Zero-Temperature-Drift Compensation

Zero-temperature-drift is the drift of the zero-offset with the temperature of the sensor body, which is originally induced by the change of ambient temperature.

The main part of the zero-temperature-drift can be compensated by using the STC gauges and the fine correction of the zero-temperature-drift can be done by means of the zero-temperature-compensation (ZC) resistors, for example, the ON-series, OB-series or OQ-series bondable ZC resistors from BCM SENSOR. The corresponding bridge circuit is demonstrated in Fig. 1. The resistance of the ZC resistor can be calculated approximately according to the formula:

$$R_T \approx |2 \cdot R \cdot (U_{O2} - U_{O1})| \,/\, |\alpha_T \cdot U_{IN}(T_2 - T_1)|$$

Where,

- R_T = the resistance of ZC resistor;
- R = the bridge resistance;
- U_{O1} = the output voltage of bridge circuit at the temperature T_1;
- U_{O2} = the output voltage of bridge circuit at the temperature T_2;
- α_T = the temperature coefficient of resistance (TCR) of the ZC resistor;
- U_{IN} = the input voltage of the bridge circuit. In the case of Fig. 1, the U_{IN} is equal to U_{EXC}.

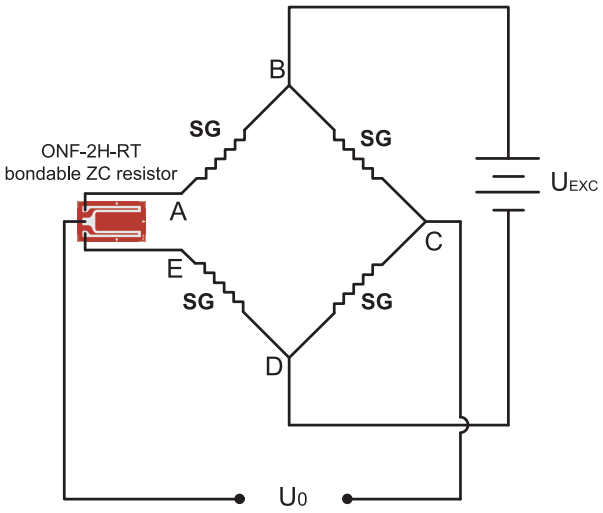

Fig. 1: Sketch of Circuit Using ONF-2H-RT to Compensate Zero-Temperature-Drift

According to the working principle of the ZA- and ZC-resistor, in some cases one can use one ZC resistor to realize both zero-offset adjustment and zero-temperature-compensation by a more complicated calculation.

The further info on the zero-temperature-drift and its corrections is explained in the technical note of STC strain gauges.

Industriepark Zone 4, Brechtsebaan 2
B-2900 Schoten-Antwerp, BELGIUM
Tel.: +32.3.238 64 69
Fax: +32.3.238 41 71
website: www.bcmsensor.com
email: info@bcmsensor.com