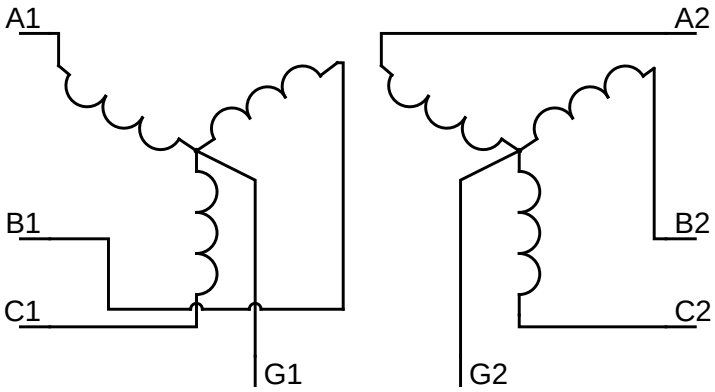
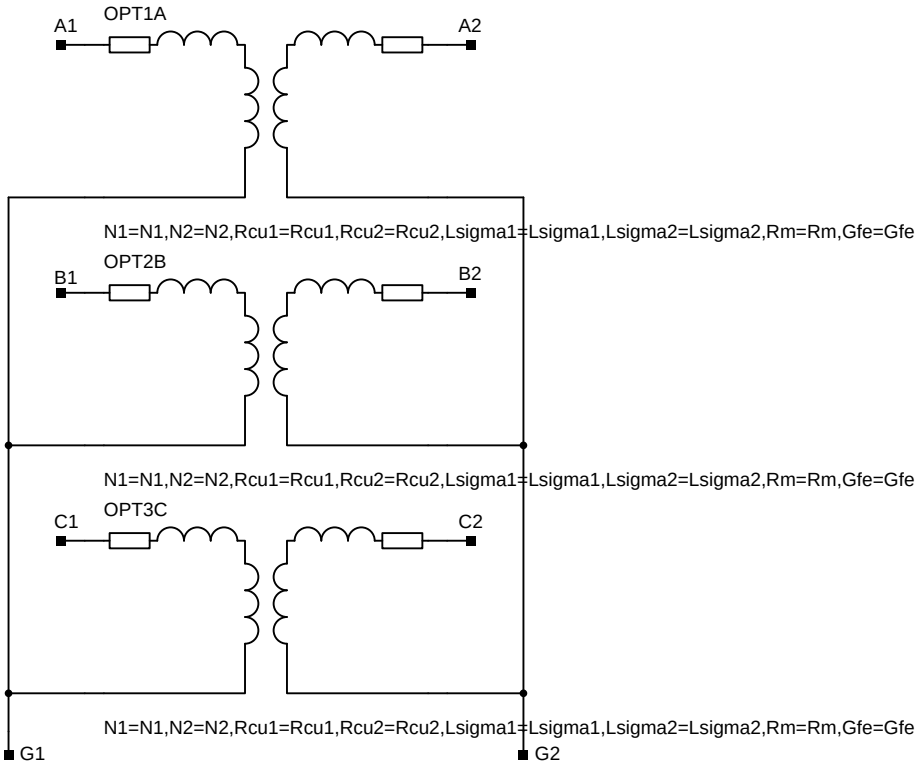
Three Phase Transformer Y-y



Assumptions

Model 3f transformátoru v zapojení Y-y bez sycení jádra s respektováním transformačního převodu, rozptylu vinutí a činného odporu vinutí



Interface

A1

B1

C1

A2
B2
C2
G1
G2

External Parameters

N1 = 22000	[–]	Pocet zavitu vinuti 1.
N2 = 110000	[–]	Pocet zavitu vinuti 2.
Sn = 20ME	[VA]	Jmenovity zdanlivy vykon
Un2 = 110k	[V]	Jmenovite napeti vinuti 2.
I0 = 0.2	[%]	Proud naprazdno
Uk = 10	[%]	Napeti nakratko
dPk = 0.3	[%]	Cinne ztraty nakratko
dP0 = 0.05	[%]	Cinne ztraty naprazdno
Freq1 = 50	[Hz]	Jmenovita frekvence

System Parameters

Data

```
:: Three Phase Transformer Y-y
TR3FYY
A1,
B1,
C1,
A2,
B2,
C2,
G1,
G2/
N1= 22000,  :: [-]  Pocet zavitu vinuti 1.
N2=110000,  :: [-]  Pocet zavitu vinuti 2.
Sn=20ME,    :: [VA] Jmenovity zdanlivy vykon
Un2=110k,   :: [V]  Jmenovite napeti vinuti 2.
I0=0.2,     :: [\%] Proud naprazdno
Uk=10,      :: [\%] Napeti nakratko
dPk=0.3,    :: [\%] Cinne ztraty nakratko
dP0=0.05,   :: [\%] Cinne ztraty naprazdno
Freq1=50;   :: [Hz] Jmenovita frekvence

Kva_Pre=N1*N1/(N2*N2);            :: [-]  Kvadrat prevodu
Omega=2pi*Freq1;                  :: [rad/sec] Uhlova rychlost
Zn=Un2**2/Sn;                     :: [Ohm] Jmenovita impedance

Rcu2=(dPk/100)*Zn/2;              :: [Ohm] Cinny odpor vinuti 2.
Rcu1=Rcu2*Kva_Pre;                :: [Ohm] Cinny odpor vinuti 1.
Zk=(Uk/100)*Zn/2;                 :: [Ohm] Podelna impedance
Lsigma2=sqrt(Zk**2-Rcu2**2)/Omega; :: [H] Rozptylova indukcnost vinuti 2.
```

```
Lsigma1=Lsigma2*Kva_Pre;          :: [H] Rozptylova indukcnost vinuti 1.

Gfe=(dP0/100)/Zn;                 :: [S] Pricna cinna admitance
Yg=(I0/100)/Zn;                   :: [S] Pricna admitance
Lh=1/sqrt(Yg**2-Gfe**2)/Omega;    :: [H] Hlavni reaktance
Rm=N2*N2/Lh;                      :: [-] Magneticky odpor jadra

OPT2B > @OnePhTra B1,G1,B2,G2 / N1=N1,N2=N2,Rcu1=Rcu1,
  Rcu2=Rcu2,Lsigma1=Lsigma1,Lsigma2=Lsigma2,Rm=Rm,Gfe=Gfe;
OPT1A > @OnePhTra A1,G1,A2,G2 / N1=N1,N2=N2,Rcu1=Rcu1,
  Rcu2=Rcu2,Lsigma1=Lsigma1,Lsigma2=Lsigma2,Rm=Rm,Gfe=Gfe;
OPT3C > @OnePhTra C1,G1,C2,G2 / N1=N1,N2=N2,Rcu1=Rcu1,
  Rcu2=Rcu2,Lsigma1=Lsigma1,Lsigma2=Lsigma2,Rm=Rm,Gfe=Gfe;
EO@;
```

Origin

Karel Noháč KEE, FEL, ZČU v Plzni

Last Update

November 8, 2019