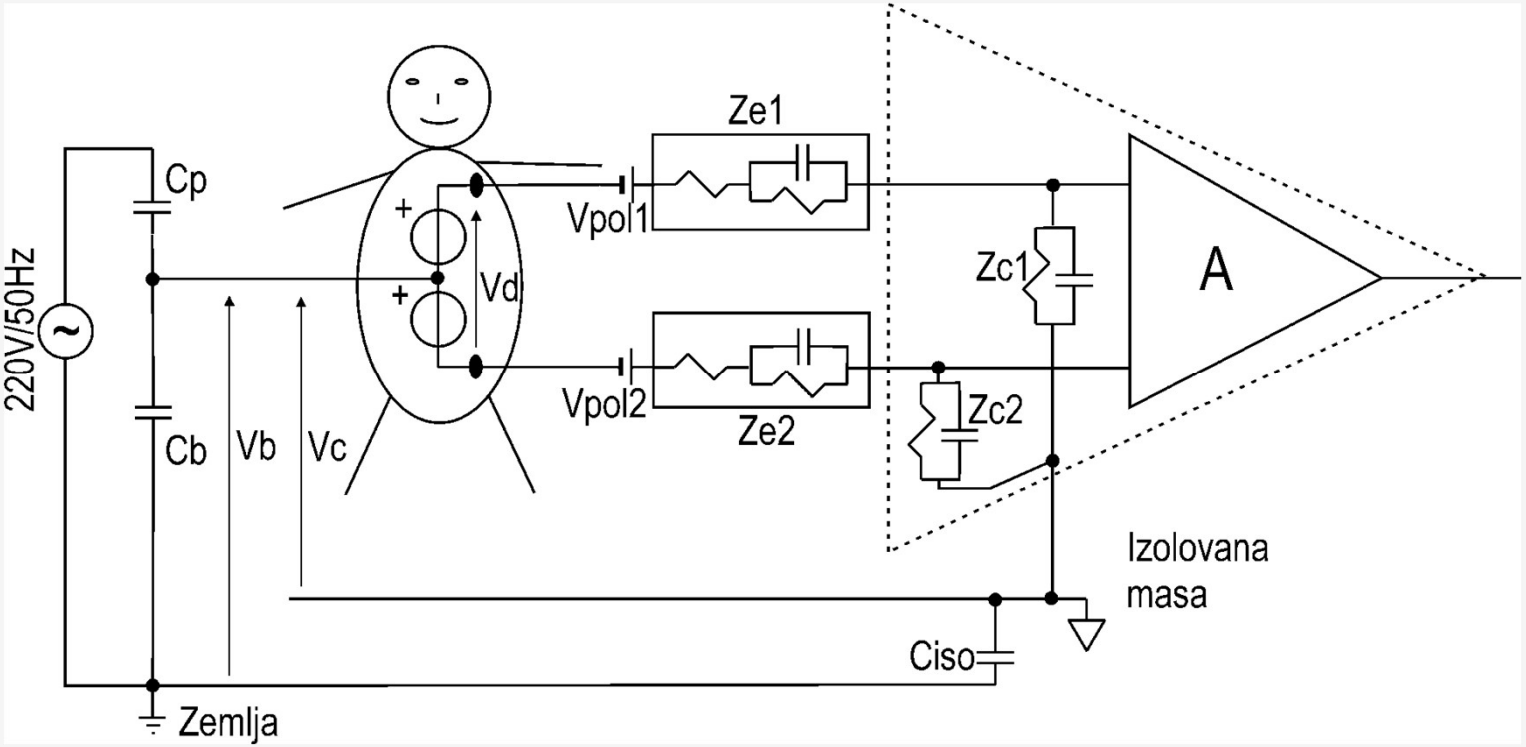
OSNOVE BIOMEDICINSKOG INŽENJERSTVA

SMETNJE PRI ELEKTROFIZIOLOŠKIM SNIMANJIMA

Model elektrofiziološkog snimanja



$$V_b = V_m \frac{C_p}{C_p + C_b}$$

$$Z_i = \frac{1}{j\omega\left(C_p + C_b\right)}$$

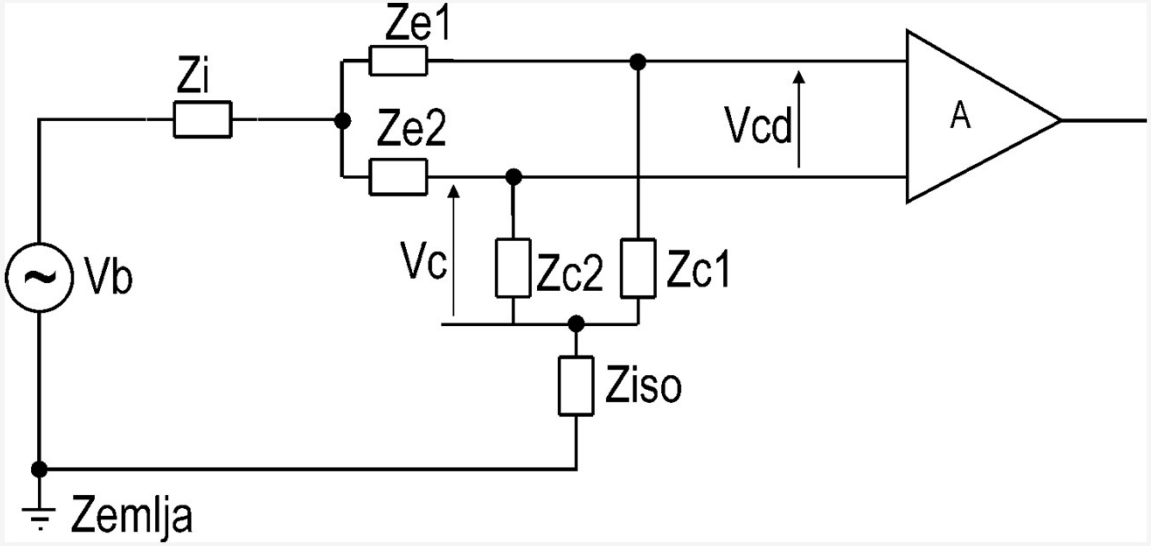
Faktor potiskivanja signala zajedničkog moda CMRR

Izlazni signal pojačavača: $$V_{out} = A_d \cdot V_d + A_c \cdot V_c$$

Faktor CMRR: $$CMRR = \frac{A_d}{A_c}$$

$$CMRR_{dB} = 20\log\left(\frac{A_d}{A_c}\right)$$

Ekvivalentna šema signala zajedničkog moda



$$V_c = V_b \frac{Z_c}{Z_e + Z_c + 2(Z_i + Z_{iso})}$$

