



O<sub>2</sub> | CO | NO

## DELTAsmart

Handheld unit for  
modern flue gas analysis.



For control measurements  
at gas-, oil- and wood-firings.



# DELTAsmart

## Robust and easy to operate

**DELTAsmart enables you to measure flue gas, pressure and temperature in one device. It is ideally suited for all control and adjustment work at gas, oil-fired, condensing and wood-burning boilers.**

**These are your special advantages:**

- Simultaneous measurement of O<sub>2</sub>, CO and NO (3rd sensor optional)
- Flue gas, temperature and differential pressure measurement
- Intuitive menu navigation via touch display
- Glass fibre reinforced housing with holding magnets
- Large data memory with interface to App and PC software
- Powerful Lithium-Ion battery for min. 15 h continuous operation
- IR printer interface



# The device in detail

## An overview of the special features



### Operation and colour display

Intuitive guidance through the measuring programs, due to easy display- and keypad-interaction



### Condensate and dirt are kept out

Large-volume condensate separator with proven star filter including water stop function



### Hands free through magnetic force

Thanks to four strong magnets on the back, the hand-held device adheres firmly and securely to metallic surfaces



### Store, transfer and print measurement data

Micro-SD, Mini-USB and Bluetooth for data transfer to Smartphone, Tablet or PC – or infrared speed printer



### Easy to clean and reliable

4 years warranty without maintenance obligation by using long-life sensors



### Practical accessories

Optionally: transport case, MRU speed printer, probe with 180 mm exchangeable probe tube and 3rd sensor for NO measurement

# DELTAsmart

## Technical data



Measured values	Measuring range	Resolution	Accuracy
Oxygen (O <sub>2</sub> )	0 ... 21.0 Vol.-% absolute	0.1%	± 0.2 Vol.-% absolute
Carbon monoxide (CO) (H <sub>2</sub> compensated)	0 ... 4,000 ppm, overload up to 10,000 ppm*	1 ppm	± 10 ppm or 5% of reading** < 4,000 ppm, 10% of reading > 4,000 ppm
Carbon monoxide (CO)	0 ... 10,000 ppm, overload up to 20,000 ppm*	1 ppm	± 20 ppm or 5% of reading** < 4,000 ppm, 10% of reading > 4,000 ppm
Nitric monoxide (NO)	0 ... 5,000 ppm, overload up to 10,000 ppm*	1 ppm	± 5 ppm or 5% of reading** < 5,000 ppm, 10% of reading > 5,000 ppm
Flue gas temperature	-40 ... +1,200 °C	0.1 °C	± 2 °C ... < 200 °C, 1% of reading** > 200 °C
Differential temperature	-40 ... +1,200 °C	0.1 °C	± 2 °C or 0.5%
Combustion air temperature	0 ... +100 °C	0.1 °C	± 2 °C
Chimney draft	± 200 hPa (mbar)	0.01 hPa	± 0.02 hPa (mbar) or 1%
Differential pressure	± 200 hPa (mbar)	0.01 hPa	± 0.02 hPa (mbar) or 1%
Combustion calculations	CO <sub>2</sub> , excess air, efficiency, dew point, CO ambient air measurement, leak test		

Calculated values	Measuring range (fuel dependent)	Resolution	Accuracy
Fuels	natural gas, light oil EL, liquid gas, pellets and many more		
Carbon dioxide (CO <sub>2</sub> )	0 ... CO <sub>2</sub> max.	0.1%	± 0.3 Vol.-% absolute
Dew point	°C	0.1 °C	
Flue gas loss (qA)	0 ... 99.9%	0.1%	
Efficiency	0 ... 120%	0.1%	
Excess air	0 ... 999%		

General technical data	
Operating conditions	+5 ... +45 °C; RH up to 95% non condensing
Storage conditions	-20 ... +50 °C
Data storage	1,000 measurements, 1,000 sites
Interface	Mini-USB, Micro-SD, IRDA, Bluetooth (data transfer to Smartphone, Tablet or PC)
Internal power supply	Li-Ion, 2,250 mAh, 8 Wh
Mains power supply	Power supply unit 100 ... 240 Vac, 50 ... 60 Hz, 5 V DC, 500 mA
Protection class	IP30
Approvals	TÜV-certified according to 1. BImSchV and EN 50379-1 and 2 (Version B) or EN 50379-3 (Version E), ByRgG 309
Dimensions (W x H x D)	82 x 169 x 44 mm
Weight	approx. 400 g (without probe)

