

MRU –  
over 30 years of  
innovative gas  
analysis

# VARIOplus

## Semi-Continuous SYNGAS Monitoring System

for portable monitoring of syngases  
at various industrial sites



### SYNGAS MEASUREMENT

**CO** ... up to 100 %

**CO<sub>2</sub>** ... up to 100 %

**CH<sub>4</sub>** ... up to 100 %

**H<sub>2</sub>** ... up to 100 %

**O<sub>2</sub>** ... up to 25 %

### Suitable for semi-continuous measurements of "syngas" from:

- Steel industry: coke oven gas, blast furnace gas
- Biomass or coal catalytic oxidation (gasification)
- Waste gasification process, plasma gasification process
- Steam reforming of liquid hydrocarbons (refinery gas etc)
- Flare gases, research ... and others

### Main features & configuration of instrument:

- Integrated, electrical gas cooler (Peltier) and automatic condensate draining pump
- Strong sample gas pump and external accessible particulate Teflon filter
- Automatic zeroing by means of 3-way solenoid valve, user programmable
- Internal sample flow monitoring with display and alarm
- Use of long-life EC cell for O<sub>2</sub>, NDIR for CO/CO<sub>2</sub>/CH<sub>4</sub> and TCD for H<sub>2</sub> measurement
- Integrated high-speed thermo printer with easy paper loading
- With universal analog input (AUX socket) for external transmitter connection
- Large, high-contrast and backlit graphic display with zoom function
- Data memory for approx. 8500 measurements
- Automatic interval measurement program, optional SD card for additional data storage
- Data-visualization and evaluation software
- Universal power supply: mains 90-264 Vac /100 W, or 12 Vdc power supply
- Internal NiMh battery for 2 hours battery operation (mains free)
- Automatic selftest and control of soft- and hardware functions

# Technical specifications

	Range	Resolution	Method
Oxygen O2	0 - 25 %	0,01 %	EC sensor long life
Carbon Monoxide CO	0 - 10 % / 30 % / 100 %	0,01 %	NDIR multi-gas bench
Carbon Dioxide CO2	0 - 10 % / 30 % / 100 %	0,01 %	NDIR multi-gas bench
Methane CH4	0 - 10 % / 30 % / 100 %	0,01 %	NDIR multi-gas bench
Hydrogen H2	0 - 10 % / 100 %	0,01 %	TCD thermal conductivity
Calculated component	Calorific value: 0 – 50 MJ/m <sup>3</sup> or MJ/kg N <sub>2</sub> as difference to 100%		
Response time T90	30 s (from analyzer inlet port)		
Detection limit	0,05 % respectively 1 ppm		
Linearity error	1 % FS		
Repeatability	1 % FS		
Offset drift	Negligible with standard auto-zero		
Span drift	2 % FS / month		
HMI human machine interface	Backlit, graphic type display, Tactile keyboard, password protected calibration menu 8x analog output 4-20 mA, floating, max. load 500R (OPTION) RS232 digital interface RS 232 to RS485 (Modbus RTU) converter (OPTION) Integrated, high speed printer		
Sample conditioning	Special gas washing device for raw syngas with heavy hydrocarbons or tar (OPTION) Electric gas cooler (Peltier) and condensate draining pump Teflon particle filter, internal Viton hosing Monitored gas sample flow: 60 - 80 l/h Sample inlet pressure: - 200 hPa to + 100 hPa Sample venting: atmosphere pressure		
Cabinet dimensions	295 x 440 x 155 mm (H x W x D)		
Weight	7 kg (without transport case)		
Protection degree	IP21		
Ambient temperature	+5 °C...+45 °C, up to 90 % RH non condensing		
Operation site	Indoor / outdoor use, with sun and rain protection (user scope) Use in safe area, low dust and non corrosive Use in hazardous area zone 2 only with „fire permit“		
Power supply	Universal 100 - 240 Vac / 47 - 63 Hz / 100 W Internal 12 Vdc NiMh battery (2 hours main free) 12 Vdc socket for external power supply connection		

DATA SUBJECT TO CHANGE WITHOUT NOTICE

## Options



- Portable SYNGAS washing device



- Gas sampling probe with heated filter and heated gas sampling line for use at raw (dirty) syngas with heavy hydrocarbons or tar



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