



# Measuring NOx

- NOx explained
- How NOx legislation affects you
- What you needs know about NOx measurement

## Measuring NOx...what's the future?

When the Energy Related Products Directive (ErP) was first implemented with regards to the domestic and commercial heating sector, our industry knew that this was only the first steps towards ever tightening legislation for manufacturers to meet. Since 26<sup>th</sup> September 2018 the next phase of the directive has come into place which has set maximum nitrogen oxide (NOx) emission levels for all new domestic and commercial heating and hot water products that are rated up to 400kw.



These new NOx limits correlate to a maximum of 56mg/kWh for gas and LPG fired boilers, and 120mg/kWh for oil fired boilers, and all boilers supplied by manufacturers within the rated range will need to be compliant to the new NOx levels on or after the September date. One common misconception is that NOx levels are related to energy efficiency, however this is not true.

Measurement of NOx values is actually directly related to the measurement of the exhaust products after combustion has taken place, and nitrogen oxides are formed through the high temperatures around the combustion process. The reason NOx levels are under increasing scrutiny is the effect they can have on air quality and health, especially in large cities where a combination of NOx from both road vehicles, heating plant, and industry, can often combine to form high pollution levels.

Taking London as a typical large city, it is thought that up to 33% of the NOx emissions are now coming from heating systems. The focus is to bring in 'greener' technology to try and reduce the levels of pollution and to therefore reduce the approx. 24,000 early deaths each year which are currently attributed directly to poor air quality (according to DEFRA figures). Installers of this new wave of low-NOx boilers currently are **not** required to monitor these NOx values as part of any installation or servicing, as the manufacturers themselves will have put their boilers through a type approval process to ensure it meets the legislation guidelines.

However, many heating service companies are looking to future-proof their flue gas analyser needs by ensuring that any unit can either be supplied with the ability to measure NOx or be retrofitted with a suitable measurement sensor in the future. Some are even adopting NOx measurement as standard practice. One technical area to be remarked on is that to obtain a 'total' NOx value for a boiler being tested/serviced the flue gas analyser needs to measure both the NO (nitric oxide) and NO<sub>2</sub> (nitrogen dioxide) gas components. Most commercial

flue gas analysers are 3-sensor analysers which only have the capability to measure the NO component and then use a calculated fixed percentage of NO<sub>2</sub> to obtain a total NO<sub>x</sub> value. Some more advanced analysers 4-sensor analysers such as the testo 340 emissions analyser can have measurement cells for both NO & NO<sub>2</sub>, enabling a true measured total NO<sub>x</sub> value.

For service companies and engineers looking for the potential to be able to measure NO<sub>x</sub> values the new testo 300 flue gas analyser offers the capability to have an NO sensor fitted either at point of ordering or retrofitted in the future. The testo 300 also has some other key features which enable it to work effectively from domestic sized boilers all the way up to 400kw, including a unique automatic 'dilution' system which enables the analyser to go beyond its normal CO measurement limit of 8,000ppm and actually still keep measuring up to 30,000ppm without risk of damage to the CO sensor.

With it's innovative 'smart' style operation using a 5" HD full colour display bringing all the flexibility we have become used to with smartphones, the testo 300 also offers the user an integral customer site database for ensuring that records are kept in a simple manner, and the built-in Wi-Fi means that no smartphone app is needed to work the device. Finally, the 'long-life' sensors are designed to give at least 5 years normal operating life, and this combined with the testo fixed price servicing means low lifetime costs.

