



PMA 100

Oxygen Analyser Series PMA®

Version PMA 100
Microprocessor based,
19"-rack unit or table version

Special Features

- Safe in operation
- High accuracy and reliability
- Physical measuring principle, linear measuring ranges
- Fast response time
- Transducer unit temperature controlled at +55 °C
- Solid 19" metal housing
- Large LCD- indicator with background lighting
- Selectable time constant for noise damping if needed for unstable process conditions
- 4 free selectable O₂ measuring ranges, incl. zero suppression, lowest span 1%
- Manual, automatic or remote range control
- User friendly menu control corresponding to NAMUR recommendations
- Isolated output signal 0/4-20mA
- 4 configurable MIN. or MAX. oxygen level alarms
- 4 free configurable isolated binary inputs, for example: alarm confirmation, measuring range control, autocal. start
- Process pressure measuring and compensation
- Analogue signal memory during adjusting and calibration
- Manual / automatic calibration
- 3 code levels, access to 2 code levels only with release code
- Interface RS 232 type
- Flow alarm monitoring
- 4 free configurable potential free relay contact outputs, for example: oxygen level alarm
- option: interface RS 485 type

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 M&C oxygen-analyser PMA 100 has a wide variety of applications. The analyser is a suitable and reliable instrument for monitoring oxygen concentrations in various gas analytical process control applications including flue gas measurements, inert gas installations, fermentation processes and laboratory process control installations.

Description

The M&C oxygen analyser PMA 100 is a temperature controlled instrument which has been designed for continuous measurements of oxygen concentrations in particle-free and dry sample gas. The PMA 100 is a reliable and easy-to-operate instrument. It is built into a housing for 19 inch rack mounting / table version.

The transducer unit maintains a constant operating temperature of 55 °C.

The programmable measuring ranges are displayed on the LCD display. Sample gas connections as well as connectors for incoming power supply and all output/input signals are located at the rear side of the analyser. The sample gas enters the analyser via an external protective fine-filter. The required flow rate can be adjusted at the flow meter with needle valve, mounted on the front panel upstream the M&C measuring cell and the flow chamber with flow alarm sensor and also with process pressure sensor. The internal tubing is made of PTFE and PVDF.

The PMA 100 has got nearly the same design as the PMA 100-L. There are only a few differences: the PMA100 is additionally equipped with a pressure sensor, i.e. a pressure compensation. Furthermore, there is an interface type RS 232 and the possibility to drive 3 external solenoid valves for an automatic calibration.

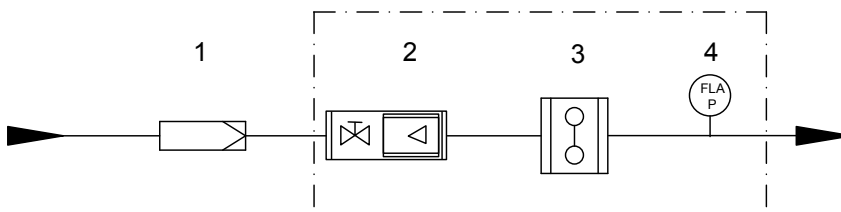
Measuring principle of M&C oxygen analyser

The PMA 100 utilises the paramagnetic principle of operation to measure oxygen concentration. 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.

