



NO<sub>x</sub> | NO | NO<sub>2</sub> | CO | CO<sub>2</sub> | SO<sub>2</sub> | HC as CH<sub>4</sub> or C<sub>3</sub>H<sub>8</sub> | O<sub>2</sub> | H<sub>2</sub>S | H<sub>2</sub>

## VARIOluxx

Portable, certified stack gas emission analyser.



Combined NDIR/EC measurement technology for precise measurement results.



# VARIOluxx

## First choice for smart gas analysis

The combination of infrared measurement technology and electrochemical sensors ensures versatility and reliable analysis even of small measuring ranges. VARIOluxx – portable industrial measurement technology for high requirements!

With VARIOluxx, the simultaneous analysis of up to 9 exhaust gas components is possible:

NO<sub>x</sub> | NO | NO<sub>2</sub> | CO | CO<sub>2</sub> | SO<sub>2</sub> | HC as CH<sub>4</sub> or C<sub>3</sub>H<sub>8</sub> | O<sub>2</sub> | H<sub>2</sub>S | H<sub>2</sub>

### We offer you these special advantages:

- Automatic measuring program with data recording
- Automatic zero point measurement for long-term measurements
- Lithium-ion battery operation, including gas cooler and measurement technology



acc. DIN EN 50379-1 and 2

### The gases and measuring ranges

Gas	Method <sup>1</sup>	Measuring range min./max.	Note
O <sub>2</sub>	EC	0 ... 25 %	TÜV certified
O <sub>2</sub>	PM	0 ... 25 %	
CO	EC	0 ... 10,000/20,000	TÜV certified
CO	NDIR	0 ... 3,000 ppm/10.00 %	
CO <sub>2</sub>	NDIR	0 ... 5.00/40.00 %	TÜV certified
CH <sub>4</sub>	NDIR	0 ... 3,000 ppm/4.00 %	
C <sub>3</sub> H <sub>8</sub>	NDIR	0 ... 1,000/10,000 ppm	
NO	EC	0 ... 1,000/5,000 ppm	TÜV certified
NO <sub>2</sub>	EC	0 ... 200/1,000 ppm	TÜV certified
SO <sub>2</sub>	EC	0 ... 1,000/5,000 ppm	TÜV certified
H <sub>2</sub> S	EC	0 ... 50/500 ppm	
H <sub>2</sub>	EC	0 ... 1,000/2,000 ppm	

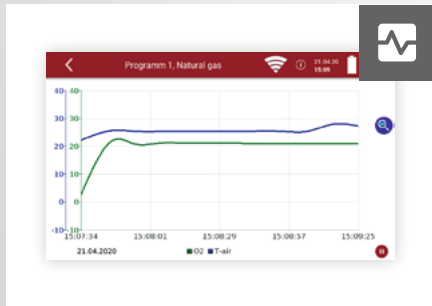
<sup>1</sup>EC = electrochemical sensor, PM = paramagnetic sensor, NDIR = non-dispersive infrared spectroscopy





# The device in detail

## An overview of the special features



### Practical touch display

High resolution 7" color display with graphical output of the measured values



### Optimal protection

All-metal housing with soft bumper corners for the harsh industrial everyday use



### Comfortable size

Very compact dimensions (W x H x D: 430 x 290 x 150 mm) and light weight (8 kg)



### On the go

Aluminum transport case with wheels or nylon carrying/protective bags

# Operation and interfaces

## Simple and clear

### Operating options



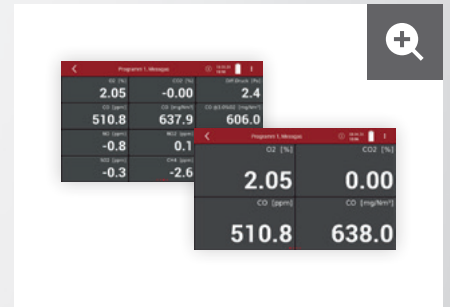
#### Touchscreen

Device operation via the 7" touch/swipe display, resolution 800 x 480 px, 750 cd/m<sup>2</sup>



#### Contactless

Operation via smartphone or PC via VNC connection, mirrored device display on smartphone



