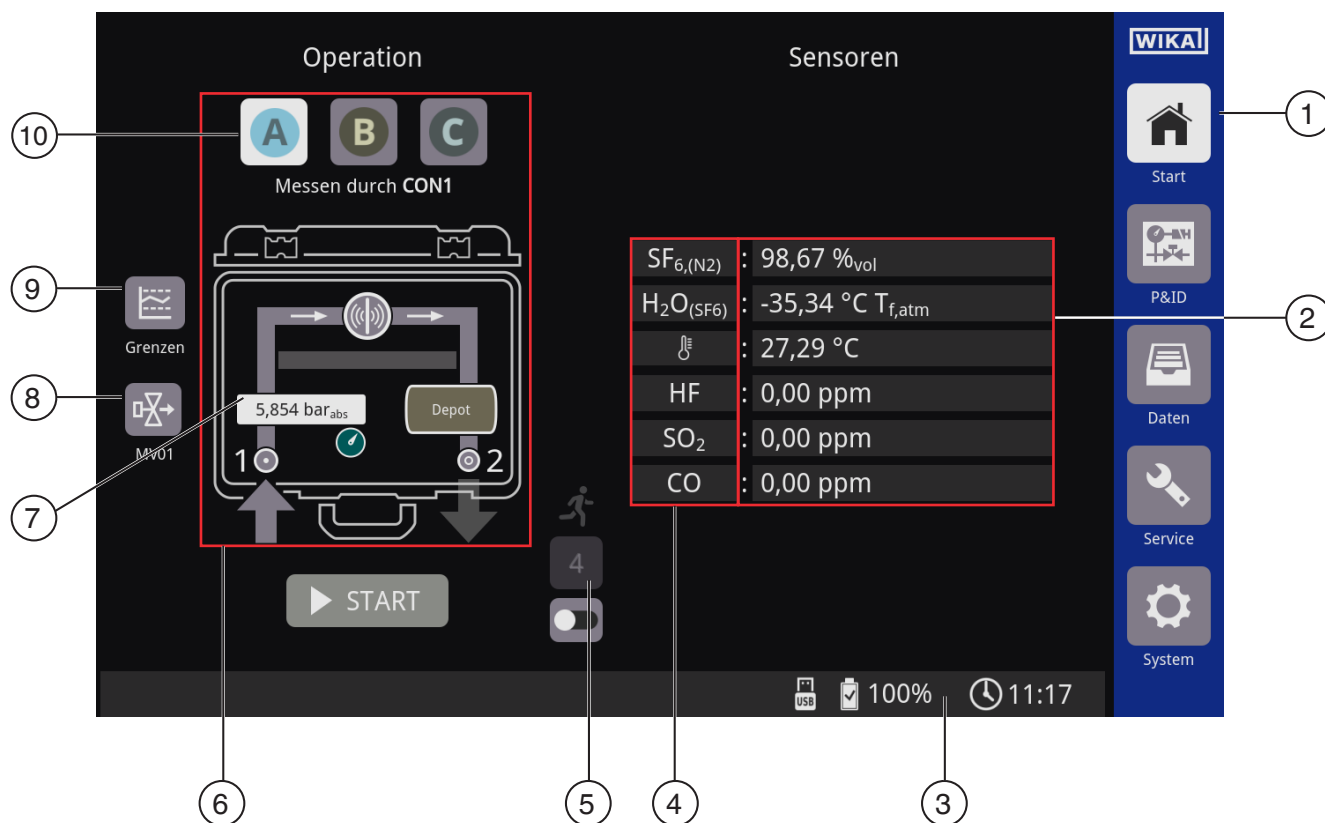
User interface

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

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 operations as well as for warning messages, an audio 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 Closing/Opening the inlet valve
- ⑨ Setting the 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 button
- ⑥ CON1 inlet, pump back
- ⑦ Grounding connection
- ⑧ USB data carrier
- ⑨ Mains connection

