Effect of Humidity on Oxygen Sensors

Humidity dilutes the gas reducing the partial pressure of the Oxygen content, and results in a lower Oxygen reading.

Assuming the Temperature (25 C) and Pressure (760mm Hg) are constant and the gas is fully saturated i.e 100% Relative Humidity it is possible to calculate the effect.

From the table at 25 C the Vapour Pressure is 23.756mmHG

$$\%H2O = 23.756 \times \frac{100}{760} = 3.13\%$$

This is how much water vapour exists in the gas.

If the original mixture contained 40% Oxygen.

The actual reading would be:

$$40 - \frac{(40 \times 3.13)}{100} = 38.7\%$$

By following these two calculations it is possible to calculate for other values.

NB **The sample must always be saturated ie. 100% RH**
The Temperature must be constant and known
The Pressure must be constant and known