**MRU – Competence in gas analysis. For over 35 years.**

### MRU · Messgeraete fuer Rauchgase und Umweltschutz GmbH

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since 1984®

AIRfair

EMISSION MONITORING SYSTEMS

O<sub>2</sub> | CO | CO<sub>high</sub> | NO | NO<sub>2</sub> | NO<sub>(x)</sub> | SO<sub>2</sub> | H<sub>2</sub>S | CO<sub>2</sub> | HC

# OPTIMA

Powerful handheld  
multigas analyzer



# OPTIMA

the advantages of the new generation



## Further development of a proven concept:

- new, high resolution 4" display for better readability and more informationen
- new menue design with many graphical displays
- illuminated condensate separator with optional water stop
- easy connection of Bluetooth™ printer and MRU4u App

# OPTIMA

## The slim multi talent handheld flue gas analyzer using up to 7 sensors

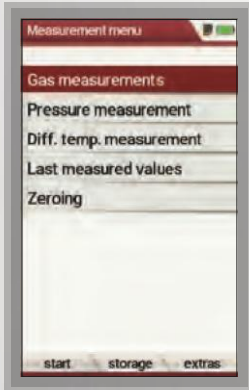
### Suitable for emission monitoring of combustions and industrial processes

Intuitive software menu and bright colour display will guide you through all measuring programs. Store up to 16.000 data sets directly in the analyser's internal data storage or on micro-SD card, or even use Bluetooth™ for wireless data transfer to notebook or MRU4u data app for smartphone or tablet. Printing via infrared, high speed thermal printer is at the tip of your fingers.

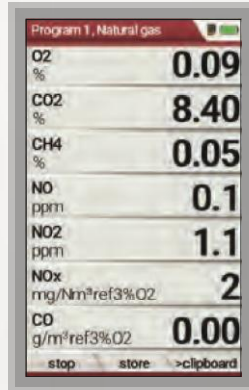


# Unit details

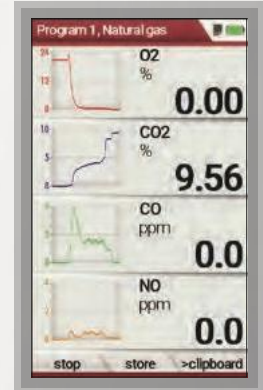
## Important Highlights



Clearly structured basic menu



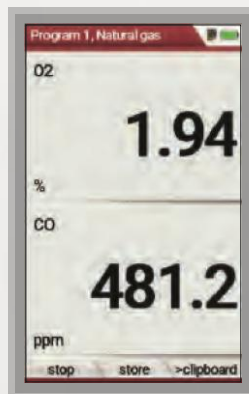
7, optionally 8 measuring results



Measuring values, incl. graphical progression curve



Optional gas flow monitoring (e. g. clogged filter)



Display zoom-function



Graphical core flow search



Detector probe for leak detection (with exchangeable sensors)



Large selection of probes and hoses for flue gas temperatures up to 1.100°C



Gas flow velocity measurement (m/s) by means of pitot tubes



# Unit details

## Special features at a glance

without waterstop



with waterstop



VA



### Large, illuminated condensate separator

now available with optional waterstop

### Robust stainless steel gas connectors

for gas- and pressure hoses

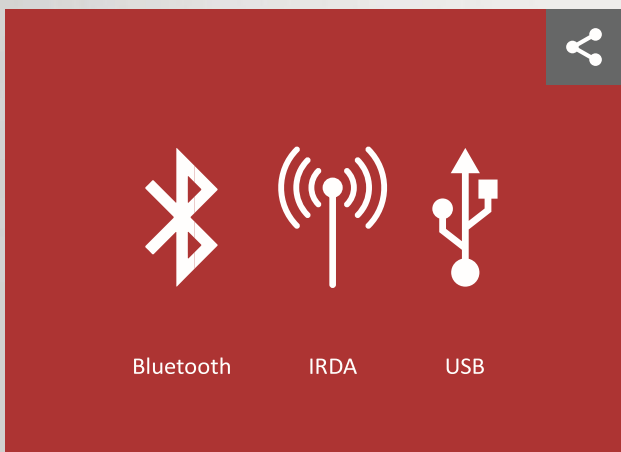


### Hands free operation

with magnetic power using the 3 magnets from the analyzer's rear side, this one will firmly stick on ferrous surfaces.

