VARIO *luxx*

Portable stack gas emission analyser

for long time measurements of industrial combustions, large boilers, gas engines and turbines, furnaces and many more

- Precise measuring technique by means of infrared (3-gas) and electrochemical cells (6-gas)
- Most suitable for precise low NOx measurements and other toxic gas emissions measurement according to new MCP Directive 2015/2193 for medium combustion plants with rated power <50 MW
- All important interfaces are available, such as Ethernet (LAN), WiFi, USB, RS485, 8 channel 4 ... 20 mA analog outputs

MRU – over 30 years of innovative gas analysis

MRU® since 1984
EMISSION MONITORING SYSTEMS AIR fair

VARIO *luxx* –for smart gas analysis technology

Simultaneous analysis of up to 9 gas components

O_2 CO CO_2 NO NO_2 SO_2 HC H_2S H_2

The new VARIO*luxx* achieves a maximum of versatility through the combination of infrared technology (NDIR) with electrochemical sensors (ECS).
The use of LINUX operating system allows smart, intuitive touch and swipe technique of the coloured display and plenty of data communication interfaces. Data exchange or remote analyser control is possible by using the cable LAN or wireless WiFi data transfer of VNC server installed on a smartphone or tablet.

Standard features and functions

- Linux operating system with 7" colour display (800 x 480 px) and intuitive touch and swipe technique
- O_2-LL sensor (long life ECS) or paramagnetic cell (PM)
- Integrated and efficient Peltier gas cooler with automatic condensate draining pump
- Automatic self-test of all internal hard- and software functions
- Automatic zeroing for long time measurements with user definable interval time
- Automatic measuring program with data logging
- Graphical data visualisation, CSV or PDF data reporting with data transfer to PC over LAN Ethernet (RJ45) or USB
- 8 channel analog output 4-20 mA and 4 channel analog input 4-20 mA, including separate universal AUX socket for 0-10 V, 4-20 mA, RS485 and K-type thermocouple
- Standard emission and combustion calculation
- Complete fuel type list, including self definable fuel types
- Flue gas and combustion air temperature measurement, differential pressure measurement
- Passive sample gas outlet port, to guide exhaust sample gas over vent line
- 48 Wh Li-Ion battery for stand-by
- Soft padded nylon transport bag

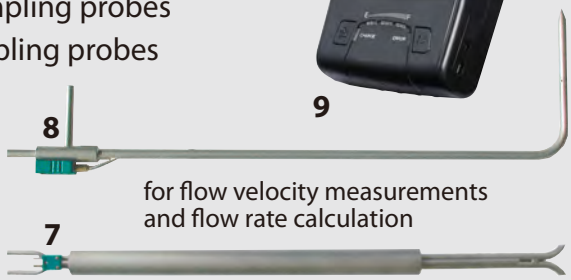
Options

- Sample gas probes, for use up to 1700 °C
- Sample gas lines, heated or unheated
- Flow velocity measurement using Pitot tube and flow rate calculation
- NDIR modules for CO_2, CO, CH_4 or C_3H_8 EC sensors for O_2, CO, NO, NO_2, SO_2, H_2S, H_2
- USB socket, USB to WiFi dongle, RS485 socket
- Active sample gas outlet port with internal gas suction pump
- Additional Li-Ion battery for prolongued stand-by usefull for multiple sampling point changeover
- Aluminium framed transport case with trolley

Trolley for comfortable and safe transport

ACCESSORIES

1 Heat deflector shield
2 Analyser PTFE main filter
3 Condensate disposal bottle & hose
4 Filter elements for gas sampling probes
5 Filter cartidge for gas sampling probes
6 Temperature probe
7 Darcy tube
8 Pitot tube
9 WiFi printer
10 Nylon protection case



Connections and interfaces

1. Pressure-/diff. pressure
2. Pressure-/diff. pressure
3. Combustion air temperature
4. AUX-socket
5. Probe electrical connector
6. Outlet fan of gas cooler
7. Sample gas inlet
8. Fresh air inlet port
9. Sample gas outlet port (VENT)
10. Condensate outlet port
11. Sample gas filter
12. Loudspeaker
13. Ethernet (LAN)
14. USB socket*
15. Second USB socket, option
16. RS485, option
17. Analog outputs 4 ... 20 mA
18. Mains power supply

*) including USB stick in MRU design for data storage and transfer
optional USB to WiFi dongle for wireless data transfer
optional RS485 connector for long cable data transfer using Modbus RTU protocol

Gas sampling probes

- for high or low dust gas sampling
- for flue gas temperatures up to 800 °C (stainless steel), up to 1100 °C (Inconel) and up to 1700 °C (ceramic tube)
- with or without heated filter
- with or without heated sampling line
- different lengths of gas sampling probe tubes

Combustion calculations (fuel type depending)

- CO_2
- CO/CO_2 ratio (poison index)
- dew point
- excess air
- efficiency
- heat loss (Siegert formula)

Emission calculations

- mg/Nm^3 (all toxic gases)
- user settable O_2 reference
- NO_x as NO_2 (mg/Nm^3)
- True $NO_x = NO + NO_2$ and NO_x as mg/Nm^3
- Flow rate and mass emission calculations using Pitot- or Darcy tube

