Baumer
Passion for Sensors

Application Report

Precise fill level detection for green electricity

At BSZ netz, the high-performing ultrasonic sensors from Baumer ensure reliable operation of mobile fuel cell generators.



Image 1

Image 1: Head of Development Ralf Bischoff (front) and Peter Wustlich, Head of Operations, check the capabilities of UR12. All you need is the sensor, a laptop with the Baumer Sensor Suite and the Baumer USB-C IO-Link Master.

Baumer *NexSonic*® technology in modern emergency power generators

Some places require ever safe power supply, even in the event of grid breakdown. Among them are hospitals, public water supply, fire departments and other infrastructure-critical facilities. Some other places call for mobile electricity generation, either since no power grid is around or because of sudden or short-term peaks in electricity consumption. Among them are research facilities at remote places, event locations, areas hit by catastrophes or rural areas where mobile power supply is required for cellphone network connection.

Decentralized power generation with fuel cells

Here, mobile or permanently installed emergency power generators usually operated by gasoline or diesel enter the scene. In the course of decarbonization, innovative companies use alternative technologies to refrain from fossile fuels. Here, fuel cells generating electrical energy from hydrogen play an important role. The young company BSZ netz GmbH in the German city of Leipzig is pioneering in the use of environmentally friendly hydrogen as redundant power supply. Mr Thomas Schulze, Managing Director of BSZ netz, explains: "Every day we work to promote clean energy technologies in Europe and firmly



Image 2

Image 2: The emergency power systems with fuel cell technology by BSZ netz characterize by higher efficiency, lower emissions and quieter operation compared to conventional generators. A methanol-water mixture serves as energy source.

believe that HT-PEM fuel cells powered by methanol will play an important role in accelerating this transition to environmental friendlyness."

Liquid methanol instead of gaseous hydrogen

Compared to conventional generators, the emergency power systems with fuel cell technology by BSZ netz characterize by improved efficiency, reduced emissions and quieter operation . "Furthermore, they adapt energy consumption to load and thanks to only few moving parts they require less maintenance. This way they are the environmentally friendly and cost-efficient solution for emergency power supply," explains Peter Wustlich, Head of Operations at BSZ netz. A mixture of methanol and water serves as energy source for fuel cell operation, which according to BSZ netz provides clear benefits in daily operation compared to all-hydrogen facilities. Peter Wustlich: "Liquid methanol is worldwide available and both safer and easier to handle and manageable in terms of logistics than gaseous hydrogen."

Sophisticated level detection with Baumer *NexSonic*® technology

The fuel cells consume the methanol-water mixture from a tank whose fill level is permanently monitored to ensure uninterrupted, safe operation. This is where the Baumer ultrasonic sensors come into play - here it is UR12 with innovative Baumer *NexSonic*® technology. This technology is based on an innovative sensor design with smart filter functions via IO-Link, adaptive sonic cones and a unique combination of the shortest blind range at yet long range. BSZ netz decided for UR12 being the shortest M12 ultrasonic sensor in a round housing of only 50 mm - maximum sensor performance, thanks to highly integrated sensor electronics.

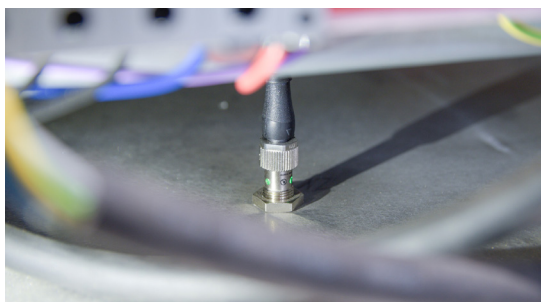


Image 3

Image 3: This is the point for methanol level detection by UR12. The space is limited, but thanks to NexSonic technology the new generation of compact Baumer ultrasonic sensors provides maximum design freedom.

The short blind range of merely 15 mm is unmatched in this class, same applies to the fast response time of up to 16 ms. This way, UR12 allows more design freedom with excellent sensor performance even in tight installation space. UR12 is just one sensor in the extensive Baumer portfolio

of ultrasonic sensors. The unrivalled toolbox of ultrasonic sensors offered by sensor expert Baumer provides the right design, performance features and interface options for every application.



Image 4

"The Baumer solution was just the perfect fit"

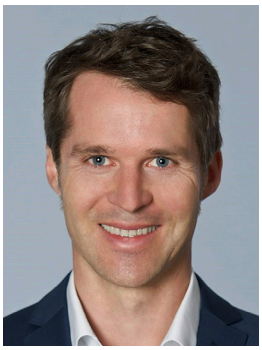
The benefits of UR12 with *NexSonic*® technology also convinced Ralf Bischoff as Head of Development: "In the development stage we worked with several other sensor manufacturers, but kept coming up against problems. Either the sensors couldn't handle our methanol mixture - meaning no signal stability in ultrasonic fill level detection - or we had to compromise on measuring range. After intensified testing and evaluation, the Baumer solution turned out to be the perfect fit. The competent support, even beyond our actual concerns, and the opportunity to first test the product on our systems on site ultimately convinced us to rely on Baumer." Only three things were needed for hassle-free tests and subsequent on-site setup: sensors, laptop with the Baumer Sensor Suite and Baumer USB-C IO-Link Master. Just a few clicks, and Ralf Bischoff and Peter Wustlich could see on screen and in real time the precise and reliable level detection provided by the connected Baumer sensors. "The testing and setup with the Baumer Sensor Suite as well as sensor installation and integration into our control unit were very convenient," reports Ralf Bischoff, Head of Development. Same applies to the Baumer sensors monitoring safe storage of the methanol mixture: capacitive sensors CFAK installed underneath the methanol tank for leakage monitoring.

Baumer ultrasonic sensors for reliable fluid monitoring

For BSZ netz, the combination of ultrasonic sensors and capacitive sensors from Baumer fulfills every expectation for reliable and smart fluid monitoring: "We are extremely satisfied with the sensor performance in our systems. So far, operation has been without any failure. To us, reliable and precise level and leakage detection in our systems is of primary priority. After all, that's what our systems' reliability and safety directly depend on," says Peter Wustlich.

More information:
www.baumer.com/c/290

Image 4: UR12 is one of the high-performance products in the Baumer ultrasonic sensor toolbox providing the right sensor in terms of design, performance features and interfaces for any application.



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