Gas-Sentry detectors use several engineering innovations introduced by Bascom-Turner for greater accuracy, higher speed and greater battery efficiency. Also, Gas-Sentries have a special CO sensor with increased reliability and range.

Greater Accuracy:

The signal from a Catalytic Combustion sensor depends on ambient temperature, which may range in the field from below zero to over 100º F. Conventionally, temperature compensation is achieved with a pair of elements – A catalytically inactive element, in each pair compensates for temperature effects on the catalytically active element. Since no two elements are identical, temperature compensation is displayed. Thermal effects introduce errors, particularly at low gas concentrations.

Bascom-Turner developed a method of power switching a single sensor to compensate for temperature changes. The result is a four-fold decrease in thermal drift and a corresponding improvement in sensitivity. Besides improving sensitivity, the sensor's specificity to natural gas (methane) is improved, though there is still significant response to other combustible gases – a feature desirable in a combustible gas indicator.

Higher Battery Efficiency:

Besides improving sensitivity and accuracy, power switching saves power since a single element consumes half the power consumed by a pair of elements. Power savings translate into low battery weight, longer operating time and lower operating costs.

Gas-Sentry detectors use 4 AA Alkaline batteries and can run up to 22 hours continuously with a set of batteries. AA batteries also have an advantage at low temperature because their internal resistance is less than for either C or D size batteries. In fact, Gas-Sentries have been used in Siberia in winter with excellent results.

CO Sensors with Increased Reliability & Range:

CO sensors use a three-electrode electrochemical cell with a reference electrode. A common version uses an air electrode as a reference. This is a "positive" system, i.e. the working and reference electrodes are at the same potential. This arrangement is simple to construct but can suffer from a "sudden death" syndrome. If the reference electrode is "poisoned", for example, by an inhibitor in the sampled gas, its potential moves away from the "air potential". Since the potential difference between the working and reference electrodes is maintained at zero, the potential of the working electrode also moves away from the "sir potential". Such potential shifts can be substantial with the result that response to CO may drop to zero.

The Gas-Sentry uses an active reference electrode kept at the same potential as the hydrogen electrode rather than air. A hydrogen electrode, under the conditions utilized in the Gas-Sentry CO sensor cannot vary by more than about 50 mV – a variation without any significant influence on it's response. Partly as a result of this stability, the CO sensor employed in the Gas-Sentry will respond to high concentrations of CO and will operate reliably even in atmospheres containing combustion products – for example, electrical fires in underground conduits.