Case Study

Quality control of keys for cylinder locks

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ProSix robots are the key to reliable accuracy

Huf-Tools understands industrial automation with robots particularly well. In a plant designed by the company, six different types of keys of the brand Carl Eduard Schulte are measured, tested, and sorted according to the measurement results.

Accuracy is essential

The specifications to be met by the system are very high: an almost 100% availability of the plant with an error ratio of maximum 20ppm, high flexibility through optical recognition procedures and short cycle times, without any loss of precision. An ideal task for the ProSix series of six-axis robots with their high freedom of movement and maximum reliability.

A complicated process made simple

Within the work cells, an Epson PS3L six-axis robot takes over the handling and quality assurance of the keys in conjunction with a fully integrated Epson image-processing system.

The milled keys are fed into the machine manually on bar magazines (sticks). The rotary table moves the magazines filled with up to 1,200 keys into pick-up position.

The Epson six-axis robot grabs a key from the receiving unit and moves it into an opening in the test box. In this position, the integrated Epson Smart Vision image processing programme takes a picture and delivers precise data on the exact position of the key in the gripper. A correction value is calculated via an actual-target comparison and transmitted to the robot controller via Ethernet.

This correction value is converted into robot coordinates by the RC170 and passed on to the manipulator. As soon as the key is placed exactly in the measuring position, Epson Smart Vision measures the bit of the key. At the same time, the interval between troughs and crests to the reference edge codes the type of key. To measure the longitudinal profile, a laser scanner that scans both profile sides is used. A rotation in the tool coordinate system ensures a perfect spin around the key longitudinal axis.

The next step

The next step is the online-comparison of the measurements with the data in the C.E.S. database. The perfect keys are stored in a stacking magazine in the rotary transfer unit, while faulty keys are placed in a separate storage unit.

Huf Tools

A six-axis robot working together with Smart Vision provides the perfect solution for precision high-volume product checking duties such as required by Huf-Tools.

Volker Spanier

Head of Robotics - Epson

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Key Facts

Huf-Tools selected ProSix six-axis robots to quality check its Carl Eduard Schulte brand keys.

Thanks to their precision, speed and high repeatability, they proved ideal for the task in hand.

Epson Smart Vision allows the robot to see the keys clearly, and identify perfect ones from faulty ones.

For more information, visit www.epson.eu

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