

MRU – over 30 years  
of innovative gas  
analysis!

## Biogas analysers

Biogas, landfill gas, biomethane,  
coal mine gas, CHP exhaust gas



Product overview

# MRU Biogas analysers

Whether biogas, landfill and coal mine gas, biomethane or gas from biomass: Emerging gases can harm the environment. Thus their composition should be monitored and analysed regularly.

Measuring biogas optimum efficiency can be achieved at biogas plants.

The complete, ready to use biogas analysers are the industrial solution to be used with:

- biogas (anaerobic digestion) plants
- cogeneration heat and power engines (CHP)
- municipal or industrial waste water treatment sites
- coal seam gas sites (coal bed methane)
- food and animal waste processing plants
- biomethane (gas to grid) plants
- landfill sites



# OPTIMA7 biogas – flexible solutions

for gas monitoring at biogas plants, landfill sites and for exhaust gas measurement at cogeneration heat and power engines (CHP).

All THREE applications in ONLY ONE analyser: OPTIMA7 biogas

For simultaneous measurements of O<sub>2</sub> - CH<sub>4</sub> - CO<sub>2</sub> - H<sub>2</sub>S - H<sub>2</sub> in **biogas** as well as pressure measurement up to ± 300 hPa.

For **landfill gas** using additionally a gas „sniffer“ and simultaneous measurement of gas flow velocity using special s-type probe, with temperature and gas sampling integrated in one probe.

For **CHP** exhaust gas measurement using CO, NO and NO<sub>2</sub> with a flue gas sampling probe with exchangeable tube and heat deflector shield.



## Possible combinations

	Art.-No. Single analyser	Combination biogas/landfill gas	Combination landfill gas/exhaust gas	Combination biogas/exhaust gas	Combination biogas/ landfill gas/exhaust gas
Biogas	410074	410077	410078	410079	410092
Landfill gas	410075				
Exhaust gas	410076				

## OPTIMA7 biogas

The flexible handheld analyser for biogas monitoring at biogas plants, landfill sites and for exhaust gas measurement at CHPs.

Intuitive software menu will guide you through all measuring programs. The glass-fiber reinforced enclosure has strong fixing magnets and a 3,5" colour TFT-display. An optimized, backlit condensate trap is integrated in the enclosure. The gas connectors are made of robust stainless steel.

Measuring data can be stored internally in the analyser or on SD-card – the data can also be immediately transferred via Bluetooth to PC or printed directly with the MRU speed printer.



Strong hold due to fixing magnets



Optimized, backlit condensate trap with re-usable PTFE filter



Robust ABS case



Soft bag with shoulder strap



## OPTIMA7 biogas

### Set BIOGAS #410074

Professional handheld analyser, designed for simultaneous measurements of 4-gas components.

- internal data storage for up to 16.000 measurements
- 5 m Viton biogas sampling hose  $\varnothing$  3 x 2 mm
- strong Lithium-Ion battery
- SD-card reader
- weight 750 g

#### Measured components

Oxygen O<sub>2</sub>

Carbon dioxide CO<sub>2</sub>

Methane CH<sub>4</sub>

Hydrogen sulfide H<sub>2</sub>S

Gas pressure

#### Measuring range

0 ... 25 % (electrochemical)

0 ... 100 % (infrared NDIR)

0 ... 100 % (infrared NDIR)

0 ... 2.000/5.000 \* ppm (electrochemical)

0 ...  $\pm$  300 hPa / mbar

\* Overload for short-term measurements only



## OPTIMA7 biogas

### Set LANDFILL GAS # 410075



Professional handheld analyser using a special 3-components-gas sampling probe, designed for the use at landfill sites.

- simultaneous measurement of:
  - flow velocity (special s-type tube, see picture)
  - temperature
  - gas concentration
- including stainless steel fitting Ø 12 mm – 1/2 inch male, with PTFE fixing ring
- barometric pressure sensor
- AUX connector for separate HC “sniffer” probe



Special straight Pitot tube

#### Measured components

#### Measuring range

Oxygen O <sub>2</sub>	0 ... 25 % (electrochemical, long-life)
Carbon dioxide CO <sub>2</sub>	0 ... 100 % (infrared NDIR)
Methane CH <sub>4</sub>	0 ... 100 % (infrared NDIR)
Hydrogen sulfide H <sub>2</sub> S	0 ... 2.000/5.000 * ppm (electrochemical)
Gas pressure	0 ... ± 300 hPa / mbar

\* Overload for short-term measurements only



## OPTIMA7 biogas

### Set CHP # 410076



Professional handheld analyser with all combustion and emission calculations and automatic measurement incl. data logging function, configurable by user.

