$$i(t) = i_{ac}(t) + i_{dc}(t)$$
$$= \frac{\sqrt{2}V}{Z}[\sin(\omega t + \alpha - \theta) - \sin(\alpha - \theta)e^{-t/T}] \quad A$$

where

$$i_{ac}(t) = \frac{\sqrt{2}V}{Z}\sin(\omega t + \alpha - \theta) \quad A$$

$$i_{dc}(t) = -\frac{\sqrt{2}V}{Z}\sin(\alpha - \theta)e^{-t/T} \quad A$$

$$Z = \sqrt{R^2 + (\omega L)^2} = \sqrt{R^2 + X^2} \quad \Omega$$

$$\theta = \tan^{-1}\frac{\omega L}{R} = \tan^{-1}\frac{X}{R}$$

$$T = \frac{L}{R} = \frac{X}{\omega R} = \frac{X}{2\pi f R} \quad s$$

P.436

$$I_{rms}(t) = \sqrt{[I_{ac}]^2 + [I_{dc}(t)]^2}$$
$$= \sqrt{[I_{ac}]^2 + [\sqrt{2}I_{ac}e^{-t/T}]^2}$$
$$= I_{ac}\sqrt{1 + 2e^{-2t/T}} \quad A$$

P.437

Component	Instantaneous Current (A)	rms Current (A)
Symmetrical (ac)	$i_{ac}(t) = \frac{\sqrt{2}V}{Z}\sin(\omega t + \alpha - \theta)$	$I_{ac} = \frac{V}{Z}$
dc offset	$i_{dc}(t) = \frac{-\sqrt{2}V}{Z}\sin(\alpha - \theta)e^{-t/T}$	
Asymmetrical (total)	$i(t) = i_{ac}(t) + i_{dc}(t)$	$I_{rms}(t) = \sqrt{I_{ac}^2 + i_{dc}(t)^2}$ with maximum dc offset: $I_{rms}(\tau) = K(\tau)I_{ac}$

P.437

X''_d = direct axis subtransient reactance
X'_d = direct axis transient reactance
X_d = direct axis synchronous reactance

P.439

Component	Instantaneous Current (A)	rms Current (A)
Symmetrical (ac)	(7.2.1)	$I_{ac}(t) = E_g\left[\left(\frac{1}{X''_d} - \frac{1}{X'_d}\right)e^{-t/T''_d} + \left(\frac{1}{X'_d} - \frac{1}{X_d}\right)e^{-t/T'_d} + \frac{1}{X_d}\right]$
Subtransient		$I'' = E_g/X''_d$
Transient		$I' = E_g/X'_d$
Steady-state		$I = E_g/X_d$
Maximum dc offset	$i_{dc}(t) = \sqrt{2}I''e^{-t/T_A}$	
Asymmetrical (total)	$i(t) = i_{ac}(t) + i_{dc}(t)$	$I_{rms}(t) = \sqrt{I_{ac}(t)^2 + i_{dc}(t)^2}$ with maximum dc offset: $I_{rms}(t) = \sqrt{I_{ac}(t)^2 + [\sqrt{2}I''e^{-t/T_A}]^2}$

P.440

T = temps de durée

Section 8

$$a^4 = a = 1\angle 120°$$
$$a^2 = 1\angle 240°$$
$$a^3 = 1\angle 0°$$
$$1 + a + a^2 = 0$$
$$1 - a = \sqrt{3}\angle -30°$$
$$1 - a^2 = \sqrt{3}\angle +30°$$
$$a^2 - a = \sqrt{3}\angle 270°$$
$$ja = 1\angle 210°$$
$$1 + a = -a^2 = 1\angle 60°$$
$$1 + a^2 = -a = 1\angle -60°$$
$$a + a^2 = -1 = 1\angle 180°$$

P. 494

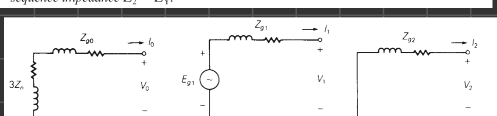
$$a^2 = (1\angle 120°)(1\angle 120°) = 1\angle 240°,$$

J = 90° de déphasage

a = 120° de déphasage

As shown in (8.2.13), the zero-sequence voltage V_0 depends only on the zero-sequence current I_0 and the impedance $(Z_Y + 3Z_n)$. This impedance is called the *zero-sequence impedance* and is designated Z_0. Also, the positive-sequence voltage V_1 depends only on the positive-sequence current I_1 and an impedance $Z_1 = Z_Y$ called the *positive-sequence impedance.* Similarly, V_2 depends only on I_2 and the *negative-sequence impedance* $Z_2 = Z_Y$.

