

EXAMPLE/EXEMPLO/EJEMPLO DATA/DADOS/DATOS

$$S_{\text{Base}} = 100 \text{ MVA}$$

$$V_{\text{Base}} = 69 \text{ kV}$$

Passive Elements

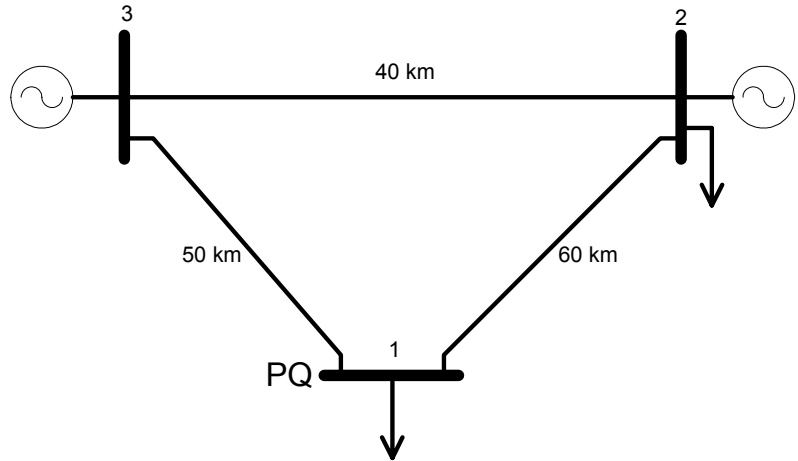
Elementos passivos

Elementos pasivos

$$X_{\text{Line/Linha/Línea}} = 0,4 \text{ } \Omega/\text{km}$$

$$R_{\text{Line/Linha/Línea}} = 0,03 \text{ } \Omega/\text{km}$$

$$X_{\text{Cap-Line/Linha/Línea}} = 0,3 \text{ M}\Omega\text{-km}$$



| Bus Barra | Bus Type Tipo de Barra | P_D (MW) | Q_D (MVAR) | P_G (MW) | Q_G (MVAR) | $ V $ | δ |
|-----------|------------------------|------------|--------------|------------|--------------|-------|----------|
| 1 | PQ | 5 | 4 | — | — | ? | ? |
| 2 | PV | 4 | 3 | 3 | ? | 1,05 | ? |
| 3 | SLACK | — | — | ? | ? | 1,08 | 0 |

p.u. for the Lines/para as Linhas/para las Líneas

$$r_{12} = \left(0,03 \frac{\Omega}{\text{km}}\right)(60 \text{ km}) \left(\frac{100 \text{ MVA}}{(69 \text{ kV})^2}\right) = 0,0378 \text{ p.u.}$$

$$r_{13} = \left(0,03 \frac{\Omega}{\text{km}}\right)(50 \text{ km}) \left(\frac{100 \text{ MVA}}{(69 \text{ kV})^2}\right) = 0,0315 \text{ p.u.}$$

$$r_{23} = \left(0,03 \frac{\Omega}{\text{km}}\right)(40 \text{ km}) \left(\frac{100 \text{ MVA}}{(69 \text{ kV})^2}\right) = 0,0252 \text{ p.u.}$$

$$x_{12} = \left(0,4 \frac{\Omega}{\text{km}}\right)(60 \text{ km}) \left(\frac{100 \text{ MVA}}{(69 \text{ kV})^2}\right) = 0,5041 \text{ p.u.}$$

$$x_{13} = \left(0,4 \frac{\Omega}{\text{km}}\right)(50 \text{ km}) \left(\frac{100 \text{ MVA}}{(69 \text{ kV})^2}\right) = 0,4201 \text{ p.u.}$$

$$x_{23} = \left(0,4 \frac{\Omega}{\text{km}}\right)(40 \text{ km}) \left(\frac{100 \text{ MVA}}{(69 \text{ kV})^2}\right) = 0,3361 \text{ p.u.}$$

$$x_{C12} = (0,3 \text{ M}\Omega\text{-km}) \left(\frac{1}{60 \text{ km}}\right) \left(\frac{100 \text{ MVA}}{(69 \text{ kV})^2}\right) = 105,0199 \text{ p.u.} \quad b_{C12} = \frac{1}{x_{C12}} \rightarrow y_{\text{Shunt } 12} = \frac{b_{C12}}{2} = 0,0048 \text{ p.u.}$$

$$x_{C13} = (0,3 \text{ M}\Omega\text{-km}) \left(\frac{1}{50 \text{ km}}\right) \left(\frac{100 \text{ MVA}}{(69 \text{ kV})^2}\right) = 126,0230 \text{ p.u.} \quad b_{C12} = \frac{1}{x_{C12}} \rightarrow y_{\text{Shunt } 12} = \frac{b_{C12}}{2} = 0,0040 \text{ p.u.}$$

$$x_{C23} = (0,3 \text{ M}\Omega\text{-km}) \left(\frac{1}{40 \text{ km}}\right) \left(\frac{100 \text{ MVA}}{(69 \text{ kV})^2}\right) = 157,530 \text{ p.u.} \quad b_{C12} = \frac{1}{x_{C12}} \rightarrow y_{\text{Shunt } 12} = \frac{b_{C12}}{2} = 0,0032 \text{ p.u.}$$

Lines/Linhas/Líneas

| i | j | r_{ij} (p.u.) | x_{ij} (p.u.) | $y_{\text{sh } ij}/2$ (p.u.) |
|---|---|-----------------|-----------------|------------------------------|
| 1 | 2 | 0,0378 | 0,5041 | 0,0048 |
| 1 | 3 | 0,0315 | 0,4201 | 0,0040 |
| 2 | 3 | 0,0252 | 0,3361 | 0,0032 |