Specifications

Basic information	
Connections	
Inlet / Pump back	Quick coupling with self-sealing valve
Outlet for gas recovery bag	Quick coupling with self-sealing valve
Permissible pressure ranges	
Inlet / Pump back	1.03 ... 35 bar abs. ¹⁾ [14.94 ... 507.63 psi abs.] / max. 10 bar abs. [145 psi abs.]
Outlet for gas recovery bag	< 1.015 bar abs. [14.72 psi abs.]
Display	10" TFT touchscreen
Flow rate of measuring gas	18 litres/hour
Dimensions	58 x 47 x 30 cm [22.8 x 18.5 x 11.8 in]
Weight ²⁾	
SF ₆ and NOG version	Approx. 22 kg [48.5 lb]
C4-FN version	Approx. 22.5 kg [49.6 lb]
Ingress protection (IP code) per IEC 60529	
Case closed	IP67
Case open	IP20

1) If used with a pressure reducer (item number: 14722090). Without pressure reducer max. 16 bar abs. [232.06 psi abs.].

2) Tare weight (without accessories)

Voltage supply and performance data	
Voltage supply	
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 (typical)
Nominal voltage	DC 21.6 V
Charging current (typ.)	1 A
Power consumption	Max. 161 W

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

Humidity sensor	
Measurement principle	Polymer-based capacitive humidity sensor
Measuring range / Accuracy ¹⁾	-40 ... +40 °C ±2 K -60 ... < -40 °C ±3 K
Resolution	0.01 °C
Units	°C T _{d,atm} °C T _{f/d,atm} °C T _{d,press} °C T _{f/d,press} ppm _w ppm _v % rH
Calibration interval	2 years

1) For dew point accuracy at 20 °C and inlet pressure, see „Dew point accuracy“ on page 9.

SF₆ version

Overview of versions							
Sound sensor	H ₂ O	SO ₂ -20 ppm	SO ₂ -100 ppm	SO ₂ -500 ppm	CO-500 ppm	H ₂ S-100 ppm	HF-10 ppm
SF ₆ /N ₂	✓	O	-	-	O	O	O
SF ₆ /N ₂	✓	-	O	-	O	O	O ¹⁾
SF ₆ /N ₂	✓	-	-	O	O	O	O ¹⁾
SF ₆ /N ₂ + SF ₆ /CF ₄	✓	O	-	-	O	O	O
SF ₆ /N ₂ + SF ₆ /CF ₄	✓	-	O	-	O	O	O ¹⁾
SF ₆ /N ₂ + SF ₆ /CF ₄	✓	-	-	O	O	O	O ¹⁾

1) SO₂ concentrations above 20 ppm can damage the HF sensor. Damage caused by excessive SO₂ concentrations will void the guarantee.

Legend:

- ✓ Required
- O Optional, multiple selection possible
- Not possible

SF ₆ percentage sensor	
Version	■ SF₆/N₂ ■ SF₆/N₂ + SF₆/CF₄ (switchable)
Measurement principle	Speed of sound
Measuring range / Accuracy ¹⁾	80 ... 100 % ±0.2 vol. %, based on SF ₆ /N ₂ mixtures 50 ... 80 % ±0.3 vol. %, based on SF ₆ /N ₂ mixtures 15 ... 25 % ±0.5 vol. %, based on SF ₆ /N ₂ mixtures 0 ... 100 % ±0.5 vol. %, based on SF ₆ /CF ₄ mixtures
Resolution	0.01 %
Calibration interval	2 years

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

Selectable sensors SF₆

SO ₂ sensor	
Measurement principle	Electrochemical sulphur dioxide sensor
Measuring range / Accuracy	In combination with HF sensor, only 20 ppm makes sense. ■ 0 ... 20 ppm ±0.4 ppm ■ 0 ... 100 ppm ±2 ppm ■ 0 ... 500 ppm ±10 ppm
Resolution	0.01 ppm
Max. zero point offset	0.5 %, of end value of measuring range
Long-term stability	< 10 % signal loss / year
Service life	2 years starting from installation

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

1) SO₂ concentrations above 20 ppm can damage the HF sensor. Damage caused by excessive SO₂ concentrations will void the guarantee.

