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Silicon reclamation company saves £5,000 per year on pumping costs

A company that reclaims silicon wafers is using an ABB variable speed drive to save over £5,000 a year on a pumping application at its plant in Swansea, South Wales.

Pure Wafer reclaims silicon for semiconductor manufacturers, allowing them to reuse silicon previously used in test wafers in their production processes. It produces up to 70,000 reclaimed wafer units per month. As part of the reclamation process, Pure Wafer uses de-ionised water, pumped in a loop by two 18.5 kW pumps. Used in a 12 hour standby/rotation duty, the flow of the pumps was restricted via a butterfly valve to maintain a water pressure of 4 bar.

“This was wasteful of energy,” says Facilities and Engineering Manager, Neil Draper. “We wanted to save energy as well as reduce our carbon dioxide production.”

The company also needed a more stable supply of water that would not be affected by different rates of water use around the plant.

Pure Wafer asked ABB Drives Alliance partner APDS to look at the application and determine how it could use variable-speed drives to cut its energy use.

APDS logged the energy use of the application for a week. This found that running a pump direct-on-line drew 23 A with a power consumption of 11.9 kW, equating to a running cost of £9,411 a year. An ABB drive was then installed on one of the pumps for a further week. It was calculated that the drive would draw only 5.3 kW at 8 A. This would cost £4,223 a year, a saving of over £5,000. This gave a payback time of six months. These figures were used as evidence for a Carbon Trust loan to finance the project.

A 22 kW ABB standard drive was installed as a permanent solution. This now runs one of the drives for 23 hours of the day, with the standby pump running for the other hour. An ABB pressure transducer is used to feed back a signal to the drive, allowing it to maintain the required pressure of 4 bar. “As well as saving money, we now have better process control, maintaining the required pressure despite water outlets in the loop being switched on and off as needed,” says Draper.

As there was no space in the existing panel, APDS attached the ABB drive to the back of the panel, providing an IP54 enclosure to avoid any danger from possible water spray in the pump room.

“I am very pleased with the project,” adds Draper. “The drive was installed in a day and we simply used the standby pump to supply the demand.”

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