



# EMISSION MONITORING SYSTEMS

We *care* about the environment

## INDUSTRIAL CONTROL AND TEST MEASUREMENTS MOBILE · VERSATILE · RUGGED



### VARIOplus Industrial

Simultaneous measurement  
of up to  
9 gas components

- O2
- CO
- CO  
very high
- NO
- NO2
- NOx
- SO2
- CO2
- CH4
- C3H8
- H2S
- H2

# VARIO plus INDUSTRIAL

## Simultaneous measurement of up to 9 gas components

TÜV approval EN 50379.

Compliant to USEPA-methods CTM-030 and CTM-034.

The **VARIOplus Industrial** combines infrared technology electrochemical sensors for maximum versatility.

### Important features and performance characteristics

- Automatic self test of software and hardware functions
- Large, high-contrast and backlit graphic display with zoom function
- Integrated, electric gas cooler unit
- Automatic condensate draining pump
- RS 232 interface and internal data storage for 8.500 measurements (data sets)
- Integrated high speed thermal printer
- Automatic interval measurement
- Data logging and visualization software for PC
- Differential pressure measurement  $\pm 100$  hPa
- Universal analog input 0 ... 10 V / 4 ... 20 mA
- 2 hours battery operation with running gas cooler and probe filter heating (without heated gas sampling line)

### Additional options

- SD card for large volume data logging
- External battery for measurement operation up to 6 hours
- Sample probe with heated filter
- Heated gas sample line, length 3 m or 5 m (only with line voltage supply)
- Sample probe tubes with length from 300 ... 2.000 mm
- Gas velocity measurement using Pitot tube [Nm<sup>3</sup>/s] and mass flow calculation [mg/s]
- 8 channel analog outputs 4 ... 20 mA
- External 12 Vdc power supply cable from car cigarette lighter
- Robust aluminium framed transport case with trolley
- Analyzer heating device (freeze protection)



### 3-gas-infrared bench

CO	0 ... 10.000 ppm / 30.000 ppm	0 ... 3 % / 10 %
CO <sub>2</sub>	0 ... 3 % / 20 %	0 ... 3 % / 30 %
CH <sub>4</sub>	0 ... 10.000 ppm / 30.000 ppm	0 ... 1 % / 3 %
C <sub>3</sub> H <sub>8</sub>	0 ... 2.000 ppm / 5.000 ppm	

### Electrochemical measurement

■ O <sub>2</sub>	0 ... 21 %
■ CO (Hz comp)	0 ... 4.000 ppm (* up to 10.000 ppm)
■ NO	0 ... 1.000 ppm (* up to 5.000 ppm)
■ NO <sub>2</sub>	0 ... 200 ppm (* up to 1.000 ppm)
■ SO <sub>2</sub>	0 ... 2.000 ppm (* up to 5.000 ppm)
■ CO (very high)	0 ... 4 % (* up to 10 %)
■ H <sub>2</sub> S	0 ... 50 ppm (* up to 500 ppm)
■ H <sub>2</sub>	0 ... 1 % (* up to 2 %)

\* max. overload, for short time

### Gas sampling probes

MRU offers industrial probes for high and low dust content, for gas temperatures for up to 650 °C (stainless steel), for up to 1.100 °C (Inconel steel) and for up to 1.700 °C (ceramic). Probes with and without heated filter element, with and without heated gas sampling line and probe tubes in several lengths.

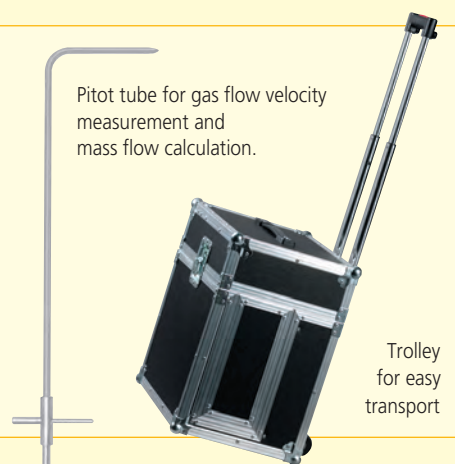
■ see separate probe brochure



Light weight protective nylon transport case with adjustable shoulder strap



Handheld remote control incl. 10 (20) m data transmission cable



Pitot tube for gas flow velocity measurement and mass flow calculation.

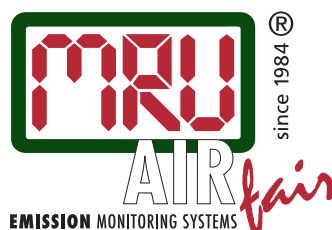
Trolley for easy transport

- |                                   |                                    |                       |
|-----------------------------------|------------------------------------|-----------------------|
| 1 Draft Differential pressure     | 7 AUX connector                    | 15 Analog outputs     |
| 2 Heated hose and gas temperature | 8 Ventilation gas cooler           | 16 RS 485             |
| 3 Sample gas inlet                | 9 Eye for sholder strap            | 17 High speed printer |
| 4 Dust and particle filter        | 10 SD card                         |                       |
| 5 Condensate outlet               | 11 External keyboard               |                       |
| 6 Combustion air temperature      | 12 External 12Vdc power supply     |                       |
|                                   | 13 110 / 230 V line voltage supply |                       |
|                                   | 14 RS 232                          |                       |

