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Clockmaker uses ABB drives on high accuracy milling machine

One of the UK's most skilled clock and watch restorers is using ABB variable-speed drives (VSDs) to control a highly accurate watch maker's milling machine.

ABB Authorized Value Provider, Inverter Drive Systems (IDS), supplied and installed a panel containing two 0.37 kW ABB machinery drives, a new fascia with forward and reverse operator controls and an emergency stop. One of the drives supplies the three-phase power for the milling machine as well as providing speed control, while the other simply provides three-phase power to the coolant pump.

James Chadburn, a member of the British Horological Institute, repairs and restores timepieces at his workshop in Dunstable, Bedfordshire. He specialises in the restoration of clocks that can be up to 400 years old, making and installing new parts that exactly match original components.

To add to the capabilities of his workshop, Chadburn bought an Aciera F1, a rare Swiss-made milling machine designed to achieve the high accuracies of around 0.0004 mm demanded in clock and watch making.

The challenge was running this three-phase machine from the single-phase supply in the workshop. Chadburn chose IDS to provide a solution. "I had contacted a number of companies," says Chadburn. "Some did not respond to my enquiries but the engineer from Inverter Drive Systems came and took copious notes of what would be needed."

As well as its use in converting the power input from single-phase to three-phase, the main VSD is used to drive the milling head at different speeds to match the work being done. The Aciera F1 has two speed selection dials, one with 125, 250 and 500 rpm and the other with 1,000, 2,000 and 4,000 rpm. The milling machine is linked to the VSD so selecting the speed on the Aciera selects the appropriate speed from the VSD.

Says Chadburn: "If I am cutting brass then I would select 4,000 rpm, certainly nothing under 3,200 rpm. With multi-tooth cutters, most of the finishing of the piece is achieved during the cut itself, doing up to 80 percent of the polishing work. Controlling the speed in this way means I can accurately replicate wear on a component, making it look 250 years old.

"For hard steel, the VSD allows me to slow the milling machine right down – if it is too fast, it can destroy the cutters or overheat and scorch the component."

ABB machinery drives are intended for use by the machine building sector and are available in ratings of 0.37 kW to 22 kW. They are designed to be quick and easy to install and commission, with Chadburn's installation taking less than a day. "I was very pleased with the service I received," adds Chadburn, "with the project having only one small hiccup that was sorted out by IDS quickly. I have had no problems with the drives since then."

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Caption: Clock and watch restorer is using ABB variable-speed drives to control a highly accurate watch maker's milling machine.



Caption: Panel containing two ABB machinery drives. One supplies the three-phase power and speed control for the milling machine, whilst the other provides three-phase power for the coolant pump.

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