



PMA 30A/D

Oxygen Analyser Series PMA®

Thermostated version PMA 30/D, PMA 30A/D
in compact 19"-cassette



Special Features

- SIL approval according to DIN EN 61508
- Thermostated, in compact 19"-cassette
- Accurate and reliable, small space requirement
- Analogue / Digital indicator, linear measuring ranges
- Physical measuring principle
- Small stagnant volume, fast response time
- Remote range control and indication
- Flow alarm sensor behind the measuring cell
- Status alarm, safety in operation

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 30 has a wide variety of applications.

The analyser is a suitable and reliable instrument for monitoring oxygen concentrations in various gas analytical control applications including flue gas-, inert gas-, fermentation processes- and process or laboratory control measurements.

Description

The M&C oxygen analyser PMA 30 is a temperature controlled instrument which has been designed for continuous measurements of oxygen concentrations in particle-free and dry sample gas.

The PMA 30 is a reliable and easy-to-operate instrument. It is built into a compact 19 inch cassette. The transducer unit maintains a constant operating temperature of 50 °C and a flashing LED on the control panel indicates the proper operating temperature of the analyser. The five measuring ranges are displayed on the analogue meter with 30/100% scale. The PMA 30A/D has a combined analogue/digital meter and the PMA 30/D has only a digital meter. Two output signals are available. Sample gas connections as well as connectors for incoming power supply, output signals, remote ranging, remote range indication and status contact are located at the rear panel of the analyser. The sample gas enters the analyser via an external protective fine-filter. The required flow rate can be adjusted at the flowmeter with needle valve, mounted on the front panel upstream the M&C measuring cell and the flow alarm sensor. The internal tubing is made of PTFE and PVDF.

Measuring principle of M&C oxygen analyser

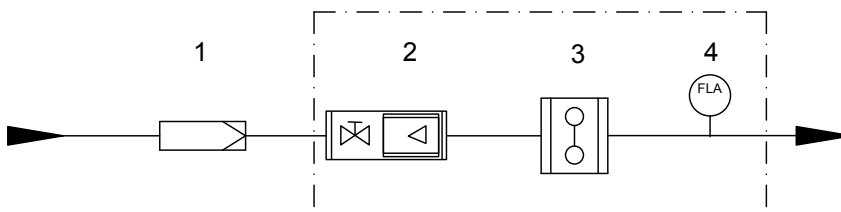
The PMA 30 utilises the paramagnetic principle of operation to measure oxygen concentrations. The analyser measures the paramagnetic susceptibility of the oxygen in the sample gas by means of the M&C magneto-dynamic measuring cell. The physical properties which distinguishes oxygen from other gases is 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 inhomogeneous 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.

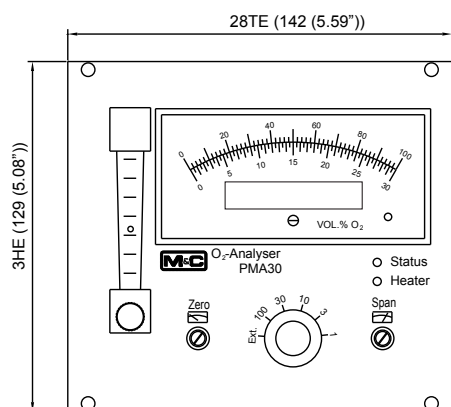
Gas flow diagram PMA 30

1. External fine filter
2. Flowmeter with needle valve
3. Oxygen measuring cell PMA
4. Flow alarm sensor

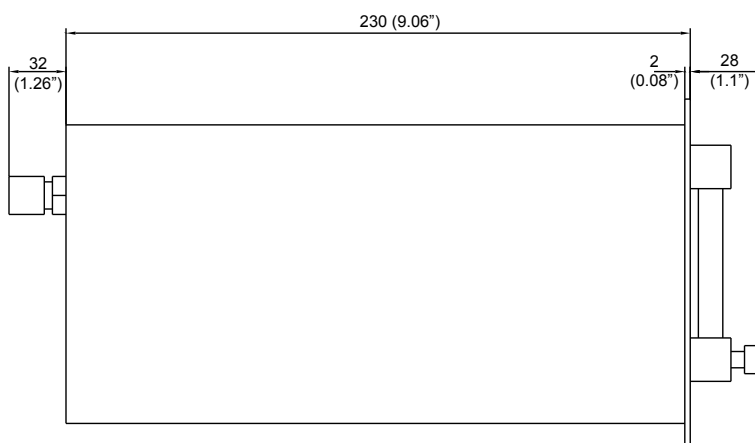


Dimensions

Front view



Side view



Dimensions in mm (Inch)

