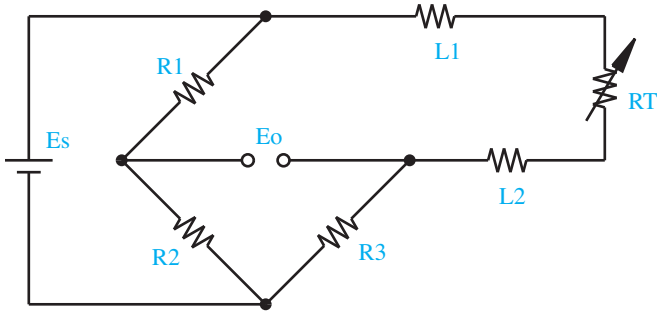
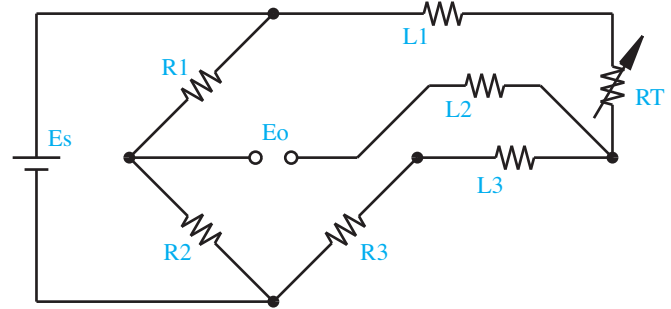


Wiring Diagrams



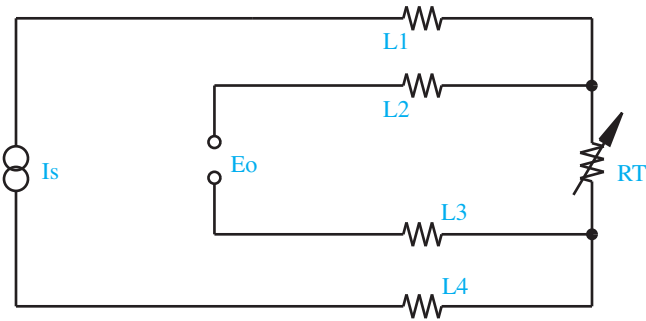
2-wire circuit

Shown is a 2-wire RTD connected to a typical Wheatstone bridge circuit. E_s is the supply voltage; E_o is the output voltage; R_1 , R_2 , and R_3 are fixed resistors; and RT is the RTD. In this uncompensated circuit, lead resistance L_1 and L_2 add directly to RT .



3-wire circuit

In this circuit there are three leads coming from the RTD instead of two. L_1 and L_3 carry the measuring current while L_2 acts only as a potential lead. No current flows through it while the bridge is in balance. Since L_1 and L_3 are in separate arms of the bridge, resistance is canceled. This circuit assumes high impedance at E_o and close matching of resistance between wires L_2 and L_3 . TEMPCO matches RTD leads within 5%. As a rule of thumb, 3-wire circuits can handle wire runs up to 100 feet.



4-wire circuit

4-wire RTD circuits not only cancel lead wires but remove the effects of mismatched resistances such as contact points. A common version is the constant current circuit shown here. I_s drives a precise measuring current through L_1 and L_4 ; L_2 and L_3 measure the voltage drop across the RTD element. E_o must have high impedance to prevent current flow in the potential leads. 4-wire circuits may be usable over a longer distance than 3-wire, but you should consider using a transmitter in electrically noisy environments.

If necessary you can connect a 2-wire RTD to a 3-wire circuit or 4-wire circuit, as shown. As long as the junctions are near the RTD, as in a connection head, errors are negligible.

