

New "Hygienic Design" AM8800 stainless steel servomotor series

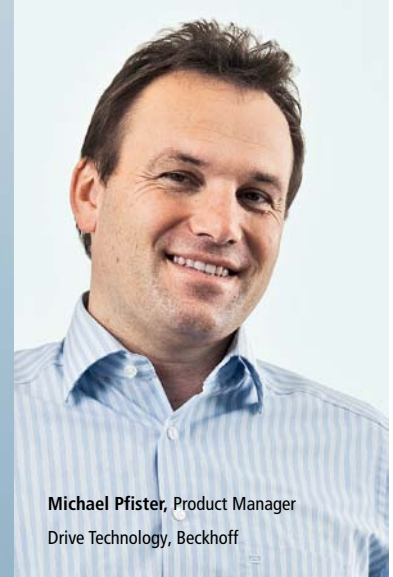
No corners and edges

The new AM8800 stainless steel motors complement the highly dynamic servomotors of the new Beckhoff AM8000 series. The motors feature all-round "hygienic design" and are suitable for application in very harsh or corrosive environments. The stainless steel motor series consists of four sizes, covering most application requirements. In conjunction with the stainless steel Control Panels and the new stainless steel I/O modules, Beckhoff offers a complete automation and Motion Control solution for the food, chemical and pharmaceutical industries.





The Beckhoff Control Panels, Panel PCs and AM8800 servomotor series in stainless steel design are optimized for application in the food industry.



Michael Pfister, Product Manager
Drive Technology, Beckhoff

In the creation of food and packaging systems the machine design is becoming increasingly important: "Hygienic design" is the cornerstone of the future development of these systems. In the past it was difficult to design and procure all system components while meeting the requirements of the machine manufacturers and the customers. Automation technology is, of course, a fundamental component of all food and packaging machines. Currently new approaches are being explored for eliminating the need for expensive enclosures of motors and gear units in order to avoid "dead spaces" in which dirt or cleaning agent residues can accumulate. DIN EN 1672-2:2005 requires the reduction of contamination risks: Voids, crevices and external threads should be minimized or avoided, if possible, in order to prevent corrosion and bacteria "nests."

Machine manufacturers are faced with challenges such as frequently changing packaging types in ever smaller batch sizes or ever larger output. In addition, there is a requirement for full control and logging of the processes. Each manufacturer and processor of food products strives for safe and monitored production of the processed products. Compliance with consumer protection according to the EC hygiene directive is imperative. Here, machines are subdivided into different sections. In control cabinets, the power and monitoring electronics are usually kept separate from the actual process. These tend to be located in the protected environment of the control cabinet, but usually have to be cooled or ventilated in order to keep the temperature of the electronic components within acceptable limits. This also influences the function and the service life of the components. Control units such as Control Panels and Panel PCs are generally not in contact with the products and can therefore be assigned a lower hygiene category. However, one needs to be aware of the fact that users touch the Control Panels or Panel PCs with their hands. Easy-to-clean surfaces and general robustness of the products are paramount. Particularly problematic areas are the motors, gear units and cables, which are installed directly in the production process.

Robust design and long service life

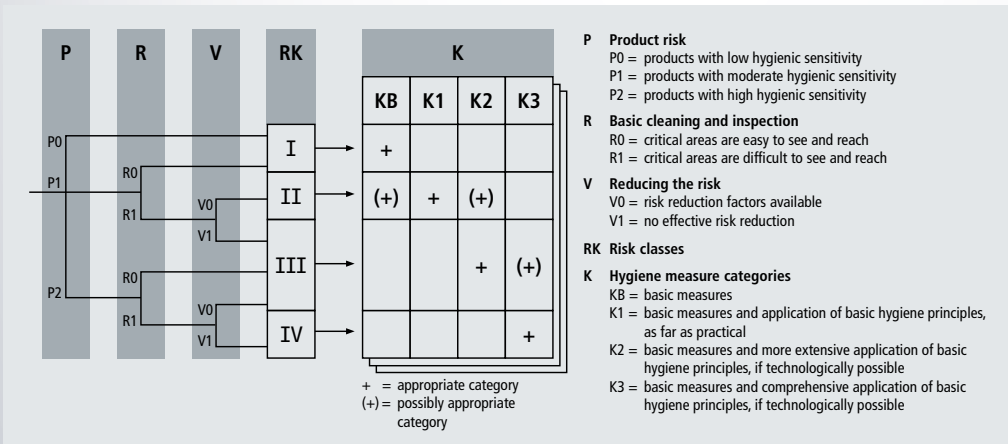
In the past, food and packaging machine manufacturers tried to meet hygiene requirements using standard motors with special coatings. However, in practice this proved to be inadequate in many cases. Scratches and chips in the coating can lead to detachment of the coating layer. If the coating ends up in the process, the whole production unit shuts down, and the associated costs for wasted batches can be significant. Also, the shape of such motors doesn't comply with the basic principles of "hygienic designs," since they invariably have corners, edges and plug connectors.

