



PMA10S

## Oxygen Analyzer Series PMA®

Portable version PMA10S  
for oxygen purity measurement

### Special Features

- Discontinuous oxygen purity measurement within the expanded range from 99 to 100 vol% O<sub>2</sub>
- Portable and rugged instrument, lightweight design
- Analog and digital linear indication of measuring ranges
- Physical measuring principle
- Small dead volume, fast response time
- High accuracy and reliability

### Application

Due to the very fast response time, the magneto-dynamic measuring cell, the small dead volume and the low cross-sensitivity to other measuring gas components, the M&C oxygen analyzer PMA10S is used in a wide range of applications for oxygen purity measurements.

### Description

The M&C oxygen analyzer PMA10S is a modified extended version of the PMA10 standard instrument.

It is equipped with an electrical zero point suppression which enables oxygen purity measurement in the range from 99 to 100 vol% O<sub>2</sub>.

The spread measuring range is indicated on the analog meter, while the digital display always shows the measuring range from 0 to 100 vol%. Zero point suppression can be switched off so that the standard functions of the PMA10 can also be used.

The application with highly suppressed zero point (99-100 vol%) is to be used exclusively as discontinuous measurement. Prior to each measurement, a calibration with test gas is performed to compensate for temperature and pressure fluctuations. This ensures the highest measurement accuracy.

The smallest measuring span of 1 vol% O<sub>2</sub> is set at the factory. Any other measuring span is possible. The measuring end value is always 100 vol% O<sub>2</sub>.

– Further technical data are provided in data sheet "Oxygen Analyzer Series PMA®, portable version PMA10 for mobile oxygen measurement". –

### The Measuring Principle of the M&C Oxygen Analyzer

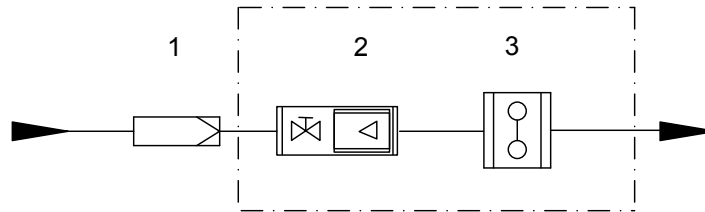
The PMA10 applies a physical measuring principle to measure the oxygen content and uses the magneto-dynamic M&C measuring cell. The measuring method is based on the very high paramagnetic susceptibility of the oxygen, which has this property almost exclusively.

The cross-flow measuring cell is characterized by robustness, extremely low drift, only 2 ml dead volume, fast response time and low cross-sensitivity to other gases. The measurement method is one of the most accurate quantitative determination methods for oxygen in the range from 0 to 100 vol%.

When used correctly, the M&C measuring cell has a very long service life. A diamagnetic dumbbell with a mirror at its pivot point is attached to band clamps and mounted in an inhomogeneous magnetic field. Due to its paramagnetism, the oxygen strives into the inhomogeneous magnetic field of the measuring cell. The O<sub>2</sub> molecules exert a torque on the dumbbell and deflect it. The optical scanning electronically induces a current which flows through a feedback coil on the dumbbell and resets it to the neutral position. The compensation current is proportional to the oxygen content of the sample gas, rendering the O<sub>2</sub> display absolutely linear.

## Gas Flow Diagram PMA10S

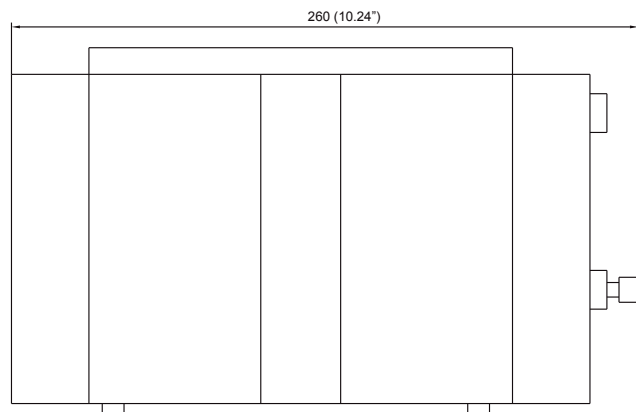
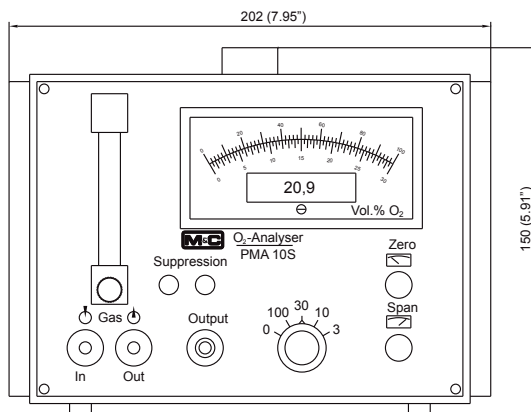
1. Fine filter
2. Flow meter with needle valve
3. Oxygen measuring cell PMA



