Zero-Offset Adjustment

Zero-offset, sometimes called zero unbalance, zero balance, or offset voltage, is an output signal of the sensor at a given excitation voltage (or excitation current) when the sensor is not charged with any physical load, like weight, force, torque, or pressure.

When the ambient temperature and humidity are kept constant, the sensor's zero-offset will increase with the excitation voltage.

At the given temperature and excitation voltage, the zero-offset of sensors should be stable without varying with time, and should be within its nominal tolerance. If the zero-offset of the sensors is beyond its nominal tolerance, one can make use of so-called zero-adjustment (ZA) resistors to adjust or trim the zero-offset to its nominal tolerance band.

The OCF-series bondable ZA resistors from BCM SENSOR are designed to adjust or trim the zero-offset so as to balance the Wheatstone bridge circuit of the sensors. Shown in Fig. 1 is an example using an OCF-2H-RZ ZA bondable resistor to adjust/trim the zero-offset.

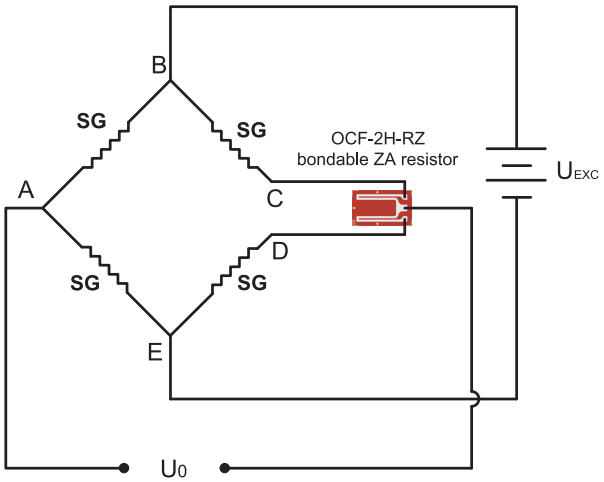

Fig. 1: Sketch of Circuit Using OCF-2H-RZ to Adjust Zero-Offset

In Fig. 2, the 100 circles represent the 100 of zero-offset of the 100 sensors before the adjustment of the zero-offset, while the dots represent the adjusted zero-offset of the sensors. It is clear that, after the adjustment, the zero-offset of the sensor has been reduced to and within a tolerance band of ±1.5%fs. In other words, compared to the original situation of the Wheatstone bridge circuit, the bridge circuit of the sensor has been balanced now.

The unbalanced part or the residual zero-offset of the Wheatstone bridge circuit is always a dc-component in the sensor's output signal. This dc-signal can be easily removed completely by the sensor signal conditioning (SSC) electronics.

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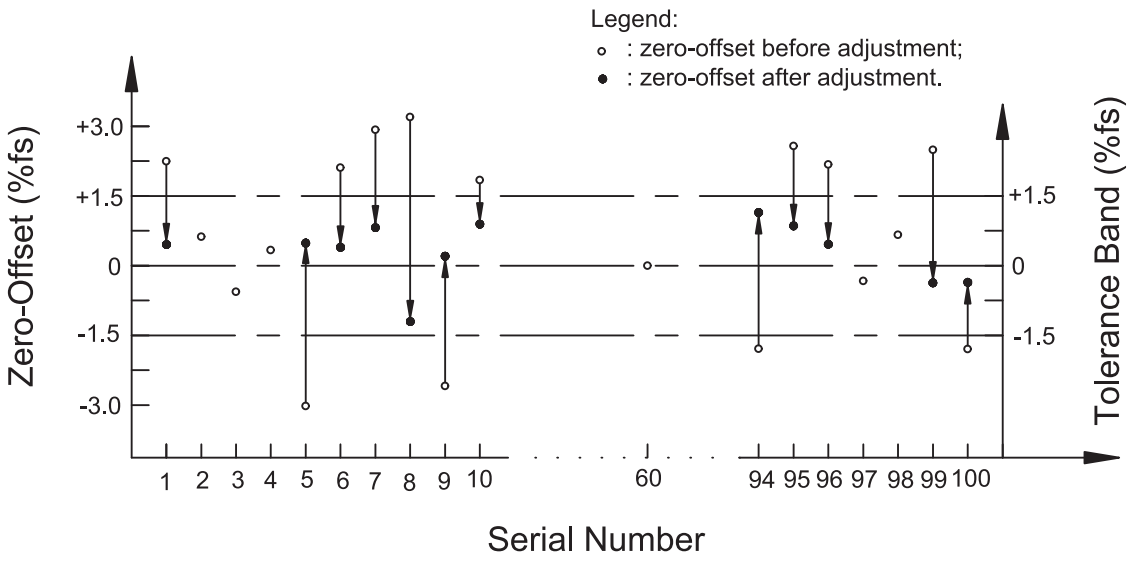

Fig. 2: Diagram of Zero-Offset Adjustment on Batch of Sensors

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