EMISSION MONITORING SYSTEMS

We *care* about the environment

INDUSTRIAL
CONTROL AND TEST MEASUREMENTS
MOBILE · VERSATILE · RUGGED

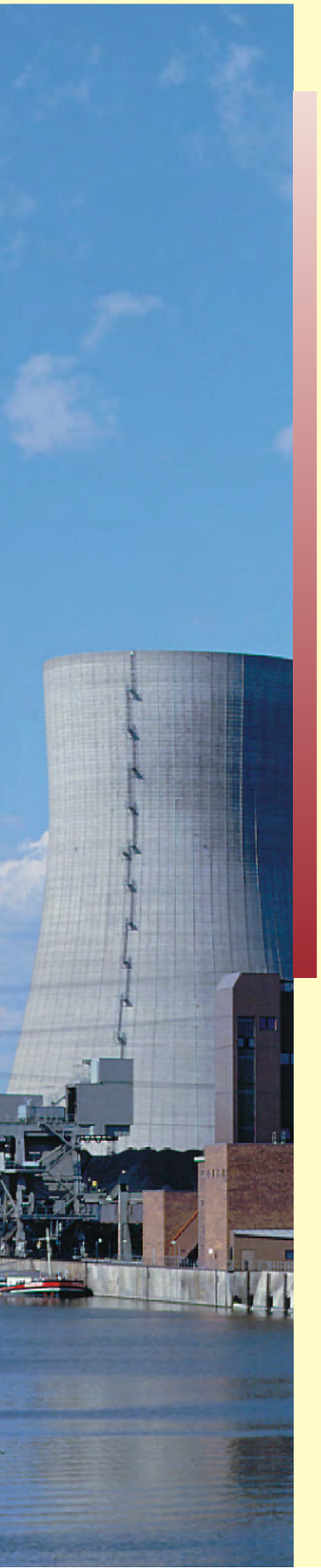
Suitable for industrial applications by means of infrared technology

MRU AIR fair ®
since 1984
EMISSION MONITORING SYSTEMS

VARIOplus Industrial
VARIOplus SE

Simultaneous measurement of up to 9 gas components

O_2 | CO | CO very high | NO | NO_2 | NO_x | SO_2 | CO_2 | CH_4 | C_3H_8 | H_2S | H_2



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 /SE** combines infrared 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 grafic display with zoom-function
- Condensate separator (SE)
- Integrated, electric gas cooler unit (Ind.)
- Automatic condensate draining pump (Ind.)
- 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 ± 100 hPa
- Universal analog input 0 ... 10 V / 4 ... 20 mA (Ind.)
- 8 hours battery operation without probe filter heating and infrared bench (SE)
- 2 hours battery operation with running gas cooler and probe filter heating (without heated gas sampling line) (Ind.)

Additional options

- SD card 1 GB for large volume data logging
- External battery for measurement operation up to 6 hours (Ind.)
- Sample probe with heated filter
- Heated gas sample line, length 3 m or 5 m (only with grid power supply) (Ind.)
- Sample probe tubes with length from 300 ... 2.000 mm
- Gas velocity measurement by means of Pitot tube [Nm³/s] and mass flow calculation [mg/s]
- 8 channel analog outputs 4 ... 20 mA
- External 12 Vdc power supply cable from car cigarette lighter (Ind.)
- Robust aluminium framed transport case with trolley
- Analyzer heating device (freeze protection) (Ind.)

3-gas-infrared bench

CO	0 ... 10.000 ppm / 30.000 ppm	0 ... 3 % / 10 %
CO_2	0 ... 3 % / 20 %	0 ... 3 % / 30 %
CH_4	0 ... 10.000 ppm / 30.000 ppm	0 ... 1 % / 3 %
C_3H_8	0 ... 2.000 ppm / 5.000 ppm	

Electrochemical measurement

O_2	0 ... 21 %
CO (H_2 comp)	0 ... 2.000 ppm (* up to 10.000 ppm)
NO	0 ... 1.000 ppm (* up to 5.000 ppm)
NO_2	0 ... 200 ppm (* up to 1.000 ppm)
SO_2	0 ... 2.000 ppm (* up to 5.000 ppm)
CO (very high)	0 ... 4 % (* up to 10 %)
H_2S	0 ... 50 ppm (* up to 500 ppm)
H_2	0 ... 1 % (* up to 2 %)

