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## **Premier sensor pressure dependency**

The Premier range of infrared gas sensors exhibit a dependency on the pressure conditions under which they operate. The principle of operation is based upon the absorption of infrared energy by molecules of the target gas within the sensor. As the gas pressure is increased, the number of molecules within the sensor is increased. This leads to increased absorption, and so the calculated gas reading is increased. The opposite effect is true when the gas pressure is reduced.

Premier sensors are pre-calibrated at normal atmospheric pressure, and the accuracy of the reading will be adequate in most instances without the need for pressure compensation. In cases where the sensors are operated at pressures significantly different from their original calibration pressure, for example high altitudes, the sensors should be re-calibrated to restore accuracy. Alternatively, a compensation factor can be applied to the reading based on the pressure within the sensor. For example when the sensor is used in process-monitoring applications at either elevated or reduced pressures, a pressure transducer can be incorporated into the gas flow and its output value can be used to determine the degree compensation to be applied.

The following graphs provide a guide to pressure compensation for each of the main Premier sensors types with a typical gas concentration.

It is important to note that the pressure/reading relationships defined by the accompanying graphs are only valid for the specific gas concentrations shown.

In the following examples the sensors have been calibrated at 100 kPa.

### **Dynamant Limited**

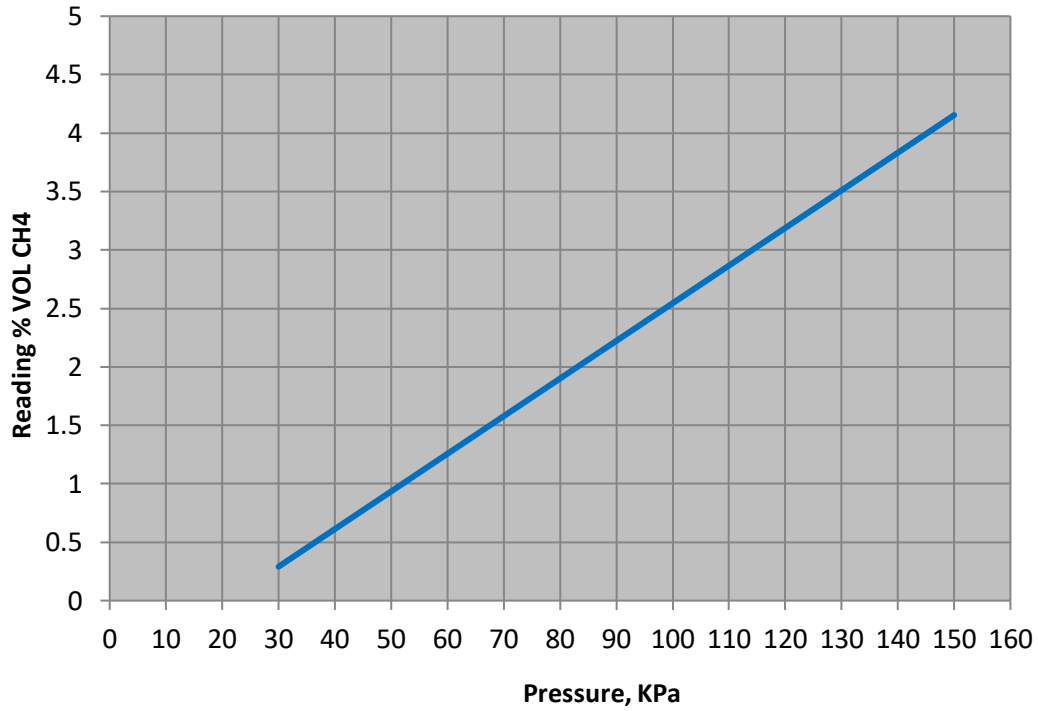
Hermitage Lane Industrial Estate • Kings Mill Way • Mansfield • Nottinghamshire • NG18 5ER • UK.

