

## West Control Solutions KS98-1 enables energy efficient oven retrofit



West Control Solutions' KS98-1 temperature controller has enabled a major component manufacturer to achieve a swift and energy efficient upgrade on its process oven that has significantly improved product quality. The results illustrate just why the KS98-1 is such a powerful solution for temperature control even in the most demanding applications.

### Temperature Control Application: Industrial Oven

The customer operates a special oven that is used to heat one of its core products - expensive graphite electrodes. Graphite electrodes carry the electricity that melts scrap iron and steel in electric arc furnaces, and are made from petroleum coke mixed with coal tar pitch. This material is extruded and shaped, then baked to carbonize the pitch; the carbon is then converted to graphite by oven heating to temperatures approaching 3000 °C. It is this careful baking process that required an upgrade and, ultimately, new temperature control solution.

### Requirements of the Temperature Controller

The customer was using an old-fashioned oil burner to heat the oven but was looking to upgrade the system by replacing the old ¼ DIN controller with a new unit, while also adding a special gaseous combustion control. The aim of this upgrade was to reduce the energy cost to such as degree



that return of investment would be achieved swiftly.

Another aim of the upgrade was to improve product quality. A graphite electrode needs to be evenly heated throughout, but a gas burner may heat areas of the oven at different rates and intensities. This can result in expensive wastage if electrodes are damaged through over heating or because they have not been heated evenly. This was a constant danger before the upgrade because there were varying temperature limits in parts of the oven and a high consumption of oil.

Stefan Langer, Director of the WCS distributor Telemetrie & Automation in Germany, explained further. “The temperature in each part of the oven was not evenly controlled,” Stefan said, “and our customer also had a big issue with the high consumption of oil so it was looking for a new and better solution.

The customer located a specialist with a good understanding of the process who designed a new heating system. This new system featured a special combination of a gas burner system and a



method of heating the oven with pure gas, using enhanced oxygen control. However, the design could not be realized with a standard controller; the new design required a more sophisticated controller with, for example, sequence controls, but one that would also be easy to operate.”

The customer was therefore in search of a programming system that, after commissioning, would be simple for engineers to operate using their own process knowledge. The customer was also tight on budget and wanted a solution that would not be expensive in terms of

software or installation time. Another crucial requirement was that the solution needed to conform to the DIN EN 60239 “Graphite electrodes for electric arc furnaces - Dimensions and designation”, industry standard.

### The Temperature Control Solution

A series of temperature control providers were consulted. One could only offer a unit that was not compatible with the existing control interface, or offered a limited facility in terms of programming. Another was unable to provide a solution that could handle the

advanced gaseous combustion control required. In contrast, the unit offered by West Control Solutions, the KS98-1, offered both the sophistication and compatibility required. The KS98-1, a compact mini PLC and DIN controller, was the perfect

retrofit solution because it fitted the existing ¼ DIN housing exactly, with all the necessary I/O options already on board. The KS98-1 was also far more cost-effective than the options offered by West Control Solutions’ competitors because other units would have taken longer to programme. For example, the KS98-1 provides a library with a lot of tested PLC and maths function that is not normally available in a DIN controller.

“A standard DIN controller normally has one control loop, sometimes two, but no kind of sequence control or PLC (Programmable Logic Controller) logic function,” Stefan Langer explained. “The KS98-1 offers this functionality but all within a DIN housing. And because it is still a DIN controller and not a PLC the set-up of the process is not so expensive. The customer’s problem could have been solved with a PLC but this would have also required a high-end PLC programmer with a lot of knowledge. The design process would have



also involved transferring a lot of knowledge from the process specialist to the PLC programmer, and all this costs a lot of money. Another significant benefit of the KS98-1 is that it has a communication interface for modern fieldbus systems; in this case the complete process is controlled via Profibus. This was a very important point for our customer, and another factor that confirmed the KS98-1 as the right solution.”

Crucially, West Control Solutions was able to offer the customer a high degree of presales support, using its expertise to demonstrate the energy-saving potential of the proposed upgrade well before its realization. Using KS98-1 simulation software, West Control Solutions was able to show the customer how the process system would work, giving the customer complete confidence in the solution.

### The Results

Once the customer had given the go-ahead, the controller application was ready within three weeks. Results have already been received from the first trials between the new system and the older system. Figures show that the customer is making massive savings in the region of around 20% of his energy every month. Although savings on energy were expected, these figures far exceed the customer’s targets. Another positive side-effect was the fact that, as a result of the new control process, the customer could significantly reduce the CO2 emissions.

Coupled with the fact that it did not require the help of a PLC and did not demand the expensive transfer of application/control knowledge to a PLC expert, the KS98-1 offered this customer an extremely cost-effective and sustainable solution.



West Control Solutions is a global specialist in temperature and process control instrumentation. Through its four leading product brands, CAL, West, PMA and Partlow, it has been supplying the industrial and scientific industries with reliable, easy-to-use temperature control equipment for over 100 years.

For more details on the complete product range from West Control Solutions please visit [www.west-cs.com](http://www.west-cs.com).

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