



PMA05

Oxygen Transmitter Series PMA®

Version PMA05

Special Features

- Physical linear measuring principle
- Negligible cross-sensitivity
- Accurate, robust and reliable
- Small space requirement
- Low dead volume
- Fast response time
- Low drift
- Low maintenance
- Temperature status contact for thermostated version
- PT100 for thermostated version optionally

Application

M&C PMA05 oxygen transmitters are suitable for continuous oxygen measurements in dry and particle-free gases.

The M&C PMA05 oxygen transmitter is a suitable and reliable analyzer component for monitoring oxygen concentrations in various gas analytical control applications including flue gas-, inert gas-, fermentation processes and process or laboratory control measurements.

Description

M&C PMA05 oxygen transmitters are designed especially for quick and easy integration into oxygen analyzers.

The advantages of the robust measuring cell are the fast response time, the flow rate up to 60 NI/h, the low dead volume of 2 ml, the extremely low drift, the absolute linearity and the negligible cross-sensitivity to other sample gas components.

The measuring method works absolutely wear-free and is characterised by an extremely long service life if suitable sample gas conditioning is used.

There are four M4 mounting holes in the bottom panel of the transmitter. A 12-pin connector provides electrical connections for power supply, signal outlets, temperature status contact for the thermostated versions and for an optional PT100 sensor. Two DN 4/6 connectors are available to connect the sample gas lines.

The thermostating of the PMA05 can be monitored with an optional PT100. The PT100 monitors the temperature of the measuring cell and the thermostat keeps the temperature of the measuring cell constant at 55 °C, i.e. the measured value remains stable even if the ambient temperature fluctuates.

At undertemperature an alarm message is generated via the temperature status contact.

Measuring Principle of the M&C Oxygen Transmitter

The PMA05 utilises the paramagnetic dumbbell principle of operation to measure oxygen concentrations. Oxygen is a paramagnetic gas, which means that oxygen molecules are attracted into a strong magnetic field. This paramagnetic susceptibility distinguishes oxygen from most other gases.

The paramagnetic operation principle is one of the most accurate and reliable procedures to determine the oxygen concentration in a gas mixture in a measuring range from 0 to 100 vol%.

The dumbbell is made of two nitrogen-filled spheres which are suspended on a fine platinum wire in an inhomogeneous magnetic field. A small mirror is mounted at the centre of the dumbbell.

The oxygen molecules in the sample gas are pulled towards the strong magnetic field, causing the nitrogen-spheres to rotate out of the magnetic field. The mirror, which is secured between the spheres at the center of the suspension wire, rotates with the dumbbell. The rotation of the mirror is detected by an optical system. When the dumbbell rotates out of the strong magnetic field, a compensating current is generated by the electronics to rotate the dumbbell back to its original state.

The compensating current is proportional to the O₂ concentration of the sample gas.

	Version PMA05 MB10	Version PMA05 MB01
Part No.	01A0510 (lowest measuring range 0 to 10 vol% O ₂)	01A0520 (lowest measuring range 0 to 1 vol% O ₂)
Measuring ranges	0 to 100 % vol% O ₂ (standard), other measuring ranges according to customer requirements	0 to 25 % vol% O ₂ (standard), other measuring ranges according to customer requirements
Measurement output	0 to 10 V DC, non-isolated and 4 to 20 mA for selected range, non-isolated, max. load 300 Ω	
Response time for 90 % FSD	< 3 seconds at 60 NI/h	
Influence of barometric pressure	The oxygen reading varies in direct proportion to changes of the barometric pressure.	
Heating according to each selected transmitter	55 °C [131 °F]	
Temperature status contact on transmitters with heating	Contact load max. 48 V 1 A AC/DC ; contact closes at temperature > 50 °C [122 °F]	
Accuracy after calibration	Deviation: analog signal output = ± 1 % of span at range of 3 to 100 %/digital indicator = ±0,1 vol% O ₂ analog signal output = ±2 % of span at range of 1 %	
Sample gas outlet pressure	The sample gas must discharge freely into atmosphere.	
Influence of sample gas flow	Variation in gas flow between 0-60 NI/h air will cause a difference of < 0.1 vol% O ₂ .	
Flow rate of sample gas	Max. 60 NI/h	
Influence of ambient temperature	No influence up to 45 °C [113 °F]	
Ambient/measurement gas temperature	-10 up to +45 °C [14 up to 113 °F]	
Storage temperature	-20 up to +60 °C [-4 up to 140 °F]	
Ambient humidity	0 to 95 % RH	
Electrical connection	12-pin connector	
Power supply	24 V DC, max. 1.5 A	
Materials in contact with sample gas	Platinum, glass, stainless steel 316Ti, FKM, polypropylene, epoxy resin	
Sample gas connection	Hose connection DN 4/6, other possible	
Dimensions (H x W x D)	115 x 115 x 112 mm [≈ 4.5" x 4.5" x 4.4"]	
Weight	Approx. 1 kg [≈ 2.2 lbs]	