Product information under www.mru.eu or scan attached QR-code

VARIO*luxx*

Technical data

Gas measurement	Method	Meas. range (0…min / max) *	Resolution	Accuracy **
O_2 - oxygen (Long-life)	ECS	0 ... 25,00 %	0,01 %	0,2 %
O_2 - oxygen	PM	0 ... 25,00 %	0,01 %	0,1 %
CO_{low} - carbon monoxide	ECS	0 ... 500,0 ppm	0,1 ppm	± 2 ppm or 5 % reading
$CO_{H2\ COMP.}$ - carbon monoxide	ECS	0 ... 10.000 / 20.000 ppm	1 ppm	± 10 ppm or 5 % reading
$CO_{very\ high}$ - carbon monoxide	ECS	0 ... 2,00 / 10,00 %	0,01 %	± 0,01 % or 5 % reading
CO - carbon monoxide	NDIR	0 ... 3.000 / 30.000 ppm	1 ppm	± 10 ppm or 2 % reading***
CO - carbon monoxide	NDIR	0 ... 1,00 / 10,00 %	0,01 %	± 0,1 % or 2 % reading
CO_2 - carbon dioxide	NDIR	0 ... 5,00 / 40,00 %	0,01 %	± 0,3 % or 2 % reading
CH_4 - methane	NDIR	0 ... 3.000 / 10.000 ppm	1 ppm	± 20 ppm or 2 % reading
C_3H_8 - propane	NDIR	0 ... 1.000 / 10.000 ppm	1 ppm	± 10 ppm or 2 % reading
CH_4 - methane	NDIR	0 ... 1,00 / 4,00 %	0,01 %	± 0,05 % or 2 % reading
NO_{low} - nitric monoxide	ECS	0 ... 300,0 ppm	0,1 ppm	± 2 ppm or 5 % reading
NO - nitric monoxide	ECS	0 ... 1.000 / 5.000 ppm	1 ppm	± 5 ppm or 5 % reading
$NO_{2\ low}$ - nitrogen dioxide	ECS	0 ... 100,0 ppm	0,1 ppm	± 2 ppm or 5 % reading
NO_2 - nitrogen dioxide	ECS	0 ... 200 / 1.000 ppm	1 ppm	± 5 ppm or 5 % reading
$SO_{2\ low}$ - sulphur dioxide	ECS	0 ... 100,0 ppm	0,1 ppm	± 2 ppm or 5 % reading
SO_2 - sulphur dioxide	ECS	0 ... 1.000 / 5.000 ppm	1 ppm	± 10 ppm or 5 % reading
H_2S_{low} - hydrogen sulphide	ECS	0 ... 50 / 500 ppm	1 ppm	± 2 ppm or 5 % reading
H_2S - hydrogen sulphide	ECS	0 ... 2.000 / 5.000 ppm	1 ppm	± 5 ppm or 5 % reading
H_2 - hydrogen	ECS	0 ... 1.000 / 2.000 ppm	1 ppm	± 5 ppm or 5 % reading

OTHER MEASUREMENTS / CALCULATIONS	Method	Measuring range	Resolution	Accuracy **
T_{gas} - flue gas temperature	NiCrNi/PtRh	0 °C ... 1.700 °C	1 °C	± 1 °C or 2 % reading
T_{air} - combustion air temperature	NiCrNi	0 °C ... 500 °C	1 °C	± 1 °C or 2 % reading
T_{amb} - ambient air temperature	PT2000	0 °C ... 100 °C	1 °C	± 1 °C or 2 % reading
P - Pressure - differential pressure	Piezoresistiv	-120 ... +120 hPa	1 Pa	± 2 Pa or 1 % reading
v - flow velocity measurement	Diff.pressure	3 ... 100 m/s	1 m/s	± 1 m/s or 1 % reading
AUX-connector		for K-thermocouple, 0 ... 10 Vdc , 4 ... 20 mA, RS485		
Combustion analysis	Software	Losses, excess air, Lambda, dew point, CO_2		
Emission calculations	Software	mg/Nm³, reference O_2, g/s, kg/h		

GENERAL TECHNICAL DATA	
Operating system	LINUX
Display, operation	7" TFT (800 x 480 px) colour display, backlit, with touch and swipe operation
Data storage type	10.000 data sets internal and external USB-Stick
Interface to PC / Notebook	Ethernet, WiFi, RS485
Data transfer over cable / wireless	RS485, RJ45 (Ethernet), WiFi
Thermal printer	external USB /WiFi printer
Analog input 4...20mA	8 channel, user free configurable/4 channel, user free configurable
Universal analog input - AUX -	0 ... 10 Vdc / 4 ... 20 mA / K-type / RS485
Mains free operation	Li-Ion , 48 Wh, for appr. 1 hr „stand-by" (optional additional battery, 48 Wh Li-Ion)
Operating data	+5 ... +50 °C ; RH up to 95 % not condensing
Storage temperature	-20 ... +50 °C
Power supply	86 ... 265 Vac / 47 ... 63 Hz / 105 W (up to 600 W with heated sampling line)
Protection class	IP20 (or IP42 inside transport case)
Dimensions	(W x H x D) 430 x 290 x 150 mm
Weight	approx. 8 kg only device / approx. 13 kg packed in bag with accessories

*** with hourly reset to zero

** which ever is larger

* overload range of ECS is usable only for short duration

Data subject to change without notice.

W-65202EN-K6-XX-059

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EMISSION MONITORING SYSTEMS

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