

With net and double bottom

Customized sensor solutions in plant engineering

Practical application examples repeatedly demonstrate the importance of sensor technology for the smooth running of a wide variety of industrial processes. Already during the development of machines and plants, not only customer-specific solutions are often required here, but also development specialists with the corresponding application know-how. H.S.T. Humpert-Sortiertechnik has been active in the field of contract sorting since 2004, with the Arnsberg-based company developing and manufacturing its own systems for this service without exception. "Over the years, we recognized that the development and construction of measuring and sorting systems had the potential for an independent line of business and therefore founded H.O.M. GmbH in 2008," reports André Humpert, managing director of both companies.

Clever combination

A contradiction in terms, one would think, with contract sorting as a service on the one hand and the development and sale of measuring and sorting systems on the other. However, André Humpert sees things differently: "Anyone who decides to take the inspection and sorting of parts into their own hands will have to purchase their own system. So if H.S.T.'s services are out of the question anyway, H.O.M.'s systems become all the more interesting, especially since our customers benefit from our extensive experience in the field of contract sorting - a profession that is anything but trivial, by the way."

Technical and aesthetic requirements

Anyone who has ever seen a system from H.O.M. would hardly disagree. It is also obvious that the company attaches great importance to the high reliability of its measuring and testing systems. This technical claim is also reflected in the aesthetics of the systems, right down to the high-quality workmanship of even the smallest system components.

Applikation Know-How required

A straight component with regard to the high reliability of the systems from H.O.M. is the sensor technology. "Our extensive practical experience in contract sorting proves time and again that the choice of the right sensor solution in specific plant areas is decisive for a smooth inspection and sorting process. For me, it is therefore not only obvious to purchase the entire sensor technology from a single source, but also to work with partners who have extensive application know-how, such as ipf electronic gmbh. This is absolutely necessary for our systems in order to be able to implement very individual sensor solutions for a wide range of applications," explains André Humpert, citing as an example his glass turntable inspection systems, compact systems for measuring and sorting small parts.

Special solution for level control

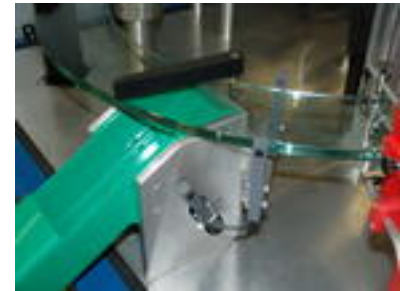
The demand for high reliability therefore already begins with the feeding of the parts, e.g. by means of an oscillation conveyor. For this purpose, ipf electronic gmbh developed a level control consisting of a contactless sensor and a pendulum suspended from a joint. The joint contains an inductive proximity switch that inquires about the parts in the container via the pendulum - a kind of plastic finger that protrudes into the conveyor. If there are parts in the oscillation conveyor, the pendulum is carried along by the material flow. If the container is empty, the pendulum falls back into its home position so that the inductive proximity switch is actuated, triggering a corresponding signal for filling.



Laser light triggers cameras

The parts conveyed into the system by the oscillation conveyor are deposited on the glass turntable via a peel-off belt. Depending on the inspection task or the parts to be inspected, the inspection station itself can be equipped with up to ten cameras for object measurement from various perspectives. In order to measure the objects correctly, their positioning must be correct. "This can be ensured either via a deflector already in the feed system or, alternatively, via a camera correction by superimposing different programs," says Humpert.

The cameras and thus the inspection process are triggered via a laser light barrier, which signals to the system that an object is in the inspection position. If an object is identified as a NOK, its position must be tracked in the further process in order to ensure targeted ejection at the sorting station. sorting station. "For this purpose, we use an incremental encoder from ipf, which is integrated in the drive unit under the glass plate."



Safe sorting

The ejection shaft for blowing out the NIO parts is located at the sorting station at the height of the glass plate. A frame light barrier in the shaft monitors the actual ejection of the NIO part into a corresponding container, the filling level of which is monitored via an ultrasonic sensor. An optical sensor additionally ensures that there is also a container under the ejection chute. But that's not all: "Since the parts to be inspected are on a glass plate, there are no fixed positions for them. If, for example, two parts are too close together, correct measurement at the inspection station is not possible. To prevent such objects from being ejected from the system as NOK parts, there is another shaft at the sorting station via which these objects are transferred to a separate container for reinspection. This area requires the same sensor technology as the blow-out station for the NIO parts," explains André Humpert.

Do not skip on monitoring

The sensor technology effort in this plant area, quasi with "net and double bottom", does not come by chance. "Practical experience has taught us that you should not skimp on the corresponding monitoring electronics at this point," emphasizes the managing director of H.O.M. GmbH. ipf electronic's task in this plant segment was, in particular, to identify suitable sensor solutions for the respective tasks and to implement them together with H.O.M. in such a way that reliable blowing of the parts into the respective containers is ensured. Of course, this also applies to the system area in which the IO parts are discharged.



The IO parts are discharged via a separator (Fig. 1) and a chute which opens into a container in the rear part of the system. The parts are counted by means of a forked light barrier. Another forked light barrier is used to check that no material builds up on the chute (Figure 2).

"The decision to monitor the chute using sensor technology also resulted from our practical experience. If a material jam occurs, this can lead to sensitive interferences in the entire testing and sorting process," reports André Humpert and adds: "If you consider the effort for the selection and design of the sensor technology on this specific system alone, it becomes clear how important a competent partner is here. Only someone who understands the complexity of our testing and sorting systems and has the corresponding practical experience can really help us with their development and realization, because it is not only the selection of the right sensor technology that is decisive, but also its application-specific modification - up to and including new developments, if absolutely necessary." According to André Humpert, the cooperation with ipf electronic gmbh has already proven its worth with H.S.T. Humpert sorting technology. "Here, we also gained valuable practical experience together, which is now benefiting us at H.O.M."