#### Zoom function

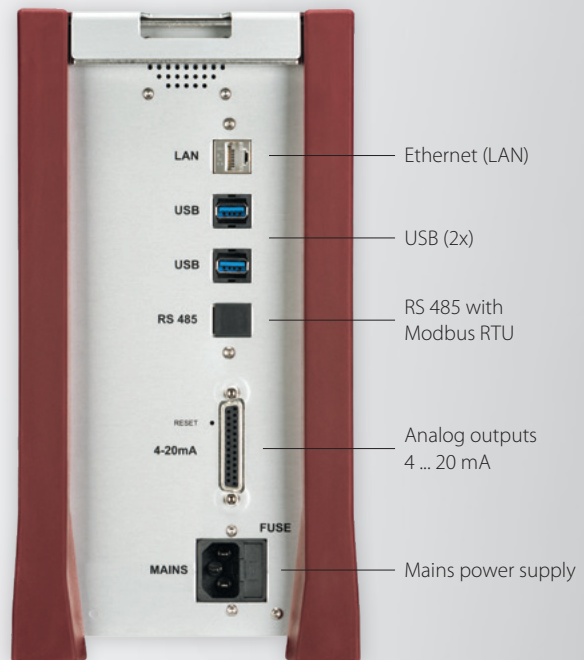
Scalable display mode for the display

### Connections and interfaces

#### Measuring technology



#### Data communication



# The gas conditioning

## An overview



### Gas sampling probe

- Robust industrial probe with heated hose
- Also possible for flue gas temperatures up to 1,100 °C
- Heated gas sampling line (3 m, 5 m or up to 50 m)
- Exchangeable probe tubes up to 2 m length
- Easy to change filter in the probe head
- Filters can be filled with different material, depending on the amount of dirt



Probe for low dirt applications



### Peltier gas cooler

Automatic condensate pumps



### Gas pump

Powerful pump for fast response times



# Data transmission and measurement

## The technology behind

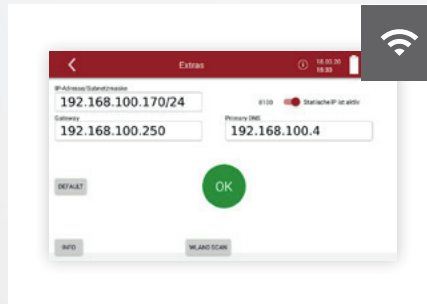
### Data transmission

#### Fully equipped standard device:

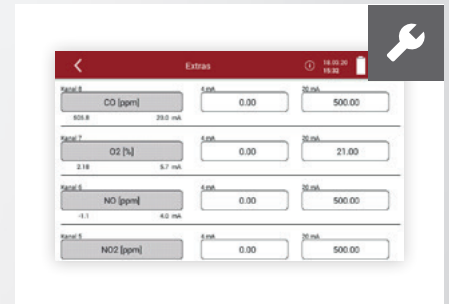
- Ethernet (LAN) TCP/IP
- WiFi
- 8 analog outputs 4 ... 20 mA
- 4 analog inputs
- USB (2x)
- RS 485 (option)

#### Internal data storage:

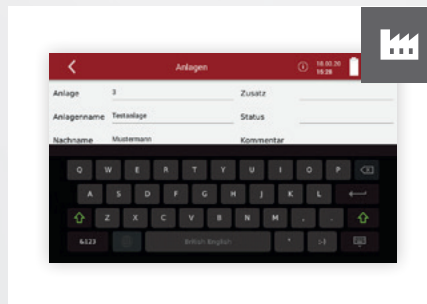
The huge memory with 400 MB offers space for thousands of facilities and data sets.



