

Multigas Analyzer V2.2

M&C premium series GENTWO® features an innovative modular navigation and sensor concept



Multigas Analyzer V2.2

▼ Special Features

- Modular design
- Innovative touch screen navigation concept with 7" color display
- Multi-sensor capable
- Paramagnetic oxygen sensor
- ZrO₂ oxygen sensor
- Electrochemical oxygen sensor
- Thermal conductivity detector (TCD)
- NDIR/NDUV photometer
- Chemiluminescence sensor (CLD)
- Measured value storage over one year directly in the analyzer
- Pressure compensation 0.8 to 1.2 bar abs., optional humidity compensation
- Analog signal outputs 0 - 20 / 4 - 20 mA
- Modbus and AK protocol TCP/IP
- Ethernet / USB
- User-programmable limit values
- Remote operation

▼ Application

The Multigas Analyzer of the GENTWO® series is suitable for continuous measurements of gases in gas mixtures. Areas of application are in particular combustion control, process optimisation, inertization monitoring, environmental protection or laboratory measurements, each in non-explosive environments.

▼ Description

The Multigas Analyzer is characterized by its modular design and innovative navigation concept. This enables fast intuitive understanding and adaptation of the analyzer to a wide variety of applications. Display and functions can be set according to the operator's requirements.

The basic design of the analyzer is mounted in a 19" rack housing and it is

connected using FKM (Viton®) tubing. It has a universal power supply, a 7" color touch screen and can be equipped with up to 6 sensors for various applications including the corresponding sensor and I/O electronics. Pressure sensors for process pressure compensation, optional humidity compensation, temperature monitoring and flow indicator are also available. The measured value is available as mA signal, as well as status, alarm and switching outputs. Two limit values per measuring channel can be user-programmed in the analyzer. All measured values are simultaneously available via Modbus and AK communication protocol at the Ethernet connection. A special feature is the integrated data logger function for time-resolved display and long-term recording of measurement, warning and alarm messages. The Multigas Analyzer offers the user convenient calibration functions for zero point and full scale calibration.

▼ Sensors

Paramagnetic oxygen sensor

The M&C oxygen transmitter uses the paramagnetic properties of oxygen. The dumbbell principle implemented here represents a physical, wear-free and proven measuring method. It is suitable for low-drift, long-term stable measurements in the range from 0 to 100 vol%.

ZrO₂ oxygen sensor

This sensor type uses the diffusion properties of oxygen ions on a high-temperature doped ceramic solid electrolyte. An electrical potential known as the Nernst voltage is established between a Pt working electrode and a reference electrode. This allows a robust in-situ oxygen measurement from 0 to 21 vol%. Mounted in M&C gas sample probes, it can be used for control tasks in combustion processes.

Electrochemical oxygen sensor

This compact, fast-response, long-life sensor measures the oxygen content in a gas mixture, typically up to 25 vol% over an electrochemically generated voltage. It is RoHS- compliant (lead-free), fully CO₂-resistant and non-toxic.

Thermal conductivity detector (TCD)

This type of sensor uses the thermal properties of gases. In the design implemented here, the thermal conductivity of hydrogen in a binary gas mixture is used to determine the H₂ concentration.

