GAS PROPERTIES AND ENERGY MEASUREMENT

The New EnCal 3000 Gas Chromatograph

Fast – Powerful – Accurate!

Around 50 years ago natural gas began to take the place of town gas. The source of this gas was almost exclusively in the Netherlands and the composition of the gas remained relatively constant. Nowadays, Europe also gets natural gas from Scandinavia, Russia and a number of other countries. Depending on the extent of the delivery and the consumption, the quantities of gas from different sources are mixed together. This means that it is becoming more important to analyse the quality of the gas. Already existing technologies are constantly being improved and new technologies are gaining in importance.

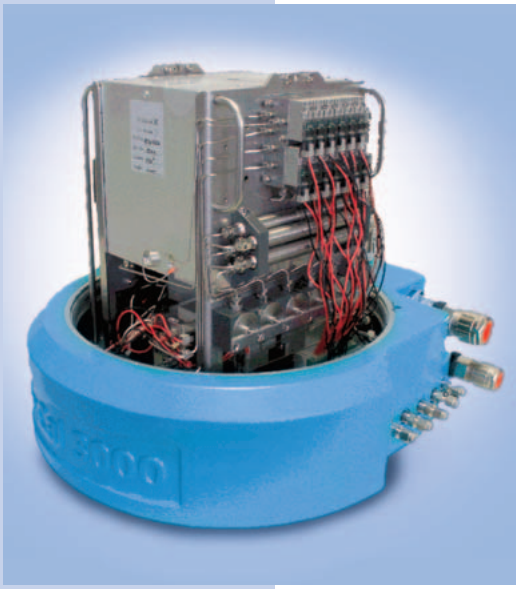

Fig. 1: The EnCal 3000 (without Ex-d cover)

Since the early 70's the natural gas market has recognised the need to measure the energy of gas for both fiscal metering and process control. One of the first automated systems used for fiscal metering was the gas chromatograph. Ease of automation, accurate measurement, reliability and application versatility were the key factors for the industrial success of this type of measurement.

Fig. 2: EnSonic installed in the field

For fiscal metering, accuracy of measurement is of the highest priority and, as a consequence, the gas chromatograph is still the number one choice. There is now a clear trend in the market towards the more compact type gas chromatographs, which provide fast and accurate analysis, but above all, extensive interfacing and diagnostic features.

Processes such as gas blending and turbine control, however, require a measurement system with a fast response. Since a typical gas chromatograph gives a result every 3-5 minutes, other systems like calorimeters are widely accepted and used for all kind of process control measurements. Operational costs for these type of meters are substantial because of the need for utilities such as compressed air, an air conditioned environment and sometimes multiple calibration gases. For this reason, the call for other types of instruments with lower operational costs is increasing.

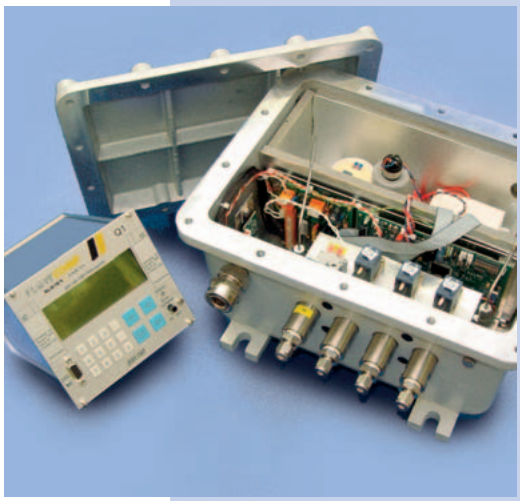

Fig. 3: gas-lab Q1

The Elster-Instromet product line of energy meters fully meets today's market demands. The EnCal 3000 integrates a 5-stream sample selection conditioning system and can be placed outdoors, which reduces installation costs substantially.

Besides Modbus communication, the device also features a TCP/IP interface enabling the user to connect to a local area network or even to the web, which ensures full remote control of the analyser and reduces costly site visits. Since there is an integrated data storage (35 days) and an on-board computer, a control or display unit is not required. However, for the German market the EnCal 3000 is connected to a display unit in accordance with DSfG specifications. The most important task of the gas chromatograph is still to provide a stable and highly accurate analysis! The EnCal 3000 will not disappoint you! With an analysis time of only 3 minutes it provides the highest degree of accuracy and repeatability available on the market for fiscal metering analysers!

For those applications where the response time of a gas chromatograph is too long, the EnSonic or gas-lab Q1 offer a fast and reliable measurement

of the calorific value and other related parameters. Both measurement systems are based on the so-called correlative measurement principle. This principle uses a calculation model and the input of three independent parameters, i.e the speed of sound, the CO2 concentration and the thermal conductivity of the gas or infrared absorption.

The EnSonic can be used for applications above 20 bar, and offers an accuracy of 0.3 % for calorific value, and 0.1 % for the density measurement. The gas-lab Q1 can also be used for low-pressure applications and offers an accuracy of 0.3 % for calorific value and 0.5 % for the density measurement.

Compared to traditional calorimeters the correlative systems offer several advantages, e. g. the absence of an open flame, the need for only one calibration gas and the avoidance of compressor systems, which require a great deal of maintenance. Furthermore, these systems are insensitive to temperature changes (within their working limits) and to the presence of combustible gases in the atmosphere.

Whereas the EnCal 3000 is universally applicable, both the EnSonic and gas-lab Q1 are typically suitable for all generic natural gases.

If you have questions concerning any other applications, our specialists will be happy to review the suitability of these systems for your specific needs. Elster-Instromet offers total solutions for all your energy measurement demands.

Measuring the quality of gas will remain an important issue – especially when you consider that gas will be supplied by even more countries in the future and the number of different mixtures will increase.

Addy Baksteen *a.baksteen@elster-instromet.com*