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 O_2 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 in^3] 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 O_2 analyzer PMA1000 V2.4 of the GenTwo® series utilizes the paramagnetic dumbbell 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.

Technical specifications and illustrations are without obligation, subject to modifications. 09.25 - 1.01.02

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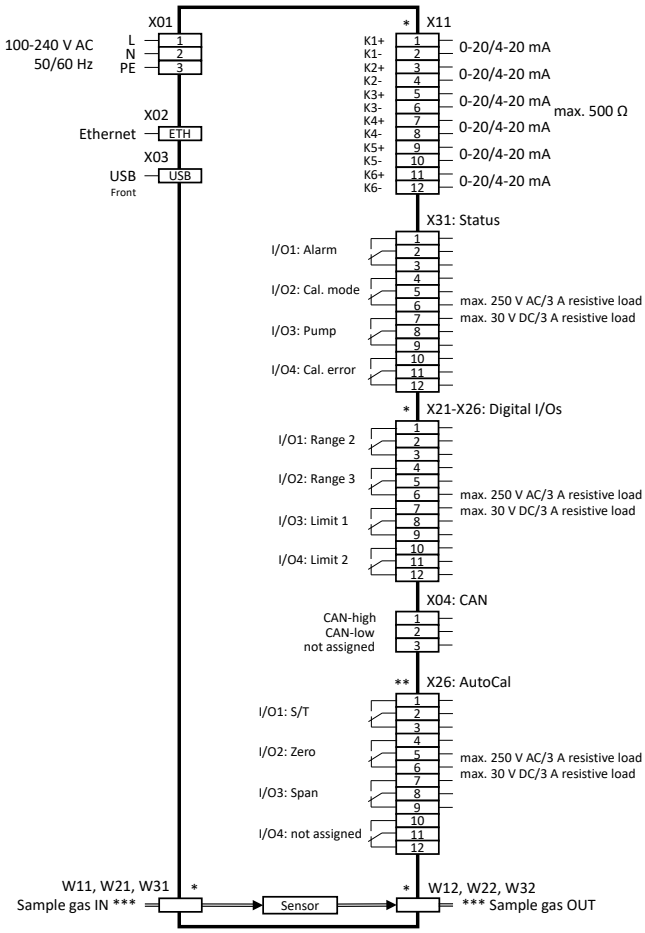
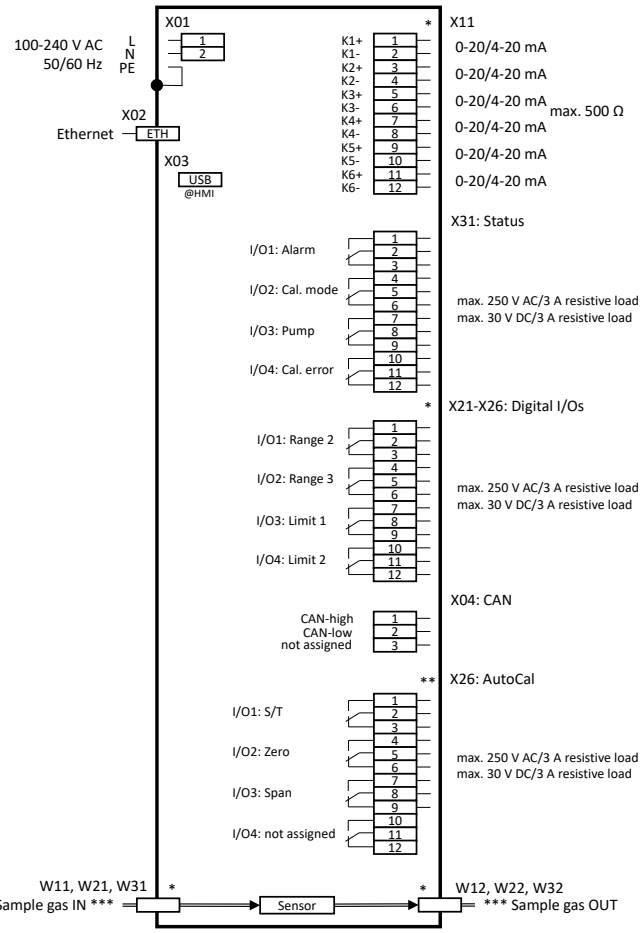
Interfaces diagrams

