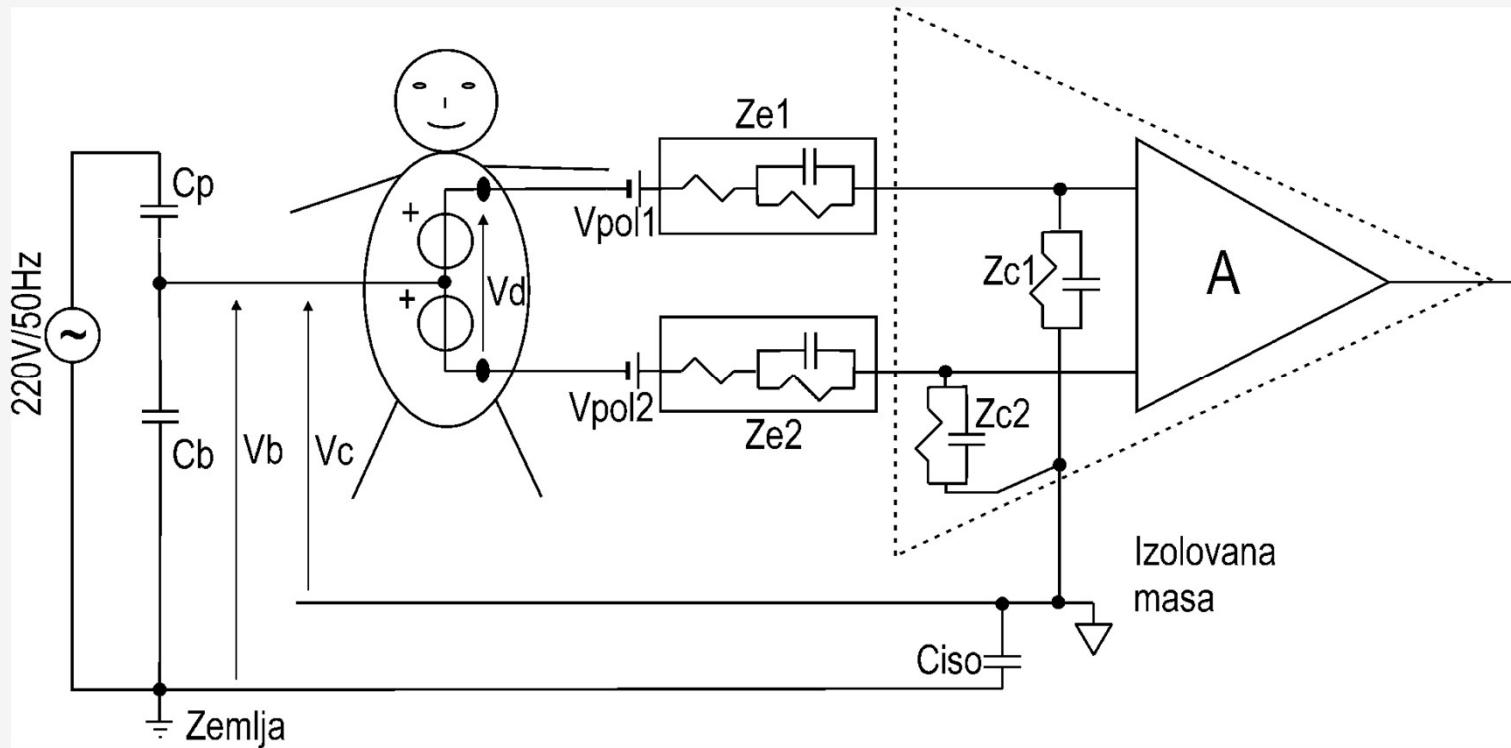


OSNOVE BIOMEDICINSKOG INŽENJERSTVA

SMETNJE PRI ELEKTROFIZIOLOŠKIM SNIMANJIMA

Model elektrofiziološkog snimanja



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

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

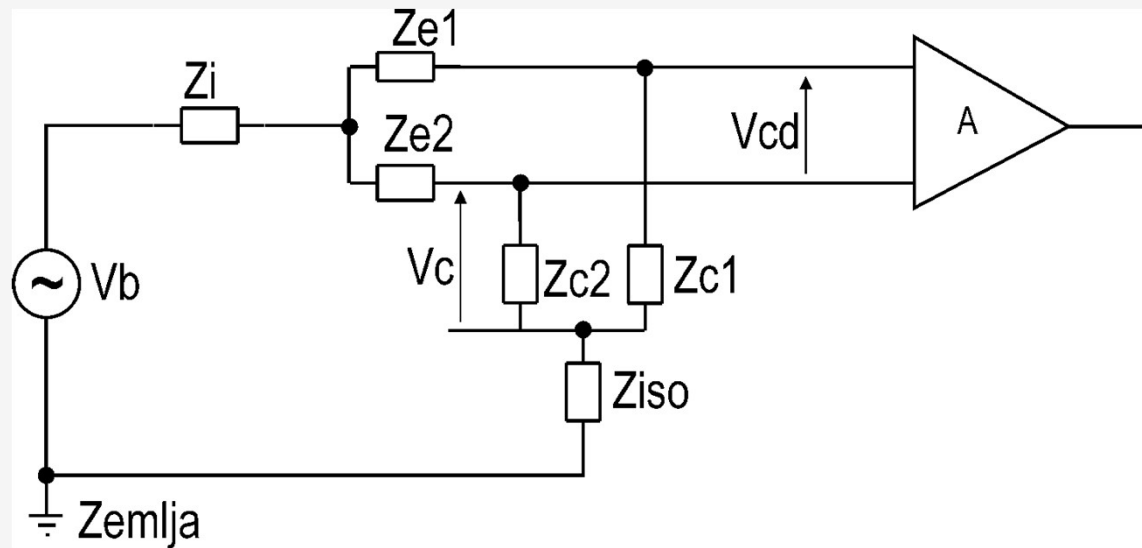
Faktor potiskivanja signala zajedničkog moda CMRR

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



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

$$Z_{e1} = Z_{e2} = Z_e$$

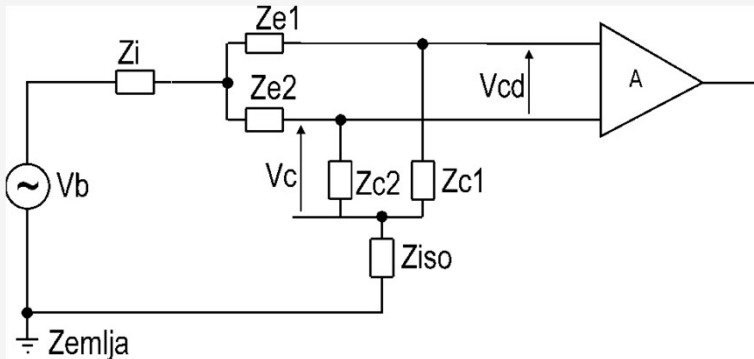
$$Z_{c1} = Z_{c2} = Z_c$$

Transformacija signala zajedničkog u diferencijalni mod

$$Z_{e1}=Z_e-\Delta e Z_e; Z_{e2}=Z_e+\Delta e Z_e; Z_{c1}=Z_c+\Delta c Z_c; Z_{c2}=Z_c-\Delta c Z_c$$

$$Z_{iso} = Z_i = 0$$

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



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

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