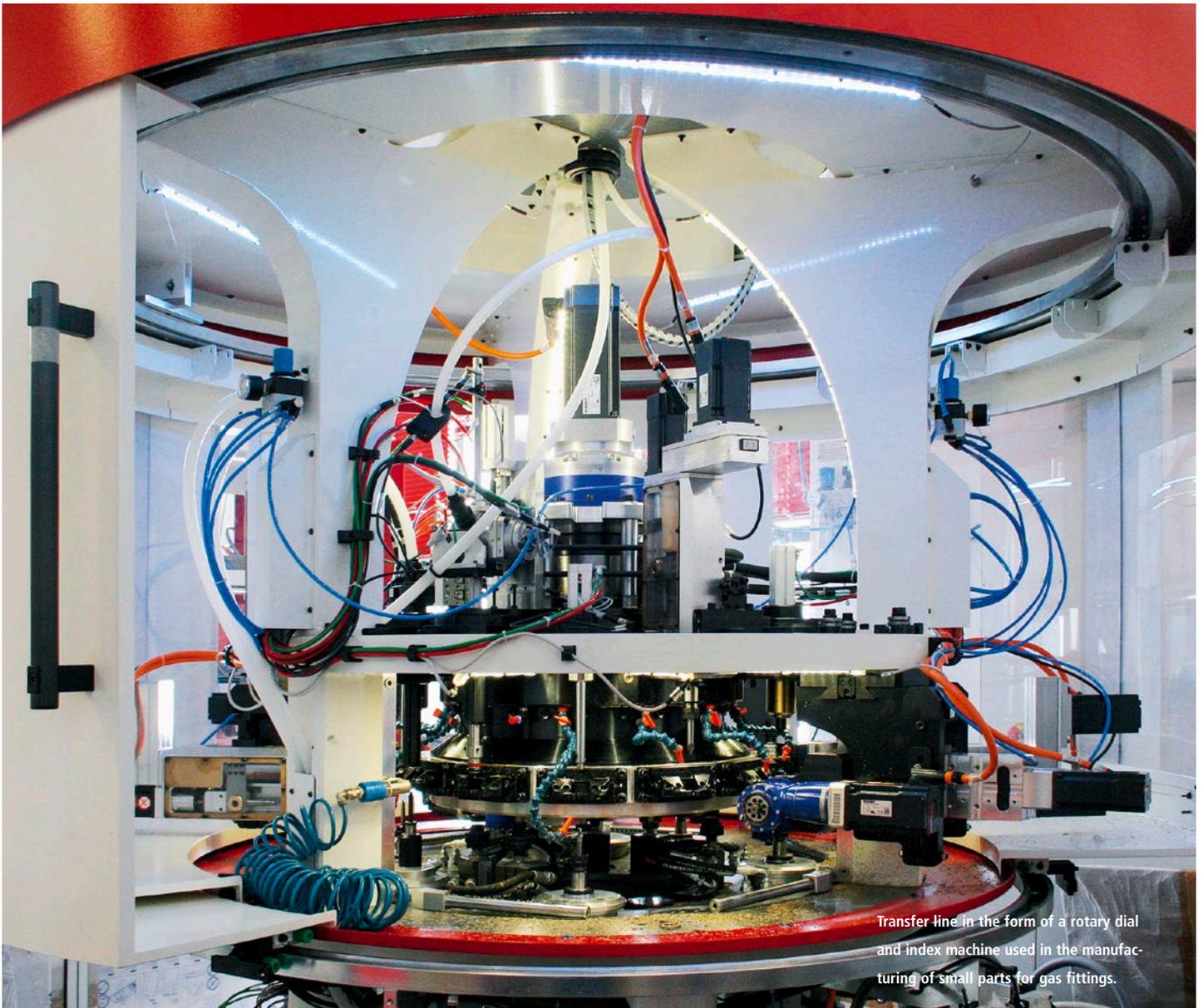


Transfer line of small parts optimizes gas fitting production

Maximum precision and speed, guaranteed

Twins brand gas fittings are used in gas cookers and ovens produced by internationally-known appliance manufacturers. These components are manufactured on machines developed and built by Beocom, based in northern Italy. Around 20 years ago, Beocom developed the first automatic tandem installation and testing machines that featured two test stations arranged in parallel, which led to the brand name, Twins. This innovation formed the basis of the company's longstanding success. More recently, Beocom implemented a new transfer line for the machining of small parts for gas fittings, based on an integrated PLC and motion control solution from Beckhoff.



