

Accurate op-amp bridge

When measurements are made using resistive transducers, the sensors are often included in the arms of a balanced bridge. An improved circuit can be achieved by using an op-amp in each arm of the bridge and positive going transducers ($+\Delta R$) in arms 1 and 2 or negative going types in arms 3 and 4. The bridge can be built around a single quad op-amp such as the LM324, and four matched sensors, and can be powered by d.c. or floating a.c. Output voltage is

$$e_{out} = \frac{4e_{in}\Delta R}{R}$$

This shows that the output is linear over a wide range and has a four-fold sensitivity compared with a single op-amp bridge. The circuit can also provide high output voltage, low output impedance and high noise immunity.

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