The boiler flue gas analyser

A modern boiler flue gas analyser is an electronic instrument designed to measure the concentration of specific pollutant gases in the waste gas from a boiler, together with the air inlet and outlet temperatures. The gases measure vary, but they usually include oxygen, carbon monoxide and nitric oxide. The oxygen is not really a pollutant, but the boiler flue gas analyser uses this as a measure of the excess air in the system. Although excess air is essential for combustion, since it is not possible to mix fuel and air completely perfectly. Excess air is the main source of losses, since this heated air is simply vented to atmosphere and wasted. For this same reason, the air inlet temperature and the temperature after the last heat exchanger give a measure of just how much energy has gone unnecessarily to atmosphere. The smaller the difference between the two readings, the more energy has been extracted.

The boiler flue gas analyser calculates these effects automatically and gives a value for the thermal efficiency of the boiler. It can also use the carbon monoxide reading to correct this value for losses caused by incomplete combustion. It is almost inevitable that some carbon monoxide will remain in the gas stream, unless the value of excess air is very high.

A boiler flue gas analyser is an essential tool for making any adjustments to a boiler combustion system. It allows the operator to see the effects of changes in real-time, and not after having a sample analysed in a laboratory.