19" rack housing

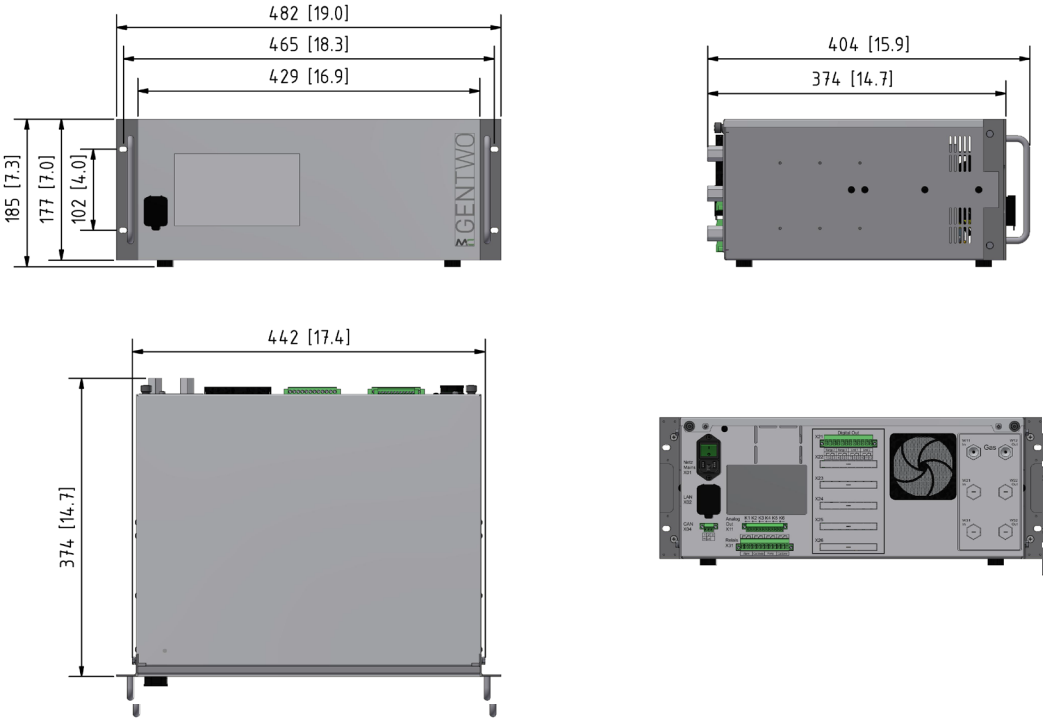


Wall-mount housing



* 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® or PTFE; 1/8" NPT female, if internal tubing is made of stainless steel

Dimensions 19" rack housing (long housing)



Dimensions in mm [Inches]

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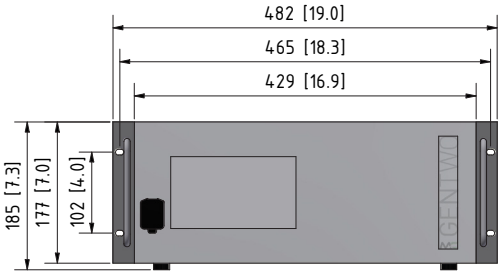
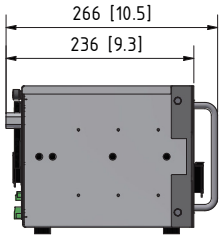
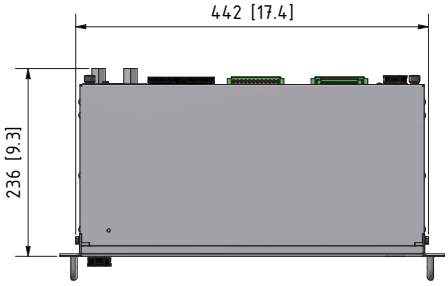
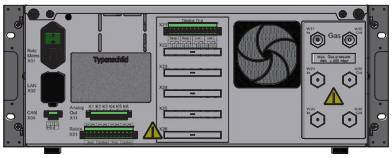
Dimensions 19" rack housing (short housing)