Ze1=Ze2=Ze

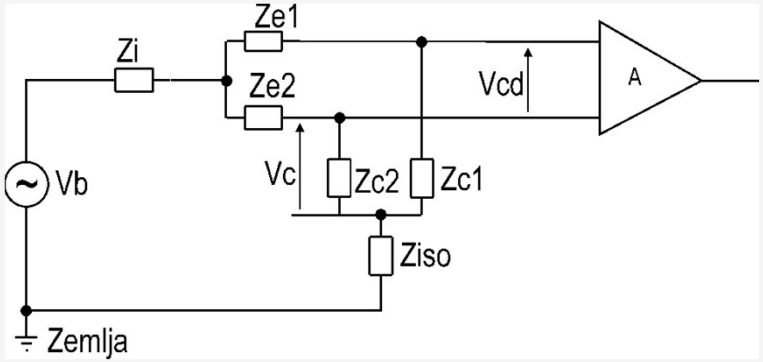
Zc1=Zc2=Zc

Transformacija signala zajedničkog u diferencijalni mod

Ze1=Ze-ΔeZe; Ze2=Ze+ΔeZe; Zc1=Zc+ΔcZc; Zc2=Zc-ΔcZc

$Z_{iso} = Z_i = 0$

$$V_{cd} = V_b \left[\frac{Z_c + \Delta c Z_c}{Z_c + \Delta c Z_c + Z_e - \Delta e Z_e} - \frac{Z_c - \Delta c Z_c}{Z_c - \Delta c Z_c + Z_e + \Delta e Z_e} \right]$$



$$CMR_{\Delta Z} = \frac{Ad}{Ac_{\Delta Z}} = \frac{Ad}{Ad\dfrac{V_{cd}}{V_b}} = \frac{V_b}{V_{cd}}$$

$$CMR_{\Delta Z} = \frac{Z_c}{Z_e} \cdot \frac{1 - \Delta c^2}{2(\Delta c + \Delta e)}$$