dBR RADAR TRANSDUCERS

FMCW Radar dBR sensor for non-contacting level and volume measurement

Flexibility, Choice, & Accuracy Like No Other.

The dBR Radar transducer range from Pulsar Measurement is a compact FMCW Radar sensor that offers high accuracy, repeatable level measurement, and compatibility with Pulsar Measurement's full range of controllers.

The introduction of the Radar sensor to the transducer range means that customers of Pulsar Measurement now have a choice of technology at their fingertips — without having to make any compromises in terms of functionality.

Features & Benefits

Radar and non-contacting ultrasonic measurements are complementary technologies — measuring level by signal analysis but excelling in different situations. Radar technology is preferred where there is a variation in temperature or changes in gas composition, and extremes of fog, haze, mist, or rain. The dBR Radar transducers feature Frequency Modulated Continuous Wave (FMCW) technology with a maximum 16 m (52.5 ft) range and accuracy of ± 2 mm (0.08 in).

FMCW radar technology offers significant advantages over other pulsed radar systems as it offers higher resolution, better signal to noise ratio, and better target discrimination.

The dBR sensors are IP68 rated and certified for external installations, offering class-leading performance in accuracy and repeatability with a short-range blanking distance. The compact size of the sensor allows for installation in cluttered, confined, or crowded spaces.

THE RIGHT METER FOR

- Foamy Applications
- Application's Subject To High Electrical Noise
- Atmospherically Volatile Applications
- Chemical Dosing Plants & IBC's
- Digester Level Monitoring

Retrofittable with All Pulsar Measurement Controllers

This series of transducers are compatible with existing Pulsar Measurement controllers that are already installed and used in the field, such as the Ultra 4 and Ultra 5, meaning that sites can retrofit a radar sensor with their existing applications, redeploy other Pulsar Measurement equipment across a wider range of applications for maximum flexibility, or test the performance of different measurement technologies without having to significantly reconfigure the device.

When Should You Consider Radar Technology?

There isn't a lot of difference between ultrasonic and radar technology, however, there are some applications where radar is better suited.

Longer Range Open Channel Flow MCERT Applications

MCERT schemes are independent schemes designed to provide a framework for businesses to meet quality requirements. Under Class 1 certification, the first three most accurate devices listed are ultrasonic, with a 0.04% combined accuracy, compared to radar on the same scheme having class 2 certification with a combined accuracy of 0.22%. However, radar does have its advantages on those applications which are more than a few meters of measurement range.

High-Temperature Applications

Where the surface of the substance being measured is hot, it can create a temperature gradient above the surface. This will affect the speed of sound and creates an inconsistent ultrasonic signal, which effectively will reduce the accuracy of the measurement.

dBR16 on a foamy aeration tank.

Acoustic Noise Interface

Electrical noise interference can be ignored by using low voltage but high acoustic power ultrasonic measurement however, sometimes acoustic noise can interfere with the signal. By using a radar sensor for these applications, it can eliminate this rare occurrence.

Foamy Applications

Radar measurement will produce more stable results than ultrasonic sensors with limited acoustic power on foamy applications. This is because the foam interrupts the signal of the ultrasonic transducer; you can still get around this issue with ultrasonic measurement by using a sensor with high acoustic power. However, one thing that both technologies have in common is that it is virtually impossible for them to see through the foam to the liquid surface.

dBR8's reading through the plastic lid of a chemical tank.

Dosing Plants & IBC's

One clear advantage of radar is that it can read through the container wall. This is particularly useful in chemical dosing plants where chemicals are supplied in IBC tanks. The low dielectric constant of plastic means that you can accurately measure usage and stock levels, without having to introduce a new process connection to the container.

Digester's

One of the long-standing issues with ultrasonic measurement is that it has struggled with the inability to measure reliably within the methane-rich, elevated temperature, and pressurized environment of a sludge digester. With businesses all over the globe making a huge effort to be more environmentally friendly with bio-gas generation; radar measurement offers an easy way to measure levels within the digester's and with a standard set of communications and protocols that communicate with the rest of the site.

