



## Quick-Ox Features and Benefits

### Effects of flow rate

As most Oxygen sensors are partial pressure measuring devices the high flow rates meeting a resistance translate into pressure give a false high reading. The sensor will work with a flow rate between 100 millilitres per minute to 2 litres per minute. This has normally been achieved by the use of a flow meter or flow reducer/restrictor. As Oxygen has a partial pressure of .209 Bar at STP, which the electronic measuring device translates to 20.9%, the most accurate pressure to take a measurement is therefore also at 1Bar.

### Effects of Temperature

When the cylinder is opened the gas pressure is reducing from 200+ Bar to 1 Bar atmospheric. This causes a severe drop in temperature of the gas. The sensors are very temperature sensitive (2.5% per degree Celsius change) so temperature compensation is required. This is usually fitted externally on the rear of the sensor. However, a temperature gradient is created where the sensor temperature compensation mechanism is fed information from room temperature and the sensor gas sensing membrane is experiencing low and dropping temperatures. This exhibits itself as a varying baseline.

### Venturi action

The diver using the device usually wants to take a measurement quickly and ideally directly from the outlet valve of the cylinder. Most devices that enable this also have the problem of a possible Venturi effect of drawing in room air during measurement and diluting the measured gas.

### How does it work

The Dome is designed to fit flush against the O ring on a Scuba cylinder and also fit into the thread of a Scuba DIN fitting.

The Dome has been fitted with a concave inlet and a small hole at the end so that the gas builds up in the concave and forces the room air to out of the sampling gas stream. The hole size has been chosen to restrict the flow yet allow sufficient gas to enter the sensor and enable the fast response. Venturi effects are eliminated.

The gas stream is funnelled by the concave on the dome through the hole and then through a one-way valve so that the gas goes in but cannot return back through the dome.

Excess high pressure gas travels directly through the Tee and out into the atmosphere. Some of the gas is deflected into the sensor by the flow divertor.

When a maximum reading is reached the gas flow is turned off and the gas is trapped at 1Bar in the sensor by a second one-way valve on the outlet.

The one-way valves on the outlet also serves to stop air re-entering the sensor during the reading period.

### Advantages

The Quick-Ox offers fast accurate measurement with minimum loss of gas and minimum skill.

A by product of this system is the gas flows across the sensor. This prevents high pressures, which can damage the membrane of the sensor and not directly onto the sensor face as in existing Dome sensing system.

This device can be used by any level of diver and is not dependent on skill to achieve accuracy. Calibration is easy and fast by removing the flow divertor and waving in fresh air.