



# 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.

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

The **VARIOplus Industrial** combines NDIR technology with electrochemical sensors and ensures a maximum amount of 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

### Additional options

- SD card 1 GB for large volume data logging
- 2 hours battery operation with running gas cooler and probe filter heating (without heated gas sampling line)
- 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 grid power supply)
- Sample probe tubes with length from 300 ... 2.000 mm
- Gas velocity measurement by means of Pitot tube [Nm<sup>3</sup>/s] and mass flow calculation [mg/s]
- Universal analog input 0 ... 10 V / 4 ... 20 mA
- 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 ... 2.000 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



Leight 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.

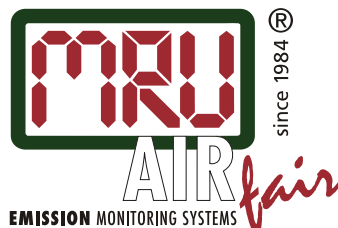
Trolley for comfortable transport

|                                   |                           |                                  |
|-----------------------------------|---------------------------|----------------------------------|
| 1 Draft                           | 7 Condensate outlet       | 14 ext. 12Vdc power supply       |
| 2 Differential pressure           | 8 Combustion air temp.    | 15 110 / 230 V grid power supply |
| 3 Differential pressure           | 9 AUX connector           | 16 RS 232                        |
| 4 Heated hose and gas temperature | 10 Ventilation gas cooler | 17 Analog outputs                |
| 5 Sample gas inlet                | 11 Eye for sholder strap  | 18 RS 485                        |
| 6 Dust and particle filter        | 12 SD card                | 19 HighSpeed-Printer             |
|                                   | 13 external keyboard      |                                  |

## 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: ±0,2 Vol.-% abs.  |
| <b>Carbon monoxide CO(H<sub>2</sub>-comp.)</b>           | 0 ... 2.000 ppm (overload up to 10.000 ppm),<br>accuracy <200 ppm, ±10 ppm or ±10 % reading<br>>200 ppm, ±20 ppm or ±5 % reading<br>>2.000 ppm, ±10 % reading  |
| <b>Carbon monoxide CO(very high)</b>                     | 0 ... 4,00 % (overload up to 10,00 %),<br>accuracy ±0,02 % or 5 % reading <0,4 % / 10 % reading >0,4 %   |
| <b>Nitric monoxide NO</b>                                | 0 ... 1.000 ppm (overload up to 5.000 ppm),<br>accuracy ±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),<br>accuracy ±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),<br>accuracy ±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),<br>accuracy ±5 ppm or 5 % reading <50 ppm / 10 % reading >50 ppm  |
| <b>Hydrogen H<sub>2</sub></b>                            | 0 ... 1 % (overload up to 2 %),<br>accuracy ±0,02 % or 5 % reading <1 % / 10 % reading >1 %  |
| <b>3-gas infrared bench</b>                              |  |
| <b>Carbon monoxide CO</b>                                | 0 ... 10.000 ppm up to max. 0 ... 10 %, accuracy ±40 ppm or ±5 % reading   |
| <b>Carbon dioxide CO<sub>2</sub></b>                     | 0 ... 3 % or up to max. 0 ... 30 %, accuracy ±0,5 % or ±5 % reading  |
| <b>Hydrocarbons CH<sub>4</sub> (Methane)</b>             | 0 ... 10.000 ppm or up to max. 0 ... 3 %, accuracy ±60 ppm or ±5 % reading   |
| <b>Hydrocarbons C<sub>3</sub>H<sub>8</sub> (Propane)</b> | 0 ... 2.000 ppm or up to max. 0 ... 5.000 ppm, accuracy ±30 ppm or ±5 % reading  |
| <b>Combustion air temp. TL</b>                           | 0 ... 300 °C, accuracy ±1 °C   |
| <b>Draft/ differential pressure ?P</b>                   | -100 ... +100 hPa, accuracy ±0,02 hPa or 3 % reading   |
| <b>Flow velocity measurement</b>                         | 1m/s ... 100 m/s, accuracy ±1m/s or 3 % reading  |
| <b>Calculated values</b>                                 | fuel type depending  |
| <b>Carbon dioxide CO<sub>2</sub></b>                     | 0 ... CO <sub>2</sub> max, accuracy ±0,3 Vol.-% abs.   |
| <b>Heat losses q<sub>A</sub></b>                         | 0 ... 99,9 %   |
| <b>Combustion efficiency</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 (option)</b>                          | by means of 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>                                | no use in aggressive, corrosive or very high dust ambiance   |
| <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   |

Dealer:



EMISSION MONITORING SYSTEMS

MRU · Measuring instruments for flue gases  
and environmental protection GmbH  
Fuchshalde 8 · 74172 Neckarsulm-Oberreiseshheim  
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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