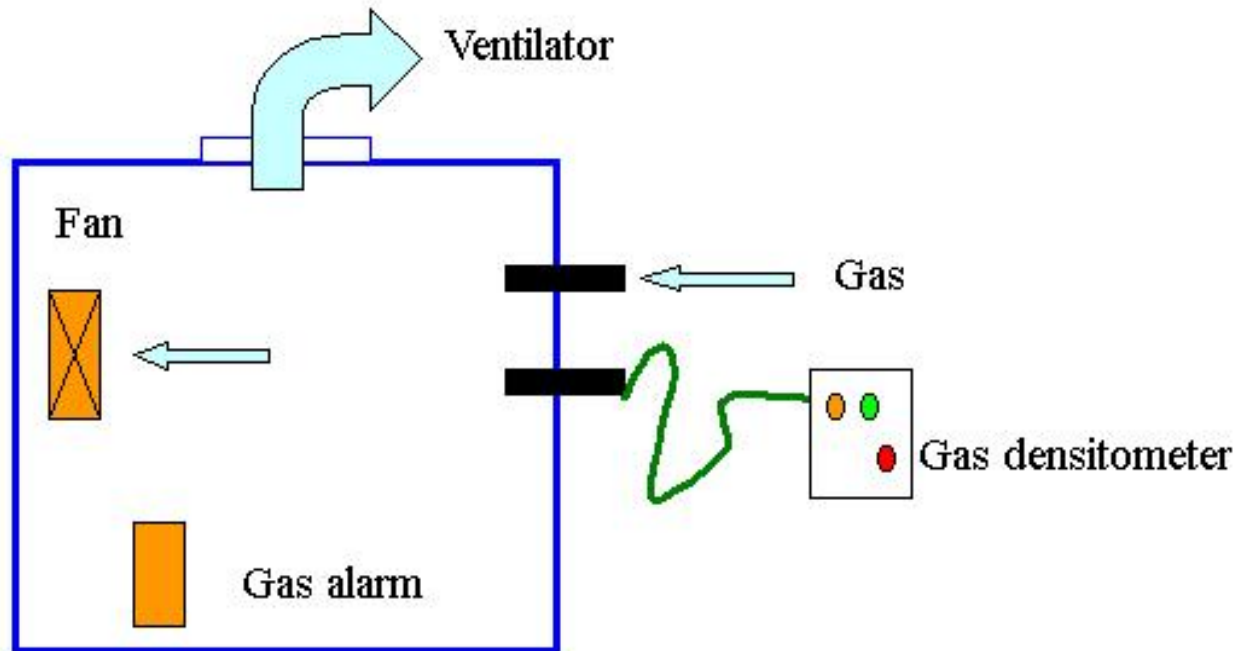


GAS SENSOR CALIBRATION

The outline of the testing chamber for the gas sensor calibration



Calibration Gas and calibration testing apparatus

As the sensor sensitivity is easily influenced by environmental terms, such as humidity, interference gas etc. when calibrating, the special testing room should provide the relative standard ambient (clean air, calibration gas) to promote the veracity and reliability.

Clear air

For the common test, we can take the clean environmental air as clean air: for the high accuracy testing, we can agitate the pure nitrogen and oxygen to simulate the clean air, after the humidity and temperature is controlled, it can be used as clean air.

The test chamber

The volume of test chamber is subject to samples quantity and volume, generally, The volume for each sensor should be more than 1 liter/pcs. The chamber should be made of glass or metal so that it may not generator or absorb any noise gases, the organic glass is also suitable. we can make a round or square chamber, there should be a fan to speed the air agitation, but not to directly blow the sensor(detector) to influence the temperature. Air flow should be less than 0.5/sec. for the testing of liquid steam, there should be a liquid evaporator. in order to remove the left gas from the chamber, a ventilator is a necessity .the ventilating ability should be more 10 times than the volume of the test chamber per min.

gas calibration

generally, Gas calibration by a volume method can be calculated according to the following formula.

(1) when testing gases

$$v = [V \times c \times 10^{-6} (273 + TR)] / (273 + TB)$$

(2) when testing liquid steam

$$v = V \times c \times M \times (273 + TR) \times 10^{-9} [22.4 \times d \times P \times (273 + TB)]$$

In the formula, the words represents the following meaning:

V: Volume of gas or liquid steam to be injected

V1: Inside volume of a chamber (ml)

C: Gas concentration to be adjusted

M: the molecular weight of liquid(g), d is the liquid proportion

TR: Room temperature, TB: chamber temperature.

TC; Temperature inside a chamber

For the calibration gas, you can buy it from the local gas plant at your end, or the common gas you used.

When actual testing :An optical -interference or an infrared gas densitometer is recommended for measuring gas concentration .(Gas densitometer)

Process of calibration method for gas leak alarm is shown below.

1. Place detectors in test chamber

*preparatory preheating more than 2 hours;

2. Introduce test gas into the chamber

*after confirming the sensor (that the output voltage level) has stabilized in air.

*Test gas is injected into the test chamber and wait for an even dispersion of the gas inside the Chamber (Usually 1 min. or more).

*The gas-air mixture inside the chamber is to be gently circulated by the small motor driven

fan so that the circuit may be independence of wind.

*Gas densitometer: An optical -interference or infrared gas densitometer is recommended for measuring gas concentration.

3. Adjust the variable resistor until the alarm sound exactly. (Please see the circuit of KB600).

4. Ventilate test gas from the chamber Thoroughly with a fresh air from outside.

5. Repeat the 2 step, the alarm should sound; or else, Repeat the 3 step

6. Take out detectors from the chamber, OK!

NOTES

- * Measure the gas sensor characteristics after operating more than 24 hours (at the least 2 hours) to fully stabilize the sensor.
- * Sensor characteristics should be measured in clean air without noise gas.
- * Do not apply any forcible strength to the mesh and take apart or change any element, and do not use it when the mesh is broken, otherwise the explosion or fire disaster will happen.
- * Solder by hand. Before using other methods of soldering, consult us.
- * If it is to be used or stored in a special environment or gas, consult us.
- * Do not press any strong strength to the pin to avoid the transmutation or contortion.
- * If for high accuracy sensitivity, e.g. for industrial use, the calibration is need timingly. (at least one time per year)

The recommended gas concentration corresponding to the gas alarm point is as follows:

Methane: 5000ppm (0.5%).

LPG: 2000ppm (0.2%).

City gas: 1000ppm (0.1%).