H ₂ S sensor	
Measurement principle	Electrochemical hydrogen sulphide sensor
Measuring range / Accuracy	0 ... 100 ppm ±2 ppm
Resolution	0.01 ppm
Max. zero point offset	0.5 %, of end value of measuring range
Long-term stability	< 10 % signal loss / year
Service life	2 years starting from installation

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

C4-FN version

Overview of versions						
Sound sensor	H ₂ O	O ₂	CO-500 ppm	CO-2,000 ppm	CO-10,000 ppm	CO-40,000 ppm
C4-FN/CO ₂	✓	✓	O	-	-	-
C4-FN/CO ₂	✓	✓	-	O	-	-
C4-FN/CO ₂	✓	✓	-	-	O	-
C4-FN/CO ₂	✓	✓	-	-	-	O
C4-FN/CO ₂ + C4-FN/N ₂	✓	✓	O	-	-	-
C4-FN/CO ₂ + C4-FN/N ₂	✓	✓	-	O	-	-
C4-FN/CO ₂ + C4-FN/N ₂	✓	✓	-	-	O	-
C4-FN/CO ₂ + C4-FN/N ₂	✓	✓	-	-	-	O

Legend:

- ✓ Required
- O Optional, multiple selection possible
- Not possible

C4-FN percentage sensor	
Version	■ C4-FN/CO₂ ■ C4-FN/CO₂ + C4-FN/N₂ (switchable)
Measurement principle	Speed of sound
Measuring range / Accuracy ¹⁾	0 ... 15 % ±0.2 vol. % based on C4-FN/CO ₂ mixtures 0 ... 15 % ±0.2 vol. % based on C4-FN/N ₂ mixtures
Resolution	0.01 %
Calibration interval	2 years

1) Output of the matrix gas (CO₂ or N₂) as complementary with the same accuracy.

O₂ sensor	
Measurement principle	Optical
Measuring range / Accuracy	0 ... 25 % ± 0.3 vol. %
Resolution	0.01 %
Max. zero point offset	0.3 vol. %
Long-term stability	< 1 % (0.25 vol. %) / 2 years
Service life	5 years starting from installation
Calibration interval	2 years

Selectable sensors C4-FN

CO sensor	
Measurement principle	Electrochemical carbon monoxide sensor
Measuring range / Accuracy ¹⁾	0 ... 500 ppm ±10 ppm (resolution: 0.01 ppm) 0 ... 2,000 ppm ±40 ppm (resolution: 0.1 ppm) 0 ... 10,000 ppm ±200 ppm (resolution: 1 ppm) 0 ... 40,000 ppm ±800 ppm (resolution: 1 ppm)
Max. zero point offset	0.5 %, of end value of measuring range
Long-term stability	< 10 % signal loss / year
Service life	2 years starting from installation

1) CO₂-based calibration gas

NOG version

Overview of versions							
Sound sensor	H ₂ O	O ₂	CO-500 ppm	CO-2,000 ppm	CO-10,000 ppm	CO-40,000 ppm	NO ₂ -20 ppm
CO ₂ /N ₂	✓	✓	O	-	-	-	-
CO ₂ /N ₂	✓	✓	-	O	-	-	-
CO ₂ /N ₂	✓	✓	-	-	O	-	-
CO ₂ /N ₂	✓	✓	-	-	-	O	-
SF ₆ /N ₂ + He/N ₂	✓	✓	O	-	-	-	O

Legend:

- ✓ Required
- O Optional, multiple selection possible
- Not possible

NOG percentage sensor	
Version	CO₂/N₂ SF₆/N₂ + He/N₂ (switchable)
Measurement principle	Speed of sound
Measuring range / Accuracy	0 ... 100 % ±1.5 vol. % based on CO ₂ /N ₂ mixtures 0 ... 15 % ±0.5 vol. % based on SF ₆ /N ₂ mixtures 0 ... 5 % ±1 vol. % based on He/N ₂ mixtures
Resolution	0.01 %
Calibration interval	2 years

O ₂ sensor	
Measurement principle	Optical
Measuring range / Accuracy	0 ... 25 % ± 0.3 vol. %
Resolution	0.01 %
Max. zero point offset	0.3 vol. %
Long-term stability	< 1 % (0.25 vol. %) / 2 years
Service life	5 years starting from installation
Calibration interval	2 years

Selectable sensors NOG

CO sensor (for version with CO ₂ /N ₂)	
Measurement principle	Electrochemical carbon monoxide sensor
Measuring range / Accuracy ¹⁾	0 ... 500 ppm ±10 ppm (resolution: 0.01 ppm) 0 ... 2,000 ppm ±40 ppm (resolution: 0.1 ppm) 0 ... 10,000 ppm ±200 ppm (resolution: 1 ppm) 0 ... 40,000 ppm ±800 ppm (resolution: 1 ppm)
Max. zero point offset	0.5 %, of end value of measuring range
Long-term stability	< 10 % signal loss / year
Service life	2 years starting from installation

