formula_list:

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To calculate the base per unit values for impedance(Z):

Z_base=V^2/S where V is in Voltage(KV) and S is complex power(MVA)

To compute per unit values for Voltage, Current and Power:

Z_pu=Z_actual/ Z_base where Z_actual is the actual impedance value

I_pu=I_actual/ I_base where I_actual is the actual current value

V_pu=V_actual/ V_base where V_actual is the actual voltage value

V=I*R

A=pi*r^2

R=rho*l/A

L=2*10^(-7)*ln(GMDb/GMRb)

Xl=2*pi*f*L

D1=D,D1=D2=D3

D2=D,D1=D2=D3

D3=D,D1=D2=D3

GMDb=(D1*D2*D3)^(1/3)

GMRb=(GMRcond*d)^(1/n),n=2

GMRb=(GMRcond*d^2)^(1/n),n=3

GMRb=1.09*(GMRcond*d)^(1/n),n=4

C=2*pi*ep/ln(GMDb/rb)

rb=r,n=1

rb=(r*d)^(1/n),n=2

rb=(r*d^2)^(1/n),n=3

rb=1.09*(r*d^3)^(1/n),n=4

Xc=1/(2*pi*f*C)

Z=R+i*Xl

Y=2*pi*C*i

matrix_representation:

Vs=A*Vr+B*Ir

Is=C*Vr+D*Ir

ABCD parameters for nominal pi or л circuit:

A=(Z*Y)/2+1

B=Z

C=Y((Z*Y)/4+1)

D=(Z*Y)/2+1

ABCD parameters for nominal T circuit:

A=(Z*Y)/2+1

B=Z((Z*Y)/4+1)

C=Y

D=(Z*Y)/2+1