HOT WIRE (CATALYTIC) vs. SEMICONDUCTOR TYPE

Following is the general information of the difference between hot-wire and semiconductor type sensors for combustible gases.

1. General

The history and consensus of the combustible gas detection industry is that;

Hot-wire type—where accuracy and reliability is required→Industrial

Semiconductor type –-where pricing is most essential →Residential

And, this is still distinctive. It was pricing that hot-wire type had not been used for residential use.

For the presidential use, semiconductor type has a long history, but the major or the most claim is the false alarm due to the shift of sensitivity toward “sensitive”. semiconductor type requires a very long initial stabilization time ,which gives an additional dollars in assembling a detector.

Hot-wire type has a long history as an industrial gas sensor but a lot shorter for residential by another reason of short life of the sensor. Now the life or the endurance of HANWEI sensor has been vindicated in the Chinese Market, which will fully meet the world satisfaction.

2. As a leading manufacture of the gas sensor, we came to commercially handle gas sensors in 1984. since then our HOT WIRE (CATALYTIC) and SEMICONDUCTOR TYPE sensor has been supplied to the major Chinese detector makers.

3. Market trend

We have been supplying hot-wire type gas sensors also to overseas users worldwide and have earned and excellent reputation for the practicality and reliability. The calibration is easier when assembled into a detector with a good independency from the ambient temperature and humidity, wider application for detection of gases due to the linearity to the individual gas concentration is practical.

In the various areas of the world, in proportion to the strengthening of the requirements for the installation of the gas detector, it is easily estimated that more and more emphasis on hot-wire type will be placed in terms of accuracy conditions and reliability, especially under severe conditions. our sensors are used in underground shopping arcade and basement where a temperature gets over 45℃ and humidity over 95%.

Recently in numbers of countries, natural gas is getting popular as an economical and convenient energy source. Thus the demand or requirements for commercially available gas detectors is called for.

4. Comparison

Item	Hot-wire	Semiconductor
Principle of detection	Variation in temperature due to contact oxidation as variation of heater resistance	Variation in electric conductivity of n-type semiconductor due to chemisorption
Sensitivity	good	Very good
reliability	Very good	Good
Gas selectivity	Good (for smoke) Bad (for combustible)	Good
Response time	Very fast(4-10sec)	Fast (5-20sec)
Stability	Very good	Good
Temp. independency	Good	bad
Humidity independency	Good	bad
simplicity	Very simple	Very simple
Cost	Very economical	Most economical
Measuring range	Up to LEL	Up to 10000ppm
Maintenance	Hardly required	Hardly required
Initial stabilization	Very short (1 min)	Long (2 hours)

All of the above, although the accuracy and reliability of semiconductor gas sensor is inferior to catalytic gas sensor, When detecting the environmental of combustible gases, CO etc at a lower concentration, the semiconductor gas sensor has a obvious superiority to the catalytic ones, and it has owned a large marketing volume with its lower cost.