



Refined control for revolutionary waste digesters

Location:

Bath, UK

Segment:

Environmental protection

Challenge:

To devise a control system for Advetec's unique bio-thermic waste digesters that would combine flexibility with reliability and ease of maintenance, while using components that are readily available and supported worldwide.

Solution:

A system with Eaton automation solutions integrated, including touchscreen operator panels with built-in PLC functionality, motor controlgear, and protection devices, all linked with SmartWire-DT.

Results:

A control system that's fast to build and test, and has powerful in-built diagnostics that make it easy to maintain, even for users with little faultfinding experience.

"We needed a dependable, versatile control system that was as innovative as our waste digestion technologies, and that's exactly what Eaton's SmartWire-DT intelligent wiring system has provided."

Craig Shaw, Managing Director, Advetec.

Background

Advetec Advanced Environmental Technologies is a world leader in bio-stimulation – a method of invigorating and stimulating thermophilic and extremophilic bacteria so that they efficiently digest organic waste.

Using its unique expertise in bio-stimulation, the company has developed compact containerised bio-thermic digesters that, in less than 72 hours, can process over 30 tonnes of organic waste. The waste is reduced in volume by 96%, and is converted to clean water together with a tiny amount of sterile residue.

Because they offer such an effective way of handling organic waste of all types, including 'difficult' material such as abattoir by-products and hospital waste, Advetec digesters are finding a ready market all over the world.

Challenge

Advetec digesters process bulky waste and so are almost always installed in tough working environments. In addition, most of the operators have skills that are focussed on the physical handling of bulk waste rather than the operation of sophisticated control systems. This makes a robust yet intuitive operator interface essential.

In addition, the machines are used all over the world and are usually expected to work 24 hours a day, 365 days a year. Rapid correction of faults is, therefore, a key requirement. This makes integrated diagnostic facilities essential, along with fast and easy local availability of spare parts.



Powering Business Worldwide

Solution

For its first 20 machines, Advetec had used control systems based on standard components and conventional panel wiring. These had proved to be largely satisfactory but when problems did occur, they were difficult to diagnose and remedy, particularly for machines installed overseas. The company was, therefore, looking for a better control solution and, as part of its process of exploring possibilities for this, it approached Eaton.

The Advetec engineers were impressed not only with the quality and range of Eaton automation solutions, which would cover all of the project's requirements, but also with the unique Eaton SmartWire-DT intelligent panel wiring system, which allows all of the major components within the control panel to be linked with standardised plug-in cables instead of ordinary panel wiring.

SmartWire-DT can also be extended outside the control panel so that, for example, sensors become, in effect, plug-in devices. It also makes detailed diagnostics possible, as information about the condition of components can be accessed via the SmartWire-DT connections. If a sensor or other component is replaced, the system automatically reconfigures itself to correctly address the new device.

Advetec quickly decided to integrate Eaton's automation solutions including SmartWire-DT into its new control system design. The company also decided to equip the control system with an Eaton HMI XV-152 touch-screen operator interface panel, which has integrated programmable controller (PLC) functionality.

This robust device, which has a high ingress protection rating and a tough damage-resistant screen, allowed Advetec to develop a very easy-to-use operator interface based on colour graphics, while at the

same time permitting a flexible scheme of control that can easily be updated should the need arise. The interface panel also allows users in possession of the appropriate security passwords to access the machine's diagnostic system.

Results

Advetec has used Eaton automation solutions in its two most recent machines and is planning to use it in all of its future machines. The company has found that SmartWire-DT simplifies the design, building, testing and commissioning of the control system, as well as allowing the use of a smaller, easier to accommodate control panel.

The advanced monitoring and diagnostic system made possible by Eaton technology conclusively proved its worth when the user of one of the new machines managed to insert a concrete building block along with the organic waste. As soon as the block stalled the transport motor, the diagnostic system detected the rapid rise in motor current and shut down the machine before damage could occur. After the block was removed, it was possible to resume normal operation immediately.

"The new control system is proving exceptionally popular with our customers," said Craig Shaw. "They love the simple touchscreen user interface, they're impressed with the neatness and simplicity of the control panel and machine wiring, and they're very enthusiastic about the diagnostics we've provided. They also very much like how easy it is to change sensors and other components without having to worry about stripping cables and making the right connections."

"Eaton itself is, however, one of the biggest benefits for us. The Eaton name is recognised and respected worldwide, so our customers instantly see that we're using top-grade products in our machines. Even better, Eaton has a presence in more than 140 countries,

so we know and our customers know that if spares should be needed, they will be delivered in less than 24 hours, irrespective of the location of the machine."



Advetec's bio-thermic digesters, which are used all over the world, can process over 30 tonnes of organic waste in less than 72 hours



Eaton's PKE and PKZ manual motor starters and DIL contactors have been tried and tested for both IE2 and IE3 motors



Craig Shaw, Managing Director at Advetec (left) and James Thomas from Eaton (right) are working closely together to make "zero waste to landfill" happen

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Publication No. CS083050EN
November 2015

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