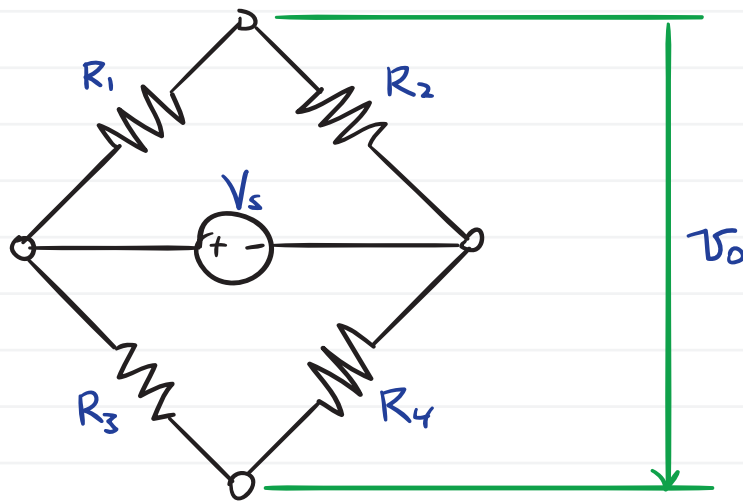


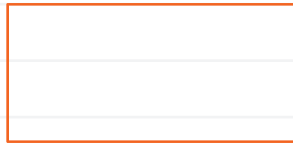
Wheatstone bridges

The Wheatstone bridge circuit is one of the most important for measurements. We will discuss a number of applications for Wheatstone bridges, including strain gages, pressure transducers, and hot-wire anemometers.



Analysis

Therefore $v_o = 0$ if



This is a useful result. When this condition is met, the wheatstone bridge is said to be **balanced**.

If one of the resistors—conventionally R_1 —is placed (remotely from the others) in an environment that changes its resistance from its nominal (balanced) value, measuring the output voltage v_o will indicate this change.

Typically one of the following two methods is used.

Null method We can determine the change in resistance of R_1 by "balancing" the bridge: adjusting the resistance of (say) R_4 until the bridge is once again balanced.

Deflection method We can also use the wheatstone bridge to output a voltage that depends on the change in R_1 , ΔR_1 . We can use (*) to determine how v_o depends on ΔR_1 .