

Press release

Automated, precise and gentle inspection

Kistler combines new vision inspection system with pick & place robot

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Kistler is now combining its expertise in modular automation technology with its proven optical quality inspection systems. Under the name Automated Vision Inspection, the company offers its first fully automated turnkey system for the quality inspection of sensitive components. The specially designed pick-and-place robot is guided by image-processing and can, for example, take parts from blisters or pick them accurately from bulk material. Precise camera technology then inspects the parts and sorts the good parts back into blisters if necessary. Bad parts are automatically sorted out and destroyed if the customer requests it.

Automatically testing sensitive components is challenging: precise part detection is necessary for the robots to sensitively handle the parts, regardless of whether they are fed into the test system in bulk or in blisters. Any errors in the position of the parts must be reliably detected by the vision system. Many very delicate parts also present further challenges for the inspection process itself. For example, it is often not possible to place the parts in front of the camera at the optimal angle on a standardized system with an inclined plane or a glass plate. Here, the testing expertise of the specialists from Kistler comes into play. They have made it their business to find creative solutions to meet the specific requirements of the parts. Kistler has now developed and built several fully automated machine vision inspection systems for the quality inspection of such sensitive parts, and has put them into operation for users in the automotive, electronics and household appliance industries.

Customized optical quality inspection in seconds

One of these vision inspection systems checks very delicate plastic connectors. While the electrical functionality is checked by hand, the system performs the optical inspection for dimensional accuracy and surface defects. To do this, employees place the components in blisters, which they then stack on a trolley and move into the system. The system then feeds the blisters individually to a camera-controlled, high-precision pick-and-place robot that recognizes the delicate parts, removes them from the blister with pinpoint accuracy and inserts them into the inspection matrix. While the robot moves on to the next test object, the part undergoes a total of three optical quality inspections. The system checks seven parameters with an accuracy of 0.005 millimeters. The inspected good parts are then

marked before they are placed back in the blister by the pick-and-place robot; bad parts are sorted out automatically. To prevent the inadvertent use of the bad parts, the system destroys them. However complex the process may appear, the cycle time for testing a part is impressive: Depending on the complexity of the parts and the inspection requirements, such a system can achieve a cycle time of two seconds.

Automated optical inspection systems – Kistler expands its portfolio

The new systems are based on Kistler's long-established solutions for the automated optical testing of mass-produced and serial parts, as well as on the company's many years of experience in automation technology. In addition to largely standardized vision inspection systems such as the KVC 121, 621 or 821, the measurement technology expert offers customized optical inspection systems that can operate either as stand-alone units or integrated into the production line. Additional modules can be added as needed. These include, for example, automated laser marking of tested parts.

“With our new developments, we are making Kistler's optical inspection technology usable for very sensitive parts,” explains Klaus Hoffmann, Business Driver in the Vision Inspection & Automated Solutions division at Kistler. “Our ability to now integrate precise and gentle part separation using a robot arm in our optical inspection systems in-house opens up new possibilities. We can provide even better support for customers with very strict requirements and extremely delicate parts in the area of quality control. Decades of experience in optical quality inspection and in-house expertise in automated parts handling enable us to find innovative solutions for special requirements that involve unusual or very delicate test parts. Thanks to the modular concept, we offer our customers individual, economical inspection systems for optical quality assurance with comparatively short development times.”

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The Automated Vision Inspection system achieves, depending on the configuration, cycle times of two seconds from the moment the test piece is picked up to the OK/NOK decision and the corresponding sorting.



The vision inspection system subjects each part to three optical quality inspections.

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About the Kistler Group

Kistler is the global market leader for dynamic pressure, force, torque and acceleration measurement technology. Cutting-edge technologies provide the basis for Kistler's modular solutions. Customers in industry and scientific research benefit from Kistler's experience as a development partner, enabling them to optimize their products and processes so as to secure sustainable competitive edge. Unique sensor technology from this owner-managed Swiss corporation helps to shape future innovations not only in automotive development and industrial automation but also in many newly emerging sectors. Drawing on our extensive application expertise, and always with an absolute commitment to quality, Kistler plays a key part in the ongoing development of the latest megatrends. The focus is on issues such as electrified drive technology, autonomous driving, emission reduction and Industry 4.0. Some 2,200 employees at more than 60 facilities across the globe are dedicated to the development of new solutions, and they offer application-specific services at the local level. Ever since it was founded in 1959, the Kistler Group has grown hand-in-hand with its customers and in 2023, it posted sales of CHF 465 million. About 9% of this figure is reinvested in research and technology – with the aim of delivering better results for every customer.