



GenTwo® PMA1000 V2.4

Oxygen Analyzer GenTwo®

PMA1000 V2.4

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

Special Features

- **Visualization of measured values of one year directly on the analyzer**
- **Modular concept**
- **Innovative operation via 7" touch color screen**
- **Pressure compensation 0.8 to 1.2 bar abs.**
- **Four O₂ measuring ranges: Two of those are user programmable**
- **Analog signal outputs 0-20/4-20 mA**
- **Modbus and AK protocol TCP/IP**
- **Ethernet/USB**
- **User-programmable limit values**
- **Remote operation via VNC viewer**
- **Three different housings:**
 - 19" rack housing short
 - 19" rack housing long
 - Wall-mount housing
- **Automatic calibration function optional**

Application

The oxygen analyzer PMA1000 V2.4, a device of the GenTwo® series, is suitable for the continuous measurement of the oxygen content in gases. Directly streaming the measurement cell with a small gas volume of just 2 ml [≈ 0.122 in³] provides a very fast response time of the analyzer.

The M&C oxygen analyzer can be used for non-flammable sample gases and setups in non-hazardous areas like combustion control, process optimization, inertization monitoring, fermentation processes, environment monitoring or for laboratory applications.

Description

A modular concept and an innovative human machine interface (HMI) are outstanding features of the PMA1000 V2.4. These enable an intuitive understanding of the operating concept and an adaptation to several applications.

Display and functions can be set according to the operator's requirements, for example language, measuring ranges, physical units, application-related designations.

The basic design of the analyzer is a 19" or wall-mount housing with Viton® tubing or tubing made of stainless steel. All device variants are equipped with a broadband power supply and a resistive 7" color touch display. The standard GenXFlow module monitors the flow rate and records the process pressure for internal compensation.

The measured concentration is available as a mA signal. Each device offers status and alarm outputs as well as two freely programmable limit values. All measured values are provided via the Modbus and AK communication protocol at the Ethernet port. A special feature is the integrated data logger function for time-resolved display and long-term recording of measurement, warning and alarm messages.

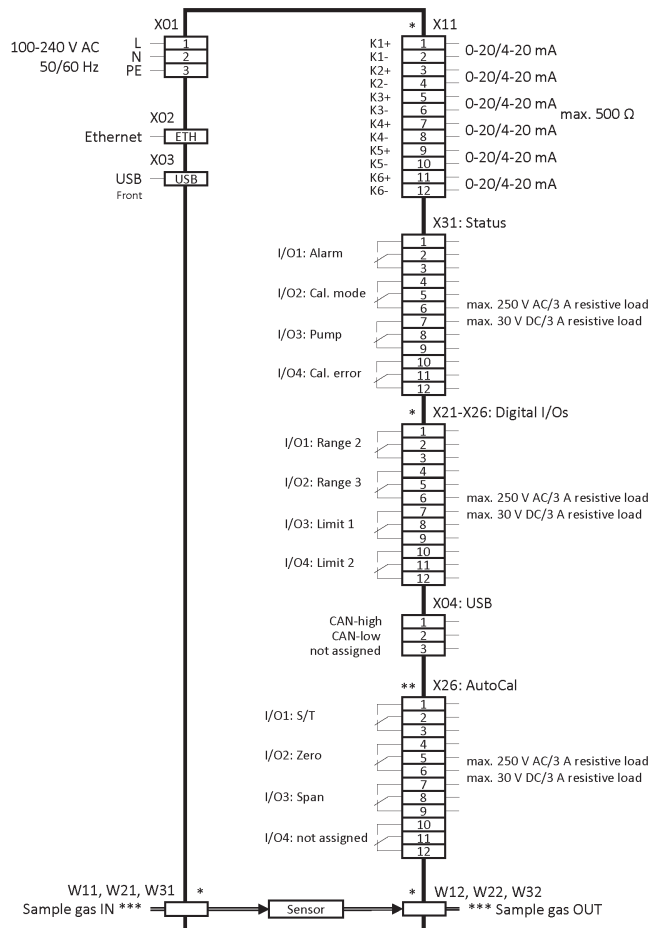
The optional AutoZero module provides the user with a convenient calibration function for the zero point. Alternatively, an interface module is available for connecting external calibration devices.

