



PMA30A/D

Oxygen Analyzer Series PMA®

Versions PMA30/D, PMA30A/D heated with compact housing width of 1/3 of a 19" rack



Special Features

- SIL approval according to DIN EN 61508
- Thermostated
- Housing takes up 1/3 of a 19" rack (28 HP)
- Accurate and reliable, small space requirements
- Analog/digital indicator, linear measuring ranges
- Physical measuring principle
- Small dead volume, fast response time
- Measuring range remote control and indication
- Flow alarm sensor downstream of the measuring cell
- Status alarm, maximum operating reliability

Application

Due to the very fast response time, the low dead volume, the magneto-dynamic measuring cell and the low cross-sensitivity to other sample gas components, the M&C oxygen analyzer PMA30 is used in almost all applications.

It is a suitable and reliable instrument for oxygen monitoring in various processes, such as flue gas monitoring, inerting systems, fermentation applications as well as process and laboratory measurements, etc.

Description

The M&C oxygen analyzer PMA30 is a temperature-controlled instrument which has been designed for continuous measurements of oxygen concentrations in dry and particle-free sample gas.

The PMA30 works reliably and is easy to operate. Its compact design is built into a housing which takes up 1/3 of a 19" rack. The analyzer is thermostatically regulated to 50 °C [122 °F] which is indicated by a flashing LED on the front panel. The analog meter with 30- and 100-vol%-scale shows the 5 switchable measuring ranges. The PMA 30A/D has a combined analog/digital display and the PMA30/D has only one digital display. Two signal outputs are available. Sample gas connections, mains connection and connections for signals, remote switching of measuring ranges and remote detection as well as status contact are located at the rear of the analyzer.

The sample gas enters the analyzer via the external ultra-fine filter. The flow rate is set on the front flow meter with a needle valve and then flows through the M&C measuring cell and the flow sensor to the gas outlet. The internal tubing is made of PTFE, PVDF.

The Measuring Principle of the M&C Oxygen Analyzer

The PMA30 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.

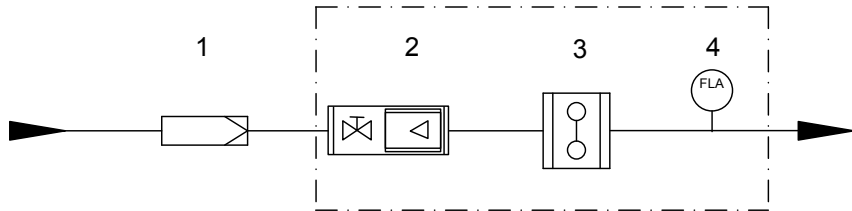
The cross-flow measuring cell is characterized by robustness, extremely low drift, only 2 ml dead volume, fast response time and low cross-sensitivity to other gases. The measurement method is one of the most accurate quantitative determination methods for oxygen in the range from 0 to 100 vol%. When 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 O₂ 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 O₂ display absolutely linear.

