

Technical Report – Cameras for splash and product contact zones

Outstanding protection against steam and bacteria

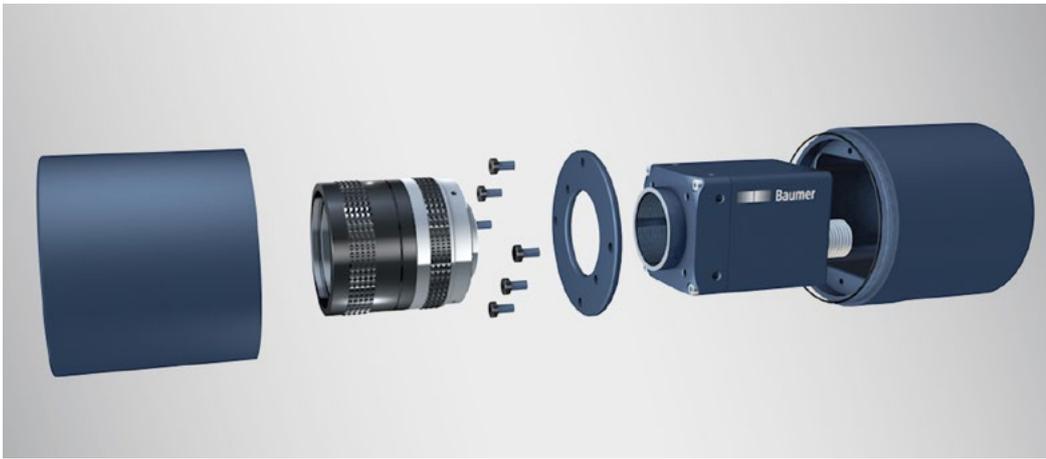
Inspections in highly sensitive areas within the food, beverage, and pharmaceutical industries require robust components that are able to withstand aggressive cleaning agents. However, there are very few camera systems available that can be individually adjusted to specific applications. The CX.I cameras from Baumer have a solution to this problem – thanks to a patented flexible lens protection system and modular housing accessories that elevates the cameras to IP65, IP67 or IP69K protection in no time at all. Only Baumer is able to provide this level of flexibility from a single source.

The pizza is supposed to contain five slices of salami – one at the center and four placed at equal distances around it. To make sure that customers are not disappointed when they slide the frozen product in the oven, the number and position of the slices must be precisely monitored during production. Manufacturers working in this kind of scenario often turn to image-based solutions using industrial cameras as a means of automatically detecting and separating faulty products. The applications of these solutions go beyond just food, however. In the pharmaceutical industry, cameras also deliver high-resolution images for purposes such as ensuring that blister packs contain exactly the 20 pills they are supposed to. Not every camera is suitable for inspection tasks like these because

of the cleaning work that starts once production shifts in the pharmaceutical, food and beverage industries are complete. To remove any potential dirt and bacteria, cleaning teams make use of aggressive cleaning agents, steam, and pressure washers. Industrial cameras must be given special protection to resist this for years on end – and this is where the wheat is separated from the chaff. Some manufacturers sell only the camera and limit the housing to just the bare essentials, or recommend third-party housings that are often inflexible and expensive. Baumer takes a different approach. With the CX.I cameras, the sensor specialist is expanding its product range for the production of safe foods and offering the most extensive camera accessory portfolio on the market. This enables customized



Thanks to the patented modular lens protection system, available with M47 or M62 threads, cameras and lenses of various lengths and diameters can be protected quickly and flexibly with a variable number of extension rings, ensuring compliance with protection classes IP54, IP65, and IP67.



The round IP 65/67 protective housing, featuring a hard anodized surface, effectively eliminates dirt traps and withstands even high-intensity cleaning.

options for protecting cameras in challenging environments – precisely matched to the design of the camera, and all from a single source.