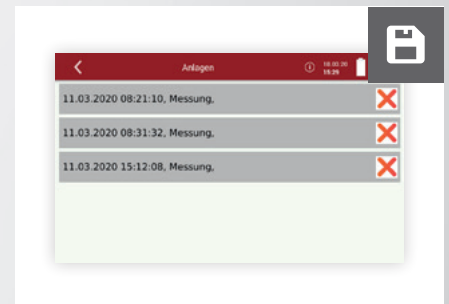
Set LAN



Set analog outputs



Manage facilities

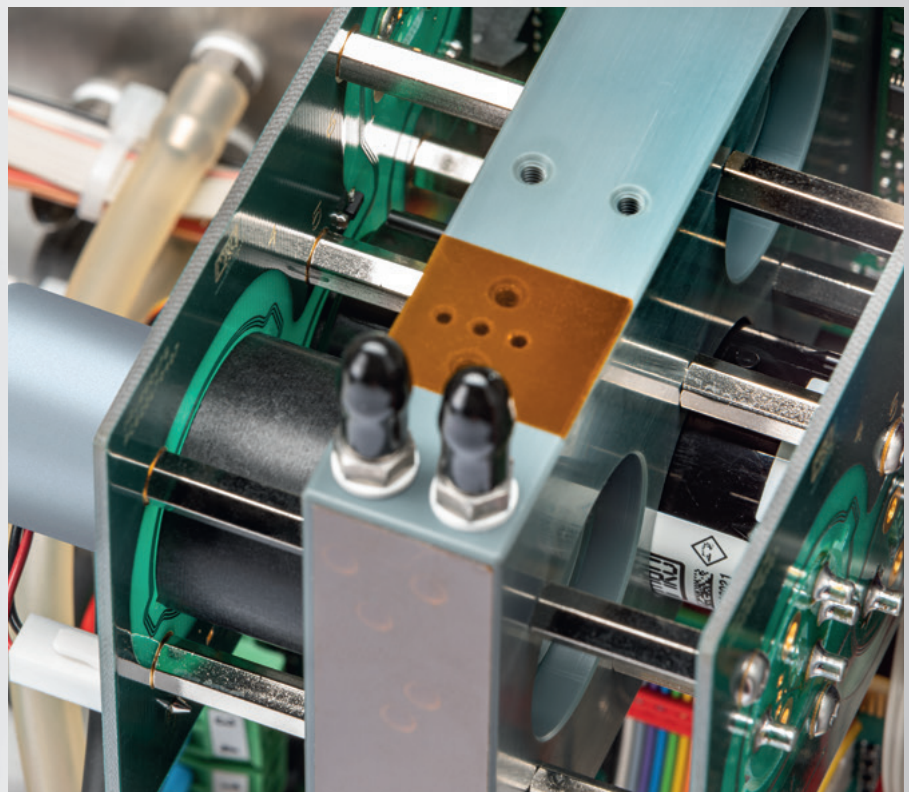


Save measurements by facility

### High quality measurement technology

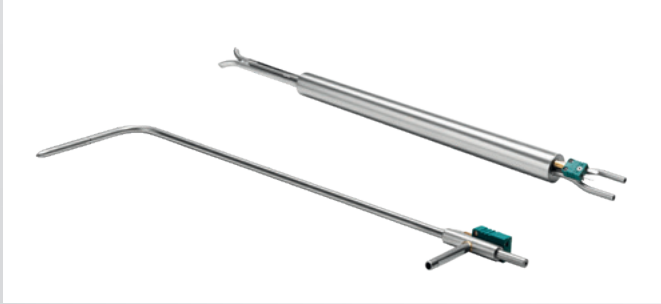
The combination of infrared measurement technology and electrochemical sensors of the VARIOluxx guarantees onereliable analysis of small measuring ranges.

- Infrared sensors (NDIR) for CO<sub>2</sub>, CO, CH<sub>4</sub>, C<sub>3</sub>H<sub>8</sub>
- Electrochemical sensors (EC) for CO, NO, NO<sub>2</sub>, SO<sub>2</sub>, H<sub>2</sub>S, H<sub>2</sub>, O<sub>2</sub> (max. 6 sensors simultaneously)
- Paramagnetic O<sub>2</sub> analysis
- Differential pressure measurement
- Temperature measurement of flue gas and combustion air
- Flow rate measurement and volume flow calculation



# Practical accessories

## For more flexibility



### Pitot tubes for flow velocity measurement

- L-type or S-type with temperature measurement (up to 1,000 °C), length: 300 ... 1,500 mm
- Measuring ranges from 3 to 100 m/s at a resolution of 0.1 m/s
- Additional calculation of the volume flow (m<sup>3</sup>/s)



### USB WiFi adapter

- For wireless data transmission



### NiMH battery

- Practical battery for safe flight transportation, instead of a lithium-ion battery



### WiFi printer

- With lithium-ion battery and USB socket
- Suitable for 80 mm paper width



### PC software "MRU4Win"

- Software for Windows to visualize measure data, manage, export and print
- Connect multiple devices at the same time and read out live values
- Logging and saving live values
- Database with customer contacts, attachments and manage users
- Export measurement reports as PDF
- Documents with customized logo and print out the address
- Read out data storage, save measurements, print and save as PDF

