

**Development of Fibre Bragg grating (FBG) dynamic pressure transducer with
diminutive voltage inconsistency**

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In this work, a diaphragm-type Fibre Bragg grating (FBG) dynamic pressure transducer was designed and developed. Pressure transducer in this study consists of elastic thin metal diaphragm which acts as a primary sensing element; and integrated with an FBG sensor for the secondary sensing element. In the common match filter interrogation system, converting optical signal to voltage is the challenging due to voltage reading inconsistency, which would cause variation in pressure reading. New alternative arrangements of matched filter interrogation system are used to address the issue. For automated pressure measurement, the optical signal from FBG was converted into voltage by using the proposed arrangement of matched filter interrogation system. Additional FBG was added as reference sensor which installed in the system for detection the change of broadband light source. Reduction of voltage inconsistency was achieved by normalizing the voltage reading from sensor with the voltage reading from reference FBG. The result shows that the FBG pressure transducer is proven to be suitable for pressure measurement of gas or liquid with an average error of 5.348%. Furthermore, the FBG sensor has a good linearity with a linear correlation coefficient of 97.29% in pressure measurement.