

# OXYPA paramagnetic oxygen sensor

measurement ranges from 0...5 Vol% O<sub>2</sub> up to 0...100 Vol% O<sub>2</sub>



## for precise and maintenance-free operation

### Description

The OXYPA paramagnetic oxygen sensor module is designed for incorporation in your analyser-systems or for the solution of oxygen measuring problems using a microprocessor or PLC-system.

The modules are maintenance-free, have a long lifetime, give a rapid and accurate signal response and are virtually insensitive to other gases. It has a compact design which meets high quality standards.

### Measuring principle

Paramagnetic (partial pressure measuring with a rotatable glass dumbbell). The sensor is heated up to 55°C. Oxygen is one of few gases showing significant paramagnetic properties which can be used for its measurement using the following method:

A small glass dumbbell filled with nitrogen is placed in an inhomogeneous magnetic field within the measuring cell. The system's position of rest is defined by a light beam, a mirror on the dumbbell and a photo detector. The dumbbell is diamagnetic and tends to turn away from the magnetic field. The paramagnetic oxygen molecules of the sample gas, however, are drawn into the magnetic field, either displacing the dumbbell or forcing it to turn in the opposite direction. The turning is stopped by an opposite magnetic field generated by means of a coil around the dumbbell, the signal of the photo detector (deviation of the dumbbell from its position at rest) determining the necessary current intensity. The difference between the current when pure nitrogen is flowing and the current when the sample gas is flowing across the measuring cell is proportionate to the concentration of oxygen in the sample gas

## Specifications

Standard measuring ranges	0-25 % O <sub>2</sub> , 0-100 % O <sub>2</sub> , other ranges on request
Minimum measuring range	0-5 % O <sub>2</sub>
Output value standard	4- 20 mA (galvanic isolated)
Output value (option)	0-1 V, 0-4 V (galvanic isolated)

## Operating conditions

Flow	18-70 l/h with fix Bypass (Standard) Maximum 250 ml/min (without Bypass)
Operating gas pressure	+/-300 hPa (0.3 bar) in operation +/- max. 1000 hPa (1bar)
Operating temperature	5°-45°C, (heated measuring cell = 55°C)
Storage and transport temperature	-25°C to +65°C
Relative humidity	0-90 %RH

## Design

Dimension (W x H x D)	80x78x93 mm without electrical connector gas connection
Weight	ca. 1090 g
Materials of gas conducting parts	PVDF, glass, steel 1.4571, gold, viton, platinum-iridium, epoxy resin, nickel
Gas connections	3 mm, 1/8", 5 mm inner thread (option)
Warm-up time	<1h at 20°C ambient temperature

## Measuring details

Repeatability	< ± 0,03 % O <sub>2</sub> (time base for gas switch ≥ 5 min)
Zero point drift	<± 0,1 % O <sub>2</sub> / week may be higher during the first days after putting into operation or after longer period of storage or transport
Temperature influence at zero	< ± 0,05 % O <sub>2</sub> /°C
Temperature influence span	<± 0,2 % of measured value /°C
Pressure influence on zero	no influence
Pressure influence span	1 % air pressure change causes 1% change in reading without backpressure regulator (Option)
Flow error	< 0.2 % O <sub>2</sub> for increase of flow from 20 to 100 ml/min reduction to < 0.1 % with in-built fix bypass (option)
T90-time	< 3 s with 150 ml/min flow and gas change from nitrogen to air
Tilt	Zero change ≤ 0,02 Vol.-% O <sub>2</sub> / 1° deviation from the horizontal position

## Power supply

Voltage	12-28 VDC
Power consumption	12 W

## Typical applications for OXYPA

- Excess oxygen analysis in all types of combustion systems
- Room air monitoring for personnel and product safety
- Monitoring oxygen content in fermentation vessels, biochemical fermenters and sewer gases
- Monitoring atmosphere in fruit stores and hot-houses
- Process analysis for continuous monitoring of required and/or allowable oxygen content
- Monitoring of low-temperature and combustion gases
- Monitoring automotive exhaust and internal combustion engines
- Monitoring blanket gases
- Monitoring tunnel and duct air quality
- Excess oxygen analysis in controlled atmospheres for systems or packaging in food industry
- Monitoring biological and waste gas content
- Excess oxygen monitoring in processes

Headquarter Switzerland:  
Pewatron AG  
Thurgauerstrasse 66  
CH-8050 Zurich  
Phone +41 44 877 35 00  
info@pewatron.com

Office Germany:  
Pewatron Deutschland GmbH  
Edisonstraße 16  
D-85716 Unterschleißheim  
Phone +49 89 374 288 87 00  
info.de@pewatron.com



**PEWATRON**  
SENSORS · POWER SOLUTIONS

## We are here for you. Addresses and Contacts.

---

### Sales Germany & Austria

**Geometrical sensors  
Other products**

Kurt Stritzelberger  
Phone +49 89 374 288 87 22  
kurt.stritzelberger@pewatron.com

**Pressure sensors  
Other products**

Gerhard Vetter  
Phone +49 89 374 288 87 26  
gerhard.vetter@pewatron.com

**Gas sensors and modules**

Peter Felder  
Phone +41 44 877 35 05  
peter.felder@pewatron.com

---

### Sales Switzerland & Liechtenstein

Postcode 3000 – 9999

Basil Frei  
Phone +41 44 877 35 18  
basil.frei@pewatron.com

Postcode 1000 – 2999

Christian Mohrenstecher  
Phone +41 76 444 57 93  
christian.mohrenstecher@pewatron.com

### Sales International Key Accounts

Peter Felder  
Phone +41 44 877 35 05  
peter.felder@pewatron.com

---

### Sales Other Countries / Product Management

**Pressure Sensors  
Load Cells**

Philipp Kistler  
Phone +41 44 877 35 03  
philipp.kistler@pewatron.com

**Gas sensors  
Gas sensor modules**

Dr. Thomas Clausen  
Phone +41 44 877 35 13  
thomas.clausen@pewatron.com

**Flow / Level / Medical products**

Dr. Adriano Pittarelli  
Phone +49 89 374 288 87 67  
adriano.pittarelli@pewatron.com

**Power supplies**

Sebastiano Leggio  
Phone +41 44 877 35 06  
sebastiano.leggio@pewatron.com

**Linear position sensors  
Angle sensors**

Eric Letsch  
Phone +41 44 877 35 14  
eric.letsch@pewatron.com

**Accelerometers  
Sensor elements**

Christoph Kleye  
Phone +49 89 374 288 87 61  
christoph.kleye@pewatron.com

**Drive technology**

CH Postcode 5000 – 9999 / DE

Roman Homa  
Phone +41 76 444 00 86  
roman.homa@pewatron.com

**Drive technology**

CH Postcode 1000 – 4999 / AT / IT / FR

Christian Mohrenstecher  
Phone +41 76 444 57 93  
christian.mohrenstecher@pewatron.com

Harald Thomas

Phone +49 89 374 288 87 23  
harald.thomas@pewatron.com