

VARIO *luxx*

Portable stack gas emission analyser

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



remote wireless control using a smartphone and MRU4u app

- Precise measuring technique by means of infrared (3-gas) and electrochemical cells (6-gas)
- Most suitable for precise low NO_x 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), WLAN, Bluetooth, USB, RS485, 8 channel 4 ... 20 mA analog outputs

MRU – over 30 years
of innovative gas analysis

VARIO

luxx –for smart gas analysis technology

Simultaneous analysis of up to 9 gas components

O₂ CO CO₂ NO NO₂ SO₂ HC H₂S H₂

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,

Standard features and functions

- Linux operating system with 7" colour display (800 x 840 px) and intuitive touch and swipe technique
- O₂-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

intuitive touch and swipe technique of the coloured display and plenty of data communication interfaces. Data exchange and transfer is also possible by means of the remote control using a smartphone with the MRU4u app.

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 CO₂, CO, CH₄ or C₃H₈
EC sensors for CO, NO, NO₂, SO₂, H₂S, H₂
- USB socket, USB to WLAN dongle, USB to Bluetooth dongle, RS485 socket
- Active sample gas outlet port with internal gas suction pump
- Additional Li-Ion battery for prolonged stand-by useful for multiple sampling point changeover
- Aluminium framed transport case with trolley
- Soft padded nylon transport bag



Useful nylon protection case with shoulder strap



Trolley for comfortable and safe transport



Pitot tube for flow velocity measurements and flow rate calculation

Gas sampling probes

- for high or low dust gas sampling
- for flue gas temperatures up to 800 °C (stainless steel), up to 1200 °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)

- CO₂
- CO/CO₂ ratio (poison index)
- dew point
- excess air
- efficiency
- heat loss (Siegert formula)

Emission calculations

- mg/Nm³ (all toxic gases)
- user settable O₂ reference
- NO_x as NO₂ (mg/Nm³)
- True NO_x = NO + NO₂ and NO_x als mg/Nm³
- Flow rate and mass emission calculations using Pitot tube

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 WLAN dongle for wireless data transfer
 optional USB to Bluetooth dongle for wireless data to smartphone with MRU4u app
 optional RS485 connector for long cable data transfer using Modbus RTU protocol



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



VARIOluxx

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	± 15 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
HC - hydrocarbons (CH ₄)	NDIR	0 ... 3.000 / 10.000 ppm	1 ppm	± 20 ppm or 2 % reading
HC - hydrocarbons (C ₃ H ₈)	NDIR	0 ... 1.000 / 10.000 ppm	1 ppm	± 10 ppm or 2 % reading
HC - hydrocarbons (CH ₄)	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 / 4.000 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

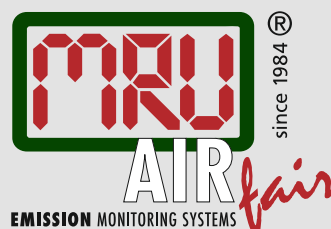
OTHER MEASUREMENTS / CALCULATIONS	Method	Measuring range	Resolution	Accuracy **
T _{gas} - flue gas temperature	NiCrNi	0°C ... 1.200°C	1°C	± 1°C or 2 % reading
T _{air} - combustion air temperature	NiCrNi	0°C ... 500°C	1°C	± 1°C or 2 % reading
T _{amb} - ambient air temperature	PT2000	0°C ... 100°C	1°C	± 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	Software	for K-thermocouple, 0 ... 10 Vdc, 4 ... 20 mA, RS485		
Combustion analysis	Software	Losses, excess air, Lambda, dew point		
Emission calculations	Software	mg/Nm ³ , 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, Bluetooth, WLAN, RS485
Data transfer over cable / wireless	RS485, RJ45 (Ethernet) / Bluetooth, WLAN
Analog output 4 ... 20 mA	8 channel, user free configurable
Analog input 4 ... 20 mA	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	appr. 7,5 kg, for minimal configuration

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** which ever is larger

* overload range of ECS is usable only for short duration

Data subject to change without notice.

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