Contents

esercizio asincrono

```
clear all

Pn=10e3
Vn=380
rendn=0.9
Rs=0.45
cosfin=0.89
n=3
pcc=10/100
vcc=15/100
po=20/100
Io=15
Tl=20
```

```
Pn =

       10000


Vn =

   380


rendn =

    0.9000


Rs =

    0.4500


cosfin =

    0.8900


n =

     3
```

```
pcc =

    0.1000

vcc =

    0.1500

po =

    0.2000

Io =

    15

Tl =

    20
```

Calcolo parametri

```
Pcc=pcc*Pn
Vcc=vcc*Vn
Po=po*Pn
Pfe=Po-3*Rs*Io^2
In=(Pfe+Pn+Pcc)/(sqrt(3)*Vn*cosfin)
Ro=Vn^2/Pfe
cosfio=Pfe/(sqrt(3)*Vn*Io)
Xo=Vn^2/(Pfe*tan(acos(cosfio)))
Rr=(Pcc-3*Rs*In^2)/(3*In^2)
cosfic=Pcc/(sqrt(3)*Vcc*In)
Xd=(Pcc*tan(acos(cosfic)))/(3*In^2)
```

```
Pcc =

        1000

Vcc =

    57

Po =

        2000

Pfe =

   1.6963e+03
```

```
In =

   21.6741


Ro =

   85.1290


cosfio =

    0.1718


Xo =

   14.8470


Rr =

    0.2596


cosfic =

    0.4673


Xd =

    1.3424
```

caratteristica linearizzata

```
om=2*pi*50
k=n*Vn^2/(om*Rr)
x=Tl/k
omega_m=om/n*(1-x)
Ir=(Vn/sqrt(3))/(sqrt((Rs+Rr/x)^2+Xd^2))
Pass=3*(Rs+Rr/x)*Ir^2+Pfe
Qass=3*Xd*Ir^2+(Pfe*tan(acos(cosfio)))
Is=sqrt(Pass^2+Qass^2)/(sqrt(3)*Vn)
rend=(Tl*omega_m)/(Pass)
```

```
om =

  314.1593


k =

   5.3123e+03
```

```
x =

    0.0038

omega_m =

  104.3255

Ir =

    3.1609

Pass =

   3.7763e+03

Qass =

   9.7661e+03

Is =

   15.9087

rend =

    0.5525
```

calcolo scorrimento nominale

```
A=(Pn*(Rs^2+Xd^2)+Rr*Vn^2)
B=2*Rs*Rr*Pn-Vn^2*Rr
C=Pn*Rr^2
xn=(-B+sqrt(B^2-4*A*C))/(2*A)
x2n=(-B-sqrt(B^2-4*A*C))/(2*A)
```

```
A =

   5.7526e+04

B =

  -3.5146e+04

C =

  673.7746
```

```
xn =

    0.5911

x2n =

    0.0198
```

dati generatore sincrono

```
Ans=20e3
Vns=380
cosfins=0.8
xs=150/100
Veccn=20
Ieccn=3
rendns=0.9
Pl=10e3
cosfil=0.78
Ins=Ans/(sqrt(3)*Vns)
Xs=xs*Vn/(sqrt(3)*Ins)
Pcus=(Ans*cosfins*(1-rendns)-rendns*(Veccn*Ieccn))/rendns

Rss=Pcus/(3*Ins^2)

Il=Pl/(sqrt(3)*Vn*cosfil)
Er=Vn/sqrt(3)+Rss*Il*cosfil+Xs*Il*sin(acos(cosfil))
Ei=-Rss*Il*sin(acos(cosfil))+Xs*Il*cosfil
E=sqrt(Er^2+Ei^2)

Ern=Vn/sqrt(3)+Rss*Ins*cosfins+Xs*Ins*sin(acos(cosfins))
Ein=-Rss*Ins*sin(acos(cosfins))+Xs*Ins*cosfins
En=sqrt(Ern^2+Ein^2)
Vecc=E*Veccn/En
delta=atan(Ei/Er)
Recc=Veccn/Ieccn
rends=Pl/(Pl+3*Rss*Il^2+Vecc^2/Recc)
```

```
Ans =

       20000

Vns =

   380

cosfins =

    0.8000

xs =

    1.5000
```

```
Veccn =

    20

Ieccn =

     3

rendns =

    0.9000

Pl =

       10000

cosfil =

    0.7800

Ins =

   30.3869

Xs =

   10.8300

Pcus =

   1.7178e+03

Rss =

    0.6201

Il =

   19.4788

Er =

  360.8261

Ei =

  156.9860
```

```
E =

  393.4972

Ern =

  431.9216


Ein =

  251.9657


En =

  500.0430


Vecc =

   15.7385


delta =

    0.4104


Recc =

    6.6667


rends =

    0.9308
```

ese trafo parallelo

```
I2t=100
cosfi2t=0.8
V1nt=1500
Anat=40e3
vccat=4/100
Anbt=20e3
vccbt=5/100
cosfict=0.6
K=5
V20=V1nt/K
Vccat=vccat*V20
Vccbt=vccbt*V20
I2nat=Anat/V20
I2nbt=Anbt/V20
Pccat=Vccat*I2nat*cosfict
Pccbt=Vccbt*I2nbt*cosfict

Rccat=Pccat/I2nat^2
```

```
Rccbt=Pccbt/I2nbt^2
Xccat=Rccat*tan(acos(cosfict))
Xccbt=Rccbt*tan(acos(cosfict))
Zat=Rccat+j*Xccat
Zbt=Rccbt+j*Xccbt
Zpar=Zat*Zbt/(Zat+Zbt)
Rpar=real(Zpar)
Xpar=imag(Zpar)
deltaV=(Rpar*I2t*cosfi2t+Xpar*I2t*sin(acos(cosfi2t)))
V2t=V20-deltaV
I2at=I2t*Zbt/(Zat+Zbt)
I2bt=I2t*Zat/(Zat+Zbt)
alfa1=abs(I2at)/I2nat
alfa2=abs(I2bt)/I2nbt

rend
rendtot=(V2t*I2t*cosfi2t)/(V2t*I2t*cosfi2t+Rpar*I2t^2)
```

```
I2t =

   100


cosfi2t =

    0.8000


V1nt =

        1500


Anat =

       40000


vccat =

    0.0400


Anbt =

       20000


vccbt =

    0.0500


cosfict =

    0.6000


K =
```

```
     5

V20 =

   300

Vccat =

    12

Vccbt =

    15

I2nat =

  133.3333

I2nbt =

   66.6667

Pccat =

   960

Pccbt =

   600

Rccat =

    0.0540

Rccbt =

    0.1350

Xccat =

    0.0720

Xccbt =

    0.1800

Zat =
```

```
    0.0540 + 0.0720i

Zbt =

    0.1350 + 0.1800i

Zpar =

    0.0386 + 0.0514i

Rpar =

    0.0386

Xpar =

    0.0514

deltaV =

    6.1714

V2t =

  293.8286

I2at =

   71.4286

I2bt =

  28.5714 - 0.0000i

alfa1 =

    0.5357

alfa2 =

    0.4286

rend =

    0.5525

rendtot =

    0.9839
```

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