Technical Data

Version PMA 30 thermostated oxygen analyser in compact 19-inch cassette	
Part-No.	PMA 30/D: 03 A 2005 = 230 V 50 Hz, 03 A 2005a = 115 V 60 Hz PMA 30A/D: 03 A 2001 = 230 V 50 Hz, 03 A 2005a = 115 V 60 Hz
Measuring ranges	selectable for 0-1, 0-3, 0-10, 0-30 und 0-100 vol% O ₂ , linear
Expanded measuring ranges***	option: zero suppression for spreading of measuring range, adjusted by the standard ranges, for example 20-21 % (1 %), 18-21% (3 %), 90-100 % (10 %), max.97-100 %, incl. process pressure compensation type SDPD** Part-No.: 03 A 9535
External measuring range indication	potential free contacts for each selected range, contact rating max. 48 V DC, 0.5 A
Remote range control	Remote range control for all 5 ranges by means of external potential free contacts
Indication	PMA 30A/D: analogue meter with a scale of 0-30 and 0-100 % for each selected range, digital meter, 4 1/2 digit 9 mm high LCD-indicator for 0-100 % O ₂ reading, selectivity 0.1 vol% O ₂ PMA 30/D: digital meter 4 1/2 digit 18 mm high LCD for 0-100 % O ₂ reading, selectivity 0.1 vol% O ₂
Output signals	0-10 V DC non-isolated, load > 100 kΩ, for the range of 100 vol%, and 0-20 mA* or 4-20 mA* for the chosen range, non-isolated, max. load 300 Ω / 900 Ω
Response time for 90 % FSD	< 3 seconds at 60 NI/h air
Accuracy after calibration	deviation: analogue signal output = ±1 % of span at range 3-100 % / digital indicator = ±0.1 vol% O ₂ = ±2 % of span at range 1 %
Reproducibility	deviation: analogue = < 1 % of span / digital = ± 0.1 vol% O ₂
Influence of ambient temperature	no influence up to 45 °C (113 °F)
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 30 required admission pressure for competent flow rate, no pump inside)
Sample gas outlet pressure	outlet of analyser must discharge freely into atmosphere; option: process pressure compensation PD** in a range of 0.4 to 1.6 bar absolut Part-No.: 03 A 9530
Flow rate of sample gas	max. 60 NI/h air, adjustable with needle valve on the flowmeter 7-70 NI/h
Temperature of sample gas	-10 °C up to +40 °C (14 °F to 104 °F) dry gas
O ₂ -transducer temperature	fixed at +50 °C (122 °F)
Ambient temperature	-10 °C up to +45 °C (14 °F up to 113 °F)
Storage temperature	-20 °C up to +60 °C (-4 °F up to 140 °F), relative humidity 0-90 % RH
Power supply	internal power unit for 230 VAC standard or 115 VAC available (a)* +/-15 %, 40-60 Hz, 35.5 VA
Electrical connections	mains supply: 3-pole chassis plug with 2 m (78.74") of cable; signals: 9 and 25-pole plugs
Materials in contact with sample gas	Platinum, Glass, PTFE, PVDF, Stainless Steel 316Ti, FPM, Epoxy resin
Sample gas connections	1/8" NPT i, optional hose connector DN 4/6 available
Flow alarm	thermo-conductive flow sensor downstream mounted after measuring cell
Status alarm	for low sample flow, transducer temperature < 40 °C (104 °F), light beam defect, power failure: LED indication and potential free change over contact, contact rating max. 48 V DC, 0.5 A (2x)
Protection / electrical standard	IP 20 EN 60529 / EN 61010
Housing / front colour	3 U/28 HP - 19-inch cassette European standard / silver
Dimension / weight	height 3 U (5.08"), width 28 HP (5.59"), depth 230 mm (9.06") + approx. 60 mm (2.36") installation space / approx. 2.5 kg (5.51 lbs)

Options

03 A 9150	Wall mountage housing out of aluminium type 30-19 with 19"-insertion system (3 U/42 TE), incl. clamp box, clamp boards and filter, with window. protection class: IP65.
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* Please specify with order.

** Without SIL-certification

*** Standard with analogue and digital meter.

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 gas mixtures in non-hazardous areas.