Beckhoff responded to these market requirements by developing the AM8800 series stainless steel motors, which was presented for the first time at SPS/IPC/DRIVES 2011. In conjunction with the CP77xx stainless steel

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Panel PCs or the CP79xx stainless steel Control Panels, Beckhoff now offers a targeted solution for the food and packaging machine sector.

The AM8800 stainless steel servomotors meet the requirements of food and packaging machine manufacturers because the industry requirements were implemented consistently. Beckhoff deliberately used the same materials as the food and packaging machine manufacturers since they benefit from long-standing experience in the food industry. The motors consist of AISI 316 L rated metals and can be safely used in all areas in which alkaline or acidic cleaning agents are used on a regular basis. Even in the "dry foods" sector, e.g. flour, chocolate, icing sugar or nuts, the use of stainless steel is recommended by the German working group on Machines and Equipment in the Confectionery industry ("Maschinen und Anlagen in der Süßwaren-industrie").



The stainless steel servomotors from Beckhoff have a surface roughness of RZ < 16 and all corners and edges have radii of r ≥ 4.0 mm, so that they comply with hygiene category K3 and all product risk allocation classifications can be met.

Source: Testing and certification body of the Fachausschuss Nahrungs- und Genussmittel (Food, Beverage and Tobacco Committee), Berufsgenossenschaft Nahrungsmittel und Gastgewerbe, BGN (German Association of the Food and Hospitality Industry), Mannheim, Germany

The ultra smooth AM8800 motors have a surface roughness of RZ < 16 and all corners and edges have radii of r ≥ 4.0 mm, so that they comply with hygiene category K3 and all product risk allocation classifications can be met.

The stainless steel motors from Beckhoff are energy-saving synchronous servomotors. High robustness was a key aim during development. The AM8800 motor bearings are designed for 30,000 hours of operation, which is up to 50 % more than commercially available motors and has a positive effect on costs. The design of the rotor/stator geometry was chosen to minimize magnetic imbalance, which also has a positive effect on the service life of the motor, since radial stresses are reduced. Users can choose from a seamless range with standstill torques between 0.9 Nm and 18.7 Nm. The windings are perfectly adapted for operation with the Beckhoff AX5000 Servo Drive. One cable technology with single- or multi-turn or resolver can be used as the feedback system. With the one cable solution the sensor data are transferred digitally via the available motor cable, so that an additional feedback cable is no longer required. The installation costs are therefore 50 % lower than for the solution with separate motor and feedback cables. In the food and packaging machines sector this a key advantage, since bundling of cables is no longer required. In addition, cable bushings in the machine are reduced up to 50 %. The connectors are much smaller than in the familiar hybrid solutions, and the bending radii of the standard cables can also be smaller. In order to ensure that the cable outlets are robust and permanently sealed, all AM8800 motors are equipped with cable glands in protection class IP 69K and maintain the hygienic design. The AM8800 motors can optionally be equipped with backlash-free permanent magnet holding brake.

Motors installed in wet areas are often subject to condensation formation inside the motor housing. The windings of the Beckhoff motors are fully encapsulated with epoxy resin, thereby protecting the copper filling and the stator lamination from corrosion. Malfunctions and production downtime can thus be reduced. For extreme cases Beckhoff offers a sealing air connection. This ensures that condensation in the motor is prevented. All motors feature protection class IP 67 as standard. Lubrication of the sealing rings is realized with USDA-H1-listed lubricant. Optionally, Beckhoff offers a IP 69K version.

High-quality stainless steel panel with IP 65 protection

The Beckhoff CP77xx Panel PCs and the Control Panels from the CP79xx series in a stainless steel finish are control and operating units that meet the strict hygiene requirements and regulations for the food, packaging and medical industries as well as for cleanrooms. The panels with IP 65 protection feature a virtually gapless housing design with flush-mounted touch screens. The housing geometry and an optimized frame profile allow liquids to run off and prevent the accumulation of contaminants. Further features, such as the resistance of the stainless steel surface and the touchscreen to cleaning agents and disinfectants, as well as the equipping of the display with a splinter guard, cover all requirements for cleanroom applications.

Thanks to the integrated Intel® Atom™ processor technology, the CP77xx device series represents a powerful Panel PC that combines operating and control functions in a compact design. On account of its low heat dissipation, the Intel® Atom™ is ideally suited for use in stainless steel housings.

As dedicated operating and display devices the CP79xx stainless steel panels with DVI/USB Extended can be operated at a distance of up to 50 m from the PC.

The stainless steel Control Panels and Panel PCs are highly functional units with 12-inch or 15-inch touch panels. An optional stainless steel mounting arm adapter for adaptation to stainless steel tubing completes the range. The range is rounded off by customer-specific amendments, such as additional display sizes or the integration of emergency stop and electromechanical buttons, short-stroke keys and RFID readers under the front foil as well as USB ports.

Further Information:

www.beckhoff.com/AM8800