### AUX-socket for other transmitters

AUX universal auxiliary socket, for connection of HC gas detector, other pressure, temperature external sensors



### All important interfaces

for data transfer and printing as well as wireless connection to MRU4u app.



### Various cases for transportation

# OPTIMA

## Technical specifications

Measurement components	Range	Resolution	Accuracy
Oxygen O <sub>2</sub>	0 ... 25,00 Vol.-%	0,01 %	±0,2 Vol.-% abs.
Carbon dioxide CO <sub>2</sub> NDIR	0 ... 50,00 Vol.-%	0,01 %	±0,3 % or 5 % of the measured value **
Hydrocarbon HC NDIR	100 ... 40,000 ppm	10 ppm	±400 ppm or 5 % reading**
Carbonmonoxide CO	0 ... 10.000/20.000 ppm*	1 ppm	±10 ppm or 5 % reading up to 4.000 ppm** or 10 % reading up to 10.000 ppm**
Carbonmonoxide CO low***	0 ... 500 ppm	0,1 ppm	±2 ppm or 5 % reading**
Carbonmonoxide CO very high	0 ... 40.000/100.000 ppm*	< 9.999 ppm: 1 ppm > 10.000 ppm: 10 ppm	±0,02 % or 5 % reading up to 4,00 %** or 10% reading up to 10,00 %**
Nitricmonoxide NO	0 ... 1.000/5.000 ppm*	1 ppm	±5 ppm or 5 % reading up to 1.000 ppm** or 10 % reading up to 5.000 ppm**
Nitricmonoxide NO low***	0 ... 300 ppm	0,1 ppm	±2 ppm or 5 % reading**
Nitric dioxide NO <sub>2</sub>	0 ... 200/1.000 ppm*	1 ppm	±5 ppm or 5 % reading up to 200 ppm** or 10 % reading up to 1.000 ppm**
Nitric dioxide NO <sub>2</sub> low***	0 ... 100 ppm	0,1 ppm	±2 ppm or 5 % reading**
Sulfur dioxide SO <sub>2</sub>	0 ... 2.000/5.000 ppm	1 ppm	±10 ppm or 5 % reading up to 2.000 ppm** or 10 % reading up to 5.000 ppm**
Sulfur dioxide SO <sub>2</sub> low***	0 ... 300 ppm	0,1 ppm	±2 ppm or 4 % reading**
Hydrogen sulfide H <sub>2</sub> S	0 ... 500/2.000 ppm	1 ppm	±5 ppm or 5 % reading up to 500 ppm** or 10 % reading up to 5.000 ppm**
Hydrogen sulfide H <sub>2</sub> S low***	0 ... 100 ppm	1 ppm	±2 ppm or 4 % reading**
Methane (CH <sub>4</sub> ) NDIR	100 ... 40.000 ppm	10 ppm	±400 ppm or 5% reading*
Stack gas temperature T.Gas	0 ... 1.200 °C	0,1 °C	±2 °C ... < 200 °C or 1 % reading up to 200°C**
Combustion air temperature T.Air	0 ... 100 °C	0,1 °C	±1 °C
Temperature / Differential temperature T1/T2	-40 °C ... 1.200°C (with thermocouple type K)	0,1 °C	±2 °C or 1% reading**
Draught / Differential pressure	-300 ... +300 hPa	0,01 hPa	±0,02 hPa

Calculated values	
Combustion calculations	based on the large fuel type list like: CO <sub>2</sub> , excess air, heat losses, combustion efficiency, flue gas dew point, CO/CO <sub>2</sub> ratio
Emission calculations	mg/Nm <sup>3</sup> , NO <sub>x</sub> as mg/m <sup>3</sup> NO <sub>2</sub> true measurement of Nox = NO + NO <sub>2</sub> including O <sub>2</sub> referencing (normalisation) to user settable value