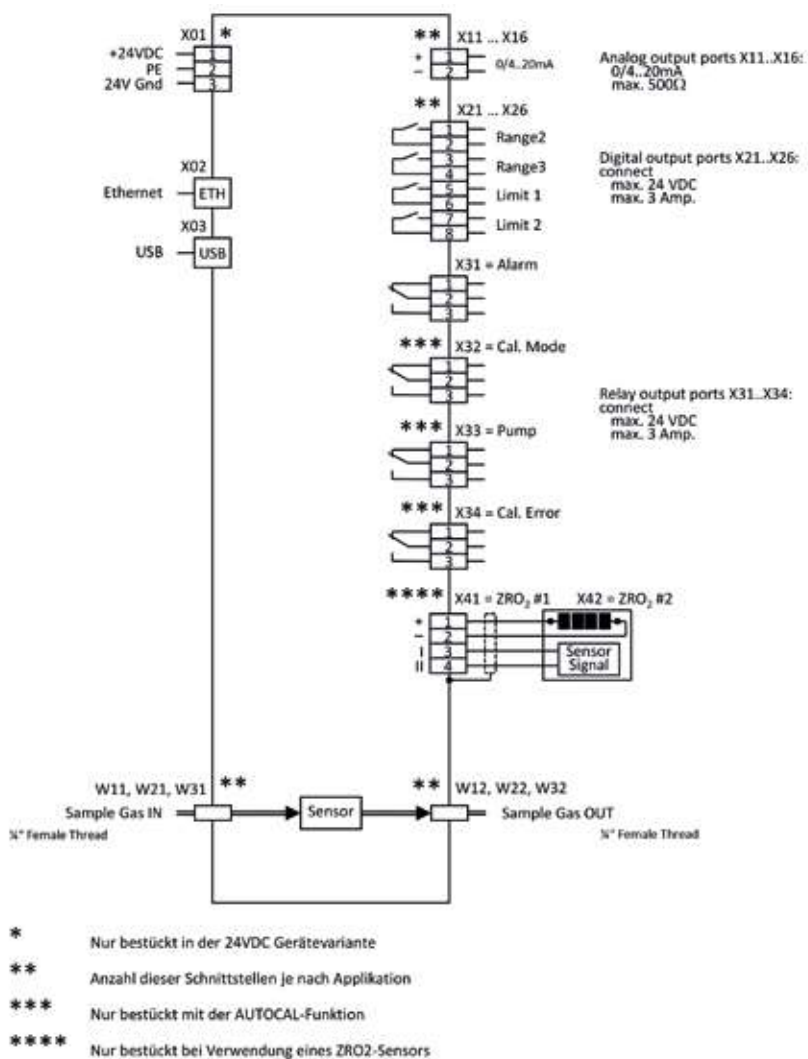
NDIR/NDUV photometer

With this technique, the concentration of multiatomic gases, i.e. molecules with permanent or induced electrical dipole moment, can be determined. The measuring cuvettes are available in different lengths for different measuring ranges. The photometer is characterized by a wide dynamic range and a fast response time. Optionally, a sensor for water vapour correction can be used for NDIR measurements.

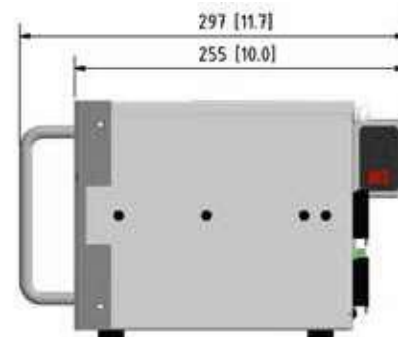
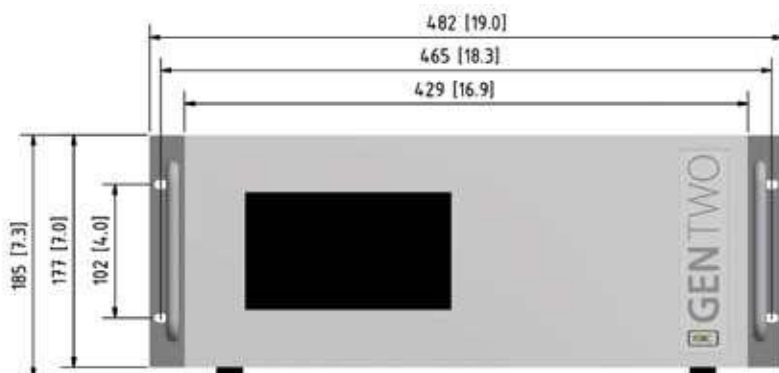
Chemiluminescence sensor (CLD)

A chemical reaction emits electromagnetic radiation in the range of ultra-violet and visible light. The number of registered light quanta is a measure of the NO concentration in the gas. The measuring range is 0-1000 ppm.

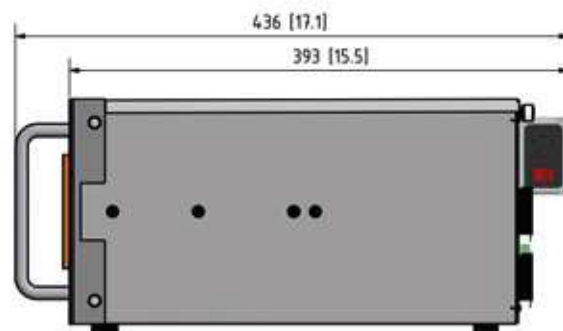
▼ Connections and pin assignment



▼ Dimensions



Short enclosure side view with power supply



Long enclosure side view with power supply

Dimensions in mm [inches]

