Hygiene is top priority

Process visualization in the food and pharmaceutical industry

Safe process visualization in the food and pharmaceutical industries often requires operating units with protection class IP69K. Complete dust and moisture encapsulation is particularly important for display and operating units that are used directly on a machine. Only a completely closed and optimally sealed housing with smooth surfaces that are as free of joints as possible prevents dirt and food residues from sticking and thus simplifies cleaning.

Handling food requires special care and also a high degree of responsibility on the part of processors and manufacturers of food and pharmaceutical products. The health of the consumer is at stake, so any risk of contamination of the product, for example with foreign particles such as plastic or metal particles, as well as dust, lubricating oil or even germs, must be absolutely ruled out.

Machines, plants and components along the production chain must therefore be designed and manufactured accordingly.

FlatClient HYG - Scalable Panel PC with IP69K for hygienically sensitive production environments

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Cleanability and disinfectability

In numerous ordinances and regulations on food hygiene, the cleanability and disinfectability of all surfaces and materials play a major role.

The resulting requirements are laid down in a number of legal regulations, recommendations and standards.

In particular, reference should be made in this context to the following documents:

- According to Regulation (EC) No. 852/2004 on the hygiene of foodstuffs (Annex II, Chapter V), objects, fittings and equipment with which foodstuffs come into contact must be constructed, designed and maintained in such a way that the risk of (microbial) contamination is kept to a minimum. They must also be easy to clean and, where necessary, disinfect and be so installed that equipment and the immediate surroundings can be adequately cleaned.
- Regulation (EC) No 1935/2004 requires that materials and articles in contact with food must be sufficiently inert and not release substances into the food that could impair its safety or quality.
- DIN 10 528 „Food hygiene - Guidance for the selection of materials in contact with food - General principles" provides practical guidance.
- Further standards for food machinery are DIN EN 1672-2 „Food processing machinery - General principles for design - Part 2: Hygiene requirements" and DIN EN ISO 14159 „Safety of machinery - Hygiene requirements for the design of machinery".
- Design criteria for hygienic machines, apparatus and components are found in the EHEDG guidelines, which detail not only the design materials, but also the functional requirements and design features for hygienic design.

All these directives and regulations represent a considerable challenge for manufacturers of machinery and equipment. Of course, the visualization, control and operating elements used must also be suitable and must also be able to withstand the strong mechanical stress caused by water pressure, e.g. in washdown applications, as well as the disturbing influences of water or dust.

Use directly on the machine

Complete dust and moisture encapsulation is therefore particularly important for display and operating units that are used directly on a machine in control, process visualization and quality control. Only a completely closed and optimally sealed housing with smooth and, if possible, seamless surfaces prevents dirt and food residues from sticking and thus simplifies cleaning.

Devices with protection class IP69 or IP69K are frequently used here. The protection class defines the suitability of electrical equipment for different environmental conditions. The degree of protection describes the extent to which the housing is protected against solid objects and liquids in order to ensure that the operating capability inside the electronics is maintained. The IP69 standard is defined in IEC 60529, whereas the IP69K standard is defined in ISO 20653.

The Panel PC FlatClient HYG developed according to EHEDG guidelines has a maximum protection class of IP69K and has a seamless display surface for best cleanability

The individual letters and numbers have the following meaning:

6 = dust-tight
9 = Protection against water ingress during high-pressure/steam jet cleaning
K = Protection against high temperatures (hot water, only provided for in ISO 20653)

Both standards provide for an intensive test procedure, which differs in a few points in the dust and leakage test. For example, in the dust test according to IEC 60529, the test specimen is subjected to negative pressure and the leak test is performed with different nozzle arrangements. In practice, both methods are considered equivalent, since the test in the individual application case cannot be completely replaced by the standardized methods anyway.

Material properties increase reliability

The materials used are also of decisive importance for use in the food, cosmetics or pharmaceutical industries: The materials used must be compatible with the product, the ambient conditions and the cleaning agents or disinfectants. A small number of materials used simplifies the design and the use of proven materials increases reliability. For example, stainless steel of class 1.4301 is considered proven and fulfills the above-mentioned conditions. It is an austenitic, acid-resistant 18/10 Cr-Ni steel, which is resistant to water, steam, humidity, food acids as well as weak organic and inorganic acids and has therefore established itself in the food industry. Thanks to its good polishing properties, very smooth and therefore easily cleanable surfaces can be produced. The steel also has particularly good formability. This makes it possible to produce housings using the deep-drawing process and thus to avoid costly and susceptible welding.

