



**Rotaltec**

**Sensors**

## ROTALEC PRESENTS: TAKING CAPACITIVE SENSING TO A NEW LEVEL

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**IT MIGHT BE TIME TO REASSESS THE POTENTIAL OF CAPACITIVE SENSORS. MARK SIMMS FINDS OUT THEY'RE CAPABLE OF MUCH MORE THAN YOU MIGHT THINK**

I would suppose that, for a manufacturer, having your technology described as mature is something of a double-edged sword. On the one hand, for 'mature', read 'proven'. In that technology's accepted scope of applications, no other technology is going to do the job better. It's tried, tested and reliable. On the other hand, even when there are significant innovative developments, it can be very hard to persuade people to try that technology outside of its accepted range of applications. And this, I think, is the general perception of capacitive sensors.

If you had a simple product counting application, or a simple level checking application, or you wanted to check that there were lids on your bottles as they passed down your production line, then chances are you'd turn to capacitive sensors.

But anything a bit more complex or a bit more demanding, and maybe you'd be tempted to look elsewhere. Capacitive sensors, after all, have limited range, are picky about working near metals, and if you want the same device to work with different products then you're going to be forever fiddling with the sensitivity adjustment. Right?

Absolutely wrong. Quite the reverse in fact, because the modern product is capable of so much more than you ever imagined.



**RECHNER  
SENSORS**

Based in Pangbourne, Berkshire, Rechner is a leading exponent of capacitive sensors, and has taken the technology to a different level. Rechner UK managing director Ian Frais says: "We have a product range that's very different to anyone else's, and we're constantly pushing the envelope and patenting new developments that open up whole new application possibilities."

Take, for example, the company's High Performance series: these sensors offer typically three times the sensing distance of standard devices, and the adjustment starts virtually from the active face of the sensor. As an example, you can quite easily tune out more than 15mm of glass with an M18 device or, more to the point, ignore a far greater level of product deposit on the active area of the sensor. This in turn opens up the opportunities for more non-invasive level measurements despite product build-up on the face of a window. It also reduces the need for cleaning that is so often necessary. The

High Performance series is capable of detecting materials with dielectric constants right down to 1-1, delivering greatly increased stability and making it possible to fit a standard capacitive sensor in applications where you might traditionally have turned to another technology such as vibrating forks. Further, the sensing distance is medium optimised, so you can detect a whole range of different products without worrying about resetting the sensitivity adjustment for each one. And this is combined with temperature stability up to 100°C as standard and excellent EMC characteristics. This opens up enormous application possibilities. “The High Performance sensors are excellent at non-invasive measurement through walls and pipes, and are even usable near metals, making them ideal for detecting the likes of bulk



powders within metal pipes in the process industry,” says Frai.

The High Performance series covers sensors in a range of sizes from M8 x 1mm up to 64mm diameter, with both flush and non-flush

mountable models. “And when we say ‘flush’ mounting, we mean exactly that,” says Frai. “Ignore the companies who tell you that you can’t have true flush mounting or that it will compromise your sensing distance. The Rechner sensors are, if you like, hyper flush and can even be recessed in metal without risk of interference.”

There are a number of housing options, including chemical resistant and food grade sensors in PTFE or PTFE/stainless steel.

An example of a High Performance sensor is an M32 threaded sensor that has a 5cm active area and is flush mounting, but with a sensing distance of more than 50mm – five times the Sn of a standard M30 sensor. The PEEK covered active area offers excellent protection, since this material is considered as oil resistant and resistant to nearly all chemicals, whilst itself being physiologically harmless.

Rechner has also pioneered the development of three-electrode products, using two plates relative to ground. With this system, one electrode is removed to the outside, so that the machine and system potential becomes a measurement electrode.

Based on this, the company’s Extreme range uses a patented technology to set new records for sensing distance and combines this with the ability to operate in the most challenging of environments. Unlike a standard capacitive sensor, these devices look for very small changes in capacitance within their field, irrespective of the static capacitance, and so can be mounted flush or non-flush. Housings are from M5 up to 120mm for the M32. Remote evaluation allows for operating temperatures from -70°C to +250°C, whilst the very small switching hysteresis allows for precise detection.

The sensors are finding new applications not just in detecting plastics granules, hot wax, cooking oil and hot melt strong adhesives, but also in component detection. Though more expensive than standard sensors, they are the ultimate at ignoring unwanted product build-up.

### PROBLEM SOLVERS

The key to success of any series of sensors is its ability to solve problems, and this is the focus of development with the Rechner range. So, for example, you’ll find capacitive top mounting level detection probes, again with patented circuits based on the three electrode principle, that are ideal for working with high viscosity and very adhesive products, even at very high temperatures. Though based on the capacitance, the di-electric constant becomes irrelevant and set-up is often done without product being present. The probes will sense a range of products from polystyrene balls to nitric acids with the same setting and will ignore unwanted deposits on the probes. Housing materials can include PTFE, and more than one switching point is possible in the same probe. Analogue versions are also an option.

“We’ve solved a number of real world problems with our range of products that no one else has been able to solve,” says Frai. “As a result, among other areas, we now lead the field in the glue industry, and have solved some very challenging problems working with printer toner.”

You’ll also find analogue models in the company’s range, as well as a number of specials, including a device developed for the brewing industry which is able to detect the liquid but ignore the foam on the liquid. Rechner can also offer sensors with sensitivity indication where that’s advantageous, and has a full range of ATEX certified products, meeting Cat 2 standards for gas and Cat 1 for dust. Rechner also