Technical Specifications

PHYSICAL

Model Options:	dBR8 & dBR16
Sensor Body Dimensions	90 mm D x 130 mm H (3.5 in x 5.1 in)
Weight	Nominal 1.1 kg (2.4 lb)
Measurement Range	dBR8: 8 m (26.2 ft); dBR16: 16 m (52.5 ft)
Frequency	V-band
Beam Angle	8°
Sensor Body Material	Valox 357U
Cable Lengths	Standard: 5 m, 10 m, 20 m, or 30 m (16.4 ft, 32.8 ft, 65.6 ft, or 98.4 ft). Optional: up to 150 m (492 ft) in 10 m (32.8 ft) increments
Maximum Separation	500 m (1,640 ft)
Mounting Connection	1" BSP or NPT
Mounting Options	ANSI or DIN flange

ENVIRONMENTAL

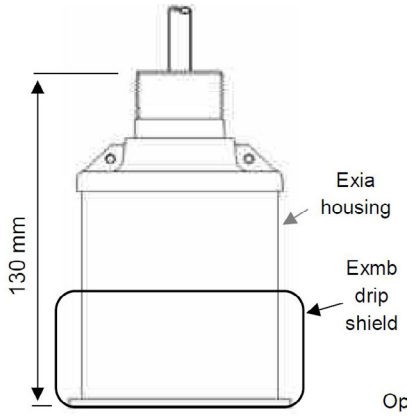
Enclosure Protection	IP68/NEMA 6P
Max. & Min. Temperature (Electronics)	-20 °C to +80 °C (-4 °F to +176 °F)
Process Pressure	-1 to +4 bar (-14.5 to 58 psi)

APPROVALS

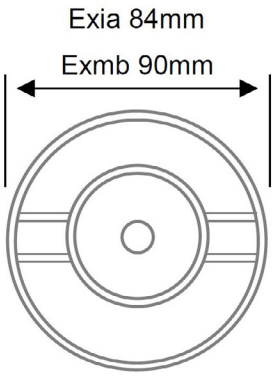
CE Approvals	Complies with EN61326-1:2013 for emissions and immunity Complies with EN302-729:2016 for radar emissions and immunity
ATEX	ATEX Zone 0 (Ex ia): Ex II 1 G Ex ia IIC T4 Ga Ta = -20 °C to +80 °C, Ex II 1 D Ex ia IIIC T135°C Da Ta =-20 °C to +80 °C. ATEX Zones 1 & 2: Ex II 2 G Ex mb IIC T4 Gb, Ex II 2 D Ex mb IIIC T135 °C Db

PERFORMANCE

Accuracy	±2 mm (0.08 in)
Repeatability	±1 mm (0.04 in)
Resolution	±1 mm (0.04 in)
Near Blanking Distance	77 mm (3.03 in) from the drip shield



dBR Radar with submergence shield drawing



dBR Radar diameter drawing

Radar or Ultrasonic? The hoice is yours.

Whatever you are measuring or trying to achieve, ultrasonic measurement will achieve what you're aiming for 95% of the time. But for those applications that are a little trickier than first thought, radar will help provide a solution. One thing that is crucial to the outcome of your measurement is ensuring that you choose a controller that is retrofittable with both technologies, so that when the needs of your application change, your system changes with you.

- ***Penetrates non-metallic containers***
- ***Unaffected by fog, haze, mist, or rain***
- ***Unaffected by ambient temperature***
- ***Unaffected by inert gas and vapor***
- ***Unaffected by steam and pressure***
- ***Non-contacting***
- ***FMCW Radar Technology***
- ***Compatible/retrofittable with standard Pulsar controllers featuring patented DATEM echo processing***
- ***Cost-effective***
- ***Accurate and repeatable***
- ***Narrow beam angle***
- ***Compact and easy to fit***
- ***IP68***
- ***ATEX Approved***

Delivering the Measure of Possibility

Pulsar Measurement offers worldwide professional support for all of our products, and our network of global partners all offer full support and training. Our facilities in Malvern, UK and Largo, USA are home to technical support teams who are always available to answer your call or attend your site when required. Our global presence, with direct offices in the UK, USA, Canada, and Malaysia, allows us to create close relationships with our customers and provide service, support, training, and information throughout the lifetime of your product.

By taking a step forward in echo processing technology, Pulsar Measurement addresses applications previously thought to be beyond the scope of ultrasonic measurement. This technology improves signal processing at the transducer head which has made it possible to increase resistance to electrical noise, enabling the transducer to 'zone in' on the true echo.

For more information, please visit our website:

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