Gas Information Sheet No. 37

Carbon Monoxide Measuring Equipment

This information sheet has been developed for gasfitters. It provides information about carbon monoxide (CO) measuring equipment used for measuring CO spillage from domestic gas appliances. Carbon monoxide gas can be measured using a gas analyser, a CO detector or a CO alarm.

Note: CO alarms are not discussed here as they are not suited for carrying out CO tests due to their low sensitivity and slow response times.

Gas analyser

Gas analysers are 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 typically two types of gas analysers. The ***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 typically 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 (O_2) measurement.
- Carbon monoxide (CO) measurement.
- Carbon dioxide (CO_2) measurement (calculated from the measurement of oxygen).
- CO/CO_2 ratio (calculated).
- Combustion efficiency (derived from the calculated level of CO_2 and the measured temperature of the flue gases).

Note: Analysers that measure CO/CO_2 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 (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 typically 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.

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Carbon Monoxide Measuring Equipment

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 is modest when compared to a gas analyser and measurement is generally in the range of 0 to 1000 ppm. However, they are more suitable for measuring ambient air quality.

Unlike the gas analyser the CO detector has only one electrochemical cell with 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 precisely measure low levels of CO (typically within ±5% of the reading).
- High resolution (typically 1 ppm or lower).
- A manual zeroing function.
- An audible and visual alarm.
- A low battery indicator.

It is 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.

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.

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.

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.

Further information

For further information please phone the Technical Information Line on 1800 652 563.