Tel: 44 (0)1623 663636 •

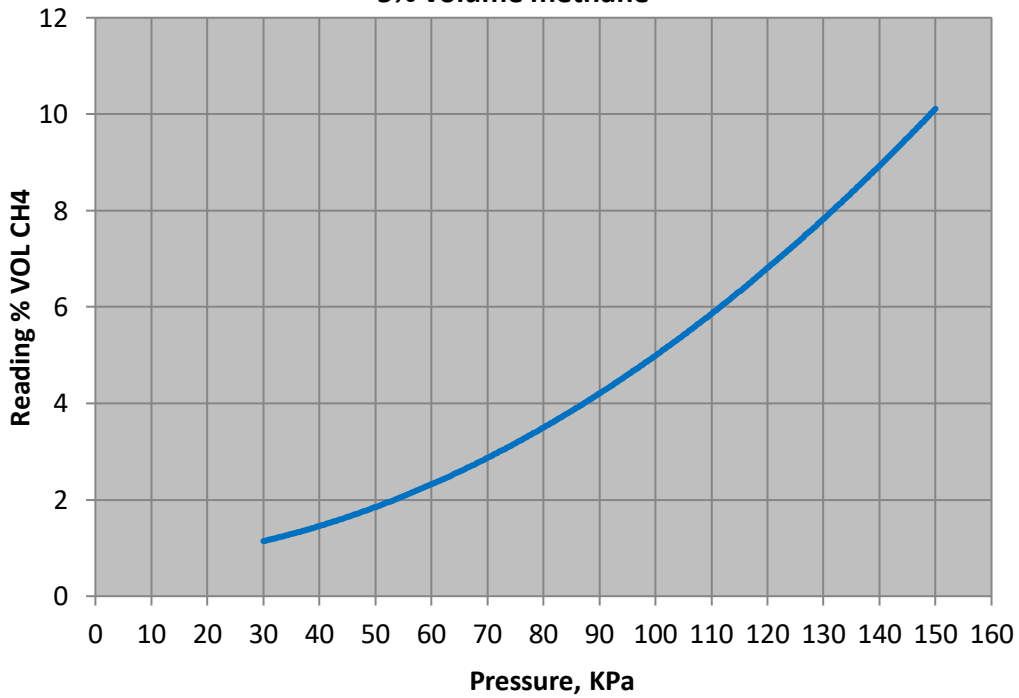
email: [sales@dynamant.com](mailto:sales@dynamant.com) • [www.dynamant.com](http://www.dynamant.com)

# 1. Premier methane sensor range 0-5% volume methane

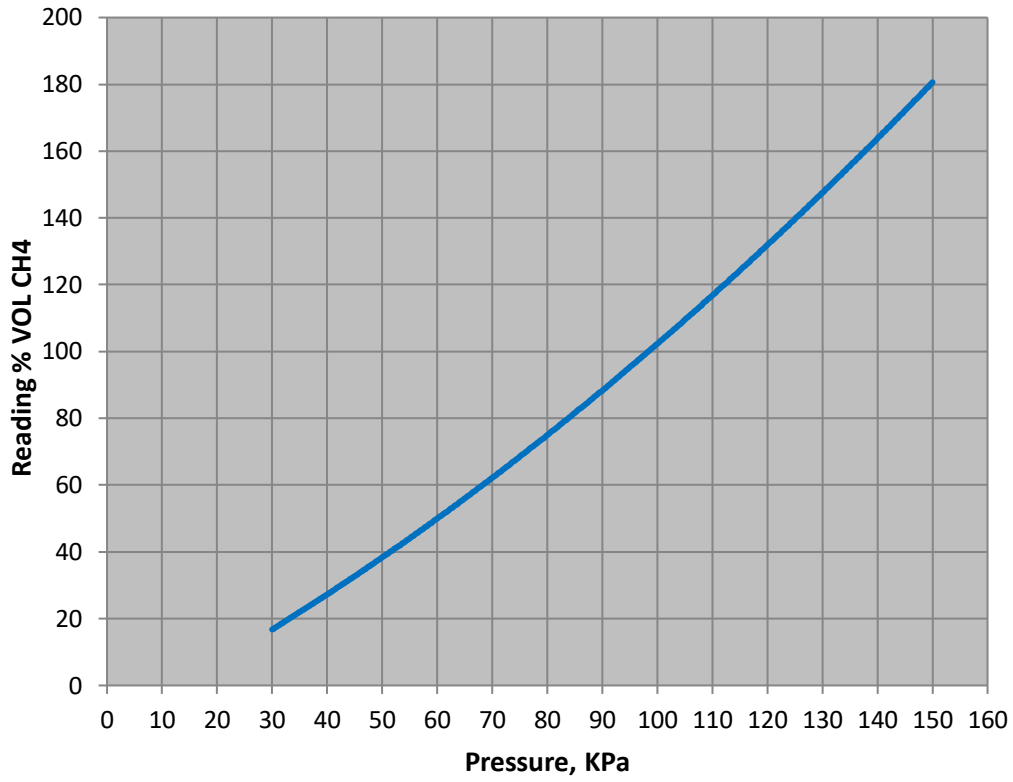
Premier methane sensor pressure dependency, applied gas 2.5% volume methane