- gas sampling probe suitable for exhaust gas
- 2,7 m VITON sampling line
- exchangeable sampling tube with heat deflector shield

#### Measured components

#### Measuring range

Oxygen O <sub>2</sub>	0 ... 25 % (electrochemical)
Carbon monoxide CO (H <sub>2</sub> comp)	0 ... 10.000/20.000*ppm (electrochemical)
Nitrogen monoxide NO	0 ... 1.000/5.000*ppm (electrochemical)
Nitrogen dioxide NO <sub>2</sub>	0 ... 200/1.000 * ppm (electrochemical)
Gas pressure	0 ... ± 300 hPa / mbar

\* Overload for short-term measurements only



Exhaust gas sampling probe

Combustion and emission calculations:  
mg / Nm<sup>3</sup>, NO<sub>x</sub> as mg / m<sup>3</sup> NO<sub>2</sub>, true NO<sub>x</sub> = NO + NO<sub>2</sub>, with O<sub>2</sub> referencing



## NOVA plus biogas Model BIOGAS # 947017

The portable NOVAplus biogas is also available as BIOGAS device, equivalent to OPTIMA7 biogas # 410074. It contains the same measuring components, and in addition it has a wireless remote control unit, a Peltier gas cooler with automatic condensate draining pump and a built-in speed printer.



## NOVA plus biogas Model CHP # 947019

Professional portable analyser with wireless remote control in a robust metal enclosure. Suitable for long-term and interval measurements, with built-in Peltier gas cooler, with automatic condensate draining pump and condensate monitoring.

- internal data storage of up to 16.000 measurements
- strong lithium-ion battery
- built-in high speed printer
- gas sampling probe, suitable for engine exhaust
- 2,7 m VITON sampling line
- exchangeable probe tube with heat deflector shield

### Measured components

### Measuring range

Oxygen O <sub>2</sub>	0 ... 25 % (electrochemical)
Carbon monoxide CO (H <sub>2</sub> comp.)	0 ... 10.000/20.000 * ppm (electrochemical)
Methane CH <sub>4</sub>	100 ... 40.000 ppm (infrared)
Nitrogen monoxide NO	0 ... 1.000/5.000 * ppm (electrochemical)
Nitrogen dioxide NO <sub>2</sub>	0 ... 200/1.000 * ppm (electrochemical)
Gas pressure	0 ... ± 300 hPa / mbar

\* Overload for short-term measurements only

Combustion and emission calculations:  
mg / Nm<sup>3</sup>, NO<sub>x</sub> as mg / m<sup>3</sup> NO<sub>2</sub>, true NO<sub>x</sub> = NO + NO<sub>2</sub>, with O<sub>2</sub> referencing



## SWG 100 biogas

### Stationary Biogas-measuring system for continuous measurements

#### Versatile and specific applications:

Biogas, biomass, ethanol, biomethane, cellulose and paper, CHP engines, landfills, waste water treatments, coal mine gas

#### Instrument main features are:

- industry compatible rugged design for harsh industrial environment, wall (rack) mounting, IP54 aluminum cabinet with anti-corrosive red structural lacquer
- standard system safety included with continuously monitored fan ventilation of cabinet, gas flow restrictor orifice at gas inlet
- electric gas cooler with automatic condensate draining pump
- sample gas pump and internal sample flow monitoring with display and system alarm
- solenoid valve for auto-zero
- direct and continuous / discontinuous measurement, with pressure and temperature compensation and event data logging
- module with 4 channel analog outputs / inputs 4 – 20 mA, with 2 x “fail safe” alarm relays
- cabinet heater for freeze protection
- RS485 digital data transfer (Modbus RTU)
- converter module of RS485 into Profibus
- up to 10 sites monitoring (time sharing technique) with only one analyser

#### Measured components, equipped variably:

Measured components	Measuring range
Oxygen O <sub>2</sub>	0 ... 25 % (electrochemical)
Carbon dioxide CO <sub>2</sub>	0 ... 100 % (infrared NDIR)
Methane CH <sub>4</sub>	0 ... 100 % (infrared NDIR)
Hydrogen sulfide H <sub>2</sub> S	0 ... 2.000/4.000 * ppm (electrochemical)
Hydrogen sulfide H <sub>2</sub> S high	0 ... 10.000/50.000 * ppm (electrochemical)
Hydrogen H <sub>2</sub>	0 ... 1.000/2.000 * ppm (electrochemical)
Hydrogen H <sub>2</sub>	0 ... 100 % (thermal conductivity detector measurements)
Carbon monoxide CO	0 ... 4.000/10.000 * ppm (electrochemical)

