

Gas Information Sheet 37

Carbon monoxide measuring equipment



Overview

This information sheet has been developed for gasfitters. It provides information about carbon monoxide (CO) measuring equipment that can be used to measure CO spillage from domestic gas appliances.

Carbon monoxide detector

Carbon monoxide detectors indicate the presence of CO in parts per million (ppm), they are smaller than gas analysers and their only function is to measure CO.

The range of measurement of 0 to 1000 ppm is modest when compared to a gas analyser; however they are more suitable for measuring ambient air quality.

The CO detector operates with only one electrochemical cell which has a shelf life of around two years.

The plumber or gasfitter who installs or services gas appliances will find this device cheaper to buy than a gas analyser but should appreciate it is limited to the measurement of CO.

Carbon monoxide detector features should include:

- The ability to measure low levels of CO (increments of 1 ppm or smaller)
- CO measurement with a precision of $\pm 5\%$ of the reading.
- A low battery indicator.

Carbon monoxide detector features may also include:

- A manual zeroing function.
- An audible and visual alarm.

Warning

Do not place your CO detector in front of a heater's discharge air stream as this hot air may overheat the CO detector and cause false CO readings. You should know the maximum rated temperature of your CO detector before positioning it in an environment subject to heat. If in doubt please contact the equipment supplier.

It is therefore recommended that CO detectors are not used to measure flue discharge. Doing this may damage the CO sensor or possibly melt the plastic outer body of the detector.

Calibration

CO gas detectors should be calibrated on a minimum yearly basis using test gases that are NATA traceable or equivalent. The supplier of your equipment should be able to assist you with this requirement.

CO detectors that cannot be calibrated must be tested against a known test gas. The accuracy against this known test gas is normally detailed on the calibration label attached to the instrument and must then be taken into account by the operator when calculating a CO reading.

Gas analyser

Gas analysers are more widely used by gas engineers and technicians. They measure CO gas in parts per million (ppm) and are also used to commission appliances. They are essential for those persons working with Type B appliances.

There are two types of gas analysers. Infrared units are typically large and not readily portable. They are highly accurate and mainly used in test laboratory environments.

Electrochemical cell analysers are smaller and portable and measure oxygen and carbon monoxide.

Depending on the number of gases to be measured the majority of gas analysers have at least two electrochemical sensors, one to measure carbon monoxide and the other to measure oxygen.

Electrochemical sensors have a limited shelf life, which is dependent upon the level of exposure to these gases.

Features of electrochemical gas analysers include:

- Oxygen (O₂) measurement.
- Carbon monoxide (CO) measurement.
- Carbon dioxide (CO₂) measurement (calculated from the measurement of oxygen).
- CO/CO₂ ratio (calculated).
- Combustion efficiency (derived from the calculated level of CO₂ and the measured temperature of the flue gases).

Note: Analysers that measure CO/CO₂ ratio are very important for precisely establishing the concentration of CO while taking into account dilution of flue products through the presence of excess air.

Gas analysers have a much larger range for reading CO than other devices typically

(0 to 4000 ppm). They are used mainly for measuring emissions directly from the flue outlet of gas appliances where CO concentrations are much higher than encountered in ambient conditions. It should be noted that generally the larger the range of measurement of the instrument the lower the accuracy for measuring at low levels.

Calibration

Gas analysers should be calibrated on a minimum yearly basis using test gases that are NATA traceable or equivalent. The supplier of your equipment should be able to assist you with this requirement.

Maintaining equipment

Handle and store this equipment with care.

Do not jar or allow contact with water.

Always read the operating instructions and ensure the instrument is correctly calibrated.

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