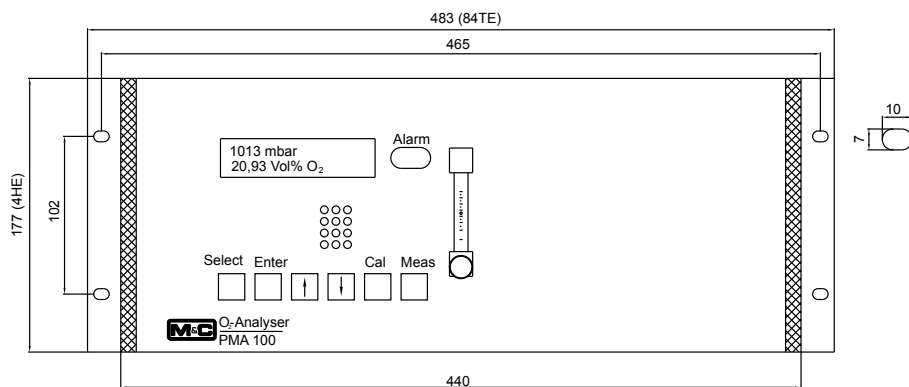
Gas flow diagram PMA 100

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

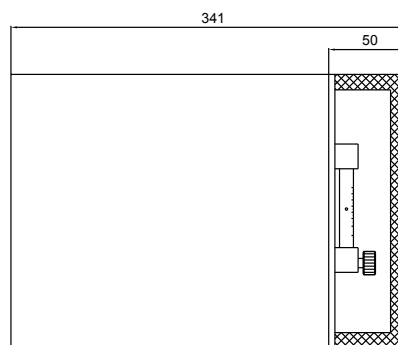


Dimensions

Front view



Side view



Dimensions in mm

Technical Data

Version PMA 100 microprocessor based oxygen analyser in 19"-housing	
Part No.	03A3000 : PMA 100 power supply 230V 50Hz, 4-20mA; 03A3000a = 115V 60Hz
Measuring ranges	4 linear measuring ranges free selectable, lowest span 1%, basis selection* 0-1, 0-10, 0-25 and 0-100 vol. O ₂ . manual, automatic or remote range control and range indication is possible
Indication	two line 16-sign LCD display, resolution 0,01vol.% O ₂ , continuous O ₂ indication and call off
Text illustration optional in English, French or German	O ₂ -transducer temperature, mA-signal, measuring range, time, date, failure-/alarm information, process pressure
Output signals	selection: isolated 0-20, 2-20, 4-20*, 4-20,5mA for the selected range, max. load 500Ω. interface RS232 type AK-communication protocol - bi-directional, option interface RS485 type
Relay outputs free configurable	4 potential free relay contacts NO, contact rating max. 48V _{DC} , 500mA, 15W
Binary outputs	drive of 3 external solenoid valves for calibration, 3x 24V _{DC} , max. 400mA
Binary inputs free configurable	potential free, 4x 12-24V _{DC} , max. 20mA or internal supply voltage 12 V _{DC}
Flow alarm	thermo-conductive sensor, mounted downstream O ₂ -measuring cell
Status alarm	for min. flow alarm, O ₂ -transducer temperature < 50 °C, central processing unit failure, pressure sensor: LED indication and potential free contact output, NO, max. 48V _{DC} , 500mA, 15W and mA-output indication - example 22mA
Alarm contact	for exceed/remain measuring range, truncate calibration, external alarm, alternatively oxygen level alarms: LED indication and potential free contact output, NO, max. 48V _{DC} , 500mA, 15W
Response time for 90% FSD	< 3 seconds at 60 NI/hr air
Accuracy after calibration	deviation ± 1% of 2-100% span, ± 2% of 1% span
Reproducibility	deviation < 1% of span
Influence of ambient temperature	no influence up to 50 °C
Influence of barometric- or process pressure	no influence within the range of 0,6 up to 1,6bar abs. with integrated pressure compensation
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 0,6 bar g, (PMA 100 requires positive pressure for adequate flow rate, no pump inside)
Sample gas outlet pressure	recommendation: discharge freely into atmosphere; however max. 0,6 to 1,6 bar abs.
Flow rate of sample gas	25-60 NI/hr air
Temperature of sample gas	-10 °C up to +50 °C dry gas
O ₂ -transducer temperature	fixed at +55 °C
Ambient temperature	-10 °C up to +50 °C
Storage temperature	-20 °C up to +60 °C, relative humidity 0-90% RH
Power supply	internal power unit for 230V _{AC} standard or 115V _{AC} available (a) +/- 10%, 40-60Hz, 35VA
Electrical connections	mains supply: 3-pole chassis plug with 2 m cable; signals: 4x Sub-D plug
Materials in contact with sample gas	Platinum, Epoxy resin, glass, FPM, Stainless Steel 316Ti, PTFE, PVDF
Sample gas connection	1/8" NPT internal thread*, option with tube connector DN 4/6 /PVDF available, Part No. 05V1045
Protection / electrical standard	IP 40 EN 60529 / EN 61010
Housing / front colour	19 inch rack mounting with front handles / grey RAL 7032
Dimension / weight	height 4U, width 84HP, depth 350 mm + approx. 60 mm installation space / approx. 11 kg

*standard

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.