Measuring principle

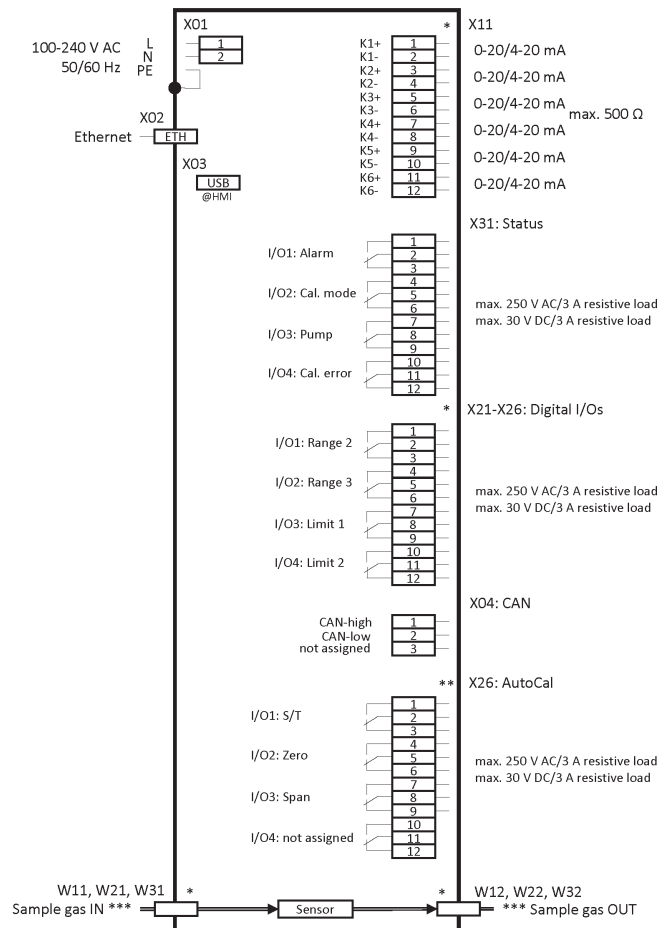
The O₂ analyzer PMA1000 V2.4 of the GenTwo® series utilizes the paramagnetic dumb-bell principle of operation to measure the oxygen concentration. This physical measuring principle is characterized by its accuracy, absolute linearity and low-drift, long-term stable measurement in the range of 0 to 100 vol% oxygen without consuming sensor material or auxiliary materials. The paramagnetic function of the temperature-stabilized measuring cell uses the paramagnetic susceptibility of oxygen and is therefore very selective and is almost free of cross-sensitivity.

The analyzer has a long service life if used as intended, and if suitable gas sampling and conditioning components are provided.

19"-rack housing

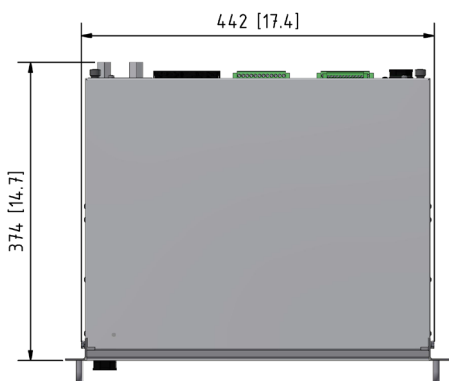
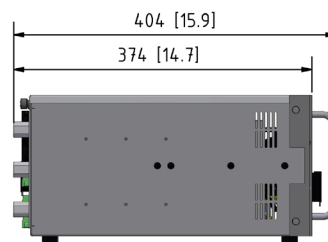
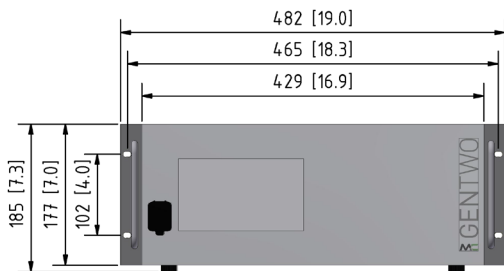