# VARIOluxx – Technical data

Gas measurement	Note	Method <sup>1</sup>	Measuring range min./max.*	Resolution	Accuracy**
Oxygen (O <sub>2</sub> ) (long life)	TÜV certified	EC	0 ... 25.00 %	0.01 %	0.2 %
Oxygen (O <sub>2</sub> )		PM	0 ... 25.00 %	0.01 %	0.1 %
Carbon monoxide (CO <sub>low</sub> )		spec. adjustment	0 ... 500.0 ppm	0.1 ppm	± 2 ppm or 5 % reading
Carbon monoxide (CO <sub>H2komp</sub> )	TÜV certified	EC	0 ... 10,000/20,000 ppm	1 ppm	± 10 ppm or 5 % reading
Carbon monoxide (CO <sub>very high</sub> )		EC	0 ... 2.00/10.00 %	0.01 %	± 0.01 % or 5 % reading
Carbon monoxide (CO)		NDIR	0 ... 3,000/30,000 ppm	1 ppm	± 10 ppm or 2 % reading***
Carbon monoxide (CO)		NDIR	0 ... 1.00/10.00 %	0.01 %	± 0.1 % or 2 % reading
Carbon dioxide (CO <sub>2</sub> )	TÜV certified	NDIR	0 ... 5.00/40.00 %	0.01 %	± 0.3 % or 2 % reading
Methane (CH <sub>4</sub> )		NDIR	0 ... 3,000/10,000 ppm	1 ppm	± 20 ppm or 2 % reading
Propane (C <sub>3</sub> H <sub>8</sub> )		NDIR	0 ... 1,000/10,000 ppm	1 ppm	± 10 ppm or 2 % reading
Methane (CH <sub>4</sub> )		NDIR	0 ... 1.00/4.00 %	0.01 %	± 0.05 % or 2 % reading
Nitric monoxide (NO <sub>low</sub> )		spec. adjustment	0 ... 300.0 ppm	0.1 ppm	± 2 ppm or 5 % reading
Nitric monoxide (NO)	TÜV certified	EC	0 ... 1,000/5,000 ppm	1 ppm	± 5 ppm or 5 % reading
Nitric dioxide (NO <sub>2low</sub> )		spec. adjustment	0 ... 100.0 ppm	0.1 ppm	± 2 ppm or 5 % reading
Nitric dioxide (NO <sub>2</sub> )	TÜV certified	EC	0 ... 200/1,000 ppm	1 ppm	± 5 ppm or 5 % reading
Sulphur dioxide (SO <sub>2low</sub> )		spec. adjustment	0 ... 100.0 ppm	0.1 ppm	± 2 ppm or 5 % reading
Sulphur dioxide (SO <sub>2</sub> )	TÜV certified	EC	0 ... 1,000/5,000 ppm	1 ppm	± 10 ppm or 5 % reading
Hydrogen sulphide (H <sub>2</sub> S <sub>low</sub> )		spec. adjustment	0 ... 50/500 ppm	1 ppm	± 2 ppm or 5 % reading
Hydrogen sulphide (H <sub>2</sub> S)		EC	0 ... 2,000/5,000 ppm	1 ppm	± 5 ppm or 5 % reading
Hydrogen (H <sub>2</sub> )		EC	0 ... 1,000 2,000 ppm	1 ppm	± 5 ppm or 5 % reading
Other measurements		Method	Measuring range	Resolution	Accuracy**
Stack gas temperature (T <sub>gas</sub> )		NiCrNi	0 ... 1,100 °C	1 °C	± 1 °C or 2 % reading
Combustion air temperature (T <sub>air</sub> )		NiCrNi	0 ... 500 °C	1 °C	± 1 °C or 2 % reading
Ambient air temperature (T <sub>amb</sub> )		NiCrNi	0 ... 100 °C	1 °C	± 1 °C or 2 % reading
Differential pressure (P-Druck)		Piezoresistive	-120 ... +120 hPa	1 Pa	± 2 Pa or 1 % reading
Flow velocity measurement (v)		DiffDruck	3 ... 100 m/s	1 m/s	± 1 m/s or 1 % reading
Standardized ext. signal (AUX connection)		software	for NiCrNi-thermocouple, 0 ... 10 Vdc, 4 ... 20 mA, RS 485		
Combustion calculations (fuel type depend.)		software	Losses, ExcAir, Air Ratio, dew point, CO <sub>2</sub>		
Emission calculations		software	mg/Nm <sup>3</sup> , reference to O <sub>2</sub> , g/s, kg/h		
General technical data					
Operating system	LINUX				
Display, operation	7" TFT (800 x 480 px) colour display, backlit, with touch pad				
Data storage type	dynamic, internally 10,000 data sets, external USB stick				
Interface to PC/notebook	Ethernet, WiFi, RS 485				
Cable/wireless communication interface	RS 485, RJ45 (Ethernet), WiFi				
Printer	external USB/WiFi printer				
Analog output/input 4 ... 20 mA	8 channel out, 4 channel in, user configurable				
Universal analog input (AUX)	0 ... 10 Vdc, 4 ... 20 mA, NiCrNi-thermocouple, RS 485				
System warm up time	30 minutes, typical				
Mains free operation time	Li-Ion, 48 Wh, for standby 1 hour (optional additional battery, 48 Wh Li-Ion)				
Operating conditions	+5 ... +45 °C; RH up to 95 % non condensing				
Storage temperature	-20 ... +50 °C				
Power supply	86 ... 265 Vac, 47 ... 63 Hz, 105 W (up to 600 W with heated gas sample line)				
Protection class	IP20 (or IP42 inside transport case, optional)				
Dimensions (W x H x D)	430 x 290 x 150 mm				
Weight	approx. 8 kg only device, approx. 13 kg packed in bag with accessories				

Data subject to change without notice. | <sup>1</sup> EC = electrochemical sensor, PM = paramagnetic sensor, NDIR = non-dispersive infrared spectroscopy  
\* overload range of ECS is usable only for short duration | \*\* which ever is larger | \*\*\* with hourly reset to zero | N-12745-K0-10-620-SDE

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



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