P. 501

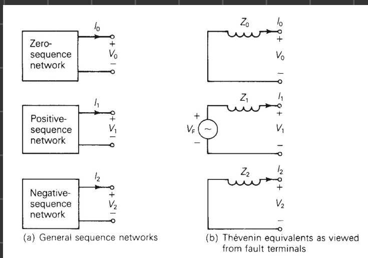


Zero-sequence network   Positive-sequence network   Negative-sequence network

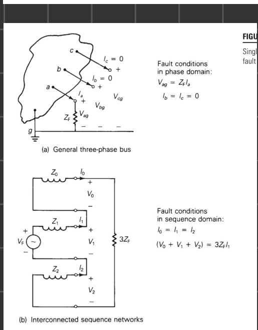
Machines synchrone

P. 511

section 9



P.549



une seul phase qui est connecter au ground donne le schéma (b)

P. 553

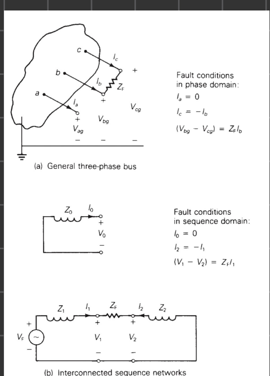
$$I_0 = I_1 = I_2 = \frac{V_F}{Z_0 + Z_1 + Z_2 + (3Z_F)}$$

Transforming (9.2.7) to the phase domain via (8.1.20),

$$I_a = I_0 + I_1 + I_2 = 3I_1 = \frac{3V_F}{Z_0 + Z_1 + Z_2 + (3Z_F)}$$

Note also from (8.1.21) and (8.1.22),

$$I_b = (I_0 + a^2 I_1 + aI_2) = (1 + a^2 + a)I_1 = 0$$
$$I_c = (I_0 + aI_1 + a^2 I_2) = (1 + a + a^2)I_1 = 0$$



Phase connecter entre eux

P. 558

$$I_1 = -I_2 = \frac{V_F}{(Z_1 + Z_2 + Z_F)} \qquad I_0 = 0 \tag{9.3.10}$$

Transforming (9.3.10) to the phase domain and using the identity $(a^2 - a) = -j\sqrt{3}$, the fault current in phase b is

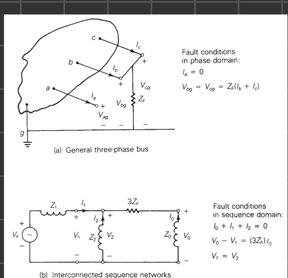
$$I_b = I_0 + a^2 I_1 + aI_2 = (a^2 - a)I_1$$
$$= -j\sqrt{3}I_1 = \frac{-j\sqrt{3}V_F}{(Z_1 + Z_2 + Z_F)} \tag{9.3.11}$$

Note also from (8.1.20) and (8.1.22) that

$$I_a = I_0 + I_1 + I_2 = 0 \tag{9.3.12}$$

and

$$I_c = I_0 + aI_1 + a^2 I_2 = (a - a^2)I_1 = -I_b$$



double au ground

P. 560

$$I_1 = \frac{V_F}{Z_1 + [Z_2//(Z_0 + 3Z_F)]} = \frac{V_F}{Z_1 + \left[\frac{Z_2(Z_0 + 3Z_F)}{Z_2 + Z_0 + 3Z_F}\right]} \tag{9.4.12}$$

Using current division in Figure 9.12(b), the negative- and zero-sequence fault currents are

$$I_2 = (-I_1)\left(\frac{Z_0 + 3Z_F}{Z_0 + 3Z_F + Z_2}\right) \tag{9.4.13}$$

$$I_0 = (-I_1)\left(\frac{Z_2}{Z_0 + 3Z_F + Z_2}\right) \tag{9.4.14}$$