\* Overload for short-term measurements only



## SWG 100 BIOcompact

### Stationary Biogas-measuring system for discontinuous measurements

Designed for discontinuous measurements of O<sub>2</sub> / CO<sub>2</sub> / CH<sub>4</sub> / H<sub>2</sub>S (up to 24 measurements per day)

# Biogas analysers

## Technical specifications

Measured components	Measuring principle	Measuring range	Accuracy	Resolution
Oxygen O <sub>2</sub>	electrochemical	0 ... 25,00 Vol.-%	± 0,2 Vol.-% absolut	0,01 %
Carbon dioxide CO <sub>2</sub>	infrared	0 ... 100,00 Vol.-%	± 0,3 % or 3 % of reading **	0,01 %
Methane CH <sub>4</sub>	infrared	0 ... 100,00 Vol.-%	± 0,2 % or 3 % of reading **	0,01 %
Methane CH <sub>4</sub> <sup>1)</sup>	infrared	100 ... 40.000 ppm	± 400 ppm or 5 % of reading **	10 ppm
Hydrogen sulfide H <sub>2</sub> S	electrochemical	0 ... 2.000/4.000 ppm*	± 5 ppm or 5 % of reading **	1 ppm
Hydrogen sulfide H <sub>2</sub> S <sup>2)</sup>	electrochemical	0 ... 10.000/50.000 ppm*	± 50 ppm or 5 % of reading **	1 ppm
Hydrogen H <sub>2</sub>	electrochemical	0 ... 1.000/2.000 ppm*	± 10 ppm or 5 % of reading **	1 ppm
Hydrogen H <sub>2</sub>	TCO	0 ... 100,00 %	± 0,2 % or 2 % of reading **	0,01 %
Carbon monoxide CO (H <sub>2</sub> comp.)	electrochemical	0 ... 10.000/20.000 ppm*	± 10 ppm or 5 % of reading **	1 ppm
Carbon monoxide CO <sup>3)</sup>	electrochemical	0 ... 4.000/10.000 ppm*	± 10 ppm or 5 % of reading **	1 ppm
Nitrogen monoxide NO	electrochemical	0 ... 1.000/5.000 ppm*	± 5 ppm or 5 % of reading **	1 ppm
Nitrogen dioxide NO <sub>2</sub>	electrochemical	0 ... 200/1.000 ppm*	± 5 ppm or 5 % of reading **	1 ppm
Flue gas temperature		0 ... 800 °C (stainless steel) 0 ... 1.100 °C (inconel)	± 2 °C or 1 % of reading ** ± 2 °C or 1 % of reading **	1 °C 1 °C
Gas pressure		- 300 ... + 300 hPa	± 0,02 hPa	0,01 hPa
Calculations (only for engine exhaust)		mg / Nm <sup>3</sup> , NO <sub>x</sub> as mg/m <sup>3</sup> , true NO <sub>x</sub> measurement NO <sub>x</sub> = NO + NO <sub>2</sub> incl. O <sub>2</sub> referencing, user adjustable		

### General specifications

Operating temperature	+ 5 ... + 45 °C, max. 95 % RF, not condensing			
Ambient conditions	not for use in aggressive, corrosive or very high dust atmosphere, not for use in hazardous area			
Power supply	lithium-ion battery for portable analyser, mains for stationary analyser			
Mains	100 – 240 Vac / 50 ... 60 Hz / 300 W (with heater)			
Weight	OPTIMA7 biogas approx. 750 g	NOVAplus biogas approx. 7,4 kg	SWG 100 biogas approx. 25 kg	SWG 100 BIO compact approx. 14 kg
Dimensions	110 x 225 x 52 mm (W x H x D)	470 x 314 x 235 mm (W x H x D)	700 x 600 x 210 mm (W x H x D)	400 x 500 x 300 mm (W x H x D)

<sup>1)</sup> engine exhaust gas measurement is measured with ppm resolution    <sup>2)</sup> option not available for OPTIMA7 biogas    <sup>3)</sup> for SWG 100 biogas

\*overload for short-term measurements only    \*\* the higher value applies

**MRU – over 30 years of innovative gas analysis!**

Dealer:



**MRU · Messgeraete fuer Rauchgase  
und Umweltschutz GmbH**

Fuchshalde 8 + 12 · 74172 Neckarsulm-Oberseesheim · Germany

Phone +49 7132 99620 · Fax +49 7132 996220

info@mru.de · www.mru.eu