



Multigas Analyzer V2.2

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

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/UVRAS measuring benches
- **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%.

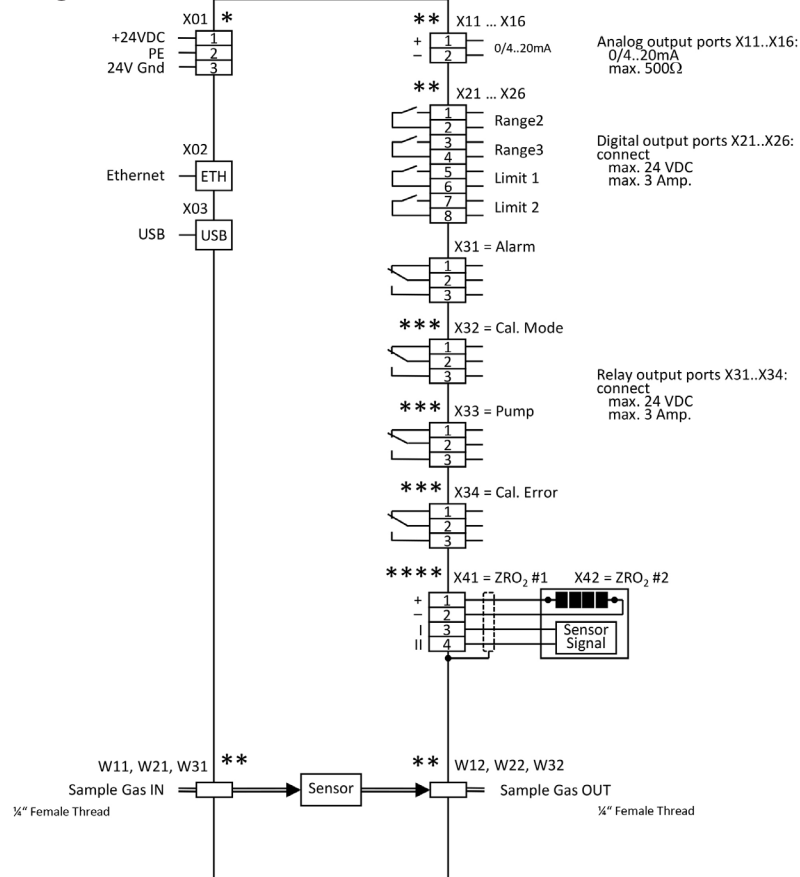
– **ZrO₂ oxygen sensor**
This sensor type uses the diffusion properties of oxygen ions on a high-temperature doped ceramic solid electrolyte. An electrical potential known as the Nernst voltage is established between a Pt working electrode and a reference electrode. This allows a robust in-situ oxygen 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.

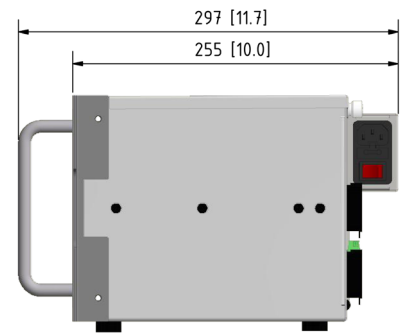
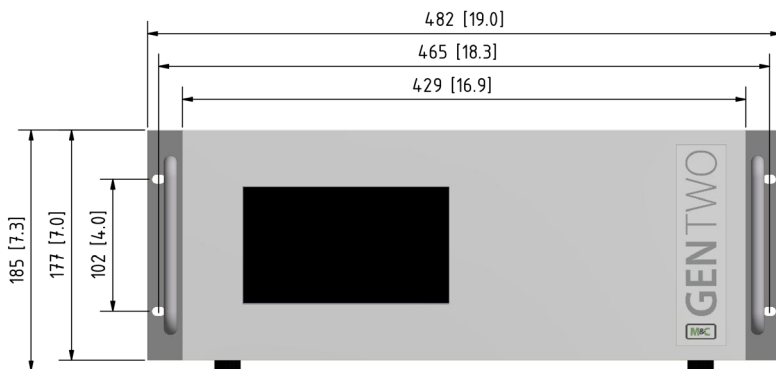
– **NDIR/NDUV/UVRAS measuring benches**
With this technique, the concentration of multiatomic gases, i.e. molecules with permanent or induced electrical dipole moment, can be determined. The measuring cuvettes are available in different lengths for different measuring ranges. The measuring benches are characterized by wide dynamic ranges and fast response times. Optionally, a sensor for water vapor correction can be used for NDIR measurements.