Wall-mount housing



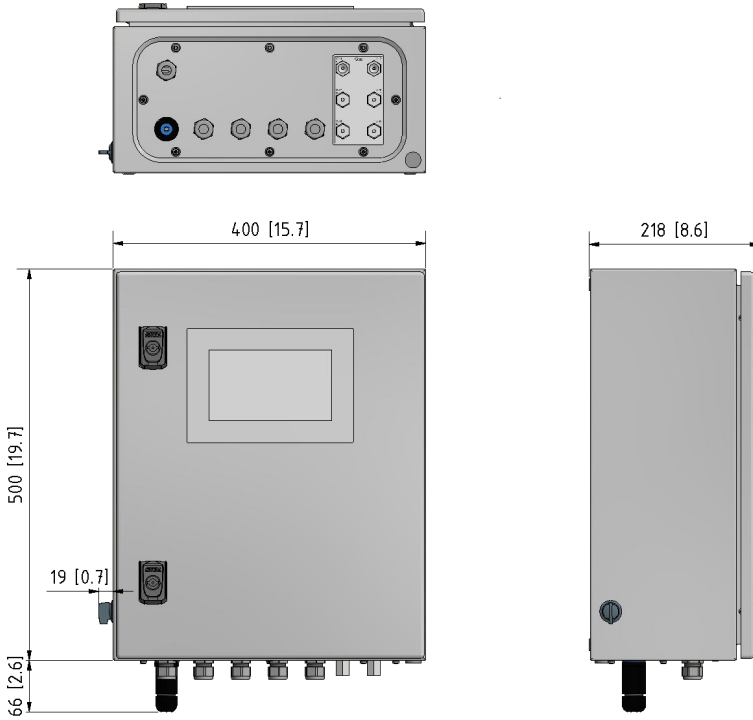
* The actual number of the analog and digital outputs depends on the configuration of the device (see technical data)
 ** Only equipped with the AutoCal function
 *** G 1/4" female, if internal tubing is made of Viton®; 1/8" NPT female, if internal tubing is made of stainless steel

Dimensions 19"-rack housing (long housing)



Dimensions in mm [Inches]

Dimensions wall-mount housing



Dimensions in mm [Inches]

Technical Data

O ₂ Analyzer - GenTwo® series	PMA1000 V2.4
Short enclosure with Viton® gas path, Part No.	08A2020
Long enclosure with Viton® gas path, Part No.	08A2025
Wall-mount housing with Viton® gas path, Part No.	08A2030
Short enclosure with stainless steel gas path, Part No.	08A2035
Long enclosure with stainless steel gas path, Part No.	08A2040
Wall-mount housing with stainless steel gas path, Part No.	08A2045
Sample gas	O ₂
Paramagnetic oxygen sensor	1 x PMA2 O ₂ transducer, thermostated at 55 °C [131 °F]
Measuring ranges	4 linear measuring ranges, 2 of those freely selectable, lowest span 1 %, factory default 0-1, 0-10, 0-30 and 0-100 vol% O ₂ , zero suppression applicable
Limit of detection (LOD)**	0.02 vol%
Response time* for 90 % FSD	< 3 seconds at 60 NI/h
Zero-point offset (drift)**	< 0.06 vol% O ₂ in 72 hours
Linearity error	< ±0.1 vol% O ₂
Accuracy after calibration**	Deviation ±1 % of full scale or 0.02 vol% O ₂ , whichever value is greater.
Reproducibility**	< ±0.01 vol%
Flow rate of sample gas	25 to 60 NI/h
Influence of sample gas flow	Variation in gas flow between 25 - 60 NI/h will cause a deviation of < 0.1 vol% O ₂
Sample gas inlet pressure	0.8 - 1.2 bar abs.
Sample gas outlet pressure	Recommendation: discharge freely into atmosphere (requires higher pressure at the analyzer inlet compared to the outlet)
Influence of sample gas pressure	< 1 % of full scale within the range of 0.8 to 1.2 bar abs. with activated pressure compensation
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
O ₂ transducer temperature	Fixed at 55 °C [131 °F]
Ambient temperature	0 to 50 °C [32 to 122 °F], avoid temperature dropping below dew point
Influence of ambient temperature	< 1 % of full scale
Display	7" resistive touchscreen
Analog output signal	1 x 0-20 mA/4-20 mA, max. 500 Ohms burden, short-circuit proof, electrically isolated
Status relay outputs	4 x relay output (1 x status, 1 x Cal. mode, 1 x pump, 1 x Cal. error) contacts: 250 V AC/3 A or 30 V DC/3 A at resistive load, change-over contact, potential-free
Digital relay outputs	4 x per measuring signal DO (2 x limit values, 2 x measuring range feedback) contacts: 250 V AC/3 A or 30 V DC/3 A at resistive load, change-over contact, potential-free
Interfaces	Ethernet / USB

