Coal-fired Burners

Now we are getting to the larger burners! Coal-fired burners are in common use in heavy industry, especially in countries with reserves of coal. They can present a problem for our flue gas analyzer due to the amount of smoke and other pollutants that some forms of coal can produce. There are very many different varieties and qualities of coal, ranging from peat to high quality material that produces a high level of energy and little waste. The efficiency of the combustion will depend largely on the preparation of the coal before burning. Power station burners will pulverise the coal and blow it in as a fine dust. The smallest burners will simply feed the chunks of coal as delivered into the combustion chamber. Obviously, the mixing of fuel and air is much better with pulverised fuel and the combustion will be both quicker and cleaner, as the flue gas analyzer will show.

Coal my contain a large amount of sulfur and other impurities, which will be found in the flue gas when measured. Particularly inferior brands of coal will contain tarry matter that will cause sticky smoke that can block a filter on a flue gas analyzer very quickly. Care must be taken to inspect the filters and change them if necessary. A blocked filter may also lead to air being drawn in at joints in the gas tubing, which falsifies the readings on the flue gas analyser.

Coal burners require a flue gas analyzer capable of measuring sulfur dioxide. This will always be present to some degree. The level of nitrogen dioxide will also be elevated due to nitrogen-bearing compounds in the coal. This means that a calculation of NOx from nitric oxide will not be reliable and a nitrogen dioxide sensor should really also be fitted.

Water is less of a problem here, except with some forms of brown coal or peat, which may contain free water as well, boosting the level of condensate greatly.

The main problems are smoke and tarry deposits. A soot test will be essential and extra filtration for the flue gas analyzer should be considered in many cases.