General specifications	
Operation temperature	+5 ... +45 °C, max. 95 % RF, non condensing
Storage temperature	-20 ... +50 °C
Data storage	dynamic, up to 16.000 measurements
Interfaces	mini-USB, SD, Infrared, Bluetooth™ (data transfer to smartphone, tablet or PC)
CO-sensor purge (option)	using second pump, for sensor protection
Power supply	high energy Lithium-Ion battery (approx. 15 h operation)
Mains	wall-plug grid power supply, 100–240 Vac / 50 ... 60 Hz
Protection class	IP 30
Certification	TÜV ByRgG 280, VDI 4206-1, EN 50379
Weight	approx. 750 g
Dimensions (W x H x D)	110 x 244 x 54 mm

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CH<sub>4</sub> | CO<sub>2</sub> | H<sub>2</sub>S | O<sub>2</sub> | H<sub>2</sub> | N<sub>2</sub> | CO | NO | NO<sub>2</sub> | NO<sub>x</sub>

# OPTIMA Biogas

Professional rugged handheld biogas analyzer.



For fast gas analysis at biogas, biomethane and landfill plants.



# OPTIMA Biogas

## Multi-use handheld device for fast control measurements

With OPTIMA Biogas we offer you additionally measurement of biogas pressure and temperature, gas flow velocity, with normalized flow rate calculation.

OPTIMA Biogas may measure, given an appropriate sensor configuration, CHP engine exhaust gases as well.

### These are your special advantages:

- Biogas measurement: CH<sub>4</sub>, CO<sub>2</sub>, O<sub>2</sub>, H<sub>2</sub>S
- Exhaust gas measurement: O<sub>2</sub>, CO<sub>2</sub>, CO, NO, NO<sub>2</sub>
- Ambient air measurement: CH<sub>4</sub> (LEL), H<sub>2</sub>S
- Different measuring units settable by user
- Intuitive menu navigation with function keys
- Glass fiber reinforced enclosure with fixing magnets
- High volume data memory with interface to App and PC software
- Strong Lithium-Ion battery for at least 15 h continuous operation



# The device in detail

## An overview of the special features



### Operation and colour display

Intuitive guidance through the measuring programs, thanks to simple display and keypad interaction



### Condensate and dirt are kept out

Large-volume condensate separator with proven star filter including water stop function



### Combination probe

For simultaneous measurement of flow velocity and biogas sampling, with temperature and pressure measurement for normalized flow rate calculation



### Store, transfer and print measurement data

SD card, Mini-USB and Bluetooth for data transfer to Smartphone, Tablet or PC – or infrared speed printer



### Simultaneous measurement of biogas and flow velocity

Measurement of bio- or landfill gas, using special S-type probe, with 2 ... 100 m/s and calculation of the flow rate in m<sup>3</sup>/h



### Practical accessories to carry along

Optionally: transport case, gas sampling probe, MRU speed printer and nylon transport bag

# OPTIMA Biogas

## Technical data



Biogas/-methane	Measuring method	Measuring range min./max.	Resolution	Accuracy
<b>Methane (CH<sub>4</sub>)</b>	NDIR	0 ... 100 %	0.01 %	± 0.3 % or 3 % reading* or 0,5 % reading after calibration*
<b>Carbon dioxide (CO<sub>2</sub>)</b>	NDIR	0 ... 100 %	0.01 %	± 0.3 % or 3 % reading* or 0,5 % reading after calibration*
<b>Hydrogen sulphide (H<sub>2</sub>S)</b>	electrochemical	0 ... 2,000/5,000 ppm	1 ppm	± 5 ppm or 5 % (0 ... 500 ppm), 10 % (> 500 ppm) reading
<b>Oxygen (O<sub>2</sub>)</b>	electrochemical	0 ... 25 %	0.01 %	± 0.2 % absolute
<b>Hydrogen (H<sub>2</sub>)</b>	electrochemical	0 ... 1,000/2,000 ppm	1 ppm	± 5 ppm or 5 % (0 ... 500 ppm), 10 % (> 500 ppm) reading
<b>Nitrogen (N<sub>2</sub>)</b>	calculated	0 ... 100 %	0.1 %	
<b>Calorific value (Hu)</b>	calculated	0 ... 50 MJ/m <sup>3</sup>	0.1 MJ/m <sup>3</sup>	