## Dimensions

Front View

Side View



Dimensions in mm [inch]

Version PMA10S Portable Oxygen Analyzer with Zero Point Suppression	
Part No.	01A2000: PMA10S, power supply 230 V/50 Hz, output signal 0-1 V; 01A2000a = 115 V/60 Hz
Measuring ranges	Selectable for 0-3, 0-10, 0-30 and 0-100 vol% O <sub>2</sub> , switchable, linear. Zero suppression measuring range 99-100 vol% O <sub>2</sub> standard, also available ranges 97/90/70-100 vol% upon request*
Display	Analog/digital meter: Analog meter selectable for each range with a scale of 0-30 and 0-100 vol% digital meter, 3 1/2-digit 9 mm high LCD for 0-100 vol% O <sub>2</sub> reading, selectivity 0.1 vol% O <sub>2</sub>
Output signal	0-1 V DC, non-isolated, load > 100 kΩ, for each selected measuring range
Response time for 90 % FSD	< 3 seconds at 60 NI/h air
Measuring accuracy after calibration	Analog = ±1 % of span/digital = ± 0.1 vol% O <sub>2</sub> deviation
Reproducibility	Analog = < 1 % of span/digital = ± 0.1 vol% O <sub>2</sub> deviation
Influence of ambient temperature	Zero point ±0.02 vol% O <sub>2</sub> /°C Sensitivity ±0.1 vol% O <sub>2</sub> /°C
Influence of barometric pressure	The oxygen reading varies in direct proportion to changes of the barometric pressure
Influence of sample gas flow	Variation in gas flow between 0 and 60 NI/h air will cause a difference of < 0.1 vol% O <sub>2</sub>
Sample gas inlet pressure	0.01 up to 1 bar g, (PMA 10S requires admission pressure for adequate flow rate, no pump inside)
Sample gas outlet pressure	Outlet of analyzer must discharge freely into atmosphere
Flow rate of sample gas	Max. 60 NI/h air, adjustable with needle valve on the flow meter 7-70 NI/h
Temperature of sample gas	-10 up to +40 °C [14 to 104 °F], dry gas
Analyzer temperature	According to ambient temperature, non-heated version
Ambient temperature	-10 up to +55 °C [14 up to 131 °F]
Storage temperature	-20 up to +60 °C [-4 up to 140 °F], relative humidity 0 to 90 % RH
Power supply	Internal power unit for 230 V <sub>AC</sub> standard or 115 V <sub>AC</sub> available (a)* +/-10 %, 40-60 Hz, 3.5 VA
Electrical connections	Mains supply: 3-pole chassis plug with 2 m cable; signal: 3-pole plug
Materials in contact with sample gas	Platinum, glass, polypropylene, stainless steel 316Ti, FPM, epoxy resin
Sample gas connection	Hose nipple for DN 11-4 mm tube
Protection/electrical standard	IP41 EN 60529/EN 61010
Housing/case color	Portable plastic case out of Makrolon®/gray
Dimension (H x W x D)	150 x 202 x 260 mm [≈ 5.9 x 8.0 x 10.2"]
Weight	Approx. 3 kg [≈ 6.6 lbs]

\* Please specify with order.

Battery and pump option not applicable to the PMA10S analyzer.

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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## WARNING! IMPORTANT!

An external fine filter must always be used at the gas inlet of the analyzer. Depending on the composition of the sample gas, it may be necessary to use a sample conditioning system. Without precautions, the analyzer is only suitable for measuring non-flammable gases or gas mixtures in non-hazardous areas.