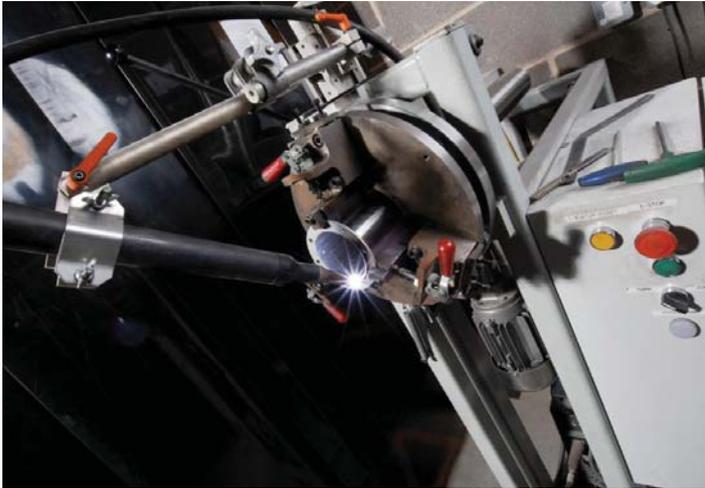


## Drive Cuts Cost of Rotational Welder



A specialist machine builder, was given a tight time scale – and a tight budget – by Sheffield based heating systems company, Trianco Heating Products Ltd, to come up with a cost-effective solution for welding the ends of a tubular heat exchanger. The solution, which required precision control and two welding programmes, was only possible thanks to a Commander SK variable speed AC drive from Control Techniques, Emerson Industrial Automation at the heart of the machine.

“We were faced with a moderately complex task that required different operating modes, but given a limited budget,” explained Alex Wilson, managing director of Telford-based Automatic Technologies International. “The two welding speeds required, dictated that a variable speed drive was required as well as overall process control. However, the extra cost of even a small PLC with its associated power supply and larger control box would have made the solution too expensive. The answer was simple. We used the on-board PLC functionality within a Control Techniques Commander SK to provide two drive programmes and on/off control of the TIG welding torch.”

This particular task, to produce a heater assembly for a central heating boiler, is to weld a 22mm pipe to a blank tube end, weld the tube end onto an 80mm tube, then complete the task by welding a flange to the other end of the tube.

The machine comprises two plates that act as a jig – one fixed and the outer one free to rotate using slewing bearings between the plates – with an 80mm central hole through both. The

rotating plate is belt driven by an induction motor controlled by a 0.25 kW Control Techniques Commander SK. After selecting the correct programme, the operator simply presses one button that initiates the sequence – clamps on the outer plate, fixes the tube base or flange into place and the tube is placed into position in the centre; the plate is reversed to top-dead-centre (detected by a proximity switch), then the TIG welding torch swings into position and the welding sequence starts. A small initial delay allows a small pool of metal to form and the drive then rotates the plate through 360° at a selected speed, plus a 5° overlap, to ensure gas tightness of the pressure vessel.

When welding the flange and vessel end, the motor speed is 80 Hz, but for welding the smaller 80mm pipe in place, the rotation speed is much slower at 20 Hz to give the same surface speed for welding.

“The use of the Commander SK simplified the whole design,” explains Alex Wilson, “and, of course, the drive’s very compact too, which also helped. All of the turntable routines, the clamp control and sequencing, the position and control of the welding torch, were programmed into the SK itself, keeping our build costs well within budget. Not only was the budget tight, but we were able to produce the design, build the machine and deliver it all in just a few days – it was up and running the same day it was delivered!”

### KEY BENEFITS

- COMPACT SIZE
- COST SAVING
- ON-BOARD PLC FUNCTIONALITY
- SIMPLIFIED DESIGN



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