



PMA 10S

Oxygen Analyser Series PMA®

Portable version PMA 10S
for oxygen purity measurement

Special Features

- **Discontinuous oxygen purity measurement within the expanded range of 99 to 100 volume % O₂**
- **Portable and rugged instrument, lightweight**
- **Analogue and digital linear indication**
- **Physical measuring principle**
- **Small dead volume, fast response time**
- **High accuracy and reliability**

Application

Due to the extremely fast response time of the patented M&C magneto-dynamic measuring cell with no stagnant volume as well as the negligible cross sensitivity from other sample gas components, the portable M&C oxygen analyser PMA 10S does not normally limit its use for a wide variety of applications where oxygen purity measurements are essential.

Description

The PMA 10S oxygen purity analyser, being an extended version of the PMA 10, is provided with an electronic suppression system which enables oxygen purity measurements within the expanded 99-100 vol.% range.

This measuring range is displayed on the analogue meter whilst the digital indicator remains for the 0-100% reading.

The electronic zero suppression system may be selected by means of a push button switch which is located on the control panel of the instrument.

The PMA 10S analyser can normally be used also for its standard PMA10 functions. Oxygen purity measurements could only be made discontinuously. The measuring accuracy of the analyser can be maintained when calibration of the instrument with a certified gas takes place before the measurement procedure in order to avoid influence of ambient temperature and pressure. A measurement of 1 vol.% can be easily realized whilst the maximum value remains at 100 vol.%. Other measurement within this range can be performed.

– Further technical data see leaflet PMA10, 13.1. –

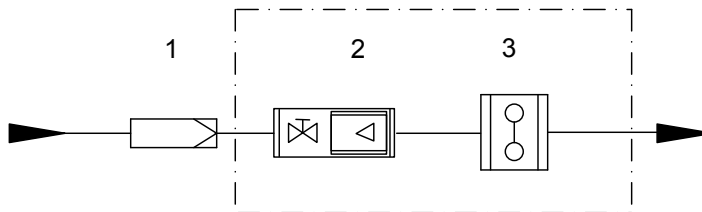
Measuring principle of M&C oxygen analyser

The PMA 10S utilises the paramagnetic principle of operation to measure oxygen concentrations. The analyser measures the paramagnetic susceptibility of the oxygen in the sample gas by means of the M&C magneto-dynamic measuring cell. The physical property which distinguishes oxygen from other gases is its paramagnetism. It is significantly higher comparing to other common gases. This operation principle is one of the most accurate and reliable procedures to determine the oxygen concentration in a gas mixture from 0 to 100 Vol.%. The robust M&C cross-flow cell has no stagnant volume. Advantages are the fast response time, the flow rate up to 60 l/hr, the small volume of 2 ml, the extremely low drift, the absolute linearity and the negligible cross sensitivity against other sample gas components. With a proper sample conditioning and pressure, the M&C cell will never need replacing. The dumbbell with a small mirror at its centre is mounted in a strong inhomogenous magnetic field. The paramagnetic oxygen strengthens the forces on the diamagnetic dumbbell and causes a shifting which is detected by a system consisting of light beam, mirror and a photo cell. A compensation current is induced via the feedback coil on the dumbbell and leads to a reset of the dumbbell into its zero-position.

The required current is linearly proportional to the oxygen concentration.

Gas flow diagram PMA 10S

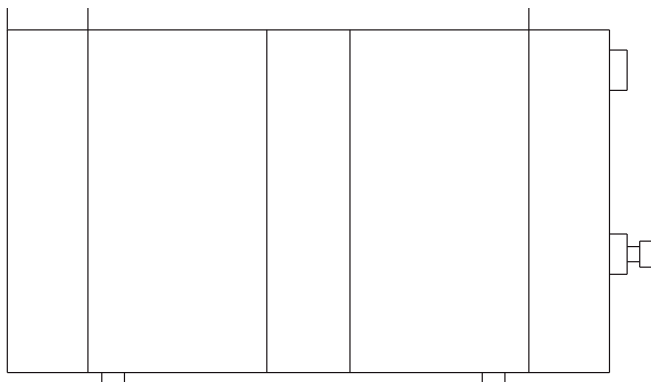
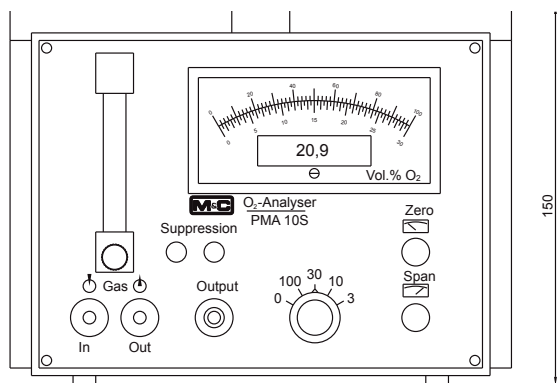
1. Fine filter
2. Flowmeter with needle valve
3. Oxygen measuring cell PMA



Dimensions

Front View

Side View



Dimensions in mm

Technical Data

Version PMA 10S portable oxygen analyser with zero suppression	
Part No.	01A2000 : PMA 10S, power supply 230V 50Hz, output signal 0-1 V; 01A2000a = 115V 60Hz
Measuring ranges	selectable for 0-3, 0-10, 0-30 and 0-100 vol.% O ₂ , linear. Zero suppression measuring range 99-100 vol.% O ₂ standard, also available ranges 97/90/70-100%*
Indication	analogue / digital meter: analogue meter selectable for each range with a scale of 0-30 and 0-100% digital meter, 3 1/2 digit 9 mm high LCD for 0-100 % O ₂ reading, selectivity 0,1 vol.% O ₂
Output signal	0-1V DC, non-isolated, load > 100 KΩ, for each selected range
Response time for 90% FSD	< 3 seconds at 60 NI/hr air
Accuracy after calibration	analogue = ± 1% of span / digital = ± 0,1 vol.% O ₂ error of precision
Reproducibility	analogue = < 1% of span / digital = ± 0,1 vol.% O ₂ error
Influence of ambient temperature	zero point ± 0,02 vol. % O ₂ / °C sensitivity ± 0,1 vol. % O ₂ / °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 0-60 NI/hr air will cause a difference of < 0,1 vol.% O ₂
Sample gas inlet pressure	0,01 up to 1 bar g, (PMA 10S required admission pressure for competent flow rate, no pump inside)
Sample gas outlet pressure	outlet of analyser must discharge freely into atmosphere
Flow rate of sample gas	max. 60 NI/hr air, adjustable with needle valve on the flowmeter 7-70 NI/hr
Temperature of sample gas	-10 °C up to +40 °C, dry gas
Analyser temperature	according to ambient temperatur, non heated version
Ambient temperature	-10 °C up to +55 °C
Storage temperature	-20 °C up to +60 °C, relative humidity 0-90% RH
Power supply	internal power unit for 230VAC standard or 115VAC available (a)* +/-10%, 40-60Hz, 3,5VA
Electrical connections	mains supply: 3-pole chassis plug with 2 m of 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 11-4mm tube
Protection / electrical standard	IP 41 EN 60529 / EN 61010
Housing / case colour	portable plastic case / gray
Dimension / weight	height 150 mm, width 202 mm, depth 260 mm / approx. 3 kg

* Please specify with order.

Battery and pump option not applicable to the PMA 10S analyser.

WARNING! IMPORTANT

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