O ₂ Analyzer - GenTwo® series	PMA1000 V2.4
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	100 to 240 V AC, -15/+10 %, 50 to 60 Hz
Power consumption	Max. 150 VA
Wetted materials	Platinum, epoxy resin, glass, FKM (Viton®), stainless steel 316Ti, PVDF, PPS, depending on tubing material and of the components installed
Sample gas connection	Screw-on bulkhead fitting with 1/4" internal thread, PVDF (standard)
Case protection	IP20: 19" rack housing, IP54: wall-mount housing, 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)	482 x 185 x 404 [≈ 19" x 7.3" x 15.9"], length of gas connection fittings is additional
Dimensions short enclosure (W x H x D)	482 x 185 x 265 mm [≈ 19" x 7.3" x 10.4"], length of gas connection fittings is additional
Dimensions wall-mount housing (W x H x D)	400 x 500 mm plus approx. 66 mm gas connection fitting x 218 mm [≈ 15.7" x 19.7" plus approx. 2.4" gas connection fitting x 8.6"]
Weight short enclosure	Approx. 13 kg [≈ 29 lbs] (depending on sensor configuration)
Weight long enclosure	Approx. 11 kg [≈ 24 lbs] (depending on sensor configuration)
Weight wall-mount housing	Approx. 18 kg [≈ 39.7 lbs] (depending on sensor configuration)

* Depends on sample gas input pressure, density and flow rate at the analyzer input.

** At constant pressure, temperature and sample gas flow rate.

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.

Options

Options for Viton® gas path	Description	Part No.
GenX AutoZero basic module AZF1 VI	AutoZero base module AZF1 for automatic zero calibration, for integration into gas paths with Viton® tubing	08A2991
GenX valve Y8 with cal. gas OUT for AZF1	Additional 3/2-way valve Y8 to upgrade the AutoZero base module AZF1 incl. separate outlet for the calibration gas	08A2994
GenX zero gas pump SC-57L for AZF1	SC-57L zero gas pump to upgrade the AutoZero base module AZF1. The pump is used to convey ambient air as zero gas	08A2995
GenX front filter FPF+	Front filter FPF+ to hold 70-mm filter elements	08A2950
GenX FM40 front	Flow meter type FM-40/70 for front-panel mounting with needle valve, measuring range: 7-70 NI/h, medium: air, connection: DN 4/6, material: PVDF, Viton®, glass	08A2940
GenX interface for ext. AutoCal	Digital output card for controlling an external calibration device with three potential-free changeover contacts (1x sample/test gas, 1x zero gas, 1x span gas), max. 3 A at 250 V AC or 3 A at 30 V DC	08A2990

Options for stainless steel gas path	Description	Part No.
GenX AutoZero basic module AZF1 SS*	AutoZero base module AZF1 for automatic zero calibration, for integration into gas paths with stainless steel tubing	08A2993
GenX valve Y8 with cal. gas OUT for AZF1	Additional 3/2-way valve Y8 to upgrade the AutoZero base module AZF1 incl. separate outlet for the calibration gas	08A2994
GenX zero gas pump SC-57L for AZF1	SC-57L zero gas pump to upgrade the AutoZero base module AZF1. The pump is used to convey ambient air as zero gas	08A2995
GenX interface for ext. AutoCal	Digital output card for controlling an external calibration device with three potential-free changeover contacts (1x sample/test gas, 1x zero gas, 1x span gas), max. 3 A at 250 V AC or 3 A at 30 V DC	08A2990

* Contains O-rings made of FKM

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Options: Telescopic slides for 19"-Rack	Description	Part No.
US-version: Set of telescopic slides for 19"-Rack	Allows the analyzer enclosure to be completely extended from the 19" rack. Kit for retrofitting to enclosure and rack. Telescopic slide type: GeneralDevices C-300-S-124 incl. mounting adapter and mounting material.	98A2500
European-version: Set of telescopic slides for 19"-Rack	Allows the analyzer enclosure to be completely extended from the 19" rack. Kit for retrofitting to enclosure and rack. Telescopic slide type: Rittal RP 3659.180 incl. mounting adapter and mounting material.	98A2550