Options

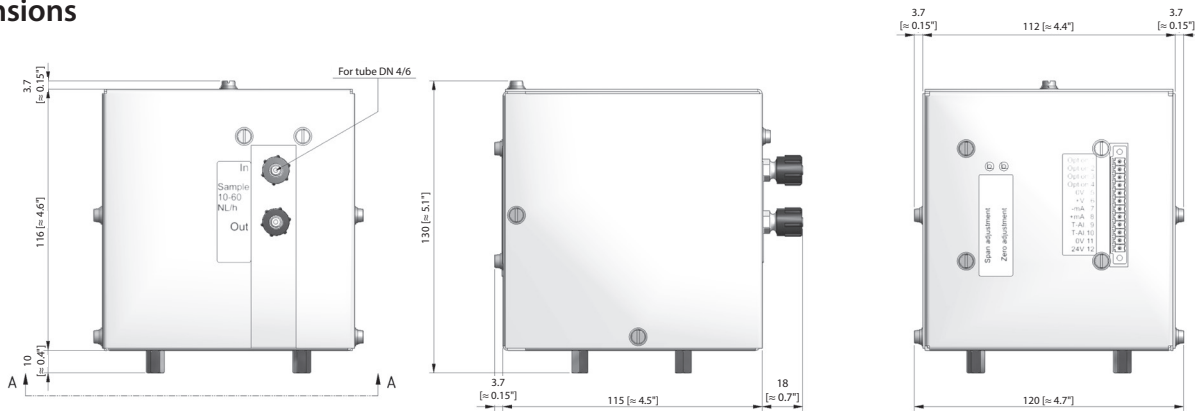
PT100 for thermostated version for external temperature display or monitoring

Measuring range different from the standard measuring range

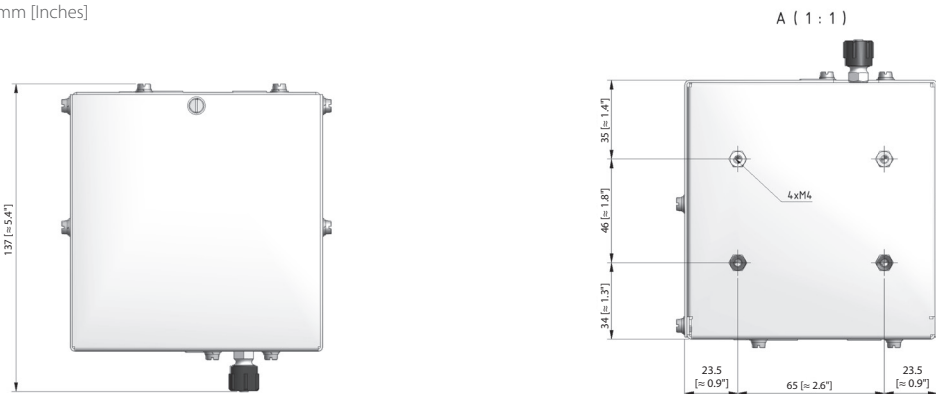
Zero suppression for measuring range expansion

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.

Dimensions



Dimensions in mm [Inches]



WARNING! IMPORTANT!

An external fine filter must always be used at the gas inlet of the M&C PMA05 oxygen transmitter. Depending on the composition of the sample gas, it may be necessary to use a sample conditioning system. Without precautions, the M&C PMA05 oxygen transmitter is only suitable for measuring non-flammable gases or gas mixtures in non-hazardous areas.