▼ Technical specifications in general

GENTWO® Multigas Analyzers	Multigas V2.2
Basic instrument without sensors: short enclosure Part-No:	08 A 2210
Basic instrument without sensors: long enclosure Part-No:	08 A 2200
Warm-up period	Approx. 30 min. depending on sensor configuration
Response time for 90%	< 5 s depends on sensor and configuration
Flow rate of sample gas	25 to 120 NI/h
Sample gas inlet pressure	800 to 1200 mbar abs. pressure-compensated
Sample gas outlet pressure	Recommendation: discharge freely into atmosphere (requires higher pressure at the analyzer inlet compared to the outlet)

▼ Technical specifications in general

GENTWO® Multigas Analyzers	
Sample gas temperature and characteristics	0 to +50 °C [+32 to +122 °F]; dry, oil- and dust-free gas, avoid temperature dropping below dew point
Ambient temperature	0 to +50 °C [+32 to +122 °F] depending on sensor configuration, avoid temperature dropping below dew point
Display	7" resistive color touchscreen
Measuring ranges in general	4 measuring ranges, two of them adjustable, suppressed zero possible
Output signals	Adjustable: 0-20 mA / 4-20 mA, max. 500 Ohms burden, Modbus, AK-protocol TCP/IP
Relay outputs	2 x relay output (1 x status, 1 x Cal-mode) contacts: 24 V / 3 A, change-over contact, potential-free
Digital outputs [DO]	4 x per measuring signal DO 24 V, max. 300 mA (2 x limit values, 2 x measuring range feedback)
Interfaces	Ethernet / USB
Communication protocol	Modbus TCP/IP and AK protocol TCP/IP
Storage temperature	-20 to +60 °C [-4 to +140 °F], avoid temperature dropping below dew point
Power supply	115 to 230 V AC, 50 to 60 Hz power supply or 24 DC connector plug
Power consumption	Max. 150 VA
Wetted materials	Platinum, Epoxy resin, glass, FKM (Viton®)*, stainless steel 316Ti, PVDF, PPS, depending on the type of sensor used
Sample gas connection	Screw-on bulkhead fitting with 1/4" internal thread, PVDF (standard)
Case protection	IP40, EN 60529
Electrical standard	EN 61010
Housing / front color	19 inch rack mounting (4RU) / white RAL 9003
Maximum installation altitude	2000 m [6561.7 ft]
Dimensions long enclosure (W x H x D)	Long enclosure with 230 V power supply (dimensions include front handles and power supply): 482 x 185 x 436 mm [19" x 7.3" x 17.1"] + approx. 60 mm [approx. 2.36"] connection depth
Dimensions short enclosure (W x H x D)	Short enclosure with power supply (dimensions include front handles and power supply): 482 x 185 x 297 mm [19" x 7.3" x 11.7"] + approx. 60 mm [approx. 2.36"] connection depth
Weight long enclosure	Approx. 13 kg (approx. 29 lbs) (depending on sensor configuration)
Weight short enclosure	Approx. 11 kg (approx. 24 lbs) (depending on sensor configuration)
Options	
Front filter FPF+ (Part.-No.: 08 A 2650)	
Flow meter FM40 (Part.-No.: 08 A 2660)	
Additional gas path (Part.-No.: 08 A 2690)	
Telescopic slides available in EU and US version	

* Viton® is a registered trademark of DuPont Performance Elastomere

▼ Technical specifications sensors

Paramagnetic oxygen sensor	
GENTWO® Multigas Analyzer	Paramagnetic oxygen sensor
Part-No: Add-on O ₂ PMA Sensor	08 A 2400
Gas measured	O ₂
Measuring ranges	Min./max. measuring ranges: 0 - 1/ 0 - 100 vol% O ₂
O ₂ -Transmitter temperature	Factory setting +55 °C [131 °F]
Limit of detection (LOD)*	0.02 vol%
Noise	0.2 % of full scale value
Linearity	< ±1 vol%
Zero drift	< 0,06 vol% in 72 hours
Accuracy after calibration*	±1 % from full scale or 0.02 vol% O ₂ , depending on which value is greater
Reproducibility*	< ±0.01 vol%
Ambient temperature	5 to 35 °C [41 to 95 °F]

