**Formulae used in the TEC Analyzer**

**A. TEC Calculator (TEC Performance Calculator)**

**Inputs:**

* Voltage () [Volts]
* Current () [Amps]
* Hot Side Temp () [°C]
* Cold Side Temp () [°C]
* Seebeck Coefficient () [V/K]
* Thermal Conductivity () [W/mK]
* Electrical Conductivity () [S/m]

**Calculations:**

1. **Temperature Difference ():**
2. **Power Consumed ():**
3. **Cooling Power ():**
   * : Seebeck coefficient
   * : Current
   * : Cold side temperature
   * : Electrical conductivity
   * : Thermal conductivity
   * : Temperature difference
4. **Figure of Merit ():**

where

1. **Coefficient of Performance (COP):**
   * If , then .

**B. TLM (Contact Resistance Measurement) Calculations**

**Inputs:**

* Probe Position (various columns: 'Probe Position', 'Position', or 'pos')
* Current (various columns: 'Current (A)', 'Current', or 'I')
* Measured Resistance (various columns: 'Cal. Resis. (Ω)', 'Resistance', or 'R')

**Processing:**

* Group data by probe position and current.
* For each group, **average resistance values**:where are resistance readings at a given current for a probe position.

**Outputs:**

* Table of average resistance for each probe position and current.
* Plot: Resistance vs. Current for each probe position.

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