

热电阻三线制接法

$$U_o = -\frac{R_2}{R_1 + R_2} E + \frac{R_3}{R_1 + R_3} E$$

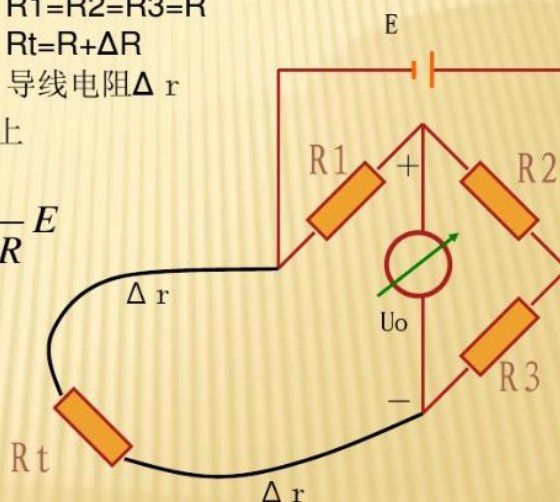
$$\begin{aligned} R_1 &= R_2 = R_3 = R \\ R_t &= R + \Delta R \\ \text{导线电阻 } \Delta r & \end{aligned}$$

两线制接法：导线电阻全加在 R_t 上

$$U_o = -\frac{1}{2} E + \frac{R}{R + \Delta R + 2\Delta r + R} E$$

$$= -\frac{(2R + \Delta R + 2\Delta r) - 2R}{2(2R + \Delta R + 2\Delta r)} E$$

$$= -\frac{1}{2} \frac{\Delta R + 2\Delta r}{2R + (\Delta R + 2\Delta r)} E$$



$$U_o = -\frac{R}{2R + 2\Delta r} E + \frac{R}{R + \Delta R + 2\Delta r + R} E$$

三线制

$$= -\frac{R[(2R + \Delta R + 2\Delta r) - (2R + 2\Delta r)]}{(2R + 2\Delta r)(2R + \Delta R + 2\Delta r)} E$$

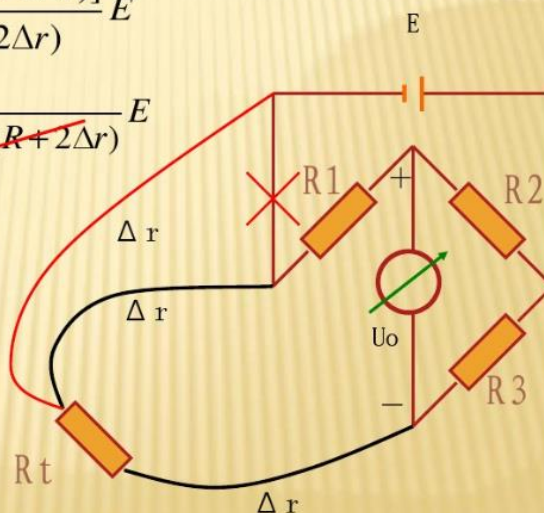
$$= -\frac{R\Delta R}{4R^2 + 2R(\Delta R + 4\Delta r) + 2\Delta r(R + 2\Delta r)} E$$

$$= -\frac{R\Delta R}{4R^2 + 2R(\Delta R + 4\Delta r)} E$$

$$\text{三线制} = -\frac{1}{2} \frac{\Delta R}{2R + (\Delta R + 4\Delta r)} E$$

两线制

$$= -\frac{1}{2} \frac{\Delta R + 2\Delta r}{2R + (\Delta R + 2\Delta r)} E$$



三线制减小引线电阻的影响