## Technical specifications

<b>Fuel types</b>	e.g. natural gas, liquid gas, oil light, pellets, coal, oil heavy, bio diesel, self-programable fuel types
<b>Measured components</b>	Electrochemical sensors
<b>Oxygen O<sub>2</sub></b>	0 ... 21,0 Vol.-%, accuracy: $\pm 0,2$ Vol.-% abs.
<b>Carbon monoxide CO(H<sub>2</sub>-comp.)</b>	0 ... 4.000 ppm (overload up to 10.000 ppm), accuracy <200 ppm, $\pm 10$ ppm or* $\pm 10$ % reading >200 ppm, $\pm 20$ ppm or* $\pm 5$ % reading >2.000 ppm, $\pm 10$ % reading
<b>Carbon monoxide CO(very high)</b>	0 ... 4,00 % (overload up to 10,00 %), accuracy $\pm 0,02$ % or* 5 % reading <4,00 % / 10 % reading >4,00 %
<b>Nitric monoxide NO</b>	0 ... 1.000 ppm (overload up to 5.000 ppm), accuracy $\pm 5$ ppm or* 5 % reading <1.000 ppm / 10 % reading >1.000 ppm
<b>Nitric dioxide NO<sub>2</sub></b>	0 ... 200 ppm (overload up to 1.000 ppm), accuracy $\pm 5$ ppm or* 5 % reading <200 ppm / 10 % reading >200 ppm
<b>Sulfur dioxide SO<sub>2</sub></b>	0 ... 2.000 ppm (overload up to 5.000 ppm), accuracy $\pm 10$ ppm or* 5 % reading <2.000 ppm / 10 % reading >2.000 ppm
<b>Hydrogen sulfide H<sub>2</sub>S</b>	0 ... 50 ppm (overload up to 500 ppm), accuracy $\pm 5$ ppm or* 5 % reading <50 ppm / 10 % reading >50 ppm
<b>Hydrogen H<sub>2</sub></b>	0 ... 1 % (overload up to 2 %), accuracy $\pm 0,02$ % or* 5 % reading <1 % / 10 % reading >1 %
<b>3-gas infrared bench</b>	
<b>Carbon monoxide CO</b>	0 ... 10 %, accuracy $\pm 0,03$ % or* $\pm 3$ % reading
<b>Carbon dioxide CO<sub>2</sub></b>	0 ... 30 %, accuracy $\pm 0,5$ % or* $\pm 3$ % reading
<b>Hydrocarbons CH<sub>4</sub> (Methane)</b>	0 ... 3 %, accuracy $\pm 0,03$ % or* $\pm 3$ % reading
<b>Hydrocarbons C<sub>3</sub>H<sub>8</sub> (Propane)</b>	0 ... 5.000 ppm, accuracy $\pm 30$ ppm or* $\pm 3$ % reading
<b>Combustion air temp. TL</b>	0 ... 300 °C, accuracy $\pm 1$ °C
<b>Draft/ differential pressure <math>\Delta P</math></b>	-100 ... +100 hPa, accuracy $\pm 0,02$ hPa or* 3 % reading
<b>Flow velocity measurement</b>	1m/s ... 100 m/s, accuracy $\pm 1$ m/s or* 3 % reading
<b>Calculated values</b>	dependent on fuel type
<b>Carbon dioxide CO<sub>2</sub></b>	0 ... CO <sub>2</sub> max, accuracy $\pm 0,3$ Vol.-% abs.
<b>Heat losses qA</b>	0 ... 99,9 %
<b>Combustion efficiency <math>\eta</math></b>	0 ... 120 %
<b>Excess air</b>	1, ... 99,9 %
<b>Reference to O<sub>2</sub>, NO<sub>x</sub></b>	mg/Nm <sup>3</sup> , ppm, NO <sub>x</sub> in mg/m <sup>3</sup> NO <sub>2</sub> , NO + NO <sub>2</sub> = NO <sub>x</sub> (if NO + NO <sub>2</sub> is installed)
<b>Digital data transfer</b>	RS 232, baud 9.600, data memory for approx. 8.500 measurements
<b>Analog input / output</b>	0 ... 10 V or 4 ... 20 mA, 8 outputs 4 ... 20 mA
<b>CO-sensor purge</b>	using 2nd pump, for sensor protection
<b>Gas cooler / condensate</b>	Peltier cooler, peristaltic pump for automatic condensate draining
<b>General specifications</b>	
<b>Operating temperature</b>	+5 °C ... +45 °C, max. 95 % rF, non condensing
<b>Storage temperature</b>	-20 °C ... +50 °C
<b>Ambient conditions</b>	not for use in aggressive, corrosive or very high dust atmosphere
<b>Power supply</b>	approx. 2 hours battery operation with gas cooler, without heated gas sampling line
<b>Mains</b>	100 ... 250 Vac / 47 ... 63 Hz
<b>Protection class</b>	IP 21
<b>Weight</b>	approx. 7,0 kg (without transport case, bag, trolley)
<b>Dimensions</b>	(W x H x D) 530 x 490 x 310 mm
	*= which ever is larger

Dealer:



EMISSION MONITORING SYSTEMS

MRU · Measuring instruments for flue gases  
and environmental protection GmbH  
Fuchshalde 8 + 12 · 74172 Neckarsulm-Obereisesheim  
Phone +49 71 32-99620 · Fax +49 71 32-996220  
info@mru.de · www.mru.eu

Data subject to change without notice.

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