



# Nominal Pi-Method in Medium Line Formulas

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# List of 20 Nominal Pi-Method in Medium Line Formulas

### Nominal Pi-Method in Medium Line 🗗

1) A-Parameter in Nominal Pi Method 🗗

$$\mathbf{x} oxed{\mathbf{A}_{\mathrm{pi}} = 1 + \left( \mathrm{Y}_{\mathrm{pi}} \cdot rac{\mathrm{Z}_{\mathrm{pi}}}{2} 
ight)}$$

Open Calculator 🗗

ex 
$$1.09555 = 1 + \left(0.021 \mathrm{S} \cdot rac{9.1\Omega}{2}
ight)$$

2) B Parameter for Reciprocal Network in Nominal Pi Method

$$egin{align} egin{align} eg$$

Open Calculator 🗗

$$ext{ex} \ 8.797727\Omega = rac{(1.095 \cdot 1.09) - 1}{0.022 ext{S}}$$

3) C Parameter in Nominal Pi Method

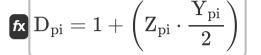
$$\mathbf{E} \mathbf{C}_{\mathrm{pi}} = \mathbf{Y}_{\mathrm{pi}} \cdot \left(1 + \left(\mathbf{Y}_{\mathrm{pi}} \cdot rac{\mathbf{Z}_{\mathrm{pi}}}{4}
ight)
ight)$$

$$oxed{ex} 0.022003 \mathrm{S} = 0.021 \mathrm{S} \cdot \left(1 + \left(0.021 \mathrm{S} \cdot rac{9.1\Omega}{4}
ight)
ight)$$





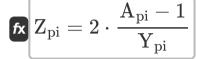
#### 4) D Parameter in Nominal Pi Method 🚰



Open Calculator

 $oxed{1.09555} = 1 + \left(9.1\Omega \cdot rac{0.021\mathrm{S}}{2}
ight)$ 

### 5) Impedance using A Parameter in Nominal Pi Method



Open Calculator 🖒

 $ext{ex} 9.047619\Omega = 2 \cdot rac{1.095 - 1}{0.021 ext{S}}$ 

### 6) Load Current using Losses in Nominal Pi Method

$$I_{L(pi)} = \sqrt{rac{P_{loss(pi)}}{R_{pi}}}$$

 $oxed{ex} 3.361508 {
m A} = \sqrt{rac{85.2 {
m W}}{7.54 \Omega}}$ 



### 7) Load Current using Transmission Efficiency in Nominal Pi Method 🖸

$$I_{L(pi)} = \sqrt{rac{\left(rac{P_{r(pi)}}{\eta_{pi}}
ight) - P_{r(pi)}}{P_{ri}} \cdot 3}$$

Open Calculator

$$extbf{ex} 5.836114 ext{A} = \sqrt{rac{\left(rac{250.1 ext{W}}{0.745}
ight) - 250.1 ext{W}}{7.54 \Omega}} \cdot 3$$

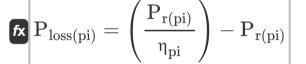
#### 8) Losses in Nominal Pi Method 🔽

$$ext{P}_{ ext{loss(pi)}} = \left( ext{I}_{ ext{L(pi)}}^2 
ight) \cdot ext{R}_{ ext{pi}}$$

Open Calculator 🖸

$$ext{ex} 85.12358 ext{W} = \left( (3.36 ext{A})^2 
ight) \cdot 7.54 \Omega$$

#### 9) Losses using Transmission Efficiency in Nominal Pi Method 🛂



$$oxed{ex}~85.6047 ext{W} = \left(rac{250.1 ext{W}}{0.745}
ight) - 250.1 ext{W}$$



### 10) Receiving End Angle using Transmission Efficiency in Nominal Pi

 $oldsymbol{\Phi}_{
m r(pi)} = a \cos igg( rac{\eta_{
m pi} \cdot {
m P}_{
m s(pi)}}{3 \cdot {
m I}_{
m r(pi)} \cdot {
m V}_{
m r(pi)}} igg)$ 

Open Calculator 🗗

 $oxed{87.99815}^{\circ} = a \cosigg(rac{0.745 \cdot 335 \mathrm{W}}{3 \cdot 7.44 \mathrm{A} \cdot 320.1 \mathrm{V}}igg)$ 

# 11) Receiving End Current using Transmission Efficiency in Nominal Pi

 $\mathbf{K} egin{aligned} \mathbf{I}_{\mathrm{r(pi)}} &= rac{\eta_{\mathrm{pi}} \cdot P_{\mathrm{s(pi)}}}{3 \cdot V_{\mathrm{r(pi)}} \cdot \left( \cos \left( \Phi_{\mathrm{r(pi)}} 
ight) 
ight)} \end{aligned}$ 

Open Calculator

## 12) Receiving End Voltage using Sending End Power in Nominal Pi

 $V_{
m r(pi)} = rac{{
m P_{s(pi)} - P_{loss(pi)}}}{{
m I_{r(pi)} \cdot cos(\Phi_{r(pi)})}}$ 