Premier methane sensor pressure dependency, applied gas 5% volume methane

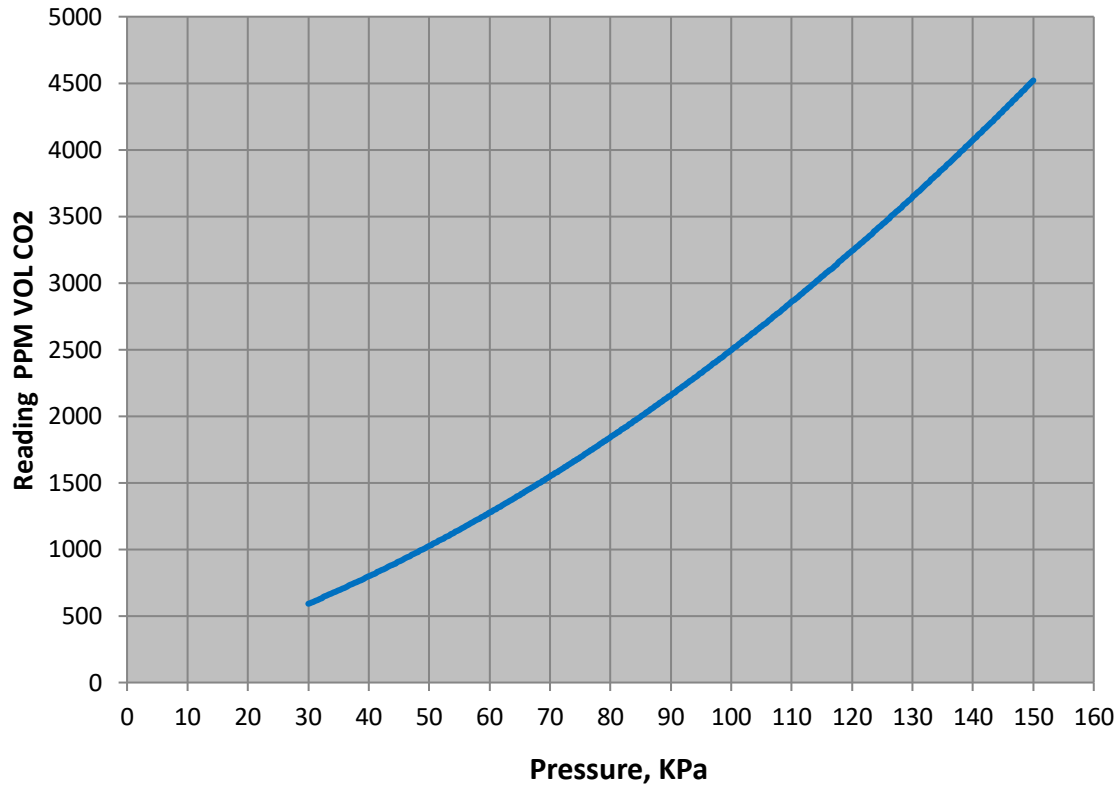


Premier methane sensor pressure dependency, applied gas  
100% volume methane

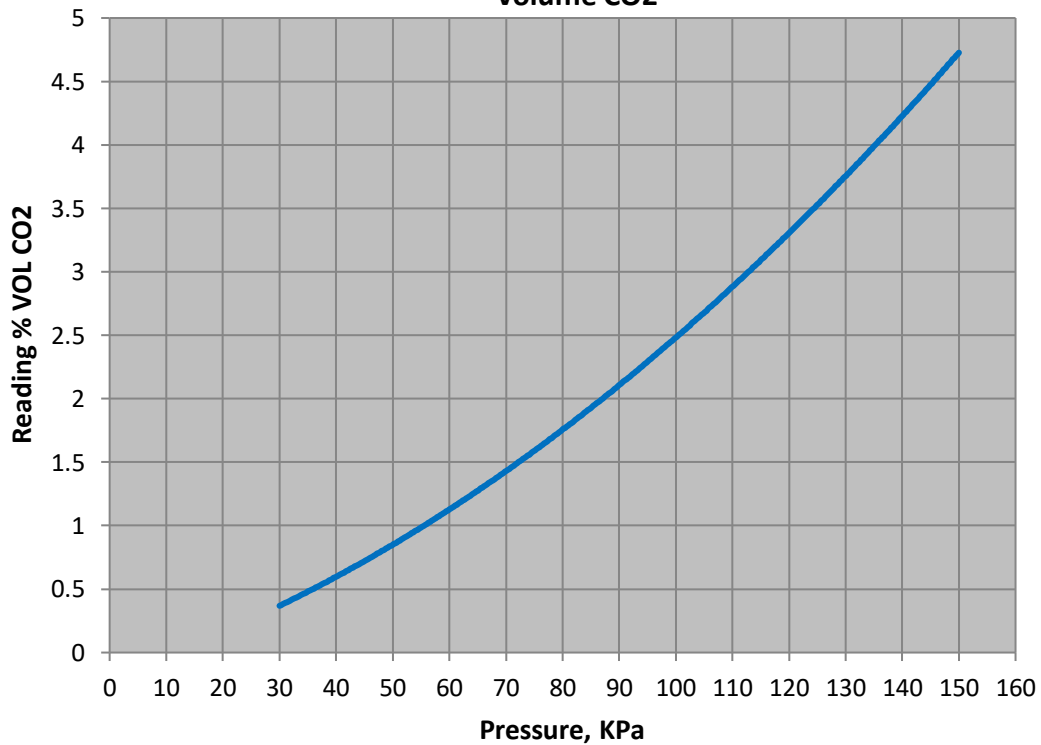


## 2. Premier CO2 sensor range 0-5% volume CO2

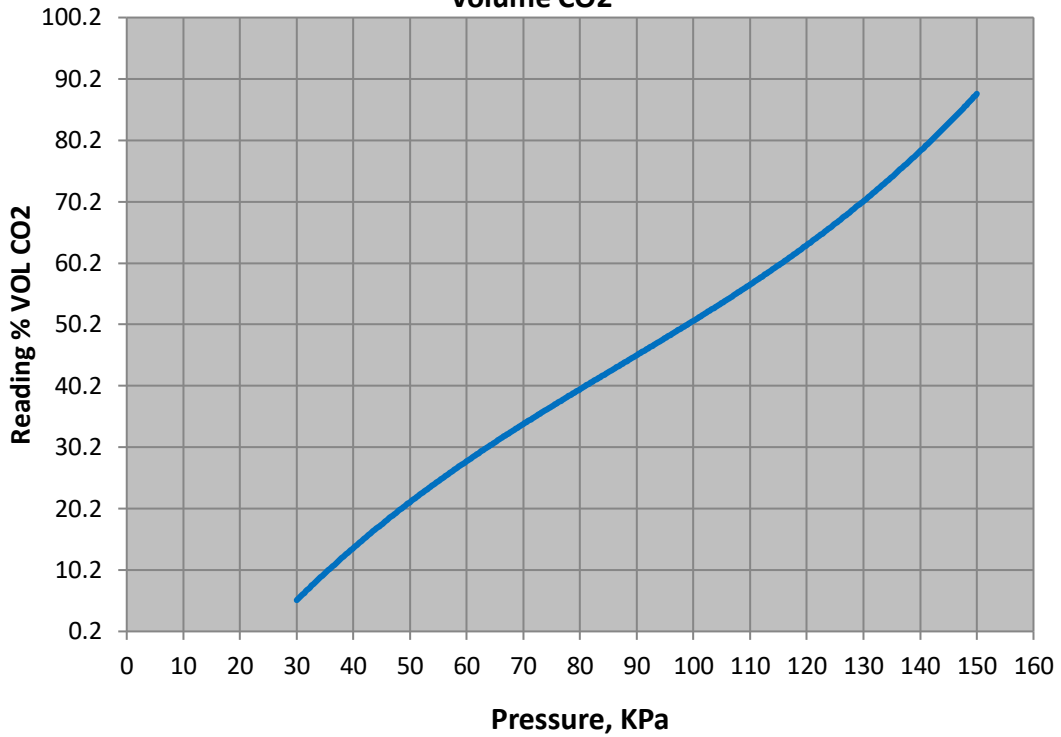
Premier CO2 sensor pressure dependency, applied gas 2500 PPM volume CO2



Premier CO2 sensor pressure dependency, applied gas 2.5% volume CO2



**Premier HCO2 sensor pressure dependency, applied gas 50 %  
volume CO2**



**3. Premier propane sensor range 0-2% volume propane, test gas 1.1% volume propane.**

**Premier propane sensor pressure dependency, applied gas 1.1%  
volume propane**

