

**Industry: Energy generation / biogas plants**  
**Products: Compact controllers, control terminals**

## A secure investment: Compact controller technologies for biogas cogeneration plants

A growing number of farmers are generating energy from biomass. However, the €1.5 million investment in a biogas heat and power cogeneration plant can only pay off if the system has a service life of at least 20 years. The technology thus needs to be absolutely reliable and easy to operate. The Jonny Beusse company in Suhlendorf, Germany, installs Mitsubishi Electric controller and control panel systems in biogas cogeneration plants because the Mitsubishi technology ensures absolutely reliable operation.



Jürgen Hinrichs is one of the many German farmers who have decided to install a biogas cogeneration plant as an additional source of income. At his poultry farm in Wittingen-Ohrdorf in the Gifhorn county, Hinrichs keeps 160,000 chickens and cultivates 740 acres of land. His primary motivation was the rapidly-rising bill for heating the chicken sheds, which was running at around €20,000 per year. These were costs that were difficult to reduce, because chickens need specific temperatures at different stages to develop and mature properly.

The investment in the cogeneration plant, which has an output capacity of 500 kilowatts each of electricity and heat, represents a significant risk for a farm of this size. The plant can only pay for itself in the calculated 20-year period if it operates reliably. Even brief failures cost around €100 per hour and longer downtime can cause much greater losses – if the temperatures in the chicken sheds fall it means both a possible loss of livestock and a threat to the long-term contracts with retail chains.

For the Jonny Beusse company contracted to configure and deliver the switchgear for the biogas plant, reliable controller and visualisation systems were thus a top priority. A fieldbus network system was chosen to ensure reliable communication between the system components. The farmer, who lives at some distance from the installation, also wanted to get immediate alarm messages whenever there was a malfunction in the system. After a thorough market analysis and a recommendation from the supplier and consulting engineering firm Sonepar Deutschland in Hanover, the switchgear specialists at Jonny Beusse chose a matched combination of a compact controller, an alarm modem and a control terminal, all from Mitsubishi Electric.

The control centre of the biogas plant is a MELSEC FX3U programmable logic controller (PLC). This powerful, latest-generation compact PLC has very extensive communication capabilities. For example, it is the only controller in its class that has a Profibus DP master module, providing a low-cost solution based on a standard network that can handle the monitoring of all system parameters, including the temperatures in the chicken sheds and the status of the fermenting tank, the gas-fired engine and the cooling system. The data is displayed with an E1061 touchscreen control terminal of the E1000 series. In the event of a malfunction the system displays an error message on the terminal screen and alerts the farmer by telephone, using the alarm modem connected to the controller.

Jürgen Hinrichs doesn't need to worry about the safety of his investment and he can now forget about spiralling heating costs. Thanks to the reliable controller and control panel technology the system runs smoothly without interruptions. Now the poultry farmer is already planning to expand his operation. He's soon going to add an additional shed for another 40,000 chickens, which will also be heated by the farm's own biogas cogeneration plant.



**The excellent cost-benefit ratio, simple programming, impressive service and our good experience with other products from this manufacturer were all factors that contributed to our choice of the controller and control panel technology from Mitsubishi Electric.**

Jonny Beusse,  
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