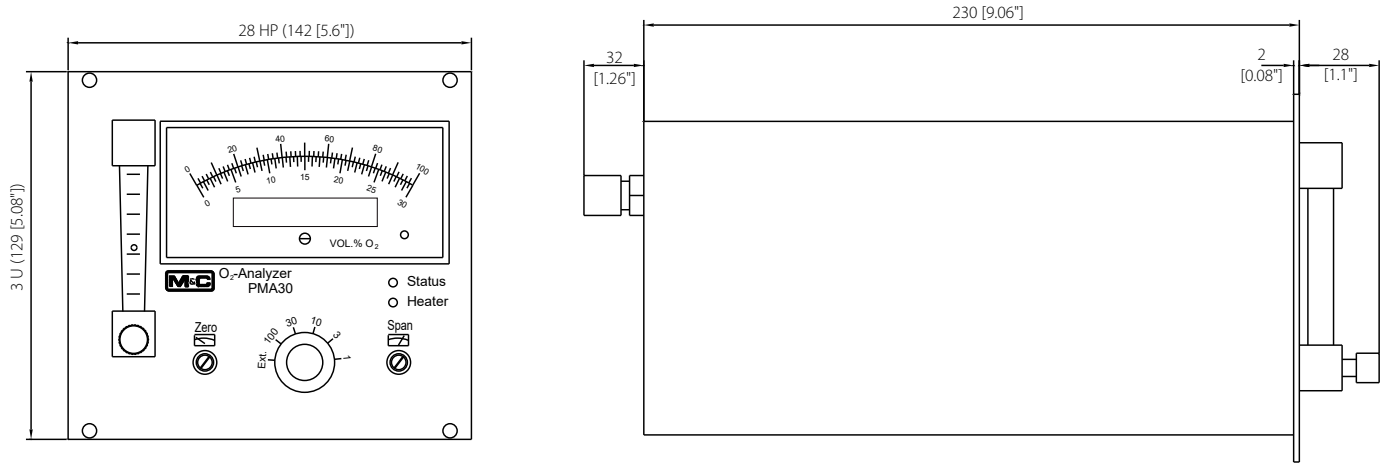
Gas Flow Diagram PMA30



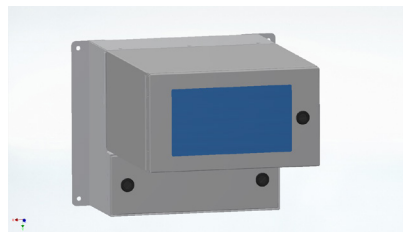
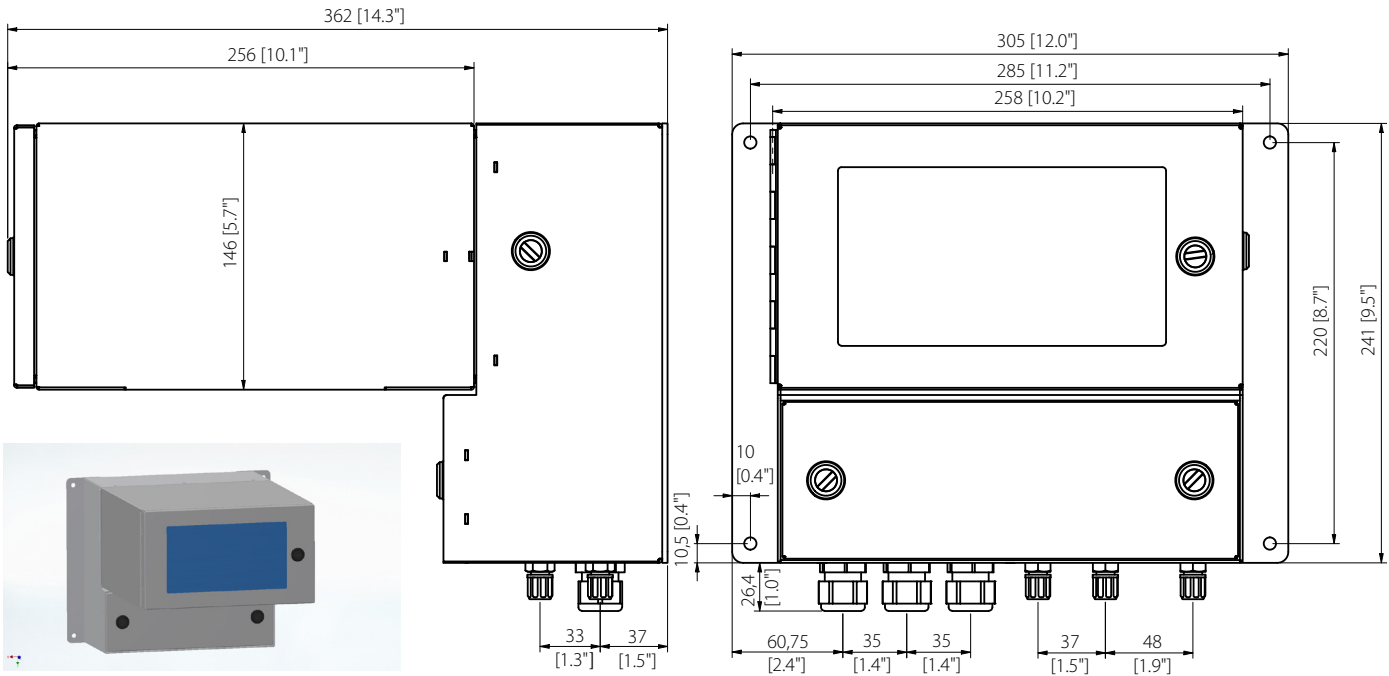
1. External fine filter
2. Flow meter with needle valve
3. Oxygen measuring cell PMA
4. Flow alarm sensor