Transfer line in the form of a rotary dial and index machine used in the manufacturing of small parts for gas fittings.



View of the central control cabinet of the Twins transfer system, on which small parts for gas fittings are manufactured. A total of fifteen 2-channel and two 1-channel AX5xxx EtherCAT Servo Drives are used for controlling the axes.

“The most innovative feature of the automatic tandem testing unit we developed at the time was the independent pick-and-place of parts at the two stations,” reports Ivan Omodei, who, together with Franco Borsi, founded Beocom in 1995. “Although automatic tandem units weren’t new at the time, parts could previously only be picked up once both machining operations were complete, which resulted in longer cycle times. The transition to a PC-based control platform enabled us to shorten the cycles and control them independently, based on sequential master logic.”

Recently, Beocom developed a transfer line for machining (milling, cutting, turning, drilling, thread cutting, etc.) of metal sleeves for installation in gas fittings. These components are responsible for the tightness of the fitting, which is why they are manufactured with maximum precision from a brass rod. “Our transfer line is based on the principle of an electronically controlled rotary table, which in turn, benefits from our solid expertise with automatic assembly and testing machines,” says Ivan Omodei. The throughput varies, but is typically within the range of several thousand parts per day, depending on the dimensions and machining requirements of the workpiece. The parts are automatically placed into transfer stations. This virtually eliminates downtime for configuration changes and productivity is increased significantly.

Embedded PC integrates both PLC and motion control

A Beckhoff CX2030 Embedded PC serves as central control unit for the transfer line. It not only monitors the distributed I/O points, but also synchronizes the motion of the 31 axes. Servomotors from the AM8000 series, with One Cable Technology, and linear servomotors are implemented. The entire periphery, consisting of sensors, converters and actuators, connects via EtherCAT. Temperature and vibration sensors enable measured value monitoring for the entire transfer line. In addition to EtherCAT I/O terminals in protection class IP 20, robust IP 67 Fieldbus Box modules are used, installed directly on the machine. The



Ivan Omodei (left), Managing Director of Beocom, and Raffaele Balzan (right), Area Sales Manager, Beckhoff Italy, at the Control Panel.

safety solution is integrated via TwinSAFE I/O terminals, which are directly connected to the Embedded PC. A remote 15-inch CP3915 multi-touch Control Panel is used as HMI hardware. The customized panel attaches to a movable mounting arm for ergonomic machine operation.

While the control architecture is based on standard components, Beocom has developed the complete application software for the transfer line in-house. Ivan Omodei proudly points out that the software offers functionalities not available in conventional NC controllers.

Beocom standardizes on PC-based control

Entrepreneur Ivan Omodei can list a number of reasons why he now implements PC-based control technology from Beckhoff as the standard in his machines. “Our previous solution was no longer competitive. Back in 2011, we equipped one of our machines with a Beckhoff control platform for the first time. We quickly realized that it was an ideal match for our requirements in terms of performance, speed and precision. Assembly and testing lines consist of many subassemblies, so centralized PC Control enabled us to achieve optimum performance with full integration of all components. In addition, EtherCAT as the high-speed communication system guarantees fast and consistent signal transfer from thousands of data points along the machine edges.”

According to Ivan Omodei, another highlight is the diagnostic capability of PC- and EtherCAT-based control: “EtherCAT enables us to target the diagnostics precisely to the individual I/O points, instead of a whole strand. Based on the PC Control platform, faults are also easy to remotely diagnose. For example, we can detect whether there is an actual problem or whether an alarm was triggered by incorrect operation or machine settings, which is quite often the case. In addition, the high-performance capacity Embedded PCs, in conjunction with suitably large storage media, enable precise product tracking.”

Further information:

www.twinsnet.com

www.beckhoff.it