1) CO₂-based calibration gas

CO sensor (for version with SF ₆ /N ₂ + He/N ₂)	
Measurement principle	Electrochemical carbon monoxide sensor
Measuring range / Accuracy ¹⁾	0 ... 500 ppm ±10 ppm
Resolution	0.01 ppm
Max. zero point offset	0.5 %, of end value of measuring range
Long-term stability	< 10 % signal loss / year
Service life	2 years starting from installation

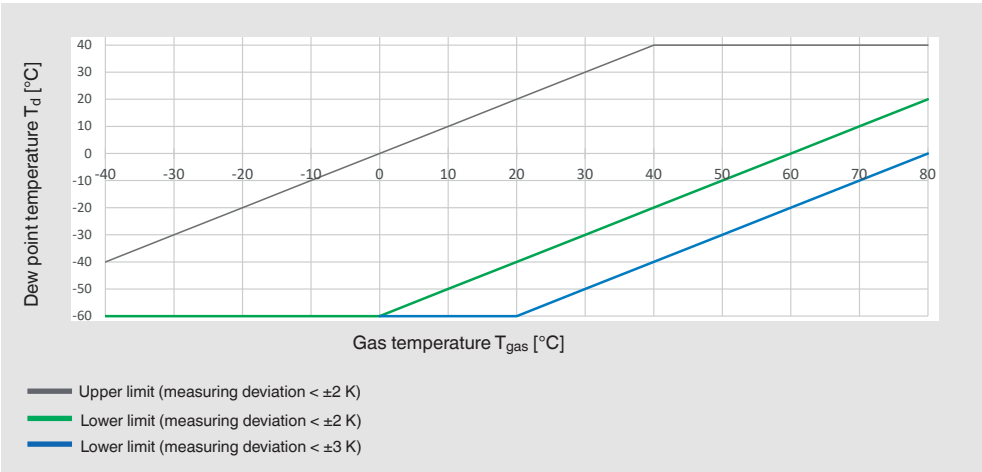
1) N₂-based calibration gas

NO ₂ sensor	
Measurement principle	Electrochemical nitrogen dioxide sensor
Measuring range / Accuracy ¹⁾	0 ... 20 ppm ±1 ppm
Resolution	0.01 ppm
Max. zero point offset	0.5 %, of end value of measuring range
Long-term stability	< 10 % signal loss / year
Service life	2 years starting from installation

1) N₂-based calibration gas

Dew point accuracy

Measuring deviation < ±2 K at span $T_{gas} - T_d < 60\text{ K}$
Measuring deviation < ±3 K at $60\text{ K} < T_{gas} - T_d < 80\text{ K}$, $T_{gas} - T_d > 80\text{ K n. d.}$



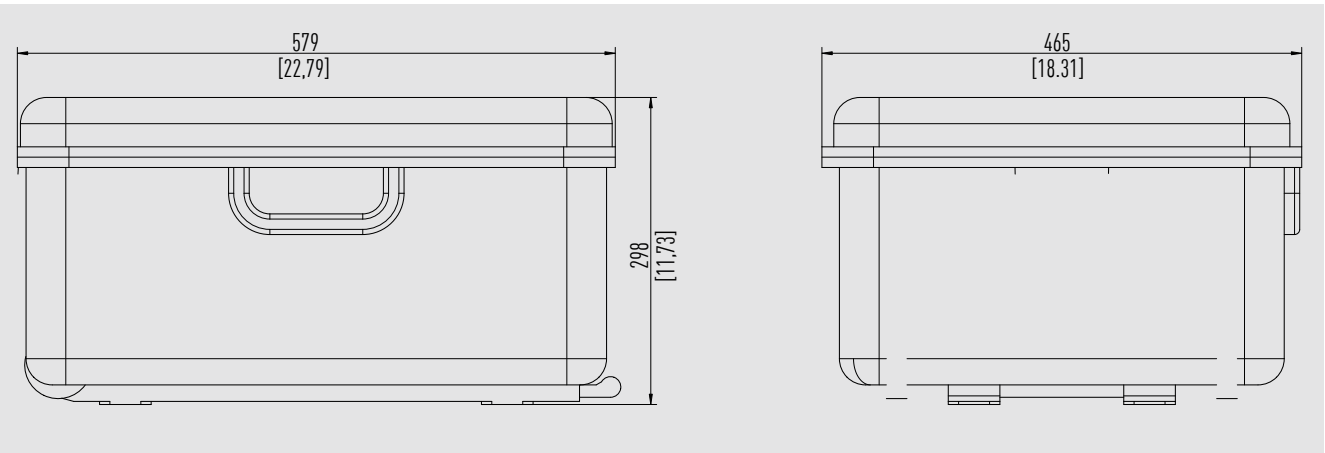
Examples:

