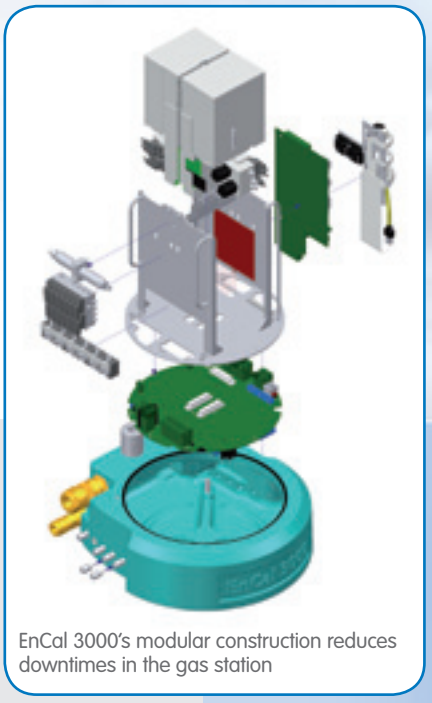
Product price is not the price of the product:

When the joy of the low price is long since forgotten…

Most of us have gone through the process of buying a new inkjet printer. After analyzing our printing needs, we then check out the printers on offer in our local computer store. Having found a model that meets our requirements, we decide to buy online to get the best deal. But was the decision as to which brand and model to buy based purely on the initial cost of the printer? If so, the first time we purchase a new set of ink cartridges may constitute an unpleasant surprise. We may have paid a low price for the printer at the outset but soon wonder why we didn't pay more attention to cartridge cost and ink consumption. The bitterness of the high maintenance costs remains long after the sweetness of the low price has been forgotten!



EnCal 3000's modular construction reduces downtimes in the gas station

If the situation described above does not sound familiar to you because you did take into account all the future costs of your new purchase, then – whether you were aware of it or not – you have based your decision on the total cost of ownership or TCO of the printer, rather than on initial cost price or gut feelings.

The concept of using the TCO as a part of the decision making process in purchasing is not very new. It has gained popularity since the eighties and has mainly been used in the IT industry and in the automotive industry. Its origin however is much older, as the first document in which it appears is a manual of the American Railway Engineering Association from 1929!

In the gas industry, we as a supplier of metering equipment are confronted with TCO as part of tendering procedures, in which the vendor is requested to make a TCO analysis of the offered goods. Let's have a look at how a TCO analysis could impact your decision on the purchase of, for example, our gas chromatograph EnCal 3000. Since we don't want to make it too complex, we will just focus on factors that have a technical and logistical background like utility consumption, maintenance costs, repair costs and engineering and installation costs.

Gas chromatographs in the natural gas industry normally use helium as a carrier gas and further consume electrical power, calibration gas, sample gas and in some cases compressed air to purge the housing (explosion proof protection) or to control pneumatically operated valves. In case of the EnCal 3000, the concept of the system is such that some of these utilities are not required at all, while the others are all minimized. Since the EnCal 3000 is based on the Ex-d explosion proof protection method, it does not require compressed air. The valves inside the EnCal 3000 used for injection and stream switching are electrically operated solenoid valves and thus do not need any pneumatic activation in the form of compressed air or helium. And last but not least, the overall design of the system is such that the helium consumption is extremely low. While most GCs for natural gas analysis do not need compressed air, low helium consumption is a true differentiator.

Traditional gas chromatographs may use up to five cylinders of helium per year, whereas the EnCal 3000 only uses one cylinder per year. This is the result of the MEMS (Micro Electro Mechanical Systems) technology applied in the EnCal 3000. Quantifying this helium consumption and comparing it with the helium consumption of other types of GCs will result in a relatively positive (= low) contribution of this factor to the total cost of ownership. Since helium is becoming a more and more scarce resource, the cost difference between one and five cylinders will be at least 4 x 300 euros each year for the gas and cylinders only. If we add up the logistics involved and the manpower to replace bottles more frequently, we may end up with a difference in helium consumption costs amounting to somewhere between 2500 and 3000 euros per year. Over the complete life span of let's say 10 years this would sum up to 25000 to 30000 euros which is close or equal to the initial cost price of the gas chromatograph itself!

Maintenance and repair costs are another factor to take into account. Of course this is where it becomes a bit tricky, because the quantity of repairs is hard to predict and is dependent on several factors such as ambient conditions, installation effects and the cleanness of the gas or quality of

the gas conditioning system. Since the EnCal 3000 is designed as a modular system, the downtime of the system after a technical problem is usually very short. More traditional gas chromatographs that are not modular in their setup normally require repair work on a component basis. Since this type of GC normally needs long stabilization time following repair, this is a time-consuming process that in many cases takes more than a day, because a reliable recalibration of the unit can only take place on the second day when the GC has been able to stabilize overnight.

In the case of the EnCal 3000, we are able to perform a reliable and stable recalibration of the GC within one hour after replacement of any component or module, even if the complete analytical module (injector, column and detector) has been replaced. This means that any repair can be done within one day, thus saving 1 day of labour and an additional overnight stay.

On top of that, it may well be the case that additional costs are involved for you as an end user when the fiscal measurement system is running without a live input of a gas chromatograph. The energy calculation for that time span will be performed based on fixed values rather than live values and correction may be required afterwards, costing valuable time and money.

Since these factors are hard to quantify for us it may be worth the effort to perform your own TCO analysis for this kind of TCO contributors. The result may well be that costs of goods for a repair are less important than the total downtime of the system.

The last point we want to highlight is the cost of engineering and installation. Once a decision has been made for a specific type of gas chromatograph, the job is not finished, it's only just beginning. The gas chromatograph needs to be integrated in a system, requiring engineering and installation work.

The costs involved in this stage are often not taken into account in the decision making process. One of the advantages the EnCal 3000 offers is that it includes a stream selection system with an integrated sample bypass. This means that if the gas chromatograph is used for more than one stream, no additional valves are required for stream switching. Some GCs on the market are single stream systems that even require external valves to be able to perform the daily calibration. Since a well designed stream switching system is based on double block and bleed configuration, the costs involved will be at least a 1000 euros for calibration gas only and several thousand if more streams are to be analyzed. The EnCal 3000 offers the calibration gas switching as standard and each additional stream for less than → 700 euros per stream. On top of that it is common engineering practice to design a sample bypass loop for each individual stream. In the EnCal 3000 system this sample bypass loop is included in the stream selection design as a standard eliminating the need for external sample bypass systems. This results in savings of at least 300 euros per stream. Another advantage of this internal bypass is that it reduces the total emission of sample gas, since the internal bypass will only work for the next stream to be analyzed, whereas external sample bypasses will continuously vent gas, even if the stream at that time is not to be analyzed at all.

Depending on the number of streams involved, the internal sample stream selection and sample bypass may save at least between 1000 to 5000 euros in consideration of the additional engineering, construction and installation time.

Of course the above examples are far from complete and some of the figures are subject to discussion, but they do give some indication of the impact that TCO could have on your decision. It does take some time and effort to think of all the cost involved, time and effort that we as a vendor have already spent for you when designing our systems. We are happy to spend this time for and with you because we do not only want you to have a good feeling when signing the contract, but also in the 10 years that follow.

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