ZrO ₂ oxygen sensor	
GENTWO® Multigas Analyzer	Zirkonium dioxide oxygen sensor
Part-No: Add-on ZrO ₂ Sensor	08 A 2430
Gas measured	O ₂
Measuring range	0 - 21 vol% O ₂
O ₂ -Sensor temperature	Factory setting > 600 °C
Limit of detection (LOD)*	0.1 vol%
Noise	0.2 % of full scale value
Linearity	< ±0.5 vol% of full scale value
Zero drift	< 1 % of full scale value per month
Accuracy after calibration*	10 % of measuring value, not better than ±0.5 vol%
Ambient temperature	5 to 50 °C [41 to 122 °F]

Electrochemical oxygen sensor	
GENTWO® Multigas Analyzer	Electro chemical oxygen sensor
Part-No: Add-on O ₂ electrochemical Sensor	08 A 2420
Gas measured	O ₂
Measuring range	0 - 25 vol%
Limit of detection (LOD)*	0.1 vol%
Noise	0.2% of full scale value
Linearity	< ±0.5% of measuring value
Zero drift	< 1% of full scale value per month
Accuracy after calibration*	±1% of full scale value not better than 0.1 vol%
Cross-sensitivity CO, CO ₂ , H ₂ , C ₃ H ₈ [0...100 vol%]	< 50 ppm
Ambient temperature	5 to 45 °C [41 to 113 °F]

Thermal conductivity detector (TCD)	
GENTWO® Multigas Analyzer	Thermal conductivity detector (TCD)
Part-No: Add-on H ₂ TCD Sensor	08 A 2410
Gas measured	H ₂
Measuring ranges	0.5 - 100 vol%
Sensor temperature	63 °C
Limit of detection (LOD)*	0.1 vol%
Noise	<1% of full scale value
Linearity	<1% of full scale value
Zero drift	<2% of full scale value per week
Reproducibility deviation	<1% of full scale value
Ambient temperature	5 to 50 °C [41 to 122 °F]

▼ Technical specifications sensors

NDIR/NDUV Photometer		
GENTWO® Multigas Analyzer		NDIR/NDUV photometer
NDIR gas measured	CO ₂	Min./max. measuring range: 0 - 1000 ppm / 0 - 100 vol%
	CO	Min./max. measuring range: 0 - 500 ppm / 0 - 100 vol%
	C _n H _m	Min./max. measuring range: 0 - 1000 ppm / 0 - 100 vol%
	NO	Min./max. measuring range: 0 - 1000 ppm / 0 - 5000 ppm
	CH ₄	Min./max. measuring range: 0-2 vol% / 0-20 vol%
	SF ₆ and other gases on request	
	H ₂ O	0 - 1 vol%
NDUV gas measured	SO ₂	Min./max. measuring range: 0 - 100 ppm / 0 - 100 vol%
	NO ₂	Min./max. measuring range: 0 - 100 ppm / 0 - 10 vol%
	C ₆ H ₆	Min./max. measuring range: 0 - 1000 ppm / 0 - 10 vol%
	Cl ₂	Min./max. measuring range: 0 - 1000 ppm / 0 - 1 vol%
	O ₃	Min./max. measuring range: 0 - 50 ppm / 0 - 1 vol%
	other gases on request	
Response time for 90% value		Adjustable between 1 s and 30 s
Noise		< 0.1 % of full scale value
Linearity		±1 % of full scale value
Accuracy after calibration*		±2 % of full scale value
Zero drift		±2 % of full scale value in 24 hours
Ambient temperature		5 °C to + 40 °C [41 to 104 °F]
Wetted materials		Depends on the selected version: FKM (Viton®)**, SS316Ti, aluminium with/without protective coating, PVDF, PPS
Options		
Pressure sensor for process pressure compensation water vapour correction		
Chemiluminescence Sensor (CLD)		
GENTWO® Multigas Analyzer		Chemiluminescence Sensor (CLD)
Part-No:		98 A 1600 + 08 A 2605
Gas measured		NO
Measuring ranges		0 - 1000 ppm
Limit of detection (LOD)*		< 0.5 ppm [2 σ, 10 s]
Noise		0.2 % of full scale value
Linearity		±1 % of full scale value
Accuracy after calibration*		±1 % of full scale value
Zero drift (8 hours)		< 0.1 % of the full scale value in 8 hours
Measuring range drift		±1 % of the full scale value in 8 hours
Ambient temperature		5 to 35 °C [41 to 95 °F]
Sample gas pump, ozonator and ozone destroyer are included in delivery		

* Calibration and determination of measurement accuracy under constant ambient conditions in the compensated temperature and pressure range (±0.015%/mbar)

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