The design is decisive

Ultimately, it is the design that determines the tightness of the system: the Kontron 'FlatClient HYG' with IP69K protection class achieves a housing construction without joints with only one sealing point, namely the one between the front glass and the housing. The rear hood is completely deep-drawn in one piece and thus has no additional weak points, such as welds or otherwise sealed joints, which could compromise the system's tightness.

The deep-drawing process results in a housing shape with gentle radii and inclined surfaces. In combination with the polished surface, this guarantees easy cleaning.

The housing is manufactured in a special deep-drawing process in one piece without disturbing welds or dirty edges.

The front with PCAP Multitouch is connected to the housing by internal screw connections. The shatterproof front glass is anti-reflective and thus offers good readability even in difficult lighting conditions. The surface is seamless and can therefore be easily cleaned. Depending on the application, the characteristics of the touch screen can be optimised so that even operation with gloves works perfectly. Legitimate control inputs can be clearly distinguished from malfunctions such as the impact of a water drop (water drop rejection) or the accidental pressing of the ball of the hand (palm rejection). This improves comfort and increases operating safety.
In general, the highest priority is given to interference and reliability. A maintenance-free design contributes significantly to this. In addition, the absence of rotating parts, such as fans for air circulation inside the housing, helps to improve reliability. Efficient system components, such as efficient processors from the notebook sector and direct and efficient heat dissipation, allow low system temperatures. These in turn reduce thermally induced aging and thus enable long-term, reliable operation even in hygienically sensitive environments.

Smart process visualization in Industry 4.0 age

Together with specialized operating units in the food and pharmaceutical industries, paperless manufacturing and Industry 4.0 scenarios open up new opportunities in the modern production environment. With the integration of control systems, work plans and formulations can be planned and managed centrally. Automated, comprehensive process data acquisition and evaluation makes the entire production process transparent and seamlessly documented. A comprehensive process visualization, as offered by the software solution FabEagle®LC in combination with the FlatClient HYG, creates maximum transparency for the operator in food production or in clean room environments.

FabEagle®LC is a modularly designed host computer solution for production lines, which can be scaled from a single production module to a fully interlinked line. The solution includes numerous configurable functions such as management of production specifications, control of production and individual product tracking, acquisition of product and machine data, visualization, reports and traceability of all goods and products involved in the process.

Further information on FlatClient HYG:
www.kontron.com/en/products/flatclient-hyg/p155285

FlatClient HYG

Panel PC with IP69K for hygienically sensitive applications

- Developed for high hygiene standards according to EHEDG Guidelines
- Stainless steel housing with IP69K (version with swivel arm)
- Suitable for washdown applications (e.g. high pressure cleaning)
- Scalable processor performance from Intel Atom® to Intel® Core™ i5
- Smooth, seamless display surface for best cleanability
- Legitimate control inputs are clearly identified (water drop rejection, palm rejection)

Mounting with support arm on 48 mm tube

Mounting with VESA 100 with M12 connector

FabEagle®LC

Master computer & line control as intelligent head in production

FabEagle®LC is a modular host computer solution for your production lines. The system can be scaled from a single production module to a fully interlinked line. You benefit from numerous configurable functions such as:

- Administration of production specifications (orders, schedules, formulations)
- Production control and individual product tracking
- Acquisition of product and machine data
- Visualization (plant overview, quantities, productivity)
- Reports (alarms, statuses, OEE, product errors, raw data)
- Traceability through archiving of quality data

Advantages

- Ensuring traceability for product & test data
- Increase of transparency through line & online visualization
- Support for multi-variant production with lot size 1
- Increase in productivity by improving production utilization with maximum machine availability
- Fast integration through standardized interfaces for many PLC and equipment providers
- Short commissioning due to our experience of over 20 years

More information on FabEagle®LC:
www.kontron-ais.com/en/products/fabeagle-lc

About Kontron

Kontron is a global leader in IoT/Embedded Computing Technology (ECT) and offers individual solutions in the areas of Internet of Things (IoT) and Industry 4.0 through a combined portfolio of hardware, software and services. With its standard and customized products based on highly reliable state-of-the-art technologies, Kontron provides secure and innovative applications for a wide variety of industries. As a result, customers benefit from accelerated time-to-market, lower total cost of ownership, extended product lifecycles and the best fully integrated applications.

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