### 13) Receiving End Voltage using Voltage Regulation in Nominal Pi Method

fx 
$$V_{
m r(pi)} = rac{V_{
m s(pi)}}{\% V_{
m pi} + 1}$$

Open Calculator 🚰

#### 14) Resistance using Losses in Nominal Pi Method 🗗

 $R_{pi} = rac{P_{loss(pi)}}{I_{L(pi)}^2}$ 

Open Calculator 🖸

$$ext{ex} \left[ 7.546769\Omega = rac{85.2 ext{W}}{\left( 3.36 ext{A} 
ight)^2} 
ight]$$

## 15) Sending End Current using Transmission Efficiency in Nominal Pi

 $I_{
m s(pi)} = rac{P_{
m r(pi)}}{3 \cdot \cosigl(\Phi_{
m s(pi)}igr) \cdot \eta_{
m pi} \cdot V_{
m s(pi)}}$ 

$$\mathbf{ex} = 0.304772 \mathrm{A} = rac{250.1 \mathrm{W}}{3 \cdot \cos(22^\circ) \cdot 0.745 \cdot 396 \mathrm{V}}$$



### 16) Sending End Power using Transmission Efficiency in Nominal Pi

 $oldsymbol{F_{s(pi)}} = rac{P_{r(pi)}}{\eta_{pi}}$ 

Open Calculator

# 17) Sending End Voltage using Transmission Efficiency in Nominal Pi

 $extbf{V}_{
m s(pi)} = rac{ ext{P}_{
m r(pi)}}{3 \cdot ext{cos}ig(\Phi_{
m s(pi)}ig) \cdot ext{I}_{
m s(pi)}}/\eta_{
m pi}$ 

Open Calculator

### 18) Sending End Voltage using Voltage Regulation in Nominal Pi Method

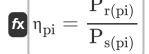
 $ag{V_{s(pi)} = V_{r(pi)} \cdot (\%V_{pi} + 1)}$ 

Open Calculator

 $\texttt{ex} \ 393.723 \text{V} = 320.1 \text{V} \cdot (0.23+1)$ 



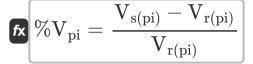
#### 19) Transmission Efficiency (Nominal Pi Method)



Open Calculator

$$= 250.1 \mathrm{W} \\ 0.746567 = \frac{250.1 \mathrm{W}}{335 \mathrm{W}}$$

#### 20) Voltage Regulation (Nominal Pi Method)



$$0.237113 = rac{396 ext{V} - 320.1 ext{V}}{320.1 ext{V}}$$



#### Variables Used

- %V<sub>pi</sub> Voltage Regulation in PI
- Ani A Parameter in PI
- B<sub>pi</sub> B Parameter in PI (Ohm)
- C<sub>pi</sub> C Parameter in PI (Siemens)
- D<sub>pi</sub> D Parameter in PI
- I<sub>L(pi)</sub> Load Current in PI (Ampere)
- I<sub>r(pi)</sub> Receiving End Current in PI (Ampere)
- I<sub>S(pi)</sub> Sending End Current in PI (Ampere)
- Ploss(pi) Power Loss in PI (Watt)
- P<sub>r(pi)</sub> Receiving End Power in PI (Watt)
- P<sub>s(pi)</sub> Sending End Power in PI (Watt)
- R<sub>pi</sub> Resistance in PI (Ohm)
- V<sub>r(pi)</sub> Receiving End Voltage in PI (Volt)
- V<sub>s(pi)</sub> Sending End Voltage in PI (Volt)
- Y<sub>pi</sub> Admittance in PI (Siemens)
- Z<sub>pi</sub> Impedance in PI (Ohm)
- η<sub>pi</sub> Transmission Efficiency in PI
- Φ<sub>r(pi)</sub> Receiving End Phase Angle in PI (Degree)
- Φ<sub>S(pi)</sub> Sending End Phase Angle in PI (Degree)





#### Constants, Functions, Measurements used

- Function: acos, acos(Number)

  Inverse trigonometric cosine function
- Function: cos, cos(Angle)

  Trigonometric cosine function
- Function: sqrt, sqrt(Number)
   Square root function
- Measurement: Electric Current in Ampere (A)
   Electric Current Unit Conversion
- Measurement: Power in Watt (W)

  Power Unit Conversion
- Measurement: Angle in Degree (°)
   Angle Unit Conversion
- Measurement: Electric Resistance in Ohm (Ω)
   Electric Resistance Unit Conversion
- Measurement: Electric Conductance in Siemens (S)

  Electric Conductance Unit Conversion
- Measurement: Electric Potential in Volt (V)
   Electric Potential Unit Conversion





#### Check other formula lists

- End Condenser Method in Medium Line Formulas
- Nominal Pi-Method in Medium Line Formulas
- Nominal T-Method in Medium Line Formulas

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