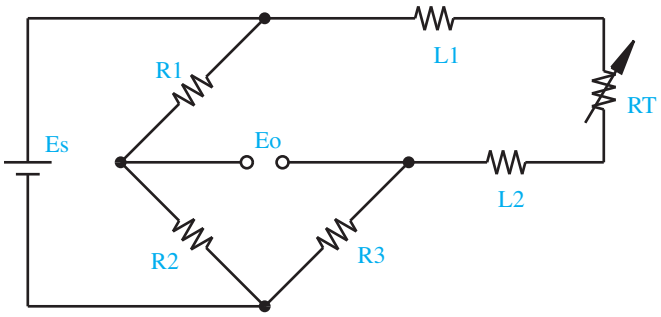
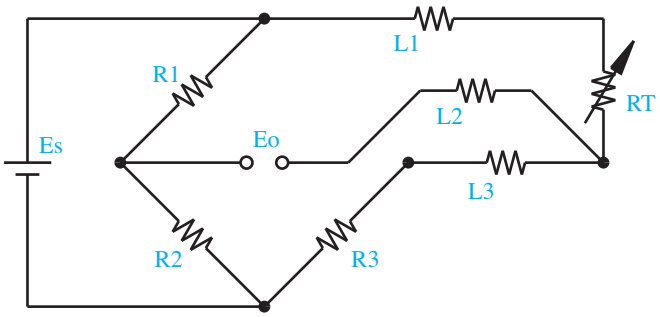
Wiring Diagrams



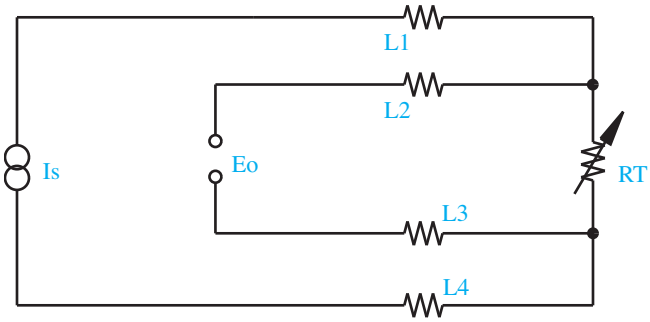
2-wire circuit

Shown is a 2-wire RTD connected to a typical Wheatstone bridge circuit. Es is the supply voltage; Eo is the output voltage; R1, R2, and R3 are fixed resistors; and RT is the RTD. In this uncompensated circuit, lead resistance L1 and L2 add directly to RT.



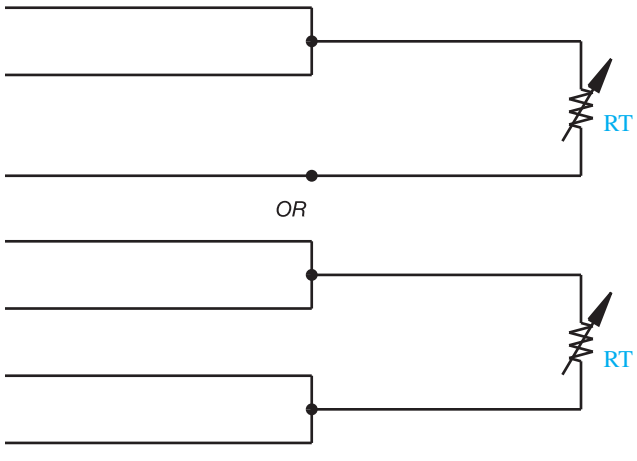
3-wire circuit

In this circuit there are three leads coming from the RTD instead of two. L1 and L3 carry the measuring current while L2 acts only as a potential lead. No current flows through it while the bridge is in balance. Since L1 and L3 are in separate arms of the bridge, resistance is canceled. This circuit assumes high impedance at Eo and close matching of resistance between wires L2 and L3. 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. Is drives a precise measuring current through L1 and L4; L2 and L3 measure the voltage drop across the RTD element. Eo 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.