

# Multi gas analyser for O<sub>2</sub> measurement



## Extractive gas analyser for continuous measurement of oxygen in potentially explosive atmospheres

### APPLICATION

The multi gas analyser MGA 12 EX can be applied as single oxygen measuring device in potentially explosive atmospheres.

For oxygen measurement two different measuring methods are applicable. These are carried out by electrochemical cell respectively by paramagnetic sensor.

### YOUR BENEFITS AT A GLANCE

- protective principle Ex d
- pressure-resistant gas path up to 3 bar
- explosive gases can be led in
- integrated zero gas valve for zero point correction
- all gas-contacting elements are made of metal

### POSSIBLE MEASURING RANGES

O <sub>2</sub> (E):	0...5 vol. %	0...25 vol. %	-
O <sub>2</sub> (P):	0...5 vol. %	0...25 vol. %	0...100 vol. %

*E = by measurement of electrochemical cell  
P = by measurement of paramagnetic sensor*

### PRECONDITIONS ON SITE

- ambient temperature: -20...+40 °C
- protection against percussions/vibrations
- appropriate gas sampling and conditioning

## ELECTROCHEMICAL CELL

The electrochemical cell consists of a non-porous fluoro-resin membrane and a solid integrated gold electrode. By the reduction at the gold electrode, current is generated and converted to voltage by a thermistor. Thereby the measured voltage is proportional to the concentration of the measuring gas component.

## PARAMAGNETIC SENSOR

The measuring cell consists of a non-homogeneous magnetic field with a diamagnetic, nitrogen-filled glass bar-bell. Therein the paramagnetic oxygen molecules of the measuring gas react. By the therefrom motivated rotation of the glass bar-bell the emitted light of the light source is led via the mirror to the photo detector in the respective interval, whereupon the incoming light signal is proportional to the oxygen concentration in the measuring gas.

TECHNICAL DATA	
Housing:	robust housing, IP66; 315 mm x 415 mm x 178 mm (w x h x d); approx. 24 kg
Measuring methods:	<ul style="list-style-type: none"> <li>• electrochemical cell</li> <li>• paramagnetic measuring method</li> </ul>
Electrochemical cell:	measuring range: 0...25 vol. %
Paramagnetic sensor:	<ul style="list-style-type: none"> <li>• measuring range: 0...5 vol. %, 0...25 vol. %, 0...100 vol. %, further on request</li> <li>• response time: <math>T_{90} &lt; 3</math> s with 1 l/min (150 ml/min, bypass) flow and gas change from nitrogen to air</li> <li>• repeatability: max. <math>\pm 0.03</math> % (time base for gas switch min. 5 min)</li> <li>• zero point drift: max. <math>\pm 0.1</math> % per week</li> <li>• influence at zero point: max. <math>\pm 0.05</math> per °C; no pressure influence</li> <li>• influence at span point: max. 0.2% of measured value per °C; backpressure regulator, no pressure influence</li> <li>• flow error: max. 0.1% with in-build fix bypass</li> <li>• position-dependent zero point deviation: max. 0.02 vol. % per 1° deviation from horizontal position</li> </ul>
Ambient conditions:	-20...+40 °C; relative humidity: max. 90% (non-condensing)
Zero point correction:	automatic by integrated zero gas valve
Sensitivity correction:	manual, with test gas (e.g. ambient air)
Air pressure correction:	internal pressure sensor for real-time pressure compensation of measuring values
Gas inputs/outputs:	measuring gas input, zero gas input, exhaust output, breather; respectively with flame barrier, 6 mm Swagelok
Display / Operating:	graphic display (LCD), 240 x 128 Pixel, background-lighted; menu-driven operating; display possibility in mg/m <sup>3</sup> , ppm and vol. %; languages (factory-set): German, English, French, Polish; 6 operating keys
Analogue outputs:	4 active analogue outputs, 4...20 mA, potential-free, burden max. 500 Ohm
Digital outputs:	4 digital outputs, potential-free, 24 V DC with max. 0.4 A (max. 10 W) for failure, maintenance, maintenance request and zero point setting
Service interface:	RS232 and remote software for maintenance and diagnostic purpose
Power supply:	230 V AC / 50-60 Hz, 40 W (max. 90 W)
<i>Special models are possible on request.</i>	