Connections and pin assignment

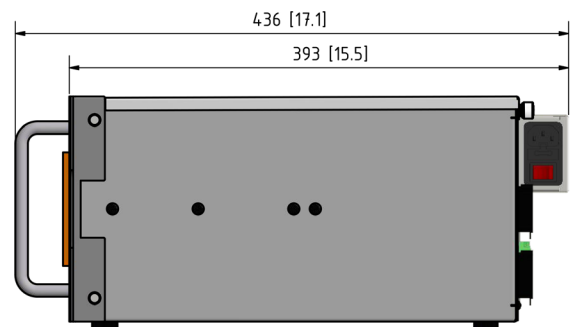


- * Only equipped in the 24 VDC analyzer version
- ** Amount of interfaces depends on application
- *** Only equipped with AutoCal function
- **** Only equipped when using a ZrO₂ sensor

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.	08A2210
Basic instrument without sensors: long enclosure Part No.	08A2200
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)
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	1500 m [≈ 4921.3 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 [≈ 2.4"] 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 [≈ 2.4"] connection depth
Weight long enclosure	Approx. 13 kg [≈ 29 lbs] (depending on sensor configuration)
Weight short enclosure	Approx. 11 kg [≈ 24 lbs] (depending on sensor configuration)

Options

Front filter FPF+ (Part No. 08A2650)

Flow meter FM40 (Part No. 08A2660)

Additional gas path (Part No. 08A2690)

Telescopic slides available in EU and US version

Please note: NI/h and NI/min refer to the German standard DIN 1343 and are based on these standard conditions: 0 °C [32 °F], 1013 mbar.

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Technical specifications sensors

Paramagnetic oxygen sensor

Technical specifications	Paramagnetic oxygen sensor
Part No. Add-on O ₂ PMA Sensor	08A2400
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	< ±0.1 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]

ZrO₂ oxygen sensor

Technical specifications	Zirkonium dioxide oxygen sensor
Part No. Add-on ZrO ₂ Sensor	08A2430
Gas measured	O ₂
Measuring range	0 - 21 vol% O ₂
O ₂ Sensor temperature	Factory setting > 600 °C [1112 °F]
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

Technical specifications	Electrochemical oxygen sensor
Part No. Add-on O ₂ electrochemical Sensor	08A2420
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)

Technical specifications	Thermal conductivity detector (TCD)
Part No. Add-on H ₂ TCD Sensor	08A2410
Gas measured	H ₂
Measuring range	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]

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

Technical specifications sensors

NDIR/NDUV/UVRAS measuring benches

Technical specifications		NDIR/NDUV/UVRAS measuring benches	
Gases and measuring ranges		Min. measuring range	Max. measuring range
NDIR*	CO ₂	0 - 50 ppm	0 - 100 vol%
	CO	0 - 500 ppm	0 - 100 vol%
	C _n H _m	0 - 1000 ppm	0 - 100 vol%
	NO	0 - 1000 ppm	0 - 5000 ppm
	CH ₄	0 - 5000 ppm	0 - 100 vol%
	N ₂ O	0 - 100 ppm	0 - 100 vol%
	SF ₆	0 - 30 vol%	0 - 100 vol%
NDUV*	SO ₂	0 - 100 ppm	0 - 100 vol%
	NO ₂	0 - 100 ppm	0 - 10 vol%
	C ₆ H ₆	0 - 1000 ppm	0 - 10 vol%
	Cl ₂	0 - 1000 ppm	0 - 1 vol%
	O ₃	0 - 50 ppm	0 - 1 vol%
UVRAS*	NO	0 - 300 ppm	0 - 5000 ppm
	H ₂ S	0 - 100 ppm	0 - 5000 ppm

Other gases on request

* NDIR: non-dispersive infrared photometer, NDUV: non-dispersive ultraviolet photometer, UVRAS: ultraviolet resonance absorption spectrometer.

Technical specifications	NDIR	NDUV	UVRAS
Response time for 90% value	1.5 to 15 s		
Limit of detection (LOD)	< 1 % of full scale value (F.S.) (3 σ)	1 ppm (3 σ)	< 1 ppm (3 σ)
Linearity error	< ± 1 % of F.S.		
Repeatability	± 0.5 % of F.S.		
Longterm stability (zero drift)*	< ± 2 % of F.S. per week	< ± 1 % of F.S. per 24 hours	< ± 2 % of F.S. per 24 hours
Longterm stability (span drift)	< ± 2 % of F.S. per month	< ± 1 % of F.S. per month	
Temperature influence zero**	< 1 % of F.S. per 10 Kelvin		
Temperature influence span**	< 2 % of F.S. per 10 Kelvin		
Pressure influence (with pressure compensation)	0.15 % per 10 hPa of reading		
Operating temperature	15 to + 45 °C [59 to 113 °F]	15 to + 45 °C [59 to 113 °F]**	15 to + 45 °C [59 to 113 °F]
Wetted materials	Depends on the selected version: FKM (Viton®), SS316Ti, aluminium with or without protective coating, PVDF, PPS		

* The long-term zero drift can be reduced by using an AutoZero module.

** The temperature dependence can be reduced by using a heated box (THB 50 °C [122 °F])

*** With THB max. 40 °C [104 °F]

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Options: NDIR/NDUV/UVRAS measuring benches

Pressure sensor for process pressure compensation

H₂O measurement with a measuring range from 0 to 1 vol%, water vapor correction