

Temperature-insensitive pressure transducer based on reflected broadened spectrum with enhanced sensitivity

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ABSTRACT

Pasting of half the grating of an FBG sensor on a natural rubber diaphragm was used to sense the pressure measurement. The pressure-induced strain on half of the grating resulted in bandwidth broadening. From the pressure range of 0 kPa to 20 kPa, the pressure sensitivity at 15 dB bandwidth changed was obtained at 77.7 pm/kPa with 99.94% of linearity. Through total reflected power monitoring via photodetector, the pressure transducer retrieved a sensitivity of 0.1686 dB m/kPa and evaded a complex demodulation technique. As a result of the temperature-independent bandwidth change, the pressure transducer was totally temperature insensitive.

KEYWORDS: Fibre Bragg grating (FBG); Pressure sensor; Pressure transducer; Temperature-insensitive

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