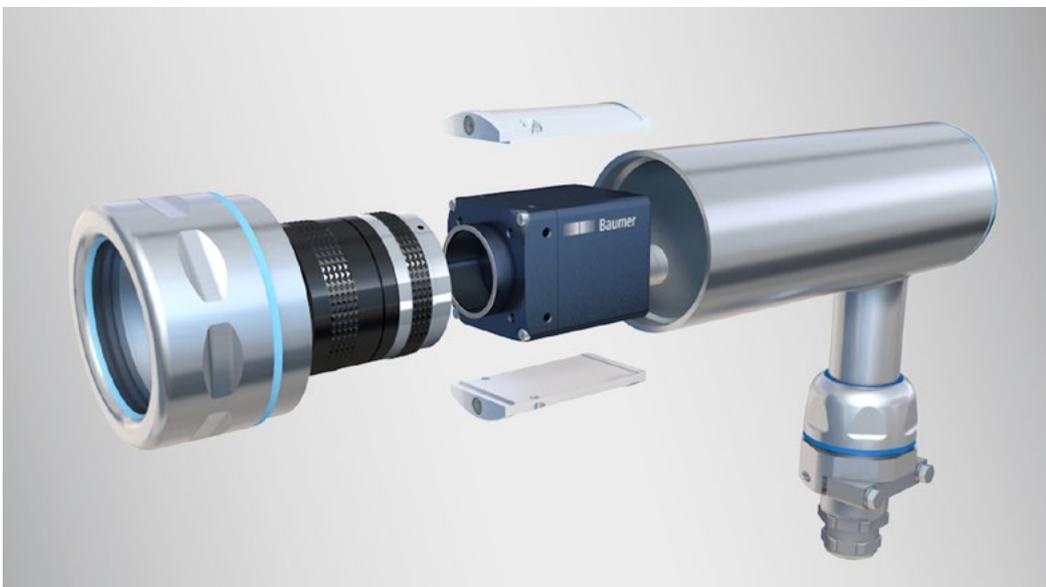
Camera and lens protection

CX.I cameras, which feature sensors from 1.3 to 12 megapixel and high frame rates, generally have a hard anodized surface finish that is able to stand up to even chemically aggressive cleaning agents. However, lenses also require the right kind of protection when cleaning agents of this nature need to be used. To provide this, Baumer has developed a patented, hard anodized type of lens protection: Available in two diameters and with M47 or M62 threads, it can be used directly on the majority of lenses. The lens protection is attached to the camera using an adapter plate and there are extension rings available for longer lenses. Installation requires just two screws, making the camera ready for use in the non-product zone within a matter of minutes. The lens protection is available with acrylic glass as well as laminated safety glass consisting of chemically strengthened aluminosilicate glass with high scratch, impact, and

shattering resistance – enabling it to withstand daily mechanical cleaning processes too.

Modular system for IP 65/67 and IP 69K

With its modular IP 65/67 and IP 69K protective housings, Baumer is taking protection one step further. These solutions combine lens protection with a compact, customized housing for all CX.I cameras. The round IP 65/67 housings have been developed in accordance with EHEDG guidelines. While dirt and pathogens are unable to attach to its smooth surface, cleaning liquid runs off it freely. Thanks to its hard anodized surface, it can withstand cleaning cycles with highly aggressive chemicals – such as hydrogen peroxide being used to combat bacteria in the pharmaceutical industry. A seal ensures that the protection class is maintained at the bolted M12 connection and the power outputs for the illumination. In addition, Baumer offers a EHEDG-compliant stainless-steel housing with a wash-down design for applications in the product contact and splash zone. It is sealed against dust and high-pressure water as well as steam jet cleaning, and complies with protection



The IP 69K protective housing, with a hygienic design and stainless-steel materials, removes any possibility of product remnants adhering to the equipment.

class IP 69K. Coupled with a surface roughness of less than 0.8 μm , an electropolished surface, and food-grade robust seals, it is especially suitable for applications in the food sector involving oil and grease. The modular protective housings offer excellent external protection for the CX.I cameras. Baumer knows how important it is to provide protection on the inside, too. For this reason, it has ensured that CX.I cameras can withstand vibrations up to 10 g and shocks up to 100 g. The standard version of these cameras can handle a temperature range from 0 °C to 65 °C, which means that they are ideally suited to applications where refrigerated foods are being processed but can also be installed near an oven. The models with an extended temperature range from -40 °C to +70 °C are suitable for processing frozen food.

Everything from a single source

From the perspective of machine manufacturers or system integrators involved in applications for the food or pharmaceutical industries, there is one key advantage that CX.I cameras offer – all that is required is one camera, which can then be adapted quickly to suit any application using the accessories that are available. This delivers far better value for the money than expensive specialist cameras that are only optimized for a single purpose. What's more, the flexibility of CX.I cameras and their accessories makes it easy to integrate them into existing processes. If there is no room for the camera immediately next to the production line, all the user has to do is position it slightly further away and use a lens – with a matching lens protective cover, of course – that has a different focal length to compensate for the distance. This enables Baumer to fulfill a popular demand from customers – for a simple, comprehensive system from a single source.

Integrated illumination controller

Baumer CX.I cameras benefit customers beyond simply the food, beverage, and pharmaceutical sectors. Companies working in mechanical engineering and automotive applications also use these cameras because they significantly cut down on the amount of installation work that is necessary. A special feature consists of four separately switchable power outputs for the direct control of illumination. These provide up to 120 W (max. 48 V / 2.5 A), delivering enough power for directly operating very bright sources of illumination whose luminosity can be controlled via pulse width modulation. Activating the four outputs in



Flexible modular housing accessories for CX.I cameras are available from a single source at Baumer – offering complete, customized protection.

sequence creates results such as four images with different shadowing, which software can then use to derive information about the inclination, curvature, and texture of a surface. This procedure – known as “shape from shading” – can be used to detect tiny scratches in painted surfaces, for instance. Cameras from other manufacturers require a separate illumination controller that increases costs and requires added installation work.

More Information:

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