* max. overload, for short time

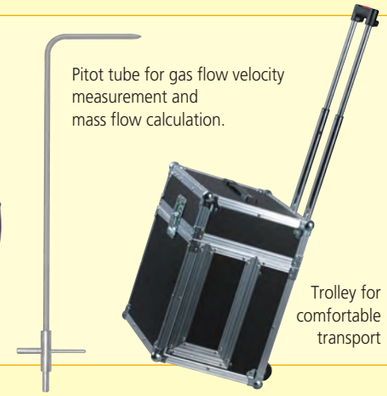
Gas sampling probes

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

VARIOplus SE

without electric gas cooler unit and heated gas sampling line

VARIOplus SE

VARIOplus Industrial

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

Technical specifications

Fuel types	e.g. natural gas, liquid gas, oil light, pellets, coal, oil heavy, bio diesel, self-programable fuel types
Measured components	Electrochemical sensors
Oxygen O_2	0 … 21,0 Vol.-%, accuracy: ±0,2 Vol.-% abs.
Carbon monoxide CO(H2-comp.)	0 … 2.000 ppm (overload up to 10.000 ppm), accuracy <200 ppm, ±10 ppm or ±10 % reading >200 ppm, ±20 ppm or ±5 % reading >2.000 ppm, ±10 % reading
Carbon monoxide CO(very high)	0 … 4,00 % (overload up to 10,00 %), accuracy ±0,02 % or 5 % reading <0,4 % / 10 % reading >0,4 %
Nitric monoxide NO	0 … 1.000 ppm (overload up to 5.000 ppm), accuracy ±5 ppm or 5 % reading <1.000 ppm / 10 % reading >1.000 ppm
Nitric dioxide NO_2	0 … 200 ppm (overload up to 1.000 ppm), accuracy ±5 ppm or 5 % reading <200 ppm / 10 % reading >200 ppm
Sulfur dioxide SO_2	0 … 2.000 ppm (overload up to 5.000 ppm), accuracy ±10 ppm or 5 % reading <2.000 ppm / 10 % reading >2.000 ppm
Hydrogen sulfide H_2S	0 … 50 ppm (overload up to 500 ppm), accuracy ±5 ppm or 5 % reading <50 ppm / 10 % reading >50 ppm
Hydrogen H_2	0 … 1 % (overload up to 2 %), accuracy ±0,02 % or 5 % reading <1 % / 10 % reading >1 %
3-gas infrared bench	
Carbon monoxide CO	0 … 10.000 ppm up to max. 0 … 10 %, accuracy ±40 ppm or ±5 % reading
Carbon dioxide CO_2	0 … 3 % or up to max. 0 … 30 %, accuracy ±0,5 % or ±5 % reading
Hydrocarbons CH_4 (Methane)	0 … 10.000 ppm or up to max. 0 … 3 %, accuracy ±60 ppm or ±5 % reading
Hydrocarbons C_3H_8 (Propane)	0 … 2.000 ppm or up to max. 0 … 5.000 ppm, accuracy ±30 ppm or ±5 % reading
Combustion air temp. TL	0 … 300 °C , accuracy ±1 °C
Draft/ differential pressure ?P	-100 … +100 hPa, accuracy ±0,02 hPa or 3 % reading
Flow velocity measurement	1m/s ... 100 m/s, accuracy ±1m/s or 3 % reading
Calculated values	fuel type depending
Carbon dioxide CO_2	0 … CO_2 max, accuracy ±0,3 Vol.-% abs.
Heat losses qA	0 … 99,9 %
Combustion efficiency	0 …120 %
Excess air	1, … 99,9 %
Reference to O_2, NOx	mg/Nm^3, ppm, NOx in mg/m^3 NO_2, NO + NO_2 = NOx (if NO + NO_2 is installed)
Digital data transfer	RS 232, baud 9.600, data memory for approx. 8.500 measurements
Analog input / output	0 … 10 V or 4 … 20 mA, 8 outputs 4 … 20 mA
CO-sensor purge (option)	by means of 2nd pump, for sensor protection
Gas cooler / condensate	Peltier cooler, peristaltic pump for automatic condensate draining (Ind.) Condensate separator (SE)
General specifications	
Operating temperature	+5 °C … +45 °C, max. 95 % rF, non condensing
Storage temperature	-20 °C … +50 °C
Ambient conditions	no use in aggresive, corrosive or very high dust ambiance
Power supply	approx. 2 hours battery operation with gas cooler, without heated gas sampling line
Mains	100 ... 250 Vac / 47 ... 63 Hz
Protection class	IP 21
Weight	approx. 7,0 kg (without transport case, bag, trolley)
Dimensions	(W x H x D) 530 x 490 x 310 mm

Data subject to change without notice.

Dealer:

since 1984 ®

EMISSION MONITORING SYSTEMS

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