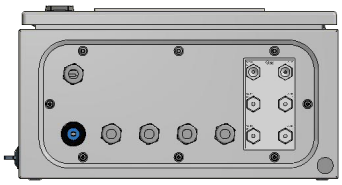


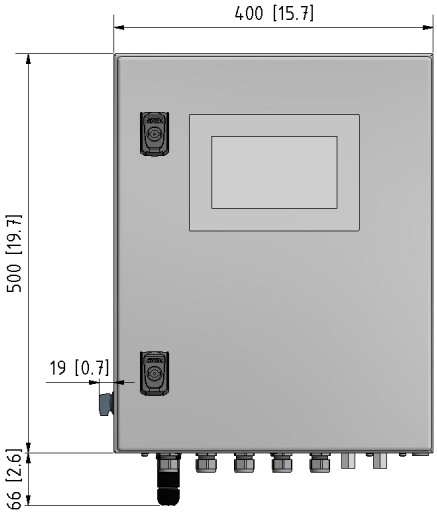


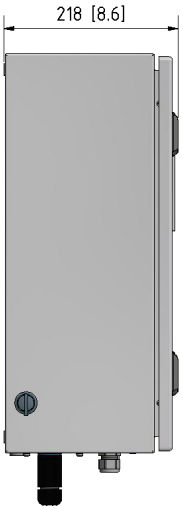




Dimensions wall-mount housing







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 Nl/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	25-60 Nl/h
Influence of sample gas flow	Variation in gas flow between 25-60 Nl/h will cause a deviation of < 0.1 vol% O_2
Sample gas inlet pressure	800 to 1 200 mbar abs. with activated pressure compensation
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
Relative humidity of the ambient temperature	0-90 %, non-condensing
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
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
Overvoltage category	OVC II
Power consumption	Max. 150 VA
Mains power connection	Wall-mount housing: 3 x 1.5 mm^2 wires (customer provided), rack housing: power cord (3 x 1.5 mm^2 wires) with 3-pin IEC plug and Schuko plug (included)
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	Internally equipped with gas path made of Viton® (standard) or PTFE: G 1/4" female thread, internally equipped with gas path made of stainless steel: 1/8" NPT female thread
Case protection	IP20: 19" rack housing, IP54: wall-mount housing, EN 60529
Electrical standard	EN 61010
Housing/front color	19" rack mounting (4RU)/white RAL 9003
Maximum installation altitude	2000 m [≈ 6561.7 ft]
Pollution degree of the intended environment	PD 2
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 long enclosure	Approx.13 kg [≈ 29 lbs] (depending on sensor configuration)
Weight short 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: Nl/h and Nl/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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Options

Options for internal tubing with different material*	Description	Part No.
GenX first gas path for 19" housing VI	Viton® tubing of the first gas path with gas connection G 1/4" f for 19" rack-mount housing.	08A2760
GenX first gas path for 19" housing PT	PTFE tubing of the first gas path with gas connection G 1/4" f for 19" rack-mount housing.	08A2770
GenX first gas path for 19" housing SS	Stainless steel tubing of first gas path with gas connection 1/8" NPT f for 19" rack-mount housing.	08A2780
GenX first gas path for wall housing VI	Viton® tubing of the first gas path with gas connection G 1/4" f for wall-mount housing.	08A2790
GenX first gas path for wall housing PT	PTFE tubing of the first gas path with gas connection G 1/4" f for wall-mount housing.	08A2800
GenX first gas path for wall housing SS	Stainless steel tubing of the first gas path with gas connection 1/8" NPT f for wall-mount housing.	08A2810
GenX additional gas path VI	Additional gas path with Viton® tubing and gas connection G 1/4" f.	08A2820
GenX additional gas path PT	Additional gas path with PTFE tubing and gas connection G 1/4" f.	08A2830
GenX additional gas path SS	Additional gas path with stainless steel tubing and gas connection 1/8" NPT f.	08A2840

*All internal tubing listed Include a GenXFlow module for recording the process pressure, compensating measurement signals and calculating the gas flow rate, incl. option to connect and control a gas sample pump.

Options for Viton® or PTFE gas path	Description	Part No.
GenX front filter FPF+	Front filter FPF+ to hold 75-mm filter elements (see filter element data sheet for details)	08A2950
GenX FM40 front	Flow meter type FM-40/70 for front-panel mounting with needle valve, measuring range: 7-70 Nl/h, medium: air, connection: DN 4/6, material: PVDF, Viton®, glass	08A2940

Options: AutoZero basic modules and upgrades	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 AutoZero basic module AZF1 PT	AutoZero base module AZF1 for automatic zero calibration, for integration into gas paths with PTFE tubing	08A2992
GenX AutoZero basic module AZF1 SS	AutoZero base module AZF1 for automatic zero calibration, for integration into gas paths with stainless steel tubing, contains O-ring made of FKM	08A2992
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

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Option: external interface for AutoCal	Description	Part No.
GenX interface for ext. AutoCal	Digital output card for controlling an external calibration device with three potential-free changeover contacts (1 x sample/test gas, 1 x zero gas, 1 x span gas), max. 3 A at 250 V AC or 3 A at 30 V DC	08A2990

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