



Contactless: The compact BC5-Q08 proximity switch detects different materials through the container wall of the dispenser cartridge

When the valves operate in dual mode, the slim BC10-QF5.5 sensors can operate next to each other without any problem

QUICK READ

Electronic components are surface mounted to the boards in semiconductor production. Dispensers help distribute solder paste or adhesive with pinpoint accuracy. In China Turck fitted out two manufacturers of automatic dosing systems, including Anda Automation Co. Ltd., with ultracompact capacitive proximity switches. These monitor the cartridge level contact-free and help to reduce machine downtimes and prevent the loss of solder paste or adhesive.

Sticking Everything

Dispensers of the Chinese manufacturer Anda Automation distribute soft solder and adhesive at high-speed and require for capacitive sensors level monitoring that are particularly compact – such as Turck's BC10-QF5.5

The “faster, bigger, further” principle is no longer suitable for all aspects of human and technical progress. Best example: Electronics developers who particularly outdo each other to fit devices with ever smaller components. The range functions of many devices is increasing without taking up any more space so that boards have to be fitted with ever more closely arranged assemblies. Whether in medical technology or in your own smartphone, evolution in electronics is leading to miniaturization – something that can only be achieved with suitable manufacturing processes.

SMT assembly: optimum board use

Miniature electronic components are assembled on boards using surface mount technology or SMT for short. Compared to previous methods, this process eliminates the use of complex drill holes for connecting wires, so that components can not only be mounted on the boards in larger numbers and smaller sizes but also on the underside. Manufacturers use fully automated processes like reflow soldering to ensure that passive components, microcontrollers or voltage regulators are securely seated on the board.

In this process soft solder is already applied to the board before assembly and heating. This is distributed, for example, by a dispenser, which is similar to the unit on an inkjet printer. High-speed machines are now capable of placing more than 100,000 dots per hour. Thanks to the additional precision in positioning and dispensing, they are widely used in semiconductor manufacturing and offer a more flexible alternative to stencil printers.

Level monitoring in restricted spaces

It was in these kinds of dispensing systems of Anda Automation Co., Ltd, one of the leading manufacturers in China, that Turck fitted a level monitoring system in a restricted space. In order to prevent any downtime and keep solder losses to a minimum, employees have to be notified when dispenser cartridges reach a critical level. This is made particularly difficult by the elements of the production machine, some of which are tiny. Only extremely small sensors that could also detect substances of different densities could therefore be considered for monitoring the cartridges – and this also had to be possible when subject to severe vibration through a one millimeter thick plastic layer. Above the dispenser needles the Dongguan-based machine builder now uses a Turck capacitive sensor with a rectangular design (BC10-QF5.5), which is only

5.5 millimeters thick and at the same time offers a rated operating distance of 10 millimeters. For parallel operation of the dosing heads, the manufacturer can fit two sensors only a small distance apart. The adaptability of the proximity switches was also impressive: Customers are able to carry out a sensor fine calibration with a potentiometer according to the adhesive or solder in use. “The compact sensor not only enables us to overcome mounting problems but also to rectify faults quickly in the field or respond to changes,” explains Lei Hui Sen, vice president at Anda Automation. “It ultimately helps to prevent any loss of adhesive or solder.”



Lei Hui Sen, vice president at Anda Automation, trusts Turck's compact capacitive sensors

Midget sensor with contactless detection

For another manufacturer of adhesive, dosing and potting machines, the ability to fit the sensor control in an even smaller mounting space was critical. The Chinese company uses Turck's Q08 capacitive sensors in the ultracompact 32 millimeter long design for the contactless level detection. The bright LED indicator of the midget sensor uses different colors to indicate the status of the operating voltage or switching state. The BC5-Q08 also enables users to check the level directly at the machine and refill with liquid, adhesive or solder if necessary.

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VERSATILE PRECISION DISPENSERS

The possibilities of using fully automated dosing machines are not only restricted to the dot-based distribution of solder paste. Different dispenser valves and heads can for example apply many different adhesives or potting compound. Some electronic components require special coatings or are provided with more stable fixings on boards with the so-called underfill process with epoxy based polymers. Differences also exist between the contact-based dispensing (for small quantities) and the jet dosing (higher speed).