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

Approvals

Logo	Description	Region
CE	EU declaration of conformity	European Union
	EMC Directive	
	Machinery Directive	
	RoHS directive	

Dimensions in mm [in]



Accessories and spare parts

Model ¹⁾	Description	Order number
	Gas recovery bag, model GA45 ■ Low weight and easily transportable ■ Cost-effective version to prevent SF₆ emissions ■ Compatible with all WIKA analytic instruments ■ With overpressure valve as burst protection ■ Resistant to decomposition products ■ Storage capacity 110 litres [29.06 gal] For further specifications, see data sheet SP 62.08	14531953
	Pressure reducer ■ Single-stage 2-port line pressure regulator for corrosive gases and gas mixtures ■ Material: stainless steel ■ Inlet pressure: 35 bar [507.63 psi] ■ Outlet pressure: 10 bar [145.04 psi], adjustable ■ Inlet: D9 female quick coupling ■ Outlet: D9 male quick coupling	14722090
-	Power cord	
	With angled EU connector type F	14647381
	With angled US connector type B	14713614
	With angled CN connector type I	14713617
	With angled UK connector type G	14713618
-	Self-sealing coupling	
	DN 20 to D9 quick coupling (SF ₆) Connection 1: M45 x 2 female thread, brass Connection 2: D9 quick coupling male thread, stainless steel	14017515
	DN 8 to D9 quick coupling (SF ₆) Connection 1: M26 x 1.5 female thread, brass Connection 2: D9 quick coupling male thread, stainless steel	14013758
	DN 20 to D9 quick coupling (C4-FN) Connection 1: M48 x 2 female thread, brass ²⁾ Connection 2: D9 quick coupling male thread, stainless steel	64483587
	DN 8 to D9 quick coupling (C4-FN) Connection 1: M28 x 1.5 female thread, brass ²⁾ Connection 2: D9 quick coupling male thread, stainless steel	64483591
	DN 20 to D9 quick coupling (NOG) Connection 1: M50 x 2 female thread, brass ²⁾ Connection 2: D9 quick coupling male thread, stainless steel	64483593
	DN 8 to D9 quick coupling (NOG) Connection 1: M30 x 1.5 female thread, brass ²⁾ Connection 2: D9 quick coupling male thread, stainless steel	64483594
	DN 20 to D9 quick coupling (NOG) Connection 1: M43 x 2 female thread, brass ²⁾ Connection 2: D9 quick coupling male thread, stainless steel	64483595
	DN 8 to D9 quick coupling (NOG) Connection 1: M24 x 1.5 female thread, brass ²⁾ Connection 2: D9 quick coupling male thread, stainless steel	64483596

Model ¹⁾	Description	Order number
-	Measuring hose	
	For analytic instruments with D9 quick coupling Ø 2.5 mm [0.1 in], length 2 m [6.56 ft]	14276756
	For analytic instruments with D9 quick coupling Ø 2.5 mm [0.1 in], length 4 m [13.12 ft]	14200598
	For analytic instruments with D9 quick coupling Ø 2.5 mm [0.1 in], length 6 m [19.68 ft]	14158232
	For analytic instruments with D9 quick coupling Ø 2.5 mm [0.1 in], length > 6 m [19.68 ft]	On request

- 1) The figures are an example and may change in design, material composition and representation depending on the state of the art.
2) Wetted parts: stainless steel and aluminium; union nut made of brass (not wetted)

Ordering information

Model / Version / Sensing technology / Accessories

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We reserve the right to make modifications to the specifications and materials.



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