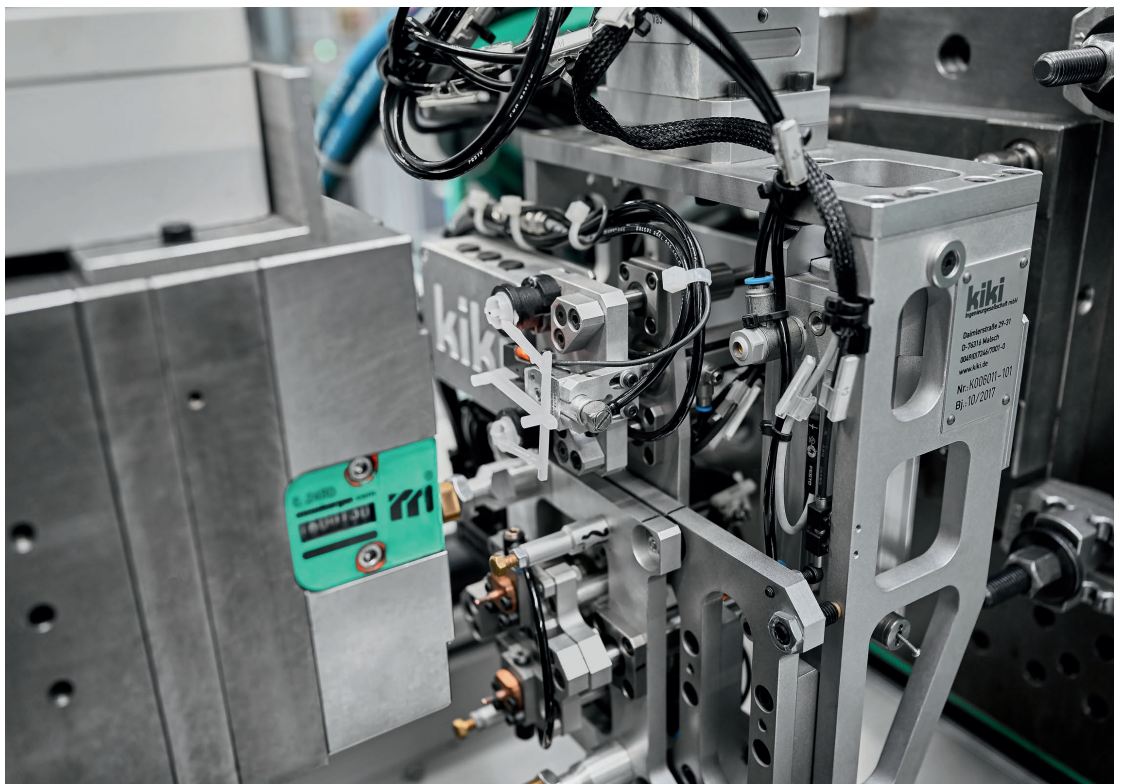


Flexible Turnkey System for Magnet-Equipped Nano Push Button Switches at elobau

Overmolding in Correct Polarity

The sensor technology specialist elobau claims a vertical integration of 90 percent – above average for the industry. Each production step – from injection molding to cable and SMD assembly – takes place in-house. When they conceived a turnkey production line for non-contacting nano push button switches, the company chose to work together with Arburg because the system supplier was able to provide an energy efficient, highly flexible solution.

The individual gripper can pick up the separated magnets of both variants and insert them into the mold with the correct pole position. © Arburg



A turnkey system was required when elobau GmbH & Co. KG, Leutkirch, Germany, wanted to expand and automate the production of nano push button switches (Fig. 1) in February 2018 to accommodate an additional new magnet variant. Manual mold-entry operations were to be avoided as far as possible because of the very small and delicate parts and the production of two variants on one machine. The magnets, which must be inserted into the mold with the poles reversed, are extremely small, at 1.5 x 2.0 x 3.0 mm, which was another point in favor of the automation of production. And according to Domi-

nik Schubert, head of injection molding at elobau, the quantities of up to 500,000 parts per year can also be supported. The nano push button switches are space-saving, safe and can be used anywhere. They are used worldwide in joysticks, handles, armrests or the housings of “off-highway vehicles” such as industrial trucks or construction and agricultural machinery, as well as in industrial applications.

