Important End Condenser Method in Medium Line Formulas PDF

Formulas
Examples
with Units

List of 17
Important End Condenser Method in Medium Line Formulas

1) Admittance using A Parameter in End Condenser Method Formula

Evaluate Formula

Formula

$$Y_{ecm} = \frac{2 \cdot \left(A_{ecm} - 1 \right)}{Z_{ecm}}$$

Example with Units

$$0.0202\,\text{S} = \frac{2 \cdot \left(1.091 - 1 \right)}{9\,\Omega}$$

2) Capacitive Current in End Condenser Method Formula

Evaluate Formula

Formula

$$I_{c(ecm)} = I_{s(ecm)} - I_{r(ecm)}$$

Example with Units

$$1.3\,\text{A} = 16\,\text{A} - 14.7\,\text{A}$$

3) Impedance using A Parameter in End Condenser Method Formula

Evaluate Formula

Formula

$$Z_{ecm} = \frac{2 \cdot \left(A_{ecm} - 1 \right)}{Y_{ecm}}$$

Example with Units

$$9.1\,\Omega = \frac{2 \cdot \left(1.091 - 1 \right)}{0.02\,\text{S}}$$

4) Impedance(ECM) Formula

Evaluate Formula

Formula

$$Z_{ecm} = \frac{V_{s(ecm)} - V_{r(ecm)}}{I_{s(ecm)}}$$

Example with Units

$$9\,\Omega = \frac{400\,\text{V} - 256\,\text{V}}{16\,\text{A}}$$

5) Line Losses in End Condenser Method Formula

Evaluate Formula

Formula

$$P_{loss(ecm)} = 3 \cdot R_{ecm} \cdot I_{s(ecm)}^{2}$$

Example with Units

$$84.48\,\text{W} = 3 \cdot 0.11\,\Omega \cdot 16\,\text{A}^{2}$$

6) Medium Line A Parameter (LEC) Formula

Evaluate Formula

Formula

$$A_{ecm} = 1 + \left(\frac{Z_{ecm} \cdot Y_{ecm}}{2} \right)$$

Example with Units

$$1.09 = 1 + \left(\frac{9\,\Omega \cdot 0.02\,\text{S}}{2} \right)$$

7) Receiving End Angle using Sending End Power in End Condenser Method Formula

Evaluate Formula

Formula

$$\Phi_{r(ecm)} = acos\left(\frac{P_{s(ecm)} - P_{loss(ecm)}}{3 \cdot I_{r(ecm)} \cdot V_{r(ecm)}}\right)$$

Example with Units

$$89.594° = acos\left(\frac{165\,W - 85\,W}{3 \cdot 14.7\,A \cdot 256\,V}\right)$$

8) Receiving End Current in End Condenser Method Formula

Evaluate Formula

Formula

$$I_{r(ecm)} = I_{s(ecm)} - I_{c(ecm)}$$

Example with Units

$$14.7\,A = 16\,A - 1.3\,A$$

9) Receiving End Voltage in End Condenser Method Formula

Evaluate Formula

Formula

$$V_{r(ecm)} = V_{s(ecm)} - \left(I_{s(ecm)} \cdot Z_{ecm}\right)$$

Example with Units

$$256\,V = 400\,V - \left(16\,A \cdot 9\,\Omega\right)$$

10) Resistance using Losses in End Condenser Method Formula

Evaluate Formula

Formula

$$R_{ecm} = \frac{P_{loss(ecm)}}{3 \cdot I_{s(ecm)}^2}$$

Example with Units

$$0.1107\,\Omega = \frac{85\,W}{3 \cdot 16\,A^2}$$

11) Sending End Current in End Condenser Method Formula

Evaluate Formula

Formula

$$I_{s(ecm)} = I_{r(ecm)} + I_{c(ecm)}$$

Example with Units

$$16\,A = 14.7\,A + 1.3\,A$$

12) Sending End Current using Impedance in End Condenser Method Formula

Evaluate Formula

Formula

$$I_{s(ecm)} = \frac{V_{s(ecm)} - V_{r(ecm)}}{Z_{ecm}}$$

Example with Units

$$16\,A = \frac{400\,V - 256\,V}{9\,\Omega}$$

13) Sending End Current using Losses in End Condenser Method Formula

Evaluate Formula

Formula

$$I_{s(ecm)} = \sqrt{\frac{P_{loss(ecm)}}{3 \cdot R_{ecm}}}$$

Example with Units

$$16.0492\,A = \sqrt{\frac{85\,W}{3 \cdot 0.11\,\Omega}}$$

14) Sending End Power in End Condenser Method Formula

Evaluate Formula

Formula

$$P_{s(ecm)} = P_{r(ecm)} - P_{loss(ecm)}$$

Example with Units

$$165\,W = 250\,W - 85\,W$$

15) Sending End Voltage in End Condenser Method Formula

Evaluate Formula

Formula

$$V_{s(ecm)} = V_{r(ecm)} + \left(I_{s(ecm)} \cdot Z_{ecm} \right)$$

Example with Units

$$400\,\text{V} = 256\,\text{V} + \left(16\,\text{A} \cdot 9\,\Omega \right)$$

16) Transmission Efficiency in End Condenser Method Formula

Evaluate Formula

Formula

$$\eta_{ecm} = \left(\frac{P_{r(ecm)}}{P_{s(ecm)}} \right) \cdot 100$$

Example with Units

$$151.5152 = \left(\frac{250\,\text{W}}{165\,\text{W}} \right) \cdot 100$$

17) Voltage Regulation in End Condenser Method Formula

Evaluate Formula

Formula

$$\%V_{ecm} = \frac{V_{s(ecm)} - V_{r(ecm)}}{V_{r(ecm)}}$$

Example with Units

$$0.5625 = \frac{400\,\text{V} - 256\,\text{V}}{256\,\text{V}}$$

Variables used in list of End Condenser Method in Medium Line Formulas above

- $\%V_{ecm}$ Voltage Regulation in ECM
- A_{ecm} A Parameter in ECM
- $I_{c(ecm)}$ Capacitive Current in ECM *(Ampere)*
- $I_{r(ecm)}$ Receiving End Current in ECM *(Ampere)*
- $I_{s(ecm)}$ Sending End Current in ECM *(Ampere)*
- $P_{loss(ecm)}$ Power Loss in ECM *(Watt)*
- $P_{r(ecm)}$ Receiving End Power in ECM *(Watt)*
- $P_{s(ecm)}$ Sending End Power in ECM *(Watt)*
- R_{ecm} Resistance in ECM *(Ohm)*
- $V_{r(ecm)}$ Receiving End Voltage in ECM *(Volt)*
- $V_{s(ecm)}$ Sending End Voltage in ECM *(Volt)*
- Y_{ecm} Admittance in ECM *(Siemens)*
- Z_{ecm} Impedance in ECM *(Ohm)*
- η_{ecm} Transmission Efficiency in ECM
- $\Phi_{r(ecm)}$ Receiving End Phase Angle in ECM *(Degree)*

Constants, Functions, Measurements used in list of End Condenser Method in Medium Line Formulas above

- Functions: **acos**, acos(Number)
  The inverse cosine function, is the inverse function of the cosine function. It is the function that takes a ratio as an input and returns the angle whose cosine is equal to that ratio.
- Functions: **cos**, cos(Angle)
  Cosine of an angle is the ratio of the side adjacent to the angle to the hypotenuse of the triangle.
- Functions: **sqrt**, sqrt(Number)
  A square root function is a function that takes a non-negative number as an input and returns the square root of the given input number.
- 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

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