

VARIO
plus
syngas

THE PORTABLE SYNGAS ANALYZER



Suitable for semi-continuous
measurements of "syngas"



Portable SYNGAS analyzer

Electrochemical sensors and IR-modules are combined in the VARIO PLUS Industrial. This multi component analyzer gives you high accuracy with extreme portability. Precision gas sensors include a NDIR-module for CO + CO₂ + CH₄, a TCD sensor for H₂ and an electrochemical sensor for O₂ .

Suitable for semi-continuous measurements of "syngas" like in

- >> 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

Measuring these gases requires:

- **Safe area (use in hazardous is allowed only for zone 2 and with fire permit)**
- **Venting of sample gas in the ambient air must be allowed**
- **Instrument location must have forced ventilation (or must be outdoor)**
- **Sample gas should be clean of impurities, tar etc.**
(otherwise add the gas washing pre-treatment system – see options below)
- **Sample gas should have low or no pressure (otherwise consult MRU)**
- **Safe use of instrument is required**
(improper use can produce severe injuries or damage, which cannot be charged to MRU)
- **Client should sign document of acknowledgement of danger of use**
(please provide this document together with each purchase order)

Features, configuration of instrument:

- >> Including all measurements and calculation from below
- >> Automatic internal test and control of soft- and hardware functions
- >> Integrated, electrical gas cooler (Peltier cooler) and automatic condensate pump (peristaltic pump)
- >> Including sample gas pump and external accessible safety filter
- >> Integrated high-speed thermo printer with easy paper loading
- >> With universal analog input (AUX socket) for standard signal 0-10 V or 4-20 mA or K-Thermocouple logging
- >> Automatic zeroing by means of 3-way solenoid valve
- >> Internal sample flow monitoring with display and alarm
- >> Automatic interval measurement program
- >> Data-visualization and evaluation software for WINDOWS 7 (32BitDataLogger)
- >> Universal power supply: mains 90-264 Vac /100 W, alternatively external 12 Vdc power supply
- >> Internal NiMh battery for 2 hour battery operation, including the power supply for gas cooler
- >> Large, high-contrast and lighted graphical display with zoom function and all measured data at one sight
- >> RS 232 interface and data memory for approx. 8,500 measurements

VARIOplus syngas

Analysis of:

- >> O2 (long-life EC sensor) 0 – 21.0 %
 - >> CO (NDIR) 0 – 10% / 30% / 100%
 - >> CO2 (NDIR) 0 – 10% / 30% / 100%
 - >> CH4 (NDIR) 0 – 10% / 30% / 100%
 - >> H2 (TCD) 0 – 10% / 30% / 100%
 - >> Calculation of BTU index (gas calorific value in kJ/m3 or MJ/kg)
- Measuring range of all three gas components CO-CO2-CH4 must have same value.**

Special measuring ranges may be available - just ask MRU
A \$170 surcharge is applied for other NDIR configurations

Accessories of basic equipment:

- >> 100 g glass wool filter (only for use of industrial gas sampling probe), lasting for 50 times filtering (2g / filter)
- >> 3 m RS 232-DB9 interface cable, user manual and 32BDL data visualization software on CD ROM
- >> Grid power supply cable and 12Vdc external power supply connector
- >> Soft nylon transport case with adjustable shoulder strap

OPTIONAL

Portable syngas treatment (washing) device, for tar or heavy hydrocarbons removal from sample gas



Interfaces:



RS232 / RS485
Data transfer

OPTIONAL *



4 to 20 mA*:
Connect to PLC



SD card*:
4 GB
Data Memory



Bluetooth*:
Data transfer



AUX*:
For additional external sensors

VARIO plus syngas

- 1 Draft
- 2 Differential pressure
- 3 Heated hose and T-Gas
- 4 Sample gas inlet
- 5 Dust and particle filter
- 6 Condensate outlet
- 7 Combustion air temp.
- 8 AUX connector
- 9 Ventilation gas cooler
- 10 Eye for shoulder strap
- 11 Easy Load Speed printer
- 12 SD card
- 13 External keyboard
- 14 Ext. 12Vdc power supply
- 15 Grid power supply
- 16 Analog outputs
- 17 RS 485
- 18 RS 232



Remote control unit

TECHNICAL SPECIFICATIONS

DATA SUBJECT TO CHANGE WITHOUT NOTICE

VARIO plus IND. Portable analyzer with up to 6 electrochemical sensors and 3 gas NDIR bench
Fuel types Natural gas, liquid gas, oil light, pellets, wood, coal, user definable fuels

Measurement components	Measuring range	Resolution	Linearity error	Repeatability
Electro chemical sensors				
O2 Oxygen	0...21.0 Vol-%	0.01%	1 % FS	1 % FS

Measurement components	Measuring range	Resolution	Linearity error	Repeatability
3 Gas NDIR Bench wit either CH4 or C3H8				
CO CO Carbon monoxide	0..10% / 0..30% / 0..100%	0.01%	1 % FS	1 % FS
CO2 Carbon dioxide	0..10% / 0..30% / 0..100%	0.01%	1 % FS	1 % FS
CH4 Hydrocarbons / Methane	0..10% / 0..30% / 0..100%	0.01%	1 % FS	1 % FS

Measurement components	Measuring range	Resolution	Linearity error	Repeatability
Thermal conductivity detector				
H2 Hydrogen	0..1% / 0..100%	0.01%	1 % FS	1 % FS

General specifications	
Response time T90	30 s (from analyzer inlet port)
Detection limit	0.05 % respectively 1 ppm
Repeatability	1 % FS
Calibration	by software, calibration gases, instrument air or clean ambient air for auto zero
Operation temperature	40°F 100°F, max. 95 % RH, none condensing
Storage temperature	-4°F 120°F
Ambient conditions	not in aggressive, corrosive or high dust environments, not for use in hazardous areas
Power supply	approx. 2 hours battery operation with gas cooler, without heated gas sampling line
Grid power supply	100 ... 250 Vac / 47 ... 63 Hz
Protection class	IP21
Weight	approx. 15.4 lbs. (without transport case, bag, trolley)
Dimensions	(W x H x D) 21" x 19" x 12"

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