Engine exhaust gas (CHP)	Measuring method	Measuring range min./max.	Resolution	Accuracy
<b>Oxygen (O<sub>2</sub>)</b>	electrochemical	0 ... 25 %	0.01 %	± 0.2 % absolute
<b>Carbon dioxide (CO<sub>2</sub>)</b>	NDIR	0 ... 100 %	0.01 %	± 0.3 % or 3 % reading*
<b>Carbon monoxide (CO)</b>	electrochemical	0 ... 10,000/20,000 ppm	1 ppm	± 10 ppm or 5 % (0 ... 4,000 ppm), 10 % (> 4,000 ppm) reading
<b>Nitric monoxide (NO)</b>	electrochemical	0 ... 1,000/5,000 ppm	1 ppm	± 5 ppm or 5 % (0 ... 1,000 ppm), 10 % (> 1,000 ppm) reading
<b>Nitric dioxide (NO<sub>2</sub>)</b>	electrochemical	0 ... 200/1,000 ppm	1 ppm	± 5 ppm or 5 % (0 ... 200 ppm), 10 % (> 200 ppm) reading
<b>Nitric dioxide (NO<sub>x</sub>)</b>	calculated	0 ... 5,000 ppm	1 ppm	± 5 ppm or 5 % (0 ... 1,000 ppm), 10 % (> 1,000 ppm) reading
<b>Methane (CH<sub>4</sub>)</b>	NDIR	100 ... 40,000 ppm	10 ppm	± 400 ppm or 5 % reading*

Landfill gas	Measuring method	Measuring range min./max.	Resolution	Accuracy
<b>Methane (CH<sub>4</sub>)</b>	NDIR	0 ... 100 %	0.01 %	± 0.3 % or 3 % reading*
<b>Carbon dioxide (CO<sub>2</sub>)</b>	NDIR	0 ... 100 %	0.01 %	± 0.3 % or 3 % reading*
<b>Hydrogen sulphide (H<sub>2</sub>S)</b>	electrochemical	0 ... 2,000/5,000 ppm	1 ppm	± 5 ppm or 5 % (0 ... 500 ppm), 10 % (> 500 ppm) reading
<b>Oxygen (O<sub>2</sub>)</b>	electrochemical	0 ... 25 %	0.01 %	± 0.2 % absolute
<b>Hydrogen (H<sub>2</sub>)</b>	electrochemical	0 ... 1,000/2,000 ppm	1 ppm	± 5 ppm or 5 % (0 ... 500 ppm), 10 % (> 500 ppm) reading
<b>Nitrogen (N<sub>2</sub>)</b>	calculated	0 ... 100 %	0.1 %	
<b>Calorific value (Hu)</b>	calculated	0 ... 50 MJ/m <sup>3</sup>	0.1 MJ/m <sup>3</sup>	
<b>Gas flow velocity</b>	S-type probe	1 ... 100 m/s	0.1 m/s	± 0.2 m/s (2 ... 10 m/s), ± 0.5 % (> 10 m/s)
<b>Flow rate</b>	calculated	0.1 ... 6,000 m <sup>3</sup> /s	0.1 m <sup>3</sup> /s	user settable cross section area
<b>Differential temperature</b>	NiCrNi	-40 ... +1,200 °C	1 °C	± 2 °C, 0.5 % reading*
<b>Differential pressure</b>		± 300 hPa	0.01 hPa	0.03 hPa, 1 % reading*

General technical data	
<b>Operating conditions</b>	+5 ... +45 °C; RH up to 95 % non condensing
<b>Storage conditions</b>	-20 ... +50 °C
<b>Data storage</b>	>20,000 data sets
<b>Interface</b>	Mini-USB, SD, IRDA, Bluetooth (data transfer to Smartphone, Tablet or PC)
<b>Internal power supply</b>	Li-Ion battery
<b>Mains power supply</b>	wall plug unit 100 ... 240 Vac, 50 ... 60 Hz, 5 V DC, 1.2 A
<b>Protection class</b>	IP30
<b>Dimensions (W x H x D)</b>	113 x 244 x 54 mm
<b>Weight</b>	approx. 750 g

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