Inserting the Smallest of Magnets

The turnkey system based around an electric Allrounder 370 A injection mold-

ing machine with Multilift V robotic system for part handling is capable of picking up the singulated magnets of both variants and inserting them with the correct polarity (Title figure), thanks to the integrated magnet singulation for the two production alternatives and the individual gripper physiognomy. The two-cavity mold comes from the company’s own mold construction in Probstzella, Thuringia, Germany.

Hall sensors are used to control the exact position of the insertion. The sensor interrogates a closed magnetic field. If the circuit does not close, an error is reported and the injection molding

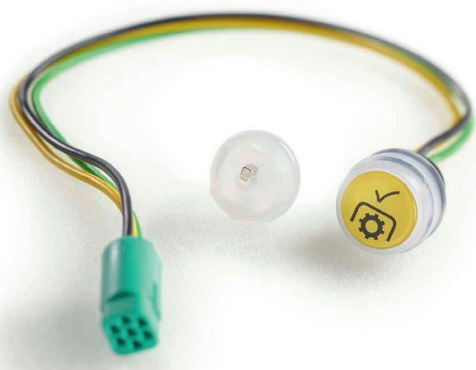


Fig. 1. The nano push button switches save room, are secure, and can be used anywhere. This flagree component is about 12.5 mm in diameter and has a magnet at its center. © Arburg

process is stopped. This check ensures that the magnets are inserted in the correct position and orientation in the mold. Following the check, the overmolding with a polycarbonate (PC) is carried out via a cold runner system and the two parts and the sprue are removed from the mold. The sprue is discharged by the robotic system and the finished parts are deposited aligned on a conveyor belt (**Fig.2**). The complete cycle takes about 26.5 s.

Two Variants – One System

The system achieves a high degree of autonomy as a result of the movable magazines for both magnet variants. The vertical and the horizontal loading plate are filled by the operators at a transfer station and work with 30 horizontal or vertical magnetic magazines each. Two lockable transfer stations can each provide two magnets per variant, which are then taken over by the gripper of the



Multilift V. The challenge was to make the magnets available lying both horizontally and upright, as the correct pole position is the most important factor during overmolding. In variant one, the polarity is on the small front end; in variant two, it is on the long side.

Fully Integrated into the Control System

According to Dominik Schubert, it was also important for elobau “that the robotic system and singling could be fully integrated into the machine control system. We also received a central ‘system controller’ from system supplier Arburg, which makes the overall process much easier to manage.”

Impressive Overall Package

The competent and transparent advice, fast quality service, particularly in respect of the supply of spare parts, as well as

the reliability of the Allrounders were the deciding factors in elobau deciding to work with Arburg on this demanding application. Another consideration was the output, precision and the low energy consumption of the system. This is something the company attaches great importance to, as its production has been climate-neutral since 2010. ■

Info

Text

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Company Profile

elobau GmbH & Co. KG, located in Leutkirch (Allgäu), Germany, manufactures sustainable controls for construction and agricultural machinery, and industrial trucks, as well as non-contact sensor and level measurement technology for mechanical and plant engineering. Since its founding by Fritz Hetzer in 1972, the company has either developed customized solutions, or could supply a product from its comprehensive standard program. In 2020, the manufacturer of electrical components with over 1000 employees achieved sales of EUR 108 million.

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Fig. 2. The turnkey system is energy efficient and can produce nano push button switches flexibly. The Multilift V robot system (right) lays the finished parts aligned on a conveyor belt. © Arburg