Dimensions



Dimensions: wall-mount housing (part No. 03A9150)



Dimensions in mm [inches]

Version PMA30 Thermostated Oxygen Analyzer in Compact 19-Inch Rack	
Part No.	PMA30/D: 03A2005 = 230 V/50 Hz, 03A2005a = 115 V/60 Hz PMA30A/D: 03A2001 = 230 V/50 Hz, 03A2005a = 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 vol% (1 vol%), 18-21 vol% (3 vol%), 90-100 vol% (10 vol%), max. 97-100 vol%, incl. process pressure compensation type SDPD** Part No.: 03A9535
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	PMA30A/D: analog meter with a scale of 0-30 and 0-100 vol% for each selected range, digital meter, 4 1/2-digit 9 mm high LCD indicator for 0-100 vol% O ₂ reading, resolution 0.01 vol% O ₂ PMA30/D: digital meter 4 1/2-digit 18 mm high LCD for 0-100 vol% O ₂ reading, resolution 0.01 vol% O ₂
Output signals	0-10 V DC isolated, load > 100 kΩ, for the range of 100 vol%, and 0-20 mA* or 4-20 mA* for the chosen range, isolated, max. load 300/900 Ω
Response time for 90 % FSD	< 3 seconds at 60 NI/h air
Accuracy after calibration	Deviation: Analog signal output = ±1 % of span at range 3-100 vol%/digital indicator = ±0.1 vol% O ₂ = ±2 % of span at range 1 vol%
Reproducibility	Deviation: analog = < 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	Fluctuations of the sample gas flow in a range from 10 to 60 NI/h nitrogen (N ₂) cause a change of the oxygen reading which is smaller than 0.1 vol% O ₂
Sample gas inlet pressure	0.01 to 1 bar g, (PMA30 required admission pressure for adequate flow rate, no pump inside)
Sample gas outlet pressure	Outlet of analyzer must discharge freely into atmosphere; option: process pressure compensation PD** in a range of 0.4 to 1.6 bar absolut Part No.: 03A9530
Flow rate of sample gas	Min. 10 to max. 60 NI/h, adjustable with needle valve on the flowmeter (flowmeter is calibrated for air and has a measuring range of 7-70 NI/h)
Temperature of sample gas	-10 to +40 °C [14 to 104 °F] dry gas
O ₂ -transducer temperature	Set to +50 °C [122 °F]
Ambient temperature	-10 to +45 °C [14 to 113 °F]
Storage temperature	-20 to +60 °C [-4 to 140 °F], relative humidity 0 to 90 % RH
Power supply	Internal power unit for 230 V AC standard or 115 V AC available (a)* ±15 %, 40-60 Hz, 35.5 VA
Electrical connections	Mains supply: 3-pole chassis plug with 2 m [≈ 78.7"] cable; signals: 9 and 25-pole plugs
Materials in contact with sample gas	Platinum, glass, PTFE, PVDF, stainless steel 316Ti, FKM, epoxy resin
Sample gas connections	1/8" NPT female, 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 (2 x)
Protection/electrical standard	IP20 EN 60529/EN 61010
Housing front width/front color	1/3 of a 19" rack (European standard)/silver
Dimensions (H x W x D)	129 x 142 x 230 mm + approx. 60 mm installation space [≈ 5.1" x 5.6" x 9.1" + approx. 2.4" installation space]
Weight	Approx. 2.5 kg [≈ 5.5 lbs]
Options	
03A9150	Wall-mount housing made of stainless steel sheet metal (version starting at 05.2024) with 19"-rack system (3 U/42 TE), incl. terminal box, terminal blocks and mains filter, housing with window, protection class: IP65

* Please specify with order.

** Without SIL certification

*** Standard with analog and digital meter, without Sil certification.

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.

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.