

Dynamic Fluid Flow Sensor

A low-cost dynamic pressure sensor that allows instantaneous measurements to be taken in multiple directions simultaneously.



Calculating the forces during an explosion is a difficult task - especially when it occurs inside a building as the directional sensors may not be correctly positioned to account for the various reflections that take place. This new sensor can measure blast flow in any direction, making it much easier to position and in turn gives more accurate results.

The accurate measurement of pressures in an explosion is very difficult. In this highly complex and unpredictable environment obtaining meaningful results can be problematic. Accurate predictions of the direction of the blast flow and then the subsequent placement of the blast sensors is critical. This is because current piezoelectric or piezoresistive sensors are directional and therefore careful pre-positioning is required relative to the expected direction of flow in order for the sensors to operate correctly.

However, predicting the blast flow is particularly prone to error when explosions occur within a building as the shock waves will be reflected off walls and other interior structures. These reflections cause changes in the direction and/or magnitude of the blast flow, making it more difficult to predict the optimum position and orientation of the sensors.

The new sensor overcomes the positioning issues experienced with current devices by being able to measure fluid flow in several directions simultaneously. The sensor is also particularly suited to measurements in turbulent environments where rapid and often unpredictable changes in speed and direction of fluid flow can occur.

Benefits

- » **Easy to Position** - avoids the need to accurately predict the blast flow due to its ability to measure fluid flow in several directions at once.
- » **Proven** - the performance of the design has been verified following several blast tests with prototype devices.
- » **Range of Parameters** - many fluid flow parameters can be measured; both static and dynamic pressures can be easily derived.
- » **Versatile** - the design can be optimised and scaled for different applications, e.g. to accommodate different measurement ranges.
- » **Simple and Robust** - sensor has no moving parts and is suitable for harsh environments or where maintenance is difficult.

Description

This technology was originally developed for high accuracy measurement of blast effects, including secondary and tertiary effects within a building.

As net explosive quantities (NEQs) are reduced, target responses to small warheads need to be understood to higher fidelity, including down to room scale or less.

Applications

Although originally developed for improved blast flow measurement, the sensor has the potential to be used in other applications.

It could, for example, also measure flow where traditional anemometers would not work. It is particularly suited for rapidly changing and short duration flow sensing where a fast response is required.

Intellectual property

» GB patent application GB1817749.3

More information

For more information about licensing this technology, or to speak to us about our other sensors related IP, please contact us.



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