The Company

Membrapor is manufacturing a complete line of gas sensors to detect the main toxic gases. They are used world-wide in portable and fixed analysers and alarm systems for air quality monitoring, for measuring flue gas emissions and for industrial safety.

The sensor is the key component of every gas analyser. Membrapor produces high quality gas sensors in Switzerland, which operate reliably and minimise maintenance and service. These are valuable benefits for the customer and help to keep the operating costs low.

Due to a strong scientific research and technical development, Membrapor is releasing every year several new sensor products. Electrochemical sensors are produced in five different sensor housings. The design and material used provide tight, robust and leak-proof fuel cell sensors. During 16 years sensors were developed for 18 different gases. The product range contains more than 200 gas sensors with specific features for every application. To choose the right one is as easy as to make a phone call to the technical staff at Membrapor.

New products often require new sensors which are not on the market yet. With Membrapor you have a partner who develops new gas sensors for you, providing customer-specific solutions and consultancy in the large field of gas measurement. An essential point is, that Membrapor is a truly independent sensor producer. All this makes it your reliable source of gas sensors now and in the future.
The Right Gas Sensors for Your Application

Most accurate measurements
4-Electrode Technology with increased filter capacity
Replacement sensors of CTL 5 series
Housing for bayonet-mounting systems

The Peak of Swiss Sensor Technology
Independent Swiss Sensor Developer and Producer

Emission Monitoring • Air Quality Monitoring • Workplace Safety for Industry
Chemical and Gas Processing Industry
Safety and Health at Work • Personal Safety Devices • Portable Gas Detectors

4-Electrode Technology
Most accurate measurements

Designing a Potentiostatic Circuit
To operate an electrochemical sensor a control circuit is required, referred to as the potentiostatic circuit. For a 3-electrode sensor the main purpose is to maintain a voltage between the reference electrode (Ref) and the sensing electrode (Sens) to control the electrochemical reaction and deliver an output signal proportional to the current generated by the sensor. The sensing electrode, also known as working electrode, responds to the target gas, either oxidizing or reducing the gas, creating a current flow that is proportional to the gas concentration. This current must be supplied to the sensor through the counter electrode.

At the counter electrode (Cnt) the opposite redox reaction must be supplied to the sensor through the counter electrode to balance the current required by the sensing electrode. The load resistor R_load is a compromise between fastest response time and best signal-to-noise ratio. The recommended value is given in the sensor data sheet.

The counter electrode potential on the counter electrode is not important, as long as the circuit can provide sufficient voltage and current to maintain a voltage between the reference electrode and the sensing electrode. Reducing oxygen or oxidizing water. The ionic current generated by the counter electrode is reflected across R_Gain, generating an output voltage relative to the virtual earth GND. C2 reduces high frequency noise.

When gas is detected, the cell current rises and the counter electrode polarises with respect to the reference electrode. The potential on the counter electrode balances the reaction of the sensing electrode. Reducing oxygen or oxidizing water. The ionic current reaching the sensing electrode is then oxidized or reduced and therefore produces or consumes current, which flows to the electrolyte.

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To maintain a voltage between the reference electrode and the sensing electrode, the circuit must be supplied with sufficient voltage and current to maintain the correct potential of the sensing electrode. The measuring circuit for the electrochemical sensor is a single stage op amp IC1 in a transimpedance configuration. The sensor current is mirrored across R_gain, generating an output voltage relative to the virtual earth GND. IC2 reduces high frequency noise.

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